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MEASURING QUALITY OF LIFE IN SOUTH AFRICA: A HOUSEHOLD -BASED DEVELOPMENT INDEX APPROACH

BY

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ABSTRACT

TITLE: MEASURING QUALITY OF LIFE IN SOUTH AFRICA: A HOUSEHOLD -BASED DEVELOPMENT INDEX APPROACH

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This study commences with an overview of the concept "quality of life" as perceived from a developmental point of view. The study focuses on the current measures of the improvements in quality of life which operate at different measurement levels. Most of the measures are economic in nature like household income and income per capita, gross domestic product (GDP) and Gross national product (GNP) (Todaro, 1997). Other quantitative measures considered by the current study include measures of wealth particularly the Living standards measurement (LSM) by the South African advertising and research foundation (SAARF), Consumer confidence index (CCI), Index of economic well-being and the Human Development index (HDI) among others (Hagerty *et al*., 2001). A household-based measure using nominal level data, the LSM in particular tracks improvements in household wealth (as opposed to household income) through changes in household possession of durable items. Subjective measures of quality of life and changes in life satisfaction are looked at by the current study, including studies by Erikson (1993), Moller (1987, 1996, 1997) and, the wellbeing measures by Diener and Suh (1997) amongst others.

Quality of life however, is not just about money as economics might have it portrayed. It is not just about how individuals feel because, according to Diener and Suh (1997), feelings are in most cases a response to external influences. Quality of life is a complex and multidimensional phenomenon which needs to be viewed holistically. As a result this study embarked on developing a measure of quality of life (a quality of life index) using household data pertaining to socio-economic aspects. The level of measurement for the data is ordinal. Operatinalised at household level, the measure was intended to

analyse changes in household quality of life (QOL) between 1996 and 1999. Data for October household surveys for the period 1999-1996 was used in the study.
The analysis focused on changes in household access to selected indicators of quality of life. The study applied cluster analysis to group households accessing similar QOL indicators into QOL groups. Identifying the indicator or indicators which differentiate the QOL conditions among QOL groups was achieved through the use of discriminant function analysis. The entire array of QOL groups or clusters from a particular set of data (OHS 1996-OHS1999) constituted the QOL index.

The main findings of this study are that broadly, there has been an improvement in household quality of life (QOL), basing on the developed measure of quality of life. This is revealed by an increase in the number of clusters of households or QOL groups from five in 1996 to eight in 1999. The study attributes the increase in QOL groups to an increase in households' ability to access the selected QOL indicators. In spite of the increase in the number of QOL clusters, the study finds that proportionally fewer households are found in the QOL groups with better material living conditions (i.e. measurable QOL) than otherwise. This is contrary to the expected pattern in development terms based on empirical evidence in South Africa (see SAARF, 2002; SAARF, 2004; Stats SA, 1996; Stats SA, 2001; Stats SA, 2004). The study also finds that female headed households are generally predominant in groups with poor QOL. Discriminant function analysis results highlight *access to toilet*, *refuse disposal services* and *water source* as discriminant indicators in addition to *Highest level of education completed by a household head* and, *Employment status of household head, among others.* The latter consistently differentiate between groups of households throughout the reference period except in 1999.

Findings relating to the influence of household material conditions on perceived quality of life show that proportionately more households in groups with the better access to the selected QOL indicators being satisfied with life than otherwise. A point worthy noting is the consistency in the proportions of households which felt that things had not changed after all, irrespective of the groups' ranks, throughout the reference period.

The key conclusion drawn from these findings is that low levels of education and employment status among household heads strongly influence household quality of life. These two indicators have been found to consistently differentiate the QOL conditions among the QOL groups that emerged. Groups on the poor side of the QOL index are characterized by high unemployment, illiteracy and dysfunctional levels of education for most household heads therein. Most households belonging to the poorest QOL groups are rural-based (found in Eastern Cape, Limpopo, Kwazulu Natal and Mpumalnga), with poor access to basic services identified under discriminant function analysis. The situation is likely to be complicated by the existence of substantial proportions of households headed by people aged 15-19 identified in this study. This needs to be taken seriously particularly in the current era of the HIV/AIDS pandemic (see HSRC, 2002; Rosa, 2003). The study's findings have revealed that poor QOL among households is not related to the sex of the household head. Although female headed households are predominant in groups of households with poor QOL conditions, adjacent to such groups are households in groups with almost equally poor living conditions the majority of which are males-headed. What is needed therefore is a holistic focus on the factors that impede households' ability to sustain better living conditions.

Most of the study's recommendations reinforce initiatives which are being undertaken in the development agenda. For instance the need to improve people's level of education does not need any more emphasis given the study's results. Sustaining improved household QOL will require households to have a capability of meeting their needs. Successful completion of education – tertiary as opposed to functional literacy- opens channels for households to lead a better life. Achieving this level of education requires time, which from a demographic point of view, most of the currently uneducated household heads may not have. While much has been done in enabling households to access basic services like housing, electricity and water, payment for such services remains the responsibility of individual households. Inability to pay for services – due to unemployment and lack of education-will just perpetuate household dependency on social grants.

It is also recommended that in-depth qualitative studies be undertaken to establish the apparent consistent gap between objective living conditions and subjective life satisfaction among households if realistic policy objectives are to be achieved.

The study recommends a further application of the formulated QOL index particularly on current data with similar indicators. A more rigorous thinking around the weighting of individual QOL indicators will iron out the inconsistencies observed in the study's results. This will provide an opportunity to standardise the indicators, update the results of the QOL index while enhancing triangulation at the same time.

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LIST OF ABREVIATIONS

AIDS	Acquired Immune -Deficiency Syndrome
AMPS	All Media Products Survey
DF	Discriminant Function
DFID	Department for Finance and International Development
EC	Eastern Cape
HIV	Human Immune Virus
HSRC	Human Sciences Research Council
ICP	International Comparison Programme
IFAD	International Fund for African/Agricultural Development
KZN	KwaZulu-Natal
LDF	Lineardiscriminant function
LFS	Labour Force Survey
LSM	Living Standards Measure
OHS	October Household Survey
PhD	Doctorate of philosophy
QOL	Quality Of Life
QOL	Quality Of Life
SAARF	South African Advertising Research Foundation
SARPN	Southern African Regional Poverty Network
Stats SA	Statistics South Africa
SWB	Subjective Well-Being
U.S.A	United States of America
U.S	United States of America
VIP	Ventilated Improved Pit latrine

CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1 Introduction

The objective of a development policy is to improve the living conditions of the people**.** In the process people's quality of life improves. One question that arises when one thinks about improving quality of life is, can quality of life be measured? This question needs an objective answer if comparison in people's quality of life is to be made. Some indicators of quality of life which are currently in use vary from micro-level indicators like household income to aggregated measures like the gross domestic product (GDP) and Gross national product (GNP) (Todaro, 2000). Quality of life however, is not just about money as expressed in terms of per capita income and other aggregated economic measures. Quality of life is a complex and multidimensional phenomenon which needs to be viewed holistically.

Other measures of quality of life have taken into consideration the basic human needs - a socio-economic status approach. One such measure is the living standards measure (LSM) which was developed by the South African advertising research foundation (SAARF). While the measure is at the micro - level (the unit of measurement being individuals or households), the measure uses data that are nominal in nature. This excludes the use of data that are ordinal in nature - take for instance, distance from a water source or the type of toilet facility used by a household. The quality of life enjoyed by households varies considerably in terms of the degree to which households access most basic needs. The aim of this study is to develop a measure of quality of life where data pertaining to socio-economic aspects are at the ordinal level of measurement.

1.2 The background

The inequalities in socio-economic conditions experienced in South Africa can be traced mainly in the previous apartheid policies. This is evident in the settlement pattern of the African people which differs considerably from those of the other racial groups in the country. According to Gelderblom and Kok (1994:67) Africans did not share the experience of widespread urbanisation undergone by the other inhabitants of South Africa to the same extent as the latter, mainly because of the influx control measures.

These measures ensured that Africans lived in predominantly rural areas that were designated to them, the intention having been, to regulate and monitor the rural-urban influx to the so-called white areas. Influx control measures had the following implications:

- Control was exercised over the mobility of Africans. In this way, Africans required, in general, permission to leave the reserves and the white farms in order to reside in the urban areas.
- Africans could stay in towns only if they satisfied various conditions. The basic principle was that Africans should be allowed in municipal areas only for as long as their presence was needed by the white population. The following two quotations are extracted from the Stallard Report (Transvaal 1922) by Gelderblom and Kok (1994:84): "The native should only be allowed to enter urban areas, which are essentially the creation of the whites, to provide in the needs of whites and should leave when he is no longer subservient", and "the masterless, idling-about native is in urban areas a source of danger and a cause of degeneration of both whites and blacks".

It needs to be mentioned however that, the Stallard doctrine was not always implemented to the word in government policies to the same degree. According to Gelderblom and Kok (1994), the amendment to the Native (Urban Areas) Act that was effected in 1937, recognised that Africans who were born in an urban area could not be removed from it if they became unemployed. This right to permanent urban settlement for some categories of African people was also included in the Bantu (Urban Areas) Consolidation Act of 1945 and, for a number of reasons, never really tampered with even during the most extreme periods of Apartheid rule.

- Africans required permission to be employed. According to Gelderblom and Kok (1994), the Black Labour Act of 1964 and the Black Labour Regulations of 1965, decreed in terms of this act, made provision for labour bureaux that controlled the employment of Africans.
- A document (the so-called reference book or “Dompas”), which had to be carried by Africans, was introduced and used to monitor their compliance with the various measures. The “Dompas”, in addition to the fact that it replaced the many documents African men used to carry before the Abolition of Pass laws, had a far wider scope for, African women also had to carry it (Gelderblom & Kok, 1994:83 – 85).

The reasons for influx control were intended to serve political and economic purposes but, the social and economic consequences were far reaching. On the economic side, many employers in South Africa (especially those in mining and agriculture) saw influx control as an aversion to the workings of the African labour market and the usual forces of supply and demand, because they felt that competing for African labourers would cause a rise in wages. This was undesirable. On the political side, there was a fear that if Africans were allowed to reside permanently in towns, they would insist on demanding political rights. Granting political rights would inevitably lead to a demand for economic rights–the rights to employment, access to municipal services and even a right to property.

With time, particularly in the early sixties, it became evident that the influx control measures were not effective, partly because restricting black urbanisation went on in spite of the influx control measures and, restricting blacks to townships resulted in overcrowding and terrible living conditions. Of course the ineffectiveness of the influx control measures never came with no cause. During the Second World War the ANC, founded in 1912, together with its allies organised protests against the pass laws. This to a fair extent, coupled with the failure of the labour bureaux to control the employment of the Africans in urban areas, saw African/Black urbanisation rise substantially. By 1960 31% of the total African population was urbanized (see Gelderblom & Kok, 1994).

To stem rural – urban – migration of Africans, the Apartheid government created homeland states, hoping that with the decentralisation of industries into the homelands, migration streams will be channeled into the homelands. It was hoped that this move will, with time, attract Blacks from the white towns. This move did not work as expected, to the extent that Blacks, who did not move voluntarily, had to be forcefully removed from white cities and towns. The movements (voluntary and otherwise) into the homelands happened without the national government making sufficient effort to ensure that the homeland administration had the capacity to provide adequate living conditions for the people, talk less of employment provision. All this changed in 1994 with the coming of the new democratically elected government.

After the 1994 national government elections, an initiative was undertaken to review development considerations. A national development programme characterised by targeted social spending on sectors such as health, education and infrastructure capacity building came into being (Erasmus, 1994:9). Economic restructuring and development required the design of a strategic framework for economic restructuring; the facilitation of public debate at national, regional and local level to achieve its translation into practical strategies on national, regional and local level, and the design of institutional systems to manage the support programmes and projects at all levels – reconstruction and development (Erasmus, 1994:10 – 11). It is against this backdrop that the current study is undertaken as a way to establish the achievements made by the new government in respect of improving people's quality of life.

1.3 The problem statement

The concept "quality of life" (QOL) is not entirely new. Equally so is the measurement of QOL as a way of assessing development. As indicated earlier on, the objective of having a development policy in place is to ensure that development takes place. Development in its broad sense is about improving people's quality of life be it at work, at home, in transit from one place to another, even in the process of healing when one is sick. Available literature indicates that several measures of development are available, some of which are at the meso- or macro- level (see Human development report, 2001; Erasmus, 1995). Most of these measures are economic in nature, like the GDP, GNP, and per capita income. These measures do not highlight the disparities within a population as far as access to resources is concerned. A rise in GDP does not necessarily imply an increase in income and improvement in people's living conditions (Todaro, 1997:148; Todaro, 2000:163). Access to resources plays a great role in determining people's living conditions. This in turn reflects the quality of life that people enjoy.

Attempts to measure quality of life in South Africa have been made at both the subjective and objective levels. At the subjective level, a study of people's perception of well-being and life satisfaction has been conducted by Moller *et al*.(1987). The main aim was to provide a basis for observation of future trends in the improvement of living standards and people's

assessment of their life circumstances. A research instrument was developed for this purpose, which could be used to monitor changes in people's quality of life based on their own assessment of the life circumstances they happen to find themselves in. This study analysed the relationship between overall quality of life (dependent variable) and various quality of life indicators. After employing a series of multivariate inferential techniques, results revealed a great deal of consistency with regard to what impacts most on overall quality of life within the population categories of the surveyed people.

Results indicated that irrespective of population group the most salient and "reliable" domain issues (or indicators in the case of the current study) of quality of life are the following:

- Ability to provide for family
- Health
- Quality and quantity of food
- Wages and incomes
- Personal possessions
- Financial security in old age
- Dwelling adequacy
- Education
- Job opportunity

(See Moller *et al*., 1987:7).

Results emanating from multivariate inferential analysis indicate a relatively low explanatory power of the components of quality of life as far as quality of life is concerned. The ten most salient components listed above for the entire sample indicate that 43% of the variation in life satisfaction is accounted for by the variation in the ten components. This seems to reinforce the complex nature of quality of life and how a multidimensional approach to analysing quality of life aspects at the ordinal level could possibly improve the explanatory power.

A more relatively recent study, also qualitative in nature, was conducted by Moller (1996). This study analysed household satisfaction by comparing past household satisfaction (in terms of financial achievement), current satisfaction, and expectations of satisfaction in future

(Moller, 1996:239). One of the questions the study addressed focused on the relationship between level of satisfaction and a household's level of income and expenditure. A related question was whether lower income levels are associated with basic needs to a greater degree than higher incomes. The findings of this study indicate a positive relationship between level of satisfaction as a variable, and household income and expenditure. This finding calls for further investigation as far as this relationship is concerned. Given the existence of this relationship, what proportion of households in South Africa fall within the confines of this established relationship currently?

A quantitative measure of quality of life at the household level was formulated by the South African advertising research foundation (SAARF). The living standards measure (LSM) is a scale used to indicate the socio-economic status of an individual or group of individuals. The LSM has undergone changes in the process of fine tuning it, to the current SAARF universal LSM (see SAARF Universal LSM, 2002). The target population of the LSM are marketers. The contribution of the SAARF Universal LSM towards measuring QOL and development as such is enormous. One shortcoming identified with this measure lies in the nature of the data used in its construction. The variables are at the nominal level of measurement. It is a fact that data pertaining to many socio-economic aspects impacting on QOL are ordinal in nature if not at higher levels of measurement.

Bearing in mind that ordinal level variables and variables at higher level of measurement can be collapsed and analysed at nominal level, the act of collapsing variables involves a trade - off of vital information in the process. The aim of this study is to develop a measure of QOL in which socio-economic aspects impacting on quality of life are measured at the ordinal level. In this way a household's level of development will be measured in respect of the socio-economic aspects (or indicators for that matter which a household accesses) impacting on the household.

1.4 Aims of the study and research questions

The aim of this study is to measure quality of life and, to analyse the changes in household quality of life between 1996 and 1999.

The analysis will focus on changes in household access to selected indicators of quality of life. The indicators will fall in the following broad categories:

- Indicators relating to durable items including household appliances like refrigeration, television, etc.;
- Indicators relating to household access to services, like water, sanitation, and electricity;
- Indicators relating to infrastructure facilities, like type of dwelling, toilet, etc. and;
- Subjective indicators pertaining to household life satisfaction.

The analysis will be guided by the following major questions which have already been raised by among others; HSRC, Stats SA, SAARF, parliamentary politicians, the media, and the public domain.

- Can quality of life be objectively measured?
- What has been happening to QOL in South Africa?
- What are the prevailing gender differentials in household QOL in South Africa?
- What is the situation regarding child - headed households and, what are the likely implications?
- What do previous research findings reflect?
- What is the international situation in terms of household QOL?
- Is household life satisfaction related to the conditions of QOL a household finds itself in? Put differently, do material conditions influence household life satisfaction?
- Has quality of life in South Africa actually improved?

Answers to these questions will enable the researcher to get a better understanding of the concept "quality of life". The researcher will then be able to measure QOL, analyse the changes that have taken place during the period 1996–1999, and answer the most pertinent question that this study seeks to answer – whether quality of life in South Africa has improved.

1.5 Operationalisation, assumptions and delimitations

The term "operationalism" refers to operations carried out in the measurement of a concept. Researchers who emphasise operationalism generally seek quantitative measures of their concepts.

Today it is customary to solve problems of representation by means of the development of operational specifications of theoretical, abstract terms. According to Kibuuka (1998:36), the function of operational specification is to transform the theoretical term to a measurable variable. To a strict operationalist, measurement error is not a major problem, simply because the concept is defined to be that which is measured.

For the purpose of this study, the construct *quality of life* needs to be defined and this is not an easy task given its complexity and the subjective value attached to its rationalization. Furthermore the definition and/or determination of *quality of life* has to be approached from a perspective of a particular discipline. According to Diener and Suh (1997:189), there are three major philosophical approaches to determining the quality of life. The first approach describes the characteristics of the good quality of life that are dictated by normative ideals based on a religious, philosophical, or other systems. An example of this approach is given where we might believe that the good life must include helping others because this is dictated by our religious principles.

Another approach to defining the good life is based on satisfaction of preferences. Within the constraints of the resources they possess, the assumption here is that people will select those things that will most enhance their quality of life. In this tradition, the definition of the quality of life of a society is based on whether the citizens can obtain the things they desire. People select the best quality of life for themselves that is commensurate with their resources and individual desires. This approach to utility or the good life based on people's choices under girds much of modern economic thinking. In a way, it is in line with the approach of the South African government to population and development. The programme of action, within the context of the current population and development paradigm, endorses a development strategy that emphasises the reciprocal relationships between population, development and environment. It focuses on meeting the needs of the people rather than on achieving demographic targets. One of the objectives is the need to fully integrate population concerns into all development strategies, planning, decision making and resource allocation, with the goal of meeting the needs and improving the quality of life of present and future generations. "Sustainable human development" sees development as a process of enlarging people's choices.

The role of government in development is the creation of an enabling environment for people to enjoy long, healthy and creative lives. The challenge is to meet the needs of the present generation and to improve their quality of life without destroying the environment or depleting non-renewable natural resources, which would compromise the ability of future generations to meet their own needs (South African population policy, 1998:4-7).

The third definition of quality of life is in terms of the experience of individuals. If a person experiences her life as good and desirable, it is assumed to be so. In this approach, factors such as feelings of joy, pleasure, contentment, and life satisfaction are paramount. This approach to defining the quality of life is most associated with the subjective well–being tradition in the behavioral sciences. This study will operationalise quality of life by considering the second and third approaches.

Bearing the two approaches above in mind, an operational definition that could possibly be close to that of *quality of life* is the one of *Level of living* used by Erikson. Erikson (1993, 72) defined *Level of living* as "*The individual's command over resources* in the form of money, possessions, knowledge, mental and physical energy, social relations, security and so on, *through which the individual can control and consciously direct his living conditions*". The central element in his definition is the individual's "command over resources". In Erikson's view, it is difficult, if not impossible to judge the level of living of an individual or a group, without knowing their resources and conditions in several respects, which are not transferable between each other. To have knowledge about, for example, economic conditions is just not enough; we also have to know about health, knowledge and skills, social relations, conditions of work, etc., in order to determine the level of living. There is no common yardstick through which the different dimensions could be compared or put on a par. No objective or impartial way exists by which it would be possible to decide which of two men is better off if one of them has, for example, worse health but better economic conditions than the other. Welfare or level of living seems, at least in the European tradition, to be based either on people's needs or on their resources. If needs are made central, then the concern is with the "degree of need–satisfaction'. If resources are made central then the concern is rather with man's capacity to satisfy those needs or, more generally, to "control and consciously direct his living conditions";

the individual's level of living thus being an expression of his "scope of action" (Erikson, 1993:72).

In view of the various approaches to quality of life mentioned above, the current study will have *quality of life* defined from a needs–satisfaction perspective. This study perceives a household's *quality of life* to be *conditioned* by the degree to which the household is able to meet its needs. The *conditioning* emanates from the fact that different households experience different QOL conditions not only in terms of what proportion of the whole range of household needs are satisfied, but also in terms of the quality of the needs which are satisfied. The whole range of household needs can certainly not be established, nor can the entire spectrum of what each household considers to be the best, in quality terms, for each need. This said however, there is a wide variety of basic human needs recognized internationally, which every human being should not miss out upon; housing, water, education, health, employment for the economically active, transport, security of life and property, to mention but a few. These are basic needs – referred to as indicators of quality of life in this study - which every household needs to access but, the degree of access differs from household to household due to a number of factors. For instance, a household in a rural area is unlikely to access tertiary education with the same ease or cost as a household in the city because tertiary institutions are usually located in urban areas. The same applies to other needs like clean water, transport, electricity, telephones, health services, etc. Households in rural areas experience relatively poorer living conditions or, call it poorer quality of life because of the differences in infrastructure - a meso-level factor. Households in the same locality also do experience different quality of life (QOL hereafter) because of the differences in ability to access what is needed and/or what is available. For instance in a rural setting, a better off household in terms of income will dig its own bore hole in the compound, and even install a water pump, which a poor household cannot do. Even if piped water were availed in the locality, installing piped water in the dwelling will be done by the household with the necessary financial capability; the poorer household will not be able to have water in the dwelling. The two households experience similar meso-level conditions but they will experience different living conditions because of the situations they experience as individual households.

Looking at household needs in a broad framework will be elusive if the contextual conditions in which such needs are satisfied are ignored. Take safety as an example. Household safety has two interconnected components, both of which, from a need perspective, are subjective. One component of household safety deals with safety within the household. This component could be judged and expressed from the point of view of how household members feel in respect of how difficult it is for an intruder to gain entry without permission. While this [safety] depends a great deal on the physical structure of the premises and other early warning systems, which in themselves are a function of income in particular, such safety is also influenced by safety in the neighbourhood or community- community safety being the other safety component. The two components may be considered by the household in assessing the overall safety situation of the household. They may be interconnected but implementing them is quite different. Community safety is implemented by security services like the police, and other local initiatives like neighbourhood watch, and private security organisations.

Most of these security services can be found in urban areas, not in rural areas. The current study will assert that while safety is a basic human need, satisfying it depends on where a household happens to be located because location determines the type of service(s) - at community level - that are available. Thus a household's perception of its safety will be contextually conditioned by the extent to which its safety as a need is satisfied. Essentially a household's quality of life is shaped or determined by what needs (or indicators in this study) it can satisfy under certain conditions. The conditions play a critical role in influencing the extent to which needs or indicators can be satisfied or accessed.

Several other terms also need to be defined. These are terms which were used in the October household surveys of Stats SA and they are as follows:

- A *household* consists of a single person or a group of people who live together for at least four nights a week, who eat together and who share resources.
- A *hostel* is a communal living quarter for workers, provided by a public organisation such as a local authority, or a private organisation such as a mining company. These were residential dormitories established for migrant workers during the apartheid era, and they continue to house people working in certain industries, such as the mining industry.

- The *employed* are those who performed work for pay, profit or family gain in the seven days prior to the household survey interview, or who were absent from work during these seven days, but did have some for of paid work that they would return to.
- The *formal sector* includes all businesses which are registered for tax purposes, and which have a VAT number.
- The informal sector consists of those businesses that are unregistered and do not have a VAT number. They are generally small in nature, and are seldom run from business premises. Instead, they are run from homes, street pavements or other informal arrangements.
- An *urban area* is one that was legally proclaimed as being urban under previous legislation. These include towns, cities and metropolitan areas.
- A *semi - urban area* is not part of a previously legally proclaimed urban area, but adjoins it. Informal settlements are examples of these types of areas. According to Statistics South Africa (2001:11), *semi- urban* areas have been included with non-urban areas.
- *Non-urban* areas include all other areas, including commercial farms, small settlements, rural villages, and other areas, which are further away from towns and cities.
- *Traditional dwellings* include huts or other dwellings made of traditional materials such as dung and straw
- Informal dwellings comprise shacks or shanties in informal settlements or in back yards. (Statistics South Africa, 2001:9 - 11).

1.5.1 **Assumptions**

There are some assumptions made for the purpose of this study namely:

- The relationship between quality of life and the indicators of quality of life.

  This study assumes that there is a direct relationship between quality of life and access to the indicators of quality of life. In this way households accessing a few of the selected indicators of quality of life are expected to experience relatively poorer quality of life as compared to households accessing most and the better part of the selected indicators. For instance a household using bore hole water or relying on public transport water and, having no telephone in the dwelling will be badly off as compared to a household having piped water in the dwelling, with its own car, and a telephone in the dwelling.

- The second assumption relates to a household's level of development. This assumption is in a way, derived from the first one. That is access to the indicators of quality of life is directly related to the household's level of development. Put in another way the more a household accesses most indicators and the better part of the said indicators the better is its quality of life and, the more developed the said household is.

1.5.2 The delimitations

Two important delimitations need to be clearly spelt out. One deals with quality of life. Quality of life will be measured, analysed and interpreted strictly in terms of access to the selected indicators thereof. The second delimitation deals with the reference period in relation to findings of the study. The study findings will refer to the period 1996 - 1999 to which the OHS data apply

1.6 Contribution of the study

This study is a follow-up on the study completed in 1999 by Kironji, titled "The formulation of a household-based development index and assessing the efficacy thereof in a rural area". The previous study served to test the methodology - the formulated index. Following its results and, having looked at the results of other studies particularly the SAARF Universal LSM^{TM}, HSRC, and Stats SA (2001), there is a need for another measure of quality of life. This study will quantify quality of life and, in the process, contribute towards an understanding of the changes in household differential access to the aspects that impact on quality of life. Not only will changes in material conditions be highlighted (a crucial factor for policy implementation), also the interrelationships between these changes and the subjective changes of quality of life will be depicted. The former is crucial in as far as refocusing the development policy objectives is concerned. This is particularly important in view of the fact that development is a collaborative process involving the various government departments.

1.7 The outline of the study

Following this introductory chapter, chapter two will focus on reviewing the literature related to the research on quality of life and related areas like living conditions, welfare, and

development. Although study findings in respect of the above research areas will be noted, particular attention will be paid to the methodology used in attaining the results. Focusing on the methodology will sharpen the understanding of the analytical methods, the technical problems associated with such methods, and how some problems have been dealt with in previous research. Of particular interest is the universal Living Standards Measure (LSM^{TM}) study by the South African advertising research foundation (SAARF). SAARF(2002) developed a measure of living standards, which constitutes an index that reflects the living standards of households or individuals on the basis of a wide range of consumer goods possessed.

Chapter three will focus on conceptualising quality of life in light of the operational definition of the concept *quality of life*, which has been dealt with at length in this chapter. A conceptual model will be developed to provide guidelines in understanding the aspects which impact on household quality of life, what makes households to experience different quality of life, and what aspects play a critical role in differentiating household quality of life (QOL hereafter). Literature on the linkages between quality of life and some pertinent indicators will be applied to inform and guide the development of the conceptual model. Following this section in Chapter three will be a description of the research methodology wherein, details regarding the processes involved in quantifying quality of life will be provided.

Chapters four to seven will present the findings of the study in respect of the emerging quality of life clusters. The quality of life index is consists of the entire array of quality of life groups emanating from cluster analysis. In the various QOL groups or clusters, conditions experienced by households in terms of what households in each cluster have access to, are described. The linear discriminant function (LDF hereafter) emanating from discriminant function analysis, describes the relative contribution of the QOL indicators to quality of life. The changes in the number and composition of the QOL groups and the corresponding LDFs for the period 1996 – 1999 will be analysed in order to assess the improvement in QOL conditions over this period.

In Chapter eight a discussion of the findings will be provided, and the extent to which the study results fit the conceptual model. The discussion will be done in collaboration with the reviewed literature in order to assess the areas where the findings are in agreement or disagreement with the literature. This is crucial as disagreement calls for possible explanation(s); whether the differences are due to changes in QOL or, due to the methodologies applied. Either way, clarity needs to be sought to avoid drawing misleading conclusions and making wrongly informed recommendations.

This study concludes with chapter nine where recommendations from the analysis of research findings is presented. The study's limitations are highlighted and, certain conclusions are drawn as well as recommendations for further research.

1.8 Summary

In this chapter, the background of the study has been presented, followed by the problem statement. Thereafter the aims of the study have been spelt out and motivated.

The research questions have been raised. Quality of life has been operationalised, and other operational definitions used in the October household surveys have been indicated. The accompanying assumptions and the study's delimitations have been stated, followed by the contribution of the study in the light of other previous research. The chapter ends by giving an outline of the study.

CHAPTER TWO: REVIEW OF THE RELATED LITERATURE

2.1 Introduction

The purpose of this chapter is to review the literature related to quality of life, population and development in general. Literature review will not only sharpen and deepen the ability to conceptualize development interactions, it will also make it possible to identify the salient variables which will serve as development indicators. Literature review will focus on a number of aspects. Among these are aspects relating to economic activity, and access to basic household needs like housing, health services, electricity and, water and sanitation. Literature related to population-development-environment link and, education and sustainable development will be conducted, plus aspects relating to subjective well being.

2.2 Qualitative measures of quality of life: A composite index of subjective "global" measure of quality of life

Measuring quality of life is a relatively new phenomenon both locally, in South Africa and internationally. With regard to South Africa, Moller *et al*. (1987) conducted a nationwide study in South Africa with the aim of measuring QOL on a subjective basis. Their study made use of data collected in 1982/83. The survey comprised of 5000 South Africans from all population groups. The study investigated respondents' perceptions of well-being and basic needs. The aim of the study was two fold:

- To provide benchmark data for the observation of future trends in the improvement of living standards and people's assessment of their life circumstance and,
- To develop an appropriate instrument for the measurement of perceived well-being - the subjective quality of life of South Africans.

The study came up with a standard set of QOL indicators which covered a wide spectrum, ranging from perceptions regarding material possessions (like dwelling, health, and income), to subjective issues like self esteem, freedom of choice and expression and, overall quality of life. By combining "global" measures of QOL - (1) satisfaction with one's life; (2) how happy a person is in life; (3) how happy a person is with taking things together-with indicators of

specific domain items, a composite index reflecting subjectively experienced QOL was derived (Moller *et al*, 1987:146).

The study went ahead and ranked the components of QOL. At this stage the degree of a person's overall satisfaction- ranging from "very satisfied" to "Don't know"- was taken as the dependent variable while QOL indicators served as the predictors. Multiple regression analysis was undertaken to quantify the contribution of the indicators to overall well-being. All the indicator variables were recorded as dichotomous scales, except in the case of per capita income (Moller *et al.*, 1987:31).

From the point of view of the current study, the derived measure has made a substantial contribution to understanding QOL in South Africa, especially along race lines. However the index is not without weakness, just like many measures. For instance, recoding the independent variables as dichotomous scales reduces their power in explaining the differences in the dependent variables. This is likely to be problematic given the fact that affluence on its own does not necessarily imply life satisfaction and happiness (Diener & Suh, 1997:207). Secondly it is important to know people's perceptions regarding how satisfied they are with life but, much as material possession does not automatically translate into life satisfaction and happiness, lack of material basic needs can never reflect satisfactory QOL. Lastly, while perceptions can be real, perception alone will be insufficient in informing policy with regard to the extent to which people's QOL has improved.

2.3 Qualitative measures of quality of life: Components of life satisfaction within South Africa's population categories

As indicated in the previous section attempts have been made to measure quality of life and life satisfaction in South Africa. Moller *et al.* (1987) tried to establish what impacts on life satisfaction within the population categories of South Africa.

This study analysed the relationship between overall quality of life (dependent variable) and various quality of life indicators. After employing a series of multivariate inferential techniques, results revealed a great deal of consistency with regard to what impacts most on overall quality of life within the population categories of the surveyed people.

Results emanating from Moller's study indicate that irrespective of population group the most salient and "reliable" domain issues (or indicators in the case of the current study) of quality of life are the following:

- Ability to provide for family
- Health
- Quality and quantity of food
- Life comparison with other races
- Wages and incomes
- Personal possessions
- Financial security in old age
- Dwelling adequacy
- Education
- Job opportunity

(See Moller *et al*., 1987:7).

As far as the Black population is concerned Moller *et al.* (1987: 29) noted that perceived quality of life is most "problematic and negative" among Blacks. In this population group the following domain issues were found to be consistently salient among both rural and urban Blacks.

- Health
- Ability to provide for family
- Quality and quantity of food
- Life compared to other races
- Family happiness and peace
- Job opportunities
- Food prices
- Education
- Personal possessions

Perceived quality of life was assumed by this study to be less problematic among the whites. In this group the most salient domain issues about life satisfaction included the following:

- Health
- Adequacy of dwelling

- Financial security in old age
- Personal possessions
- Choice of where to live

(See Moller *et al.*, 1987:33 for a detailed list of the results in respect of ranking of the components of quality of life).

Results emanating from multivariate inferential analysis indicate a relatively low explanatory power of the components of quality of life as far as quality of life is concerned. The ten most salient components listed above for the entire sample indicate that 43% of the variation in life satisfaction (or quality of life) is accounted for by the variation in the ten components. This seems to reinforce the complex nature of quality of life and how a multidimensional approach to analysing quality of life aspects at the ordinal level could possibly improve the explanatory power.

2.4 Qualitative measures of quality of life: Household satisfaction - Past, present and future perspectives

Concern about happiness and quality of life is common to all societies on earth and can be traced back to the beginning of civilisation. According to Moller (1996), the scientific study of QOL is however, relatively new. One of the consistent research findings over the past three decades is that subjective well-being has three components; satisfaction with life as a whole and, positive and negative effect. High levels of subjective well-being occur when people are infrequently sad, frequently happy or joyful, and generally feel good about their lives. The three components are interrelated but do not overlap completely. Satisfaction with life is largely a cognitive summary evaluation of one's life situation, which leaves to individual judgment the importance of various aspects of life.

Moller (1996) analysed secondary data on QOL. The original data was part of the Project for Statistics on Living Standards and Development (PSLD) which was conducted by the South African Labour and Development Research Unit (SALDRU). Moller (1996) had, among others, the following questions that guided her analysis:

What is the relationship between perceived financial achievement ("past satisfaction"), current satisfaction, and expectations of satisfaction in future ("future satisfaction")?
Are high levels of satisfaction related to high levels of household income and expenditure? A related question is whether lower income levels are associated with basic needs to a greater degree than higher income levels.

According to Moller (1996: 241), recent cross-cultural studies shed more light on the significance of income and fulfillment of basic needs in relation to happiness. Numerous cross-national studies show that material wealth is a consistent and important predictor of QOL. Money has increasingly become a global value and universal goal. Income straddles the material and non-material divide in that it confers social standing and begets influence in most societies. It allows individuals to fulfill a wide range of personal goals including non-material ones. Regarding Moller's findings as far as the relationship between income and satisfaction is concerned, a consistent pattern emerged: income and expenditure levels co-varied with levels of satisfaction with living standards. This finding suggested that income levels might influence expressions of present satisfaction with QOL. However, future satisfaction was not income-linked.

Regarding the relation between "past satisfaction" and "future satisfaction", Moller (1996) finds future satisfaction indicators to have highlighted the raised expectations for a future beyond apartheid which was most pronounced among black South Africans. She indicates that when present and future satisfactions were combined the future winners (current dissatisfaction and optimist for the future) and lower income earners expressed the need for basics such as food, shelter, infrastructure and income - providing jobs. Current satisfaction and higher income regardless of future outlook were linked to needs for stability, peace and income maintenance.

Higher-and lower-income groups shared to a certain degree the need for peace, which may be viewed as a prerequisite for the provision of basic needs. These findings support the hypothesis that *satisfaction is not relative but linked to basic needs and income especially in the case of poorer populations*.

The effect of income on satisfaction was stronger in lower - income families at the bottom of the racial hierarchy (Blacks) but still had an effect when basic needs were met. This in way suggests that income continues to influence satisfaction beyond basic needs.

2.5 Quantitative measures of quality of life: The SAARF Universal Living Standards Measure

The South African Advertising Research Foundation (SAARF) developed a measure of living standards referred to as the SAARF AMPS™ Living Measure. This is a measure that was initiated in 1988/89 and has evolved to become a universal measure of living standards. The SAARF Universal LSM™ is a scale used to indicate the socio-economic status of an individual or group (SAARF, 2002:3). Households are grouped on the basis of access to specific household variables such that households accessing similar variables are grouped together forming one living standards measurement (LSM) group.

Towards the end of 2000, (SAARF) in conjunction with its contractors ACNielsen Media International realised the apparent need to introduce a universal living standards measure (LSM) which could be used consistently for all markets and across all its products. According to SAARF (2002: 2), SAARF's principal objectives are:

"To promote, sponsor, arrange, authorize, commission, manage, control or cause to be arranged, organised, conducted, authorised or commissioned, the obtaining of all kinds of advertising research, media audience research, surveys, investigations and reports. Likewise to do all things and carry on any activity related, connected or associated with any of the above objects and purposes by itself or through agents, employees, contractors and other interested parties and to employ companies, firms and persons for such purposes and generally to do all things necessary and incidental in order to give effect to any of the objects of the South Africa Advertising Foundation".

The need for a universal living standards measure stemmed from the conflict between the desire to sustain consistency for trending purposes and the need to reflect changes in the market. This called fore a measure that will not need year - on – year adjustments.

Within this context, the SAARF Universal LSM™ was formulated. SAARF LSM™ stands for "Living Standards Measure". It is a scale indicating the socio-economic status of an individual or group. The reasoning behind formulating the new SAARF Universal LSM™ was for the measure to be based on household variables. In this way the household would be the unit of analysis whereby households can be grouped on the basis of the variables they access (SAARF, 2002:60).

The new SAARF Universal LSM™ draws its success from SAARF's previous work on the living standards measure (LSM) which dates back in 1988/89. Developing such a measure had its origin in comments that while the community size measure, which splits the population into groups according to the size of the community in which they reside, was effective in reflecting people's lifestyles, persons who live in similar community sizes lead different and at times quite sophisticated lifestyles. In particular, it became apparent that all rural dwellers were no longer (if they had been) living a simple, unsophisticated lifestyle.

The search was then commenced for a measure which could be able to distinguish living standards better than any single demographic variable. The development of the new measure - the SAARF AMPS™ Living Standards Measure (LSM) which has evolved into the SAARF Universal LSM™ - involved a great deal of preliminary discussion and experimentation before reaching the present form (see SAARF, 2002 for details).

As a start, using the entire SAARF AMPS™ 87/88 data base, each respondent was assigned a score on a large number of variables which had been selected on judgment. The variables included the possession of a range of durable household articles, access to reticulated water and electricity supplies, use of the various media and a wide range of demographics including population group, income, education and others. Some twenty variables were coded into 71 classes (SAARF, 2002:56).

For each respondent a score on an index was calculated. Using the total population frequency distribution, the index was divided into a number of groups. Persons falling into the various groups were cross-tabulated against their consumption of goods, services and media to obtain

an idea of whether the groups were giving sufficient segmentation of the population. The results were promising (SAARF, 2002: 57)

A principal component analysis was used to examine the spread of the data points of variables, in order to determine the combination of variables along which the largest proportion of the spread occurred. The variables used were the 71 indicator variables defining the classes of the original 20 variables. After the axis of the first principal component has been defined, a number of further "directions" or axes are determined such that the second axis is the axis along which "most" of the rest of the variability in the data occurs, but with the second axis perpendicular to the first principal component and so on. The first principal component was found to cater for a large proportion of the variation in the data (just over one quarter), with the other principle components catering for smaller proportions. Stepwise regression analysis was then used to choose a sub set of the variables that would accurately predict the scores of the respondents on the first principle component. (SAARF 2002: 57)

The SAARF AMPS™ has evolved considerably since then, with some variables being dropped and new ones being incorporated. The new SAARF Universal LSM™ has been based entirely on household variables. The variables were agreed upon by the SAARF council in July 2001. In the process of developing the new SAARF Universal LSM™ it was agreed that the list of variables be expanded to 29 to give finer definition to the scale. The council also agreed to increase the number of LSM groups in the scale from seven to ten. Using the procedure described above, the 29 variables resulted into the weights indicated in Table 2.3 below, with the data base having been divided into ten LSM groups. The ten groups constitute the SAARF Universal LSM scale denoted as LSM 1 - LSM 10. A description of the most outstanding findings of some of the LSM groups is provided in sections 2.6.1-2.6.3. A full description of the findings with regard to the SAARF Universal LSM™ scale is available in SAARF (2002, 14 - 55).

Table 2.1: Variables used in the new SAARF universal LSM and results of stepwise regression analysis

Attribute	Squared multiple correlation	Weight
Built in kitchen	0.6463	0.165505
Microwave oven	0.7692	0.126829
Fridge/freezer(combination)	0.8287	0.152515
Vacuum cleaner/floor polisher	0.8617	0.135318
Flush toilet in/outside house	0.8887	0.142228
No cell phone in household	0.9085	-0.175184
0 or 1 radio set in household	0.9216	-0.158252
No domestic worker in household	0.9320	-0.222364
TV set	0.9418	0.133830
Traditional hut	0.9489	-0.201085
VCR	0.9555	0.134488
Washing machine	0.9606	0.138930
Electric stove	0.9650	0.163219
Motor vehicle in household	0.9689	0.155217
PC	0.9720	0.132148
Electricity	0.9748	0.128613
M-net/Dstv subscription	0.9768	0.126068
Hi-fi/music centre	0.9787	0.105378
Hot running water	0.9805	0.158200
Home telephone	0.9820	0.097140
Water	0.9835	0.127671
Tumble drier	0.9848	0.117338
Deep freezer	0.9857	0.093849
Rural rest(exc. W. Cape & Gauteng rural)	0.9865	-0.093228
Sewing machine	0.9872	0.090320
Home security service	0.9877	0.091632
Dishwasher	0.9881	0.119925
Western Cape (this can not be a variable)	0.98840	0.079999
Gauteng (this can not be a variable)	0.9888	0.056788

Source: SAARF Universal LSM, 2002:62

It should be pointed out that since 2004, SAARF has dropped four attributes from the list above. These include traditional hut, electricity, Gauteng, and Western Cape. These have been replaced by the attributes *House/cluster house/town house, Metropolitan dweller, DVD player,* and *1 cell phone in household* (SAARF, 2004). It is indicated that as South African society develops, the SAARF Universal LSM has the ability to be extended beyond group 10, and 11, 12, etc. will be added as time goes by.

2.5.1 Findings in respect of SAARF Universal LSM™ - 1

The SAARF Universal LSM™ - 1 happens to be the group at the lowest end as far as access to selected goods, services and facilities is concerned. The group accounts for 10.5% of the sampled adult population. With regard to demographics, virtually everyone in this group lives in a rural area (99%). Females constitute the majority (58.8%), of which 28.8% are above fifty years old. According to SAARF (2002:16) the proportion of women in this group with children and/babies is above average. Hardly anyone in this group has received more than some high school education; two thirds having even less, with 27% having no formal schooling at all - functionally illiterate. The average monthly income for this group is R 777 and, the group contains a large proportion of people who are not working (i.e. the unemployed and not seeking work). A significant portion of adults in this group (28%) regard themselves as active gardeners, an indication of active participation in agricultural activities at least for subsistence purposes. Most households in this group (74%) are concentrated in KwaZulu Natal and the Eastern Cape. In general terms the majority of people in these households are Zulu and Xhosa - speaking people (SAARF 2002:16).

As far as residence is concerned, three quarters of the people in LSM™ - 1 live in traditional huts with an earthen floor. Eleven percent are reported to have had access to mains electricity and, only 4% having a water supply on the property (SAARF 2002:16). With regard to household possessions or durables, LSM™ - 1 is reported to have been lacking on most of the items listed in Table 2. It is only the radio which was found to be possessed by most households (71%). TVs were reportedly possessed by 3% and hi-fi/music centres were found to be possessed by and 10%. About 4% of the households were reported to be cooking with electricity, while possession of refrigerators was reported at around 1% (SAARF, 2002:17).

When it comes to lifestyle, most of the activities dealt with by the survey are found to be either of little interest to LSM^{TM} – 1, or not within their orbit. In this group, 4% of the households buy take – away foods in a four – week period while 3% eat at a restaurant in the same period. A major exception to the norm is provided by lottery tickets bought by 15% and scratch cards by 3% during the year, and gardening activities in which 28% of the households indicate to be participating. One in ten households is reported to have gone on holiday, almost invariably to stay with relatives. This group LSM^{TM} – 1, is reported to be physically very stable, with a home- moving rate of 3 in a 100 which is a third of the average, and hardly any having changed jobs. (SAARF 2002: 18)

2.5.2 Findings in respect of SAARF Universal LSM^{TM} - 5

The SAARF Universal LSM^{TM} - 5 consists of households belonging to a group that is located around midway along the scale. This group accounted for 12.5% of the adult population which was sampled. From a demographic point of view, 10% of the adult population in this group are English speakers while 12% speak Afrikaans. The group is generally young, with 28% of adults falling in the 16 - 24 age groups, 29% falling in the 25 - 34 age group, and adults over 50, years accounting for around 17%. The proportion of rural households keeps on dwindling as one moves from SAARF Universal LSM^{TM} - 1 - where virtually everyone is a rural dweller - to the point that only 12% of the adult population in SAARF Universal LSM^{TM} - 5 is rural. Some 32% of the adult population in this group lives in Gauteng. The level of illiteracy shows a similar pattern, with illiteracy levels moving from 27% in SAARF Universal LSM^{TM} - 1 to around 3% - 4% in SAARF Universal LSM^{TM} - 5. Average monthly household income is R2205 which accrues to people working mainly in mining/production, service and clerical/sales sectors. Only 2% of the adults in this group are employed in the agricultural sector. Unemployment stands at 38%.

With regard to residence, 85% of the population in SAARF Universal LSM^{TM} - 5 live in a conventional dwelling (77% live in a house). Squatter camps house some 4%, while 3% of the population live in structures in backyards. Three percent of the population in this group live in hostels/compounds.

Seventy four percent of the households own the homes they live in. Ninety eight percent of the households have access to electricity and the same percentage holds true for access to water on site, 58% have taps inside the home. Everyone in SAARF Universal LSM™ - 5 has access to a toilet - 86% use flushing toilets. (SAARF 2002: 33).

When it comes to possessing durable items, adults in group 5 were found to engage extensively in electronic media. Some 90% live in homes with television and, 67% do have hi-fi's. Access to radio stands at 89% but access to a VCR drops to 18%. Only 1% have a PC in the home. Seventy one percent of the households cook on electric stoves while some 30% use electric hotplates. Microwave ovens start emerging in this group with some 9% having the same at home. Eighty six percent have access to refrigerators, and 11% are reported to having access to freezers. Some 16% are reported to have a cell phone, while vehicle ownership stands at 5%.(SAARF 2002: 34)

Findings in respect of lifestyle reveal some concerns for personal well - being beginning to appear at significant levels in LSM™ – 5. Taking exercise for health, building gradually through the previous group categories, is reported to reach 18% here(though only 2% go to gym) while 4% have attempted to lose weight during the previous 12 months. During the past 4 weeks, 3% will visit a casino, 11% buy scratch cards, while 58% will buy lottery tickets. Fourteen percent have decorated indoors, 6% have painted the outside of their home, and 7% have spent upwards of R1000 on improvements in the last 12 months. During an average month 18% will eat at a restaurant and 30% purchase take-away food. Going away on holiday is reported to remain an infrequent luxury though 10% will do so in a year. Eight percent are reported to have moved house in the past 12 months while 3% changed jobs and 4% undertook part-time study/education. As far as possessing hi-fi's is concerned, tapes and CD's are bought by 9% and 8% respectively. (SAARF 2002: 35)

2.5.3 Findings in respect of SAARF Universal LSM™ - 10

At the top most end of the scale is SAARF Universal LSM™ - 10 which accounted for 5.1% of the adult population. Herein, 55% of the population speaks English and 48% speaks Afrikaans.

It is generally a "mid- aged" group with 35% of the adults falling in the 35 - 49 age group, while people aged between 25 and 34 years make up 18%. Forty percent have gone on to post - matric studies - 15% at university. Seventeen percent of the adults in this group are engaged in "Professional/technical" and "administrative/managerial" work, with household income for this group averaging R13788 per month. According to SAARF (2002: 53), the group is very entrepreneurial (presumably not least because of its access to appropriate resources), with nearly a quarter (24%) classifying themselves as self - employed. Unemployment in this group was recorded at 4%. Four out of five people (83%) make use of a domestic worker (with 27% living in). Seventy two percent of the households in this group live metropolitan areas (42% living in Gauteng) (SAARF 2002: 53).

With regard to residence, most households in the SAARF Universal LSM^{TM} - 10 (88%) own the dwellings they occupy and these are houses being referred to here. Only 4% of the households in this group reside in flats (SAARF 2002: 53).

When it comes to possessing durable items, cost is a minor item in group ten. Seventy eight percent have a PC in the home and, 39% have a satellite dish. Virtually every household has a microwave oven in the kitchen (99%), while possession of freezers stands at 81%. Possession of a cell phone stands at 74% and, vehicle ownership is reported at 82%. Possession of these latter two items is in stark contrast to the situation in group one where virtually no household was reported to possess either a cell phone or a vehicle (SAARF, 2002:54).

When it comes to lifestyle**,** almost every activity that reflects wealth is reported to reach its highest incidence in group 10. Some of the notable peaks (compared to preceding groups – group 9) are: buying CD’s (60); buying jewellery over R500 (14%); spending R1000 + on home maintenance (38%); eating out in a restaurant monthly (74%); and paying for home security (41%). According to SAARF (2002, 55) lifestyle preferences are also apparent. Being a member of a gym is well above previous groups, at 13%, while taking exercise rises to 30% and “losing weight” to 17%. Gardening is reportedly an “active pursuit”, appealing to 36% - a higher proportion than in any other group – while accessing the internet leaps from 18% in group 9 to 38% in Group 10.

Eating in restaurants is as widespread in this group as buying take – away foods (both 74%). Casino attendance reaches the highest level here at 18%. Traveling by air is reportedly double the proportion reached in group 9 (inside South Africa: 23% versus 11%; outside South Africa: 25% versus 13%). Every year 61% goes on holiday in South Africa and 18% visited other countries in the past 3 years for pleasure only. (SAARF 2002: 55).

So the SAARF Universal LSM^{TM} scale shows systematically the lifestyle changes, and changes in living conditions experienced by South African households. The lifestyles portrayed by households in the different groups of the index are greatly influenced by the conditions experienced by those particular households and this, to a great extent, is a function of what households have access to. Table 2.4 has been incorporated into the literature to provide a snapshot of the findings of the SAARF Universal LSM^{TM} scale in respect of the sample distribution, household income, and gender profile.

Table 2.2: Summary findings in respect of population distribution, average household income and gender profile

		SAARF Universal LSM^{TM} groups									
		1	2	3	4	5	6	7	8	9	10
Proportion of sample (%)		10.5	14	14.3	13.8	12.5	12.6	6.0	5.8	5.4	5.1
Average household income (RAND)		77	885	1107	1523	2205	3557	5509	7428	9861	13788
Gender profile (%)	Male	41.2	46.4	49.5	48.8	51.0	49.4	49.7	50.2	51.0	49.9
	Female	58.8	53.6	50.5	51.2	49.0	50.6	50.3	49.8	49.0	50.1

Source: SAARF Universal LSM (2002:10 – 11)

2.6 Descriptions of inequality: The Swedish approach to welfare research

Erikson (1993) provided a critical analysis of the problems encountered in measuring and describing welfare, using data from Sweden. His analysis was based on findings from data originating from "The level of living surveys". These surveys had been commissioned by the Swedish government to describe the conditions and problems of low income earners, using data collected in 1968, 1974, and 1981. The task was approached in three steps: (1) a study of the distribution of factor income, (2) a study of the distribution of disposable income, and (3)

a study of the distribution of welfare in non-monetary terms (Erikson, 1993: 67). It is the third study that is of particular interest as far as QOL is concerned.

The study about the distribution of welfare in non-monetary terms investigated the respondents' living conditions in nine different areas or components of life. A large number of indicators were used for most of the components. The components, as referred to by Erikson (1993:75) are "conditions and problems which we all meet during our lives and which are of such importance that there are collectively organised attempts to cope with them in all societies". These components, together with some typical indicators are shown in Table 2.5. According to Erikson (1993: 69), the overriding aim of the three surveys, whose report was published in 1994 was to answer three questions:

(a) Had there been an average change in the level of living between 1968 and 1981?

(b) Were there any differences in level of living between different population groups, especially between men and women, social classes, age groups, or regions?

(c) Had there been any changes between 1968 and 1981 in differences in level of living between groups?

In attempting to answer the three questions above, questions were asked within the context of the components of life. For instance three questions were asked about physical mobility: whether the respondent could walk 100 metres briskly without problems, whether he or she could go up and down stairs without difficulty, and whether he or she could run 100 metres without difficulty.

Table 2.3: Components and some typical indicators in the Swedish level of living surveys

Components	Indicators
1. Health and access to health care	Ability to walk 100 metres, various symptoms of illness, contacts with doctors and nurses
2. Employment and working conditions	Unemployment experiences, physical demands of work, possibilities to leave the place of work during working hours
3. Economic resources	Income and wealth, property, ability to cover unforeseen expenses of up to $1,000 within a week
4. Education and skills	Years of education, level of education reached
5.Family and social integration	Marital status, contacts with friends and relatives
6. Housing	Number of persons per room, amenities
7. Security of life and property	Exposure to violence and thefts
8. Recreation and culture	Leisure-time pursuits, vacation trips
9. Political resources	Voting in elections, membership of unions and political parties, ability to file complaints

Source: Erikson (1993:68)

The study made use of both subjective and objective indicators. Findings in respect of disability indicate that there had been no overall change from 1968 to 1981 in the proportion of disabled people. However, the results highlighted the important finding that women tend to be disabled more often than men, when other factors are accounted for. The findings also revealed that older people are disabled more often than younger people but this difference had diminished between the period under consideration. As far as regional differences are concerned, no clear disability differences emanated between cities, towns, and the countryside.

Findings in respect of class revealed that members of the working class are disabled more often (having accounted for age, etc.) than members of the upper middle class, with the lower middle class falling in between.

Findings of one objective indicator sighted by Erikson (1993:70) relates to income inequality due to employment between different classes and occupational groups. This finding indicates that the overall income inequality decreased over the period 1967 – 1980. This decrease was partly the result of diminishing differences between occupational groups, but partly also of lessening inequality within classes. Wages in occupations mainly employing women increased considerably during the period.

2.7 Basic needs and the Physical Quality of Life Index (PQLI)

From an international point of view, there has been a growing awareness of the urgency to meet basic needs. The "Declaration of Principles and Programme of Action" adopted at the 1976 World Employment Conference stated that: Strategies and national development plans and policies should include explicitly as a priority objective the promotion of employment and the satisfaction of the basic needs of each country's population (Morris, 1979:20).

Basic needs as understood in this program of action, include two elements. First, they include certain minimum requirements of a family for private consumption: adequate food, shelter and clothing, as well as certain household equipment and furniture. Second, they include essential services provided by and for the community at large, such as safe drinking water, sanitation, public transport and health, educational and cultural facilities. A basic-needs-oriented policy implies the participation of the people in making the decisions which affect them through organizations of their own choice. It is important to recognize that the concept of basic needs is a country- specific and dynamic concept. This concept should be placed within a context of a nation's over- all economic and social development. In no circumstances should it be taken to mean merely the minimum necessary for subsistence; it should be placed within a context of national independence, the dignity of individuals and people and their freedom to chart their destiny without hindrance.

2.7.1 Criteria for a composite Indicator and its application

Bearing in mind the complexity *of basic needs* it becomes clear as to how difficult it is to come up with a single quantitative measure for this concept. In the formulation of a physical quality of life index, six criteria that a composite measure of international socio-economic

performance should meet were established at the outset. According to Morris (1979:21), these are as follows.

(a) It should not assume that there is only one pattern of development.
(b) It should avoid standards that reflect the values of specific societies.
(c) It should measure results, not inputs.
(d) It should be able to reflect the distribution of social results.
(e) It should be simple to construct and easy to comprehend.
(f) It should lend itself to international comparison

The three indicators that met the set out criteria are Infant mortality, life expectancy and, basic literacy. These are the components of a physical quality of life index.

Physical quality of life indices for various developed and developing countries of the world were compiled in a study by Morris. The importance of a PQLI is revealed by its application in conjunction with the Gross National (Product (GNP). In this study poor countries (those with low per capita GNPs) tended to have low PQLIs and, high income countries (i.e. the first world) tended to have high PQLI's. While this pattern may have been expected, correlations between GNP and PQLI were found not to be close at all. On one hand several oil producing countries of the Middle East (particularly Saudi Arabia, United Arab Emirates, Qatar and Libya) stood out with high per capita GNP and low PQLIs. On the other hand low GNP countries like Cuba, Republic of Korea, Sri Lanka and, (before their rapid rises in per capita GNP) Costa Rica, Hong Kong and Taiwan have different political systems but all registered high PQLIs in the mid- eighties at per capita GNP levels below US$700 (see Morris, 1979:61). This shows that money is not everything. A lot more than money is required to improve quality of life. Improving quality of life has a lot to do with the presence or absence of the social infrastructure that determines a society's PQLI (Morris, 1979: 57-66).

2.8 Measuring quality of life: Economic, Social, and Subjective indicators

In the endeavor to improve people's living conditions, measuring quality of life, and improvements made in this regard, has become essential the world over. While improving people's quality of life is a crucial development objective, the means to achieving this objective differ in conceptual terms.

According to Diener and Suh (1997:189) there are three major philosophical approaches to determining quality of life. The first approach describes characteristics of the good life that are dictated by normative ideals based on a religious, philosophical, or other systems. The second approach is rooted in the economic domain and defines good life on the basis of satisfaction of preferences. This economic approach assumes that people will, given their resource constraints, select those things that will most enhance their quality of life (i.e. utility maximisation). The third definition of quality of life is in terms of the experience of individuals. If a person experiences his or her life as good and desirable, it is assumed to be so. In this approach factors such as feelings of joy, pleasure, contentment, and life satisfaction are paramount. Each of the three approaches to defining quality of life has its merits and demerits but the latter two seem to out compete the first approach. In fact, emphasis in conceptualising quality of life is put on the latter two and, above all, policy formulation, monitoring and implementation are commonly based on the economic approach. For that matter this literature will highlight the merits and demerits of the objective or social indicators, as well as the indicators of subjective well-being (SWB).

2.8.1 Objective or Social indicators

Objective or social indicators are societal measures that reflect people's objective circumstances in a given culture or geographic unit. According to Diener and Suh (1997:192), the hallmark of social indicators is that they are based on objective, quantitative statistics rather than on individuals' subjective perceptions of their social environment. Under the conceptual umbrella of social indicators, variables representing a wide range of societal domains have been identified, and measured. In the health domain these include indices like infant mortality and life expectancy, doctors per capita, and bed occupancy ratio. Indicators related to crime, like police per capita, incidence of rape, suicide and homicide rates, have been established to assess crime–related quality of life. Other commonly used social indicators include literacy rates, unemployment rates and income per capita. Income and wealth in general, are found to significantly influence quality of life but it is not an accurate predictor of good or satisfactory quality of life. Diener and Suh (1997:193) highlight this issue in two instances. The first instance refers to a situation where Israel is twice as better off financially (in terms of per capita income) as Tunisia but the two enjoying the same quality of

life on the social indicator index. The second instance involves a situation where Mauritius and Spain are at par in terms of per capita income but Spain enjoying far better quality of life in terms of the social indicators.

Social indicators have their strong and weak points, some of which are highlighted hereafter. Among the strengths of social indicators is objectivity. Social indicators can be fairly precisely defined and quantified. This enables cross- section and time series comparison with regard to information pertaining to such indicators, be it locally or globally. For instance infant mortality is globally defined and measured in the same way. This enables policy makers to assess the improvements made with regard to reducing infant mortality. One needs to take note of the meaning of "objectivity". In the example above, objectivity refers to the degree of precision as far as measuring infant mortality is concerned. However, Diener and Suh (1997: 193) indicate that objectivity may also mean that there is widespread agreement about the value of what is being measured. In this context high infant mortality is rationalised as something bad while an improvement in life expectancy is rationalized as a good thing. Objectivity may also refer to the exclusion of the opinion of the observer (i.e. value–free).

Another strength of social indicators that relates to rationalisation is that social indicators often reflect normative ideals of a society. People are likely to value the absence of crime, clean air and a quiet environment. People are likely to value these things regardless of whether they influence happiness. Thus, social indicators can assess societal qualities that do not rest solely on their influence on subjective well-being, but which are based on widely shared values.

Social indicators, however, do have some pitfalls. One such pitfall is the inevitable subjectivity that creeps in as the researcher decides on what indicators to select and what value(s) should be assigned to such indicators (see Diener & Suh, 1997: 197 At times wisdom is questioned even in situations involving clearly defined indicators. Diener and Suh (1997: 196) give an example regarding the justification of increasing the longevity of people who are extremely senile or severely incapacitated.

They highlight that questions often arise about the optimum levels of indicators, and about trade offs between specific indicators and other values.

2.8.2 Subjective Well – Being (SWB) indicators

The preceding section has focused on objective or social indicators, highlighting some of their strengths and weaknesses. This section will look at subjective well-being (SWB) research, highlighting its strengths and weaknesses. At the end of the section, an attempt will be made to show how combining social indicators and subjective well-being indicators plays a complementary role, a combination that enhances the comprehension of aspects impacting on quality of life.

The basic premise of subjective well-being research is its importance in measuring directly, the individual's cognitive and affective reactions to the individual's whole life, as well as to specific domains of life, if we are to understand the individual's well-being. Subjective well-being consists of three interrelated components: life satisfaction, pleasant affect, and unpleasant affect. Affect refers to pleasant and unpleasant moods and emotions, whereas life satisfaction refers to a cognitive sense of satisfaction with life. Both affect and reported satisfaction judgments represent people's evaluations of their lives and circumstances. Since subjective well-being consists of life satisfaction, pleasant and unpleasant affect, high subjective well-being can include negative experiences as well as the presence of positive affect, and satisfaction with life and domains of life such as work and leisure. Since an individual or society that is high on one of the subjective well-being components can be low on the others, it is imperative that all three components should be assessed (Diener & Suh, 1997:200).

Subjective well-being is concerned with the respondents' own internal judgment of well-being. It is a concept that reflects on how people internally react to and experience the events and situations in their lives. Subjective well-being is a reflection of people's reactions to the conditions and experiences in life; how pleasant or unpleasant a job is, how satisfied or unsatisfied with the salary, working conditions, etc. The relationship between social indicators- reflecting objective conditions – and subjective well-being measures, is not always

a given. Diener and Suh (1997) found small correlations between subjective well-being and objective resources. In their analysis of the World Value Survey II (comprising of nationally representative samples of 43 nations and regions), Diener and Suh (1997) found subjective well-being correlating 0.13 with physical attractiveness, 0,10 with physician–related health, 0.12 with income, and 0.17 with intelligence. Several factors could arguably be responsible for such low correlations, one being adaptability. People tend to rapidly adapt to their levels of resources and experiences. As a result people who had reported to be unhappy at a certain level of material conditions could later report to be happy. Another reason for the low correlations could be the fact that well-being is influenced not only by external life conditions but also by stable dispositional characteristics. Different people may perceive the same life circumstances differently (Diener & Suh, 1997: 201).

People's psychological adjustment strategies to objective conditions appear to be remarkably flexible but the degree of flexibility seems to be limited by resource availability. People tend to aspire for, or set goals of achievements basing on the material resources at their disposal. People choose personal goals for which they have relevant resources, and the degree of congruence of individuals' goals with their resources predicts their subjective well-being (Diener & Suh, 1997: 202). It will be fair then to say that objective conditions greatly shape people's expression of what they report with regard to well-being, bearing in mind that people adapt psychologically to any level of material circumstances at a given time.

Just like objective indicators, subjective well-being measures also have strong points and weak points. One major advantage of subjective well-being (SWB) measures is that they capture experiences that are important to the individual. These may be experiences of events that are negative or positive. Because most objective social indicators are indirect measures of how people feel about their life conditions, SWB measures provide an important additional assessment that can be used to evaluate the evidence summarized by objective indicators. If objective and subjective indicators converge, the researcher can make more definitive conclusions about quality of life. Where objective and subjective measures diverge, a deeper analysis of the meaning of the indicators is required. Another strength of subjective well-being measures is that when proven inadequate, they are often easier to modify in subsequent

studies than objective indicators, which are usually compiled by sources (e.g. government departments) beyond the reach of most researchers (Diener & Suh, 1997: 205). This however, will not affect the choice of indicators in the current study as all data have been collected sequentially by the same organisation, covering the same scope, and applying the same instrument. Another strength of subjective well-being measures is that by measuring the experience of well-being on a common dimension such as degree of satisfaction, subjective well-being measures can more easily be compared across domains than can objective measures that usually involve different units of measurements. This enhances comparability across time and regions. This factor also will neither work in favor nor against measuring quality of life in the current study as all the indicators selected are being set at the same level of measurement (i.e. ordinal).

Subjective well-being measures do have some serious weaknesses. One such weakness is epistemic in nature. The fact that someone reports to be happy does not necessarily mean that that person is actually happy. This compromises validity. The compromise on validity is worsened by the fact that a person experiencing certain material conditions can report different levels of satisfaction or dissatisfaction at different times within a short space of time. This is a failure on reliability grounds. In a similar breath subjective well-being measures may not fully reflect the objective quality of community life in a locale because they may be more dependent on temperament and personal relationships than on actual societal factors. Also because people naturally adapt to situations, social expectations may influence individuals' subjective well-being. For instance, poor economic conditions may be perceived less negative if experts remind citizens about the nation's economic improvements from the past instead of focusing on the problems of the current economy (Diener & Suh, 1997:206).

Having looked at the merits and demerits of both the objective and subjective measures of quality of life, it is imperative to briefly indicate the importance of using both measures to get a better understanding of quality of life. For policy makers, an accurate assessment of quality of life is crucial if policies are to achieve their objectives. For this to be achieved, reliable and valid social indicators must be used for this purpose to assess the changes in quality of life.

Subjective well-being indicators are equally important for people to express their satisfaction or dissatisfaction with the actual conditions they happen to be in; this takes care of the context. This is not withstanding the fact that people's expression of life satisfaction or dissatisfaction is generally a transformation of objective conditions that they [people] experience, but it will be wrong to assume that this transformation is always automatic. From a methodological point of view, the parallel use of both measures is reinforcing in that the measurement weaknesses of the two types of indicators are not the same. As such it provides alternative views of assessing quality of life that are not likely to be affected by common errors of measurement (Diener & Sun, 1997: 207).

2.9 Quality of life indexes and national policy

Numerous attempts have been made by governments and public policy institutes to develop quality of indexes, with the intention of measuring quality of life. Hagerty *et al*.(2001) developed fourteen criteria for determining the validity and usefulness of twenty two commonly used QOL indexes. The QOL indexes reviewed address various domains of quality of life, at different levels of conceptualisation – micro, meso or macro levels (Hagerty *et al*., 2001:3). The fourteen criteria developed for reviewing the QOL indexes are briefly as follows:

(i) The index must have a clear practical purpose, i.e. a public policy purpose.

(ii) The index should help public policy makers develop and assess programs at all levels of aggregation.

(iii) The index should be based on time series to allow periodic monitoring and control.

(iv) The index should be grounded in well-established theory. "Theory" in this context means the "nomological net" of concepts and causal paths that specify how QOL is related to exogenous and endogenous variables. "Well-established" means that its parts have been subjected to empirical test (Hagerty *et al*., 2001: 6).

(v) The components of the index should be reliable, valid, and sensitive. By sensitive is meant the index's ability to show changes in response to public policy inputs.

(vi) The index should be reported as a single number, but can be broken down into components.

(vii) The domains in aggregate must encompass the totality of life experience.

(viii) Each domain must encompass a substantial but discrete portion of the QOL construct

(ix) Each domain must have the potential to be measured in both objective and subjective dimensions.

(x) Each domain within a generic QOL instrument must have relevance to most people

(xi) If a specific domain is proposed for a non-generic instrument, it must be demonstrated to contribute unique variance to the QOL construct beyond the generic domains for the target group.

(xii) Domains must be potentially neutral, positive, or negative in their contribution the QOL construct.

(xiii) Domains differ from the dimensions of personality, cognitive processes, and affect in that they cannot be measured objectively.

(xiv) The subjective dimension of each domain has both a cognitive and an affective component. They are measured by questions concerning "satisfaction" Hagerty *et al*. (2001: 2-11).

As indicated above, twenty two commonly used QOL indicators were reviewed. These include the U.N. Human Development index, consumer confidence index (CCI), Index of economic well-being (IEWB), World Health Organisation QOL, and Index of social health, among others (Hagerty *et al*., 2001: 11- 71). The QOL indexes reviewed by a nine–man committee, were selectively applicable to public policy. The QOL indexes were reviewed in accordance with the fourteen criteria while at the same time, identifying the QOL domains addressed by the indexes. As examples, four of the reviewed QOL indexes are dealt with hereafter namely the CCI, IEWB, Index of social health, and U.N. Human Development index.

2.9.1. The Consumer confidence index (CCI)

According to Hagerty *et al*. (2001: 20), consumer confidence indexes measure the "economic outlook" domain of quality of life in subjective terms.

The index is comprised of questions addressing issues at household and society levels. In addition, current conditions and those expected in the future are also included. Among the questions asked are the following:

a) We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?
b) Now looking ahead- do you think that a year from now you (and your family living there) will be better off financially, or worse off, or just the same as now?
c) Now turning to business conditions in the country as a whole- do you think that during the next 12 months we will have good times financially, or bad times or what?
d) Looking ahead, which would you say is more likely – that in the country as a whole we will have continuous good times during the next five years or so, or that we will have periods of widespread unemployment or depression or what?
(See Hagerty *et al*., 2001: 21 for a complete list of questions).

The Consumer confidence index is found to have a clear practical purpose for policy makers (criterion 1), through its ability to measure society's economic expectations and gauging societal hope. In this context the CCI is viewed as an indicator of subjective QOL, reflecting subjective opinions about material living conditions. The CCI however, is criticised for its inability to reflect on several other QOL domains which encompass the totality of life experience. Further more the CCI is found to fall short on the ninth criterion which requires that as an economically focused domain, it must be able to be measured in both objective and subjective dimensions (Hagerty *et al*., 2001: 20-22).

2.9.2. **The Index of economic well- being (IEWB)**

The IEWB is based on the view that the economic well-being of a society depends on the level of average consumption flows, aggregate accumulation of productive stocks, inequality in the distribution of individual incomes and insecurity in the anticipation of future incomes. Hagerty *et al*. (2001) say that the weights attached to each of these components of economic well-being will vary, depending on the values of different observers. The four components or dimensions of economic well-being on the index are:

- Effective per capita consumption;
- Net societal accumulation of stocks of productive resources;
- Poverty and inequality; and
- Economic security from job loss and unemployment, illness, family breakup, and poverty in old age (Hagerty *et al*., 2001: 24-25).

Evaluation of the IEWB shows that the index enables policy makers to ascertain trends in overall economic well-being as well as identifying where problems exist so that corrective actions can be taken. It is an index that is more applicable at the meso- and macro-levels as opposed to the micro-level. The IEWB is found to be well grounded in economic theory, with clearly defined and operationalised concepts like the gini coefficient. The weakness identified in using the IEWB as a QOL index lies in its lack of variables addressing the subjective perceptions of well-being. According to Hagerty *et al*. (2001: 8-10) quality of life is an end state of being. If this is the case, both subjective and objective indicators are needed to capture the totality of the means and ends of QOL. Bearing this in mind, the IEWB will need to incorporate variables which address the subjective dimension in order to reflect on QOL as an end state of being.

2.9.3. Miringoff's Index of social health

The index of social health is said to be one of the few that (1) evaluates several domains using reliable, objective measures, and (2) integrates the domains into a single measure. The domains which include sixteen measures as time series since 1970, composed of :

- Infant mortality;
- Child abuse;
- Children in poverty;
- Teenage suicide;
- Drug abuse;
- High school dropout rate;
- Teenage births;
- Unemployment;
- Average weekly earnings;
- Health insurance coverage;
- Poverty among those over 65 years
- Life expectancy at age 65
- Violent crime rate
- Alcohol-related traffic fatalities
- Housing affordability; and
- Gap between rich and poor (measured using gini coefficient)

(See Hagerty *et al*. (2001: 43-44).

The sixteen components are organised in age groupings, with the first three pertaining to children, the next four to youth, the next three to adults, the next two to the ageing, and the last five to all groups.

The committee's evaluation finds the index of social health to have a clear public policy purpose and uses time series data to allow monitoring and control. Most of the components are considered reliable as the measures were developed by federal government agencies using large samples of the U.S population. However, the index is criticised on issues of validity. It is not clear as to whether the 16 components correlate with people's experienced quality of life. Further more, no sufficient explanation is given regarding what informed the choice of the sixteen measures. As such it is inconclusive that the chosen measures are the best measures of people's QOL. (See Hagerty *et al*. (2001: 44-45 for details).

2.9.4. The Human Development Index (HDI)

Each year since 1990, the United Nations Development Program (UNDP) has published a human development index (HDI). According to United Nations Development Program (1996: 28), the Human Development Index is a composite index of achievements in basic human capabilities in three fundamental dimensions- a long and healthy life, knowledge and a decent standard of living. The variables chosen to represent the three dimensions are life expectancy, educational attainment and income (see also UNDP, 2006: 263). The HDI value for each country indicates how far it has to go to attain certain defined goals: an average life span of 85 years, access to education for all and a decent standard of living. According to United Nations Development Program (1996: 30) the HDI is constructed by measuring a country's relative achievement in each of the three basic variables and taking a simple average of the three indicators. United Nations Development Program (2006: 263) highlights that the HDI is not in any sense a comprehensive measure of human development. It does not, for example, include important indicators such as respect for human rights, democracy and inequality. What it provides is a broadened prism for viewing human progress and the complex relationship between income and well-being.

Much as each indicator can be used separately for comparison purposes, the three indicators are at national levels. This is to the disadvantage of areas that need a more focused approach if their specific needs are to be addressed. For instance, according to United Nations Development Program (1996: 32), when South Africa's HDI was desegregated for the nine provinces, the strong correlation between regional disadvantage and ethnic origin became obvious. The Limpopo province (formerly called Northern Transvaal, and later on the Northern province after 1994 elections) had a HDI value of 0.45. Herein, 90% of the population was black. Western Cape had the highest HDI value of 0.791. Herein, only 17 percent of the population was black. The difference in HDI values between the two provinces was due mostly to income disparity. Western Cape's per capita income of US $6000 in purchasing power parity rates (PPP) was five times as high as Northern province's US $1190. The income disparity could be traced mainly to the absence of economic opportunities for the blacks in northern province. This is inter-provincial comparison where disaggregation is revealing just part of the inequalities in access to basic human needs. Greater disparities are likely to be revealed within provinces especially with respect to access to facilities, services and economic opportunities in rural areas; a task the current study intends to address.

According to the United Nations Development Program (1996: 132), estimates of income in the HDI are also fraught with measurement difficulties. Economic data are initially reported in domestic currencies and then converted into say US dollars. Due to fluctuations in exchange rates, purchasing power parity rates in US dollars (PPP) have been used for conversion by the World Bank and International Monetary Fund (IMF). But even then the PPP - based estimates of GDP present problems of comparability because of differences in the international comparison programme (ICP) survey procedures and, in the methods used in producing the estimates.

As far as life expectancy as an indicator of long and healthy life is concerned, it has a number of weaknesses. It is not only based on population aggregates (life tables determined from census data which may at times be out dated), but demographic interest is also systematically shifting from knowing about how long people live, to how healthy they have been in their life

span. In fact focus is currently on reducing the time people spend as disabled before they die- compression of morbidity (Crimmins *et al.*, 1994; Hagerty *et al*., 2001: 39).

In summary Hagerty *et al*.(2001) find that many of the commonly used indexes can be put to successful use because they are reliable and have established time series measures which enhance comparison. Many such indexes can also be disaggregated to study subpopulations. However, many QOL indexes are found to fall short in four areas:

(i) Indexes vary greatly in their coverage and definitions of domains of QOL;

(ii) None of the indexes was found to distinguish among the concepts of input, throughput, and output;

(iii) Indexes fail to show how QOL outputs are sensitive to public policy inputs; and

(iv) None of the reviewed indexes examined convergent validity against each other.

All in all it is concluded that many of the commonly used indexes are potentially useful for public policy and, research aimed at their improvement is recommended (Hagerty *et al*., 2001: 86).

2.10 Housing, electricity supply, water and sanitation

Although the government has made major strides in providing water and electricity, far too many South Africans still live in shacks, without safe water, sanitation, or electricity. According to the Department of Welfare (1998:13), most people in non- urban areas rely on pit latrines, only 20% of which have been improved to an acceptable, hygienic standard. With regard to housing, about one quarter of South Africa's housing stock consists of traditional dwellings and shacks, nearly all of which are located in non-urban areas. The high proportion of shacks in urban and peri-urban areas is the result of limited housing and increased rural-urban migration since the 1980s. The Department of Welfare (1998) reports that some 36% of the very poor live in shacks or traditional dwellings. Very poor households are crowded, with an average of 2.3 persons per room. Africans and Coloureds have an average of 0.8 rooms per person while the average for whites is 1.9. Only 15% of the very poor households have electricity. As a result, most of the very poor households use wood for cooking, which must also be fetched over long distances.

Studies conducted recently paint a rather different picture. In 2001 Statistics South Africa published findings emanating from the analysis of the October Household Survey (OHS) data for the period 1995 - 1999. As far as housing is concerned results indicate an overall gradual increase in the proportion of households living in formal dwellings. Statistics show that the percentage of households in this category increased from 65.5% in 1995 to 69.9% in 1999. The percentage of households living in traditional dwellings declined steadily from 15.3% in 1995 to 10.9% in 1999. A rather surprising finding however relates to the proportion of households living in informal dwellings. The percentage of households in this type of dwellings showed an increasing trend, rising from 7.5% in 1995 to 12.3% in 1999. This increase is in fact higher than the increase realised among households living in formal dwellings (Stats SA, 2001:71-74).

Much as the findings do not offer any conclusive explanation (i.e. the actual percentages are subject to sampling and non-sampling errors and therefore not directly comparable) internal migration could be part of the answer. The reason here being that in addition to the trends shown in the formal and informal dwelling categories, the proportion of households living in traditional dwellings showed a declining trend. This could signal rural-urban migration whereby a significant proportion of people move to urban areas where the majority may end up in informal settlements. This is fairly supported by the statistics from the 1999 OHS relating to the urban versus non-urban household situation. While close to 75% of the urban households lived in formal dwellings, around 17% lived in informal dwellings. Of the households living in non-urban areas, 63.3% lived in formal dwellings while only 6% lived in informal dwellings.

As far as water is concerned, the water situation is reported in the population policy to have been particularly bad for poor rural households. While 57% of African households do not have access to piped water (i.e. internal households or yard taps), only 17% of the households in rural areas fetch water from less than one kilometer away. Only 19% have piped water, while only 11% have flash toilets or improved latrines.

The task of fetching water rests mainly on women's shoulders. African women living in households without their own water supply spend more than three hours a day fetching water. The Department of Welfare (1998:13) cited poor housing, poor hygienic water supplies and lack of sanitation as major underlying causes of the high mortality and morbidity rates, especially among children from poor families.

A major benefit from improved water supply will be a general improvement in health. Mothers and children will also be released from fetching water; a relief that could enable women to devote more time to their families, and perhaps earn income (Department of Welfare, 1998).

Findings from the 1995-1999 OHS indicate some improvement with regard to household access to clean water (piped water inside the dwelling or on site, communal tap or public tanker). Figures indicate an improvement in household access to clean water from 78.5% in 1995 to 83.4% in 1999. This having been the case with clean water, the proportion of households obtaining water from rivers, streams and dams, remained almost constant at around 11%. This indicates a possibility that improved access to clean water may not have significantly filtered through to the previously disadvantaged areas (Stats SA, 2001:75).

That paints the broader picture of the water situation. A deeper look at the situation involved fetching water from a source outside the dwelling unit. Findings from the 1999 OHS indicate that the problem of fetching water is experienced both in urban and non-urban areas. The problem is obviously more severe in non-urban areas where the majority are Africans. Statistics indicate that at least 52% of African women and 41% of African men had to fetch water from a source outside the dwelling unit. The problem is less with the other population groups, with coloureds following the Africans and whites having the least of this problem (Stats SA, 2001: 76).

A further look at the problem of fetching water involved an age and sex analysis. In both urban and non-urban areas, females were found to be more involved than males. The problem is worse in non-urban areas where most of the water fetching is done by males and females

between five and twenty four years. This is likely to have a negative impact on these youngsters as far as education is concerned.

2.11 Access to sanitation

The importance a clean environment and sanitation in general need not be emphasised as far as satisfactory quality of life is concerned. This said however, findings from the October household surveys for the years 1995-1999 send mixed signals with regard to household access to sanitation. According to Stats SA (2001: 88) there has been a possible slight decrease in the proportion of households with access to flush or chemical toilets. Figures show a decrease in the percentage of households with flush or chemical toilets from 56.9% in 1995 to 55.8% in 1999. During the same time period the percentage of households with informal facilities like going to the bush or stream, shows a possible slight increase from 8.3% to 10.6%. Findings from the 1999 OHS indicate that at least 46% of households living in traditional dwellings were using the bush or a river or a stream as toilets with majority of the remainder using pit latrines. Among households living in informal dwellings 10% were found to be using the bush or, a river or stream as toilets. Some 12.5% used the bucket system while 44% used pit latrines. Even among households living in formal dwellings at least 6% indicated that they were using the bush or, a river or stream as toilets. Some 2.5% used the bucket system while close to 60% used flush or chemical toilets.

The above findings paint a grim picture as far as quality of life is concerned. This is especially for households living in traditional and informal dwellings. With the majority of households in traditional dwellings being located in non-urban areas, sanitation becomes a real problem since these happen to the same areas experiencing problems when it comes to clean water. The risks of increased morbidity and mortality are worsened.

2.12 Health services

South Africa has relatively well financed health services. Unlike most Sub- Saharan African countries with small and declining health expenditure (see Brockerhoff, 1995), the health budget of South Africa accounts for 8.5% of the GDP (see the South African population policy, 1998).

State expenditure on health services in 1995/96 financial year accounted for 10% of the total state budget expenditure. Expenditure in the health sector however, is concentrated in tertiary institutions, which benefit 20% of the population, who are members of medical schemes. More than half of South Africa's doctors serve only 25% of the population. Primary health care, (a basic service for rural masses), accounts for only 12% of public spending on health and is not readily accessible to a major section of the population.

According to Cockerham (1995:55), to be poor is by definition to have less of things (including health care) produced by society. This situation is seen in the experience of the poor in obtaining health care in the United States. Medical systems in the United States have not been designed to meet needs of the poor. Large medical centres (mainly designed for training purposes) can be especially complex and confusing to people with low levels of education. The manner in which the poor live and conduct their daily lives is not always considered by health care providers. A review of relevant research discloses that a number of studies substantiate the relationship between poverty and lack of access to *quality* medical care in the United States. Despite evidence of more frequent visits to physicians made possible by greater insurance coverage through government-sponsored programs, the poor are still treated within the framework of welfare medicine and still live on a day-to-day basis within an environment of poverty. Obtaining equal access to care is a major step in improving the health of the general population. However, improved access to health services is only part of the solution for advancing health. The fact remains that people at the bottom of society have the worst health of all, regardless of what country they live in and which type of health insurance they have (Cockerham, 1995:56).

2.13 Human development and quality of life

Human development with the aim of improving the quality of life for all has been the objective of most governments**.** In her report on the human development of South Africa, Erasmus (1995) reported that the issues of poverty, development and reconstruction are currently at the centre of the stage with the implementation of the reconstruction and

development program (RDP). The Development Bank of Southern Africa is making a special effort to support this process, *inter alia* by focusing on the main issues of reconstruction and development policy and programming at national, provincial and local levels, within the framework of the human development approach. The human development approach attempts to widen the range of choices for all South Africans by expanding their capacities and their opportunities for using these productively. It provides an encompassing vision, over arching intermediate socio-economic objectives such as growth, income distribution and economic stability. Each of these objectives becomes a necessary, but not sufficient, condition for development. Thus, economic growth is necessary to enable the implementation of human development strategies, but it is only by empowering people through human development that sustained growth becomes an achievable objective (Erasmus, 1994: 22-45).

In analysing human capacities, and access to services in particular, Erasmus (1994:23) put it that, " ...services such as housing, water and sanitation, energy, transport and communication are vital to enabling people to fulfill their potential. The absence of these services limits people's environment, affects health, education, and the utilisation of time. Data on access to services are particularly poor…".

A similar view is provided by the United Nations Development Program (2002). According to this report, human development is much more than the rise or fall of national incomes. It is about creating an environment in which people can develop their full potential and lead productive, creative lives in accord with their needs and interests. In this context, people are perceived to be the real wealth of nations. Development is about expanding the choices people have, to lead lives that they value. As such, development is about much more than economic growth, which is only a means of enlarging people's choices (United Nations Development Program, 2002:9).

Fundamental to enlarging these choices is building human capabilities – the range of things that people can do or be in life. The most basic capabilities for human development are to lead long and healthy lives, to be knowledgeable, to have access to the resources needed for a decent standard of living and to be able to participate in the life of the community.

According to the Human Development Report (2002), a lot of progress has been made with respect to human development in the past three decades but, the challenges remain large in the new millennium. Of the 4.6 billion people living in developing countries, more than 850 million are reportedly illiterate, nearly a billion lack access to improved water sources, and 2.4 billion lack access to basic sanitation. Nearly 325 million boys and girls are reportedly out of school. And 11 million children under age five die each year from preventable causes – equivalent to more than 30, 000 a day. Around 1.2 billion people live on less than $1 a day (1993 PPP US$), and 2.8 billion on less than $2 a day. These drawbacks are not restricted to developing countries only. In the OECD countries, 130 million people are reportedly income poor, 34 million are unemployed, and adult functional illiteracy rates average 15%. Several developing countries have experienced a drop in human development as revealed by the human development index (HDI). The HDI is a composite index of achievements in basic human capabilities in three dimensions – life expectancy, literacy, and standard of living. Table 2.6 indicates countries that experienced setbacks in the HDI, as reported in 1999.

Table 2.4: Countries suffering setbacks in the human development index, 1999

HDI lower than in 1975	HDI lower than in 1980	HDI lower than in 1985	HDI lower than in 1990	HDI lower than in 1995
Zambia	Romania Russian Federation Zimbabwe	Botswana Balgaria Burundi Congo Latvia Lesotho	Belarus Cameroon Kenya Lithuania Moldova Republic of South Africa Swaziland Ukraine	Malawi Namibia

Source: Human development report, 2002: 10

From Table 2.6 countries, mainly in the developing country category experienced declines in human development at different times and of course, from different causes. Much as this could be so, most countries experienced declines in the last fifteen years or so, and facts indicate that HIV/AIDS has been rampant during this period (Human development report, 2002: 13). According to this report, 36 million people were living with HIV at the end of 2000 – 95% of them in developing countries and 70% in Sub-Saharan Africa. In Sub–Saharan Africa, mainly because of HIV/AIDS, more than 20 countries experienced drops in

life expectancy between 1985–1990 and 1995–2000. In six countries – Botswana, Burundi, Namibia, Rwanda, Zambia and Zimbabwe – life expectancy declined by more than seven years. This alone had a significant effect on the human development indices of the countries concerned. It is important to bear in mind that the spread of HIV has multiple consequences for development and quality of life. It robs countries of people in their prime, and leaves children uncared for. United Nations Development Program (2002) states that by the end of 1999, 13 million children were HIV orphans. The setbacks in the human development indices above portray a grim picture with regard to development for developing countries, including South Africa.

2.14 Household fertility and development

In recent years attention has been focused on the micro economic determinants of family fertility in an attempt to provide a better theoretical and empirical explanation for the falling birth rates associated with the third stage of the demographic transition. Economists have drawn on the traditional neo-classical theory of household and consumer behaviour for their basic analytical model. They have used the principles of economy and optimisation to explain family-size decisions (see Todaro, 1994). The conventional theory assumes that rational self-interested people will choose to consume goods that offer them the greatest utility. This is subject to income constraints and the subjective tastes or preferences.

The conventional theory is applied to fertility analysis and, considering children as a special kind of consumption good, fertility is considered a rational economic response to the consumer's (family) demand for children relative to other goods.

That is if other factors are held constant, the desired number of children can be expected to vary directly with household income, inversely with the price (cost) of children, and inversely with the strength of the tastes for other goods relative to children (Todaro, 1994:196-199).

According to Todaro (1994:199), there exists a strong intrinsic psychological and cultural determinant of family size in developing countries whereby the first two or three children should be viewed as "consumer goods" for which demand may not be very responsive to relative price changes.

Cost-benefit analysis in fertility consideration is assumed to begin there after. The theory of family fertility as applied to less developed countries (LDCs), concludes that when the price or cost of children rises as a result of say, increased educational and employment opportunities for women, or a rise in school fees or the establishment of minimum-age child labour laws or the provision of publicly financed old-age social security schemes, parents will demand fewer additional children, substituting, perhaps, quality for quantity or a mother's employment income for her child-rearing activities**.** It follows that one way to induce families to desire fewer children is to raise the price of child rearing by say, providing greater educational opportunities and a wider range of higher-paying jobs for young women (i.e. empowerment of women).

Empirical evidence exists in the statistical studies conducted in countries like Chile, Taiwan, Philippines and Thailand. For example it has been found that high female employment opportunities outside the home and greater female and male school attendance, especially at the primary and early secondary schooling, are associated with lower levels of fertility. As women become well educated, they tend to earn a larger share of household income and to produce fewer children. Moreover, the studies have confirmed the association between declines in mortality and the subsequent declines in fertility. Assuming that households desire a target number of surviving children, increased incomes and higher levels of living can decrease child mortality and therefore increase the likelihood that the first born will survive. As a result, fewer births may be necessary to attain the same number of surviving children. This fact alone underlines the importance of improved public health and child nutrition programs in ultimately reducing third world fertility (Todaro, 1994:200).

Finally, although increased income may enable the family to support more children, evidence seems to show that with higher incomes, parents will tend to substitute child quality for quantity by investing in fewer, better-educated children whose eventual earning capacity will be much higher. It is further argued that more income may also tend to lower fertility because the status effect of increased incomes raises the relative desire for material goods, especially among low-income groups whose budget constraints precluded the purchase of these goods.

In other words, additional children beyond a socially accepted minimum desired number may be “inferior goods” in low-income countries; above some threshold subsistence level, higher incomes may induce families to desire fewer children. (Todaro, 1994:200).

2.15 Household-based development index and Quality Of Life

Kironji (1999) conducted a pilot study to measure household Quality Of Life (QOL) at Goodwood, a rural area located in the North West province of South Africa. The study applied cluster analysis and discriminant analysis to formulate a household-based development index. The study findings show that distinct clusters of households existed which enjoyed different QOL depending on the type of indicators accessed. Findings in respect of cluster analysis show that households having access to land for commercial crop growing scored highest on the index, with a mean index of 4.9 above the standard mean of zero. Households in this cluster happen to be the ones in which a household member has a reasonably good job (usually skilled like teaching) and, other household members have access to training in preparation for formal employment. Within this cluster are the few business people like shop owners in Goodwood. Households in this cluster were found to be in a better position to meet most of the household needs. They are the ones which for instance, use gas and paraffin for cooking and, in most cases they possess refrigerators. They are likely to have the best QOL in Goodwood (see Kironji, 1999).

The second cluster scored a mean index of 1.25 above the standard mean of zero. This consists of households that rely mostly on pension money and remittances from working household members. The working people (usually males) in this cluster are mostly semi-skilled or unskilled migrant workers on mines. Households in this cluster usually have a piece of land for subsistence crop-growing plus access to communal grazing. These households commonly use paraffin and firewood for cooking while gas is mostly used on refrigerators where a household has one. Since remittances are usually made on month ends and pension money is insufficient to meet all the basic household needs, refrigerators in these households are not used all the time through the month. Households in this cluster enjoy moderate QOL (Kironji,1999).

The third cluster scored a mean index of 4.1 below the standardized distribution mean. This cluster consists of households with unstable income. The household members who happen to be working are usually seasonal workers on neighboring farms. Others work on grape farms at Upington which is some 450 kilometers away, while some rely on casual work like brick making, house construction and repairing farm fences around Goodwood. Some households receive donations from extended families. Households in this cluster have small plots of land which can only be used to construct a house. They are unable to participate in animal rearing even though communal grazing land is available. Households in this cluster have the poorest access to basic household needs when compared with those in the first two clusters (Kironji, 1999).

2.16 Aspects of the quality of life in black townships in a South African city: implications for human development

Beukes and Van der Colff (1997) conducted a study on aspects of quality of life in the black townships around Bloemfontein. Their study focussed on quality of life and human development. The study used social indicators to measure the contribution to general well-being of health, nutrition, housing, income - distribution, some economic indicators (e.g. transport and communications), and other aspects of social and cultural development. In essence the study tried to appraise what the people themselves felt about their living conditions. Ordinary people were given the opportunity of making and communicating their own judgements about their social, economic, and political conditions (Beukes & Van der Colff, 1997:229-250).

One important aspect of this type of study is that it attempts to record the subjective feelings and opinions about what people think and feel about their conditions. This is against the backdrop of the current development paradigm where development is people centered; human development is predicted on what the ordinary person in a situation of poverty or deprivation sees as his/her life-chances and what can be done by the individual to change this for the better. (Beukes & Van der Colff, 1997: 231).

Human development in this context is determined by a complex variety of functionings and capabilities of people in the every day course of their lives in which commodities and access to

these can play an enabling role but doe not in itself establish living standards and the quality of life. Implicitly then, if the interest is to assess progress in human development, it becomes crucial top establish what resources are available, how people evaluate the use they can make of the resources and, whether they are experiencing progress in improving their lives. (Beukes & Van der Colff, 1997 ; 232 – 233).

In applying the analysis of quality of life studies to estimating development potential, the study tried to ascertain whether gaps or "tension" existed between what people have at their disposal - as appraised by themselves - and how they experience the usefulness of these resources for improving their lives. These "tensions" were interpreted as possible "windows of opportunity" through which people have to improve matters for themselves. This could be taken as an indicator of the potential for human development (Beukes & Van der Colff, 1997: 233).

Several dimensions were investigated by the study to ascertain the subjective willingness to use opportunities to improve functioning. One particular dimension stands out clearly and links well with the conceptual model to be used in assessing quality of life at household level. This is the dimension investigating the relation between what people consider their objective resources to be and how they evaluate the sufficiency of these resources. Within this relation derives "tensions" regarding who people (households in the context of proposed study) think should carry the responsibility for their own development - a socio-psychological and/or financial matter (Beukes & Van der Colff, 1997: 234).

The findings of this study are numerous but one stands out clearly as far as this literature is concerned in relation to the proposed study. This finding is in respect of where the responsibility lay for improving people's overall quality of life. A majority of 51% of the sampled respondents indicated that they themselves are the main determinants of their future life quality, while 34% held government (at various levels) responsible, and 14% looked to their families for improving things. The fact that most people see it as their responsibility to improve their living conditions seems to suggest a shift towards creating a conducive environment to individual or household development rather than institutions trying to do the development for the people (Beukes & Van der Colff, 1997: 242).

In general the study indicates that quality of life studies can be used and their results interpreted in a way that provides grounds for assessing the potential for human development in a surveyed area. The analytic device used to come to the above finding, was that of identifying the elements in people's quality of life assessments which indicate positive and creative tensions between their current and their desired future condition. These could serve as priority areas in which policy interventions can be designed to enhance people's capacity to become more self - reliant and improve their own living standards (see Beukes & Van der Colff, 1997:247).

2.17 Summary

This chapter has reviewed the literature related to aspects pertaining to quality of life. Literature related to subjective and objective indicators of wellbeing has been reviewed. International views regarding quality of life at different levels of conceptualization have been consulted. Local measures related to quality of life, particularly the living standards measure have been widely reviewed. In the process of reviewing the related literature, strong points and weaknesses of various existing measures of wellbeing have been noted. Chapter three will deal with how the current study conceptualises quality of life and, the methodology to be applied.

CHAPTER THREE: THE DEVELOPMENT OF A HOUSEHOLD – BASED MEASURE OF QUALITY OF LIFE

3.1 Introduction

As indicated earlier on, the main objectives of this study are twofold. The first objective is to develop a measure of QOL. Developing a measure of QOL is not an end in itself but rather a means to the end; to enable the study to achieve its second objective. The second objective which in actual sense is the prime objective, is to analyse and describe the changes in QOL which have occurred during the period 1996 through 1999 in South Africa. For the study to achieve the two objectives, a good amount of work will have to be done, especially around the issues relating to conceptualising and quantifying QOL. This chapter will deal with these two issues. Sections 3.2 and 3.3 will deal with issues pertaining to the conceptualisation of quality of life. In this section a conceptual model will be developed, whose function among others, will be to indicate the processes through which household QOL conditions are differentiated. The model will also indicate the interactions between the model variables and quality of life. In the end the conceptual model, together with the results of the study, will provide a basis for making recommendations as to how to improve QOL further. Section 3.4 will address issues relating to the research methodology. Herein, a description of the sources and nature of data will be addressed, together with the stages involved in analysing the data.

3.2 Conceptualisation of quality of life

A conceptual model indicating the relationship between the indicators of quality of life and quality of life itself, together with the processes involved is developed in this study. This model will guide the research in the following ways:

- It [the model] provides theoretical guidance by indicating which variables impact on quality of life, the way variables interact and, the processes involved.
- The variables and processes in the model will be used in analysing the data to derive a quality of life index and to establish which variables contribute most to the differences in quality of life conditions reflected by the index.

- The conceptual model, in conjunction with the results of the study, will provide a basis for making recommendations as to which variables (or indicators) need to be targeted to improve on the quality of life conditions depicted by the quality of life index.

When trying to conceptualise the interactions between quality of life and its indicators, and how the interactions between the indicators would enhance or suppress quality of life, it is necessary to conceptualise such interactions on the basis of past research. Kibuuka (1998: 230) shows that variables influencing one another, can be linked in various ways in a model. Variables can be linked serially in the sense that one variable influences another; the influenced variable also influences another and so on. For instance, completed level of education influences the prospects of getting a good job; a good job leads to earning a decent salary (earning and of course spending power), which salary determines where one lives (location and type of dwelling), the transport one affords, which health facility to use when sick – all of which influence quality of life. This is a rather simplistic way of viewing the interactions between quality of life and the aspects impacting on it.

Variables in the model could also be linked parallel; in this way, two or more variables are jointly influencing another variable(s). For example location of a household (rural or urban), parents' level of education and income could jointly influence the type of dwelling occupied, the type of energy used for household purposes, transport and, children's education – all these impacting on household quality of life.

Another way of linking variables is what Todaro (1997: 19) describes as being holistic in nature. With this approach a large range of variables are at any time, in a very complex interaction with one another, enhancing or depressing an outcome variable (i.e. economic development). For instance education and government policies will influence entrepreurship, which in turn will influence government policies again. There is also a large number of social and political factors present influencing government policy, which in turn influences education leading again to education influencing entrepreneurship. This could be a more realistic approach to analysing the aspects impacting on quality of life, given their multitude and interactions.

3.2.1 The questions informing the conceptualisation of QOL

In trying to come to an understanding of the aspects impacting on quality of life, several questions need to be asked namely,

- What aspects impact on quality of life?
- Are these aspects operating on the household level or some other relatively higher level?
- Can these aspects (or variables) be operationalised and if so at what level does measurement take place?
- What type of modeling is applicable given the level at which the variables are measured?

In the case of this study the analytical models to be applied will involve a linear probabilistic approach (i.e. cluster analysis and discriminant analysis). The reason for choosing this approach has to do with the nature of the data and what the study has set out to achieve – assessing the quality of life at a particular point in time, as opposed to a time series analysis. The latter would call for dynamic modeling, an approach which is not compatible with the ordinal level data. The aim of this study is to describe the quality of life conditions experienced by households at particular times during the reference period (1996 – 1999), and the changes that have occurred during the reference period. This however, should not be taken to mean that QOL and the aspects impacting on QOL are linear in nature. According to Kibuuka (1998, 226), a researcher will be more likely to use linear probabilistic methods to analyse data if he/she views social phenomena as something which can accurately be described by research as it manifests at a specific time. Kibuuka goes on to say that the linear probabilistic view of society has dominated social research for many years mainly because the statistical methods used to analyse data like linear regression and analysis of variance (ANOVA) are both probabilistic models–models from which the physical and economic sciences are trying to shift, towards non-linear deterministic models. Whereas linear probabilistic models try to identify the probability of there being a relationship between variables, non-linear deterministic models focus on describing the dynamic interaction between variables. As indicated earlier on, the latter model would have offered a better description of the interactions if the data were at the interval or ratio level, which is not entirely the case for this study. The current study aims at developing a measure of QOL on a cross-section basis, using ordinal level data.

3.2.2 Conceptualising the model: The link between female education and quality of life

Attempting to have a clear view of the interactions between quality of life and the aspects impacting on QOL will require a conceptual framework. This will provide guidelines in addressing the questions raised above. Jumping to the conceptual framework without providing some underlying theory will be undermining what other studies have already found out as far as QOL and development in general are concerned. Sections 3.2.2 - 3.2.5 will provide a theoretical overview of the linkage between QOL and some of the key variables (indicators) considered in the model.

In recent years attention has been focused on the micro economic determinants of family fertility in an attempt to provide a better theoretical and empirical explanation for the falling birth rates associated with the third stage of the demographic transition. Economists have drawn on the traditional neo-classical theory of household and consumer behavior for their basic analytical model. They have used the principles of economy and optimisation to explain family-size decisions. The conventional theory assumes that rational self-interested people will choose to consume goods that offer them the greatest utility. This is subject to income constraints and the subjective tastes or preferences. Becker in Todaro (1994) applied this theory to fertility analysis. Considering children as a special kind of consumption goods, fertility was considered a rational economic response to the consumer's (family) demand for children relative to other goods. That is if other factors are held constant, the desired number of children can be expected to vary directly with household income, inversely with the price (cost) of children, and inversely with the strength of the tastes for other goods relative to children. (Todaro, 1994:196-199).

According to Todaro (1994:199), there exists a strong intrinsic psychological and cultural determinant of family size in developing countries whereby the first two or three children should be viewed as "consumer goods" for which demand may not be very responsive to relative price changes. Cost-benefit analysis in fertility consideration is assumed to begin there after. The theory of family fertility as applied to less developed countries (LDCs), concludes that when the price or cost of children rises as a result of say, increased educational and employment opportunities for women, or a rise in school fees or the establishment of

minimum-age child labour laws or the provision of publicly financed old-age social security schemes, parents will demand fewer additional children, substituting, perhaps, quality for quantity or a mother's employment income for her child-rearing activities**.** It follows that one way to induce families to desire fewer children is to raise the price of child rearing by say, providing greater educational opportunities and a wider range of higher-paying jobs for young women (i.e. empowerment of women).

Empirical evidence exists in statistical studies conducted in countries like Chile, Taiwan, Philippines and Thailand. For example it has been found that high female employment opportunities outside the home and greater female and male school attendance, especially at the primary and early secondary schooling, are associated with lower levels of fertility. As women become well educated, they tend to earn a larger share of household income and to produce fewer children. Moreover, studies have confirmed the association between declines in mortality and the subsequent declines in fertility. Assuming that households desire a target number of surviving children, increased incomes and higher levels of living (*better QOL*) can decrease child mortality and therefore increase the likelihood that the first born will survive. As a result, fewer births may be necessary to attain the same number of surviving children. This fact alone underlines the importance of improved public health and child nutrition programs in ultimately reducing third world fertility (Todaro, 1994: 200).

Finally, although increased income may enable the family to support more children, evidence seems to show that with higher incomes, parents will tend to substitute child quality for quantity by investing in fewer, better-educated children whose eventual earning capacity will be much higher. It is further argued that more income may also tend to lower fertility because the status effect of increased incomes raises the relative desire for material goods, especially among low-income groups whose budget constraints precluded the purchase of these goods. In other words, additional children beyond a socially accepted minimum desired number may be "inferior goods" in low-income countries; above some threshold subsistence level, higher incomes may induce families to desire fewer children (Todaro, 1994).

The above literature provides insight on the multiple role "female education" plays in changing the QOL scenario. By improving women's employment capabilities, education provides a multi-dimensional effect on QOL including reduced child and maternal mortality, reduced fertility, and raising household income. These have a direct bearing on the children's education–a feedback mechanism – which has a direct impact on their QOL when they grow up to form households of the next generation. (See Todaro, 1994:201).

3.2.3 Conceptualising the model: Social status and quality of life

According to Bird *et al*. (2000:48) social status has four main components: education, employment, work, and economic status. Education status includes years of schooling and academic qualifications. It indicates the knowledge, skills, values, and behaviours learned at school, as well as the credentials that structure job opportunities. Employment status differentiates categories of labour, distinguishing among being employed full time, employed part time, laid off or unemployed, unable to work because of a disability, in school full time, retired, or keeping house. The third component, work status, corresponds to various aspects of productive activity. It includes occupational prestige or rank and class for employed persons, and the conditions and qualities of activity for employed persons and others. The fourth component, economic status, includes aspects of economic well-being such as personal earnings, household income, and material or economic hardship. The work of Bird *et al*. (2000) focuses among others, on links between social status and health status, not on QOL per se. Their work never the less, links up with some aspects impacting on QOL either directly or otherwise. With this born in mind, Bird *et al*. (2000, 49) emphasise the need to view each element of social status as distinct rather than as interchangeable with others. They say that some researchers measure general social standing by averaging together rank on a number of dimensions such as education, occupational prestige, and household income. That practice obscures two things needed for understanding the relationship of social status to health. First, it obscures the causal relationships among the different aspects of social status. Education, employment, work status, and economic resources occupy ordered positions in a causal chain.

As far as education is concerned, it acts as the key to position in the stratification system. As the root component of social status, education shapes the likelihood of being employed, the

qualities of the job a person can get, and income. Education has a fundamental influence on adult health and well-being because it generates social inequalities in employment, job, and economic status. People with high levels of education experience better physical health than those with less education; they tend to report their health as being good; they tend to experience high levels of physical functioning and low levels of morbidity, mortality, and disability. In the context of the current study, people in this category are likely to form a cluster(s) with the best QOL conditions.

As far as employment is concerned, it improves the physical and psychological well – being. On the aggregate level, higher levels of unemployment coincide with higher rates of morbidity and mortality, including heart disease mortality, infant mortality, and admissions to mental hospitals, and suicide (Bird *et al*., 2000: 51). According to this literature, studies that follow individuals provide more direct tests of the effect of unemployment on health. Most find that people who are unemployed have worse physical and mental health than others of similar background who remain employed. Literature suggests that education increases the likelihood of employment. For instance Bird *et al*. (2000, 51) indicate that among American persons aged 25–34 in 1991, 87% of the college graduates were employed, compared to 77% of those with only high school degree, and 56% of those with eight years of education or less. The unemployment rate for college graduates stood at 3%, or one-fifth of the rate for persons with some high school, of whom 15% were unemployed. Lack of education limits employment opportunities. The poorly educated often work at low – status, poorly paid jobs and have the greatest risk of losing their jobs in an economic downturn. Among the employed, education increases the likelihood of full-time employment. Part-time work typically offers lower returns to experience and fewer benefits.

With regard to work conditions, there is a strong causal linkage between education, work conditions and health. These three status components possess a potential to impact directly or indirectly on QOL. Workers doing routine, simple jobs closely controlled by management report higher levels of psychological distress compared to workers doing other types of jobs. Workers who constantly face role overload or who persistently work overtime report significantly higher levels of psychological distress, and they have higher rates of morbidity

and mortality. Education gives people access to subjectively rewarding work. Well – educated people are more likely than the poorly educated to control their own work. They often have autonomy on the job and stimulating non-routine work, both of which increase psychological functioning, the sense of personal control, job satisfaction, and psychological well–being (Bird *et al*., 2000:51).

With regard to economic well–being, studies referred to by Bird *et al*. (2000, 52) find that low income, poverty, and economic hardship erode health and well-being, raising the risk of morbidity, impairment, and death. This however, does not automatically translate into a direct relationship between income and economic well-being, especially if one looks specifically at health. A number of observations suggest that the differences in health resulting from differences in income depend on circumstances. First, the desirable effect of additional income on health occurs only at the bottom of the income scale. In the US, differences in income predict larger differences in health the lower one gets on that scale. Below the 20th percentile, poor health, chronic disease, physical impairment, and the risk of death increase more and more sharply as one approaches the lowest levels of income. Above the 20th percentile higher income produces little or no effect on health. The diminishing incremental effects of income show up in international comparisons too. Increases in GNP per capita generally reduce infant mortality and increase life expectancy. Once countries get above the per capita GNP of, say, Greece, Portugal, Taiwan, and the Czech Republic, differences in GNP account for little of the differences in life expectancy and infant mortality. Second, the effect of income depends on education. This is so because education reduces the association between low income and economic hardship.

The effect of income on health, and well-being in general, needs further scrutiny given the fact the association is assessed at a macro-level and, above all, the LSM study-a micro-level study – found income not to be statistically significant in discriminating between LSM groups. The statistical insignificance of income however, could be attributed to a number of factors, including measurement problems. Though it is globally known to be a powerful indicator of well-being, poverty or QOL-whichever one wants to call it - income is very difficult to measure reliably and accurately.

Because it is derived from multiple sources, it can be defined in different ways. Non-money metric forms of income are extremely difficult to identify and measure, such as the value of public goods, public services, barter or in - kind income. This is especially problematic in rural areas or barter economies where large numbers of people may depend on these types of income. In the Afro barometer survey, Mattes *et al.* (2003:9) found that in Malawi, approximately two–thirds of the national sample was not receiving a cash income from a job nor looking for a job. Further more, the sensitivity of the subject can lead to inaccurate responses yet, even if respondents are willing to answer honestly, they may not accurately recall all sources of income. The effect of these irregularities is likely to be reflected not only in micro-level studies like the Living Standards Measurement survey, but it can be compounded and amplified in aggregated measures including GDP per capita. This in turn invalidates the effect of incremental changes arising from measures on say health, life expectancy, or well-being.

3.2.4 Conceptualising the model: lifestyles and quality of life

The above explanation has thrown light to the relationships between social status and QOL without mentioning what "status" itself means. According to Cockerham (1998, 86) status as a concept is subjective, consisting of the amount of esteem a person is accorded by other people. The basis for a person's status, which determines the amount of esteem, depends greatly on a person's occupation and level of education. Of course the two are greatly linked in that highly educated people usually occupy better paying jobs which carry a lot of ostentation. People in this category tend to share many things in common, including tastes, place of residence, the type of cars they drive, etc. These commonalities end up grouping them together in what is referred to as status groups. Cockerham (1998) defines a status group as referring to people who share similar material circumstances, prestige, education, and political influence; moreover, members of the same status group share a similar lifestyle-a very important part of QOL.

According to Bird *et al*. (2000:160) "lifestyle" is a key concept in explaining human social behaviour. Lifestyles are adopted by individuals and are utilitarian social practices and ways of living that reflect personal, group, and socio-economic identities. Put in another way, the

study of lifestyles helps make sense of what people do, why they do it, and what doing it means to them and others. Both Cockerham and Bird bring in Max Weber's theoretical perspective in trying to explain the concept of lifestyle, which has a lot to do with status groups. Cockerham (1998: 86) points out that a status group refers to people who share similar material circumstances, prestige, education, and political influence; moreover, members of the same status group share a similar lifestyle. In Cockerham's view, a particular lifestyle is what distinguishes one status group from another. People with high social economic status (SES) clearly lead a different style of life than those at the bottom of society and those somewhere in the middle. Weber (1978:932), as quoted by Bird *et al*. (200, 161) links lifestyle to status by pointing out that a distinguishing characteristic of status is 'status honor or prestige which is normally expressed by the fact that above all else a specific *style of life* is expected from all those who wish to belong to the circle'. It is pointed out by both Cockerham (1998) and Bird *et al.* (2000) that the lifestyles of status groups are based not so much on what they and the people within them produce but on what they consume. Hence Bird *et al.* (2000, 161) quotes Weber to have put it that, "One might thus say that classes are stratified according to their relations to the production and acquisition of goods: whereas status groups are stratified according to the principles of their *consumption* of goods as represented by special styles of life".

To link with the assertion that one's lifestyle is a reflection of the types and amounts of goods and services one uses or consumes, it is argued that the economic mode of production sets the basic parameters within which consumption takes place; it does not determine or even necessarily affect specific forms of it. This is because the consumption of goods and services conveys a social meaning that displays, at the time, the status and social identity of the consumer. Consumption can therefore be regarded as a set of social and cultural practices that establish differences between groups, not merely a means of expressing differences that are already in place because of economic factors. It is the use of particular goods and services through distinct lifestyles that ultimately distinguishes status groups from one another (Bird *et al.*, 2000: 161).

Without getting into the pure origins of Weber's explanation of "lifestyles", the three terms he used to express lifestyle are the following:

- Stylisation of life or put simply, lifestyle
- Life conduct
- Life chances.

Lifestyle refers to the choices that people have in their selection of lifestyles, while life chances refers to the probability of actually realizing those choices. It is important to note that much of Weber's work was completed on his behalf (i.e. after his death). Life chances are interpreted to mean the 'crystallized probability of finding satisfaction for interests, wants and needs, thus the probability of the occurrence of events which bring about satisfaction'. The probability of acquiring satisfaction is anchored in structural conditions that are largely socio-economic, but Dahrendorf (the interpreter of Weber's work) suggests the concept of life chances also involves rights, norms, and social relationships (the probability that others will respond in a certain manner). Weber does not consider life chances to be a matter of pure chance; rather, they are the chances people have in life because of the social situation. His overall thesis is that chance is socially determined, and social structure is an arrangement of chances. Hence, lifestyles are not random behaviours unrelated to structure but typically are deliberate choices influenced by life chances. (Bird *et al.*, 2000: 161 - 162)

The above explanation clarifies the relationship between lifestyle and SES on one hand, and quality of life on the other. That is household QOL is conditioned by what that household can access and, although this situation can be changed for the better, change is not entirely in the hands of the household, as some factors determining its capability are at the meso- or macro-levels. In fact the relationship brings to light the link between poverty and QOL which follows in the next section.

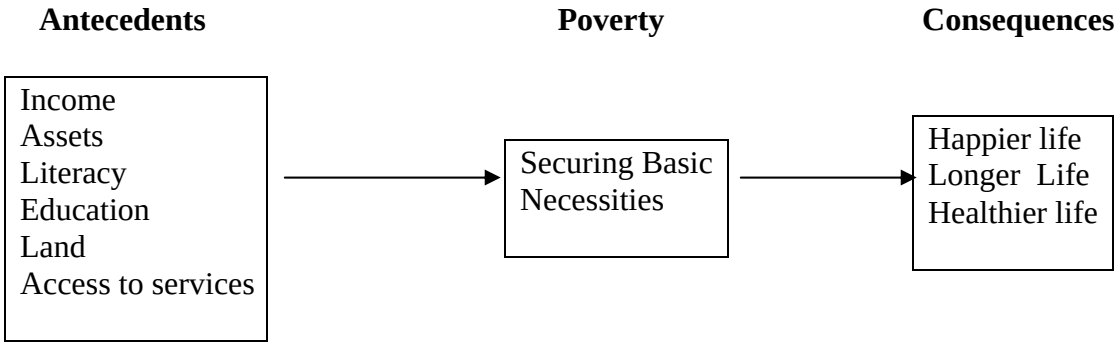
3.2.5 Conceptualising the model: poverty and quality of life

Mattes *et al*. (2003) developed a measure of lived poverty-the Lived Poverty Index (LPI). The study used data from seven 1999–2000 Afro barometer surveys in Southern Africa to develop measures of poverty and well being, as well as its possible consequences both in terms of day-

to-day survival, and political attitudes and behaviour. In capturing lived poverty, the LPI targeted among other indicators, basic needs including food, water, home security, medical treatment, and cash income. The study views well being as being severely impacted on by poverty in a multi-faceted way. Poverty is seen to have various manifestations, including lack of income and productive resources sufficient to ensure sustainable livelihoods.; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increased morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments and social discrimination and exclusion. Absolute poverty is described as a condition characterised by severe deprivation of basic needs, including food, safe drinking water, sanitation facilities, health, shelter, education, and information (Mattes *et al*., 2003: 2-4).

In conceptualising "lived poverty", Mattes *et al.* (2003: 8) came up with a set of items which they argued to be valid measures of poverty. These were used to in the following conceptual model.

Figure 3.1: Poverty, Its Antecedents and Consequences



Source; Mattes et al. (2003: 8).

The findings of the study on poverty, survival and democracy in Southern Africa are many but, there are two key findings which help in informing the conceptualisation of the current study. The first and less important finding relates to the location of a household in to access to basic services. Mattes *et al*. (2003, 22) report that there is a strong urban bias to poverty and development in Southern Africa.

People who live in urban areas are less likely to go without basic necessities, and more likely to have gone farther in the education system. Urban areas are also much more likely to have been the beneficiaries of state- and/or donor- financed projects to build development infrastructure (such as electricity, water, sewerage, and places to shop). Rural – urban location is also found to play a strong role in shaping poverty when placed into the analysis along with age and gender. But once variables such as education and employment status are introduced into the analysis, the impact of rural – urban location becomes extremely small.

The second and perhaps most important finding relates to the relationship between lived poverty (or QOL if one thinks in terms of the current study) on one hand, and the existence of development infrastructure in the immediate area around the respondent, and individual education attainment on the other. Mattes *et al*. (2003, 22) found that within each country and race group, within both rural or urban populations, and at equal levels of employment, the more governments have built electricity and water grids, sewerage systems, health clinics and paved streets in the immediate surrounding area, and the further you have advanced through the education system, the less likely you are to live in poverty. Not having a job, now or at any point in the past year, is also strongly associated with poverty. This is symptomatic of lack of state unemployment benefits across the region, except in South Africa, and the very limited impact of these benefits in keeping the unemployed out of poverty.

Another finding of interest but of lesser importance relates poverty to race. Mattes *et al*. (2003: 22) found that in all countries of the Southern African region, being white, coloured or Indian is associated with sharply reduced levels of poverty. This finding largely reflects the legacies of legally- enforced racial discrimination in South Africa, Namibia and Zimbabwe. The study used South Africa as a reference point and, in doing so, it was found that being a resident of Botswana and Malawi is associated with reduced poverty (after controlling for factors like education, employment or rural/urban status). However, being from Zambia, Zimbabwe and Lesotho is associated with an increase in poverty compared to South Africa. Mattes *et al*. (2003) do not maintain that there is something essential or genetic to race or to national culture that accounts for these results. Rather, they see race and country as summary, proxy measures of differing socialisation and historical experiences, as well as variations in

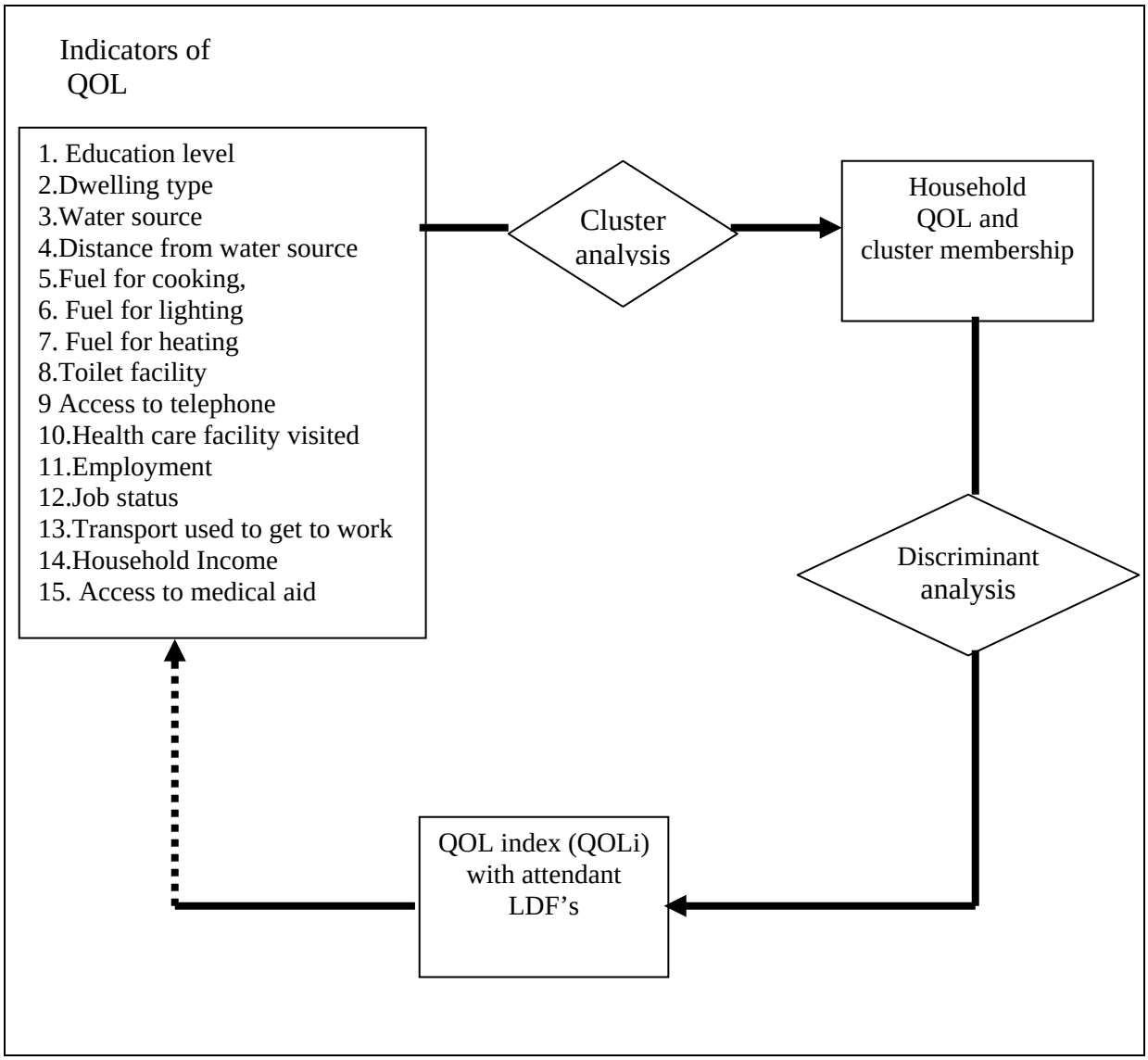
current perceptions about how the differing groups are affected by economic trends and government performance.

3.3 The conceptual model

In conceptualizing quality of life (QOL), indicators of quality of life need to be identified. These will have to be selected within a framework of human needs given that every household strives to satisfy its needs and preferences. Within the constraints of the resources they possess, households are assumed to select those things that will most enhance their quality of life. Along this line of thinking, QOL is conceptualised in terms of people's ability to access the things they desire. According to Diener and Suh (1997:190) people select the best quality of life for themselves that is commensurate with their resources and their individual desires.

The possible effects of the selected indicators on quality of life are perceived to be multidimensional with some indicators being more influential but on the whole, indicators are expected to interact with one another. A conceptual model has been developed in this regard to provide guidelines in the selection of the relevant indicators (see Figure 3.2). Within the context of the model a household serves as a nucleus for human life around which hopes are built and realized, and needs perceived and satisfied. From the household's point of view, each indicator satisfies a need and, satisfaction of that need is perceived to have a financial and/or social-psychological effect. The effect could be direct or indirect. For example education enhances the prospects of getting a good job in the formal sector. On one hand a job in the formal sector usually leads to improved material living conditions like decent accommodation and ability to afford a regular balanced diet, which reduces numerous risks to life. On the other hand education enlightens people, which leads to a change in behavior like sexual behavior and eating habits. According to Cockerham (1995) well-educated people are generally the best informed about the merits of a healthy lifestyle and the advantages of seeking preventive or medical treatment for health problems when they need it. This is of course made possible by the improved financial capability which is greatly enhanced by education and better employment prospects. These are direct effects, made possible by financial capability.

Figure 3.2: The conceptual model of the interactions between quality of life and the variables (indicators) impacting on quality if life (QOL)



On the social/ psychological side, education**,** through its improvements in employment and income prospects, enables an individual or household to lead an autonomous life. This improves decision-making. The individual or household for that matter, experiences a shift to a better social class and an improvement in status. With decision- making in the hands of the individual or household, several other socio-economic and demographic factors like fertility decision-making are influenced.

This leads not only to changes in household size and quality of life of the household in question, but through the process of learned behavior, other households in the locality are likely to emulate the prospering household (Turke, 1989:62-63).

In a broad context then, education plays a crucial role in differentiating QOL conditions for households because of the various ways it influences a household's ability to satisfy its needs. It is the differential ability to satisfy household needs that results into households to live under different conditions. In other words, QOL is conditioned by what a household is able to access. When looked at from this perspective, households accessing or satisfying similar needs, in essence live under similar conditions. Such households can be grouped together on the basis of what they access, and this will constitute a QOL group. It is this kind of thinking that is being portrayed in the conceptual model in Figure 3.2 below. The point is, households are classified or clustered into different groupings on the basis of the aspects (i.e. goods, services and amenities) they access. In the context of this study, the goods, services and amenities constitute the indicators of QOL. The indicators used to classify households are objective because they reflect measurable conditions. This differentiation reflects the objective or measurable QOL. In this study, it is asserted that the objective QOL conditions households experience shape the perceived QOL that the said households report (see Moller, 1996: 241). Households which can only satisfy a few of the household needs, access a few of the selected indicators because of resource constraints. Such households will belong to a group or cluster with poor QOL. Such households will be expected to be unsatisfied with life in general (i.e. perceived QOL). It suffices to point out however, that the list of selected indicators (see Figure 3.2) is not at all exhaustive. In any case it is doubtful if a comprehensive list of all human needs can be drawn and agreed upon, given the fact that human desires change relative to budget constraints and context. This borne in mind, the selection of indicators has been informed by the review of existing literature but, above all, indicator selection has been restricted by the fact the data to be used are secondary in nature.

When households are grouped into different QOL conditions, there is a need to identify what actually differentiates the apparent QOL conditions. In other words, there is a need to identify what indicator or indicators differentiate between the resultant groups of households.

This is important because not all indicators impact equally on QOL, as indicated by the role of education as an indicator. By applying discriminant function analysis it would be possible to identify the importance of the selected variables. Knowing the relative contribution of the indicators is the cornerstone for this study because it sets the platform for informing policy on what needs to be addressed in order to further improve quality of life. Details regarding cluster analysis and discriminant function analysis are provided in section 3.4, which deals with the research methodology. The selected indicators of quality of life, and their corresponding components are provided in appendix A. These indicators extracted from the questionnaire for OHS 1999, to show how components were weighted.

While education has been found empirically to have a significant positive effect on people's living conditions (Turke, 1989; United Nations, 1995:57; United Nations Development Program, 1996: 28), several people have missed out on attaining education. The reasons for not attaining education are numerous. It could be absence of schooling facilities in a community in which case, distance and related financial costs deter people from attaining education. It could be political insecurity and/or social unrest as was the case in apartheid South Africa. In some instances it could be the way society is set up, like in patriarchal societies where boys have preferential access to resources including education (Caldwell, 1987). Whatever the reason could be**,** lack of education and enlightenment in general, obstructs the perceived financial and/or social-psychological effects. This has a negative effect on quality of life. Section 3.4 will explain the methodology applied in this study together with a justification of the indicators selected for the study.

3.4. The research methodology

3.4.1 Introduction

Research may be characterised as methodical investigations into a subject problem. According to Malcom and May (1996:7), to "research" is to seek answers that involve understanding and explanation, whereas the credibility of its outcomes will rest heavily upon the conduct of the investigation. The research process consists of a series of steps and judgments that involve the application of techniques. This is where the design of the study becomes very crucial. Research design is described as the strategy, the plan and the structure of conducting a

research project, aiming at maximising the eventual validity of the research findings. It is a program to guide the researcher in collecting, analysing and interpreting observed facts (Mouton & Marais, 1990: 32; Bless & Higson-Smith, 1995:63).

This section will explain the research methodology used in this study. The data sources and nature of the data will be described in sections 3.4.2. A description of the sample sizes for the four data sets will be provided in section 3.4.3, followed by a comment on the research instruments used in section 3.4.4. Reference to the relevant indicators is made in section 3.4.5, alluding to the relevance of the selected indicators in quantifying QOL.

Sections 3.4.6-3.4.10 provide a detailed description of the different phases involved in data analysis and interpretation of the study's results. The section ends with a description of what constitutes the QOL index and an example of its interpretation.

3.4.2 Data sources

This study will use four secondary data sets. All of them are October Household Survey (OHS) data sets from 1996 through 1999. The data sets have been obtained from the South African Data Archive (SADA). They are nationally representative and were collected by Statistics South Africa (Stats SA). The data sets contain information on a series of subjects including household composition, education, health, fertility, employment, and income to mention but a few. It should be emphasised that although the study will focus on the above mentioned data sets, data right from 1994 are available. These data could be used to explore and describe the conditions prior to 1996. However, comparability will be hampered by the fact some indicators contained in the data sets for the period 1996 - 1999 are not included in the OHS data sets prior to this period. For this reason, the study will focus only on the period between 1996 and 1999.

3.4.3 Sample size

As indicated earlier on, the household will be the unit of analysis in this study. The OHS data sets for the four years under consideration, vary considerably in sample size as indicated in Table 3.1 below.

Despite this observation, no explanation has been sought by this study in connection with the variation in sample size. In any case, the methodology used in adhering to sample representativity is clearly articulated in the meta data files for each of the four data sets.

Table 3.1: Sample sizes and number of cases for OHS 1996-1999

Year	Number of households	Number of cases
1996	15 917	72 988
1997	29 811	140 151
1998	18 981	82 364
1999	26 134	106 650

3.4.4 The instrument and its design

The research instruments used in the OHS surveys for the four years are available and can be obtained from South African data archives (SADA) on request. They constitute part of the information package. Structured questionnaires were designed by Stats SA which were used to collect the data for the OHS data sets for 1996 through 1999. Since the data to be used in this study are secondary in nature, no research instrument needs to be designed.

3.4.5 The relevant indicators

In attempting to measure QOL, the household-based development approach will have limited objectives. Limitations are three fold. First, due to the complexity and multitude of the aspects that impact on QOL, the study will only focus on a limited number of indicators. This will enable the study to provide a comprehensible interpretation of the influence of the selected indicators. Second, since the data to be used are secondary in nature, the indicators to be used will to a great extent, be data – driven. Thirdly it is true that parsimony, that is, economy or simplicity of description will be born in mind. This however, will not be the major determinant of which indicators to be included in the study. According to Huberty (1994: 228) fewer outcome variables make explanations and interpretations substantively simpler. This may be a practical reason for deleting some variables in a MANOVA/DDA (multivariate analysis of variance and descriptive discriminant analysis respectively) context. All in all it is recognised that regardless of the care taken in the initial variable choice, some relatively worthless variables may be chosen for initial inclusion. In this way it is the data analysis

which determines whether it may be desirable to delete some variables. Thus the final list of indicators to be used in the analysis and interpretation of QOL will be determined by discriminant analysis as detailed in section 3.3.7.4. The indicators that are tentatively being considered are indicated in the conceptual model in section 3.2, and the details regarding the components of the indicators are provided in the appendix.

The indicators selected for this study meet most, if not all the criteria for a composite indicator as elaborated on by Morris (1979). For example:

- All of the selected indicators (with the possible exception of *dwelling type*) do not assume a particular pattern of development or depend in a way, on a particular organization of the economy. A system can be market-oriented or not, and households still have good access to the selected indicators of QOL. Regardless of the system in place, people would prefer to have the best of the selected indictors and not the worst.
- The selected indicators measure results, not inputs. These indicators focus on how many households access the selected indicators rather than the cost of providing the said indicators.
- The selected indicators fit the requirements of simplicity and comprehension. The data required to formulate the selected indicators are data commonly collected by most social research institutions and government departments. The data are unambiguous and the resulting index is likely to be easy to comprehend (Morris, 1979: 20-40).

Much as the indicators selected meet most, if not all the requirements above, one might wonder why objective and subjective indicators are being used in this study. Diener and Suh (1997:206) highlight the complementary role that the two sets of indicators play in understanding quality of life. While objective social indicators address fundamental policy questions regarding measuring improvements in quality of life, subjective well-being (SWB) measures assess people's actual reactions to the social conditions they experience. People transform the objective conditions- measured by objective indicators – they experience individually, taking culture into consideration, to express what they perceive as desirable or undesirable. The transformation process however, is not always explicit as one would imagine.

Diener and Suh (1997: 207) caution that scientific findings on well-being sometimes contradict lay beliefs that are prevalent in our culture. While wealth is often considered the most obvious indicator of happiness, Diener and Suh (1997:207) report of the finding that 37% of the wealthiest Americans were found to be less happy than the average Americans. People who aspire for material success and fame often suffer more from depression and anxiety than others.

This is one extreme that needs to be considered. On the other extreme, we find people in abject poverty who, for one reason or another, might seem contented with the rather harsh conditions by any standard. Measures that are based on objective standards are needed to judge the conditions of a society, because people can be tolerably happy even in many undesirable circumstances (see also Allardt, 1993:92). The point being made here is that both objective social indicators and SWB measures need to be employed in QOL studies if we are to have a more comprehensive picture.

A conceptual framework is crucial in selecting the indicators of quality of life. Diener (1995) is quoted in Diener and Suh (1997: 198) to have proposed a value based index of quality of life. In his proposal, Diener (1995) suggested that the variables selected for measuring quality of life are commonly reflective of the prominent values endorsed in the society. The value based index of quality of life proposed by Diener is grounded on the universal structure of values namely, hierarchy, mastery, affective autonomy, intellectual autonomy, and conservatism. Diener's QOL index – an aggregated national index–consisted of two separate indices namely, the Basic QOL Index and the Advanced QOL index. His argument is that previous measures of quality of life were often based on variables that discriminate the quality of life of nations at one level of development, but were less sensitive to the quality of life features of nations at a different level of development. Diener (1995) for instance, found that roughly 62% of the variance in the overall quality of life of nations was accounted for by income (GDP). Despite the high relation, however, a significant number of quality of life variables had a nonlinear relation with income. For example, quality of life variables such as literacy and percent attending tertiary schools, rose rapidly with income among low income nations but leveled off at high levels of income.

On the other hand, variables reflecting advanced scientific activity, such as Nobel prizes per capita, were found to accelerate rapidly at the upper levels of income. Overall, the findings indicated that advanced scientific achievements and technology tend to emerge after the basic physical needs of the citizens are fulfilled during a society's economic development process. As such the Basic QOL Index was found to be more sensitive in differentiating the quality of life in less wealthy nations, and the Advanced QOL Index better at discriminating wealthier societies. The point being emphasized here is that the context is crucial in selecting the relevant indicators of quality of life if a meaningful measure is to be achieved.

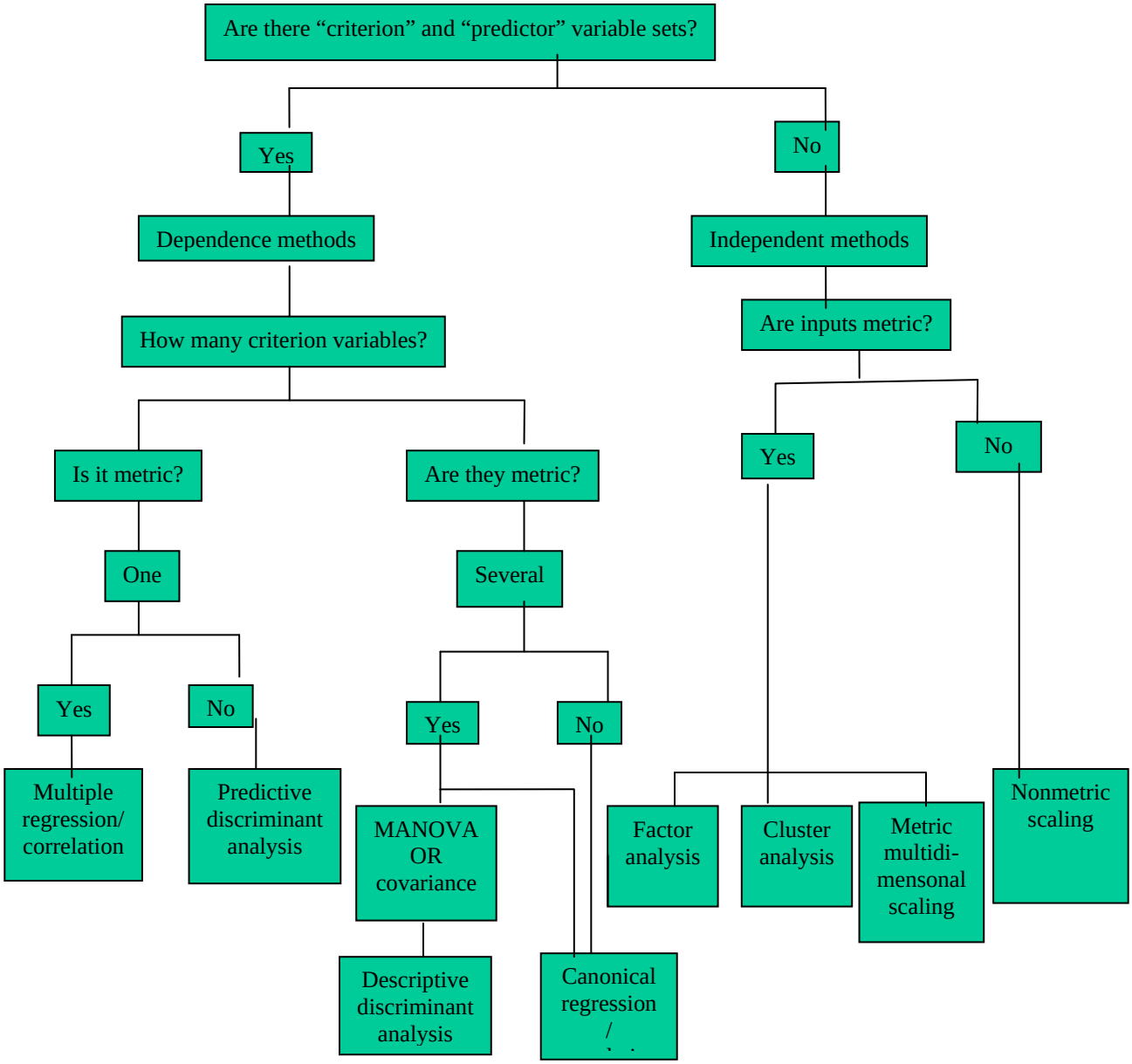
3.4.6 Overview of data analysis

In most social research situations it is rare for a researcher to be confronted with a situation whereby a social problem is impacted upon by one variable. A similar situation arises when one thinks of the aspects that impact on QOL. When we think of the indicators accessed by a household as predictors of household QOL we obtain a multiple correlation involving indicators f_1, f_2, …..,f_n on one hand and QOL on the other. This would clearly be a multivariate situation. Anlysing and interpreting the simultaneous effects of the various indicators on household QOL calls for multivariate statistical methods. In this case cluster and discriminant analysis are the statistical methods that will be applied. To get an idea of how the two methods systematically follow each other, consider figure 3.3. When one thinks of the selected indicators having an influence on QOL, one comes up with a possibility of an existing relationship between household QOL and the indicators in question. According to Huberty (1994: 28) the techniques of interest in such a situation involve multiple or canonical correlation. Such techniques are listed on the right in figure 3.3. They are employed in a situation where a single group of units (in this case households) is being studied to identify individual differences. Since households accessing similar indicators of QOL are likely to experience similar QOL conditions, such households are likely to form one stratum or cluster if stratification is based on indicators accessed. This is where cluster analysis will be applied.

After identifying household clusters, the objective of the study will be to describe the cluster or group differences on the basis of the fact that the selected indicators will have contributed to differentiating the household clusters.

In this situation discriminant analysis techniques will be appropriate. The following sections describe the phases through which data analysis will be conducted.

Figure 3.3. Classification of multivariate methods.



Source: Huberty C. J. (1994: 27)

3.4.7 Ordinal level data analysis

Analysing data at ordinal level will involve looking at variability within each of the selected indicators. Here, variability within the indicators will be analysed by considering the order of importance of the attributes constituting each indicator. Components are assigned values starting from one. The minimum value of one (1) is assigned to the attribute considered to be the poorest for the indicator, while the highest value depends on the number of attributes identified. The highest value will be assigned to the attribute considered to be the best as far as a particular indicator is concerned. For example, for the indicator *source of water*, a household with piped - hot and cold - water in the dwelling will take on the highest score, depending on the number of water sources identified in the survey. A household with the poorest water source, say water fetched from a dam, will take the value of "one". A score around the middle of the continuum would reflect a moderate quality of life as compared to the two extremes in respect of water. This could be water fetched from a bore hole from the neighbourhood. (See also Moller, 1997:53 - 59).

It should be noted that assigning values or weights to attributes within indicators introduces an element of subjectivity. If "type of dwelling" is taken as an example, a figure of "5" is assigned to a household occupying a traditional dwelling or a hut. A household living in a "Dwelling/house or brick structure on a separate stand/yard" is assigned a figure of "11" (see Appendix A). In numerical analytical terms, this could give the implication that the QOL of a household living in a traditional dwelling is almost half as good as the QOL experienced by a household in a brick house on a separate stand, in as far as this indicator is concerned. This is not entirely true because the subjective value (attached by households) to the type of dwelling they occupy, can only be known by them. Therefore assigning weights to QOL indicator attributes is not entirely value-free; it could have an impact on the study's results.

Hagerty *et al.* (2001: 83) indicate that some QOL indexes avoid the controversies around weighting by not weighting domains and, not providing explanations for adopting such an approach. They say that no weighting is still a form of weighting – equal weighting. However, Hagerty *et al.* (2001: 84) go ahead to caution that "no weighting" does not always result in equal weighting and can result in methodological flaws and misrepresentation of intended

objectives. The point being made here is that weighting of indicator attributes is inevitable albeit the subjectivity issue, and the apparent inadequacy of empirical background against which the weighting is enforced.

A list of the attributes and QOL indicators extracted from OHS 1999 is provided in the appendix A as an example. A comprehensive list for all indicators could not be compiled because of the way the questionnaires used in the surveys subsequent to OHS 1996, kept on being amended.

3.4.8 Cluster analysis

Households differ in respect of access to goods, services and facilities or amenities. This difference is crucial because it influences the quality of life conditions households experience. The quality of life a household enjoys is, to a great extent, determined by the goods and services (i.e. indicators of QOL) accessed by the household in question. A household which accesses most or all of the considered indicators, enjoys better QOL than a household which accesses a few. Ideally, households accessing the "best" attributes for all indicators under consideration enjoy the best QOL. Despite the differential access to goods, services and facilities, households accessing the same goods and services are likely to experience similar living conditions–this being referred to as QOL in this study. In other words households can be stratified according to the type and number of indicators they access. The resultant strata or groups can be analysed in order to establish the QOL experienced, on the basis of the number and type of indicators. This is where cluster analysis will play a role in this study.

According to Van Ryzin (1977: 18) clustering can be derived systematically from the data. There are three main types of data used in clustering; (1) multivariate data, (2) proximity data and, (3) clustering data. Multivariate data gives the values of several variables for several individuals. Proximity data consist of proximities among objects of the same kind: proximities among individuals, proximities among variables, proximities among stimuli and the like. Clustering data generally consist of the information derived from cluster analysis.

Of central importance in attempting to identify clusters of observations which may be present in data is knowledge of how "close" individual observations are to each other, or how far apart they are. Two observations are said to be "close" or similar when they have many characteristics that are common to both of them. Several measures exist for measuring proximity–a quantitative measure of closeness - depending on the level of measurement (Everitt *et al.,* 2001: 35). In some cases the purpose of undertaking cluster analysis is to identify and define groups of observations and how close the groups are – inter-group proximity. According to Everitt *et al.,* (2001: 46) there are two basic approaches to defining inter-group proximities. One approach is to define the proximity between the two groups by a suitable summary of the proximities between individuals from either group. Secondly, each group might be described by a representative observation by choosing a suitable summary statistic for each variable, and the inter-group proximity defined as the proximity between the representative observations. In the case of this study cluster analysis will be applied to classify households into groups on the basis of the QOL indicators accessed by households. From this point of view, interest is in identifying and defining groups rather than individual households. For that matter, the latter approach is more suitable. Further more, the number of clusters is not known *apriori*. As a result, cluster analysis will be used mainly for exploratory–vague-purposes, simply "to see what is there" (Van Ryzin, 1977: 22).

The K-means cluster technique will be applied in this instance to group households into QOL clusters on the basis of the indicators accessed by the households. This technique will also enable the study to establish household cluster membership. Because the indicators are measured on different scales (for example age is in completed years while income is in Rands and, grouped for that matter), the K-means cluster algorithm is suitable as it is not invariant under scaling. (Everitt *et al*., 2001: 106). According to Stockburger (1996) the K-means cluster analysis technique is appropriate in situations where the number of clusters is known before hand. In this case however, the number of clusters is not known and this is a problem. The K-means technique can still be used but it will require guessing the number of clusters and then adjust that number until an appropriate number is acquired in terms of the distance between the groups or clusters. The process involved in determining the ultimate number of clusters is explained in the following paragraphs.

According to Everitt *et al.* (2001: 35) two individuals are close when their dissimilarity or distance is small or their similarity large. In the K-means cluster technique dissimilarity or similarity between groups is measured and the distance is given depending on the number of clusters. Having too many clusters reduces the differences between the groups which reduces the distance between them. This undermines the identification of clear clusters as several individuals or items stand at or close to the cluster borders. Having too few clusters on the other hand like just two clusters, maximises the difference between clusters but this may obscure some characteristics that could be clearly identifiable if the number of groups were to be increased a bit. So the idea is to adjust the number of clusters to a point that maximises the group differences.

Deciding on the number of groups or clusters which optimises the criterion remains contentious but computer software has been developed at least, to reduce the burden of partitioning. According to Everitt *et al*. (2001: 99) the number of different partitions of *n* objects into *g* groups is given by the following formula.

$$N(n,g) = \frac{1}{g!}\sum_{m=1}^{g}(-1)^{g-m}\binom{g}{m}m^{n} \qquad (3.1)$$

Because of the numerous possible partitions, algorithms have been designed to search for the optimum value for a clustering criterion by rearranging existing partitions and keeping the new one only if it provides an improvement. The essential steps in the development of algorithms are as follows:

- Find some initial partition of the *n* objects into g groups.
- Calculate the change in clustering criterion produced by moving each object from its own to another group.
- Make the change which leads to the greatest improvement in the value of the clustering criterion.
- Repeat the previous two steps until no move of a single object causes the cluster to improve.

The details of the above procedure together with an example of how it works can be found in Everitt *et al. (2001: 100 – 102).*

The problem of determining the number of groups or clusters is not automatically solved by the steps mentioned above. The choice of the initial number of groups or clusters is random. The real task lies in determining the ultimate number of distinct clusters that maximises the differences between groups or clusters. This requires a need to establish how close groups are in terms of the summary measures (i.e. inter-group proximity). Everitt *et al.(2001)* proposes the use of Mahlanobis's distance given by the following formula:

$$D^2 = (\bar{X}_A - \bar{X}_B)' W^{-1} (\bar{X}_A - \bar{X}_B) \qquad 3.1$$

where W is the pooled within-group covariance matrix for the two groups. When correlations between variables within groups are slight, D^2 will be similar to the squared Euclidean distance calculated on variables standardised by dividing by their within-group standard deviation.
Thus, the Mahlanobis's distance increases with increasing distance between the group centres and with decreasing within-group variation (Everitt *et al., 2001:46).*

The concept of between-group distance relative to within-group variation is used in this study to decide on the optimum number of clusters. Assuming that a minimal number of clusters is started with, say two, increasing the number of clusters will increase the distance between the group centers since several households had initially been compacted into a few groups. Remember that households are being grouped on the basis of several QOL indicators accessed by households. The between-group distance will increase as households accessing the same indicators get stratified distinctively into particular groups. At the same time, within-group variation will be minimised as households with common characteristics (i.e. accessing similar QOL indicators) are grouped together. This process of increasing the number of clusters gradually, causes D^2 to increase as objects or households get slotted into clear distinct groups which reduces the within-group variation. The increase in D^2 however, reaches a maximum at a certain point where increasing the number of clusters causes an overlap of cases – reducing the distance between group centers – while the within-group variation is virtually non-existent.

Hereafter, D^2 begins to decrease and it marks a point where increasing the number of clusters is no longer justified. This will provide a basis for deciding on the number of clusters or QOL groups for this study.

Another alternative could be resorting to hierarchical clustering methods. These are two namely, divisive and agglomerative. They are applicable where no prior knowledge of the number of clusters is available. This method works well where clearly distinct clusters exist (See Everit *et al.*, 2001:55). In the context of this study, it is highly unlikely to get clearly distinct QOL clusters, particularly on the lower part of the continuum where households struggling to meet basic needs are located. Therefore the K-means cluster technique turns out to be most appropriate.

Going through the process described above, this study was able to establish the number of QOL clusters which enabled the study to describe the different QOL conditions in the various clusters. The study would then be able to analyse the changes in cluster composition for the period 1996 – 1999. This is where one would be able to ascertain the changes in access to the selected indicators in the various QOL clusters. A description of how subjective indicators of QOL relate with the objective indicators, is made possible and how this relationship may have changed during the period under review. The clusters obtained were used in discriminant function analysis to determine the indicators that discriminate between QOL groups (i.e. coefficients of the indicators of QOL). This is described in the following section and, it is the last phase of data analysis.

3.4.9 Discriminant function analysis

Households differ in living conditions mainly because they differ in ability to meet their needs. Ability to meet household needs depends on factors pertinent to a household like household income and employment status of household members. These factors are considered to be internal and hence could be regulated by the household in question. There are other factors like location (rural or urban) which are external to and outside the household's control, but they are influential to a household's ability to meet its needs. The external factors tend to play an indirect role in influencing household quality of life.

The two sets of factors – internal and external – are conceptualised in this study as QOL indicators and combine to influence household quality of life. In this context, household QOL is perceived to be a function of the indicators accessed by a household. It is important to stress that the indicators themselves are not static. Considering "source of water" as an example, it is clear that a household with piped water in the household will live better than a household with a tap in the compound. A household with a tap in the yard is better off in terms of access to water than a household relying on public tap water, because the latter has to travel some distance to fetch water. All this is clean water but there is a difference when it comes to accessibility. The difference in "accessibility" – a particular attribute - influences household QOL. Thus the indicators accessed by a household and their quality, differentiate between household quality of life and in the process, determine the cluster to which a household belongs (cluster membership).

From the example above, it can be seen that the contribution of the various indicators to QOL is not the same. This is likely to be the case because an indicator with many attributes will influence the classification of households just on the basis of its attributes as opposed to an indicator with a few attributes.

Contribution to QOL by the various indicators is in itself not known. What is established so far is the difference in QOL conditions depicted by the resultant clusters, on the basis of differential access to the selected QOL indicators. There is a need to establish the contribution of the various indicators to household quality of life. It is important to remember that households will belong to a particular cluster because they access certain indicators. A particular cluster of households will reflect a certain level of quality of life (QOL_i). Quality of life in a particular cluster will differ from quality of life in other clusters because of specific indicators and their relative importance. It is on this point of relative indicator importance that discriminant analysis will be applied.

According to Amemiya (1985: 291) discriminant analysis serves to measure the characteristics of an individual or an object and, on the basis of the measurements, the individual or object is classified into one or more groups.

Discriminant analysis techniques are appropriate in situations where groups of units are known and the purpose of the research is either to describe group differences or to predict group membership. The latter involves predictive discriminant analysis (PDA) in which group membership is predicted using a combination of variables. The variables determine group membership and, as such they serve as independent variables, while the groups form the dependent variables or grouping variable (Huberty, 1994:28; Tabachnick & Fidell, 2001:456). In the context of this study applying PDA enables the study to establish the percentage of cases – in this case, households – that are correctly placed on the basis of the selected indicators. This to a great extent verifies the extent to which results from cluster analysis are in agreement with the results emanating from discriminant function analysis, given that households are grouped using the same QOL indicators.

Descriptive discriminant analysis (DDA) strives to describe the effect the grouping variable(s) have on the multiple response variables. In other words the multiple response variables are viewed as the outcome variables and the grouping variable(s) as the explanatory variables. The primary goals of discriminant function analysis are to find the dimension or dimensions along which groups differ, and to find classifications to describe group membership. The degree to which these goals are met depends on the choice of variables. Choice is made either on the basis of theory about which variables should provide information about group membership, or on the basis of pragmatic considerations such as expense, convenience, or unobtrusiveness (Tabachnick & Fidell, 2001:458). The objective of this study is to establish whether quality of life in South Africa has improved. This will require a description of the changes in the prevailing conditions during the period under consideration. The choice of variables or indicators of quality of life is informed by theory (refer to Chapter two).

If one could recall the situation in multiple regression, there is a criterion or dependent variable (Y) and a set of predictor (independent) variables (X_i). A linear composite of predictors - call it X - is determined so that a simple correlation between the criterion variable and the predictors is determined. In this way a set of weights (w_i) for the predictor variables is determined so that the correlation (for the data being used) is higher than if any other set of w_i is used in determining Y.

This idea of determining w_i for some response variables in order to maximise correlation is also applied in DDA. In DDA the idea is to determine weights w_i for which the correlation between the group differences or group separation and the response variables is a maximum (Huberty, 1994: 207; Tabachnick & Fidell, 2001:464). The weights are part of the linear composite of the predictors x_i. The linear composite is of the form below.

$$Y = \sum_{i=1}^{n} w_i x_i \qquad (3.2)$$

Where:

Y = a linear composite of indicators of QOL,

w_i = the weight (canonical discriminant function coefficient) for a particular indicator,

x_i = a particular indicator accessible to households and,

n = the number of indicators or variables used in creating QOL groups

The linear composite in Equation 3.2 is referred to as a linear discriminant function (LDF). In discriminant function analysis, the coefficients (w_i) are chosen to maximise differences between groups relative to differences within groups. Just as in multiple regression, Equation 3.2 can be written either for raw scores or for standardized scores. A discriminant function score for a case (Y_i), then, can be produced by multiplying the raw score on each predictor by its associated unstandardised discriminant function coefficient, adding the products over all predictors, and adding a constant to adjust for the means.

Just as Y_i can be calculated for each case, a mean value of Y_i can be calculated for a group. The members of each group considered together have a mean score on a discriminant function that is the distance of the group, in standard deviation units, from the zero mean of the discriminant function. Group means on Y_i are typically called centroids in reduced space, the space having been reduced from that of the n predictors to a single dimension, or discriminant function (Tabachnick & Fidell, 2001:466).

In the context of this study QOL is not known but, households have been grouped into QOL groups or clusters in respect of the indicators of quality of life they access.

These should definitely be household clusters with different quality of life conditions much as quality of life itself may not be known. By taking the household quality of life groups or clusters on one side as a grouping variable and, the multiple response indicators on the other, the result will be a set of linear discriminant function(s) - depending on the number of groups or number of variables, whichever is smaller - in the form of equation 3.2 above. The discriminant function or functions will be used in the description and interpretation of the relative contribution of the quality of life indicators in differentiating between the QOL conditions existing in the QOL groups. In this way DDA will have played a role in determining the contribution of the various indicators to QOL (i.e. canonical discriminant function coefficients w_i, or LDF's as referred to by Huberty (1994: 208)), and to discriminate between household QOL clusters**.**

The study would then be able to identify household cluster membership, and what indicators are accessed by different household clusters- the latter reflecting the QOL conditions. The study will also be able to identify the most probable causes of the differences in household QOL conditions. The value of the coefficients (w_i) of the LDF, also known as the canonical discriminant function coefficients, will offer the basis for recommending as to which indicators should be targeted for purposes of further improving QOL – an issue for policy consideration. The following section will offer some insight regarding the interpretation of the results of discriminant function analysis.

3.4.10 Interpretation of study findings

The main objectives of this study are (1) to measure QOL at household level and (2) establish whether QOL has improved. An explanation of how the first objective will be achieved has been provided. To achieve the second objective, the task is to make sense of the resultant LDF's. This is more demanding than assessing the changes in cluster composition which forms part of the second objective. One of the questions that arises pertains to the meaning of the weights (w_i) of the LDF's.

According to Tabachnick and Fidell (2001: 457) discriminant function analysis has got two facets and one or both facets could be used in the interpretation of research findings.

One facet involves a situation where discriminant function analysis is used to classify cases and the researcher is interested in the classification rules pertaining to the classification process. In such a situation the researcher's interest is in establishing the existence of distinct classes or groupings of cases without trying to attempt to understand the meaning of the related combinations of predictors. The other facet involves a situation whereby interest is more in the meaning of the combinations of predictors in the various dimensions – discriminant functions – that separate the resultant groups from each other, than just establishing the existence of groupings of cases. The researcher is not merely interested in establishing whether distinct groups of cases exist or not. In the context of this study the latter facet is more relevant as the objective is not just to identify QOL groups but also to identify what discriminates between them.

To get an understanding of the whole process- description and interpretation- let us make use of the results in the example of Tabachnick and Fidell (2001: 464). In this example, learning – disabled children are grouped into three. The three groups are *memory* (children whose major difficulty seems to be with tasks related to memory), *perception* (children who show difficulty in visual perception), and *communication* (children with language difficulty). Children are classification into the three groups using predictors *performance IQ, age, information*, and *verbal expression*.

The hypothetical data are given in Table 11.1 in Tabachnick and Fidell (2001: 464). After performing a discriminant function analysis using SPSS, the following results in Table 3.2 are obtained as part of the SPSS output.

Table 3.2: Anatomy of discriminant function results

Part one: Summary of Canonical Discriminant Functions

Function	Eigenvalue	% of Variance	Cumulative %	Canonical correlation
1	13.486	70.7	70.7	0.965
2	5.589	29.3	100.0	0.921

a. First 2 canonical discriminant functions were used in the analysis

Part two: Wilks' Lambda

Test of functions	Wilks' Lambda	Chi square	df	Sig.
1 through 2	.010	20.514	8	.009
2	.152	8.484	3	.037

Part three: Standardised Canonical Discriminant Function coefficients

	Function	
	1	2
Performance IQ	-2.504	-1.474
Information	3.490	-.284
Verbal expression	-1.325	1.789
Age	.503	.236

Part four: Functions at group centroids

	Function	
Group	1	2
Memory	-4.102	.691
Perception	2.981	1.942
Communication	1.122	-2.633

Unstandardised canonical discriminant functions evaluated at group means

Part five: Structure matrix

	Function	
	1	2
Information	.228*	.066
Verbal expression	-.022	.446*
Performance IQ	-.075	-.173
Age	-.028	-.149

Pooled within-groups correlations between disciminanting variables and standardised canonical discriminant functions.

Variables ordered by absolute size of correlation within function

*Largest absolute correlation between each variable and any discriminant function

Source: Tabachnick & Fidell (2001: 465-470)

The results in Table 3.2 are just part of the SPSS output when discriminant function analysis is executed. The first part of Table 3.2 provides a summary of the canonical discriminant functions. This part indicates the number of canonical discriminant functions used in the analysis, together with the Eigenvalues, % of variance, cumulative percentage, and canonical correlation for each discriminant function. A central feature of this part of Table 3.2 is "% of variance" because it describes the proportion of variance in the solution that is accounted for by each discriminant function. The Eigenvalue associated with a particular discriminant function indicates the relative proportion of between – group variability accounted for by the function in question. In this case 70.7% of the variation is accounted for by the first discriminant function, while the remainder is accounted for by the second. In some cases, there are more than two discriminant functions, depending on the number of groups or number of predictors, whichever is smaller. In the case of the former, the maximum number of discriminant functions is less the number of groups by one (i.e. equal to the degrees of freedom for the groups). In case of the latter, the maximum number is equal to the number of predictors (Tabachnick & Fidell, 2001: 482). Of rather less importance in this part of the table are the canonical correlations for the respective discriminant functions. These correlations are a measure of association between the combinations of predictors in the linear discriminant functions and the grouping variable. These canonical correlations are of less significance, particularly for the current study because interest is more in the individual indicator/indicators in a LDF which share the most variation with that particular LDF than the joint canonical correlations. Such indicators which share the most variation with a given LDF are the ones which should define what attribute the LDF represents. This is a subject of part five of Table 3.2 (i.e. structure matrix) and as such, will be dealt with later on.

The second part of Table 3.2 -Wilks' Lambda – indicates the degree of association between the groups and the predictors. The table indicates the level of significance for discriminant functions as they are successively tested in the analysis. For instance, when both functions are tested simultaneously, a Chi square value of 20.514 is obtained which is significant at both 1% and 5% significance levels. When the first discriminant function is removed, the test of function 2 yields a Chi square value of 8.484 which is statistically significant at 5% but not 1% (i.e. Sig.

= 0.037). This means that the second discriminant function is also significant and should be considered in the analysis.

In situations involving many groups and predictors, more than two discriminant functions may turn out to be statistically significant. Caution needs to be taken when deciding on the number of discriminant functions to use while interpreting the results, as some functions may be statistically significant but not carrying worthwhile information. In most instances, the first one or two discriminant functions account for most of the between - group variation, necessitating to leave out the other discriminant functions which may not be adding on much in terms of description. The onus is upon the researcher to decide on the number of functions to use in the analysis, given that flexible statistical procedures do exist to provide assistance in this regard (Tabachnick & Fidell, 2001: 483).

Part three of Table 3.2 shows the canonical discriminant function coefficients in a standardised format. A standardised discriminant function consists of standardised coefficients (z_i) which when multiplied by standardized scores of each case and summed up, yield standardised scores for the cases in question. The mean of each discriminant function over all cases is zero with a standard deviation of 1. Standardised scores can also be derived for groups of cases using the standardised coefficients. The scores of cases in each group together have a mean score on a discriminant function that is the distance of the group, in standard deviation units, from the zero mean of the discriminant function. These group means are commonly referred to group centroids. Unstandardised scores for cases can be derived by using unstandardised discriminant functions. In such a situation a discriminant function score for a case is obtained by multiplying the row score on each predictor by the corresponding unstandardised discriminant function coefficient. The sum of the products over all predictors for a particular case yields its unstandardised score, after adding a constant to adjust for the means. Just like in standardised discriminant functions, group centroids for unstandardised discriminant functions reflect the average discriminant score for each group on each function; these form part four of Table 3.2. Group centroids can also be displayed graphically as part of the SPSS output if that option is highlighted.

As highlighted earlier on in this section, one crucial part of discriminant function analysis is the interpretation of the contribution of individual predictors to the LDF. Predictors in a LDF differ in influence and this is indicated by the magnitude with which particular indicators correlate (or load) with a LDF. If predictors X_1, X_2, and X_3 load highly with a particular function while others do not, the task is to try and establish the commonalities between X_1, X_2, and X_3 as opposed to the rest of the predictors. The task for the researcher is to understand the common features between the predictors which load highly with the LDF and how these features differ from those of the rest of the predictors. A particular LDF is defined and interpreted in terms of the predictors (or indicators in the case of the current study) which share the most variation with it. This variation is indicated in part five of Table 3.2. In this example the first discriminant function loads most highly with *Information* (r = 0.228) while the second function loads most highly with *Verbal Expression* (r = 0.446). Tabachnick & Fidell (2001: 485) go further to explain that a full interpretation of the findings requires relating the correlation values with the discriminant function plots. The latter provide a visual display of the centroids which makes it easy to see which factor separates a particular group from the others. In the case of the example used, the discriminant function plots relating to the described results are shown in Figure 11.1 (Tabachnick & Fidell, 2001:483). Interpretation is reportedly easy when one predictor loads highly with a discriminant function; it is more challenging and, interesting from a research perspective, when a number of predictors load highly with a discriminant function. The question of how high correlations should be for consideration in the interpretation process remains contestable. However, convention allows for correlations in excess of 0.33 to be considered eligible while lower ones are not (Tabachnick & Fidell, 2001:485).

The results of discriminant function analysis emanating from the data sets (i.e. OHS 1996 – OHS 1999) will be interpreted in a way similar to that described in the example above. Since the indicators of quality of life (i.e. predictors) used in discriminant function analysis are the same indicators used in cluster analysis, a comprehensive picture regarding QOL changes will be obtained by linking the interpretation of the results from both discriminant function analysis and cluster analysis. Recommendations regarding the steps to be taken to further improve QOL will be based on this interpretation.

3.4.11 The Quality of Life index

One needs to recall that in this study, cluster analysis makes it possible to group households into quality of life groups or clusters. This is achieved on the premise that households experience similar quality of life conditions because they access similar QOL indicators. As a result, households accessing different QOL indicators are grouped into different QOL groups, because they experience different quality of life conditions. As described above, the resultant clusters or QOL groups form the grouping variable which serves as the dependent variable in discriminant function analysis.

Emanating from discriminant function analysis in conjunction with cluster analysis are LDF's whose coefficients indicate the relative contribution or importance of indicators to household QOL. Discriminant function analysis, through the resultant coefficients of the LDF's, enables us to identify the indicator or indicators that share the most variation with the LDF's. The coefficients are derivatives of indictors accessed by households involved in the study. In other words, knowing the QOL groups and the indicators accessed by the households in those groups, enables us to describe and compare the QOL conditions experienced by the households in question. It is important at this stage to indicate that a comparison of QOL conditions in the resultant QOL groups requires a mechanism through which the QOL groups can be ranked. This is achieved through the use of the group centroids associated with the first LDF.

As indicated earlier on, discriminant function analysis provides a distribution of grouped cases along particular dimensions or discriminant functions. The first discriminant function (DF) accounts for most of the between - group variation. The clusters will have their centroids distributed along a particular DF on the basis of the indicator characteristics used in the analysis. A group of households with the best access to the selected QOL indicators will have its centroid located farthest on the positive side of the first dimension or discriminant function. Similarly a group of households with the poorest access to the selected QOL indicators will be have its centroid located farthest on the negative or left side of the first dimension. This enables this study to rank the QOL groups. The entire array of QOL group constitutes the QOL index.

Identifying indicators which account for differences in the QOL conditions of the QOL groups or clusters – linear discriminant function analysis- enables us to describe and synthesise the possible effect of such indicators in influencing quality of life. In this context, it becomes apparent that neither the results of cluster analysis alone nor those of discriminant function analysis, can independently provide us with a comprehensive picture of quality of life. The Quality of Life index therefore exists because of the results of the two models (i.e. cluster and discriminant analysis). Comparing the QOL groups emanating from cluster analysis is made possible through the ranking of the QOL groups. The ranking process is premised on the results of discriminant function analysis which would not have been achieved without linking the inputs for the two models [cluster and discriminant analysis]. The two therefore provide a clear picture of the actual quality of life conditions in the various groups and, what differentiates between the QOL conditions experienced in the different groups of households.

Since this study is dealing with data for four years (1996 – 1999), the results will consist of four separate indices, each having a set of QOL groups and a corresponding set of linear discriminant functions. A comparison of the changes in cluster composition and the indicators that load highly with the discriminant functions will provide grounds for commenting on the improvements in quality of life in South Africa. Recommendations regarding further improvements in quality of life will be based on the identified changes and interpretation of the study findings.

3.5 Summary

This chapter has dealt with issues relating to conceptualising QOL and the research methodology. With regard to the former, a conceptual model has been developed to indicate the interactions between QOL indicators and QOL. The model also shows the processes through which household QOL conditions are differentiated on account of the indicators accessed. Research questions have been raised. The theoretical linkages between the model variables and QOL have been highlighted. In the research methodology, the data sources, nature of data, and the sample sizes have been described.

Motivation for including or excluding certain indicators has been provided. The phases through which data are to be analysed have been described. A description of how the study's findings will be interpreted, particularly in respect of discriminant function analysis has been given. The chapter ends with a description of what constitutes the quality of life index and its interpretation. The following chapter (four to seven) will present the findings of the study.

CHAPTER FOUR: FINDINGS OF THE STUDY IN RESPECT OF OHS 1999

4.1 Introduction

Having looked at the methodology used in the study, chapters four to seven will present the findings of the study. Data for four different years (OHS 1996 – OHS 1999) has been used in the study. Because of the numerous variables involved in data analysis for each year and, the numerous QOL groups emanating from the analysis, the results for each year will be presented as a separate chapter. Following this approach, chapter four will present the findings pertaining to the analysis of the data for OHS 1999 while chapter seven will present the findings emanating from the analysis of the data for OHS 1996. In each case, results will be divided into two broad categories. The first category relates to findings in respect of discriminant function analysis. This deals with aspects or indicators which differentiate between groups of households experiencing different QOL conditions. This section also highlights the extent to which households are correctly classified on the basis of the QOL indicators considered in the study. The results of discriminant function analysis also provide a basis for ranking the QOL groups emanating from cluster analysis.

The second category of results relates to groups emanating from cluster analysis. Results in this category describe characteristics of the various QOL groups, highlighting how the groups differ from one another demographically and, in terms of the indicators considered. Finally a description of the subjective assessment of QOL is incorporated to assess the possible relationship between objective and subjective quality of life among the emerging QOL groups.

4.2 Applying discriminant function analysis to the OHS (1999) data

As indicated earlier on in chapter three, discriminant function analysis is frequently employed in processes requiring classification of cases into groups. According to Amemiya (1985: 281) discriminant analysis techniques are appropriate in situations where groups of units are known and the purpose of the research is either to describe group differences or to predict group membership.

In the context of this study, discriminant function analysis has been applied for both purposes. In the first place it has been applied to assist in identifying and describing the indicator/indicators that differentiate between groups of households in respect of the quality of life conditions experienced. This is known as descriptive discriminant ananlysis (DDA). As indicated in chapter three DDA strives to describe the effect the grouping variable(s) have on the multiple response variables. The multiple response variables are viewed as the outcome variables and the grouping variable(s) as the explanatory variables (Huberty, 1994; Tabachnick & Fidell, 2001). In this study, the multiple response variables are the various QOL indicators which have been used to classify households (i.e. cluster analysis) into eight groups experiencing different QOL conditions. Multiple response in this study refers to a variable or indicator possessing several attributes to which a particular household could respond. Multiple response should not be taken to mean that a household could respond to a particular indicator/variable through more one attribute. The eight groups or clusters of households (i.e. QOL1 – QOL8) form the grouping variable. The groups are then used in discriminant function analysis, in conjunction with the multiple response variables to conduct the analysis.

The second reason for applying discriminant function analysis lies in its ability to predict group membership - referred to as predictive discriminant analysis (PDA). Applying PDA enables this study to establish the percentage of cases – in this case, households – that are correctly placed on the basis of the selected indicators. This to a great extent verifies the extent to which results from cluster analysis are in agreement with the results emanating from discriminant function analysis, given that households are grouped using the same QOL indicators. Findings pertaining to PDA are dealt with in section 4.2.1.

Table 4.1 shows the output summarizing the canonical discriminant functions - the eigenvalue, % of variance, cumulative % of variance accounted for by each function, and the canonical correlation for each discriminant function. The eigenvalues associated with discriminant functions indicate the relative proportion of between –

group variability accounted for by each function. The results in this case indicate that 66.4% of the between-group variability is accounted for by the first discriminant function and 19% is accounted for by the second. The additional variance accounted for by functions three to seven is also shown but the discriminating power for these functions is relatively small. In most cases, meaningful interpretation is limited to the first two functions, which in this case account for 85.4% of the variance. Because the analysis involved many indicators and groups, the maximum number of functions is the lesser of either the degrees of freedom for the groups (seven), or equal to the number of predictors, namely seventeen (Tabachnick & Fidell, 2001:482). As such there are seven functions that could be considered but the first two are the most crucial in the interpretation of the findings as they account for the largest variance between the eight QOL groups.

Table 4.1: Summary of canonical discriminant functions (OHS 1999)

Function	Eigenvalue	Percentage of Variance	Cumulative %	Canonical Correlation
1	8.634	66.413	66.413	0.947
2	2.470	18.999	85.412	0.844
3	1.743	13.404	98.816	0.797
4	0.131	1.006	99.822	0.340
5	0.012	0.093	99.914	0.109
6	0.008	0.059	99.973	0.087
7	0.004	0.027	100	0.059

The issue of how many functions to be used in the interpretation of results remains contested in this study. The canonical correlations for each function indicated in Table 4.1 are a measure of association between the QOL groups and the indicators. The interpretation of the strength of these correlations is made easy when the chi-square results in Table 4.2 are taken into account. The chi–square results indicate that with all seven functions included, the $\chi^2(119)$ of 101903.3 indicates a high relationship between the eight QOL groups and the QOL indicators which serve as the predictors.

With the first discriminant function removed, there is still a reliable relation between the QOL groups and the indicators as indicated by $\chi^2(96)$ of 52412.21 (p =0.000). The same goes for all the seven functions as one function is systematically removed. All seven functions indicate reliable relations between the QOL groups and the indicators despite the decrease in the magnitude of the canonical correlations in Table 4.1.

Table 4.2: Statistical significance of discriminant functions (OHS 1999)

Test of Function(s)	Chi-square value	Degrees of freedom	Sig.
1 through 7	101903.3	119	0.000
2 through 7	52412.21	96	0.000
3 through 7	25230.87	75	0.000
4 through 7	3189.32	56	0.000
5 through 7	504.30	39	0.000
6 through 7	243.744	24	0.000
7	76.11	11	0.000

Much as the association - indicated by chi-square values - is high and statistically significant, it is imperative to remember that the eight groups have been classified on the basis of seventeen indicators. There is a high likelihood for at least one indicator to differentiate a group of households – one QOL - from another or a combined group of other groups. The first discriminant function identifies what indicator(s) discriminate between one QOL group from the rest of the groups. The second function identifies what indicator(s) discriminate between group two from groups 3 – 8 given that group one is already taken out, and so on. Because there are numerous indicators in the analysis - and rightly so because QOL is multidimensional – individual indicators could discriminate between groups after the second discriminant function, making the associations statistically significant. even if the functions have low discriminatory power. This is likely to be the case as indicated in the pooled within-groups correlations results shown in Table 4.3. The correlation figures marked (*) have been identified by the discriminant function model to be statistically large in absolute terms and, when one checks, such correlations are not many (at most three) in most of the functions, with the exception of function four.

In any case the argument of the multitude of indicators impacting on QOL still holds when one looks at which indicators emerged with the largest absolute correlation value(s) in the various functions; they are different for each function. On the basis of both, statistical grounds and the findings of this study, interpretation of the discriminant function results will be limited to the first two discriminant functions (See Tabachnick & Fidell**,** 2001: 459).

Table 4.3: Pooled within-groups correlations between the standardized canonical discriminant functions and the predictors

	Function						
	1	2	3	4	5	6	7
Type of toilet facility	0.3439	-0.5906*	0.2110	-0.0841	0.3550	-0.0308	0.0885
Highest education level completed	0.8098*	0.5633	0.1501	0.0260	0.0009	-0.0017	0.0197
Occupation of employee/self employed	-0.3733	0.0992	0.9063*	0.0200	0.0778	-0.0554	-0.0043
Household own a vehicle?	-0.1566	0.0230	0.0756	0.3963*	-0.2778	0.3661	0.0024
Does h/hold have a phone in house/cell-phone?	0.1865	-0.1154	0.0238	-0.3515	0.1042	-0.4078*	0.3416
Is person covered by medical aid?	-0.1766	0.0200	0.1286	0.5140*	-0.1451	-0.0630	0.0241
Household's distance from water source	0.1690	-0.2965	0.0984	0.1293	0.2605	0.1817	0.5324*
Household's fuel for lighting	0.1488	-0.2095	0.0691	-0.0202	-0.0275	-0.0336	-0.2373*
Household access to TV?	-0.1287	0.0749	-0.0283	0.1867	0.1268	0.4820*	-0.0434
Did person work for pay during past 7 days?	-0.2029	0.1223	0.5670	-0.6192*	-0.2436	0.2088	0.1950
Dwelling ownership	-0.0629	0.1263	0.0487	-0.2396*	0.1405	0.0571	-0.1184
Household's fuel for cooking	0.2377	-0.2416	0.0761	0.0910	-0.4972*	-0.2438	0.2663
Household's fuel for heating	0.1948	-0.1891	0.0347	-0.093	-0.3099	-0.5169*	-0.0324
How is refuse removed?	-0.2549	0.4388*	-0.2384	0.1134	0.2670	-0.0232	0.1808
Household's water source	0.1836	-0.2482	0.0832	-0.0478	0.1345	-0.2521	0.3513*
Type of dwelling	0.0680	-0.0506	0.0444	-0.3739*	0.1316	-0.1799	-0.2154
H/hold's time to travel to telephone	0.2180	-0.2325*	0.0906	-0.0703	-0.1414	-0.0161	0.1779

NB. Variables ordered by absolute size of correlation within function.

*Largest absolute correlation between each variable and any discriminant function.

4.2.1 Prediction of group membership

Before we get into the interpretation of the results emanating from discriminant function analysis, it is proper to look at the extent to which the discriminant function results are in line with the results of cluster analysis. As one would recall, cluster analysis provides the initial step in grouping households into QOL groups. Households are grouped on the basis of selected QOL indicators. Much as determining the number of clusters was based on Mahlanobi's distance as explained in chapter three, it is crucial to establish the validity of the QOL groups emanating from cluster analysis. This is revealed by the classification results in Table 4.4. Results in this table indicate how cases originally classified in cluster analysis are grouped in discriminant function analysis. These results indicate that 94.5% of the cases originally classified into eight QOL grouped are correctly classified in the discriminant function analysis model. This is a satisfactory fit between the two models. Having said that however, one needs to look at where most of the discrepancy occurs.

The upper section of the table compares the number of cases grouped in cluster analysis with the number of cases as predicted in discriminant function analysis. The lower part of Table 4.4 provides the comparison in terms of percentages. Focusing on percentages, one finds that the best results in terms of fit are found in groups 2,4,5,6, and 7 where the correctly predicted percentages are above the overall percentage of 94.5%. The poorest fit between the two models is found in group three where 90.6% of the original cases are correctly classified by the discriminant function model. For this group 7.45% of the households which were originally classified as belonging to group three(ranked sixth) are predicted as belonging to group eight (ranked fifth) and 1.5% are predicted as belonging to group seven (ranked fourth). The most probable cause of around 9% of the cases being predicted to belong to groups seven and eight is the relatively poor level of education in the three groups. As will be explained in detail in section 4.4, groups three, seven and eight have most of the households being headed by people with education levels below standard nine (i.e. grade 11). Besides this particular group (i.e. QOL 3) and possibly QOL8 the discriminant function results compare fairly well with the cluster analysis results.

Table 4.4: Classification results of original and predicted group membership for OHS 1999

		Predicted Group Membership								
	Cluster Number of Case	1	2	3	4	5	6	7	8	Total
Original Count	1	**4383**	0	7	6	1	7	125	172	**4701**
	2	0	**2878**	76	0	0	43	0	8	**3005**
	3	0	11	**2714**	0	0	1	46	223	**2995**
	4	11	0	1	**1757**	42	0	0	0	**1811**
	5	0	0	6	1	**785**	0	1	0	**793**
	6	2	22	5	0	0	**2278**	37	5	**2349**
	7	82	0	25	0	0	10	**3808**	11	**3936**
	8	38	69	9	0	0	80	10	**2065**	**2271**
	Percentages									
	1	**93.2**	0	0.15	0.13	0.02	0.15	2.66	3.66	**100**
	2	0	**95.8**	2.53	0	0	1.43	0	0.27	**100**
	3	0	0.37	**90.6**	0	0	0.03	1.54	7.45	**100**
	4	0.61	0	0.06	**97.0**	2.32	0	0	0	**100**
	5	0	0	0.76	0.13	**99.0**	0	0.13	0	**100**
	6	0.09	0.94	0.21	0	0	**97.0**	1.58	0.21	**100**
	7	2.08	0	0.64	0	0	0.25	**96.8**	0.28	**100**
	8	1.67	3.04	0.40	0	0	3.52	0.44	**90.9**	**100**

NB. 94.5% of original grouped cases correctly classified

4.2.2 Interpretation of discriminant function results

Up to so far, attempt has been made to establish the validity of the results from discriminant function analysis. The next step is to try and understand the meaning of the discriminant function itself. According to Tabachnick and Fidell (2001: 484) the meaning of the function is inferred by a researcher from the pattern of correlations

between the function and the predictors. If predictors X_1, X_2, and X_3 load (correlate) highly with the function but predictors X_4 and X_5 do not, the researcher attempts to understand what X_1, X_2, and X_3 have in common with each other that is different from X_4 and X_5; the meaning of the function is determined by this understanding.

Results in Table 4.3 show that the indicator which correlates highly with the first discriminant function (marked with "*") is "highest education level completed by the head or acting head of the household". As will be shown in section 4.4 this indicator differentiates basically five groups where the level of education completed by heads of households is low, from the other three. The five groups are groups 2,3,6,7, and 8 in which most households are headed by people below standard nine or no education at all. In group two for instance 73% of the household heads have had no formal education while 51.5% of the household heads in group six fall in the same category. The other three groups have most of the households headed by people with education levels below standard nine.

Completed level of education is critical in improving quality of life. It becomes even more critical if the majority of households – in this case households in five groups – are headed by people with low or no education. Remember that 66.4% of the between-group variability is accounted for by the first discriminant function and 19% is accounted for by the second discriminant function. Addressing issues associated with the indicators which load highly with these two discrminant functions will go a long way in minimising the existing group differences thereby improving QOL.

When it comes to the second discriminant function, two indicators correlate highly with it, namely "Type of toilet facility" and "Time taken to travel to a telephone facility". With regard to type of toilet, five groups namely group 1, 4, 5, 6, and 7 rely mostly on a flush toilet either in the dwelling or on site. This sanitation aspect is differentiating between these five groups from the other three which rely mostly on pit latrines (VIP's and ordinary pit latrine). Details pertaining to this indicator are provided later on in section 4.4.4.

As for the variable “time taken to travel to a telephone facility”, this indicator differentiates three groups (group 2, 3, and 8) from the rest of the groups. Possession of a cellular or landline telephone is low in these groups which requires most of them to travel when the need to make a telephone call arises. One common feature between these three groups is the relatively big number of households which have to spend more than an hour while traveling to a telephone facility. Close to 12% of the households in group eight spend over an hour to get to a telephone facility while 14.6% of the households in group three experience the same situation. Virtually 20% of the households in group two spend at leas an hour in order to get to a telephone facility. Details of this particular indicator are provided later on in section 4.4.6.

The indicators which load or correlate highly with functions three to seven are indicated with (*) in Table 4.3. A detailed interpretation of the attendant functions will not be provided as indicated earlier on. However, such interpretation can always be made by researchers who are interested provided the interpretation is done in reference to the findings described in section 4.4. A complete set of the results emanating from discriminant function analysis is provided in Appendix C.

At this stage it is proper to comment on the canonical discriminant function plots and the territorial map for the QOL groups (QOL 1–QOL8) in Appendix C. These two [canonical discriminant function plots and the territorial map] display the partitioning of the eight QOL groups which constitute the QOL index. In case of the canonical discriminant function plots, the groups have been displayed separately on account of space. A comprehensive picture of the distribution of the QOL groups could be depicted with all eight groups displayed on one graph but owing to the numerous cases involved and relatively large number of groups, the groups get so congested that one cannot visualise them independently, talk less of the group centroids. This in a way, is solved by incorporating the territorial map which displays the distribution of QOL groups (the group number) and group centroids, along the first two canonical discriminant functions. The plots for each group are obtained by use of Fisher’s linear discriminant function coefficients corresponding to a particular group.

At this juncture it is proper to briefly talk about how the distribution of the group centroids enhanced the ranking of the groups or clusters of households. According to Tabachnick and Fidell (2001) the first discriminant function accounts for most of the between-group variation (66.4% in this case). The first discriminant function therefore provides the most vivid distribution of the eight clusters of all seven discriminant functions. As a result the distribution of group centroids along the first discriminant function or dimension has been used in this study to determine the rank of the QOL groups emanating from cluster analysis (described in section 4.3). Ranking has been based on the values of the eight group centroids along the first discriminant function or dimension such that a group with the best QOL has its centroid located farthest along the positive side of the dimension. From the information in Table 4.5 below, group four with its centroid located +5.49 points along the first discriminant function is ranked number one while group two with its centroid located -4.78 points (i.e. to the left) along the first discriminant function is ranked number eight. These results are also indicated in Table 4.7 in the following section where cluster analysis is dealt with.

Table 4.5: Functions at group centroids

	Function						
Cluster Number of Case	1	2	3	4	5	6	7
1	2.3501	-0.9733	-0.9594	0.0848	-0.0517	-0.0902	-0.0516
2	-4.7840	0.3724	-0.5428	-0.5042	0.0921	-0.0758	0.0009
3	-1.5797	2.4874	0.6594	0.0610	-0.1630	0.0555	-0.0461
4	5.4938	0.9524	-1.2775	-0.6557	0.0274	0.1270	0.0535
5	4.2957	2.7734	2.5435	0.3796	0.3982	-0.0191	-0.1061
6	-2.1363	-2.7998	0.2985	0.0881	0.0430	0.1674	-0.0494
7	0.7290	-0.8356	2.0028	0.0016	-0.0368	-0.0431	0.0736
8	-1.3860	0.8577	-1.8150	0.7078	0.0584	0.0207	0.0844

NB. Unstandardised canonical discriminant functions evaluated at group means

4.3 Formation of the quality of life groups using cluster analysis

As indicated in chapter three, clustering can be derived systematically from the data. Of central importance in attempting to identify clusters of observations is knowledge of how "close" individual observations are to each other, or how far apart they are – proximity (Everit *et al*., 2001: 35). In this study cluster analysis was undertaken in order to identify and define groups of households accessing certain QOL indicators. Quality of life has been conceptualised in terms of a household's ability to satisfy its needs. Ability to satisfy household needs is constrained by what a household can access. The issue of constraint comes in because satisfying a number of basic household needs is influenced by exogenous factors. For example every household would like to have a permanent spacious house with a flushing toilet, electricity, piped water and, possibly in a physical environment where most of the services are readily accessible. The reality however is that accessing some of these services and, by implication satisfying households' needs in respect of such services, is subject to conditions operating at a level other than the household level. As a result households differ in terms of ability to satisfy their needs due to individual households' capabilities as well as other exogenous factors. This results into households experiencing different living conditions. The differential access to services and, ability to satisfy household needs, influences a household's living conditions - conceptualised as QOL in this study.

When looked at from this perspective, households can be classified on the basis of the needs they are able to satisfy. Households which are capable of satisfying or accessing similar needs, will in essence experience similar living conditions. Such households can be grouped together on this basis, hence constituting a QOL group. Classification of households along the line of household access to selected indicators of QOL has been achieved through the application of cluster analysis. In the case of OHS 1999, this [cluster analysis] process yielded eight QOL clusters or groups (QOL1 – QOL8) whose details are described in section 4.4. Determining the number of clusters was based on Mahlanobis's distance as described in chapter three. Table 4.6 shows the final cluster centres for the eight clusters.

The entire set of the eight QOL groups constitutes what is referred to as the QOL index. The detailed results pertaining to cluster analysis for OHS 1999 are available in Appendix B.

Table 4.6: Final cluster centers for OHS 1999

	Cluster number							
	1	2	3	4	5	6	7	8
Dwelling type occupied by h/hold	4.19	3.73	3.59	4.68	4.26	3.91	4.21	3.22
Ownership of dwelling	3.55	4.49	4.45	3.81	4.17	3.71	3.87	3.88
Nature of contract/Employment status	1.13	3.36	3.38	1.06	2.93	2.59	3.28	1.27
H/hold fuel for cooking	4.72	2.74	3.19	4.84	4.34	4.12	4.54	3.41
H/hold fuel for heating	4.45	2.39	2.68	4.66	3.93	3.63	4.11	2.86
H/hold fuel for lighting	4.81	2.97	3.14	4.84	4.44	4.51	4.67	3.34
Time taken to nearest phone	6.26	3.97	4.36	6.59	5.97	5.68	6.14	4.54
Does h/hold have a phone/cell-phone in house?	1.57	1.06	1.09	1.80	1.53	1.28	1.49	1.10
Highest qualification for h/h head or acting h/h head	11.23	0.97	9.18	18.59	19.94	1.99	9.60	6.89
Is person covered by medical aid?	1.63	1.98	1.97	1.29	1.72	1.94	1.85	1.94
Occupation of employee/self employed	5.23	11.13	11.29	2.83	10.54	10.11	11.37	6.75
Household own a vehicle?	1.57	1.92	1.92	1.29	1.59	1.89	1.75	1.89
Toilet facility accessed by h/hold	10.41	5.50	5.43	10.36	9.32	10.14	10.43	6.31
Household access to TV?	1.23	1.65	1.58	1.10	1.26	1.47	1.29	1.60
H/hold's main water source	4.66	3.34	3.38	4.74	4.42	4.39	4.62	3.63
Distance from water source	4.93	3.66	3.69	4.89	4.69	4.92	4.97	4.08
How h/hold refuse is disposed of	1.72	5.63	5.31	1.84	2.50	1.83	1.35	5.28

4.4 Comparing the different aspects of the eight quality of life

Before comparing the quality of life conditions in the various QOL groups, there is a need to objectively determine how the emerging QOL groups differ from each other in terms of the conditions they experience. In other words, one needs to rank the quality of life groups.

Ranking the QOL groups has been based on the findings of the discriminant function model as explained earlier on in section 4.2. Amongst other results, discriminant function analysis provides a distribution of grouped cases along a particular dimension or discriminant function. The first discriminant function (DF hereafter) accounts for most of the between - group variation as detailed in section 4.2. The clusters will have their centroids distributed along a particular DF on the basis of the characteristics used in the analysis. In the context of this study then, a group of households with the best access to the selected QOL indicators will have its centroid at the extreme positive point of the first dimension or discriminant function. Similarly a group of households with the poorest access to the selected QOL indicators will be have its centroid at the extreme negative point of the first dimension. In this way the discriminant function model enhanced the objective ranking of the QOL groups constituting the QOL index. Table 4.7 provides information pertaining to the ranking of the eight quality of life groups. This information has been extracted from Table 4.5 which provides details on the distribution of functions at the group centroids. Note that no attempt has been made to change the order of the groups from the order that came out of the clustering process as this could cause confusion should replication be deemed necessary.

Table 4.7: Distribution of QOL groups and their respective ranks based on group centroids (OHS 1999)

QOL Group number	1	2	3	4	5	6	7	8
Group centroids – First discriminant function	2.35	-4.78	-1.58	5.49	4.3	-2.14	0.73	-1.39
Rank of QOL Group	3	8	6	1	2	7	4	5

Having explained how households experiencing similar QOL conditions were grouped, the next step is to provide a description of the characteristics of the QOL groups themselves. Note that the description of findings is presented according to the ranking as opposed to the numbering of the QOL groups. It is hoped that presenting the findings this way will make comparison easier as findings are systematically presented starting with a QOL that is ranked to enjoy the best measurable quality of life.

Table 4.8 provides a synopsis of the demographics for the eight QOL groups whose details are provided hereafter.

Table 4.8: Demographics, employment and income of the QOL groups (OHS 1999)

	Cluster number							
Rank of QOL Group	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***
Original cluster number	4	5	1	7	8	3	6	2
Population group								
Asian	4.2	2.5	5.3	3.2	0.1	0.1	1.3	0.1
Black	46.4	59.9	57.3	63.8	92.6	96.0	81.5	95.8
Coloured	7.2	12.1	14.7	17.1	7.2	3.7	16.9	4.1
White	41.7	25.2	22.7	15.8	*	0.2	0.3	*
Age of head of the household								
Under 19 years	-	0.1	0.2	1.2	0.5	3.3	-	0.2
20 - 29	14.4	9.0	15.6	12	14.1	18.9	3	2.5
30-49 years	66.8	38	65	39.7	63.6	44.6	40.4	27.9
50 - 69	18.1	37.7	18.4	35.3	20.4	26	40.5	43.4
70 years and older	0.6	15.1	0.6	11.9	1.4	7	16.1	25.8
Median age	39	51	39	48	41	40	52	60
Sex of head of the household								
Male	74.5	69.6	82.5	51.5	79.2	45.9	59.1	46.7
Female	25.5	30.4	17.5	48.5	20.8	54.1	40.9	53.3
Education Level								
No schooling	-	-	-	-	3.0	-	51.5	73.0
Below standard 9 (grade 11)	-	-	56.8	84.9	94.2	89.8	48.5	27
Standard ten (grade 12 or Matric)	-	-	42.5	15.0	2.8	9.8	-	-
Certificate or Diploma	52.3	34.7	0.7	0.2	-	0.4	-	-
Degree or post graduate Degree	42.4	19.2	-	-	-	_	_	-
Employment Status								
Full time	96.4	31.9	90.7	20.9	81.9	17.1	43.1	17.9
Part time	2.4	5.2	6.0	3.5	9.9	3.6	4.1	3.6
Casual/seasonal	0.6	1.4	2.6	2.7	7.7	3.0	3.8	2.9
Unemployed	0.7	61.5	0.7	73	0.6	76.3	49	75.6

NB. * Stands for one case (i.e. household)

Table 4.8: Demographics, employment and income of the QOL groups (OHS 1999) -continued

	Cluster number							
Rank of QOL Group	***1***	***2***	***3***	***4***	***5***	***6***	***7***	***8***
Original cluster number	4	5	1	7	8	3	6	2
Household monthly Income								
No income	1.5	10.4	1.2	19.0	1.3	18.2	8.2	11.8
R0–R399	0.5	10.3	3.4	15.9	20.9	27.8	14.4	20.6
R400– R799	1.6	23.0	6.7	30.4	24.7	33.8	44.3	55.3
R800-R1199	2.2	8.5	9.9	10.5	17.1	9.3	12.2	6.9
R1200-R1799	4.3	7.6	18.5	7.7	17.4	5.0	11.2	2.9
R1800-R2499	7.1	6.8	12.4	4.5	8.4	2.1	4.4	0.9
R2500-R4999	26.4	10.6	22.7	5.3	6.0	1.3	3.0	0.4
R5000-R9999	24.8	4.7	9.9	1.8	0.7	0.3	0.4	0.1
R10000 +	18.2	1.9	4.7	0.4	-	0.1	-	0.1
Don't know	8.7	11.4	6.9	2.5	3.2	1.8	1.7	1.1
Refused	4.6	4.8	3.8	2.0	0.3	0.1	0.4	0.1
Total Response rate	1809 (99.9)	790 (99.6)	4694 (99.9)	3926 (99.8)	2267 99.8)	2985 (99.7)	2348 (99.9)	3000 (99.8)
Median income (Rands)	6274.56	1098.01	2389.30	597.32	870.30	446.48	647.19	528
Number of cases (N = 21861)	1811	793	4701	3936	2271	2995	2349	3005
Percentage	8.3	3.6	21.5	18	10.4	13.7	10.8	13.8

4.4.1 **Analysis of Demographics (OHS 1999)**

(a) Demographics of Quality of Life: Group 4

This group is ranked first on the QOL index. It accounts for 8.3% of the sampled households. No household in this group is headed by a person under nineteen years of age. Households headed by people aged 20 – 29 constitute 14.4% while two thirds of the household heads fall in the 30 – 49 age category. Relatively few households (0.6%) are headed by elderly people (i.e. 70 years and older). Household headship is predominantly male (74.5%) and, 85.5% of the households are urban.

As far as race is concerned, 46.4% of the households are African followed by whites at 41.7%. Coloured households make up 7.2% while Indian households are the least (4.2%). Afrikaans and English are the most spoken languages at home, 27.3% and 26.2% while 9.7% of the households speak Zulu. Xhosa and Sepedi – speaking households constitute 8.2% each while 7.1% speak Setswana.

The level of education completed by household heads is highest in this group with all household heads having tertiary education. Household heads with a diploma or certificate make up 52.3% while the rest have at least a degree.

The education profile described above in a way reflects the employment and income profile of this group. Unemployment is low (0.7%) with over 96% of the household heads being permanently employed. Household heads with part time employment constitute 2.4% and 0.6% work as casual or seasonal employees. Compared with other QOL groups the distribution of household monthly income for group four is skewed towards the high income categories. This group has the biggest percentage of households (18.2%) which earn at least R 10 000 a month (see Table 4.8). It may not be surprising then that 71.3% of the households in this group are covered by medical aid.

(b) Demographics of Quality of Life Group 5

Group five ranks second on the QOL index. It is relatively small compared with the rest of the QOL groups, with 793 households or 3.6%. The age distribution of household heads in group five differs from that of group four in that the majority of household heads (37.7%) fall in the 50 – 69 category. Resultantly the median age for group five (51) is substantially higher than the 39 recorded for group four. One household (0.1%) is headed by someone aged 15 – 19 while households headed by people aged 20 – 29 make up 9%. Households headed by people aged 30 – 49 constitute 38%, a figure that is quite low compared with 66.8% in group four. The age distribution of household heads in group five differs quite markedly in the elderly category; 15.1% of the households in group five are headed by someone that is at least seventy years compared

with 0.6% registered in group four. The majority of households in group five (69.6%) are headed by males and more than three quarters of them (76.4%) are urban.

In terms of race, African households are in the majority (59.9%) followed by white households (25.2%). Coloured households make up 12.1% while Indian households constitute 2.5%.

The language profile of the group depicts Afrikaans to be the most spoken language by households (24.1%) followed by English (15.7%). Zulu speaking households constitute 13.8% while 13% speak Xhosa. Setswana is used by 9.7% of the households while 7.7% speak South Sotho. Households which speak Sepedi constitute 6.3%.

The education profile of household heads in group five is somehow similar to that of group four in that all household heads have tertiary education. The difference is that group four is quite better off. For instance household heads in group five with a certificate or diploma make up 35% of whom 22.8% have a diploma with standard ten. Of the complement, 9.2% have a diploma or certificate without standard ten while the rest have a National teacher's certificate (NTC II or NTC III). Households headed by people with a degree or post graduate degree in Group 5 make up 19.2% compared with 42% in group four. A rather big percentage of households in group five (45%) indicated that they "don't know" the level of completed education which is rather strange.

When it comes to employment status, marked differences exist between group four and five. For instance unemployment is comparatively high in group five (61.5%) compared with just 0.7% in group four. Similarly households headed by people with full time employment in group four are more than three times those in group five, the latter being 31.9% (see Table 4.8 for details).

The income profile of households in Group 5 differs much from that of group four. While more households in group four fall in the higher income categories (R 5000 and higher), the reverse holds for group five with 10.4% of the households having no

income and 10.3% earning less than R 400 a month. Incidentally group five has the highest percentage of households (i.e. 11.4%) which did not disclose their monthly income. Close to 30% of the households in group five have no medical aid cover, a feature that should not be a surprise given the group's high level of unemployment and, income and education profile.

(c) Demographics of Quality of Life: Group 1

Group one accounts for 21.5% of the sampled households and ranks third on the QOL index. It consists of households headed by generally young people, with a median age of 39 (a situation similar to that in group four). Eleven households (0.2%) are headed by people aged 18 and 19 while 15.6% of the household heads are aged 20 – 29. The majority of household heads (65%) are aged between thirty and forty nine years. A relatively small proportion of households (0.6%) are headed by elderly people (70 years and older). Group one is not only the biggest in absolute number of households but, it also has the largest percentage of male headed households (82.5%). The majority of households (84.8%) are urban.

When it comes to racial composition, African or black households constitute the majority (57.3%) but the dominancy is not as high as in some of the other groups, particularly groups six, seven (see Table 4.8). White households make up 22.7% followed by coloured households (14.7%). Asian households make 5.3%.

In group one Afrikaans is the most spoken language at home (26.1%) followed by English (17.2%). Zulu speaking households make up 16.4% while households speaking Xhosa constitute 10.2%. South Sotho is spoken by 8.4% of the households while Setswana is used by 7.6% of the households. Households which speak Sepedi make up 6.7%.

The education profile of the household heads is comparatively poor with none of the household heads having a degree. Household heads with tertiary education constitute 0.7% the contents of which (i.e. tertiary education) are NTC I up NTC III.

Households headed by people with standard ten constitute 42.5% while the rest have not completed standard ten.

When it comes to employment status, nine out of ten household heads are employed on a full time basis while 6% have a part time job. Casual employees make up 2.6% with unemployment standing at 0.6%.

The income profile of group one is somehow similar to that of group four with a bias towards high income. Close to one in ten households earns between R 5000 and R 9999 while 4.7% of the households earn at least R10 000 a month (see Table 4.8 for details). Unlike in group four where medical aid cover stands at over 70%, medical aid cover is relatively low in group one, standing at 37.6%. This may not be so surprising if the proportions of households in the corresponding income categories are taken into consideration.

(d) Demographics of Quality of Life Group 7

Group seven is the second biggest group with 18% of the sampled households and ranks fourth on the QOL index. Three quarters of the household heads are aged between 30 and 69, with the median age for the entire group being forty eight. Forty six households (1.2%) are headed by people aged between sixteen and nineteen while 12% of the households are headed by someone aged 29 – 29. Close to four out of ten households are headed by people aged 30 – 49 while 35.3% of the households are headed by people aged 50 – 69. Elderly people (i.e. 70 years and older) head some 12% of the households in this group. Male headed households outnumber the female headed households (51.5%) the group is predominantly urban (93.3%).

When it comes to race, Black households are in the majority (63.8%), followed by coloured households which make up 17.1%. White households constitute 15.8% while Asian/Indian households are the least (3.2%).

Afrikaans is the most spoken language at home (26.4%), followed by Isizulu (17%). Xhosa speaking households account for 14.7% while English speaking households constitute 10.8%. South Sotho is spoken by 10.4% of the households while 9.4% speak Setswana.

The level of education completed by household heads is low with none of them having a degree. Six household heads (0.2%) have got tertiary qualifications in the form of NTC I and NTC II. Fifteen percent of the households have completed standard ten while the rest (84.9%) have not completed standard ten.

Unemployment is high among household heads in Group 7 with 73% of them having been unemployed at the time of the survey. Households headed by someone with a full time job make up 20.9% while those employed on a part time basis constitute 3.5% (see Table 4.8).

The income profile of households in group 7 depicts a distribution with the majority of households falling in the lower income categories. Nineteen percent of the households have no income while 46.3% earn below R 800 a month. In this group 15.5% of the households have medical aid cover.

(e) Demographics of Quality of Life Group 8

Group eight ranks fifth on the QOL index and accounts for 10.4% of the sampled households. It consists of households headed by relatively young people with a median age of 41. Eleven households (0.5%) are headed by people aged between sixteen and nineteen years while 14.1% of the household heads fall in the 20 – 29 age category. The majority of household heads (63.6%) are aged between 30 and 49 years. Thirty two households (i.e. 1.4%) are headed by elderly people, aged 70 years and older. Close to eighty percent of the households are headed by males and 65% of the households are rural.

Group eight is dominated Africans/Blacks (92.6%), while Coloured households make up 7.2%. White and Indian households are quite few, the latter making up 0.1% while the former is just one household.

Isizulu is the most spoken language at home (23.4%) followed by Xhosa (16.7%). Households speaking South Sotho make up 14.6% while 11.5% speak Setswana. Sepedi is spoken by 9.1% of the households while Afrikaans speaking households constitute 7.4%. Six percent of the households speak Siswati while 5.3% speak Tsonga at home.

The level of education completed by household heads is low with none of them having tertiary education. Close to 3% of the households are headed by someone with standard ten while 94.2% have not completed standard ten. Three percent of the household heads have had no schooling.

When it comes to employment status, unemployment among household heads in this group is low in spite of the low education levels (0.6%). Close to 82% of the households are headed by people with a full time job while 9.9% are employed on a part time basis. Household heads employed on a casual or seasonal basis make up 7.7%.

In spite of the high incidence of full time employment, the income profile of Group 8 depicts generally poor living conditions. For instance no household earns R 10 000 a month and less than 1% of the households earn between R 5000 and R 9999.
Forty five percent of the households earn below R 800 a month and, 1.3% of the households have no income at all. Although the majority of household heads in Group 8 are permanently employed, only 6.5% of the households have medical aid cover.

(f) Demographics of Quality of Life Group 3

Group three is ranked sixth out of the eight QOL groups constituting the QOL index. It accounts for 13.7% of the households in the sample.

With a median age of 40 years, over a fifth of the household heads (22.2%) are younger than thirty, with 3.3% of them being under nineteen years. In fact this group has the biggest percentage of household heads who are younger than thirty years of age. Households headed by someone aged 30–49 make up 44.6% while 26% of the household heads are aged 50 – 69. Elderly people (i.e. 70 years and older) head 7% of the households. This group happens to be one of two groups (the other being QOL2) where female headed households are in the majority – 54.1%. At least seven out of ten households (71.6%) are rural.

Isizulu is the most commonly spoken language at home (22.3%) followed by Xhosa (199.9%). Households speaking Setswana make up 14.7% while Sepedi speaking households constitute 13.7%. South Sotho is spoken by 11.2% of the households while 4.5% speak Siswati.

When it comes to race the group is predominantly African (96%) with coloured households making 3.7%. White households make 0.2% and Indian households are the least (0.1%).

The level of education completed by household heads is with none of them degree. Three household heads (0.1%) have a diploma or certificate with standard ten and six households are headed by someone with an NTC qualification. Household heads with Standard ten make up 9.8% with the rest (89.8%) not having completed standard ten.

The level of unemployment in QOL 3 is high with over three quarters of the households (76.3%) falling in this category. Households headed by someone with a full time job make up 17.1% while households headed by a person employed on a part time basis constitute 3.6% (see Table 4.8).

The income profile of group three seems to reflect the employment profile; 18.2% of the households have no income while three quarters (75.9%) of the households earn less than R 800 a month. In this group, 96% of the households have no medical aid cover.

(g) Demographics of Quality of Life Group 6

Group six is the last but one in terms of poor access to the measurable indicators of quality of life. With 2349 households, it accounts for 10.8% of the sampled households. The distribution of age of household heads is skewed with a bias towards old age groups, a feature that influences its median age of 52 . No household in this group is headed by a person younger than nineteen while household headed by people aged 20 – 29 are also few (3%). Close to four out of ten household heads (40.4%) are age 30 – 49 and a similar proportion of households (40.5%) are headed by people aged 50 – 69. A relatively large percentage of households (16.1%) are headed by elderly people. As a matter of this is one of the groups where households headed by elderly people is higher than 15% (see Table 4.8). Males dominate the household headship (59.1%) and, at least eight out of ten households (81.4%) are urban.

When it comes to population composition the African households constitute the majority (81.5%) followed by coloured households which make up16.9%. Asian households constitute 1.3% and white households are the least (0.3%).

In this group Isizulu is the most spoken language (21.7%), followed by Afrikaans (18.6%) and Xhosa (17.1%). Households which speak South Sotho make up 13.3% while 11% speak Setswana. Sepedi speaking households constitute 5.7% while households speaking Tsonga make up 3.4%. The education level of education completed by household heads is low with none of them having completed standard ten. Over half of the household heads (51.5%) have had no schooling while the rest have education levels ranging between grade zero and grade five or standard three.

In spite of the low level of education, several households are headed by people employed on a full time basis (43.1%). Households heads with part time jobs make up 4.1% while 3.8% of the households are headed by someone employed casually. Close to half of the household heads in group six were unemployed at the time of the survey.

The income profile of households in Group 6 some how reflects the employment and education profile of the group. Close to sixty percent of the households (i.e. 58.7%) earn less than R 800 a month and 8.2% of the households indicated that they had no income at all (see Table 4.8). In this group, 6.2% of the households have medical aid cover.

(h) Demographics of Quality of Life: Group 2

This group with 13.8% of the sampled households is ranked eighth on the QOL index. In other words it is judged to be experiencing the poorest measurable conditions on the basis of the selected QOL indicators. With a median age of sixty, group two has the largest proportion of households headed by elderly people; at least a quarter of the household heads in this group are aged seventy and older. Five households (i.e. 0.2%) are headed by people aged 16–19 while 2.5% of the household heads are aged 20 -29. Group two has the smallest percentage of households (i.e. 27.9%) headed by people in the 30 - 49 age category. On the other hand it has the largest proportion of households (43.4%) headed by people aged 50 -69. As indicated earlier on this group is one of the two groups where female headed households out number male headed households; 53.3% of the households in group two are headed by females. At least eight out of ten households (82.1%) in this group are rural.

When it comes to the racial breakdown, households in group two are predominantly African (95.8%) with Coloured households accounting for 4.1%. Indian and white households constitute minute proportions, the former constituting 0.1% and the latter being just one household.

The language profile of group two reflects the racial composition described above with 23.8% of the households speaking Zulu and 14.6% of the households speaking Setswana. Sepedi is spoken by 14.4% of the households while Xhosa – speaking households make up 12.3%. Nine percent of the households speak South Sotho while 7% speak Tsonga. Six percent of the households speak Siswati while Afrikaans speaking households constitute 4.6%.

The education profile of household heads in group two is quite low with 73% of them having had no education at all. The remaining 27% of the households have education levels ranging between grade zero and grade four or standard two. As a matter of fact group two has the largest proportion of household heads with no education.

The employment profile of group two shows a prevalence of unemployment; at least three quarters of the household heads were unemployed at the time of the survey. Households headed by someone with a full time job make up 17.1% while 3.6% are headed by someone employed on a part time basis (see Table 4.8).

The income profile of group two shows a distribution of household income that is biased towards the low income categories. At least three quarters of the households (75.9%) earn a monthly income below R 800 and, 11.8% of the households have no income at all. In this group 97.6% of the households have no medical aid cover.

4.4.2 Analysis of residence (type of dwelling)

This section provides an analytical description of the type of dwelling occupied by households in the various QOL groups. The information pertaining to this aspect is summarised in Table 4.9 below. It is important to note that the information provided in Table 4.9 is brief. The description provides details which may not be appearing in the summarised figures in Table 4.9. The reader is further informed that in all chapters dealing with the study's results (Chapter 4 to Chapter seven), percentages have been calculated vertically. In some situations the percentages may not add to 100% because the information in the tables highlights key findings

In addition to type of dwelling, the section also looks at the geographical distribution of households at provincial level. Once again the reader is reminded that description is provided basing on the ranking results of quality of life groups. In general, analytical results indicate that the majority of households across QOL groups have access to formal accommodation.

Table 4.9: Type of dwelling and geographical distribution of households by QOL group (OHS 1999)

	Cluster /QOL/Group number							
Rank of QOL Group	1	2	3	4	5	6	7	8
Original cluster number	4	5	1	7	8	3	6	2
Type of dwelling								
Formal dwelling	97.6	86.6	88.6	88.4	58.9	64	81.7	65.1
Informal dwelling	1.4	9.6	7.5	9.4	23.8	19.5	13.2	13.2
Traditional dwelling	0.9	3.0	0.4	0.3	10.9	15.4	0.7	21.3
Total	100	100	100	100	100	100	100	100
Province								
Gauteng	24.7	18.5	29.3	27.1	12.1	5.9	20.7	2.5
Western Cape	14.3	15.8	16.1	17.8	6.5	2.9	15.6	1.7
Northern Cape	4.3	4.9	4.9	5.6	3.7	3.0	9.2	3.8
Eastern Cape	10.8	13.9	**7.1**	11.0	9.7	18.0	7.5	10.8
Free State	6.2	6.4	7.9	8.6	12.7	9.2	10.3	8.7
Limpopo	13.5	8.8	5.1	4.1	11.1	17.7	4.8	22.2
North West	6.7	11.1	8.8	7.8	13.1	14.7	10.0	15.1
Mpumalanga	7.1	6.7	7.7	6.3	14.0	11.4	12.0	17.4
KwaZulu-Natal	12.4	13.9	13.1	11.7	17.0	17.3	9.9	17.7
Total	100	100	100	100	100	100	100	100

(a) Analysis of residence for Group 4 (QOL 4)

Results pertaining to type of dwelling show that the majority of households in group four (with the best QOL conditions) live in formal dwellings. Of the 97.6% households which fall in this category, 79.3% occupy a permanent brick house on a separate stand while 8.4% live in a flat or apartment in a block of flats. Six percent of the households live in semi- detached house (simplex or duplex) while 2.9% live in a house or flat in the backyard. Households which live in informal dwellings constitute 1.4% (see Table 4.9).

In terms of spatial distribution close to quarter of the households in group four (24.7%) are located in Gauteng while 14.3% are in Western Cape. Limpopo province accounts for 13.5% of the households while 12.4% of the households are in KwaZulu-Natal. The least number of households (6.2%) are found in Free State (see Table 4.9).

(b) Analysis of residence for Group 5 (QOL 5)

Group five ranks second on the QOL index. In this group access to formal dwellings is high but, comparatively lower than the situation in group four which ranks first on the index. Close to 87% of the households in group 5 live in formal dwellings of which 70% occupy permanent brick houses on separate stands. Close to 10% of the households live in informal dwellings of which 7.1% are on separate stands. Town flats accommodate 5.7% of the households while 4.7% live in semi-detached houses.

Close to 19% of the households in Group 5 are located in Gauteng while 15.8% are in Western Cape. Eastern Cape and KwaZulu-Natal account for 13.9% each 11.1% are in North West province. The least number of households in group five (constituting 4.9%) is found in Northern Cape.

(c) Analysis of residence for Group 1 (QOL 1)

Access to formal dwellings is relatively higher in group one than in group five even though the former group ranks third on the QOL index. A closer scrutiny however, shows that there is a difference when it comes to the quality attributes. For example in group one 88.6% of the households live in formal dwellings, a figure that is higher than the 86.6% recorded in group five. When it comes to the proportion of households living in brick houses on separate stands, 66.6% of the households in group one fall in this category compared with 70% in group five. In group 1, town flats are proportionately more prevalent (8.5%) than in group five (5.7%). Semi-detached houses provide shelter to 4.3% of the households in group 1, a figure that is slightly lower than 4.7% recorded in group five. The incidence of informal dwellings is slightly higher in group five (9.6%) than in group one where it is recorded at 7.5%. In the case of group one, 4.4% of the informal dwellers have their dwellings on separate stands.

A substantial number of households in this group (37.3%) live in informal dwellings; 30.3% being informal settlements on a separate stand or site. Traditional dwellings

accommodate 20.3% of the households while households occupying formal dwellings constitute 42.4%.

Of the 42.4% households who live in formal dwellings, 32.3%) live in permanent brick structures occupying a separate stand while 3.3% live in flats and town houses.

When it comes to geographical distribution, Gauteng province has the largest percentage of households in group one (29.3%) followed by Western Cape (16.1%). The rest of the provinces have percentages smaller than 9% with the smallest (4.9%) being found in Northern Cape (see Table 4.9).

(d) Analysis of residence for Group 7 (QOL 7)

Access to formal dwellings differs slightly in group seven when compared with the situation in group one which group seven follows in terms of ranking; the difference is just 0.2%. The slight difference is evident not only from the holistic point of view but also in the quality attributes. For example 67.5% of the households in group seven live in permanent brick houses occupying a separate stand, a figure that differs slightly from 66.6% recorded in group one. In group seven 5.8% of the households live in town flats while 5.1% live in Semi-detached houses (i.e. simplex/duplex). One percent of the households live in a unit in a retirement village while 6.3% occupy a house/flat in the backyard. Informal dwellings accommodate 9.4% of the households 5.4% of which are not in the backyard.

When it comes to geographical distribution, Gauteng accounts for the biggest proportion (27.1%) followed by Western Cape (17.8%) and KwaZulu-Natal (11.7%). Eleven percent of the households are found in Easter Cape, while 8.6% are in Free State province. Limpopo province has the least number of households constituting 4.1%, (see Table 4.9 for details).

(e) Analysis of residence for Group 8 (QOL 8)

Group Eight has the lowest proportion of households living in dwellings despite being fifth on the QOL index. Just close to 59% of the households live in formal dwellings of

which 46.8% occupy brick houses on separate stands. Town flats provide accommodation to 2.8% of the households while 1.5% live in semi- detached houses (i.e. duplex/ simplex). Some 3.5% of the households live in a house or flat in the backyard while 4.3% live in a room or flat let on a separate stand. Group eight has the largest proportion of households living in informal dwelling. Households falling in this category make up 23.8% of which 5.3% are in the backyard. The percentage of households living in traditional dwellings is equally relatively large constituting 10.9%.

When it comes to spatial distribution the largest percentage of households (17%) are found in KwaZulu-Natal followed by Mpumalanga (14%). North West comes in third position with 13.1% followed by Gauteng with 12.1% of the households. The smallest number of households constituting 3.7% are found in Northern Cape province.

(f) Analysis of residence for Group 3 (QOL 3)

Access to formal dwellings is better in group three than in group eight as indicated in Table 4.9. In spite of being ranked lower than group eight, group three is also relatively better off when it comes to the proportion of dwellings living in informal dwellings (19.5%) compared with 23.8% in group eight. In group three 16.2% of the informal dwellings are not in the backyard compared with 18.5% in group eight. However, group three has the second largest percentage of households (15.4%) living in traditional dwellings. As for households living in formal dwellings, 56.9% live in brick houses on a separate stand while 2.4% live in town flats. Sixteen households (0.5%) live in semi – detached houses while 3.2% live in a house or flat in the backyard.

As far spatial distribution is concerned, 18% of households are found in Eastern Cape while 17.7% are in Limpopo province. KwaZulu-Natal accounts for 17.3% of the households while North West accounts for 14.7%. The least number of households making up 2.9% are found in Western Cape.

(g) Analysis of residence for Group 6 (QOL 6)

Group six ranks seventh on the QOL index. In spite of such a low rating, close to 82% of the households have access to formal dwelling; 61.9% of the households live in permanent brick houses on a separate stand.

Semi-detached houses (i.e. duplex or simple) provide accommodation to 5.3% of the households while 3.4% live in town flats. Households which occupy a room or flat let on a separate stand make up 6.1% while 4.8% live in house or flat in the backyard.

When it comes to spatial distribution, 20.7% of the households are located in Gauteng while 15.6% are in Western Cape. Mpumalanga province accounts for 12% of the households while 10.3% are in Free State province. The smallest proportion of households (4.8%) are found in Limpopo province.

(h) Analysis of residence for Group 2 (QOL 2)

Group two ranks seventh on the QOL index but not the poorest when it comes to housing. Sixty five percent of the households live in formal dwellings of which 60.2% occupy permanent brick houses on a separate stand. Town flats are few in group two (1.4%) just like semi detached houses (0.7%). Two percent of the households live in a house or flat in the backyard while twenty households or 0.7% live in a room or flat let on a separate stand. Traditional dwelling are a common feature in group two with 21.3% of the households living in these type of dwelling. In fact group two has the highest percentage of households living in traditional dwellings.

When it comes to geographical distribution, most households in group two (22.2%) are found in Limpopo followed by KwaZulu-Natal (17.7%) and Mpumalanga with 17.4% of the households. Northwest accounts for 15.1% of the households while 10.8% are found in Eastern Cape province. The least number of households (1.7%) are found in Western Cape province (see Table 4.9 for details).

4.4.3 Analysis of Fuel used by households

This section describes the type of fuel used by households in respect of cooking and lighting in the eight QOL groups. Although the description provides details which include other fuel types, focus is mainly on fuel types that are considered as key indicators in this respect as indicated in Table 4.10. In general, results reveal that electricity is used more for lighting than for cooking purposes.

Table 4.10: Fuel used by households for cooking (OHS 1999)

	Cluster /QOL/Group number							
Rank of group	1	2	3	4	5	6	7	8
Original cluster number	4	5	1	7	8	3	6	2
Fuel for cooking								
Electricity	91.2	69.5	86.0	76.1	29.6	21.3	58	11.5
Paraffin	3.6	20.1	8.2	16.5	39.2	42.3	25.8	28.4
Wood	1.8	7.7	0.9	1.0	21.9	27.6	5.3	49.6
Gas	3.0	2.3	2.1	3.1	4.8	4.1	2.8	2.1
Fuel for lighting								
Electricity	95.4	84.2	94.2	90.6	54.7	48.2	86.2	45.1
Paraffin	1.8	5.0	2.1	3.6	12.9	17.5	4.2	14.9
Candles	2.7	10.1	3.2	5.4	31.6	33.3	8.9	39.5
Gas	0.1	-	0.1	0.1	0.3	0.3	0.3	0.1

(a) Fuel used by households in Group 4

The majority of households in group four use electricity both for lighting and cooking as indicated in Table 4.10. With regard to fuel used for cooking, 91.2% of the households use electricity while 3.6% use paraffin. Three percent of the households use gas to cook while thirty two households or 1.8% use wood as fuel for cooking. As far fuel for lighting is concerned, 95.4% of the households use electricity while 2.7% light the dwellings with candles.

(b) Fuel used by households in Group 5

Marked differences prevail between group four and group five with regard to fuel used for household purposes. This is particularly so with respect to the use of electricity. Although group five follows group four in terms of ranking, the use of electricity does

not follow suit as indicated in Table 4.10. For instance household use of electricity for cooking is markedly lower in group five than in group four with the former recording 69.5% compared with 91.2% in group four. Close to one in five households in group five (20.1%) uses paraffin to cook while 7.7% use wood. Eighteen households (2.3%) use gas for cooking purposes. When it comes to fuel for lighting, comparatively more households in group five use electricity to light the dwellings than for cooking (84.2%) but still this is 11.2% smaller than the percentage in group four. Close to one in ten households uses candles to light a dwelling and 5% of the households use paraffin.

(c) Fuel used by households in Group 1 (QOL 1)

Group one ranks third on the QOL index but it is better than group five (ranked second) when it comes to fuel used by households in the respective QOL groups. For instance 86% of the households in group one use electricity to cook compared with 69.5% in group five. Households using paraffin for cooking make up 8.2% in group one while 20.1% of the households use paraffin in group five. Household use of gas is the only item where comparison can be made: 2.1% of the households in group one use gas to cook compared with 2.3% in group five. When it comes to fuel used for lighting purposes, there is a 10% difference between group one and group five as far as the use of electricity is concerned. Households which use electricity to light the dwellings in group one constitutes 94.2%. Candle use stands at 3.2% while households which use paraffin make up 2.1%.

(d) Fuel used by households in Group 7

Group seven is ranked fourth on the QOL index but even with it, household use of electricity is better than the situation in group five. In group seven 76.1% of the households use electricity to cook while 16.5%use paraffin. The use of gas stands at 3.1% while one percent of the households use wood. Regarding fuel or energy used for lighting 90.6% of the households in group seven use electricity while 5.4% use candles.

A closer look at the results pertaining to household use of fuel in relation to the results of the ranking of the QOL groups highlights a possibility of the existence of other

indicators playing a more salient role in the overall results. This emanates from the comparison of the results regarding fuel use for groups five, one and seven. While the results for groups one and seven are in line with the ranking results, the results of group five being ranked as a better off group are in disagreement. This possibility is likely to be clarified later when results pertaining to discriminant function analysis are dealt with.

(e) Fuel used by households in Group 8

The fuel situation in Group 8 is poorer than the situation in the four groups described so far. For instance just close to 30% of the households in group eight use electricity to cook while 39.2% use paraffin. Households which rely on wood as fuel for cooking make up 21.9% while 4.8% use gas for this purpose. Eighty six households (or 3.8%) in group eight use coal to prepare meals. When it comes to fuel use to light the dwellings, 54.7% of the households use electricity while 31.6% use candles. Close to 13% of the households use paraffin and seven households (0.3%) use gas to light the dwellings.

(f) Fuel used by households in Group 3

Access to fuel or energy for household use in group three relates well with the ranking of the group itself. Ranked sixth on the QOL index, 21.3% of the households in group three use electricity to cook with the majority (42.3%) using paraffin. Wood serves as fuel for cooking for 27.6% of the households while 4.1% use gas. A hundred and twelve households (3.7%) while nineteen households (0.6%) use animal dung. Use of electricity for lighting is more than double its use for cooking, with 48.2% of the households using it to light the dwellings. One in three households uses candles while 17.5% uses paraffin (see Table 4.10).

(g) Fuel used by households in Group 6

Group six is yet another case where the results pertaining to fuel used for household use do not agree with the ranking results. Group six ranks seventh on the QOL index but use of electricity is higher than electricity use in groups eight and three which are perceived to be better off. Results in Table 4.10 show that 58% of the households in group six use electricity to cook while around a quarter (25.8%) use paraffin.

Households which rely on wood as fuel for cooking constitute 5.3% while 2.8% use gas. One hundred and fifty four households (6.6%) use coal to cook. When it comes to energy used for lighting, 86.2% of the households use electricity while 8.9% use candles.

(h) Fuel used by households in Group 2

Results pertaining to energy used for household use, in group two align themselves well with the ranking results; group two ranks eighth on the QOL index. This being the case one would expect the poorest conditions when it comes to access to fuel or energy for household use and, this is generally the case. Results in this respect show the lowest use of electricity by households with regard to cooking (11.5%) while 28.4% of the households use paraffin. Close to half of households (49.6%) use wood as fuel for cooking while 2.1% use gas for the same purpose. When it comes to fuel used for lighting, the situation is not as grim, with electricity use for this purpose being more than four times its use for cooking (45.1%). Other than that, 39.5% of the households use candles to light the dwellings while 14.9% use paraffin. Four households (0.1%) use gas for lighting purposes and, another seven households (0.2%) use generators.

4.4.4 Analysis of sanitation

This section looks at sanitation services accessed by households in the eight QOL groups. In this study sanitation is operationalised in terms of “type of toilet facility” a household uses and, “rubbish removal services”. Table 4.11 provides information in respect of the key indicators in respect of sanitation. Once again the reader is notified that the narrative contains details that go beyond the information provided in Table 4.11.

Table 4.11: Sanitation by QOL groups (OHS 1999)

	Cluster /QOL/Group number							
Rank of group	1	2	3	4	5	6	7	8
Original cluster number	4	5	1	7	8	3	6	2
Sanitation								
Flush toilet in dwelling	81.2	57.3	64.4	54.2	3.6	0.6	34.8	0.5
Flush toilet on site	7.8	14.4	28.5	41.0	15.7	2.4	55.7	1.8
VIP/Ordinary pit latrine	8.1	19.5	4.8	3.4	52.1	66.5	5.8	67.8
Bucket toilet on site	0.7	3.5	0.3	-	7.8	10.0	-	7.9
Refuse disposal								
Removed at least once a week	79.7	67.6	81.6	88.5	14.3	14.3	77.4	8.8
Own rubbish dump	12.3	21.6	8.2	3.5	54.8	63.4	7.7	70
No rubbish removal services	1.5	4.5	1.0	0.3	13.8	14.8	1.0	15.4

(a) Sanitation for Quality of Life 4 (QOL 4)

Results in respect of sanitation indicate that most households in group four have access to a flush toilet. Households with a flush toilet in the dwelling make up 81.2% while 7.8% access a flush toilet on site but not inside the dwelling. Some seven households (0.4%) make use of a flush toilet which is off the dwelling's site. Around 8% of the households use pit latrines on site 2% of which are ventilated (VIP). Thirteen households (i.e. 0.7%) use a bucket toilet on site.

Regarding refuse disposal, close to 80% of the households have their refuse removed by local authorities at least once a week, while 12.3% make use of their own rubbish dumps. Twenty seven households (i.e.1.5%) have no rubbish removal services.

(b) Sanitation for Quality of Life 5 (QOL 5)

The sanitation situation in this group is poorer than in group four. Around 57% of the households in this group have a flush toilet in the dwelling while 14.4% access a flush toilet on site but not in the dwelling.

Close to 20% of the households use a pit latrine on site 4.2% of which are ventilated. Twenty seven households (3.4%) use an ordinary pit latrine (i.e. without ventilation) while 3.5% rely on a bucket toilet on site.

When it comes to refuse disposal, at least two thirds of the households in group five (67.6%) have their refuse collected at least once a week by local authorities while 21.6% make use of their own rubbish dumps. Households with no rubbish removal services constitute 4.5%, a figure that is three times that in group four (see Table 4.11).

(c) Sanitation for Quality of Life 1 (QOL 1)

The sanitation situation in Group 1 (ranked third on the QOL index) is better than that in group five as far as access to toilet is concerned. Over 90% of the households in group one have access to a flush toilet 64.4% of which have it in the dwelling. Households which use a flush toilet on site but not in the dwelling constitute 28.5% while sixty two households (1.3%) make use of a flush toilet that is off site. Households using a pit latrine make up 4.8%. Of these households, 1.7% make use of ventilated latrines (VIP). Fifteen households (i.e. 0.3%) use a bucket toilet on site while another 0.3% use a pit latrine which is off the dwelling's site.

When it comes to refuse disposal, group one is still better off with 81.6% of the households having their rubbish removed by local authorities at least once a week. Proportionately fewer households in group one (8.2%) make use of their own rubbish dumps as compared with 21.6% in group five. Similarly proportionately fewer households in group one (1%) do without refuse removal services than the 4.5% in group five (see Table 4.11).

(d) Sanitation for Quality of Life 7 (QOL 7)

The sanitation situation in group seven could easily be judged as being better than that in group one given that 95% of the households in group seven have access to a flush toilet. A closer look at the results however, indicate that 41% of the households in group seven have their flush toilets outside the dwellings compared with 28.5% in

group one. In other words group one has more households (64.4%) with flush toilets in the dwellings than group seven which has 54.2%. Otherwise the percentage of households relying on pit latrines do not differ much in groups one and seven, 4.8% and 3.4% respectively.

When it comes to refuse removal, group seven is better than group one with 88.5% of the households in the former group having their refuse collected by local authorities at least once a week. Group seven has proportionately fewer households (3.5%) which make use of their own rubbish dumps than group one with 8.2%. Similarly relatively fewer households in group seven (0.3%) have no rubbish removal services than households in group one (1%).

(e) Sanitation for Quality of Life 8 (QOL 8)

The sanitation situation in group eight is poorer than the situation in all the groups covered so far. Households which use a flush toilet in the dwelling make up 3.6% while 15.7% have a flush toilet on site but not in the dwelling. Another 2.5% households access a flush toilet off site. Over half of the households (52.1%) rely on pit latrines on site 44.7% of which being ordinary pit latrines with no ventilation. Households which make use of pit latrines off the dwellings' sites constitute 14.9%. Close to 8% of the households use bucket toilets on site.

The situation regarding refuse removal is equally poor; 14.3% of the households have their refuse removed by local authorities at least once a week. The majority of households (54.8%) make use their own rubbish dumps while 13.8% have no refuse removal services.

(f) Sanitation for Quality of Life 3 (QOL 3)

Group three ranks sixth on the QOL index and, the sanitation situation seems to be in line with ranking results. For instance households with a flush toilet either in dwelling or on site but not in dwelling make up 3%, the constituting 0.6%. Twenty four households or 0.8% make use of a flush toilet off the dwelling's site.

Two thirds of the households use pit latrines on site, 7.9% of which are ventilated. Households which use a pit latrine off the dwelling site make up 15.5% while one in ten households uses a bucket toilet on the dwelling's site.

Refuse removal is equally problematic in group three with 14.3% of the households having their refuse removed by local authorities at least once a week. Households which make use of their own rubbish dumps make up 63.4% and, 14.8% have no refuse removal services.

(g) Sanitation for Quality of Life 6 (QOL 6)

Group six, the second lowest in rank terms, is better off in terms of sanitation than groups eight and three which are ranked fifth and sixth respectively. At least a third of the households in group six (34.8%) have got a flush toilet in the dwelling while 55.7% have a flush toilet on site but not in the dwelling. An additional 3.2% households use a flush toilet off site. Households which rely on pit latrines on site constitute 5.8% of which 3.5% are ventilated.

Results pertaining to refuse disposal indicate tat 77.4% of the households have their refuse removed by local authorities at least once a week while 7.7% make use of their own rubbish dumps.

(h) Sanitation for Quality of Life 2 (QOL 2)

This group with is judged to be the poorest in terms of the QOL indicators considered in OHS 1999. Access to a flush toilet in the dwelling is lowest in this group; fifteen households or 0.5% have a flush toilet in the dwelling. Households with a flush toilet on site make up 1.8% while an additional 0.5% make use of a flush toilet off site. Over two thirds of the households (67.8%) use pit latrines of which only 8% are ventilated. Households which use a bucket toilet make up 7.9%.

When it comes to rubbish removal, group two has the least percentage of households (8.8%) whose refuse is removed by local authorities at least once a week. Seven out of ten households have their own rubbish dumps while 15.4% have no rubbish removal services.

4.4.5 Analysis of households' water source

This section provides a description of the sources of water which households in the eight QOL groups have access to. Table 4.12 provides information in respect of access to piped water by the eight QOL groups and distance households travel to fetch water. Like in some of the previous sections, the description pertaining to water source provides more details than the information in Table 4.12.

Table 4.12: Access to clean water and distance from water source (OHS 1999)

	Cl**uster /QOL/Group number**							
Rank of group	1	2	3	4	5	6	7	8
Original cluster number	4	5	1	7	8	3	6	2
Water source								
Piped in dwelling	82.4	59.5	67.9	62.5	7.3	3.0	41.4	3.1
Piped on site	11.2	22.4	27.5	35.0	40.7	30.4	52.4	29.9
Public tap	2.3	10.5	3.4	2.1	32.6	38.7	5.0	36.6
Bore hole on site	0.8	1.0	0.3	-	1.4	2.4	0.2	1.7
Communal bore hole	0.6	1.5	0.3	0.1	3.8	5.4	0.2	7.8
Distance from water source (where fetching water is applicable)								
Within 100 meters	1.9	6.6	2.4	1.8	19.0	19.1	3.8	18.6
101 – 200 meters	1.3	5.5	0.8	0.4	14.1	17.5	1.4	18.8
201 – 500 meters	0.3	1.9	0.5	0.2	7.4	10.1	0.5	11.1
501 meters – 1 Kilometer	0.5	1.6	0.2	-	5.9	8.9	0.2	8.8
More than 1 Kilometer	1.0	1.1	0.3	-	3.1	7.4	-	7.3

(a) Source of water for households in Group 4 (QOL4)

Over 95% of the households in group four have access to piped water either on site or via the public tap. Households with piped water in the dwelling make up 82.4% while 11.2% have piped water in the yard but not in dwelling itself. Households which rely on public tap water constitute 2.3% (see Table 4.12). Fifteen households (0.9%) get water from streams and dams with another thirteen households (0.8%) relying on water from springs and wells.

With 93.6% of the households having water on site, fetching water is a task to the remaining 6.7% of the households which get water from public taps, boreholes and other sources. Around 2% of the households which have to fetch water, do so within a hundred meter radius while 1.3% travel between a hundred and two hundred metres to get water. One percent of the households in this group travel over a kilometer to fetch water.

(b) Source of water for households in Group 5 (QOL5)

Access to clean water in Group five differs slightly from the situation in group four; 92.4% households in group five have access to clean water compared with 95% in group four. The difference however is mainly in terms of access to piped water in the dwelling where proportionately more households in group four (82.4%) have water in the dwelling while 59.5% in group five fall in this category. Proportionately more households in group five (22.4%) rely on piped water in the yard than 11.2% of the households in group four. Similarly proportionately more households in group five (10.5%) rely on water from public taps (10.5%) as compared with 2.3% in group four.

With at least 13% of the households in group five relying on water from public taps, boreholes and other sources, 6.6% of them fetch water within a hundred meters while 5.5% travel between a hundred and two hundred meters to get water. Almost a similar percentage of households in group five (1.1%) like in group four travel over a kilometer to fetch water.

(c) Source of water for households in Group 1 (QOL 1)

Group one - ranked third on the QOL index – compares well with groups four and five in terms of access to clean water. In fact proportionately more households in group one (98.8%) have got access to clean water than groups four and five. The results pertaining to the ranking of the QOL groups are in disagreement with the results pertaining to access to clean water, as the water situation in group one is better than that in group five which is ranked second. For instance 67.9% of the households in group one have piped water in the dwelling, a figure that is higher than 59.5% in group five. Similarly proportionately more households in group one have piped water in the yard (27.5%) than in group five. The same goes for access to public tap water whereby 3.4% of the households in group one rely on the public tap, a figure that is quite lower than 10.5% recorded in group five (see Table 4.12).

Among the 4% of the households which have to fetch water, 2.4% get water within a hundred meter radius while the rest travel over a hundred metres for the same reason (see Table 4.12).

(d) Source of water for households in Group 7 (QOL7)

The water situation in this group compares well with the situation on the first three groups as 97.6% of the households in group seven have access to clean water. A marked difference between group seven and the other groups is in terms of access to piped water in the yard. Proportionately more households in group seven (35%) have got water in the yard than in the other groups. Otherwise access to piped water in the dwelling is fairly high with 62.5% of the households having water in the dwelling (see Table 4.12).

With 95.5% of the households having water either in dwelling or on site, fetching water is a task to a few households in group seven. Households which fetch water within a hundred meter radius constitute 1.8% while 0.4% of the households travel between 200 meters and half a kilometer to fetch water. No household in group seven travels over 500 meters to fetch water.

(e) Source of water for households in Group 8 (QOL8)

Over 80% of the households in group eight have access to clean water however, the majority of these households (73.5) do not have water in the dwelling. Households with piped water in the dwelling make up 7.3% while 40.7% have water on site but not in the dwelling. Close to a third of the households get water from a public tap while some 5% of the households rely on boreholes for their water needs. Eighty nine households (3.9%) get water from streams while 5.4% get water from a well, dam or spring.

From the results above, over half of the households in group eight have a task of fetching water, 19% of which do so in a hundred meter radius. Households which travel between 200 and 500 meters to fetch water make up 14.1% while 3.1% travel over a kilometer to get water (see Table 4.12).

(f) Source of water for households in Group 3 (QOL3)

Over seventy percent of the households (72.1%) in group three have got access to clean water but like in group eight, relatively few of them have it in the dwelling (3%). Households with piped water on site constitute 30.4% while 38.7% of the households rely on water from public taps. Close to 8% of the households get water from boreholes (see Table 4.12). Two hundred and eight households (6.9%) get water from streams while 7.9% obtain water from a dam, spring or well.

The results above indicate that just around a third of the households in group eight do not have to travel long distances to get water. For the remaining two thirds or so 19.1% get water within a hundred meter radius while 17.5% travel between 200 and 500 meters to fetch water. A substantial 7.4% of the households travel over a kilometer to get water.

(g) Source of water for households in Group 6 (QOL6)

The situation pertaining to access to water in group six is somehow in contrast with the group's ranking. While the group is ranked seventh, 98.8% of the households in this group have access to clean water; 41.4% have piped water in the dwelling while 52.4%

have it on site. Five percent of the households get water from a public tap and 0.8% rely on water from boreholes.

Around six percent of the households in group six have to travel some distance get water. Of such households 3.8% get water within a hundred meter distance while 1.4% travel between 200 and five hundred meters to get water. No household in this group travels over half a kilometer to fetch water.

(h) Source of water for households in Group 2 (QOL2)

Close to 70% of the households in this group (ranked eighth on the QOL index) have access to clean water but a few of them (3.1%) have piped water in the dwelling. Close to 30% of the households have water in the yard while 36.6% get water from public taps. Two hundred and thirty five households (7.8%) rely on water from streams while 8.3% rely on water from a dam, well or spring.

The results above indicate that just around a third of the households in group two do not have to travel in order to get water. For the remaining two thirds or so, 18.6% get water within a distance of a hundred meters while 18.8% travel between 200 and five hundred meters to get water. Households which travel over a kilometer to get water make up 7.3%.

4.4.6 Analysis of durables

Section 4.4.6 describes the distribution of possession of durable items among households in the various QOL groups. A few indicators have been selected for use in this regard depending on the available information (see Table 4.13 below). The variable addressing possession of a “cell phone/telephone” was captured without separating households possessing either of the two; as a result, it has been dealt with as that. In addition to “possession of a telephone” in the dwelling, “time taken to get to the nearest telephone” has been included in the analysis due to the fact a household without a telephone in the dwelling will have to seek one when the need to make a telephone arises.

Table 4.13: Possession of durable items

	Cluster /QOL/Group number							
Rank of group	1	2	3	4	5	6	7	8
Original cluster number	4	5	1	7	8	3	6	2
Durables								
Possession of a vehicle	71.1	40.9	43.4	25.3	11.2	8.4	11.0	7.6
Cellular phone or Landline telephone	80.1	52.8	56.6	48.6	9.9	9.0	28.1	5.5
Television	90.0	73.6	77.3	71.0	40.0	42.3	52.7	35.5
Radio	94.7	86.9	88.4	82.1	74.7	75.7	71.7	73.6
Travel time to nearest telephone								
Within 5 minutes	7.9	15.4	21.6	25.4	17.7	13.1	31.1	9.5
6 – 15 minutes	6.7	17.0	15.3	19.2	27.8	28.6	27.5	24.1
16 – 30 minutes	3.0	8.6	4.6	5.5	21.3	22.2	9.4	25.9
31 – 60 minutes	1.2	3.8	1.2	1.1	11.6	12.5	2.1	15.1
More than one hour	1.0	2.4	0.6	0.3	11.7	14.6	1.7	19.9

(a) Possession of durables by households in Group 4 (QOL 4)

Access to selected durable items is highest in this group which ranks first on the QO index. Nine out of ten households have a television in the dwelling while possession of a radio stands at 94.7%. Eight out of ten households (80.1%) have got either a cellular or landline telephone and, 71.1% of the households have got a vehicle.

For the 20% households or so without a telephone in the dwelling 7.9% are able to get hold of one within five minutes while 6.7% spend between six and fifteen minutes to access a telephone. One percent of the households spend over an hour in travel time in order to make a phone call.

(b) Possession of durables by households in Group 5 (QOL 5)

Access to durable household items is comparatively poorer in group five than in four. For instance 73.6% possess a television compared with 90% in group four. Possession of a radio in group five stands at 86.9% while households with either a cellular or

landline telephone in the dwelling constitute 52.8%. Close to 41% of the households in group five have got a vehicle compared with 71.1% in group four.

With around 53% of the households having a access to a telephone in the dwelling, the remaining 47% of the households have to travel some distance to make a telephone call. Around 15% of the households without a telephone in the dwelling are able to get hold of one within five minutes while 17% travel for six to fifteen minutes in order to make a telephone call. Households which spend over an hour in travel time to make a telephone call make up 2.4% compared with 1% in group four.

(c) Possession of durables by households in Group 1 (QOL 1)

Access to durable household items is slightly better in group one (ranked third on the QOL index) than in group five. For instance 77.3% of the households in group one have got a\television compared with 73.6% in group five. Similarly 88.4% of the households in group one have a radio, a figure that is slightly higher than 86.9% recorded in group five (see Table 4.13). Possession of a vehicle in group one stands at 43.4% and, 56.6% of the households have got a cellular or landline telephone in the dwelling.

For the 43.4% of the households without access to a telephone in the dwelling, 21.6% get hold of a telephone within five minutes while 15.3% spend between six and fifteen minutes in travel time to access a telephone. Proportionately fewer households in group one (0.6%) spend over an hour in travel time to make a telephone call than the 2.4% in group five.

(d) Possession of durables by households in Group 7 (QOL 7)

Access to durable items in group 7 is poorer than the situation in the previous three groups dealt with so far.

For instance 71% of the households in group seven have got a television in the dwelling while 82.1% possess a radio. Around a quarter of the households (25.3%) have got a vehicle and 48.6% have got a cellular or landline telephone in the dwelling.

Results pertaining to possession of a telephone indicate that over half of the households in group seven have to travel some distance in order to make a telephone call. Of these households 25.4% get hold of a telephone within five minutes while 19.2% spend between six and fifteen minutes in travel time to make a telephone call. Ten households (0.3%) spend over an hour while traveling to a telephone facility.

(e) Possession of durables by households in Group 8 (QOL 8)

Group eight ranks fifth on the QOL index and, results pertaining to access to durable items seem to reflect that situation. For instance four out of ten households possess a television in the dwelling and close to three quarters (74.7%) possess a radio. Close to one in ten households (9.9%) is in possession of a cellular or landline telephone and, 11.2% of the households have got a vehicle.

With 90% of the households having no access to a telephone in the dwellings, 17.7% are able to physically access a telephone within five minutes. Close to 28% of the households spend between six and fifteen minutes to get to a telephone facility while 21.3% spend between a quarter of an hour to half an hour to get to a telephone facility (see Table 4.13). Households which spend over an hour while traveling to a telephone facility make up 11.7%.

(f) Possession of durables by households in Group 3 (QOL 3)

Group three follows group eight in terms of the ranking results (i.e. sixth on the QOL index) but possession of durable items does not entirely reflect this kind of situation. For instance possession of a television is higher in group three (42.3%) than the 40% recorded in group eight. Similarly possession of a radio is 1% higher in group three (75.7%0 than in group eight. As for possession of a vehicle, the percentage is lower for group three with 8.4% of the households having a vehicle than the 11.2% recorded in group eight. The same goes for possession of a cellular or landline telephone where 9% of the households in group in group three have a telephone in the dwelling compared with 9.9% in group eight (see Table 4.13).

Results pertaining to possession of a telephone indicate that 91% of the households in group three have to travel some distance to make a telephone call when the need arises. Of these households, 13.1% are able to get to a telephone facility within five minutes while 28.6% spend between six minutes and a quarter of an hour in travel time to get a telephone facility. Households which spend over an hour to get to a telephone facility constitute 14.6%.

(g) Possession of durables by households in Group 6 (QOL 6)

Results pertaining to possession of durable items, in the case of group six, are not consistent with the ranking results. While group six is ranked second from the bottom (seventh on the QOL index) 52.7% of the households in this group possess a television compared with the 42.3% in group three which it follows. Similarly proportionately fewer households in group six (71.7%) possess a radio than the 75.5% recorded in group three. When it comes to possession of a vehicle, group is still better off with 11% of the households having a vehicle than the 8.4% recorded for group three. Possession of a cellular or landline telephone is at least three times as high in group six (28.1%) as it is in group three (9%).

When it comes to distance traveled to a telephone facility, again group six is better off in the sense that proportionately more households spend less time to get to a telephone facility; 58.6% of the households get hold of a telephone within a quarter of an hour compared with 41.7% in group three. (refer to Table 4.13).

(h) Possession of durables by households in Group 2 (QOL 2)

Group two ranks eighth on the QOL index and, results pertaining to possession of durable items reflect this scenario - with the exception of possession of a radio. For instance possession of a television is lowest in this group at 35.5% like possession of a vehicle which stands at 7.6%. In group two 5.5% of the households – the lowest percentage in all groups – have got a cellular or landline telephone in the dwelling.

With 94.5% of the households having no telephones in dwellings 9.5% of the households are able to get hold of a telephone within five minutes while 24.1% spend between six and fifteen minutes while traveling to a telephone facility. Almost one in five households in group two spends over an hour in order to make a telephone call (see Table 4.13 for details).

4.4.7 Subjective evaluation of Quality Of Life

Diener and Suh (1997: 200) highlight that one of the components of subjective well-being is life satisfaction. Subjective well-being measures assess people's actual reactions to the objective conditions they experience. Objective conditions serve as inputs for individuals and cultures to produce what is perceived by people as desirable or undesirable (Diener and Suh, 1997: 207). This makes objective and subjective well-being measures complementary.

In the context of the current study, data pertaining to household life satisfaction were collected in the 1999 October household survey. The question required households to compare their QOL in 1999 to their QOL a year before. This variable was not used in cluster and discriminant analyses because of the way QOL has been conceptualised. It is rather being used as an exogenous variable firstly for descriptive purposes (Milligan, 1996: 365), and secondly to assess the extent to which subjective and objective findings relate with the existing literature. Table 4.14 shows the results pertaining to the subjective evaluation of quality of life in the various QOL groups.

Table 4.14: Subjective evaluation of quality of life (OHS 1999)

	Cluster /QOL/Group number

Rank of group								
Original cluster number	4	5	1	7	8	3	6	2
Perception								
Life has improved	35.6	19.3	26.4	15.6	18.3	15.8	16.5	13.9
Life is the same	42.7	49.6	49.3	46.3	49.9	45.1	49.6	47.0
Life is worse than 1998	21.6	31.1	24.2	38.1	31.7	39.1	33.9	39.1

The results highlighted in Table 4.14 show generally more optimism in groups with better material conditions than in groups with relatively poor living conditions based on the selected QOL indicators. This is made clear when results in Table 4.14 are compared with the findings relating to the ranking of the quality of life groups indicated in Table 4.7. Group four is ranked number one; it has the best access to the selected QOL indicators. In this group 35.6% of the households indicated that life had improved in 1999. This is followed by groups one and five which are ranked third and second respectively on the QOL index. In group one, 26.4% of the households reported an improvement in life while group five recorded 19.3% in this regard. In other words the first three groups on the QOL index happen to have more households which experienced improvements in quality of life.

A further analysis of the groups which follow in terms of ranking show some discrepancies. For instance group seven ranks fourth on the QOL index but the percentage of households which experienced an improvement in life is lower (15.6%) than in group eight wherein 18.3% of the households reported an improvement in life despite the group being ranked fifth. Otherwise the pattern of optimism viz. a viz. material conditions generally holds with the lowest percentage of optimism being recorded in group two where 13.9% of the households reported improvement in life.

When it comes to households' experience in terms of retrogression of life, the inverse of the pattern shown in optimism prevails. Proportionately more households in groups with poor living conditions reported that life had worsened compared to the situation in

1998 than households in groups with better material conditions. The biggest percentage of such households is found in groups two and three which rank eighth and sixth on the QOL index respectively. In these two groups 39.1% of the households reported their life to have worsened than what it was in 1998. This is followed by groups seven and six - ranked fourth and seventh respectively. Once again there discrepancies among the groups in between but the top three groups (i.e. groups four, five and one respectively) have the lowest proportion of households which reported a retrogression in life (see Table 4.14).

One striking feature of the results pertaining to subjective life satisfaction is the slight variation in the proportion of households reporting indifference to life. With the exception of group four, results in Table 4.14 show that the proportion of households whose life had not changed from what it was in 1998 do not vary much across the QOL groups. Apart from group four in which 42.7% of the households reported their life not to have changed, the rest of the groups have proportions varying from 45.1% in group three to 49.9% in group eight. These findings will be looked into in more detail in Chapter 8 during the discussion of the study's findings.

4.5 Summary

This chapter has presented the findings emanating from the analysis of the data for OHS 1999. Cluster analysis produced eight QOL groups of which, group four (QOL4) experiences the best measurable conditions. The group experiencing the poorest measurable conditions has been identified as group two. Discriminant function analysis has yielded results highlighting the indicators which discriminate between the eight QOL groups. These include highest level of education completed by the household head, type of toilet facility accessed by a household, and time taken to travel to a telephone facility. These indicators have been found to differentiate the living conditions experienced among the eight groups of households.

In other words, focus needs to be put to these particular indicators if QOL is to be further improved. Chapter five will provide the results emanating from the analysis of the data for OHS 1998.

CHAPTER FIVE: FINDINGS OF THE STUDY IN RESPECT OF OHS 1998

5.1 **Introduction**

The previous chapter presented the findings emanating from the analysis of the Data for OHS 1999. Chapter five will present the findings arising from the analysis of the data for OHS 1998. Like in chapter four, results of chapter five are divided into two broad categories. The first category deals with findings in respect of discriminant function analysis. This [discriminant function analysis] provides a description of the indicators which differentiate between groups of households experiencing different QOL conditions. Put in a different way, discriminant function analysis enables the study to identify the key indicator or indictors that are responsible for the existence of the different measurable living conditions existing among the QOL groups. Secondly the findings in respect of discriminant function analysis highlight the extent to which households are correctly classified into the QOL groups they belong to on the basis of the QOL indicators used in the study – a validity check. Finally as will be showed in due course, the results of discriminant function analysis provide a basis for ranking the QOL groups emanating from cluster analysis. The two models - cluster analysis and discriminant function analysis– have been applied in the study; the former to classify households into QOL groups, and the latter to validate the results as well as identifying the discriminating QOL indicators.

The second category of results deals with findings arising from cluster analysis. This category of results describes the characteristics of the various QOL groups, highlighting how the groups differ from one another in terms of the QOL indicators considered. Finally a description of the subjective assessment of QOL is provided in the attempt to find out whether there is a relationship – not statistical though - between the distribution of the QOL groups in the QOL index (i.e. the measurable living conditions) and households' subjective evaluation of quality of life.

5.2 Applying discriminant function analysis to the OHS (1998) data

As you may recall from chapter three dealing with the methodology as well as chapter four, discriminant function analysis was applied to identify the indicator or indictors that discriminate between quality of life groups. In analysing the data for OHS 1998 a total of fourteen indicators or multiple response variables were used in discriminant function analysis (these are listed in Table 5.3). The same variables were used to classify households (i.e. cluster analysis, to be dealt with later on) into groups experiencing different QOL conditions; details regarding cluster analysis follow in Sections 5.3 and 5.4. It should be noted that the variables used in the analysis for all four datasets (OHS 1999-OHS1996) are not the same. This is due to the changes in the way data was collected in the OHS surveys which followed OHS 1996.

In analysing data for OHS 1998, seven groups of households (i.e. QOL 1-QOL 7) were obtained. The seven QOL groups form the "grouping variable" in discriminant function analysis. The grouping variable, in conjunction with the fourteen multiple response variables (i.e. QOL indicators) have been used to derive the discriminant functions. Since the number of indicators – fourteen - is bigger than the degrees of freedom for the seven groups (i.e. six), the maximum number of discriminant functions in the analysis is six.

Table 5.1 shows the output summarising the canonical discriminant functions - the eigenvalue, percentage of variance, cumulative percentage of variance accounted for by each function, and the canonical correlation for each discriminant function. The eigenvalues associated with the discriminant functions indicate the relative proportion of between – group variability accounted for by each function. The results in this case indicate that 45.2% of the variation between the groups is accounted for by the first discriminant function and 40.3% of the variation is accounted for by the second discriminant function. The first two discriminant functions thus account for 85.5% of the variation between the quality of life conditions in the seven groups. The additional variance accounted for by functions three to six is also shown, with a combined discriminating power of around 14.5%.

As in OHS 1999, interpretation of the findings in respect of discriminant function analysis will be limited to the first two discriminant functions as the remaining functions are not likely to provide reliably additional information with regard to group membership (Tabachnick, 2001:459).

Table 5.1: Summary of canonical discriminant functions – OHS 1998

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	6.1534	45.1876	45.1876	0.9275
2	5.4843	40.2744	85.4620	0.9197
3	1.8371	13.4910	98.9529	0.8047
4	0.1144	0.8404	99.7933	0.3205
5	0.0228	0.1672	99.9605	0.1492
6	0.0054	0.0396	100	0.0732

NB. First 6 canonical discriminant functions were used in the analysis.

The association between the QOL groups and the indicators is depicted by the canonical correlations for each function as indicated in Table 5.1. The first two discriminant functions indicate strong correlations (i.e. 0.93 and 0.92 respectively) between the QOL and the indicators. The third discriminant function shows a 0.8 correlation between the QOL groups and indicators which is also high. Functions four to six reveal substantially reduced correlations between the QOL groups and the indicators.

The interpretation of the strength of these correlations is enhanced by considering the Chi - square results in Table 5.2**.** These results indicate that with all six functions tested together, a $\chi^2(84)$ of 90255.3 with p = 0.000 is obtained indicating a high relationship between the six QOL groups and the QOL indicators. With the first discriminant function removed, there is still a reliable relationship between the QOL groups and the indicators as shown by $\chi^2(65)$ of 54851.55, p = 0.000. The same goes for all the six functions as one function is removed in succession. All six functions indicate reliable relationships between the QOL groups and the indicators despite the systematic decline in the magnitude of the canonical correlations for the respective indicators.

Table 5.2: Statistical significance of discriminant functions (OHS 1998)

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 6	0.006631	90255.3	84	0.00
2 through 6	0.047434	54851.55	65	0.00
3 through 6	0.30758	21214.67	48	0.00
4 through 6	0.872643	2451.233	33	0.00
5 through 6	0.972507	501.6165	20	0.00
6	0.994643	96.64968	9	7.48E-17

The associations indicated by the Chi-square values above are reliable. However, it is crucial to remember that they arise from an association between seven QOL groups and fourteen indicators. With many indicators being involved in the analysis, there is a likelihood of at least one indicator to discriminate between QOL groups for each dicsriminant function. As a result all six functions show reliable associations between the QOL groups and the indicators although each function has one or two outstanding indicators as revealed by the canonical correlations in Table 5.3. The indicator or indicators that load highly with a particular discriminant function are marked with (*) and these are the focal points in discriminant function analysis.

5.2.1 Interpretation of discriminant function results

Results in Table 5.3 indicate that *Main transport used to get to work* is the outstanding QOL indicator that correlates highly (0.686) with the first discriminant function. This indicator has been used in the analysis to investigate the possible relationship between quality of life (i.e. group membership) and possession of durable goods with particular reference to possession of a car. In its entirety however, the indicator captures information on the type of transport used by working household members when getting to work. Analysis in this study has been restricted to household heads only.

A closer analysis of this indicator reveals a differentiation between households with working household heads and non-working household heads. As will be shown in detail in section 5.4, groups one, four and seven have most of the households headed by

someone with a full time job 92.5%, 84.4% and 87% respectively.
The rest of the groups (QOL 2, QOL3, QOL5, and QOL6) have large proportions of unemployed household heads. For instance unemployment among household heads stands at 95.6% in group while in group three half of the household heads are unemployed. In QOL5 92% of the household heads are unemployed and, 89% of the household heads in group six are unemployed.

Given the situation highlighted above, the observation is that for households in groups where household heads are working (QOL1, QOL4, and QOL7) the head of house household either walks to the work place or uses public transport if the household has no car (these details will be described in section 5.4.6 which addresses issues around possession of durable items). In groups or clusters where the majority of household heads are unemployed (i.e. groups two, five and six), the household head stays at home.

The discriminating effect of this particular indicator arguably underpins the influence of unemployment on household QOL. In general as will be highlighted, possession of a car is lo across all QOL groups. The solution therefore lies in addressing unemployment in order to minimise the group differences.

Witt regard to the second discriminant function, *Highest education level completed* by a household head loads highly with this function, with an absolute correlation of 0.554. This indicator is outstanding given the fact that the level of education is low in groups four to seven (i.e. QOL 4 - QOL 7) and group two (details will be dealt with in section 5.4).

This indicator basically differentiates groups one and three from the rest of the groups. Twenty seven percent of the households in group three possess tertiary education qualifications ranging from a diploma to Honours degree while 13% of the household heads in group one fall in the same category, with qualifications ranging from just a certificate (2.6%) to Masters Degree (0.1%). These two QOL groups basically have the best access to the selected QOL indicators and by implication the best QOL conditions.

On the basis of these results completed level of education stands out clearly as one factor that differentiates between quality of life conditions in groups with educated household heads as opposed to conditions in groups with uneducated household heads.

Table 5.3: Pooled within correlations between discriminating variables and standardized canonical discriminant functions - structure matrix.

	Function number					
	1	2	3	4	5	6
Main transport used to work	-0.6864*	0.6830	0.0685	-0.1603	0.0470	0.1185
Highest education level completed	0.5396	0.5542*	-0.6201*	0.0625	-0.0210	-0.0720
H/hold's main fuel for cooking	0.4322	0.3708	0.5894*	-0.1955	-0.2514	-0.1408
H/hold's main fuel for lighting	0.2672	0.2302	0.4351*	-0.2605	-0.0358	-0.0926
Type of toilet facility used by h/hold	0.2777	0.2452	0.3185*	0.0088	-0.1497	0.2367
Is there a phone in the dwelling?	0.1383	0.2299	0.1718	0.5811	0.1447	0.0652
Does person have access to medical aid?	0.1241	0.1433	0.0579	0.5609	-0.4027	0.0326
Did person work for pay during past 7 days?	0.4335	-0.2040	-0.0031	0.5130	-0.1226	0.3254
Does h/h have a cellular phone?	0.0709	0.1288	0.0465	0.5037	-0.0475	-0.1806
Usual facility for h/hold medical help	0.1307	0.1124	0.0940	0.4641	-0.1577	-0.2501
Dwelling's distance from water source	0.2792	0.1947	0.3627	0.1806	0.5390	-0.2897
Dwelling's main water source	0.2314	0.1717	0.2766	0.1641	0.4960	-0.1027
How is h/hold refuse disposed of?	0.2390	0.2306	0.3001	0.0247	0.4052	0.5794
H/hold distance from medical facility	0.0579	0.0676	0.0908	-0.1630	0.2635	0.3303

NB. Variables ordered by absolute size of correlation within function.

*Largest absolute correlation between each variable and any discriminant function

5.2.2 Predicting group membership

The results above emanate from the application of discriminant function analysis to the QOL groups obtained in cluster analysis. Like in chapter four, it is important to establish the extent to which cluster analysis results agree with the results arising from the application of discriminant function analysis. Information Table 5.4 shows how cases which were originally classified in cluster analysis, are grouped in discriminant function analysis.

These results indicate that 95.3% of the original cases are correctly classified by the discriminant function analysis model. The best results in terms of fit are found in groups two, three and four where the percentage of correctly predicted cases is above the overall percentage of 95.3%. The poorest fit between the two models is found in group seven where 91.3% of the original cases are correctly classified by the discriminant function model. In this case 5% of the households which were classified as belonging to group seven are predicted as belonging to group. Another 2.8% of the cases originally classified as belonging to group seven are predicted as belonging to group four.

The prediction of 5% of the households as belonging to group one could have been caused by the fact that both groups – QOL1 and QOL7 - have almost the same percentages of households living in formal dwellings, 76.5% and 74.2% respectively. The 2.8% of the households predicted differently from the original classification could be due to the fact that group four and group seven have proportionately high percentages of households using wood as fuel, 43% and 32% respectively. Besides this particular group (i.e. QOL7) the discriminant function results are more in agreement with the cluster analysis results than otherwise.

Table 5.4: Classification results of original and predicted group membership for OHS 1998

	Predicted Group Membership (discrimimnant function analysis)								Total
	Cluster Number of Case	1	2	3	4	5	6	7	
Original Count- (cluster analysis)	1	**2807**	0	77	119	1	1	2	3007
	2	0	**2355**	0	0	0	30	0	2385
	3	14	0	**4759**	0	87	2	0	4862
	4	51	0	0	**1566**	8	0	13	1638
	5	0	5	121	1	**2690**	42	0	2859
	6	4	74	28	0	38	**1573**	0	1717
	7	77	5	0	43	0	8	**1404**	1537
	Percentages								
	1	**93.3**	0	2.6	4.0	0.03	0.03	0.07	100
	2	0	**98.7**	0	0	0	1.3	0	100
	3	0.3	0	**97.9**	0	1.8	0.04	0	100
	4	3.1	0	0	**95.6**	0.5	0	0.8	100
	5	0	0.2	4.2	0.03	**94.1**	1.5	0	100
	6	0.2	4.3	1.6	0	2.2	**91.6**	0	100
	7	5.0	0.3	0	2.8	0	0.5	**91.3**	100

NB. 95.3% of original grouped cases correctly classified

Like in OHS 1999 the quality of life clusters were ranked as indicated in the cluster analysis results that follow in section 4.3. The ranking process was based on the distribution of the group centroids for the first discriminant function or dimension, such that a group with the best QOL is located to the extreme positive side of the dimension. Table 5.5 shows the results of the discriminant functions evaluated at group means. These results show that group one-with its centroid located +3.49 units along the first discriminant function - is ranked number one and, judged to experience the best measurable QOL conditions. Group two with its centroid located – 4.3 units along the same discriminant function is ranked number seven; it experiences the poorest

measurable conditions. The results of the ranking process are indicated in Table 5.7 in the following section which deals with cluster analysis.

Table 5.5: Functions at group centroids

Cluster Number of Case	Discrimiminant Function number and corresponding group centroids					
	1	2	3	4	5	6
1	3.4921	-0.67447	0.1601	-0.3277	-0.1946	0.0405
2	-4.3309	-1.3789	0.3727	0.281	-0.1753	0.0747
3	1.0298	2.9024	0.2554	0.3203	0.0284	-0.0119
4	1.5832	-3.0311	-2.0796	0.1839	0.2735	0.103
5	-2.1395	0.8534	-1.9871	-0.3501	-0.011	-0.0802
6	-1.8097	0.5686	2.5352	-0.5568	0.2345	0.038
7	0.9447	-4.7144	1.3809	0.2691	0.0298	-0.1608

Unstandardized canonical discriminant functions are evaluated at group means

5.3 Formation of the QOL groups using cluster analysis

Like in the analysis for OHS 1999, cluster analysis was performed on the OHS 1998 data to group households into QOL groups. As indicated earlier on, seven QOL groups emerged when households were classified on the basis of fourteen indicators. Table 5.6 shows the results pertaining to the final cluster centres for the seven QOL groups. A description of the findings regarding cluster analysis follows in Section 5.4 where aspects of the seven quality of life groups are analysed.

Table 5.6: Final cluster centers for OHS 1998

	Cluster number						
	1	2	3	4	5	6	7
Does h/h have a cellular phone?	1.1041	1.0092	1.2781	1.0140	1.0192	1.0361	1.0143
Did person work for pay during past 7 days?	4.8467	1.1514	2.9414	4.7021	1.2872	1.4001	4.7573
H/hold's main fuel for cooking	7.7170	3.4038	7.8863	3.8773	3.9811	7.1334	5.3221
H/hold's main fuel for lighting	5.9235	3.1338	5.9657	3.3010	3.4285	5.8608	4.4528
H/hold distance from medical facility	3.7207	3.0398	3.7731	3.2228	3.2312	3.8923	3.2206
Highest education level completed	11.2404	1.4730	12.5559	9.3120	9.4624	3.6313	2.2713
Is there a phone in the dwelling?	1.3216	1.0122	1.6512	1.0220	1.0332	1.2813	1.0644
Does person have access to medical aid?	1.2527	1.0088	1.4159	1.0495	1.0189	1.0361	1.0553
Usual facility for h/hold medical help	3.7789	3.1032	4.0856	3.2979	3.1326	3.3594	3.4619
How is h/hold refuse disposed of?	4.2714	1.9719	4.6785	2.5598	2.3200	4.1508	2.8562
Type of toilet facility used by h/hold	4.6186	2.3421	4.8028	2.7387	2.6810	4.1386	3.2277
Dwelling's main water source	4.5191	2.8214	4.8009	3.4078	3.0437	4.3454	3.8315
Dwelling's distance from water source	6.3987	3.7543	6.7653	4.5678	4.0147	6.1677	5.4470
Main transport used to work	4.4769	12.8897	11.5422	3.5934	12.8013	12.7094	2.6649

5.4 Comparing different aspects of the seven quality of life groups

Before comparing the quality of life conditions in the various QOL groups, there is a need to determine how the QOL groups differ from each other in terms of the conditions experienced. In other words, there is a need to rank the quality of life groups. Throughout the analysis (i.e. including the subsequent data sets) ranking the QOL groups is based on

the findings of the discriminant function model. Discriminant function analysis provides a distribution of grouped cases along particular dimensions or discriminant functions.
The first discriminant function (DF) accounts for most of the between - group variation as detailed in section 5.2. The clusters will have their centroids distributed along a particular DF on the basis of the indicator characteristics used in the analysis. A group of households with the best access to the selected QOL indicators will have its centroid located farthest on the positive side of the first dimension or discriminant function. Similarly a group of households with the poorest access to the selected QOL indicators will be have its centroid located farthest on the negative side of the first dimension. This enabled the study to rank the QOL groups. Table 5.7 shows the results emanating from the ranking process. Information in Table 5.7 has been extracted from Table 5.5 which provides details on the distribution of functions at the group centroids.

Results in this respect indicate that group 1 with its centroid located 3.49 units on the right side (or positive for that matter) of the first DF is ranked number one. It has the best access to the QOL indicators considered in the study hence judged to experience the best quality of life. It is followed by group 4 whose centroid is located 1.58 units along the same DF. By contrast Group 7 whose centroid is located 4.33 units on the left side (i.e. negative) of the DF is ranked seventh on the QOL index; it is judged to experience the poorest QOL as it has the least access to the indicators considered in the study.

Table 5.7: Distribution of QOL groups and their respective ranks based on group centroids

QOL Group number	1	2	3	4	5	6	7
Group centroids – First discriminant function	3.49	-4.33	1.03	1.58	-2.14	-1.81	0.94
Rank of QOL Group	1	7	3	2	6	5	4

Having looked at how households experiencing similar QOL conditions were grouped, the study will embark on describing the characteristics of the QOL groups. Table 5.8 provides a summary of the demographics for the seven QOL groups that emerged in cluster analysis. Details pertaining to these results are provided hereafter.

Table 5.8: Demographics, employment and income of the QOL groups (OHS 1998)

	Cluster number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	1	4	3	7	6	5	2
Population group							
Asian	2	0.2	6.0	0.13	2.6	-	-
Black	76.2	93.5	37.4	87.8	78	97.6	97
Coloured	14.7	6.1	15.4	11.9	18	2.2	3.0
White	7.1	0.2	41	0.13	1.1	0.2	-
Age of head of the household							
15-19 years	0.2	0.4	1.13	0.2	0.3	4.2	0.04
20-29	14.6	19	11.5	8.3	2.6	17	1.5
30-49 years	65.2	63.2	45.5	55.2	24.2	42.9	21.1
50-69	19.8	16.9	32.1	35.2	45.5	27.6	50.7
70 years and older	0.2	0.5	9.8	1.1	27.3	8.2	26.6
Median age	39	38	45	45	61	42	62
Sex of head of the household							
Male	74.9	73.3	71.3	78.8	45.3	43	41
Female	25.1	26.7	28.7	21.2	54.7	57	59
Education Level							
Below standard 9	71.8	92.1	49.3	100	100	94.5	100
Standard ten (Matric)	28.2	7.9	50.7	_	_	5.5	_
Certificate or Diploma	9.7	2.5	16.0	_	0.2	1.5	0.04
Degree or post graduate Degree	2.0	0.4	8.9	_	_	0.2	_
Gross monthly **Household Income**							
R0–R500	28.9	57.6	11.0	62	51	41.8	79.1
R501– R2500	53.2	37.4	32.9	35.7	38.5	44	0.4
R2501-R6000	16.0	3.9	36.4	1.6	6.3	8.8	-
R6001-R16000	1.4	0.5	15.3	0.6	2.1	3.3	-
R16001-R30000	0.1	0.2	0.7	0.1	1.0	1.1	-
R30000 +	0.4	0.3	0.8	-	1.0	1.1	-
Don’t know	-	-	-	-	-	-	-
Refused	-	-	-	-	-	-	-
Median income (Rands)	698.68	433.28	3047.75	402.73	489.30	875.50	315.68

Table 5.8: Demographics, employment and income of the QOL groups (OHS 1998)- continued

	Cluster number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	1	4	3	7	6	5	2
Employment Status							
Full time employment	92.5	84.4	47	87	9	6.3	3.1
Part time employment	4.0	8.8	2	7.6	1.0	1.0	0.8
Casual employment	2.7	6.1	1.0	5.1	0.8	0.7	0.6
Unemployed	0.8	0.7	50.0	0.3	89	92	95.6
Number of cases (N = 18005)	3007	1638	4862	1537	1717	2859	2385
Percentage	16.7	9.1	27.0	8.5	9.5	15.9	13.3
Total	3007	1638	4862	1537	1717	2859	2385
Response rate	(56.7)	(71.2)	(15.2	(74.8)	5.6)	(3.2)	(1.8)

5.4.1 Analysis of Demographics (OHS 1998)

(a) Demographics of Quality of Life (Group 1)

This group with 16.7% of the sampled households has been identified as the group with the best access to the selected QOL indicators. With a median age of 39, the majority of households in this group (65.2%) are headed by people aged between 30 and 49 years. Five households (0.2%) are headed by people under nineteen years as are households headed by people aged 70 years and older (0.2%). Close to 15% of the households are headed by someone aged between 20 and 29 years (see Table 5.8 for details). A quarter of the households are headed by females and, three quarters of the households are urban.

As far as race is concerned 76.2% of the households are African while Coloured households make up 14.7%. White households constitute 7.1% while Indian/Asian households constitute 2%. Afrikaans and Zulu are the most spoken languages, 18.7% and 18.3% respectively while Xhosa and English – speaking households constitute 12.5% each. Twelve percent of the households speak English while 11.3% speak South Sotho. North Sotho or Sepedi is spoken by 6.3% of the households.

When it comes to education, the majority of households are headed by people without Matric or Standard ten (71.8%) while household heads with Matric make up 28.2%. Close to 12% of the household heads or acting household heads have tertiary education.

Of the 12% with tertiary education, 7.1% have got a Diploma while 2.6% have a certificate. Household heads having a Bachelor's Degree make up 1.6% while those with an Honors Degree make up 0.1%. A similarly small proportion of 0.1% household heads have a Masters Degree.

In spite of the relatively low education levels among household heads, the level of employment in Group 1 is high with 92.5% of the household heads having a full time job while 4% work on part time basis. Casual workers make up 2.7% and, only 0.8% of the household heads are unemployed.

It is difficult to comment on household income for OHS 1998 due to the low response rate as shown in Table 5.8. In the case of Group 1 with a response rate of 56.7%, the majority of households (82%) live on at most R 2500 a month. Households earning between R 2500 and R 6000 make up 16%. Just close to 2% of the households earn at least R 6000 a month. It needs to be emphasised that the response rate regarding household income is quite low which necessitates treating the results in this particular respect with caution. One indication of the need to be cautious about the income results is access to medical aid. Results in this regard show that 25.3% of the households have access to medical aid and, 44.2% of the households make use of private health services (private doctor, a private clinic or hospital). This finding does not relate well with the income profile of the group.

(b) Demographics of Quality of Life (Group 4)

Group 4 accounts for 9.1% of the sampled households and ranks second on the QOL index. A small proportion of households (0.4%) are headed by people aged 15 – 19 while households headed by people aged 20 – 29 make up 19%. With a median age of 38, the majority of households (63.2%) are headed by people aged 30 – 49 while 16.9% of the household heads are aged 50 – 59. Elderly people (70 years and older) head a relatively small percentage of households in this group (0.5%). Households headship is dominated by males (73%) and, unlike group one, rural households are in the majority (62.5%).

The race profile of Group 4 indicates African households to dominate the group (93.5%), followed by Coloured households (6.1%). White and Indian households make up equal minute percentages of 0.2% each. The distribution of languages spoken at home shows Zulu to be the most spoken language (18%) followed by Afrikaans and Xhosa, 16.4% and 16.2% respectively. Some 9.3% of the households speak Setswana while 9% speak South Sotho. Sepedi – speaking households make up 8.5% while English – speaking households constitute 8.7. Tsonga and Siswati are spoken by 4.7% and 4.3% of the households respectively.

The level of education completed by household heads in Group 4 is quite low, with just 2.9% of them having a tertiary qualification. Of this percentage, 2% of the household heads have got a Diploma and 0.5% have got a certificate. Household heads with a Bachelor's Degree make up 0.4%. For the 97% households headed by people without a tertiary qualification, 7.9% have completed Standard ten with the rest having education levels below Standard nine.

In spite of the low level of education, most household heads in this group are employed on a full time basis (84.4%). Some 8.8% have part time work while 6.1% are employed as casual workers. Only 0.7% of the households in this group are headed by unemployed people.

A substantial proportion of households provided information pertaining to income (71.2%). Information in respect of household income shows this group to be a generally low income group with a median income of R 433. Ninety five percent of the 1166 households which provided information in respect of household income earn a monthly income of just up to R 2500 and, around 4% of the households earn between R 2500 and R 6000 (see Table 5.8). It should not be surprising that 95% of the households in Group 4 have no access to medical aid and, as a result, 80% of the households relying on public clinics and hospitals. Households which visit a private doctor make up 15.6% while 2.2% visit a private clinic or hospital.

(c) Demographics of Quality of Life (Group 3)

This group ranks third on the QOL index and accounts for the biggest percentage of the sampled households in OHS 1998 (27%). The demographic profile of households heads in this group differs from the that of the groups one and four in a number of respects. Firstly 1.13% of the households in group three are headed by people aged 15 – 19 which is relatively bigger than in groups one and four. Secondly group three has relatively fewer households headed by people aged 30 - 49 (45.5%) compared with over 60% in groups one and four. Thirty two percent of the households in group three are headed by people aged 50 – 69 and, 9.8% of the households are headed by elderly people aged 70 and older. Male headed households constitute the majority (71%) and, at least nine out of ten households (90.7%) are urban.

The race profile of Group three shows White households constituting the majority (41%) followed by African households (37.4%) while Coloureds households constitute 15.4%. Asian households make up 6% of the sampled households. At least one in five households (22.4%) speaks Afrikaans at home while Zulu- and Xhosa- speaking households constitute 15.6% and 15% respectively. Fourteen percent of the households speak English while eleven percent speak South Sotho. Setswana-speaking households make up 8.7% while 2.7% speak Tsonga or Shangani.

The education profile of the household heads in Group 3 is far better off when compared with the situation in Group two. For Group three, at least half of the households (50.7%) have completed Standard ten unlike in Group two where only one person had completed Standard ten (see Table 5.8). A quarter of the household heads in Group three have got tertiary education; five percent have got a certificate while 11% have a Diploma. Household heads with a Bachelors Degree make up 6.6% while 1.3% have got post – graduate Diploma or Honours Degree. Household heads with a Masters Degree or PhD constitute 1%.

In spite of the relatively better off education levels in this group, half of the household heads are unemployed.

Household heads with full time employment make up 47% while part time workers constitute some 2%. One percent of the household heads are employed on a casual basis.

In Group three, 15.2% of the households responded to the question addressing the issue of household income. Close to 44% (i.e. 2134 households) of the households which responded to this question earn at most R 2500 a month while 36.4% earn between R 2500 and R 6000. Some 15% or 729 households earn between R 6000 and R16 000 a month (see Table 5.8). In this group, 42% of the households have access to medical aid. This is reflected by the high use of private health services where 51% of the households visit a private doctor and 8% visit a private clinic or hospital. Public clinics or hospitals are visited by some 40% of the households.

(d) Demographics of Quality of Life (Group 7)

Group 7 ranks fourth on the QOL index and accounts for 8.5% of the sampled households. The demographic profile of group seven is more similar to that of group three than that of groups one and four. With a median age of 45, the ages of household heads are concentrated in the 30 - 49 and 50 – 69 age groups, 55.2% and 35.2% respectively. Unlike group three however, relatively few households in group seven (0.2%) are headed by people aged 15 – 19. Some 8.3% of the households are headed by people aged 20 - 29 and, around 1% of the households are headed by elderly people aged 70 and older. Household headship is dominated by males (79%) and, at least two thirds of the households (67.7%) are rural.

African households constitute the majority (87.8%) followed by Coloureds (11.9%), with Whites and Indians making equal small percentages of 0.13% each. Around one in five households (20.4%) speaks Afrikaans at home while 16.9% speak Zulu and 15.4% speak Setswana. Xhosa- and South Sotho – speaking households differ slightly in proportions, 11.6% and 11.3% respectively while 6.3% of the households speak Sepedi. Households speaking English at home make up 5.6% while 5% speak Swazi or Siswati.

The level of education completed by household heads in group seven is low with none of them having a tertiary qualification talk less of Standard ten. The majority of household heads (68.8%) have no education at all while 24.3% have education levels varying between Standards one and three. Some 2% of them have either Grade zero or Grade one; the highest education level indicated to be possessed by a household head or acting household head is Standard three.

In spite of the low education levels completed by household heads in group seven, most of them (87%) are employed on a full time basis. Some 7.6% are part time employees while 5.1% are casual workers. A small proportion of household heads (0.3%) are unemployed.

Close to three quarters of the households (i.e. 1150 households) in Group 7 provided information pertaining to household income. Of these households, 97.7% or 1123 households earn a monthly income which does not exceed R 2500. Only eight households or 0.7% earn at least R6000 a month. The majority of households in Group seven (94.5%) have no access to medical aid. This group ranks fourth on the index with two thirds of the households being rural. The income profile of the respondents suggests an inability of the 75% households to access medical aid. However, 22.4% of the households in this group make use of the services of a private doctor or specialist and, 5.1% of them visit a private hospital or clinic. Households which visit a public clinic or hospital for health care services constitute 70.3%. Given the rank of this group (fourth), the low access to medical aid could be attributed more to the rural nature of the majority of the households as opposed to the income profile depicted by the households that responded.

(e) Demographics of Quality of Life (Group 6)

With 9.5% of the sampled households, group six ranks fifth on the QOL index. The distribution of age of household heads in this group is skewed with a bias towards older ages: 27.3% of the households are headed by people aged 70 and above. In fact group six has the biggest percentage of households headed by elderly people. With a median age of 61, a small percentage of households (0.4%) are headed by people aged 15 – 19 while

2.6% of the households are headed by someone aged 20 - 29. Unlike most of the other groups, with the exception of Group 2, this group has a small proportion of household heads in the 30 – 49 age category (24.3%). A substantial 45.5% of the household heads are aged 50 - 69. Female headed households outnumber the male headed households (54.7%) and, three quarters of the households in this group (75.8%) are urban.

When it comes to population composition, seventy eight percent of the households are African and 18% are Coloured. Indian and White households constitute small percentages, 2.6% and 1.1% respectively. Afrikaans is the most spoken language at home (21%) followed by Zulu (16%) and Xhosa (12%). Setswana – speaking households constitute 14% while eleven percent speak South Sotho. English is spoken by some 9% of the households while Siswati and Shangani are spoken by 3.6% and 3.1% of the households respectively.

The level of education for people heading households in Group 6 is low with half of them having had no education at all and 45% having education levels between Standard one and Standard four. None of the household heads has got a degree neither did any of them complete Standard ten. However, one household head has got a certificate and two others have a diploma, making up 0.2%.

Unemployment is high with 89*%* of the households being headed by in this category. Household heads with full time employment constitute 9% while those employed on a part time basis make up 1%. Some 0.8% of the household heads are employed as casual workers. A few households (i.e. 96 households or 5.6%) provided information in respect of household income. Close to 90% of these households (i.e. 86 households) earn a monthly income below R 2500 as indicated in Table 5.8. Like group five, group six is one of the QOL groups close to the bottom of the QOL index. Considering its rank, fifth and the limited information regarding household income, a deduction on low access to medical aid may be feasible. The majority of households in Group six (96.4%) have no access to medical aid. This could explain why 78.9% of them rely on the public clinic or hospital when the need for medical help arises.

Households which visit a private doctor or specialist constitute 18% while some 2% visit a private clinic or hospital for medical help.

(f) Demographics of Quality of Life (Group 5)

This group ranks second from the bottom (i.e. sixth) in terms of access to the selected QOL indicators. With 15.9% of the sampled households, group five has the biggest percentage of households (i.e. 4.2%) headed by people aged 15 – 19. Seventeen percent of the households are headed by people aged 20 – 29 while the majority (42.9%) are headed by people aged 30 – 49. Household heads aged 50 - 69 make up 27.6% while 8.2% of the households are headed by elderly people aged 70 years and older. The majority of the households are headed by females (57%) and, 76% of them are rural.

African or Black households dominate the group (97.6%) while Coloured households constitute 2.2%. White households make up 0.2%. The language profile of the group depicts the race distribution with one in four households (25.7%) speaking Xhosa at home while 18.5% speak Zulu. Fourteen percent of the households speak Sepedi while South Sotho and Setswana are spoken by 6.8% and 8.9% respectively. Shangani-speaking households make up 6.6% while Afrikaans- and English-speaking households constitute 7.8% and 5.5% respectively.

The level of education for household heads in group five is low with 98% of them having no tertiary education. Just close to 2% of the household heads have tertiary qualifications of whom, 0.2% have a Bachelors Degree. Diploma holders make up 1% while 0.5% have got a certificate. For household heads without tertiary education, 5.5% have completed Standard ten and the rest (94.5%) have got education levels below Standard nine.

Unemployment among household heads is high with 92% of them falling in this category. Households headed by people with full time employment make up 6.3% while people with part time employment make up 1%. Households headed by people in the casual work category constitute 0.7%.

Information pertaining to household income is quite scanty, with only 3.2% of the 2859 households having provided information in this regard. Of the 92 households which provided information regarding household income, 85.8% of them (i.e. 78 households) earn a monthly income that does not exceed R 2500. Just around five households earn at least R 6000 a month. Given the rank of the group (sixth) and the scanty information regarding household income, it may not be surprising that the majority of households in Group 5 (i.e. 98%) have no access to medical aid, which is possibly why 91% of them visit a public clinic or hospital. Households which make use of private health services – private clinic or hospital-make up just 8%.

(g) Demographics of Quality of Life (Group 2)

This group ranks lowest 9i.e. seventh) on the QOL index and consists of households with the poorest access to the selected QOL indicators. Similar to group six, the age distribution of household heads in group two is skewed with a bias towards old age. The majority of household heads (50.7%) fall in the 50 – 69 age category while 26.6% are headed aged seventy and older; 7% of the household heads are aged eighty and older. Unlike the rest of the QOL groups – with the exception of Group six - this group has relatively few households (21.1%) headed by people aged 30-49. Females dominate the household headship at 59% and, the majority of the households (90%) are rural.

When it comes to race composition, African households are predominant at 97%, with the rest being Coloured. The language spoken at home somehow follows the race profile of the group, with Xhosa and Zulu being the most commonly spoken languages, 23% and 22% respectively. Sixteen percent of the households speak Sepedi while 8% speak Setswana. Tsonga is used by 6.4% of the households while Tshivenda and Siswati are spoken by 4.4% and 4.6% respectively. English and Afrikaans are used by relatively few households, 3.3%. and 6.5% respectively.

The level of education for household heads in this group is low, with just one household having a tertiary certificate.

Eighty seven percent of the households are headed by people with no education. The remaining 12% or so have education ranging between Grade zero and Grade three (i.e. Standard one).

The level of unemployment in this group is high (95.6%), with only 3.1% of the household heads having full time jobs. Households headed by people with part – time jobs make up 0.8% while casual workers constitute 0.6%.

When it comes to household income, quite a few households (1.8% or 429 households) disclosed their monthly income as shown in Table 5.8. Of the 429 households, 79.1% (i.e. 335 households) earn a monthly income of just up to R 500. The majority of households in this group (99%) have no access to medical aid. This could be the likely reason for 92% of the households relying on public clinics and hospitals when the need for medical help arises. Households which make use of private health services – private doctors and, private clinics and hospital – constitute 6.7%.

5.4.2 Analysis of residence (type of dwelling)

This section describes the type of dwelling households in various QOL groups live in. Information pertaining to this aspect is summarised in Table 5.9 below. In addition to type of dwelling, the section also looks at the geographical distribution of households by province. Like in chapter four, the description provides additional information which may not be appearing in the summarized figures in Table 5.9. Please note that description of the findings is presented according to the ranking results of the quality of life groups.

Table 5.9: Type of dwelling and geographical distribution of households by QOL group (OHS 1998)

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	1	4	3	7	6	5	2
Type of dwelling							
Formal dwelling	76.5	50.9	92.9	61.5	83.9	59.1	52.2
Informal dwelling	8.1	28.3	3.0	11.8	10.1	14.7	8.3
Traditional dwelling	1.9	14.3	1.1	14.1	3.3	23.8	38.1
Caravan/tent	0.1	0.3	-	0.4	0.2	-	-
Other	13.5	3.3	1.7	9.4	1.7	1.0	0.2
Province							
Gauteng	22.7	11.0	22.9	7.6	14.5	4.2	1.9
Western Cape	15.1	7.6	22.5	7.7	12.2	2.2	1.3
Northern Cape	5.3	4.9	6.0	11.1	12.1	2.3	2.4
Eastern Cape	6.4	14.8	8.8	5.5	8.6	26.3	23.5
Free State	11.1	11.8	7.8	15.0	11.1	7.8	3.8
Limpopo	5.3	14.4	3.5	9.2	6.8	22.6	26
North West	11.6	10.4	6.8	16.1	11.5	11.0	10.2
Mpumalanga	9.9	12.3	6.5	16.7	10.9	7.6	11.4
KwaZulu-Natal	12.6	13	15.2	11.3	12.3	15.9	19.3

(a) Analysis of residence for households in Group 1 (QOL1)

Results in respect of type of dwelling show that at least three quarters of the households in group one (76.5%) live in formal dwellings. Sixty three percent of these households live in permanent brick houses occupying separate stands, while 4.7% live in a flat or apartment in a block of flats. Town houses provide accommodate 3.3% of the households, while 1.8% occupy a house or room in the backyard. Some 8% of the households live in informal dwellings, 6.1% of which live in informal dwellings on separate stands with the remaining 2% being in the backyard. Traditional dwellings provide accommodation to 1.9% of the households. A sizable 13.5% of the households live in some "other" unspecified dwellings as indicated in Table 5.9.

When it comes to geographical distribution, at least one in five households (22.7%) is found in Gauteng province while 15% are located in the Western Cape. Northwest and the Free State provinces account for 11.6% and 11.1% respectively, while Kwazulu Natal accounts for 12.6% of the households. Close ten percent of the households are found in Mpumalanga while Limpopo and Northern Cape account for 5.3% each.

(b) Analysis of residence for households in Group 4 (QOL4)

Housing conditions in group four are relatively poor in spite of the group ranking second on the QOL index. Just around half of the households have live in formal dwellings of which 43.9% live in a permanent brick house on a separate stand. Households which live in flats or town houses make up 2.1% while 1.7% live in a house in the backyard. Some 3.2% of the households occupy a room or flat let on a separate stand. Group four has the largest percentage of households which live in informal dwellings (28.3%), 4.6% of which are in the backyard. Traditional dwellings provide accommodation to 14.3% of the households.

Households in this group are fairly evenly distributed throughout all the provinces, with 14.8% being in Eastern Cape and 14.3% in Limpopo province. KwaZulu Natal has got 12.9% of the households while 12.3% are in Mpumalanga. Households in Free State and Gauteng make up 11.8% and 11% respectively. Around one in ten households (10.4%) is found in Northwest while Western Cape has 7.6% and Northern Cape has the least percentage of 4.9.

(c) Analysis of residence for households in Group 3 (QOL3)

Households in group three have the most access to formal dwellings among all seven QOL groups (92.9%). Households living in permanent brick houses on separate stands constitute 77.9% while 6.4% live in a flat in a block of flats. Town houses or simplexes accommodate 5.2% of the households. Households living in informal settlements constitute 3% of which 2.2% live in informal dwellings or shacks on separate stands. Just around 1% of the households in group three live in traditional houses.

When it comes to geographical distribution, 22.9% of the households are in Gauteng province while 22.5% are found in Western Cape. KwaZulu Natal accounts for 15.2% of the households while 8.8% are found in Eastern Cape. Households in Northwest and Mpumalanga make up 6.8% and 6.5% respectively while six percent are found in Northern Cape. The least proportion of households (3.5%) is found in Limpopo province.

(d) Analysis of residence for households in Group 7 (QOL7)

Households access to formal accommodation in group seven is better than the situation in group four despite its rank (i.e. fourth). At least six out of ten households in group seven (61.5%) live in formal dwellings. Households living in permanent brick houses on separate stands make up 53.4% while 2% live in town houses or simplexes. One percent of the households live in a flat in a block of flats while 3.6% live in a room on a separate stand. Some 1.4% of the households live in a house in a backyard. Informal dwellings or shacks provide shelter to 11.8% of the households, 9.6% of which are informal dwellings on a separate stand. A relatively large number of households (9.4 %) live in some "other" unspecified type of dwelling as indicated in Table 5.9.

In terms of geographical distribution, 16.7% of the households are in Mpumalanga while 16.1% are found in North West. Fifteen percent of the households are in Free State while Kwazulu Natal and Northern Cape account for 11.3% and 11.1% respectively. Limpopo province accounts for 9.2% of the households while Gauteng and Western Cape have almost the same percentages, 7.6% and 7.7% respectively. Eastern Cape has the least number of households constituting 5.5%.

(e) Analysis of residence for households in Group 6 (QOL6)

Most of the households in this group (83.9%) have access to formal accommodation. Close to 73% of the households live in permanent brick houses occupying separate stands while 3.9% live in a town house or duplex. Some 2.4% households live in a flat in a block of flats while 3.2% occupy a house in a backyard. A few households constituting 0.5% occupy a room on a separate stand. Households living in informal dwellings make up 10.1% with 8.2% of them being informal dwellings on separate stands.

When it comes to distribution by province, households in this group are fairly geographically distributed with 14.5% of them located in Gauteng while 12.3% being in KwaZulu Natal. Western Cape has got 12.2% of the households while 12.1% are in Northern Cape. Mpumalanga and Free State have around 11% each wile North West accounts for 11.5% of the households. Eastern Cape has got 8.6% and Limpopo has the smallest percentage of 6.8%.

(f) Analysis of residence for households in Group 5 (QOL5)

Group five ranks number six out of seven QOL groups. Access to formal dwellings is relatively low (59.1%) even though it is higher than in group four which ranks second on the QOL index. Fifty four percent of the households live in permanent brick houses occupying a separate stand while 1.1% live in flats or town houses. Two percent of the households occupy a house in the backyard while 2.1% live in a room on a separate stand. Informal dwellings provide shelter to 14.7% of the households, twelve percent of which live in informal dwellings on a separate stand.

At least a quarter of the households in group five (26.3%) are found in the Eastern Cape while 22.6% are in Limpopo province. KwaZulu Natal has got 15.9% of the households while 11% are found in North West. Free State and Mpumalanga account for 7.8% and 7.6% respectively while 4.2% are in Gauteng. Western Cape and Northern cape have got around 2% each (see Table 5.9).

(g) Analysis of residence for households in Group 2 (QOL2)

Group two ranks seventh on the QOL index and, decent accommodation is a bit of a problem to several households in this group. Much as 52.2% of the households live in formal dwellings, a figure that is higher than 50.9% recorded in group four, 38.1% of the households live in traditional dwellings. Informal dwellings provide shelter to 8.3% of the households, 6.5% of which occupy are on a separate stand. For households living in formal dwellings, 48.4% occupy permanent brick houses on separate stands while 0.8%

live in a flat or town house. Some 1.6% households live in a house in the backyard and 1.4% live in a room or flat let.

As far as spatial distribution is concerned, over a quarter of the households in group two (26%) are found in Limpopo while 23.5% are in the Eastern Cape. KwaZulu Natal has got 19.3% while 11.4% are found in Mpumalanga. Close to one in ten households (10.2%) is located in Northwest province while 3.8% are in the Free State. Gauteng and Western Cape have less than 2% each, while Northern Cape accounts for 2.4% of the households.

5.4.3 Analysis of Fuel used by households

This section deals with the type of fuel used by households in respect of cooking and lighting in the various QOL groups. In some cases the description includes details pertaining to other fuel types. The focus however, is on fuel types that are considered as key indicators in this respect as indicated in Table 5.10 below. In general, results indicate that electricity is used more for lighting than for cooking purposes.

Table 5.10: Fuel used by households for cooking and lighting

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	1	4	3	7	6	5	2
Fuel for cooking							
Electricity	90	2.5	95	39	74	7.2	0.8
Paraffin	4.1	54	1.5	21	14	40	23
Wood	0.2	33.3	0.1	32	1.2	43	68
Fuel for lighting							
Electricity	97.5	25.8	99.0	58.3	95.7	28.9	21.5
Paraffin	1.1	25.2	0.4	11.2	2.1	26.5	26.4
Candles	1.0	48.2	0.5	30.0	1.8	44.2	51.7

(a) Fuel used by households in Group 1 (QOL1)

There is a heavy reliance on electricity as energy for household use in group one. Nine out of ten households use electricity for cooking while 4.1% use paraffin. Some 3.7% households use gas while a few households (0.2%) use wood as fuel for cooking; the same percentage (0.2%) uses solar energy for cooking.

As far as energy used for lighting is concerned, 97.5% of the households use electricity for lighting while 1.1% use paraffin. One percent of the households use candles and 0.3% of the households use gas.

(b) Fuel used by households in Group 4 (QOL4)

Access to quality fuel for household use is a problem to most households in group four. For instance only 2.5% of the households use electricity to cook while a third of the households use wood. More than half of the households (54%) use paraffin as fuel for cooking while 6% rely on coal and 2.7% use Gas. The situation is relatively better off when it comes to fuel used to light the dwellings. At least a quarter of the households (25.8%) use electricity for lighting purposes and 25.2% use paraffin. Close to half of the households (48.2%) use candles as fuel for lighting.

(c) Fuel used by households in Group 3 (QOL3)

Use of electricity as energy for cooking is higher in group three than in groups one and four. Ninety five percent of the households in group three use electricity to cook while 1.5% use paraffin. Some 2.3% of the households use Gas to cook while 0.1% use wood and, close to 1% use coal.

A similar situation prevails when it comes to fuel used for lighting. All but 1% of the households use electricity for lighting, with small percentages using candles and paraffin, 0.5% and 0.4% respectively. Quite a few households constituting 0.1% use gas to light up the dwellings.

(d) Fuel used by households in Group 7 (QOL7)

Group seven ranks fourth on the QOL index but it is better than group four (ranked second) in terms of access to quality energy for household use. For instance 39% of the households use electricity to cook a figure that is far higher than 2.5% recorded in group four. Households which use paraffin make up 21% while thirty two percent of the households cook with wood. Households which rely on coal as fuel for cooking make up 5.4% while 1.3% of the households use animal dung.

When it comes to energy used for lighting, the situation is relatively better off, with close to sixty percent of the households (58.3%) using electricity. Still a sizable percentage (30%) rely on candles to light the dwellings and 11.2% use paraffin. Gas and solar energy are used by a few households constituting, 0.3% and 0.13% respectively.

(e) Fuel used by households in Group 6 (QOL6)

Access to electricity is better in group six than in group seven despite the former being ranked lower. For instance 74% of the households use electricity to cook while 14% use paraffin. Seven percent of the households use coal while 4% rely on Gas as energy for cooking. Households which cook with wood constitute 1.2%.

When it comes to energy used to light dwellings, 96% of the households use electricity while 2% use paraffin. Candles provide light in 1.2% of the dwellings and, a small portion of the households (0.4%) use gas to light the dwellings.

(f) Fuel used by households in Group 5 (QOL5)

The situation in group 5 differs substantially from the situation in group six which it follows in terms of ranking. Comparatively few households in group five (7.2%) cook with electricity as compared with 74% in group six. Forty percent of the households in group five use paraffin to cook while 43% rely on wood as energy for cooking. Some 6.3% of the households use coal to cook while 2.7% use gas.

The situation is not so different when it comes to fuel used for lighting. Close to twenty nine percent (i.e. 28.9%) of the households use electricity for lighting purposes while the majority (44.2%) use candles. Over a quarter of the households (26.5%) use paraffin as fuel for lighting in the dwellings.

(g) Fuel used by households in Group 2 (QOL2)

Households in group two have poor access to quality fuel with over two thirds (68%) relying on wood for cooking. Twenty three percent of the households use paraffin while 5.5% use coal to cook. Around 1% of the households use animal dung while 0.9% cook with gas. Electricity is used by only 0.8% of the households. When it comes to energy for lighting, 51.7% of the households use candles while 26.4% use paraffin. Households which use electricity to light up the dwellings make up 21.5%.

5.4.4 Analysis of sanitation

This section will describe the findings in respect of sanitation services accessed by households in the seven QOL groups. As indicated in the previous chapter (i.e. findings for OHS 1999), sanitation has been operationalised in terms of "type of toilet facility" a household accesses and, "rubbish removal services". Table 5.11 provides information regarding access to sanitation services by households in the seven QOL groups. Once again in some instances, the description of findings provides details that go beyond the information provided in Table 5.11 depending on the magnitude of the response in a particular instance.

Table 5.11: Access to sanitation by households

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	1	4	3	7	6	5	2
Sanitation							
Flush toilet	83.6	14.7	91.2	34.2	64.2	9.7	2.6
VIP/ Ordinary Pit latrine	13.4	51.6	6.5	40.3	23.6	61.0	58.5
Bucket	2.5	9.5	1.7	6.2	10.0	6.5	3.9
No access to toilet	0.6	22.7	0.2	18.8	1.3	22.0	34.0
Refuse disposal							
Removed at least once a week	73.2	22.3	88.2	29.9	71.2	15.5	5.2
Own rubbish dump	13.3	50.7	5.9	47.8	17.8	62.5	71.4
No rubbish removal services	5.1	19.7	2.3	14.4	6.3	18.7	21.3

(a) Sanitation for households in Group 1 (QOL1)

Most of the households in group one (83.6%) have access to a flush toilet; 47.3% have a flush toilet in the dwelling while 34.8% have it on site but not in the dwelling. Some 1.3% of the households access a flush toilet off site while 13.4% use a pit latrine. Households which make use of a bucket toilet constitute 2.5%. Six households (0.2%) make use of a chemical toilet while eighteen households (0.6%) have no access a toilet.

When it comes to rubbish removal, 73.2% of the households have their refuse removed at least once a week, while 4.4% of the households have their refuse removed less often than once a week. Households which make use of their own rubbish dumps constitute 13.3% while 4% make use of communal rubbish dumps. Households with no access to refuse removal services make up 5.1%.

(b) Sanitation for households in Group 4 (QOL4)

Unlike group one, sanitation is a problem to many households in group four (QOL 4). For instance just close to 15% of the households in group four have access to a flush toilet; 2.8% have a flush toilet in the dwelling while 10.1% have a flush toilet on site but not in the dwelling.

Some 1.8% of the households make use of a flush toilet from the neighbourhood. More than half of the households (51.6%) use pit latrines 12.6% of which are ventilated improved pit latrines (VIP) and, on site. Four percent of the households rely on VIP's in the neighbourhood while 35% use ordinary pit latrines on site. SOME 8.5% households use a bucket toilet and, at least one in five households in group four (22.7%) has no toilet.

When it comes to refuse disposal, from 22.3% of the households have their refuse removed at least once a week while the majority (50.7%) use their own rubbish pits. Close to twenty percent of the households (19.7%) have no access to rubbish removal services and, 5.7% rely on communal rubbish dumps.

(c) Sanitation for households in Group 3 (QOL3)

Access to sanitation is better in group three – ranked third on the QOL index - as compared with the situation in groups one and four. The majority of households (91.2%) have access to a flush toilet; 77% of the households have a flush toilet in the dwelling while 13.6% have it in the yard. Twenty nine households (0.6%) access a flush toilet at the neighbourhood. Households using pit latrines make up 6.5% of which 3% are VIP's. Eighty two households (1.7%) make use of a bucket toilet while eleven households (0.2%) have no access to a toilet.

When it comes to refuse removal, 88.2% of the households have their refuse removed by local authorities at least once a week while 2% have their refuse removed less often than once a week. Close to 6% of the households have their own rubbish pits while 1.6% rely on communal rubbish dumps. Households with no refuse disposal services constitute 2.3%.

(d) Sanitation for households in Group 7 (QOL7)

The sanitation situation in group seven is generally in line with the ranking of the group (fourth) particularly in respect of households without a toilets (with the exception of group four). For instance 34.2% of the households in group seven use a flush toilet; 12.2% of the 34.2% have a flush toilet in the dwelling and 19.8% have it on site.

Close to four out of ten households (40.3%) use pit latrines; 10.7% of the households use VIP's while the rest use ordinary pit latrines. Some 5.6% of the households use a bucket toilet and, 18.8% of the households have no access to a toilet.

With regard to refuse disposal, 29.9% of the households have their refuse collected by local authorities once a week while 2.5% have theirs removed less often than once a week. The majority of households (47.8%) use their own refuse dumps while 5.5% of the households have their refuse removed by community members once a week. Households with no access to refuse removal services constitute 14.4%.

(e) Sanitation for households in Group 6 (QOL6)

The sanitation situation in group six is better than the situation in groups four and seven which are ranked second and fourth respectively. The majority of households (64.2%) have access to a flush toilet; 29.1% have a flush toilet in the dwelling while 32.8% have it on site but not in the dwelling. Some 2.3% households make use of a flush toilet in the neighbourhood. Close to 24% of the households use pit latrines, 9.1% of which VIP's while 14.5% are ordinary pit latrines. One in ten households uses a bucket toilet while 1.3% have no access to a toilet.

Regarding refuse disposal, 71.2% of the households have their refuse collected by local authorities at least once a week while 3.2% have theirs removed less often than once a week. Households which use their own rubbish pits to get rid of household refuse make up 17.8% while 1.5% use communal rubbish dumps. Households which have no access to rubbish removal services constitute 6.3%.

(f) Sanitation for households in Group 5 (QOL5)

Group five ranks sixth on the QOL index and the group's sanitation situation seems to reflect that situation. For instance just close to ten percent of the households (i.e. 9.7%) have access to a flush toilet. Households with a flush toilet in the dwelling make up 2.3% while 5.9% of the households have it on site but not in the dwelling. Some 1.5% households make use of a flush toilet from the neighbourhood.

Sixty one percent of the households use pit latrines, 41% of which are ordinary pit latrines. Twenty two percent of the households have no access to a toilet.

Regarding refuse disposal, the majority of households in this group (i.e. 62.5%) get rid of their refuse through the use of their own refuse dumps while 2.1% rely on a communal refuse dump. Households whose refuse is collected by local authorities on a weekly basis make up 15.5% while 1% have their refuse collected less often than once a week. A sizable 18.7% of the households have no access to refuse removal services.

(g) Sanitation for households in Group 2 (QOL2)

Group two ranks seventh on the QOL index and, the sanitation situation fits the rank. For instance households with a flush toilet, either in the dwelling or in the yard make up just 2.6%. The majority of households (58.5%) use pit latrines while 4% use a bucket toilet. At least a third of the households (34%) have no access to a toilet.

The situation is similar with regard to refuse disposal whereby 21.3% of the households have no such services. The majority of households (71.4%) make use of their own rubbish pits and, only 5.2% of the households have their refuse removed at least once a week by local authorities.

5.4.5 Analysis of households' water source

Section 5.4.5 describes the sources of water that households in the various QOL groups have access to. In the description of water sources, details are provided including water sources like bore holes, dams and rivers which are deemed to provide water that is unsafe for human consumption. The focus though, will be on household access to piped water and the hassles which households face to access clean water where such water is not readily available. Table 5.12 provides information in respect of access to piped water by the seven QOL groups and the distance that households travel to fetch water.

Table 5.12: Access to clean water and distance from water source

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	1	4	3	7	6	5	2
Water							
Piped in dwelling	54.8	4.8	81.6	18.7	40	3.3	1.6
Piped on site	36.1	30.2	14.5	42.8	46.2	20.7	16.7
Public tap	7.1	38.4	2.9	22.5	10.7	35.7	34.7
Distance from water source (where fetching is applicable)							
Within 100 metres	4.3	20.8	2.1	15.5	6.5	17.3	15.8
101 – 200 metres	2.6	16.9	0.8	10.1	3.6	18.0	19.1
201 – 500 metres	1.1	10.7	0.3	5.2	1.7	14.8	16.8
501 metres – 1 Kilometre	0.6	9.2	0.1	4.2	0.8	14.2	16.1
More than 1 Kilometre	-	4.9	-	1.2	0.2	9.4	11.4

(a) Source of water for households in Group 1 (QOL1)

Access to clean water is not a problem to most households in group one where 54.8% of the households have piped water in the dwelling and 36.1% have it in the yard. This implies that nine out of ten households in group one do not have a problem of fetching water. Households which rely on public tap water make up 7.1% while 1.3% get water from bore holes. A small percentage of 0.4% households obtain water from dams or streams, while 0.2% of the households rely on the water carrier for their water needs.

Given the situation above, fetching water is a task to just around 10% of the households in group one. Of these households, 4.3% fetch water within a distance of a hundred metres while 2.6% travel between a hundred and two hundred metres to fetch water. Around one percent of the households travel between two hundred metres and half a kilometer to get water while 0.6% of the households travel between half a kilometer and a kilometer to fetch water.

(b) Source of water for households in Group 4 (QOL4)

Access to piped water for households in group four is not as good as it is in group one even though it could be judged as good enough. Close to three quarters of the households in group four (73.4%) have access to clean piped water but quite a few of them (4.8%) have water in the dwelling. Three out of ten households have piped water in the yard and 38.4% rely on water from a public tap. Four percent of the households obtain water from a water tanker or carrier while 5.3% get water from a borehole. Households which rely on streams or rivers for their water needs constitute 5.3% while 3.4% obtain water from springs. Some three percent of the households rely on stagnant water from dams and 26 households (1.6%) obtain water from wells.

Thus apart from the 35% of the households which have water on the premises, 20.8% of the households fetch water within a hundred meter radius while 16.9% travel between 100 and 200 meters to fetch water. Close to eleven percent of the households travel between 200 meters and half a kilometer to fetch water while 9.2% travel between half a kilometer and a kilometer to fetch water. Some 5% of the households in this group travel over a kilometer to get water.

(c) Source of water for households in Group 3 (QOL3)

The situation regarding access to clean water in group three is better than the situation in groups one and four. The majority of households in group three (96.1%) have water on the premises. Of the 96.1% households which have water on site, 81.6% have piped water in the dwelling while 14.5% have it in the yard. Close to three percent of the households rely on water from a public tap while 21 households (0.4%) have their own boreholes.

The above findings indicate that fetching water is a task to just around four percent of the households in group three. Of the four percent, 2.1% or 104 households fetch water within a distance of a hundred meters while the rest travel farther than that to get water (see Table 5.12).

(d) Source of water for households in Group 7 (QOL7)

The situation regarding access to clean water in group seven is slightly better than that in group four despite the former being ranked fourth and the latter, second. The majority of households in group seven (84%) have access to clean piped water. Differences appear in terms of source; group seven has a bigger percentage of households with piped water in the dwelling (18.7%) than the 4.8% recorded in group four. However, group seven has proportionately more households which have water in the yard but not in the dwelling 42.8%) than 30.2% in group four. As for households which rely on public tap water, group four is worse off with 384.% of the households in this category compared with 22.5% in group seven (see Table 5.12). Some 2.3% of the households in group seven rely on water delivered by water tankers or carriers while boreholes provide water to 4.4% of the households; 1.7% of the households have a bore hole in the yard. The remaining 5.3% obtain water from rivers, streams and dams.

The above findings imply that apart from the 61.5% of the households which have water on site, the rest have to fetch water. Of the households which have to fetch water, 15.5% get water within a hundred meters while one in ten households travels between a hundred and two hundred meters to fetch water. The rest travel over two hundred metres to get water as indicated in Table 5.12.

(e) Source of water for households in Group 6 (QOL6)

Access to clean water is not a big problem to most households in group six (QOL 6). In fact group six beats both groups four and seven even though group six is ranked lower than groups four and seven. The majority of households in group six (96.9%) have access to clean piped water; 40% of them have piped water in the dwelling and 46.2% have piped water in the yard. Close to eleven percent of the households (10.7%) obtain water from a public water tap and, 1.5% get water from a borehole. Eleven households (0.6%) rely on water a carrier with the remaining households rely on other water sources like a well, spring and stream water.

From the information above, fetching water is a task to around 13% of the households, of which 6.5% travel at most a hundred meters to fetch water and 3.6% travel between 100 meters and 200 meters for the same reason (See Table 5.12 for details).

(f) Source of water for households in Group 5 (QOL5)

Group five ranks sixth on the QOL index and, access to safe drinking water is a problem to most households in this group. Just over half of the households (54.7%) have access to clean piped water of which, 3.3% have it in the dwelling. Just over a fifth of the households (20.7%) have piped water in the yard and 35.7% rely on water from the public tap. Some 2.2% households rely on a water tanker for their water needs while boreholes provide water to 9.3% of the households. Rivers or streams provide water to 11.3% of the households while 8.7% rely on water from springs. Households which rely on wells and dams make up 2.2% and 2.8% respectively.

From the above statistics, it is clear that fetching water is a task to some 76% of the households in group five, with 17% of them having to travel up to 100 meters to fetch water. Households which travel between 100 and 200 meters constitute 18% while 14.8% travel between 200 meters and half a kilometer to get water. Some 14% of the households travel between half a kilometer and one kilometer and 9.4% of the households travel more than a kilometer to fetch water.

(g) Source of water for households in Group 2 (QOL2)

Group two ranks seventh on the QOL index and, access to clean water is a problem to many households in this group two. Just over half of the households (53%) having access to piped water and, only 1.6% of them have piped water in the dwelling. Households with piped water in the yard constitute 16.7% while around a third of the households (34.7%) rely on water from public taps. One in ten households gets water from springs while 15.4% rely on untreated water from streams. Boreholes provide water to 9.3% of the households and 2.5% of the households fetch water from a well. Five percent of the households rely on water from stagnant sources like dams.

It is clear from the above figures that fetching water is a common task to most households in QOL2. Besides the 18% or so households which have water on site, 15.8% of the households fetch water from within a hundred metre radius while 19.1% travel between a hundred and two hundred meters to get water. Close to 17% of the households travel between 200 meters and half a kilometer to fetch water while 16.1% households travel between half a kilometer and a kilometer. A sizable 11.4% of the households travel at least one kilometer to fetch water (see Table 5.12).

5.4.6 Analysis of durables

Section 5.4.6 describes the distribution of possession of durable items among households in the various QOL groups. A few indicators have been selected for use in this regard depending on the available information. These indicators include household possession of a vehicle, possession of a cellular phone and, existence of a landline telephone in the dwelling (see Table 5.13 below). In addition to “possession of a telephone” in the dwelling, “time taken to get to the nearest telephone” has been included in the analysis due to the fact a household without a telephone in the dwelling will have to seek for one when the need to make a telephone call arises.

It should be highlighted that household durable items like radio and television and vehicle have not been included in the analysis due to unavailability of data. As for possession of a vehicle, the study has used “transport used by a household to get to work” as a proxy indicator for possession of a vehicle; the assumption being that households possessing a vehicle are likely to use it while getting to work as opposed to using public transport, unless they work from home.

Table 5.13: Possession of durable items (OHS 1998)

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	1	4	3	7	6	5	2
Durables							
Car	-	-	43	-	4.8	3.6	1.7
Household with a cellular phone	10.4	1.4	27.8	1.4	3.6	1.9	0.9
Landline telephone in dwelling	32.0	2.1	64.7	6.4	27.8	3.2	1.2
Travel time to nearest telephone							
Within 5 minutes	29.7	17.9	13.4	26.1	22.4	10.6	6.9
6 – 15 minutes	25.7	30.4	13.0	28.1	31.1	23.8	20.6
More than 15 minutes	11.9	49.6	6.2	39.3	18.1	62.3	71.2

(a) Possession of durable items by households in Group 1 (QOL1)

As indicated in the previous paragraph, indicators in respect of durable household items were not adequately captured in OHS 1998. Among those omitted are possession of a radio, television, and a car. Findings in respect of possession of a telephone reveal that 32% of the households in QOL1 possess a land line telephone in the dwelling while 10.4% possess a cellular phone. These statistics indicate that making a phone call involves some traveling to as many as 67.2% of the households: 32.8% of the households indicated that they have either a land line or cellular phone in the dwelling.

As for households without a telephone in the dwelling, 29.7% of them get hold of a telephone within a five minutes traveling distance while 25.7% spend six to fifteen minutes in travel time to make a phone call. Close to 12% of the households spend more than a quarter of an hour to get to the nearest telephone; twenty six households (i.e. 0.9%) travel for at least an hour to get hold of a telephone.

As indicated earlier on, household possession of a car was not included as a variable in the dataset. In this study, “transport used to get to work” was used as a proxy indicator for possession of a car; the likelihood being that households possessing a car are likely to use it while getting to work as opposed to using public transport, unless they work

from home. Findings in respect of transport used when getting to work show that none of the households in group one uses its own car to get to work. The likelihood is a low possession of cars as durable items by households in group one. At least half of the households heads (51.3%) use public transport; 20.1% use a bus while 31.2% use a minibus taxi. Some 32.9% walk to the work place.

(b) Possession of durable items by households in Group 4 (QOL4)

Access to telephones among households in group four is quite lower than the situation in group one. For instance 1.4% of the households possess a cellular phone in the dwelling while possession of landline telephones stands at 2.1%. This implies that traveling in order to make a phone call is not uncommon for most households in group four.

Close to 18% of the households get hold of a telephone within five minutes of travel time while 30.4% spend six to fifteen minutes while traveling to a telephone facility. Almost half of the households (49.6%) spend more than a quarter of an hour in travel time to get hold of a telephone; 14% of the households spend at least an hour for this purpose.

When it comes to transport used by households to get to work, the situation is similar to the one in group one; no household in this group reported to get to work by its own car. Information pertaining to type of transport used to get to work indicates that 49.5% of the households get to work on foot while 23.1% use minibus taxis. Households which rely on buses to get to work constitute 13.2%. Whichever one looks at it, the indication is that cars are a rarely possessed items among households in this particular group.

(c) Possession of durable items by households in Group 3 (QOL3)

Possession of selected durable items is higher in group three (QOL 3) than in groups one and four. In fact group three has the highest access to telephones among the seven groups. Close to 65% of the households have a land line telephones in the dwelling while 27.8% indicated that they possess a cellular phone. For the 35% or so of the households without a cellular phone or landline telephone, 13.4% get hold of a telephone within a five minute traveling distance.

Thirteen percent of the households spend six to fifteen minutes while traveling to a telephone facility while 6.2% spend at least a quarter of an hour in travel time to get hold of a telephone (see Table 5.13 for more details).

As for type of transport used by households to get to work, 43% of the households indicated that they use their own cars to get to work. Households which indicated that they work at home and, therefore do not need transport make up 5.4%. Almost half of the household heads indicated that they were not working, therefore the question was not applicable to their situation. The figure of 43% indicates that several households in group three possess a car even though an equally high percentage of household heads (49.9%) are without employment.

(d) Possession of durable items by households in Group 7 (QOL7)

Group seven is slightly better than group four (but not groups one and three), when it comes to possession of telephones. Households with a landline telephone in group seven constitute 6.4% while possession of a cellular phone stands at 1.4%. As a matter of fact some of the households with a land line telephone do also possess cellular phones. Thus it is safe to say that as many as 93.6% of the households have to travel some distance in order to make a phone call.

Among the 93.6% households without a telephone, at least a quarter (26.1%) require five minutes in travel time to get hold of a telephone while 28.1% spend six to fifteen minutes to get to a telephone facility. Households which spend more than fifteen minutes while traveling to a telephone constitute 39.3%; a sizable 156 households (10.2%) spend at least one hour in travel time to make a phone call.

When it comes to the type of transport used to get to work, none of the households indicated using their own car to get to work. Close to two thirds (64.7%) walk to the workplace while 10.9% use minibus taxis. Household heads who use buses to get to work make up 11.9%. These findings indicate that most households are not likely to be in possession of car.

(e) Possession of durable items by households in Group 6 (QOL6)

Possession of selected durable items is better among households in group six than in group seven, despite the former being ranked higher. For instance 27.8% of the households in group six have a landline telephone in the dwelling while possession of cellular phones stands at 3.6%. This implies that communication by telephone is a problem to many households, with 22.4% having to travel for some five minutes to get hold of one. Thirty one percent of the households spend six minutes to a quarter of an hour to get to a telephone facility while 18.1% spend more than a quarter of an hour in travel time to get to a telephone facility; 1.4% of the households travel for at least an hour to get to a telephone facility.

With regard to transport used to get to work, 4.8% of the households in group six indicated that they use their own cars to get to work. Close to ninety percent of the household heads (89.1%) indicated that they were not working, so this question was not applicable while 4.9% indicated that they work from home. Three households (0.2%) use minibus taxis to get to work. From this information, all indications are that possession of a car is rare among households in group six.

(f) Possession of durable items by households in Group 5 (QOL5)

Possession of selected durable items is generally low in group five as indicated in Table 5.13. For instance just around two percent of the households have a cellular phone while possession of a landline telephone stands at 3.2%. From this information, it is clear that communication by telephone is a problem to as many as 95% of the households. For households with no access to a telephone in the dwelling, 10.6% of them spend five minutes in travel time to make a telephone call while 23.8% spend six minutes to a quarter of an hour to access a telephone. The majority of the households (62.3%) spend more than a quarter on an hour while traveling to a telephone facility: 21.6% of the households spend at least an hour for this particular reason.

As for transport used when getting to work, 103 households (i.e. 3.6%) indicated that they use their own cars to get to work.

Ninety two percent of the household heads are unemployed and, therefore this particular aspect is not applicable to them while 3.8% work from. For all intents and purposes possession of a car is low among households in group five.

(g) Possession of durable items by households in Group 2 (QOL2)

Group two is ranked seventh on the QOL index and, the situation regarding possession of durable items reflects that situation. Quite a few households have access to either a cellular phone or landline telephone in the dwelling. As for cellular phones, just around 1% of the households possess a cellular phone while households with a landline telephone in the dwelling constitute 1.2%. For the remaining ninety eight percent or so of the households, access to a telephone involves some traveling with 6.9% of the households getting hold of a telephone within five minutes. Around a fifth of the households spend six to fifteen minutes while traveling to a telephone facility and, 71.2% of the households spend more than a quarter of an hour while traveling to a telephone facility: 158 households (6.6%) spend over two hours while traveling to a telephone facility.

When it comes to the type of transport used by households to get to work, 41 households (i.e. 1.7%) indicated that they use their own cars for this purpose. Unemployment among household heads stands at 95.5% as such, this issue is not applicable to them. Fifty one household heads (2.1%) work from home. This information indicates that possession of a car among households in this group is low.

5.4.7 **Subjective evaluation of Quality Of Life**

Subjective well-being measures assess people's reactions to the objective conditions they experience. Objective conditions serve as inputs for individuals and cultures to produce what is perceived by people as desirable or undesirable (Diener & Suh, 1997: 207). In the context of the current study, data pertaining to household life satisfaction was collected in the OHS 1998. Households were asked to indicate how satisfied they felt, all things put together. Table 5.14 provides the results pertaining to households' subjective evaluation of quality of life in the seven QOL groups.

Table 5.14: Subjective evaluation of quality of life

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	1	4	3	7	6	5	2
Perception							
Very satisfied with life	18.3	12.8	20.9	13.5	15.9	13.9	10.9
Satisfied with life	51.6	37.2	52.0	45.0	45.1	37.6	39.9
Satisfied and Very satisfied (combined)	**69.9**	**50**	**72.9**	**58.5**	**61**	**51.5**	**50.8**
Neither/Nor dissatisfied	**15.5**	**22.3**	**14.1**	**21.0**	**20.0**	**20.0**	**22.4**
Dissatisfied	12.1	21.9	10.1	15.7	14.6	23.3	21.7
Very dissatisfied with life	2.5	5.8	2.9	4.8	4.4	5.1	5.2
Dissatisfied and Very dissatisfied (combined)	**14.6**	**27.7**	**13**	**20.5**	**19**	**28.4**	**26.9**
Total for bold face rows	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Results in respect of subjective evaluation of quality of life show a tendency for households being satisfied with life, in groups where material conditions are better off than in groups where living conditions are generally poor. This is particularly the case with groups one and three in Table 5.14. When results in Table 5.14 are compared with the findings relating to the ranking of the quality of life groups, one finds that groups one, four and three are ranked in that order, as the three groups with better QOL, based on the selected QOL indicators. In group 1- ranked number one on the index – 69.9% of the households reported that they are satisfied with life; 18.3% being very satisfied for that matter. Group three ranks third on the index but when it comes to subjective quality of life evaluation, it has the biggest percentage of households (i.e.72.9%) that are satisfied with life; 20.9% being very satisfied with life. Apart from these two particular groups (i.e. one and three), no clear pattern comes out to reflect differences in subjective life satisfaction among the QOL groups which experience different material conditions.

Even group two which ranks seventh on the QOL index, 50.8% of the households therein reported to be satisfied with life; 10.9% of these households reported to be very satisfied with life.

Among the dissatisfied category, the same two groups (QO 1 and QOL 3) come out clearly as the groups with the smallest percentage of households which are not satisfied with life. In group one which ranks first on the QOL index, 14.6% of the households reported being dissatisfied with life, 2.5% of the them being very dissatisfied. Group three ranks third on QOL index; 13% of the households herein reported that they are not satisfied with life. Groups two, four and five have the biggest percentages of households that are dissatisfied with life - 26.9%, 27.7% and 28.4% respectively. In general it suffices to say that there are proportionately more households which are satisfied with life in all QOL groups than households that are dissatisfied with life.

The third category is that of households which reported indifference in life satisfaction. The pattern in this category, in a way, follows the patterns portrayed in the previous two categories described above. Groups one and three have the lowest percentages of households which reported their lives to have stayed the same – neither satisfied nor dissatisfied. For group one, 15.5% of the households reported that they were neither satisfied nor dissatisfied with life while 14.1% of the households in group three felt that way. For the rest of the groups, proportions vary slightly between 20% and 22.4% (see Table 5.15).

5.5 **Summary**

This chapter has presented the findings emanating from the analysis of the data for OHS 1998. Cluster analysis resulted in seven QOL groups of which group one experiences the best measurable conditions (i.e. QOL conditions) and group two experiences the poorest quality of life. Discriminant function analysis yielded results indicating two major discriminating indicators between the quality of life groups. One such indicator pertains to transport used by household heads to get to the work place. A critical analysis of this indicator shows that the real issue surrounding this finding is the

employment status of household heads; employed household heads travel, by whichever means, to the work place while unemployed household heads stay at home. Thus the discriminating effect of this indicator stems from the employment status of household heads. The second indicator is “highest level of education completed by a household head”. Households headed by people who have tertiary education belong to QOL groups which rank high on the QOL index; they experience better living conditions as opposed to households headed by people with low education. These two indicators have been identified as the key discriminant indicators which differentiate the quality of life conditions between the seven QOL groups. Chapter six will provide the results emanating from the analysis of the data for OHS 1997.

CHAPTER SIX: FINDINGS OF THE STUDY IN RESPECT OF OHS 1997

6.1 Introduction

The previous chapter presented the findings emanating from the analysis of the Data for OHS 1998. Chapter six will present the findings arising from the analysis of the data for OHS 1997. Like in the previous two chapters dealing with the study's findings, results of chapter six are divided into two broad categories. The first category deals with the findings in respect of discriminant function analysis. Discriminant function analysis in the context of this study, provides a description of the indicators which differentiate between groups of households experiencing different QOL conditions. Put in a different way, discriminant function analysis enables the study to identify the key indicator or indictors that are responsible for the existence of the different measurable living conditions observed among the QOL groups. Secondly the findings in respect of discriminant function analysis highlight the extent to which households are correctly classified into the QOL groups they belong to on the basis of the QOL indicators used in the study – a validity check. Finally as will be showed in due course, the results of discriminant function analysis provide a basis for ranking the QOL groups emanating from cluster analysis. The two models - cluster analysis and discriminant function analysis– have been applied in the study; the former to classify households into QOL groups, and the latter to validate the results as well as identifying the discriminating QOL indicators.

The second category of results deals with findings arising from cluster analysis. This category of results describes the characteristics of the various QOL groups, highlighting how the groups differ from one another in terms of the QOL indicators considered. Finally a description of the subjective assessment of QOL is provided in the attempt to find out whether there is a relationship – not statistical though - between the distribution of the QOL groups in the QOL index (i.e. the measurable living conditions) and households' subjective evaluation of quality of life.

6.2 Applying discriminant function analysis to the OHS (1997) data

As you may recall from chapter three dealing with the methodology as well as chapters four and five, discriminant function analysis was applied to identify the indicator or indictors that discriminate between quality of life groups. In analysing the data for OHS 1997 a total of fourteen indicators or multiple response variables were used in discriminant function analysis (see Table 6.3 and Appendix F). The same variables were used to classify households (i.e. cluster analysis, to be dealt with later on) into groups experiencing different QOL conditions; details regarding cluster analysis follow in Sections 6.3 and 6.4. Once again the reader is notified that this study has not succeeded in selecting the same indicators for all four datasets (OHS 1996-OHS1999). This is because in some cases, data was collected in such a way that the methodology applied in the study could not be meaningfully applied to such data. In some cases indicators were not consistently included in the four surveys, forcing the study to incorporate other indicators considered relevant within the context of the conceptual model in chapter three.

Just like in the explanations regarding discriminant analysis for OHS 1999 and OHS 1998, several quality of life indicators (i.e. multiple response variables) were used to classify households into groups which experience different QOL conditions; seven QOL groups emerged in this case. The multiple response variables - the fourteen QOL indicators - were used in cluster analysis to classify households. The same indicators were used in discriminant function analysis. In discriminant function analysis the seven QOL groups (i.e. QOL1 – QOL7) form the grouping variable. The grouping variable is used in discriminant function analysis, in conjunction with the multiple response variables to derive the discriminant functions. Since the number of indicators is bigger than the number of degrees of freedom for the seven groups (i.e. six), the maximum number of discriminant functions for this analysis is six. Like in OHS 1999 and OHS 1998, the seven QOL groups emanating from cluster analysis constitute the quality of life index.

Table 6.1 shows the output summarizing the Canonical Discriminant Functions - the Eigenvalue, percentage of variance, Cumulative percentage of variance accounted for by each function, and the Canonical Correlation for each discriminant function. The Eigenvalues associated with the discriminant functions indicate the relative proportion of between – group variability accounted for by each function. Results in this case indicate that 59.1% of the variation between the groups is accounted for by the first discriminant function and 25.7% of the variation is accounted for by the second discriminant function. The additional variance accounted for by functions three to six is also shown with a combined discriminating power of 15.2%. The first two discriminant functions account for close to 85% of the variation between quality of life conditions in the seven groups which is substantial. Accordingly the interpretation of discriminant function results will be limited to these two functions.

Table 6.1:Summary of canonical discriminant functions for OHS 1997

Function	Eigenvalue	Percentage of Variance	Cumulative percentage	Canonical Correlation
1	7.9553	59.1376	59.1376	0.9425
2	3.4626	25.7399	84.8775	0.8809
3	1.5583	11.5837	96.4612	0.7805
4	0.4089	3.0394	99.5006	0.5387
5	0.0633	0.4707	99.9714	0.2440
6	0.0039	0.0287	100	0.0620

NB. The first six canonical discriminant functions were used in the analysis.

The association between the QOL groups and the indicators is depicted by the canonical correlations for each function (Last column of Table 6.1). The first two discriminant functions indicate strong correlations (i.e. 0.94 and 0.88 respectively) between the QOL groups and the indicators. The third discriminant function shows a 0.78 correlation between the QOL groups and indicators which is also fairly high. Functions four to six reveal substantially reduced correlations between the QOL groups and the indicators. The interpretation of the strength of these correlations however, is enhanced by taking into consideration the Chi - square results in Table 6.2. The Chi – square results indicate that with all six functions tested together, the $\chi^2(78)$ of

144151.8 indicates a high relationship between the six QOL groups and the QOL indicators which serve as the predictors. With the first discriminant function removed, there is still a reliable relationship between the QOL groups and the indicators as indicated by χ^2 (60) of 81392.12, p = 0.000. The same goes for all the six functions as one function is systematically removed. All of the six functions indicate reliable relationships between the QOL groups and the indicators despite the systematic decline in the magnitude of the canonical correlations for the respective indicators.

Table 6.2: Wilks' lambda and chi – square results – OHS 1997

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 6	0.0065	144151.8	78	0.00
2 through 6	0.0583	81392.12	60	0.00
3 through 6	0.2599	38572.39	44	0.00
4 through 6	0.6650	11681.28	30	0.00
5 through 6	0.9368	1867.896	18	0.00
6	0.9962	110.11	8	3.62E-20

The associations indicated by Chi-square values are reliable but, it is important to note that they emanate from a relationship between seven QOL groups and fourteen indicators. Since there are numerous indicators in the analysis, there is a high likelihood of at least one indicator to discriminate between QOL groups for each discriminant function. As a resultant all of the six functions show reliable associations between the QOL groups and the indicators although each function has one or two outstanding indicators as revealed by the within correlations between discriminating variables and discriminant functions (Table 6.3). The outstanding indicators are marked with (*) and these are the focal points in discriminant function analysis.

6.2.1 Interpretation of discriminant function results

Results in table 6.3 indicate that *Type of dwelling occupied by the household* is the outstanding QOL indicator that correlates highly (0.697) with the first discriminant function. This indicates that the type of dwellings occupied by households in the various groups differ substantially, a feature to be described in detail in section 6.4.

As a synopsis, it suffices to indicate at this point that none of the households in groups three and six (i.e. QOL 3 and QOL 6) occupies a permanent brick house on a separate stand. Details pertaining to differences between QOL conditions among groups are provided in section 6.4.

Witt regard to the second discriminant function, *Highest class/standard completed* by a household head loads highly with this function, with an absolute correlation of 0.729. This indicator as will be shown in section 6.4, differentiates particularly QOL7 – with the best living conditions – from the rest of the groups. This group, accounting for 37.5**%** the of the sampled households has the highest percentage of households headed by people with tertiary education (close to 20%). The rest of the groups have less than 3% of household heads having tertiary education (Details are in Table 6.8).

Table 6.3: Pooled within correlations between discriminating variables and standardised canonical discriminant functions – OHS 1997

	Function					
	1	2	3	4	5	6
Type of dwelling occupied by h/hold	0.6974*	-0.6368	-0.3181	-0.0327	-0.0514	0.0343
Highest class/standard completed	0.4304	0.7287*	-0.5156	-0.0014	0.0876	0.0519
Does h/hold have to pay for water?	0.2211	0.1037	0.2545*	0.2154	0.1176	0.1656
H/hold's main water source	0.3501	0.1767	0.5986	-0.6522*	0.1921	0.1052
Is there a land line phone in h/hold?	0.2049	0.0861	0.1194	0.3647	0.6446*	0.0015
How h/hold refuse is disposed of	0.2810	0.2226	0.4296	0.3477	-0.4335*	0.3462
H/hold transport to health facility	0.0875	0.0798	0.0025	0.2593	0.4314*	0.3679
Facility the h/hold usually seeks medical help	0.1367	0.0993	0.0769	0.2611	0.3942*	0.3486
H/hold's main fuel for cooking	0.3826	0.2019	0.3999	0.4026	-0.0044	-0.5418*
H/hold's main fuel for heating	0.3826	0.2019	0.3999	0.4026	-0.0044	-0.5418*
Did person work for pay during past 7 days?	0.1008	0.1278	0.0685	0.0221	-0.08	0.4511*
H/hold's main fuel for lighting	0.2811	0.1124	0.3411	0.2214	-0.0508	-0.3531*
Does anyone in h/hold have a cellular phone?	0.0749	0.0505	0.0505	0.1388	0.1853	0.2784*
H/hold distance from health facility	0.0597	0.0414	0.1184	-0.0550	-0.1158	0.1403*

NB. Pooled within correlations between discriminating variables and standardized canonical discriminant functions. Variables ordered by absolute size of correlation within function.

*Largest absolute correlation between each variable and any discriminant function.

6.2.2 Prediction of group membership

The results above emanate from the application of discriminant function analysis to the grouping variable (QOL 1 – QOL 7) and the multiple response variables, also referred to as the QOL indicators. Table 6.4 provides results on the extent of fit between the cases predicted by the discriminant function model and the cases originally classified in cluster analysis. These results indicate that 96% of the cases classified by cluster analysis are correctly classified in the discriminant function analysis model. With the exception of QOL5, the fit between the classification results of the two models is above the overall result of 96%, with the best fit being in QOL7 where 97.4% of the original cases are correctly predicted under discriminant function analysis. The poorest fit between the two models is found in QOL 5 where 88.3% of the original cases are correctly classified by the discriminant function model. In this case 4.3% of the households which were classified as belonging to QOL5 are predicted as belonging to QOL1. Another 4.3% of the cases originally classified as belonging to QOL5 are predicted as belonging to QOL2.

The prediction of 8.6% cases as belonging to QOL1 and QOL2 is likely to have been caused by the fact that all three groups – QOL1, QOL2 and QOL5 - have large percentages of households headed by people with education levels below standard nine (see Table 6.8). In QOL5, virtually all household heads (99.9%) have their education level below standard nine.

Table 6.4: Classification results of original and predicted group membership for OHS 1997

	Predicted Group Membership								Total
	Cluster Number of Case	1	2	3	4	5	6	7	
Original Count	1	**4290**	51	40	1	2	1	46	4431
	2	57	**4162**	0	1	22	3	89	4334
	3	11	0	**1782**	30	5	12	0	1840
	4	0	3	17	**2107**	9	45	5	2186
	5	109	109	20	0	**2224**	58	0	2520
	6	0	3	41	25	24	**2497**	0	2590
	7	63	130	0	102	0	0	**10443**	10738
	Percentages								
	1	**96.8**	1.2	0.9	0.02	0.05	0.02	1.04	100
	2	1.3	**96.0**	0	0.02	0.51	0.07	2.1	100
	3	0.6	0	**96.9**	1.6	0.3	0.7	0	100
	4	0	0.1	0.8	**96.4**	0.41	2.1	0.2	100
	5	4.3	4.3	0.8	0	**88.3**	2.3	0	100
	6	0	0.1	1.6	1.0	0.9	**96.4**	0	100
	7	0.6	1.2	0	1.0	0	0	**97.4**	100

NB. 96.0% of original grouped cases correctly classified.

In the previous two chapters dealing with the study's findings, and indeed throughout the study, the quality of life clusters have been ranked as indicated in section 6.4 (dealing with cluster analysis results). The distribution of group centroids for the first discriminant function has been used in each case to rank the QOL clusters. In the case of OHS 1997, results of the discriminant functions, evaluated at the group means are shown in Table 6.5. The results of the ranking process are shown in Table 6.7 where they play a critical role in describing the results pertaining to cluster analysis and the QOL index as such.

Table 6.5: Unstandardised canonical discriminant functions at group centroids

	Discrimiminant Function number					
QOL/Cluster Number	1	2	3	4	5	6
1	0.1677	-2.9507	1.3401	-0.3771	-0.0997	-0.0704
2	0.6126	-0.8507	-2.0563	-0.8089	-0.1468	0.0518
3	-4.5875	0.1098	2.1480	-0.6408	0.4146	0.1420
4	-2.3711	3.5894	1.2044	-0.0655	-0.6528	0.0008
5	-4.2617	-2.0545	-1.0108	1.5530	-0.0858	0.0270
6	-3.8992	2.1752	-1.197	-0.3342	0.3414	-0.1201
7	2.8930	0.7689	0.1897	0.3214	0.1000	0.0063

NB. Unstandardised canonical discriminant functions are evaluated at group means

6.3 Formation of quality of life groups using cluster analysis

As indicted in the introduction, cluster analysis was applied on the OHS 1997 data to group households into QOL groups. In the application of cluster analysis to the OHS 1997 data, seven QOL groups emerged when households were classified on the basis of fourteen indicators. Table 6.6 shows the indicators involved in the analysis and the final cluster centres for the seven QOL groups that emerged. Details of the findings pertaining to the results of cluster analysis follow in Section 6.4 where aspects of the seven quality of life groups are described.

Table 6.6 Final cluster centers for OHS 1997

Variables in analysis	Cluster number						
	1	2	3	4	5	6	7
Did person work for pay during past 7 days?	2.2805	2.5187	2.3098	3.4790	1.5337	2.3073	3.5732
Type of dwelling occupied by h/hold	10.8626	10.9486	4.4473	4.0544	7.4163	4.6950	10.7088
Does anyone in h/hold have a cellular phone?	1.0289	1.0127	1.0185	1.0517	1.0028	1.0046	1.1477
H/hold's main fuel for cooking	5.6840	4.2958	4.1609	6.2150	3.2929	3.6193	7.8575
H/hold's main fuel for heating	5.6840	4.2958	4.1609	6.2150	3.2929	3.6193	7.8575
H/hold's main fuel for lighting	4.7362	3.4938	3.5696	4.7987	2.6683	2.8363	5.9460
Highest class/standard completed	2.0273	9.5803	1.6435	10.0631	1.9452	9.2614	11.7999
Does h/hold have to pay for water?	2.9616	1.9700	2.1870	3.1135	1.2984	1.4417	4.3571
Is there a land line phone in h/hold?	1.1451	1.0321	1.011957	1.0691	1.0052	1.0062	1.5407
H/hold distance from health facility	3.6084	3.3057	3.5120	3.8079	2.8587	3.1189	3.7704
H/hold transport to health facility	3.4593	3.6599	3.57120	3.7635	3.8587	3.8761	4.9600
Facility the h/hold usually seeks medical help	4.8310	4.7077	4.7147	5.1066	4.5956	4.7174	6.2713
How h/hold refuse is disposed of	5.0643	3.3159	4.0576	7.0009	2.5782	2.7085	7.4147
H/hold's main water source	10.8883	8.9003	10.3223	10.6981	4.3008	7.6552	11.7244

6.4 Comparing different aspects of the seven quality of life

Before comparing the quality of life conditions in the various QOL groups, there is a need to determine how the QOL groups differ from each other in terms of the conditions experienced. In other words, there is a need to assess the objective conditions in the quality of life groups, which brings in the issue of ranking. Like in chapters four and five, ranking the QOL groups has been based on findings of the discriminant function model.

Discriminant function analysis provides a distribution of groups of cases along particular dimensions or discriminant functions. As detailed in section 6.2, the first discriminant function (DF) accounts for most of the between - group variation. Clusters will have their centroids distributed along a particular DF on the basis of the indicator characteristics used in the analysis. A group of households with the best access to the selected QOL indicators will have its centroid located farthest on the positive side of the first dimension or discriminant function. Similarly a group of households with the poorest access to the selected QOL indicators will be have its centroid located farthest on the negative side of the first dimension. This enabled the study to rank the QOL groups whose results are provided in Table 6.7.

Findings in this respect indicate that group seven with its centroid located 2.89 units on the right side (i.e. the positive side) of the first DF is ranked number one. It has the best access to the QOL indicators considered in the study, hence judged to experience the best quality of life. It is followed by group two whose centroid is located 0.61 units on the positive side of the DF. By contrast group three with its centroid located - 4.59 units on the left side of the DF is ranked seventh on the QOL index. This group is judged to experience the poorest QOL as it has the least access to the indicators considered in the study.

Table 6.7: Distribution of QOL groups and their respective ranks based on group centroids

QOL Group number	1	2	3	4	5	6	7
Group centroids – First discriminant function	0.17	0.61	-4.59	-2.37	-4.26	-3.9	2.89
Rank of QOL Group	3	2	7	4	6	5	1

Having looked at how households experiencing similar QOL conditions were grouped, the study will embark on describing the characteristics of the QOL groups themselves. Table 6.8 provides a summary of the demographics for the seven QOL groups that emerged in cluster analysis. Details pertaining to these results are provided hereafter.

Table 6.8: Demographics, employment and income of the QOL groups (OHS 1997)

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	7	2	1	4	6	5	3
Population group							
Asian	5.4	0.02	0.1	0.5	-	-	0.05
Black	48	93.7	81	89	97.8	98.5	96.3
Coloured	20	6.0	17.4	7.7	2.1	1.5	3.6
White	26.4	0.2	0.5	2.4	0.1	-	0.05
Age of head of the household							
15 -19 years	0.4	3.1	0.1	1.1	2.4	0.12	0.1
20 - 29	10.6	17.4	2.9	18.2	17.5	2.6	3.4
30-49 years	52.7	48.1	28.0	60.1	51.6	27.2	36.3
50 - 69	29.7	25.4	45.4	18.3	23.1	47.5	41.6
70 years and older	6.5	6.0	23.6	2.3	5.6	22.5	18.5
Median age	44	41	59	38	40	60	55
Sex of head of the household							
Male	72	51	53	66.3	50	42	52.3
Female	28	49	47	33.7	50	58	47.7
Education Level							
Standard 9 and below	61.4	85.2	99.7	86.6	94.1	99.9	100
Standard ten (Matric)	19.2	8.9	0.2	13.4	5.9	0.04	-
Certificate or Diploma	13.0	2.8	0.1 (5)	2.3	1.9	0.04	-
Degree or post graduate Degree	6.2	0.4 (16)	0.05 (2)	1	0.1	-	-
Gross monthly **Household) Income**							
R0–R500	7.2	16.2	16.9	20.9	16.7	9.1	19.3
R501– R2500	15	13.8	9.6	23.7	10.2	3.4	9.3
R2501-6000	10.5	2.3	0.8 (37)	2.9	1.5 (38)	0.4 (9)	0.5 (10)
R6001-R 16000	2.6	0.3 (11)	0.1 (6)	0.1 (2)	0.3 (7)	0.04 (1)	0.1 (2)
R16001-R30000	0.17 (18)	0.02 (1)	0.07 (3)	0.05 (1)	-	-	-
R30001 +	0.4 (41)	-	0.02 (1)	0.05 (1)	-	-	-
Response rate	34	33.9	28.4	49.1	29.9	13.9	30.7
Median income (Rands)	1803.91	495.00	400.30	760.83	431.38	339.50	375.27

Table 6.8:: Demographics, employment and income of the QOL groups (OHS 1997)- continued

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	7	2	1	4	6	5	3
Employment Status							
Full time	62.5	35	30.3	58	29.7	11.7	29.6
Part – time	2.2	3.0	1.8	4.9	3.2	1.5	3.5
Casual	1.0	1.5	1.3	2.3	2.6	1.9	2.0
Unemployed	34.4	60.0	66.5	35.0	65.0	84.9	64.8
Number of cases (N = 28639)	10738	4334	4431	2186	2590	2520	1840
Percentage	37.5	15.1	15.5	7.6	9	8.8	6.4

NB. The numbers in brackets indicate the number of cases – included in situations where percentages are small.

6.4.1 Analysis of Demographics (OHS 1997)

(a) Demographics of Quality of Life (Group 7)

Group seven contains the biggest percentage of the sampled households (37.5%). It is also judged to be enjoying the best QOL in terms of access to the selected quality of life indicators. More than half of the households (52.7%) are headed by people aged 30 – 49 with 27.1% of them falling in the 30 – 39 age category. Some forty seven households (0.4%) are headed by people aged 15 – 19 while 10.6% of the households are headed by people aged 20 – 29. Close to thirty percent of the households (i.e. 29.7%) are headed by people aged between fifty and sixty nine years. Households headed by elderly people aged seventy and older constitute 6.5%. Males dominate the household headship (72%) and, the majority of these households are urban (89%).

When it comes to racial composition 48% of the households are African or Black the other population groups feature substantially while 26.4% are white. One in five households is Coloured and 5.4% of the households are Indian households.

The language profile of the group is diverse, with Afrikaans dominating at 35.5% followed by English at 16.9%.

Zulu is spoken by 12.6% of the households while 8.1% speak Xhosa at home. Sotho languages follow with Setswana being spoken by 7.8% of the households, South Sotho (7.7%) and, Sepedi by 5% of the households. Shangani – speaking households constitute 2% while 1.7% of the households speak Siswati at home.

The level of completed education for household heads in this group is comparatively high although there are households with low education levels. Close to twenty percent (19.9%) of the households are headed by people with tertiary qualifications. Households headed by a person having a tertiary certificate constitute 3.8% while 9.2% of the households are headed by a Diploma holder. Bachelors Degree holders head 4.6% of the households while 40 households (i.e. 0.4%) are headed by someone with Bachelors Degree plus a Diploma. Thirty eight households (0.4%) are headed by people possessing a Bachelors Degree and an Honours Degree while sixty seven households (0.6%) are headed by someone with a Masters Degree. PhD holders head 23 households which is approximately 0.2% of the households in this group. As for the 80% or so household heads without tertiary education, 19.2% have completed Standard ten while the rest (61.6%) have education levels ranging between standard one and standard nine.

The relatively high level of education in group seven could be responsible for the high percentage of household heads being employed on a full time basis (62.5%). Household heads with a part time job make up 2.2% while one percent of the household heads are employed on a casual basis. Compared with other groups, unemployment is lowest in group seven (34.4%), a figure that compares only with 35% in group four (see Table 6.8).

In all seven groups, disclosure of household income is poor as indicated in Table 6.8; 34% of the households in group seven disclosed income earned by working household heads. Of the households which provided household income 7.2% earn at most R500 a month while 15% earn between R500 and R2500. Some 10.5% of the households earn between R2500 and R6000 while 2.6% earn between R6000 and R16 000 a month. Basing on households which provided information on household income, group seven is relatively better off with a median income of R1803.91.

Given the income profile of group seven, however inconclusive it might be with close to 90% of the households being urban, it may not come as a surprise that the majority of households (51.8%) visit private health facilities when in need of health care services; 47.4% visit a private clinic or specialist. Households which visit public health facilities constitute 44.5% with 20.4% of them visiting a public clinic.

(b) Demographics of Quality of Life (Group 2)

Group two ranks second on the QOL index. The age profile of household heads in group two differs slightly from that of group seven. With a median age of forty one, 45.7% of the household heads are younger than 40 years. Group two however, differs substantially from group seven when it comes to households headed by teenagers; 3.1% of the households in group two – the biggest in al groups – are headed by people aged 15 – 19 years. Households headed by people aged 20 – 29 constitute 17.4% while close to half of the household heads (48.1%) fall in the 30 – 49 age category. Around a quarter of the households (25.4%) are headed by people aged 50 - 69 and, households headed by elderly people (70 years and older) make up six percent. The sex distribution of household headship is almost balanced with males having a slight edge at 51%. Unlike in group seven the majority of households in group two (83.7%) are found in rural areas.

When it comes to population composition, African households constitute the majority (93.7%) followed by Coloureds (6%). White households make up a small percentage of 0.2% while Indian households constitute an even smaller percentage of 0.02%.

As far language spoken at home is concerned, Sotho – speaking households constitute the majority (41.7%), with Sepedi accounting for 16.1% and Setswana, 16%; households which speak South Sotho at home make up 9.6%. Nineteen percent of the households speak Xhosa while 15.6% speak Zulu. Shangani and Afrikaans are spoken by 6.3% each while Tshivenda is used by 3.1% of the households.

The level of education completed by household heads or acting household heads is lower than that in group seven. While none of the households is headed by a person without education, 85.2% of the household heads have education level below Standard nine; those who have completed Standard ten make up 8.9%. A hundred and thirty six households (i.e. 3.1%) are headed by people with tertiary education. Of the 3.1% household heads, 2.8% are Diploma holders while sixteen (i.e. 0.4%) have at least a Bachelors Degree.

Unemployment is high with 60% of the household heads being unemployed. Household heads who reported having a full time job at the time of the survey make up 35% while 3% indicated being employed on a part time basis (see Table 6.8 for details).

A third of the households in group two provided information in respect of household income. With a median income of R495, 16.2% of the households earn at most R500 a month while 13.8% earn between R500 and R2500. Some 2.3% of the households earn between R2500 and R6000.

Information in respect of household income indicates that a substantial number of households in this group are low income earners. This income profile coupled with the employment status of household heads and, given that the majority of households are rural, could be contributing to most of the households relying a lot on public health services. Fifty six percent of the households visit a public clinic while 30% visit a public hospital. Households which make use of private health services (private clinic, hospital or private doctor) make up 11.8%.

(c) Demographics of Quality of Life (Group 1)

Group one with 15.5% of the sampled households ranks third on the QOL index. Compared with groups seven and two, households in group one are headed by generally older people with a median age of 59. A few households (0.1%) are headed by people aged 15 – 19 while 2.9% of the households are headed by people aged 20 – 29. In most cases, the 30 – 49 age category contains the majority of household heads but this is not the case with group one where 28% of the household heads fall in this category.

Households headed by people aged 50 – 69 make up 45.5%; close to a quarter of the households (25.4%) are headed by someone aged 60 – 69. Elderly people (aged 70 years and older) account for 23.6% of the household headship, the biggest of all QOL groups. Male headed households outnumber female headed households (53%) and, the majority of households in this group (54.7%) are rural.

As far as race is concerned, African households dominate group one at 81% followed by Coloured households which make up 17.4%. Asian and White households are in the minority, 0.1% and 0.5% respectively.

When it comes to language spoken at home, Afrikaans is the most commonly spoken language (18.2%) followed by Setswana and Isizulu, 14.4% and 14.3% respectively. Sepedi is used by 13.3% of the households while South Sotho and Xhosa are used by 10.7% and 10.2% of the households respectively. Ndebele and Shangani are spoken by 4.8% and 4.3% households respectively while Tshivenda is spoken by 2.1% of the households.

The level of completed education by household heads or people acting in this capacity is low; 99.7% of them have an education level that is below standard nine or grade 11. Three quarters (75.8%) have had no education and, 0.2% have completed standard ten. Seven households constituting 0.2% are headed by people with tertiary qualifications five of whom possess a Diploma while the remaining two possess at least a Bachelor's Degree.

Unemployment is comparatively high with 66.5% of the household heads being unemployed. Households headed by people with full time employment make up 30.3% while 1.8% are part time employees.

Information pertaining to household income is inconclusive as a few households (28.4%) provided such information. Of these households 16.9% earn less than R500 a month while 9.6% earn between R500 and R2500.

This income profile, however questionable it may be and, the high level of unemployment could be contributing to most of the households to rely on public health services–54.2% visit a public clinic while 27.3% visit a public hospital. Households which make use of private health services make up 16.1%.

(d) Demographics of Quality of Life (Group 4)

Group four ranks fourth on the QOL index. Relatively few households in this group are headed by people on both ends of the age continuum. On the young side of the age continuum, 1.1% of the households are headed by people aged 15 – 19 while 18.2% are headed by a people aged 20 – 29 years. The majority of household heads 60.1% fall in the 30 – 49 age category, the biggest of all QOL groups. Households headed by people aged 50 – 69 make up 18.3% while at the older side of the age continuum lies a small percentage of households, (2.3%) headed by people aged seventy years and older. Almost two thirds of the households (66.3%) are headed by males and, the majority of the households (83.5%) are urban.

African households are in the majority (89%) followed by Coloured households (7.7%). White households constitute 2.4% while Indian households are the least in proportion at 0.5%.

Zulu and Xhosa are the most commonly spoken languages at home, 23.5% and 23.2% respectively followed by South Sotho (17,8%). Afrikaans is spoken by 9.4% of the households while Setswana – speaking households make up 9.2%. Sepedi is spoken by 6.7% of the households while Shangani is spoken by 4.7% households.

The level of completed education for household heads in this group is relatively high compared with the situation in group one. Household heads in possession of tertiary education make up 3.3% compared with 0.15% in group one. Of the 3.3%, 1.3% of the households have got a Diploma while 1% have got a certificate and another 1% have a Degree or Masters Degree.

For household heads without tertiary education, 13.4% completed Standard Ten while the rest (86.6%) have education levels ranging between standard one and standard nine.

The relatively high level of education for household heads in this group could be contributing to the comparatively low unemployment rate of 35%. The majority of household heads (58%) are employed on a full time basis while part time employment accounts for 4.9%.

Close to half of the households in group four (49.1%) provided information pertaining to household income. Results in this regard indicate that in spite of the low unemployment rate several households live on low monthly incomes as reflected by the group's median income of R760.83. For instance 20.9% of the 49.1% households earn at most R500 a month and 23.7% earn between R500 and R2500. Close to 3% of the households earn between R2500 and R6000 with the remaining five households (i.e. 0.2%) earning at least R6000 a month.

Even though 83.5% of the households are urban, 77.2% of the households in group four rely on public health services; 44.4% of the households seek medical help from public clinics. Households which make use of private health services in this group constitute 21.2%. The high reliance on public health services could be due to the generally low household incomes.

(e) Demographics of Quality of Life (Group 6)

This group is fifth on the QOL index and, accounts for 9% of the sampled households. The distribution of age of households heads is slightly skewed towards the young side with a median age of 40 years. A relatively large proportion of households (2.4%) – in comparison with other groups - are headed by young people aged 15 – 19 while 17.5% of the household heads are aged 20 – 29. At least half of households (51.6%) are headed by people aged 30 – 49 while 23.1% of the household heads are aged 50 – 69. Elderly people – aged seventy and older – head 5.6% of the households in this group.

There is parity when it comes to male and female headed households and, the majority of the households (79%) are rural.

When it comes to population composition 97.8% of the households are African while 2.1% are Coloured. White households constitute around 0.1%.

Xhosa is the most spoken language with 35.7% of the households using it at home, followed by Zulu (26.2%). One in ten households speaks South Sotho while North Sotho or Sepedi is spoken by 7% of the households. Households which speak Setswana at home make up 6.6% while Shangani is spoken by 6% of the households. Households which speak Tshivenda constitute 3.2%.

The level of education completed by household heads in this group is relatively low with just 2% of them having a tertiary qualification. Of the two percent, 1.9% of the household heads have got a Diploma or certificate and, three household heads or 0.1% possess a Degree. Besides the household heads with tertiary education, 5.9% have completed Standard ten with the reset having education levels varying between Standard one and Standard nine.

Unemployment is high with 65% of the households being headed by someone without a job. Close to 30% of the households are headed by people with a full time job while 3.2% are headed by people employed on a part time basis.

Around thirty percent of the households in group six provided information pertaining to household income. Out of this percentage, 16.7% earn at most R500 a month while 10.2% earn between R500 and R2500. Thirty eight households (i.e. 1.5%) earn between R2500 and R6000 a month.

Given the income profile above however inconclusive it might be coupled with high unemployment and, 79% of the households being rural, it may not be surprising that just around one in ten households (10.5%) seeks medical help from private health services.

The majority of households (88.6%) rely on public health facilities with 55.5% visiting a public clinic when the need for medical help arises.

(f) Demographics of Quality of Life (Group 5)

This group which accounts for some 8.8% of the sampled households ranks sixth on the QOL index. It consists of households headed by relatively old people with a median age of sixty. Three households (0.12%) are headed by people aged 15 – 19 while 2.6% of the household heads are aged 20 – 29. This group has the smallest proportion of household heads in the 30 – 49 category (27.2%). Close to half of the household heads (47.5%) are aged between fifty and sixty nine years. Households headed by elderly people make up 22.5%, of whom 5.3% are eighty years and older. Female headed households constitute the majority (58%) and all households but 1.3% are rural.

As far as race is concerned, African households are predominant (98.5%) with Coloured households complementing them. Most of the households (42%) speak Zulu followed by Xhosa speaking households which make up 32%. One in ten households speaks Sepedi while 4.5% speak Setswana.

The level of education completed by household heads is low with just one household head having a tertiary certificate (not a degree certificate). Virtually all household heads (99.9%) have not completed standard ten; 78.1% of the households are headed by people with no education while 22.3% have got education levels varying between grade zero and grade six or standard four.

Unemployment is high with 84.9% of the household heads having been without a job at the time of the survey. Close to 12% of the household heads had full time jobs with the rest working either on a casual or part time basis (see Table 6.8).

Quite a few households (13.9%)-the smallest proportion among the seven QOL groups-provided information regarding household income. Of the 13.9% households, 9.1% indicated to be earning at most R500 a month while 3.4% earned between R500 and

R2500 a month. Nine households or 0.4% indicted that they earn a monthly income that is between R2500 and R6000. Much as information pertaining to household income is inconclusive, the high rate of unemployment and the majority of the households being rural could be contributing substantially to close to 92.4% of the households relying on public health services when a need for such services arises. Households which seek medical help from private health services (Private doctor, clinic and hospital) constitute 6.5%.

(g) Demographics of Quality of Life (Group 3)

This group ranks seventh on the QOL index. It is thus judged to have the poorest access to the selected QOL indicators. This group, with a median age of 55, is one of three groups (the other two being groups one and five) where large proportions of households are headed by elderly people– aged 70 and older. In the case of group three 18.5% of the households are headed by elderly people. At least four out of ten households (41.6%) are headed by someone aged between 50 and 69 years. Households headed by people aged 30 to 49 are relatively few, constituting 36.3%. Sixty two households (i.e. 3.4%) are headed by someone aged 20 – 29 and two households or 0.1% are headed by people aged 15 – 19. The majority of households are rural (60%) and, male headed households slightly outnumber the female headed households (52.3%).

As far as race is concerned, African households are predominant (96.3%) with Coloureds accounting for 3.6%. Indian and White households make up 0.05% each.

Isizulu is the most spoken language at home (24.4%) followed by South Sotho (16.4%) and Xhosa (16.2%). Households speaking Setswana constitute 10.5% while households speaking Shangani or Tsonga make up 9.1%. Eight percent of the households speak Sepedi or North Sotho while 4.6% speak Tshivenda at home. Siswati is spoken by 4.2% of the households while 3.9% of the households speak Afrikaans.

The level of education completed by household heads in this group is quite low with 83.4% of them having had no education at all. In fact none of the household heads got

closer to completing Standard ten. The highest level completed by 2.8% of the household heads is standard two. The remaining 13.8% of the household heads have education levels varying between grade zero and grade three or standard one.

The level of unemployment among household heads is high with 64.8% of them having had no employment at the time of the survey. Household heads who were employed on a casual basis constitute 2% while 3.5% were employed on a part time basis. Households headed by people employed on a full time basis make up 29.6%.

In group three, 30% of the households provided information pertaining to household income. Of these households close to 19.3% earn at most R500 a month while 9.3% of the households earn between R 500 and R 2500 a month (see Table 6.8 for details). With an unemployment level of 64.8% and majority of the households being rural, it may not be surprising that 85.9% of the households rely on public health services; 60.3% of the households seek medical help from public clinics. Households which make use of private health services constitute 12.7%.

6.4.2 Analysis of Residence (type of dwelling)

This section provides a description of the type of dwelling occupied by households in various QOL groups. Information pertaining to this aspect is summarised in Table 6.9 below. In addition to type of dwelling, a description of the geographical distribution of households by province is provided. Like in chapters four and five, the description provides additional information which may not be appearing in Table 6.9. Please note that description of the findings is presented according to the ranking results of the quality of life groups.

Table 6.9: Type of dwelling and geographical distribution of households by QOL group (OHS 1997)

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	7	2	1	4	6	5	3
Type of dwelling							
Formal dwelling	99.95	100	99.9	13.6	4.2	42.5	4.3
Informal dwelling	-	-	-	68.1	28.7	2.4	43.5
Traditional dwelling	0.05	-	0.1	10.3	66.0	54.8	49.5
Caravan/tent	-	-	-	0.4	0.1	-	0.2
Other	-	-	-	7.5	0.9	0.2	2.5
Province							
Gauteng	26.0	2.4	9.2	27.8	7.7	0.3	9.8
Western Cape	20.8	3.5	11.0	14.5	2.6	0.4	3.8
Northern Cape	6.8	3.0	8.9	3.4	0.8	1.0	3
Eastern Cape	7.4	18.3	6.8	9.1	33.3	33.9	10
Free State	8.6	7.5	8.7	14.0	7.4	0.7	15.5
Limpopo	4.4	23.6	16.7	3.2	12.9	13.8	18.3
North West	6.8	18.4	14.4	9.5	6.4	4.7	10.3
Mpumalanga	6.2	10.4	15.6	4.3	8.5	6.0	15.5
KwaZulu-Natal	12.8	13	8.7	14.2	20.5	39.2	13.8

(a) Residence for households in Group 7 (QOL7)

This group (ranked number one on the QOL index) has the best access to accommodation with 99.95% of the households living in formal dwellings. The majority of households (85%) live in permanent brick houses occupying separate stands while 5.3% live in town houses or simplexes. Flats in a block of flats accommodate 7.5% of the households while twenty one households or 0.2% occupy a unit in a retirement village. Thirty six households (i.e. 0.3%) occupy a room on a separate stand while 1.6% live in a room or two roomed house in a backyard.

In terms of spatial distribution, Gauteng province has the biggest proportion of households in this group (26%) followed by Western Cape (20.8%) and KwaZulu-Natal

(12.8%). Free State province accounts for 8.6% of the households while 7.4% are found in Eastern Cape. The least number of households are found in Limpopo province as indicated in Table 6.9.

(b) Residence for households in Group 2 (QOL2)

The situation regarding type of dwelling is quite similar to that in group seven which it precedes in terms of ranking. All households in group two have got access to a formal dwelling; 96.8% of the households live in permanent brick houses occupying a separate stand. Town houses and simplexes accommodate 1.5% of the households and, the same number of households (1.5%) live in a flat in a lock of flats.

When it comes to geographical distribution, the biggest percentage of households (23.6%) are found in Limpopo province followed by North West with 18.4%. Eastern Cape has 18.3% of the households while 13% are found in KwaZulu-Natal. Close to ten percent of the households (10.4%) are in Mpumalanga and 7.5% are found in Free State province. Gauteng province has the least number of households, constituting 2.4%.

(c) Residence for households in Group 1 (QOL1)

Like in groups two and seven, the majority of households in group one (99.9%) live in formal dwellings with 93.3% of them living in brick houses on separate stands. Close to 3% of the households (i.e. 2.9%) live in town houses (Duplex or Simplex) while 2.4% live in a flat in a block of flats. Relatively few households occupy a house in the backyard (0.7%) or a room on a separate stand (0.5%).

When it comes to spatial distribution, 16.7% of the households are found in Limpopo province while 15.6% are in Mpumalanga. North West province accounts for 14.4% of the households while Western Cape has got 11%. Close to nine percent of the households are in Northern Cape while Free State and KwaZulu-Natal have 8.7% each. Eastern Cape has the smallest number of households making up 6.8%.

(d) Residence for households in Group 4 (QOL4)

Group four ranks fourth on the QOL index and, the situation regarding type of dwelling is poorer for households in this group than in the three groups described so far. For instance 13.6% of the households live in formal dwellings. Of these households, 7.5% live in a one roomed house on a separate stand while 5.6% live in a room or two roomed house in a backyard. Two households (i.e. 0.1%) live in a flat in a block of flats. Unlike in groups one, two, and seven, the majority of households in group four (68.1%) live in informal dwellings, 52.9% of which are informal dwellings on separate stands. Close to one in ten households (10.3%) lives in a traditional dwelling.

When it comes to geographical distribution, 27.8% of the households are found in Gauteng province while 14.5% are in Western Cape. KwaZulu-Natal and Free State accommodate almost similar proportions, 14.2% and 14.0% respectively while North West accounts for 9.5% of the households. Northern Cape has the least number of households constituting 3.4%.

(e) Residence for households in Group 6 (QOL6)

Group six ranks fifth on the QOL index and, access to formal dwellings is a problem to most households in this group. Close to two thirds of the households (66%) reside in traditional dwellings while 28.7% live in informal dwellings; 24.4% of the informal dwellings are on separate stands. Six households (i.e. 0.2%) live in a flat in a block of flats while 2.4% of the households live in a room or two-roomed house on a separate stand; 1.6% of the households occupy a room or two roomed house in the backyard.

As far as spatial distribution is concerned, a third of the households are in Eastern Cape and a fifth are in Kwazulu-Natal. Close to 13% of the households are in Limpopo while Mpumalanga, Gauteng and Free State have got 8.5%, 7.7% and 7.4% of the households respectively. Northern Cape has the least number of households in this group as indicated in Table 6.9.

(f) Residence for households in Group 5 (QOL5)

Accommodation is better off in this group than in group six which it precedes in terms of ranking. At least four out of ten households live in formal dwellings; 39.7%) of them occupy permanent brick houses on a separate stand. Thirty one households (1.2%) live in one-roomed houses on a separated stand while fifteen households (0.6%) occupy a room or house in the backyard. Households living in a flat in a block of flats constitute 0.8%. Putting the formal dwellers aside, the majority of households in group five (54.8%) live in traditional houses while 2.4% live in informal dwellings; 1.9% of the informal dwellings are on separate stands.

When it comes to geographical distribution, KwaZulu-Natal accounts for the biggest proportion of households (39.2%) followed by Eastern Cape (33.9%). Limpopo province accounts for 14% of the households while 6% are in Mpumalanga.

(g) Residence for households in Group 3 (QOL3)

Group three ranks seventh on the QOL index and the situation regarding type of dwelling for households in the group reflects the ranking. Close to half of the households (49.5%) live in traditional houses and 43.5% live in informal dwellings. Of the 43.5% households living in informal dwellings, 33.7% are informal dwellings on a separate stand. Eleven households (i.e. 0.6%) live in a flat in a block of flats while 2.3% of the households live in a room or house in the backyard; 1.4% of the households live in a room on a separate stand.

When it comes to geographical distribution of households, Limpopo has the biggest percentage (18.3%) followed by Mpumalanga and Free State, each having 15.5%. Kwazulu-Natal has got 13.8% of the households while 10.3% are in North West province. One in ten households is found in Eastern Cape and 9.8% are found in Gauteng province. Northern Cape has the least number of households belonging to group three as indicated in Table 6.9.

6.4.3 Analysis of Fuel used by households

This section provides a description of the type of fuel used by households in respect of cooking and lighting. Table 6.10 shows the fuel types focused upon in this study. In some cases the description includes details pertaining to fuel types other than those indicated Table 6.10. The focus however, is on fuel types in the table which are considered as key indicators in this respect. In general, results indicate a tendency for households to use electricity more for lighting than for cooking purposes across QOL groups.

Table 6.10: Fuel used by households for cooking and lighting

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	7	2	1	4	6	5	3
Fuel for cooking							
Electricity	94.0	11.7	43.5	49.8	2.0	1.9	10.7
Paraffin	1.6	39.6	18.8	38.0	38.5	13.2	36.4
Wood	0.2	37.3	24.5	1.2	51.0	78.8	39.9
Fuel for lighting							
Electricity	98.4	31.8	66.6	65.7	13.6	11.2	34.2
Paraffin	0.5	20.2	7.9	15.1	28.4	21.6	19.8
Candles	0.9	47.0	25.5	18.5	57.6	67.0	45.9

(a) Fuel used by households in Group 7 (QOL7)

This group has the best access to quality fuel for household use. At least nine out of ten households (94%) use electricity for cooking while 301 households (i.e. 2.8%) use gas for the same purpose. A hundred and thirty two households (i.e. 1.3%) use coal for cooking while 177 households (1.6%) use paraffin.

When it comes to fuel used for lighting, the majority of households (98.4%) use electricity while 21 households (i.e. 0.2%) use gas. A few households use paraffin and candles as indicated in Table 6.10.

(b) Fuel used by households in Group 2 (QOL2)

The situation regarding fuel for household use differs substantially in group two from that in group seven. For instance 11.7% of the households in group two use electricity to cook, a figure that is quite lower than the 94% recorded in group seven. (see Table 6.10). Close to forty percent of the households use paraffin to cook while 37.3% use wood for the same purpose. Some 5.7% of the households use gas while 4.8% cook with coal. Thirty seven households (0.9%) use animal dung as fuel for cooking.

When it comes to fuel used for lighting, almost half of the households use candles to provide light in dwellings. Households which use electricity constitute 31.8% while 20.2% light with paraffin. Minute proportions of households (0.4% each) use gas and solar energy to provide light in dwellings.

(c) Fuel used by households in Group 1 (QOL1)

The fuel situation in group one is better than that in group two even though the former is ranked third. For instance use of electricity for cooking purposes in group one stands at 43.5%, a figure that is almost four times that in group two (see Table 6.10). Close to a quarter of the households in group one use wood for cooking while 18.8% use paraffin. Nine percent of the households use coal while 3.6% use gas for cooking.

As for fuel for lighting in dwellings, at least one in four households uses candles while 7.9% use paraffin. Close to two thirds of the households use electricity to light the dwellings while a few households constituting 0.2% use gas.

(d) Fuel used by households in Group 4 (QOL4)

Group four is relatively better off than some of the first three groups (particularly group two) when it comes to fuel for household use. Almost half of the households in this group use electricity for cooking while 38% use paraffin for the same purpose. Some 6.3% of the households use gas to cook while 4.7% cook with coal. A few households use wood as fuel for cooking as indicated in Table 6.10.

With regard to fuel used for lighting purposes, close to two thirds of the households use electricity, a figure that is close to that in group one, while 18.5% use candles.
Close to fifteen percent of the households use paraffin while a few households constituting 0.5% use gas.

(e) Fuel used by households in Group 6 (QOL6)

Group six ranks fifth on the QOL index and the fuel situation in a way, reflects the group's rank. At least half of the households use wood as fuel for cooking while 38.5% use paraffin to cook. Some 4.9% of the households use coal to cook while 2.1% use animal dung. Just 2% of the households in this group use electricity for cooking while 1.5% use gas for the same purpose.

With regard to fuel used for lighting, close to 60% of the households use candles while 28.4% use paraffin. Close to 14% of the households use electricity for lighting and, six households (i.e. 0.2%) use gas.

(f) Fuel used by households in Group 5 (QOL5)

The fuel situation in group five (ranked sixth on the QOL index) differs slightly from the situation in is group six which the former proceeds in terms of rank. This is particularly the case in respect of use of electricity. Close to two percent of the households in group five use electricity to cook just like in group six. However, marked differences exist between the two groups with regard to the use of paraffin and wood. For instance 78.8% of the households in group five rely on wood as fuel for cooking compared with 51% in group six. The use of paraffin is lower in group five (13.2%) than the 38.5% recorded in group six. Use of gas in group five is low (0.8%) just like in group six with 0.2%. Animal dung provides fuel for cooking to 2.4% of the households in group five while 2.9% use coal.

When it comes to fuel for lighting in dwellings, relatively few households in group six (11.2%) use electricity. The majority of households (67%) use candles while 21.6% use paraffin. A few households constituting 0.2% use gas for lighting purposes.

(g) Fuel used by households in Group 3 (QOL3)

The fuel situation in group three is not as bad as the group's rank (i.e. seventh). Proportionally more households in group three use electricity than in groups five and six which are judged to be better off in rank terms (see Table 6.10). For instance 10.7% of the households in group three use electricity to cook, a figure that is five times that of groups five and six. Almost forty percent of the households in group three use wood to cook while 36.4% use paraffin. Close to one in ten households uses coal for cooking and close to 1% of the households use animal dung.

With regard to fuel for lighting, at least a third of the households use electricity while 45.9% use candles. Close to a fifth of the households use paraffin and, a few households constituting 0.1% use gas.

6.4.4 Analysis of households' water source

Section 6.4.4 describes the sources of water accessed by households in the various QOL groups. In the description, attempt is made to provide details on water sources including bore holes, dams and rivers which are deemed to provide water that is unsafe for human consumption. However, the focus will be on household access to piped water and the hassles that households face to access piped water in situations where it is not readily available. Table 6.11 provides information in respect of access to piped water by the seven QOL groups and the distance that households travel to fetch water.

Table 6.11: Access to clean water and distance from water source

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	7	2	1	4	6	5	3
Water							
Piped in dwelling	77.8	7.6	29.6	12.7	0.9	-	5.7
Piped on site	18.6	24.3	40.9	55.9	9.7	-	34.4
Public tap	2.9	35.9	24.6	28.4	41.6	0.2	53.9
Distance from water source (where fetching is applicable)							
Within 100 metres	1.4	20.0	10.4	16.7	27.1	17.1	26.4
101 – 200 metres	0.9	17.8	7.5	9.0	22.9	21.6	18.1
201 – 500 metres	0.4	14.7	5.3	2.5	16.2	22.4	10.7
501 metres – 1 Kilometre	0.2	9.0	2.2	0.9	13.0	21.5	3.8
More than 1 Kilometre	0.1	6.4	1.1	0.7	8.3	15.6	1.4

(a) Source of water for households in Group 7 (QOL7)

Group seven has the best access to clean water with 96.4% of the households having water either in the dwelling or on site; the former constitutes 77.8%. Households which depend on the public tap make up 2.9% while 42 households (i.e. 0.4%) have their own bore holes in the yards. Ten households (i.e. 0.1%) depend on water delivered by the water tanker while another 0.1% get water from a communal borehole.

From the information above, at least 96% of the households in this group do not have to fetch water. Of the remaining four percent or so, 1.4% fetch water within a hundred meter radius while the rest travel at least two hundred meters to fetch water (see Table 6.11).

(b) Source of water for households in Group 2 (QOL2)

Access to clean water by households in group two is not as high as in group seven. In group two 7.6% of the households have piped water in the dwelling compared with 77.8% in group seven. As for water on site (but not in dwelling), 24.3% of the households in group two have water on site compared with 18.6% in group seven. There is a higher reliance on water from public taps in group two; 35.9% of households obtain water from

public taps. In other words as far as access to water is concerned, group two differs from group seven mainly because the latter has more access to water in dwelling. (see Table 6.11 for details). So fetching water is more of a task for households in group two than it is for households in group seven.

Households with their own boreholes (i.e. group two) constitute 3.7% while 7.8% rely on communal boreholes. The water tanker or carrier provides water to 2.7% of the households while 9% rely on river or stream water. Close to 5% of the households rely on water from springs and wells while 2% rely on stagnant water from dams.

It is clear from the above findings that fetching water is a burden to some 68% of the households in group two. Of the households which have to fetch water, one in five households gets water in a hundred meter radius while 17.8% travel between 100 and 200 meters to get water. Three out of ten households travel at least 200 metres to get water as indicated in Table 6.11.

(c) Source of water for households in Group 1 (QOL1)

Access to clean water is better for households in group one than in group two in spite of the latter being ranked higher (i.e. second). At least seven out of ten households have piped water either in the dwelling or in the yard, the former constituting 29.6%.This percentage is higher than the 31.9% recorded in group two. Close to a quarter of the households in group one get water from a public tap, a figure that is smaller than 35.9% recorded for group two. Households in group one which have boreholes on site constitute 2.3% while forty one households (0.9%) get water from communal boreholes. The water carrier provides water to some 0.9% of the households while twenty three households (i.e. 0.5%) rely on stream or river water for their water needs.

The water situation described above indicates that fetching water is a task to some 30% of the households in group one. For households which have to fetch water, 10.4% get water within a distance of a hundred meters while 7.5% travel between 100 and 200 metres to fetch water. The remaining 9% or so travel at least 200 metres to get water.

(d) Source of water for households in Group 4 (QOL4)

The situation regarding access to clean water in group four differs slightly from that in group one which precedes it in rank terms. Proportionately fewer households in group four (12.7%) have piped water in the dwelling compared with 29.6% in group one. However, group four has proportionately more households with water on site (55.9%) than group one with 40.9%. Households which get water from public taps in group four make up 28.4%, a figure that is higher than 24.6% recorded in group one. The water tanker provides water to 1.0% of the households in group four while 0.8% get water from communal boreholes; households with their own boreholes make up 0.4%.

The water situation described above indicates that 68.6% of the households do not face the inconvenience of having to fetch water. As for the complement, 16.7% of the households fetch water within a hundred meter radius while 9% travel between a hundred and two hundred meters to fetch water. The remaining 4% or so households travel over 200 metres to get water.

(e) Source of water for households in Group 6 (QOL6)

Group six ranks fifth on QOL index and it is one of the groups in which reality greatly tallies with the group's ranking. For instance, twenty four households (i.e. 0.9%) have piped water in the dwelling while households with water on site (but not in the dwelling) constitute 9.7%. Households which get water from public taps make up 41.6%. Two percent of the households rely on the water carrier for their water needs while close to a quarter of the households (24.5%) rely on river or stream water. A hundred and seventeen households or 4.5% get water from springs. The dam or a similar stagnant water source provides water to 3.7% of the households while 1.7% get water from wells. Communal boreholes provide water to 8.2% of the households while 1.1% have their own boreholes in the yard.

From the figures above, it is clear that fetching water is a routine task to all but around 10% of the households in this group. Of the ninety percent or so households which have to fetch water, 27.1% fetch water from a hundred meter radius while 22.9% travel

between a hundred and two hundred meters to fetch water. Close to 40% of the households in this group travel over 200 metres to fetch water.

(f) Source of water for households in Group 5 (QOL5)

This group ranks sixth on the QOL index and, despite being ranked second poorest, it has the poorest access to clean water. None of the households has piped water in the dwelling or on site. Five households (i.e. 0.2%) get water from a public tap and 36 households (i.e. 1.4%) rely on the water carrier. Fourteen households (i.e. 0.6%) have their own boreholes while 16.8% rely on communal boreholes. Some 6.9% of the households fetch water from wells while 14.3% rely on springs for their water needs. A dam or pool provides water to 13.3% of the households while 41.1% rely on stream or river water.

With just 0.6% of the households having water on site in form of their own boreholes, fetching water is a task to virtually all households in group five. Some 17% of the households fetch water within a hundred meter radius while 21.6% travel between a hundred and two hundred meters for the same reason. Close to 60% of the households travel over two hundred meters to fetch water.

(g) Source of water for households in Group 3 (QOL3)

The water situation in group three is better than the situation in group five even though group three is ranked seventh. Forty percent of the households in group three have piped water on the premises while no household in group five is in this situation. Households with piped water in the dwelling make up 5.7% while 34.4% have piped water in the yard. The majority of households (53.9%) get water from public taps. Some 1.8% of the households have their own boreholes while 1.6% rely communal bore holes for their water needs. The water carrier provides water to 2.3% of the households.

The findings above indicate that some 60% of the households in group three have to fetch water, 26.4% of which fetch water within a distance of hundred meters while 18.1% travel between 100 and 200 metres for the same reason. Close to 17% of the households travel at least 200 meters to get water.

6.4.5 Analysis of sanitation

Section 6.4.5 looks at sanitation services accessed by households in the seven QOL groups. In all chapters dealing with the study's findings (i.e. chapters four to seven), sanitation has been operationalised in terms of "type of toilet facility" a household accesses and, "rubbish removal services". In analysing data for OHS 1997 it was realised that data on "toilet facility" was captured in such a way that households with toilet on site (i.e. either in the dwelling or in the yard) were separated from households accessing toilets from elsewhere. Much as the two are mutually exclusive, substantial inconsistencies in responses were picked up in the analysis – the cases in the two variables could not tally up. A decision was made to leave out the variable on "access to toilet off site" firstly due to the inconsistencies and, secondly due to the relatively small number of cases involved in that variable. The most unfortunate outcome of this decision however, is that households with no access to toilet are left out in the analysis because data pertaining to this aspect was captured under the variable labeled "access to toilet off site". Table 6.12 provides information in respect of access to sanitation services by households in the seven QOL groups. Once again in some instances, the description of findings provides details that go beyond the information provided in Table 6.12 depending on the magnitude of the response in a particular instance.

Table 6.12: Access to sanitation by households

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	7	2	1	4	6	5	3
Sanitation							
Flush toilet on site	66.6	8.5	28.1	47.3	2.8	2.8	18.8
VIP Pit latrine	5.2	13.5	11.3	8.4	17.4	14.0	11.7
Ordinary pit latrine	15.4	71.7	47.3	21.9	75.7	82.3	54.1
Bucket	10.2	5.7	11.8	20.8	3.4	0.7	14.6
Refuse disposal							
Removed at least once a week	84.3	9.9	40.4	72.9	0.6	0.3	24.8
Own rubbish dump	7.5	69.4	43.0	11.5	73.0	64.6	49.5
No rubbish removal services	0.9	15.4	8.3	1.9	20.3	23.6	18.3

(a) Sanitation for households in Group 7 (QOL7)

Group seven has the best access to sanitation among the seven QOL groups. Two thirds of the households have got a flush toilet on site and, there is less reliance on pit latrines. Households which use ventilated improved pit latrines (VIP) constitute 5.2% while ordinary pit latrines are used by 15.4% of the households. Close to ten percent of households rely on the bucket toilet.

As far as refuse disposal is concerned, 84.3% of the households have their refuse collected once a week by local authorities while 4% have theirs collected by local authorities less often. Community members collect refuse once a week for 168 households (i.e. 1.6%) and, they [community members] collect refuse less often than a week for 26 households (i.e. 0.2%). Some 7.5% of the households make use of their own rubbish dumps while 1.2% make use of communal rubbish dumps.

(b) Sanitation for households in Group 2 (QOL2)

The sanitation situation in group two is poorer than the situation in group seven. As far as the flush toilet is concerned group two has proportionately far fewer households (8.5%)

which use a flush toilet, compared with 66.6% in group seven. Households in group two rely more on pit latrines; close to 72% of the households use an ordinary pit latrines while 13.5% use the VIP. In group seven around 20% of the households use pit latrines be it VIP's or ordinary latrines (refer to Table 6.12 for details). However, when it comes to the bucket toilet, one finds a higher percentage of households using this type of toilet in group seven (10.2%) than in group two (5.7%).

As far as refuse disposal is concerned, Close to 10% of the households have their refuse removed by local authorities on a weekly basis while 2% have theirs removed by local authorities less often than once a week. The majority of households (69.4%) make use of their own rubbish dumps while 1.8% of the households rely on communal rubbish dumps. One percent of the households have their refuse removed by community members on a weekly basis and, 15.4% of the households have no access to rubbish removal services.

(c) Sanitation for households in Group 1 (QOL1)

Proportionately more households in group one experience better sanitation than households in group two even though the latter is ranked second while the latter is ranked third on the QOL index. Households which have a flush toilet on site in group one make up 28.1% compared with 8.5% in group two. In both groups however, the majority of households make use of pit latrines, with 47.3% of the households in group one using ordinary pit latrines and, 11.3% using a Ventilated improved pit latrine (see Table 6.12). In group one, households which use bucket toilets make up 11.8%, a figure that is lower than 14.6% recorded in group two.

With regard to refuse disposal, four out of ten households in group1 have their refuse removed by local authorities on a weekly basis while 3.1% have theirs removed less regularly. Households which make use of their own rubbish dumps constitute 43% while 2.4% rely on communal rubbish dumps. Community members regularly remove refuse for 2% of the households and, 8.3% of the households in group one have no refuse removal services.

(d) Sanitation for households in Group 4 (QOL4)

The sanitation in group four is generally better than the situation in groups one and two which are judged to be better off in terms of ranking. This is particularly the case with regard to access to the flush toilet and pit latrine. In case of access to flush toilet, 47.3% of the households in group four have it on site while three out of ten households use pit latrines; 8.4% use a VIP. The situation is different when it comes to the use of bucket toilets. There is a relatively high incidence of the bucket toilet as a toilet facility in group four (20.8%) than in groups one and two, 11.8% and 5.7% respectively.

With regard to refuse removal, close to 73% of the households have their refuse removed by local authorities at least once a week while 6.3% have theirs removed less often. Community members remove refuse for 4% of the households while 3% of the households make use of communal rubbish dumps. Households which make use of their own rubbish dumps constitute 11.5% and 1.9% have no access to refuse removal services.

(e) Sanitation for households in Group 6 (QOL6)

Group six ranks fifth on the QOL index and, the sanitation situation seems to agree with the rank. For instance only 2.8% of the households have a flush toilet on site. Around three quarters of the households use ordinary pit latrines while 17.4% use ventilated improved pit latrines. Households which use a bucket toilet make up 3.4%.

When it comes to refuse removal, sixteen households (0.6%) have their refuse removed by local authorities at least once a week. The majority of households (73%) use their own rubbish dumps while 4.6% of the households rely on communal rubbish dumps. One percent of the households have their refuse removed by community members and, close to a fifth of the households have no access to refuse removal services.

(f) Sanitation for households in Group 5 (QOL5)

Group five ranks sixth on the QOL index. Sanitation in this group differs slightly from that in group six which it follows in rank terms.

Households with access to a flush toilet on site make up 2.8% just like in group six. The majority of households (82.3%) use ordinary pit latrines, a figure that is higher than 75.7% recorded in group six. Fourteen percent of the households use a VIP and contrary to the other groups, quite a few households in group five (0.7%) make use of the bucket toilet.

When it comes to refuse removal, eight households (i.e. 0.3%) have their refuse removed once a week by local authorities while twelve households (i.e. 0.5%) have their refuse removed by local authorities less often. Close to two thirds of the households make use of their own rubbish dumps. Community members render refuse removal services to ten households (i.e. 0.4%) on a weekly basis and, almost a quarter of the households have no such services.

(g) Sanitation for households in Group 3 (QOL3)

Group three ranks seventh on the QOL index but the sanitation situation somehow contradicts the ranking results; sanitation is not entirely poorest in this group. Close to nineteen percent of the households have got a flush toilet on site which is more than double the 8.5% in group two. The majority of households in group three rely on pit latrines – 54.1% use ordinary pit latrines and 11.7% use VIP's. However, when it comes to the bucket toilet, close to 15% of the households in group three make use of this facility, a figure that is only surpassed by 20.8% in group four.

With regard to refuse disposal, close to a quarter of the households have their refuse removed by local authorities at least once a week while 3% have theirs collected less often than once a week. Almost half of the households use their own rubbish dumps while 3% rely on communal rubbish dumps to get rid of their refuse. Households with no access to rubbish removal services make up18.3%.

6.4.6 Analysis of durables

This section provides a description of possession of durable items by households in the various QOL groups.

A few indicators have been selected for use in this regard due to the limited information that is available. These indicators include possession of a cellular phone and, existence of a landline telephone in the dwelling (see Table 6.13 below). In addition to "possession of a telephone" in the dwelling, "time taken to get to the nearest telephone" has been incorporated in the analysis due to the fact a household without a telephone in the dwelling will have to seek for one when the need to make telephone call arises. Household items like radio, television and vehicle have not been included in the analysis due to unavailability of data. As for possession of a vehicle, a proxy indicator namely "transport used by a household to get to work" has been used. The assumption made is, households possessing a vehicle are likely to use it while getting to work as opposed to using public transport. Details regarding transport used to get to work are presented in order to further investigate possibilities regarding possession of a vehicle in situations where a household could opt not to use one even though it is available.

Table 6.13: Possession of durable items

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	7	2	1	4	6	5	3
Durables							
Car	42.1	8.0	5.5	6.9	5.8	5.1	1.3
Cellular phone	14.8	1.3	2.9	5.2	0.5	0.3	1.8
Landline telephone	54.1	3.2	14.5	6.9	0.6	0.5	1.2
Travel time to nearest telephone							
Within 5 minutes	19.3	11.5	19.9	26.0	6.4	3.1	12.2
6 – 15 minutes	16.7	24.6	27.6	37.3	20.1	12.3	29.8
More than 15 minutes	7.7	60.0	36.9	28.8	72.2	83.7	55.7

(a) Possession of durable items by households in Group 7 (QOL7)

Group seven has the best access to durable items compared with the rest of the QOL groups. Possession of a cellular telephone stands at 14.8% and, over half of the households possess a landline telephone in the dwelling.

Results pertaining to possession of a telephone indicate that at least 55% of the households in group seven do not have to travel in order to make a telephone call. For the remaining households, 19.3% spend at most five minutes while traveling to a telephone facility while 16.7% spend between six and fifteen minutes to get hold of a telephone. Households which spend more than a quarter of an hour while traveling to a telephone facility make up 7.7%; sixty nine households (i.e. 0.6%) require at least an hour in travel time to get to a telephone facility.

Regarding transport used by households to get to work, 42.1% of the households indicated that they use their own cars for this purpose. Four percent of the household heads work from home while 15.9% walk to the place of work. Household heads that use minibus taxis to get to work constitute 17.6% while 9.2% use a bus. These results indicate that at least four out of ten households in group7 posses a car.

(b) Possession of durable items by households in Group 2 (QOL2)

Group two is in a worse situation than group seven as far as possession of durable items is concerned. For instance only 1.3% of the households in group two possess a cellular phone compared with 14.8% in group seven. Households in group two which possess a land line telephone in the dwelling make up 3.2% compared with 54.1% in group seven.

The telephone situation in group two implies that at least 95% of the households have to travel some distance to make a telephone call. Households which get hold a telephone within five minutes' travel time constitute 11.5% while 24.6% spend between six and fifteen minutes while traveling to a telephone facility. Six out of ten households spend more than a quarter of an hour while traveling to a telephone facility; 17.5% of the households travel for more than one hour to physically get hold of a telephone.

As far as transport used to get to work is concerned, 8% of the households indicated that they use their own cars for this purpose, an indication that relatively few households in this group possess cars.

Four percent of the household heads walk to the work place while 42.7% work from home. Thirty two percent of the households use buses and minibus taxis, the former constituting 15.7%.

(c) Possession of durable items by households in Group 1 (QOL1)

Inconsistencies in respect of possession of durable items exist in group one compared to the situation in group two. Possession of cellular phones in group one is higher than in group two (2.9%), just like possession of landline telephones (14.5%) as indicated in Table 6.13. Results in this respect indicate that just around 15% of the households have access to either a cellular phone or a landline telephone since the two are not necessarily mutually exclusive. It implies that making a telephone call for most of the households in group one involves some traveling. Close to 20% of the households access a telephone within five minutes of travel time while 27. 6% spend between six and fifteen minutes while traveling to make a telephone call. Close to 37% of the households spend more than fifteen minutes while traveling to a telephone facility; nine percent of the households spend more than an hour in travel time to get to a telephone facility.

When it comes to transport used when going to work, group two has more households which make use of private cars to get to work (8%) than 5.5% recorded in group one. At least half of the households in group one (51.1%) walk to the work place while 23.1% use minibus taxis and buses; the latter make up 12.7%. Some 5% of the household heads work from home. These results seem to suggest that possession of a car is relatively lower in group one than in group two.

(d) Possession of durable items by households in Group 4 (QOL4)

Possession of durable items in group four compares favorably with the situation in groups one and two which precede it in terms of ranking. Possession of a cellular phone in group four stands at 5.2%, a figure that is higher than the figures for groups one and two while possession of landline telephones is recorded at 6.9%, higher than 3.2% for group two (see Table 6.13). These findings reveal that at least 7% of the households in group four do not have travel in order to make a telephone call.

Of the remaining households (i.e. 93% or so), 26% get hold of a telephone within five minutes travel time while 37.3% spend between five and fifteen minutes to physically access a telephone. Close to 29% of the households require more than fifteen minutes to access a telephone, 3% of which require more than an hour for this purpose.

When it comes to transport used to get to work, 6.9% of the households indicated that they make use of their own cars to get to work, a figure that falls between the percentages for groups one and two. Proportionately more households in group four use buses and minibus taxis than groups one and two (42.6%) and, 10% of the households in group four use a train; neither of the other two groups comes close to this figure. These results indicate that around 7% of the households in group four possess a car.

(e) Possession of durable items by households in Group 6 (QOL6)

Group six ranks fifth on the QOL index. Access to selected QOL indicators is quite poor with just twelve households (i.e. 0.5%) possessing a cellular phone and sixteen (i.e. 0.6%) being in possession of a landline telephone in the dwelling. This implies that communication by telephone requires traveling for around 99% of the households. Of the households which have to travel in order to make a telephone call, 6.4% of them spend at most five minutes while traveling to a telephone facility while a fifth of the households spend six to fifteen minutes while traveling to a telephone facility. More than seventy percent of the households (i.e. 72.2%) spend at least a quarter of an hour to get to a telephone facility; 30% of these households require at least an hour to get hold of a telephone.

When it comes to transport used to get to work, 54 households (5.8%) indicated that they use their own cars to get to work. A third of the household heads (33.5%) walk to their place of work while 33.4% use minibus taxis and buses; the former constitutes 19.7%. Seven percent of the household heads use trains to get to their places of work and, 5.7% of the household heads work from home make. These results indicate that possession of a car in group six is relatively low.

(f) Possession of durable items by households in Group 5 (QOL5)

The situation regarding access to durable items in group five (ranked sixth on the QOL index) differs slightly from that in group six which it follows. Seven households (i.e. 0.3%) possess cellular phones, compared with 0.5% in group six, while thirteen households (i.e. 0.5%) have a land line telephone in the dwelling (see Table 6.13). These results indicate that over 99% of the households in group five have to travel when they need to make a telephone call. Of these households, 3.1% spend at most five minutes to get hold of a telephone while 12.3% spend between six and fifteen minutes to get to a telephone facility. At least eight of ten households (83.7%) require more than fifteen minutes to access a telephone, 43.3% of which require more than an hour for this reason.

As for transport used by households to get to work, twenty households (i.e. 5.1%) indicated that they use their cars for this purpose. More than half of the households which need transport to get to work (55.5%) walk to the work place. It is important to keep the unemployment statistics in mind; for group five, 84.9% of the households do not form part of the households which need transport because the household heads are unemployed. Seventy nine households (20.4%) use minibus taxis and buses get to work while 5.9% use trucks. Five percent of the households are headed by people who work from home. So a scrutiny of mode of transport used shows that possession of cars by households in group five is low.

(g) Possession of durable items by households in Group 3 (QOL3)

Group three ranks seventh on the QOL index but the situation regarding possession of durable items is not entirely worst in this group. For instance thirty four households (i.e. 1.8%) possess a cellular phone while twenty two households (1.2%) have a land line telephone in the dwelling. In this respect, group three is better off than group five whether relatively or in absolute terms. All in all, the telephone situation in group three implies that communication by telephone necessitates traveling to as many as 97% of the households. Households which get hold of a telephone within five minutes of travel constitute 12.2% while 29.8% spend six to fifteen minutes while traveling to a telephone facility.

Over half of the households (55.7%) spend more than fifteen minutes while traveling to a telephone facility; fourteen percent of the households spend at least an hour in travel time to get to get to a telephone facility.

With regard to transport used when going to work, 23 households (i.e. 1.3%) indicated that they use their own cars for this purpose. Close to 28% of the households use minibus taxis and buses as transport to the work place while 4.4% use trains. The majority of household heads (45.6%) walk to the place of work while 3.8% work from home. Some 6.3% households use trucks as transport to the work place while 2.7% use bicycles. These findings suggest that a few households in group three possess cars.

6.4.7 Subjective evaluation of quality of life

This section provides a description of the results pertaining to household satisfaction with life in general. In OHS - 1997, households were asked to indicate how satisfied they felt, all things put together. Data pertaining to households' response in this regard was collected and, has been analysed in the current study. Table 6.14 provides the results pertaining to households' subjective evaluation of quality of life in the seven QOL groups.

Table 6.14: Subjective evaluation of quality of life

	Cluster /QOL/Group number						
Rank of group	1	2	3	4	5	6	7
Original cluster number	7	2	1	4	6	5	3
Perception							
Very satisfied	19.4	18.1	18.3	11.2	11.1	11.1	12.0
Satisfied with life	54.7	46.8	49.7	46.4	41.3	41.1	43.2
Satisfied and Very satisfied (combined)	**74.1**	**64.9**	**68.0**	**57.6**	**52.4**	**52.2**	**55.2**
Neither/Nor dissatisfied	16.1	20.2	19.2	21.2	24.8	27.5	22.9
Dissatisfied	7.8	11.4	9.7	14.4	17.9	15.8	16.1
Very dissatisfied	2.0	3.5	3.2	6.7	4.8	4.5	5.7
Dissatisfied and Very dissatisfied (combined)	**9.8**	**14.9**	**12.9**	**21.1**	**22.7**	**20.3**	**21.8**

Results pertaining to household life satisfaction show that proportionately more households in QOL groups with better living conditions reported to be satisfied with life than households in groups with poor living conditions. This is the case with groups one, two and seven in Table 6.14. When the results in Table 6.14 are compared with the findings relating to the ranks of the quality of life groups in Table 6.7, one finds that these same groups are ranked as the better off groups on the QOL index; group seven is ranked number one, followed by groups two and one respectively. In group seven - ranked number one on the index – close to three quarters of the households (74.1%) reported to be satisfied with life; 19.4% of them being very satisfied for that matter. Group two ranks second on the QOL index. When it comes to subjective quality of life evaluation, 64.9% of the households indicated that they are satisfied with life; 18.1% being very satisfied with life. In group one which ranks third on the QOL index, 68% of the households reported to be satisfied with life in general; 18.3% being very satisfied. The trend continues with group four which ranks fourth on the QOL index. Herein, 57.6% of the households indicated that they are satisfied with life, 11.2% of them being very satisfied.

When it comes to the remaining three groups, results are mixed. Group three ranks seventh on the QOL index, meaning that it has the poorest access to the selected QOL indicators. When it comes to subjective life satisfaction, this group has more satisfied households (55.2%) than groups five and six whose proportions of satisfied households are 52.2% and 52.4% respectively (see Table 6.14 for details).

When it comes to life dissatisfaction, results in a way relate with the results described above (i.e. for the satisfied category). The three groups with high proportions of satisfied households with life, contain fewer dissatisfied households. For instance group seven which ranks first on the QOL index, has 9.8% of its households reporting to have been dissatisfied with life; 2.0% of them being very dissatisfied. Close to 15% of the households in group two - ranks second on the QOL index - reported to be dissatisfied with life, 3.5% of them being very dissatisfied. Group one ranks third on the QOL index; 12.9% of the households herein reported to be dissatisfied with life - 3.2% of

them reported to be very dissatisfied. For the remaining four groups, the proportions of dissatisfied households vary slightly, from 20.3% recorded in group five (which ranks fifth on the QOL index) to 22.7% in group six (ranked fifth).

The third category of results pertains to households which reported indifference in life satisfaction. In this respect again relatively fewer households in the three groups with better living conditions reported to be neither satisfied nor dissatisfied with life in general. What comes out clearly is the inherently high proportions of households that are neither satisfied nor dissatisfied being found in QOL groups with poor living conditions. The group with the highest percentage of households whose life had neither improved nor deteriorated is group five – ranked sixth on the QOL index. In this group 27.5% of the households reported indifference in this regard. In group six – ranked fifth on the QOL index – 24.8% of the households indicated that life had neither improved nor deteriorated. Group three is judged to experience the poorest measurable living conditions among the seven QOL groups. In this group 22.9% of the households reported that they were neither satisfied nor dissatisfied with life. A closer look at these findings shows a higher level of indifference and dissatisfaction in the groups with poor measurable living conditions than in groups where households live a better life.

6.5 Summary

Chapter six has presented the findings arising from the analysis of the data for OHS - 1997. Findings in respect of cluster analysis yielded seven QOL groups. Group seven (i.e. QOL 7) ranks number one on the QOL index and, has been identified as the group experiencing the best QOL conditions. Group three (QOL 3) ranks seventh on the QOL index; it has the least access to the QOL selected indicators. As such it is identified as the group with the poorest QOL. Results emanating from Discriminant function analysis indicate that *Type of dwelling occupied by the household* and *Highest level of education completed by the household head* are the most crucial indicators differentiating between the QOL conditions experienced by the seven groups of households. Results pertaining to subjective evaluation of quality of life indicate an existence of association between household material living conditions and households'

life perception but this holds mainly for QOL groups that are distinctively better off. The following chapter – chapter seven - will present the results emanating from the analysis of the OHS 1996 data; the last dataset used in this study.

CHAPTER SEVEN: FINDINGS OF THE STUDY IN RESPECT OF OHS 1996

7.1 Introduction

Chapter six presented the findings arising from the analysis of the Data for OHS 1997. Chapter seven will present the findings arising from the analysis of the data for OHS 1996. Like in the previous three chapters dealing with the study's findings, results of chapter seven are divided into two broad categories. The first category deals with findings in respect of discriminant function analysis. Discriminant function analysis in the context of this study, facilitates a process through which indicators that differentiate between groups of households with different QOL conditions can be described. Put in a different way, discriminant function analysis enables the study to identify the key indicator or indictors that are responsible for the existence of different measurable living conditions existing among the QOL groups. Secondly the findings in respect of discriminant function analysis highlight the extent to which households are correctly classified into the QOL groups they belong to on the basis of the QOL indicators used in the study – a validity check. Finally as will be showed in due course, the results of discriminant function analysis provide a basis for ranking the QOL groups emanating from cluster analysis. The two models - cluster analysis and discriminant function analysis– have been applied in the study; the former to classify households into QOL groups, and the latter to validate the results as well as identifying the discriminating QOL indicators.

The second category of results deals with findings arising from cluster analysis. This category of results describes the characteristics of the various QOL groups, highlighting how the groups differ from one another in terms of the QOL indicators considered. Finally a description of the subjective assessment of QOL is provided in the attempt to find out whether there is an association – not statistical though - between the distribution of the QOL groups in the QOL index (i.e. the measurable living conditions) and households' subjective evaluation of quality of life.

7.2 Applying discriminant function analysis to the OHS (1996) data

As you may recall from chapter three - dealing with the methodology - as well as chapters four to six, discriminant function analysis was applied to identify the indicator or indictors which discriminate between quality of life groups. In analysing the data for OHS 1996 thirteen indicators or multiple response variables were used in discriminant function analysis (see Table 7.3 and Appendix I). The same variables were used to classify households (i.e. cluster analysis, to be dealt with later on) into groups experiencing different QOL conditions; details regarding cluster analysis follow in Sections 7.3 and 7.4. Just like in the explanations regarding discriminant analysis for OHS 1999, OHS 1998 and OHS 1997, several quality of life indicators (i.e. multiple response variables) were used to classify households into groups which experience different QOL conditions; five QOL groups emerged in this case. The multiple response variables - the thirteen QOL indicators - were used in cluster analysis to classify households. The same indicators were used in discriminant function analysis.

In discriminant function analysis the five QOL groups (i.e. QOL1-QOL5) form the grouping variable. The grouping variable is used in discriminant function analysis, in conjunction with the multiple response variables to derive the discriminant functions. Since the number of indicators (thirteen) is bigger than the number of degrees of freedom for the five groups (i.e. four), the maximum number of discriminant functions for this analysis is four. Like in OHS 1999 through OHS 1997, the five QOL groups emanating from cluster analysis constitute the quality of life index.

Table 7.1 shows the output summarizing the canonical discriminant functions - the eigenvalue, percentage of variance, cumulative percentage of variance accounted for by each function, and canonical correlation for each discriminant function. The eigenvalues associated with discriminant functions indicate the relative proportion of between-group variability accounted for by each function. Results in this case indicate that 75.4% of the between-group variability is accounted for by the first discriminant function and 18.3% is accounted for by the second discriminant function. The additional variance accounted for by functions three and four is also shown with a

combined discriminating power of 7.7%. Like in chapters four to six, interpretation of the discrimimnant function results in respect of OHS 1996 will be limited to the first two functions, which account for 92.2% of the variance.

Table 7.1: Summary of canonical discriminant functions for OHS 1996

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	7.6088	73.856	73.8560	0.9401
2	1.8847	18.2946	92.1506	0.8083
3	0.7518	7.2972	99.4478	0.6551
4	0.0569	0.5522	100	0.2320

Note: The first four canonical discriminant functions were used in the analysis

The association between the QOL groups and the indicators is depicted by the canonical correlations for each function (Last column of Table 7.1). The first two discriminant functions indicate strong correlations (i.e. 0.94 and 0.81 respectively) between the QOL and the indicators. The third discriminant function shows a 0.66 correlation between the QOL groups and indicators which is moderate. The correlation of 0.23 between the QOL groups and the indicators depicted by the fourth function is substantially low. Interpreting these correlations is enhanced by taking into consideration the chi - square results in Table 7.2.

The chi-square results indicate that with all four functions tested together, the $\chi^2(52)$ of 58800.61 indicates a reliable relation between the five QOL groups and the QOL indicators which serve as predictors. With the first discriminant function removed, there is still a reliable relation between the QOL groups and the indicators as indicated by χ^2 (36) of 25733.93, p = 0.000. The same goes for all the four functions as one function is systematically removed. All four functions indicate reliable relations between the QOL groups and the indicators despite the decrease in the magnitude of the canonical correlations.

Table7.2 Wilks' lambda and chi – square results – OHS 1996

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 4	0.0218	58800.61	52	0.00
2 through 4	0.1872	25733.93	36	0.00
3 through 4	0.5401	9461.03	22	0.00
4	0.9462	849.8541	10	0.00

7.2.1 Interpretation of discriminant function results

The associations indicated by Chi-square values are reliable but, it is important to note that they emanate from the classification of households into five groups on the basis of thirteen indicators. Because of the numerous indicators, there is a possibility that at least one indicator could differentiate a group of households from other groups of households (i.e. QOL groups). Resultantly all of the four functions show reliable associations between the QOL groups and the indicators although each function has one or two outstanding discriminating indicators. The outstanding discriminating indicators are marked with (*) in Table 7.3 and they are the focal points in discriminant function analysis.

Table 7.3: Pooled within correlations between discriminating variables and standardized canonical discriminant functions (OHS 1996)

	Function			
	1	2	3	4
Highest education level completed	0.759*	-0.634	-0.097	-0.029
Worked past 7 days	-0.139*	-0.00581	-0.0008	0.082
H/hold's main water source	0.487	0.761*	-0.391	-0.088
H/hold's fuel for cooking	0.428	0.287	0.559*	0.215
H/hold's fuel for heating	0.393	0.260	0.503*	0.209
H/hold's fuel for lighting	0.288	0.265	0.427*	0.004
H/hold refuse disposal	0.311	0.269	0.370*	0.300
Type of dwelling occupied by h/hold	0.161	0.143	0.362*	-0.302
Have access to the medical scheme	-0.145	0.014	-0.135	0.588*
Cellular phone telephone	-0.082	0.039	-0.067	0.521*
Telephone in dwelling	-0.23	-0.05	-0.332	0.442*
Health facility usually visited by h/hold	0.159	-0.014	0.193	-0.370*
H/hold distance from medical facility	0.086	0.132	0.022	0.166*

NB. Pooled within correlations between discriminating variables and standardized canonical discriminant functions. Variables ordered by absolute size of correlation within function.

*Largest absolute correlation between each variable and any discriminant function.

Results in table 7.3 indicate that two indicators correlate highly with the first discriminant function These are *highest level of education completed* by the household head (correlation = 0.76) and whether the household head was employed at the time of the survey (correlation = -0.139). Completed level of education contributes substantially in differentiating the QOL conditions experienced by the five households groups. This is particularly the case with group two in comparison with the rest of the groups. Group two happens to be the group with the best QOL and herein most of the households are headed by people with tertiary education (at least 98.8%), 33.5% of whom have at least degree. This is in contrast for instance with groups one and three wherein none of the households is headed by someone with Standard Ten (see Table 7.8); details regarding differences in QOL groups will be dealt with in section 7.4.

Employment status of the household head also emerges as an outstanding discriminating indicator. Again when one looks at Table 7.8 one sees that this indicator clearly differentiates groups two and four from the rest of the QOL groups. In groups two and four most households have full time jobs, 78.6% and 57.5% respectively. Unemployment levels are relatively low in these two groups, 18.8% in group two and 37.9% in group four. This is in contrast with the other three groups where the percentage of household heads with full time employment is lower than 40% and, unemployment at least half of the household heads are unemployed. As will be seen in section 7.4 this finding is symbolic of the multidimensional influence of education on the various aspects that impact on household QOL. Households in QOL groups where the household head is educated generally experience better living conditions than otherwise and this has several implications. It suffices to leave this aspect at this point for now; it will be dealt with later on during the discussion of the study's findings.

Witt regard to the second discriminant function, *household's main source of water* loads highly with this function, with an absolute correlation of 0.761. This indicator differentiates group three from the rest of the groups. As will be detailed in section 7.4, group three is the only group without a single household having access to piped water (see Table 7.12). The rest of the groups rely mostly on piped water in the dwelling (i.e. groups two and four at 87.8% and 77% respectively) or they rely on piped water in the yard and public tap water (see Table 7.12). This finding highlights the problem of access to clean water and by implication, the problem of fetching water. The finding should be viewed in a broader social and demographic context given the fact that the majority of households in group three are headed by females (53.2%), with low education and predominantly rural (96.6%). The rural situation of most of these households is likely to impact negatively on household access to other QOL indicators.

7.2.2 Prediction of group membership

The results above emanate from the application of discriminant function analysis to the five QOL groups obtained in cluster analysis. As indicated earlier on discriminant function analysis was applied through the use of pre-determined QOL groups (QOL 1-

QOL 5) serving as the grouping variable, and the multiple response variables or QOL indicators. As one may recall, the reason for applying dicriminant function analysis was two fold. Firstly to identify the discriminating indicators and describe the possible causes of the circumstances leading to such differences (DDA). The second reason for applying discriminant function analysis was to predict household group membership on the basis of the QOL indicators accessed (PDA). The thinking being, group membership depends on what indicators a household accesses.

Since the same indicators were used to classify households into the five QOL groups, predictive discriminant analysis (PDA) should be able to ascertain predict household group membership. Table 7.4 shows the results indicating the extent of fit between the cases predicted by the discriminant function model and the cases originally classified in cluster analysis. These results indicate that 95.5% of the original cases are correctly classified in the discriminant function analysis model. With the exception of QOL5, the fit between the classification results of the two models is above the overall result of 95.5%, with the best fit being in QOL3 and QOL4 where 98% and 97.8% of the original cases in the respective groups are correctly predicted under discriminant function analysis. The poorest fit between the two models is observed in group five where 87.6% of the original cases are correctly classified by the discriminant function model. Most of the misclassification is observed in group three (QOL3) where 8.8% of the cases originally classified under QOL5 are predicted to belong to QOL3 by discrminant analysis. This is likely to be a result of the similarities in education level of household heads, access to sanitation and type of dwelling occupied. With regard to education, both groups have low education levels, with 90.3% of the household heads in QOL5 having education below Standard 9 as compared to 100% of their counterparts. When it comes to sanitation almost equal proportions of households in both groups rely on pit latrines; 24.3% in QOL5 and 25.1% in QOL3. As for type of dwelling, 36.5% of the households in QOL5 live in formal dwellings while 28.6% in QOL3 enjoy similar conditions.

The prediction 2.9% of the cases as belonging to QOL4 instead of belonging to QOL5 as originally classified could be due to the fact that the two groups experience similar conditions with regard to access to water on site. Households with piped water on site make up 18.8% in QOL4 as compared with 18.3% in QOL5. Details of these results are provided in section 7.4 dealing with cluster analysis.

Table 7.4: Classification results of original and predicted group membership for OHS 1996

	Predicted Group Membership						
	Cluster Number of Case	1	2	3	4	5	Total
Original count	1	**3321**	0	10	44	43	**3418**
	2	0	**1343**	0	8	14	**1365**
	3	32	0	**1944**	0	8	**1984**
	4	18	25	1	**5180**	74	**5298**
	5	22	1	292	96	**2894**	**3305**
	Percent ages						
	1	**97.2**	0	0.3	1.3	1.3	**100**
	2	0	**98.4**	0	0.6	1.03	**100**
	3	1.6	0	**98.0**	0	0.4	**100**
	4	0.3	0.5	0.02	**97.8**	1.4	**100**
	5	0.7	0.03	8.8	2.9	**87.6**	**100**

In all the chapters presenting the study's findings, the quality of life clusters have been ranked as indicated in the results relating to cluster analysis. The distribution of the group centroids for the first discriminant function has been used in each case to rank the QOL clusters. This process has been applied to the results in OHS 1996. Table 7.5 shows results of the discriminant functions evaluated at the group means. The group centroids for the first discriminant function were used to rank the QOL groups in cluster analysis. According to these results, group two (QOL2) with its centroid located 4.94 units at along the first discriminant function is ranked as number one and QOL3 with its centroid located -4.55 units along the same DF, is ranked number five.

Table 7.5: Unstandardised canonical discriminant functions at group centroids

Cluster Number of Case	Function			
	1	2	3	4
1	-2.2728	1.8719	-0.4148	-0.2036
2	4.9480	-1.598	-0.0558	-0.5684
3	-4.5507	-1.8417	1.2804	-0.0494
4	2.1392	0.6332	0.6197	0.1809
5	-0.3905	-1.1853	-1.3100	0.1849

7.3 Formation of quality of life groups using cluster analysis (OHS 1996)

As indicated in chapter three – dealing with the methodology – and chapters four to six, cluster analysis enabled the current study to group households which access similar QOL indicators, into QOL groups. As part of the analysis a thorough scrutiny of the data with the intention of eliminating cases with missing variables was done for each data set. In the case of OHS 1996, this process reduced the number of households from 15917 to 15370. The 15370 households or cases were subjected to the clustering process based on thirteen indicators. This process resulted in five clusters of households (QOL1 – QOL5). Table 7.6 shows the indicators involved in the analysis together with the final cluster centres for the five QOL groups that emerged. (see also Appendix H). Details of the findings pertaining to the results of cluster analysis follow in Section 7.4 where aspects of the five quality of life groups are described.

A crucial indicator – *Type of toilet facility used by a household* – was not used in cluster and discriminant analyses because of the way it was captured; households accessing a particular type of toilet on site were captured separately from households accessing a toilet off site. In the latter category are households with no access to a toilet. Although data pertaining to the two variables should point to two mutually exclusive outputs, the analysis found numerous inconsistencies. As a result this indicator could only be used for descriptive purposes. Details of these findings are provided in section 7.4.4 which deals with sanitation.

Table 7.6: Final cluster centers for OHS 1996

Variables in analysis	Cluster				
	1	2	3	4	5
Cellphone telephone	1.9942	1.7985	1.9965	1.9360	1.9918
Type of dwelling occupied by h/hold	6.6524	8.5106	5.9723	8.2760	5.4678
Worked past 7 days	2.3297	1.40	2.6502	1.8020	2.1359
H/hold's fuel for cooking	4.4228	6.7861	3.2903	6.7641	3.8980
H/hold's fuel for heating	4.3847	6.6996	3.2767	6.6682	3.9029
H/hold's fuel for lighting	3.5731	4.8410	2.6885	4.9117	2.9474
Health facility usually visited by h/hold	4.7384	6.9473	4.6709	5.9621	4.7788
Have access to the medical scheme	1.8918	1.3172	1.9501	1.6506	1.9062
Telephone in dwelling	1.9155	1.2843	1.9924	1.5134	1.9828
H/hold refuse disposal	4.6934	7.1480	2.7893	7.5221	3.8596
H/hold's main water source	10.6656	11.71578	4.3468	11.7174	9.1652
H/hold distance from medical facility	3.4026	3.5421	2.6245	3.7809	3.1567
Highest education level completed	2.0661	18.0220	3.0625	10.4428	9.2590

7.4 Comparing the different aspects of the five quality of life groups

Before attempt is made to compare the quality of life conditions in the various QOL groups, one needs to determine how the QOL groups themselves differ from each other in terms of the conditions experienced. In other words, there is a need to assess objectively the conditions in the quality of life groups. This brings in the issue of ranking the QOL groups. Like in chapters four to six, ranking the QOL groups was based on the findings of the discriminant function model. Discriminant function analysis provides a distribution of groups of cases along particular dimensions or discriminant functions. As detailed in Section 7.2, the first discriminant function (DF) accounts for most of the between - group variation. Clusters or QOL groups will have their centroids distributed along a particular DF on the basis of the indicator characteristics used in the analysis. A group of households with the best access to the selected QOL indicators will have its centroid located farthest on the positive side of the first dimension or discriminant function. Similarly a group of households with the poorest access to the selected QOL indicators will be have its centroid located farthest on the opposite side of the first dimension or

discriminant function. This enabled the study to rank the QOL groups whose results are provided in Table 7.7.

Findings in this respect indicate that group two with its centroid located 4.95 units on the right side (i.e. the positive side) of the first DF is ranked number one. Households in this group have the best access to the QOL indicators considered in the study. As such group two is judged to experience the best quality of life. Group two is followed by group four whose centroid is located 2.14 units along the first DF. By contrast Group three with its centroid located -4.55 units along the first DF is ranked fifth. Households in this group have, in most cases, the poorest access to the QOL indicators considered in the study. Group three is thus judged to experience the poorest QOL. The entire distribution of the five ranked groups of households (i.e. QOL groups) constitute the QOL index.

Table 7.7: Distribution of QOL groups and their respective ranks based on group centroids

QOL Group number	1	2	3	4	5
Group centroids – First discriminant function	-2.27	4.95	-4.55	2.14	-0.39
Rank of QOL Group	4	1	5	2	3

Having looked at how households experiencing similar QOL conditions were grouped, the study will now embark on describing the characteristics of the QOL groups themselves. Table 7.8 provides a summary of the demographics for the five QOL groups which came out of the clustering process. Details pertaining to these results are provided in section 7.4.1.

Table 7.8: Demographics, employment and income of the QOL groups (OHS 1996)

	Cluster number				
Rank of group	1	2	3	4	5
Original cluster number	2	4	5	1	3
Population group					
Asian	5.3	8.6	0.2	1.3	0.1
Black	36.4	55.2	95.8	90	98.2
Coloured	7.7	15.2	3.5	8.3	1.8
White	50.6	21.1	0.5	0.4	-
Age of head of the household					
15-19 years	0.1	0.8	3.6	0.2	0.7
20 - 29	14.1	10.5	23.3	3.8	4.6
30-49 years	59.9	52.7	54.7	37.6	35.2
50 - 69	21.2	30	15.5	42.1	44.1
70 years and older	4.8	6.0	2.9	16.4	15.4
Median age	40	44	36	54	55
Sex of head of the household					
Male	77.8	69.1	56.5	54.6	46.8
Female	22.2	30.9	43.5	45.6	53.2
Education Level					
Below standard 9	-	70.3	90.3	100.0	100.0
Standard ten (Matric)	-	29.3	9.1	-	-
Certificate or Diploma	65.3	0.4	0.6	-	-
Degree or post graduate Degree	33.5	0.1	0.03	-	-
Employment Status					
Full time	78.6	57.5	39.8	30.8	15
Part – time	2.6	4.5	6.1	4.4	2.4
Unemployed	18.8	37.9	53.8	64.5	82

Table 7.8: **Demographics, employment and income of the QOL groups (OHS 1996)- continued**

	Cluster number				
Rank of group	1	2	3	4	5
Original cluster number	2	4	5	1	3
Gross monthly (Household) Income					
R1 – R200	0.6	1.0	3.4	4.7	3.3
R 201 – R500	0.7	2.8	9.0	8.8	6.5
R501 – R1000	1.1	7.0	10.5	7.7	3.1
R1001 – R1500	2.5	9.7	9.7	6.8	1.7
R1501 – R2500	6.7	13.7	5.8	3.0	0.6
R2501 – R3500	12.5	8.2	2.3	0.9	0.3
R3501 – R4500	10.1	5.0	0.8	0.3	0.1
R4501 – R6000	13.6	3.9	0.5	0.2	-
R6001 – R8000	8.1	1.7	0.4	0.2	-
R8001 – 11000	5.9	0.9	0.1	0.1	-
R11001– 16000	3.9	0.4	0.1	-	0.1
R16001 - 30000	1.9	0.2	0.1	-	-
R 30000 +	0.4	0.1	-	-	-
TOTAL RESPONSE RATE	990 (72.5 %)	3023 (57.1%)	1433 (43.4%)	1148 (33.6%)	329 (16.6%)
Median income (Rands)	4261. 37	1904.77	899.21	652.60	383.06
Number of cases (N = 15370)	1365	5298	3305	3418	1984
Percentage	8.9	34.5	21.5	22.2	12.9

7.4.1 Analysis of Demographics (OHS 1996)

(a) Demographics of Quality of Life (Group 2)

Group two is the smallest among all five QOL groups with just around 9% of the households involved in the study. It ranks first on the QOL index hence judged to experience the best access to the selected QOL indicators. The majority of households in group two are headed by relatively young people with a median age of 40 years. One household (0.1%) is headed by a person aged nineteen while 14.1% of the household heads are aged 20-29. The majority of household heads are in the 30-49 age category. In fact group two has the biggest proportion of households aged 30-49 of all QOL groups (see Table 7.8).

At least one in five households is headed by someone aged between fifty and sixty nine years while households headed by elderly people (70 years and older) constitute 4.8%. Households in group two are predominantly urban (84.2%) and, males dominate the household headship (77.8%).

When it comes to population composition, at least half of the households are White while 36.4% are African. Coloured households constitute 7.7% and Asian households are the least (5.3%).

Close to a third of the households (32.7%) speak English at home and 30.3% speak Afrikaans. Xhosa - speaking households constitute 9% while those speaking Zulu make up 6.5%. Five percent of the households speak Sepedi while 4.8% speak Sesotho at home. Households which speak Setswana constitute 3.7%.

The level of education completed by household heads in this group is substantially high with one in three household heads (33.5%) having a degree and 48% having a diploma with Standard ten. Sixty eight households or 5% for that matter have a diploma with Standard nine while 12.5% have a National Teachers' diploma.

The level of unemployment is relatively low (18.8%) with most of the household heads having full time jobs (78.6%). Households headed by people working on part time basis make up 2.6%.

Group two has the highest response (72.5%) when it comes to disclosing information on household income. Proportionately fewer households (1.3%) earn less than R500 a month compared with the rest of the QOL groups. Around ten percent of the households earn between R500 and R2500 while 36.2% of the households earn between R2500 and R 6000 a month. Group two has the biggest percentage of households (3.9%) which earn over R 11000 a month (see Table 7.8 for details).

The income and employment profile of this group suggests that households in group two are in a relatively better position to make use of private health services. Information in this regard shows that 66.4% of the households visit a private doctor or specialist and 4% visit a private hospital. Households which visit a private clinic constitute 3.8%. Public hospitals provide health services to 15.2% of the households while 9% visit a public clinic when the need arises. Twenty three households or 1.7% make use of other public health services to meet their health needs.

(b) Demographics of Quality of Life (Group 4)

This group, ranked second on the QOL index, contains the largest number of households involved in the study; a third of the sampled households are in group four. The age distribution of household heads is approximately normal with a mean of 45.5 and a median of 44. Unlike group two, this group has quite a number of households (44 households or 0.8%) headed by people aged 15-19. A comparatively smaller percentage of the household heads (10.5%) are aged 20-29. Similar to the situation in group two, the majority of households (52.7%) are headed by people aged 30-49 (see Table 7.8). Three out of ten households are headed by people aged between fifty and sixty nine years while 6% of the household heads are elderly people aged 70 and above. Males dominate the household headship (69.1%) and the majority of households are urban (91.2%).

With regard to population composition, Africans/Blacks constitute the majority (55.2%) followed by Whites (21.1%) while Coloureds and Asians make up 15.2% and 8.6% respectively. Afrikaans and English dominate the language spoken at home, 25.4% and 18.4% respectively while Zulu and Xhosa – speaking households account for 16% and 11.5% respectively. Households which speak South Sotho constitute 8.2% while those speaking Setswana make up 8.4%. Sepedi is used by 4.5% of the households in group four.

The level of education completed by household heads is comparatively low with six household heads (0.1%) having a degree and, twenty three households (0.4%) headed

by someone with a certificate or diploma. Close to three out of ten household heads have completed Standard ten while seven out of ten households are headed by someone with education below standard nine.

Despite the relatively low level of education, unemployment among household heads is moderate compared with most groups constituting the QOL index (37.9%). Close to six out of ten household heads are employed on a full-time basis while 4.5% are employed on a part-time basis.

Close to sixty percent of the households in group four provided information pertaining to household income. Of these households 3.8% earn less than R500 a month while 30.4% earn between R500 and R2500. Seventeen percent of the households which disclosed the households' monthly income earn between R2500 and R 4500 and (0.7%) earns at least R11 000 a month (see Table 7.8 for details).

Relatively fewer households rely on the public health sector when the need for health care services arises. At least half of the households (51.8%) rely on the public health service sector; 23.4% visit public clinics and 28.4% visit public hospitals. The private health sector provides health services to 45.5% of the households of which, 41.3% visit a private doctor or specialist while 2.5% visit a private hospital. Probably the high level of employment particularly on full time basis could be contributing to this kind of situation.

(c) Demographics of Quality of Life (Group 5)

Group five ranks third on the QOL index, consisting of 21.5% of the sampled households. With a median age of 36, the age distribution of household heads is skewed towards the old age groups. Group five happens to have the biggest number of households (118 or 3.6%) headed by people aged 15-19. Households headed by people aged 20-29 make up 23.3% while households headed by someone aged 30-49 constitute 54.7% (see Table 7.8). On the ageing side of the age continuum, group five has the smallest proportion of households headed by elderly people (2.9%).

Although males constitute the majority of household heads (56.5%), the dominance is not as high as in groups two and four (see Table 7.8). The majority of households in group five are rural (63.6%).

When it comes to racial composition African households dominate the group (95.8%) followed by Coloureds (3.5%). Indian and White households make up small proportions, 0.2% and 0.5% respectively.

No single language comes out prominently as the language spoken by most households in group five although Xhosa leads by 28.7% followed by Zulu (17.5%) and Sepedi (11.6%). Twelve percent of the households speak South Sotho while one in ten households speaks Setswana. Tsonga/Shangani – speaking households make up 6.7% while 3.9% speak Afrikaans.

The level of education completed by household heads is low with one household head (0.03%) having a degree while twelve household heads (0.4%) have a Diploma. Seven households or 0.2% have got a National Teachers' Certificate (NTC) and 9% of the households are headed by someone who has completed Standard ten. Nine out of ten households are headed by people without standard ten (see Table 7.8).

The level of unemployment is relatively high with 53.8% of the household heads having had no jobs at the time of the survey. Households headed by people with full time employment make up 39.8% while those with part-time jobs make up 6.1%.

Less than half of the households (43.4%) provided information in respect of income. The income profile of households which disclosed income shows a bias in distribution towards the low income categories. For instance 12.4% of these households earn less than R500 a month while 26% earn between R500 and R2500. Households which earn between R2500 and R6000 make up 3.6% and 0.2% earn at least R11 000 a month; no household in this group earns more than R 30 000 a month.

There is a strong reliance on public health services by households in group five; 85.2% of the households visit either a public clinic or public hospital. The public clinic provides health services to 51% while 34.2% visit a public hospital. The private health sector offers health services to 12.8% of the households. This situation could be due to the rural nature of most households, employment status of the household heads and the income profile described above.

(d) Demographics of Quality of Life (Group 1)

This group with 22.2% of the sampled households ranks fourth (i.e. second last) on the QOL index. Unlike in group five, the age distribution of household heads in group one is skewed towards young ages; the median age is 54. In fact group one has the biggest percentage of households headed by elderly people (16.4%). On the young side of the age continuum, six households constituting around 0.2% are headed by people aged 15–19 while 3.8% of the households are headed by people aged 20 – 29. In most cases as indicated in Table 7.8, the 30 – 49 age category contains the majority of household heads but this is not the case with group 1 where 37.6% of the household heads fall in this category. Instead, the majority of household heads (42.1%) are in the 50 – 69 age category. Male headed households outnumber female headed households, with the former constituting 54.6% and, 59% of the households in this group are rural.

As far as race is concerned, African households dominate group one at 90% followed by Coloured households which make up 8.3%. Asian and White households are in the minority, 1.3% and 0.4% respectively.

When it comes to language used at home, no single language comes out as the most commonly spoken language in this group. Xhosa is spoken by 15.7% while 15.4% of the households speak Zulu. Households speaking Sepedi make up 12.8% while Afrikaans - speaking households constitute 9.3%. South Sotho is spoken by 12% of the households while 11.7% speak Setswana. Nine percent of the households in group one speak Tsonga or Shangani while 4.6% speak Siswati.

The level of education completed by household heads or people acting in this capacity is low, with two thirds of them having had no education and, none has gone beyond standard three; only 3.5% of the household heads indicated to have completed standard three.

Unemployment is high with 64.5% of the household heads indicating that they had not been working during the seven days prior to the survey. Households headed by someone with a full time job constitute 30.8% while those employed on a part time basis make up 4.4%.

Information pertaining to household income is inconclusive as just a third of the households provided such information. Of these households 13.5% earn less than R500 a month while 17.5% earn between R500 and R2500. Households earning between R2500 and R6000 a month make up 1.4% (see Table 7.8 for details).

The high level of unemployment and the generally low household incomes could be contributing to most of the households to rely on public health services – 54.2% visit a public clinic while 28.2% visit a public hospital. Households which make use of private health services make up 14.3% - two percent of the households visit a private clinic or hospital.

(e) Demographics of Quality of Life (Group 3)

This group accounts for around 13% of the sampled households. It ranks lowest (i.e. fifth) on the QOL index hence judged to be experiencing the poorest measurable conditions. With a median age of 55, most households are headed by relatively old people; 15.4% of the household heads are aged 70 years and older. On the young side of the age continuum, thirteen households (0.7%) are headed by people aged 15-19 while 4.6% of the households are headed by a person aged 20 – 29. Group three has the smallest proportion of households (35.2%) headed by people aged 30-49. Group three has the largest proportion of household headed by people in the 50-69 category

(44.1%). Female headed households are in the majority (53.2%) and, at least nine out of ten households (96.6%) are rural.

As far as population composition is concerned, Blacks or African households are predominant (98.2%) with Coloureds making up 1.8% and Asians 0.1%.

As far as language is concerned, Xhosa - speaking households are in the majority (45.4%) followed by Zulu-speaking households (25.2%). Five percent of the households speak Setswana and 4% speak South Sotho.

The level of education completed by household heads in this group is low with 55% of them having had no education. None of the household heads completed Standard ten; the highest level completed by a household head is Standard seven, completed by just 0.5% of them.

The employment status of household heads portrays the education profile of the group as the majority of household heads (82%) are unemployed. In this group, 15% of the household heads or acting household heads are employed on a full – time basis while 2.4% are headed by someone with a part time job.

Information pertaining to household income is quite scanty; 16.6% of the households provided information in this respect. Of the 16.6% households which disclosed the household income, close to ten percent (9.5%) earn less than R500 a month while 5.4% earn between R500 and R2500. Six households or 0.4% earn between R2500 and R 4500 a month and one household (0.1%) earns between R11 000 and R 16 000 (see Table 7.8 for details).

The rural nature of the group coupled with a high level of unemployment and the generally low household incomes could be contributing to most of the households to rely on public health services – 55.5% visit a public clinic and 31.8% visit a public hospital.

Twelve households or 0.6% visit a traditional healer and, another twenty households or 1% make use other public health services. Households which make use of private health services make up 11.1%.

7.4.2 Analysis of residence (type of dwelling)

This section provides a description of the type of dwelling occupied by households in the various QOL groups. Information pertaining to this aspect is shown in Table 7.9 below. In addition to type of dwelling, a description of the geographical distribution of households by province is provided. Like in the previous three chapters dealing with the study's results, the description provides additional information which may not be appearing in Table 7.9. Once again it is brought to the reader's attention that the description of findings is presented according to the ranking results of the quality of life groups, starting with a group ranked as number one.

Table7.9: Type of dwelling and geographical distribution of households by QOL group (OHS 1996)

	QOL Group /Cluster number				
Rank of group	1	2	3	4	5
Original cluster number	2	4	5	1	3
Type of dwelling					
Formal dwelling	95.8	94.7	36.5	57.9	28.6
Informal dwelling	1.0	3.7	33.6	17.8	3.4
Traditional dwelling	3.0	1.3	29.3	23.6	67.9
Other	0.4	0.3	0.8	0.7	0.3
Province					
Gauteng	27	31.1	10.6	11.7	0.6
Western Cape	15.2	14.5	6.7	5.1	0.7
Northern Cape	2	5.4	1.6	5.8	2.0
Eastern Cape	15.3	11.2	21.9	12.1	45.3
Free State	8.5	7	9	9.8	1.6
Limpopo	9.5	3.8	17.5	23.3	14
North West	3.9	5.6	10.3	10.2	5
Mpumalanga	4.7	5.5	9	11.8	5
KwaZulu-Natal	13.9	16	13.5	10.1	25.8

(a) Analysis of residence for Group 2 (QOL2)

The majority of households in this group (95.8%) live in formal dwellings with 82% of them occupying permanent brick houses on separate stands. Households living in flats and town houses constitute 5.6% and 4.5% respectively while those occupying a room in the backyard make up 3.2%. Informal dwellings provide shelter to 1% of the households, 0.3% of which are in the backyard. Some eight households or 0.6% live in a room in a hostel or compound for workers and, three percent of the households in this group live in traditional houses.

When it comes to geographical distribution, the highest percentage of households (27%) is found in Gauteng for followed by Eastern Cape (15.3%) and Western Cape (15.2%). Close to 14% of the households are in KwaZulu-Natal while 9.5% are found in Limpopo. Northern Cape has the least number of households constituting 2% (see Table 7.9).

(b) Analysis of residence for Group 4 (QOL4)

The situation in group four regarding type of dwelling, differs slightly from that in group two. Most of the households in group four (94.7%) have access to formal dwellings. More than three quarters of the households (76.3%) live in a brick house on a separate stand while 5.7% live in a town house and 5.4% occupy a flat in a block of flats. Some 5.5% of the households occupy a room in the backyard while 1.8% live in a room in hostel or compound for workers. Informal dwellings provide shelter to 3.7% of the households with 0.8% of them being in the backyard. Traditional houses provide accommodation to 1.3% of the households in this group.

As far as spatial distribution is concerned, at least three out of ten households are found in Gauteng while 16% are in Kwazulu-Natal. Western Cape accounts for 14.5% of the households while 11.2% are found in Eastern Cape. Seven percent of the households are in Free State and 5.6% are in North West. The least number of households constituting 3.8% are found in Limpopo.

(c) Analysis of residence for Group 5 (QOL5)

Access to formal dwellings is poor in this group compared with the situation in groups two and four. Only 36.5% of the households in group five live in formal dwellings compared with over 90% in groups two and four (see Table 7.9). Households living in permanent brick houses on separate stands constitute 29.3% while 0.7% live in a town house. Flats accommodate 1.4% of the households while 3% live in a room in the backyard. Sixty nine households or 2.1% occupy a room in a hostel or compound for workers and, at least one in three households lives in an informal dwelling, with 5.8% of them being in the backyard.

When it comes to geographical distribution, close to 22% of the households are found in Eastern Cape while 17.5% are in Limpopo province. Kwazulu-Natal accounts for 13.5% of the households while Gauteng and North West have almost similar proportions of 10.6% and 10.3% respectively. Mpumalanga and Free State account for 9% each while 6.7% are in Western Cape (see Table 7.9).

(d) Analysis of residence for Group 1 (QOL 1)

Households in group one (ranked fourth on the QOL index) have better access to formal dwellings than households in group five which it follows. Close to sixty percent of the households in group one live in formal dwellings; 48.4% live in permanent brick houses occupying separate stands. Flats and town houses are less common, accommodating 1.4% and 2.4% of the households respectively. Fifty four households or 1.6% live in a room in a hostel or compound for workers while 17.8% live in informal dwellings. Close to a quarter of the households in group one live in traditional houses.

As far as spatial distribution is concerned, 23.3% of the households in group one are found in Limpopo province while 12.1% are in Eastern Cape. Mpumalanga has got 11.8% of the households while 11.7% are found in Gauteng. North West and KwaZulu-Natal have almost the same proportions 10.2% and 10.1% respectively while 9.8% are

in Free State province. The least number of households constituting 5.1% are in Western Cape (see Table 7.9 for details).

(e) Analysis of residence for Group 3 (QOL3)

Group three ranks fifth on the QOL index and, it has the poorest access to formal dwelling among all the five groups. In this group 28.6% live in formal dwellings, a quarter of which live in permanent brick houses on separate stands. Households living in a flat in a block of flats make up 1.2% while town houses provide shelter to three households or 0.2%. Informal dwellings accommodate 3.4% of the households with 0.6% of them being in the backyard. Over two thirds of the households in group three live in traditional houses.

In as far as spatial distribution is concerned, the majority of households this group (45.3%) are found in Easter Cape while 25.8% are found in KwaZulu-Natal. Limpopo province has got 14% of the households while North West and Mpumalanga have 5% each.

7.4.3 Analysis of fuel used by households

This section provides a description of the type of fuel used by households in respect of cooking and lighting. This section provides a description of the type of fuel used by households in respect of cooking and lighting. Table 7.10 shows the fuel types focused upon in this study. In some cases the description includes details pertaining to fuel types other than those indicated Table 7.10. The focus however, is on fuel types in the table which are considered as key indicators in this respect. The key indicators in respect of fuel for cooking include electricity, wood and paraffin while indicators considered in respect of fuel for lighting include electricity, paraffin and candles. Focusing on these indicators emanates from the fact that most households use these fuel types yet some of them, like paraffin can be hazardous to life in various ways particularly in informal dwellings. Results indicate that in spite of the differences in access to amenities and of course ability to access selected QOL indicators, households

tend to use electricity more for providing lighting in dwellings than for cooking purposes across QOL groups.

Table 7.10: Fuel used by households for cooking and lighting

	QOL /Cluster number				
Rank of group	1	2	3	4	5
Original cluster number	2	4	5	1	3
Fuel for cooking					
Electricity	91.1	88.8	6.2	23.0	2.7
Paraffin	2.4	4.3	46.9	27.4	13.7
Wood	2.3	0.4	37.5	38.2	76.4
Fuel for lighting					
Electricity	93.8	96.5	21.5	45.9	11.1
Paraffin	2.3	1.4	29.7	19.4	34.8
Candles	3.7	2.0	48.4	34.3	53.6

(a) Fuel used by households in Group 2 (QOL2)

Electricity is the most commonly used type of energy for household purposes in group two. As for fuel for cooking at least nine out of ten households use electricity while 2.4% use paraffin. Households which rely on wood as fuel for cooking make up 2.3%. Forty five households or 3.3% use gas to cook while twelve households (0.9%) use coal. With regard to fuel for lighting, 93.4% of the households use electricity while 3.7% use candles. Households which use paraffin to light dwellings constitute 2.3%.

(b) Fuel used by households in Group 4 (QOL4)

Group four is one of two groups – the other being group two – which are better off when it comes to fuel used for household purposes. With regard to fuel for cooking, 88.8% of the households in group four use electricity while 4.3% use paraffin. Households which use coal make up 2.4% while twenty two households or 0.4% in each case, use gas and wood. When it comes to fuel for providing light in dwellings, close to 97% of the households use electricity while 2.0% use candles.

Households which use paraffin make up 1.4% and, six households or 0.1% use gas to light the dwellings.

(c) Fuel used by households in Group 5 (QOL5)

Group five ranks third on the QOL index. This group is worse off than the first two groups when it comes to fuel used for household purposes. For example, just around six percent of the households use electricity to cook while 37.5% use wood. The majority of households use paraffin as fuel for cooking (see Table 7.10). Four percent of the households cook with gas while 3.9% use coal. Some forty seven households (1.4%) use animal dung to prepare meals. When it comes to fuel for lighting 21.5% of the households use electricity while 29.7% use paraffin. Close to half of the households use candles to provide light in dwellings.

(d) Fuel used by households in Group 1 (QOL1)

Group one ranks fourth on the QOL index but the situation regarding fuel for household use is better than that in group five which is ranked third. For instance 23% of the households in group one use electricity as energy for cooking, a figure that more than trebles the 6.2% in group five (see Table 7.10). Households in group one which use paraffin constitute 27.4% while 38.2% use wood to cook. Some 8.2% of the households use coal for cooking while 2.5% use gas. When it comes to energy for lighting, 45.9% of the households in group one use electricity while 19.4% use paraffin. At least a third of the households use candles to provide light in the dwellings and, eight households (0.2%) use gas for the same purpose.

(e) Fuel used by households in Group 3 (QOL3)

Group five is ranked lowest (i.e. fifth on the QOL index) and, household use for electricity as a form of energy is lowest in this group. With regard to energy for cooking, just 2.7% of the households use electricity while 13.7% use paraffin. More than three quarters of the households rely on wood to cook. Some 3.5% of the households use animal dung to cook while 2.3% use coal. Twenty six households (1.3%) use gas to prepare meals.

When it comes to fuel used for lighting, more than half of the households use candles while 34.8% use paraffin. Households which use electricity to provide light in dwellings make up 11.1% and, eight households (0.4%) use gas.

7.4.4 Analysis of sanitation

This section looks at the sanitation services accessed by households in the five QOL groups. Like in the previous three chapters dealing with the study's findings (i.e. chapters four to six), sanitation has been operationalised in terms of "type of toilet facility" a household accesses and, "rubbish removal services". Similar to the situation in OHS 1997, the variable "toilet facility" in the data for OHS 1996 was captured in such a way that households with a toilet on site (i.e. either in the dwelling or in the yard) were separated from households accessing toilets from elsewhere. Much as the two are mutually exclusive, substantial inconsistencies in responses were picked up in the analysis – the cases in the two variables could not tally up. It was decided to leave out the variable "access to toilet off site" because of the inconsistencies. Like in the case of OHS 1997, data on households with no access to toilet gets excluded from the analysis as it was captured under the variable labeled "access to toilet off site". The number of households (with the corresponding percentages) having a toilet on site are indicated in Table 7.11. This on its own indicates the gravity of this indicator even without toiling with the inconsistencies caused by the incorporation of households which access toilets elsewhere. Table 7.11 shows the results in respect of access to sanitation by households in the five QOL groups. Like in the previous chapters dealing with the study's findings, the description of findings provides details which in certain instances go beyond the information provided in Table 7.11.

Table 7.11: Access to sanitation by households

	Cluster number				
Rank of group	1	2	3	4	5
Original cluster number	2	4	5	1	3
Toilet on site					
Flush toilet	31.7	42.3	19.3	23.7	12.6
Ordinary pit latrine	55.0	43.7	66.2	62.8	78.5
Bucket	10.1	11.4	10.7	10.5	3.4
Number of cases involved in analysis	**347 (25.4%)**	**1168 (22%)**	**1052 (31.8%)**	**1001 (29.3%)**	**522 (26.3%)**
Refuse disposal					
Removed at least once a week	81.6	87.2	18.9	33.9	0.3
Own rubbish dump	13.0	5.9	58.1	48.7	74.5
No rubbish removal services	1.3	1.0	16.4	11.5	23.2

NB. The number of cases involved in the analysis on "Toilet facility" are reflected because they exclude households accessing toilets off site. As such they do not include the total number of cases in each QOL group. In the case of "Refuse disposal", all cases as reflected in Table 7.8 are involved in the analysis.

(a) Sanitation for households in Group 2 (QOL2)

Access to flush toilet in group two is not as high as one would have expected it given that it [group two] ranks number one on the QOL index (see Table 7.11). Close to 32% of the households involved in the analysis have a flush toilet while one in ten households uses a bucket. The majority of households (55%) use pit latrines.

As for rubbish removal more than 80% of the households have their refuse removed by local authorities at least once a week. Thirteen percent of the households have their own rubbish dumps while six households (0.4%) make use of communal refuse dumps.

(b) Sanitation for households in Group 4 (QOL4)

Access to a flush toilet is better in group four (ranked second on the QOL index) than in group two.

Findings in this respect indicate that 42.3% of the 1168 households in group four have access to a flush toilet on site. Households which use a pit latrine make up 43.7% while 11.4% use a bucket toilet.

When it comes to refuse disposal, the majority of households (87.2%) have their refuse removed by local authorities at least once a week. Another 3.4% of the households have theirs removed by local authorities less often than once a week. Almost six percent of the households make use of their own rubbish pits while 1.4% have their refuse removed by community members.

(c) Sanitation for households in Group 5 (QOL5)

Group five ranks third on the QOL index. Results indicate that close to a fifth of the1052 households analysed have a flush toilet on site while (66.2%) use a pit latrine. Close to eleven percent of the households use a bucket toilet.

As far as refuse disposal is concerned, 58.1% of all the households in group five make use of their own rubbish pits while 3.4% rely on communal rubbish dumps. Local authorities remove refuse for 19% of the households at least once a week while 1% of the households have such services less often than once a week. Households with no refuse removal services constitute 16.4%.

(d) Sanitation for households in Group 1 (QOL1)

The situation regarding sanitation in group one differs slightly from that in group five, the former being better off even though it ranked lower. Close to 24% of the 1001 households in group one with a toilet on the premises have it in form of a flush toilet. This is higher than 19.3% recorded in group five. As for households which use pit latrines, such households make up 62.8% in group one compared with 66.2% in group five (see Table 7.11). Households in both groups which use a bucket toilet differ slightly in proportion terms, 10.5% in group one and 10.7% in group five.

When it comes to refuse disposal, close to half of the households in group one have their own rubbish pits while 2% make use of communal rubbish dumps. At least a third of the households have their rubbish removed by local authorities at least once a week. Households with no refuse removal services make up 11.5%.

(e) Sanitation for households in Group 3 (QOL3)

Sanitation findings for group three show that around 26% of the households in this group have access to a toilet on site. The majority of these households (78.5% of 522 households) use pit latrines while 3.4% use bucket toilets. Households which have access to a flush toilet make up 12.6%, the smallest among all QOL groups in OHS 1996.

When it comes to refuse disposal, around three quarters of the households make use of their own rubbish pits while 1.2% rely on communal rubbish dumps. Six households or 0.3% have their refuse removed by local authorities at least once a week and, another 0.3% have theirs removed by community members. Close to a quarter of the households have no access to refuse removal services as indicated in Table 7.11.

7.4.5 Analysis of households' water source

Section 7.4.5 describes the sources of water accessed by households in the five QOL groups. In the description, attempt is made to provide details on water sources including bore holes, dams and rivers which are rather unsafe for household use especially for human consumption. However, the focus is mainly on household access to piped water and the hassles that households face to access piped water in situations where it is not readily available. Table 7.12 provides information in respect of access to piped water by the five QOL groups and the distance traveled by households to fetch water.

Table 7.12: Access to clean water and distance from water source

	Cluster number				
Rank of group	1	2	3	4	5
Original cluster number	2	4	5	1	3
Water					
Piped in dwelling	87.8	77.0	5.8	21	-
Piped on site	4.5	18.8	18.3	30.7	-
Public tap	5.1	3.7	49.6	43.9	-
Distance from water source (where fetching is applicable)					
Within 100 metres	6.1	4.7	19.7	17.5	19.0
101 – 500 metres	8.0	5.2	32.0	30.6	33.0
501 metres – 1 Kilometre	2.6	1.3	12.0	9.9	17.2
More than 1 Kilometre	1.3	1.1	11.7	8.3	18.3

(a) Source of water for households in Group 2 (QOL2)

Group two has the best access to piped water among all five groups. Close to nine out of ten households have piped water in the dwelling while 4.5% have it on site (but not in dwelling). Some 5% of the households get water from a public tap. Communal boreholes provide water to 0.4% of the households while 0.7% of the households have a borehole on site. Eight households (0.6%) rely on the rain water tank while one household (0.1%) fetches water from a stream or river.

Given the water situation above fetching water is not a huge task in the daily chores of many households. Around six percent of the households which have to fetch water, do so within a hundred metre radius while 8% travel between 100 and 500 meters to fetch water. Thirty five households (2.6%) travel between half a kilometer and a kilometer to fetch water while eighteen households (1.3%) travel more than a kilometer to get water (see Table 7.12).

(b) Source of water for households in Group 4 (QOL4)

Access to clean water in group four is better than the situation in group two. The two groups however, differ in terms of the source. Close to 96% of the households in group four have piped water either in the dwelling or on site; 77% of the households have it in the dwelling. This is higher than the 92% recorded in group two. Where group two happens to be better off is that proportionately more households have water in the dwelling (87.8%) compared with 77% in group four. Similarly fewer households in group four have water in the yard (4.5%) while group four has many such households (18.3%). A hundred and ninety seven households in group four (3.7%) rely on water from a public tap while sixteen households (0.3%) have their own boreholes.

With 96% of the households having no burden of fetching water (it is on site), 4.7% of the complement (i.e.1256 households with no water on premises) fetch water within a hundred meter radius while 5.2% travel between a hundred and five hundred meters to fetch water. Seventy one households (1.3%) travel between half a kilometer and one kilometer to fetch water while fifty nine households (1.1%) travel over a kilometer to fetch water (see Table 7.12).

(c) Source of water for households in Group 5 (QOL5)

The water situation in group five is worse than the situation in groups two and four which it follows in terms of ranking. Relatively few households (5.8%) have piped water in the dwelling while households with water on site constitute 18.3%. Close to half of the households rely on public tap water while 2.5% rely on water delivered by a water tanker or carrier. Ninety nine households (3.0%) have a bore hole at home.

Apart from the six percent of the households or so which have water in the dwelling, 19.7% of the households fetch water within a hundred meter radius while 32% travel between 100 and 500 meters. Twelve percent of the households travel between 500 meters and a kilometer to fetch water while 11.7% travel more than a kilometer to fetch water.

(d) Source of water for households in Group 1 (QOL1)

Access to clean water is better for households in group one than in group five. At least half of the households have piped water either in the dwelling or in the yard, the former constituting for 21%. This is better than the 24% recorded in group five. Three out of ten households in group one have water in the yard, a figure that is higher than 18.3% recorded in group five. The two groups however, differ slightly when it comes to reliance on water from public taps; virtually 44% of the households in group one rely on water from public taps which does not differ so much from 49.6% recorded in group five (see Table 7.12). Forty four households (1.3%) in group one have a borehole on site while six households (0.2%) rely on a communal borehole. Ninety three households (2.7%) rely on water from a water carrier.

With over 40% of the households having to fetch water, 17.5% do so within a hundred meter radius while 30.6% travel between 100 and 500 meters. One in ten households travels between half a kilometer and one kilometer to fetch water while 8.3% travel over a kilometer for this purpose.

(e) Source of water for households in Group 3 (QOL3)

This group (ranked fifth on the QOL index) has the poorest access to clean water. None of the households has piped water in the dwelling or on site. Over forty percent of the households (41.3%) rely on water from streams while 15.7% rely on stagnant water from dams. Two hundred and eighty one households (14.2%) fetch water from springs while 13.9% rely on water from communal boreholes; 2% of the households have their own boreholes. Wells provide water to 7.5% of the households and forty four households (2.2%) rely on rain water tanks on site.

The scenario above indicates that fetching water is a routine task for all but around 5% of the households in group three. Apart from the 5% or so, 19% of the households fetch water within a hundred mater radius while one in three households travels between a hundred and five hundred meters to fetch water.

Seventeen percent of the households travel between half a kilometer and one kilometer to fetch water while 18.3% travel over a kilometer to get water.

7.4.6 Analysis of durables

This section provides a description of possession of durable items by households in the various QOL groups. A few indicators have been selected for use in this regard due to the limited information that is available. These indicators include possession of a vehicle, possession of a cellular phone and, existence of a landline telephone in the dwelling (see Table 7.13). In addition to "possession of a telephone" in the dwelling, the variable "Distance from nearest telephone" has been incorporated in the analysis due to the fact a household without a telephone in the dwelling will have to travel in search of one when the need arises. Household items like radio, television and vehicle have not been included in the analysis due to unavailability of data. As for possession of a vehicle, a proxy indicator namely "transport used by a household to get to work" has been used. The assumption being, households possessing a vehicle are likely to use it while getting to work as opposed to using public transport. Like in chapters four to six, details regarding transport used to get to work are incorporated in order to investigate possibilities regarding possession of a vehicle in situations where a household could opts not to use one even though it is available.

Table 7.13: Possession of durable items

	Cluster number

Rank of group	1	2	3	4	5
Original cluster number	2	4	5	1	3
Durables					
Car	53.8	21.3	2.4	1.8	0.5
Cellular phone	19.7	5.7	0.5	0.3	0.2
Landline telephone	71.3	48.5	1.7	8.3	0.7
Distance from nearest telephone					
Less than 100 metres	6.7	18.0	9.9	14.5	2.5
100 metres – less than 200 metres	4.0	11.9	13.5	13.4	5.5
200 metres – Less than 1 KM	4.4	10.3	17.8	18.8	8.1
1 KM – less than 5 KM	5.3	6.2	20.3	18.5	16.6
5 KM – less than 10 KM	2.6	1.0	13.8	10.0	19.5
10 KM or more	2.2	0.8	20.1	11.9	41.8
Don't know	1.0	1.1	2.2	3.0	4.6

(a) Possession of durable items by households in Group 2 (QOL2)

Group two has the best access to the selected durable items among the five QOL groups. Close to a fifth of the households possess a cellular phone and over 70% of the households have a land line telephone in the dwelling (see Table 7.13). This implies that at least 71% of the households do not have to travel in order to make a phone call.

For households which have to travel in search of a telephone 6.7% get hold of a telephone within a hundred metre radius while 4% travel between a hundred and two hundred meters. In this group one in ten households travels more than a kilometer to make a telephone call as indicated in Table 7.13.

As far as transport used to get to work is concerned, at least half of the households indicated that they use their own cars to get to the work place.

A hundred and twenty four households (9.1%) walk to the work place while 12.7% use mini bus taxis and buses; the latter constitute 4.2%. Thirty four households (2.5%) work from home and 18% do not need transport as the household heads are unemployed. All in

all these results indicate that possession of cars for households in this group is relatively high.

(b) Possession of durable items by households in Group 4 (QOL4)

Group four comes second after group two in terms of ranking and, results pertaining to possession of durable items reflect that kind of situation. Close to 49% of the households in group four possess a landline telephone in the dwelling while possession of a cellular telephone is relatively low (5.7%) when compared with the 19.7% for group two. Findings in respect of possession of a telephone indicate that around half of the 5298 households in this group do not have to travel in order to make a telephone call. For the remaining half or so households, 18% get hold of a telephone within a hundred meters while 12% travel between a hundred and two hundred meters to make a telephone call. Eight percent of the households travel at least a kilometer get hold of a telephone.

As for transport used to get to work, at least one in five households indicated that it uses its own car to get to the work place. Ninety seven household heads (1.8%) work from home while 8.5% walk to their places of work. Household heads that use buses and mini bus taxis constitute 21.5%, of which 14.5% use the latter. At least a third of the household heads (34.5%) are unemployed and therefore do not need transport for this purpose. These findings suggest that at least one in five households in group four has got a car.

(c) Possession of durable items by households in Group 5 (QOL5)

Group five ranks third on the QOL index and, possession of durable items is quite low in comparison with the first two groups. For instance 55 households (1.7%) have a landline telephone in the dwelling while fifteen households or 0.5% possess a cellular telephone (see Table 7.13). This implies that the majority of households in this group have to travel some distance to make a telephone call.

For the 98% or so households which have to travel in order to get hold of a telephone, one in ten households gets hold of a telephone within a hundred meter radius while 13.5% travel between 100 and 200 meters to make a telephone call. Over half of the households in group five (54.2%) travel more than a kilometer to get hold of a telephone; 20% of these households travel at least ten kilometers for this purpose.

Regarding transport used by households to get to work, 79 households out of a total of 3305 (i.e. 2.4%) indicated that they use their own cars to get to the work place. A fifth of the households (20.3%) use minibus taxis and buses, the former constituting 12.3%. A hundred and seventeen households (3.5%) use a train to get to work while 14.3% just walk. Over half of the household heads (53.6%) are unemployed and therefore do not need transport for this purpose. These results implicitly indicate that possession of cars by households in group five is relatively low.

(d) Possession of durable items by households in Group 1 (QOL1)

Access to durable items considered in this study is poor for households in group one. For instance just around 8% of the households have a landline telephone in the dwelling and, ten households or 0.3% have cellular phones. These results indicate that less than ten percent of the households in this group have access to either a cellular phone or a landline telephone. The implication is that making a telephone call involves traveling for most of the households in group one. Around 15% of the households get hold of a telephone within a hundred metre radius while 13.4% travel between a hundred and two hundred metres. Four out ten households travel over a kilometer to get hold of a telephone (see details in Table 7.13).

When it comes to transport used when going to work, 61 households or 1.8% indicated that they use their own cars to get to the work place. Sixteen percent of the household heads walk to the place of work while 11.2% use minibus taxis and buses; the latter constitute 6.1%. Forty six household heads (1.3%) use a train while 53 household heads (1.6%) make use of trucks to get to their place of work. Unemployment among household heads in group one stands at 64.5% which means that people heading such households

do not need transport in this regard. Results in respect of transport used to get to work, implicitly indicate a relatively low possession of cars by households in this group.

(e) Possession of durable items by households in Group 3 (QOL3)

Group three ranks fifth on the QOL index and seems to be the worst among all five QOL groups with regard to possession of durable items. For instance just three households in a group of 1984 households (i.e. 0.2%) have a cellular phone. Possession of a landline telephone in the dwelling stands at 0.7%; thirteen households possess a landline telephone.

The above findings imply that less than one percent of the 1984 households in group three are privileged by not having to travel in order to make a telephone call. For the 99% or so, forty nine households or 2.5% get hold of a telephone within a hundred meter radius while 5.5% travel between 100 and 200 meters to make a telephone call. Around 78% of the households in group three travel at least a kilometer to get hold of a telephone; 41.2% of these households travel over ten kilometers for this purpose.

As far as transport used to get to work is concerned, forty nine households (0.5%) indicated that they use their own cars to get to the work place. Eighty five households (4.3%) use minibus taxis and buses; household heads who use buses make up 1.9%. Household heads that walk to the place of work constitute 9.3% while the majority 82% are unemployed and therefore do not need transport for this purpose. These findings point to a likelihood of low possession of cars by households in this group.

7.4.7 Subjective evaluation of Quality of Life

Section 7.4.7 provides a description of the results pertaining to household satisfaction with life in general. In the OHS - 1996, households were asked to indicate how satisfied they felt, all things put together.

Data pertaining to households' responses in this regard was collected and, has been analysed. Results in respect of households' subjective evaluation of quality of life for the seven QOL groups are indicated in Table 7.14.

Table 7.14: Subjective evaluation of quality of life

	Cluster number				
Rank of group	1	2	3	4	5
Original cluster number	2	4	5	1	3
Perception					
Very satisfied	18.2	16.9	7.9	10.5	5.5
Satisfied with life	49.2	44.9	39.6	39.9	35.0
Satisfied and Very satisfied (combined)	**67.4**	**61.8**	**47.5**	**50.4**	**40.5**
Neither/Nor dissatisfied	20	20.2	26.0	26.7	31.9
Dissatisfied	10.7	14.3	20.4	17.8	22.0
Very dissatisfied	1.8	3.7	5.9	4.7	5.3
Dissatisfied and Very dissatisfied (combined)	**12.5**	**18.0**	**26.3**	**22.5**	**27.3**

Results pertaining to household life satisfaction show a tendency for households in QOL groups with better living conditions to be satisfied with life more than households in groups with poor living conditions. This is the case with groups two and four in Table 7.14. A comparison of results in Table 7.14 with the findings relating to the ranks of the quality of life groups in Table 7.7, shows that groups two and four rank first and second respectively on the QOL index. In group two over two thirds of the households (67.4%) reported to be satisfied with life; 18.2% of them being very satisfied for that matter. In group four which ranks second on the QOL index, 61.8% of the households indicated that they are satisfied with life; 16.9% being very satisfied with life. Variations in the association between objective and subjective QOL assessments emerge in the results for groups one and five. Group five is judged to be better off in terms of material living conditions than group one; the former is ranked third on the QOL index while the latter ranks fourth. When it comes to subjective QOL assessment, discrepancies emerge with group one having proportionately more satisfied households than group five although the discrepancy is more in the very satisfied household category (see Table 7.14). If material possession is a predictor of household life

satisfaction, it would go without saying that the least satisfied households will be in group three but even here one finds 40% of the households being satisfied with life.

Results pertaining to life dissatisfaction relate in a way with the results described above (i.e. for the satisfied category). The two groups with high proportions of households that are satisfied with life, contain fewer dissatisfied households. For instance in group two which ranks first on the QOL index, 12.5% of the households reported to have been dissatisfied with life; 1.8% of them being very dissatisfied. The second group on the QOL index is QOL 4. Herein 18% of the households reported to be dissatisfied with life, 3.7% of them being very dissatisfied. Once again the discrepancy in the results for groups one and five appear, with group five – ranked third – having proportionately more dissatisfied households (26.3%) than group one which ranks fourth. Note that even in group three which ranks fifth on the QOL index, the proportion of dissatisfied households (27.3%) does not differ much from the 26.3% in group five.

The third category of results pertains to households which reported to be neither satisfied nor dissatisfied with life. In this respect proportionately fewer households in the two groups with better living conditions reported to be neither satisfied nor dissatisfied with life in general; in both cases the percentage is around twenty. The proportions of households which reported indifference to life satisfaction differ slightly between groups one and five, 26.7% and 26% respectively. The group with the largest proportion of households that are neither satisfied nor dissatisfied (31.9%) is group three. This group ranks lowest on the QOL index, it has the smallest percentage of households that are satisfied with life in general and, it has the largest percentage of households that are dissatisfied with life.

7.5 Summary

Chapter four has presented the findings arising from the analysis of the data for OHS 1996. Cluster analysis was used to classify households into QOL groups.

This process yielded five QOL groups of which, group two experiences the best QOL conditions while group three experiences the poorest QOL. Results emanating from

Discriminant function analysis indicate that *Highest level of education completed by the household head* and *Employment status* of the household head are the most crucial indicators differentiating between the QOL conditions experienced by the five groups of households. Like in chapters four to six, results pertaining to subjective evaluation of quality of life indicate an existence of association between household material living conditions and households' life perception but this holds mainly for QOL groups that are distinctively better off.

Chapter eight will discuss the findings of the study wherein attempt will be made to evaluate the extent to which the conceptual model provides an understanding of the aspects impacting on household quality of life basing on the study's results.

CHAPTER EIGHT: DISCUSSION OF FINDINGS

8.1 Introduction

Having looked at the results of the study, this chapter will discuss the findings of the study with reference to the existing related literature. The findings of the study will be interpreted and, an attempt will be made to evaluate the extent to which the conceptual model provides an understanding of the aspects impacting on household quality of life basing on the study's results. The research findings will be discussed in view of the following aspects.

- Age and sex distribution of household heads in the various QOL groups;
- Changes in the composition of QOL groups – cluster analysis;
- Indicators contributing to differences in QOL conditions between household groups – Discriminant analysis and;
- Perceived quality of life, objective QOL and the conceptual model.

The changes or improvement in household QOL will be discussed within the framework of the aspects listed above, in conjunction with the related literature.

8.2 Summary of findings

From the analysis of the demographic data, the following findings were obtained.

- Overall, males dominate household headship in all the data sets anlysed (i.e. OHS 1996 – OHS 1999)
- Females generally dominate household headship among households headed by young people (15 – 19) and the elderly (over 70 years)
- Males dominate household headship in groups with better QOL
- The majority of females heading households have a low level of education (lower than standard ten).
- More often than not, households for whites are in the majority, in groups with better QOL conditions

Results arising from cluster analysis indicate the following

- Clusters or household groups dominated by female headed households experience the poorest QOL conditions
- The majority of households rely on public health services except in groups with better QOL conditions.
- Generally there is substantial improvement in household access to piped water, particularly in respect of the public tap
- The level of unemployment is high particularly among households in QOL groups which rank low on the quality of index

Results obtained from discriminant analysis indicate the following indicators to be discriminating between household groups:

- Highest level of education completed by the household head;
- Household's main water source and distance from water source;
- Main transport used by households to get to work;
- Type of toilet used by the household;
- Refuse disposal services available to households and;
- Time taken by households to get to the nearest telephone.

8.3 Discussion of findings in respect of age and sex distribution of household heads

Findings emanating from the analysis of demographic data pertaining to household heads reveal household headship being dominated by males. For OHS 1999, a total of 21861 households were classified into eight QOL groups. Two out of the eight groups, (i.e. QOL2 and QOL3) have females heading the majority of households, 53.3% and 54.1% respectively. Household headship in the rest of the groups is dominated by males (see Table 4.8).

As far as results for OHS 1998 are concerned, a total of 18005 households were grouped into seven QOL groups. Female headed households constitute the majority in three groups; QOL 2, QOL 5, and QOL 6.

The three groups account for around 39% of the households involved in the study and, although female headed households are in the majority, the margin is not as big – varying between 54,7% in QOL 6 and 59% in QOL 2 (see Table 5.8). For the remaining QOL groups constituting 61% of the households, males dominate the household headship with percentages ranging from 71.3% in QOL 3 to 78.8% in QOL 7.

When it comes to OHS 1997, 28639 households were classified into seven QOL groups. Of these groups, parity in household headship exists in QOL 6 (with N = 2590) while females dominate headship in QOL 5 at 58%, a group with 2520 households, which accounts for 8.8% of the households studied. This finding indicates that males dominate in 91.2% of the households with dominance varying between 51% in QOL 2 and 72% in QOL 7 (refer to Table 6.8 in Chapter 6). A similar pattern is revealed in OHS 1996 in which 15328 households were classified into five QOL groups. Of the five groups, female headed households are in the majority at 53.9% in QOL 1 only (with N = 1877) which accounts for 12.2% of the households studied. The majority of households in the rest of the groups are headed by males with percentages varying between 54% in QOL 5 and 79.5% in QOL 4 (see Table 7.8).

Findings in respect of household headship also reveal a general pattern of relatively poor QOL conditions associated with female-headed households. Groups of households in which female headed households constitute the majority tend to exhibit high levels of unemployment and low levels of education. These households show a tendency of relying heavily on wood as fuel for cooking, poor sanitation with high proportions having no toilet, poor access to water and, poor access to modern decent housing. Details of these findings will be discussed in the forthcoming section dealing with cluster analysis.

Findings in respect of age distribution of household heads indicate a dominance of females in the young age group (15 – 19) and the old age category (over 70 years). For instance, findings from the analysis of OHS 99 close to 1% of the households are headed by a person aged between 15 and 19 years. Of these households, 43.7% are headed by females and this is the only case where males dominate the household headship in the 15-

19 age group. Results from OHS 98 indicate that 208 of the 18005 sampled households (i.e. 1.2%) are headed by a person aged 15-19 and, 53.9% are headed by a female. Results from OHS 97 show that 286 of the 28639 (i.e. 1%) households are headed by someone aged 15-19 and the majority (54.9%) are headed by females. A similar finding is revealed by results emanating from the analysis of OHS 96 in which 192 of 15328 sampled households (i.e. 1.3%) are headed by a person aged 15-19 and, 57.8% are headed by a female.

Households headed by people aged 30-49 constitute the majority in all the data involved in the study and, in all these cases, males overwhelmingly dominate the headship. For instance in OHS 99, close to half of the household heads (48.6%) in the sample are headed by people aged 30-49 and, two thirds of these households are headed by males. Results from the analysis of OHS 98 indicate that 48.1% of the sampled households are headed by people aged 30-49. The majority of these households, 67.5% are headed by males. When it comes to OHS 97, 47.3%) of the sampled households are headed by people aged 30-49 and, 65.5% of them are male headed. A similar finding emanates from the analysis of OHS 96 wherein half of the 15328 households involved in the study are headed by someone aged 30-49 and, 66.6% of them are headed by males.

When it comes to households headed by the elderly (i.e. over 70 years), women predominate the headship once again. Results emanating from the analysis of OHS 99 data indicate that 9% of the households involved in the study are headed by someone aged seventy years and older. Out of the households in this category, 53.4% are headed by females. Results emanating from the analysis of OHS 98 data reveal that 10.7% of the households studied are headed by elderly people and, 54.7% of them are headed by females. Analytical findings for OHS 97 indicate that 11.3% of the 28639 households involved in the study are headed by someone aged over seventy and, 54.8% of them are headed by females. A similar finding is revealed by the results from the analysis of OHS 96 data where 9.1% of the 15328 households studied are headed by elderly peoples and, the majority of them (51.3%) are headed b females. In general it suffices to say that the proportion of households headed by young people has fluctuated around 1% while the

proportion of households headed by people aged 30 – 49 has fluctuated around 50% for the period under review. The proportion of households headed by elderly people has fluctuated around 10%.

The changes in the age and sex distribution of the household heads revealed above highlight consistencies with national trends in some instances and, discrepancies in others. As far as age is concerned, the proportion of households headed by people aged 30-49 is consistent with the national age–sex distribution pattern. South Africa's population pyramid is broad based with a significant potential for population momentum. Results of 1996 census indicate that 23.5% of South Africa's population was aged between 30 and 49 years. During the census conducted in 2001 the population in the same age category was found to have risen to 24.8%. The results of these two censuses also indicate that the total number of households in South Africa increased by 23.7% from 9 059 571 in 1996 to 11 770 274 in 2001 (Statistics South Africa, 1998; Statistics South Africa, 2001). When one looks at this pattern, it's not entirely strange that the percentage of households headed by people aged between 30 and 49 years has risen to the level that this study has found it at. Of particular interest are the proportions and headship of households at both ends of the age continuum.

The existence of households headed by people in the teens is a point of concern particularly in the current era of HIV/AIDS. In a paper presented at a workshop in Cape Town, Rosa (2003) highlights the need to widen the reach of social assistance to cover street children and child headed households, given the growing number of orphans. According to Rosa (2003), roughly 900 000 children under the age of eighteen in South Africa were estimated to have lost a mother by December 2002. The loss in the majority of cases is attributed to HIV/AIDS, and the figure is expected to rise to roughly 3 million by the year 2015 in the absence of major health interventions. The majority of children whose biological parent(s) have died are cared for by relatives, primarily in informal care arrangements, though a small proportion have been placed in formal sector care through the courts (Rosa, 2003).

As a matter of fact child headed households as a concept is relatively new, having been illuminated by HIV/AIDS. As a result, comprehensive literature and empirical evidence to substantiate the revelations in the current study with regard to child headed households are equally scanty. For instance, the Human Sciences Research Council (HSRC) conducted a national survey on HIV/AIDS among households in South Africa in 2002. The findings of HSRC (2002) indicate that 3% of the households involved in the study were reportedly being headed by a person between the ages of 12 and 18 years. This is against the backdrop of community–based programmes reporting an increase in households headed by children, or consisting only of children. This finding may not necessarily provide sufficient ground to speculate that households headed by young people are on the increase but it is a point of concern particularly given the period that the data corresponds with.

Results of the census conducted in 2001 indicate that South Africa had a total of 11 770 274 households, 18 708 (0.2%) of which were found to be headed by people under the age of fifteen. These households fit the description of child headed households since the de facto heads are people not belonging to the economically active category. The majority of these households (71.7%) are found in three provinces - Eastern Cape, KwaZulu Natal and Limpopo. Limpopo province has the highest percentage (28%) followed by KwaZulu Natal with 23% while Eastern Cape has 20.7%. The remaining 28% or so of the households are found in the rest of the provinces with Mpumalanga accounting for 7.8% and Gauteng 6.3%. North West province has some 5.9% of the households while Free State has 4.1%. The smallest percentages of child headed households are found in Western Cape and Northern Cape with percentages of 2.3% and 1.9% respectively (Stats SA, 2001). In view of these revelations, attention needs to be paid to the results of the current study regarding child headed households, given the collaborative evidence from other independent sources.

In looking at the sex distribution of household heads in the various QOL groups, it is important not to draw concrete conclusions on the association between poor QOL and female headed households.

Poor QOL conditions are not entirely associated with female headed households. Preliminary findings indicate that although female headed households are predominant in groups of households with poor QOL conditions, adjacent to those groups are groups of households with almost equally poor QOL conditions that are headed by males. Please note that a detailed discussion of findings relating to cluster analysis follows in Section 8.4. In OHS-1999 cluster analysis resulted into eight QOL groups of which the poorest QOL conditions are experienced in QOL 2 ranked number 8. This particular group accounts for 13.8% of the sampled households and, it consists of houses the majority of which are headed by females. The next group ranked number 7 is QOL 6 in which 59.1% of the households are headed by males. Adjacent to group six in rank terms (i.e. sixth on the QOL index) is QOL3 in which 54.1% are female headed households.

When it comes to results for OHS 98, seven groups of households were obtained from cluster analysis. Out of the seven groups, females dominate the headship in three (i.e. QOL 2, QOL 5 and QOL 6). In this case the poorest conditions are found in QOL 2 and, the other two groups - QOL 5 and QOL 6 - are ranked sixth and fifth respectively. In other words all three groups with the poorest QOL have the majority of households being headed by females. In OHS 97 seven QOL groups were obtained. In this case females dominate household headship in QOL 5. This group happens to be ranked number sixth yet the group with the poorest QOL is group three wherein 52.3% of the households are headed by males. In the case of OHS 96 five QOL groups emerged and the poorest conditions are found in group three. The majority of households (53.2%) are headed by females. These findings indicate that in the main, females still experience the worst conditions.

In a working paper prepared for DFID, Southern African regional poverty network (SARPN) (2004) highlights the following observations based on the 1999 October Household Survey.

- A household headed by a resident male has a 28% probability of being poor, whereas a household with a de jure female head has a 48% chance of being poor and a

household with a de facto female head (because the nominal male head is absent) has a 53% chance of being poor.

- SARPN identifies at least four factors at play namely female – headed households being more likely to be in rural areas where poverty is concentrated; a tendency for female – headed households to have fewer adults of working age; female unemployment rates being higher and; the persistence of the wage gap between male and female earnings.

While the paper's focus was on poverty and inequality in South Africa wherein "poor" meant a household with a monthly income of less than R800 (1999 Rands), it provides insights on the proposition that households headed by women are more likely to be poor. The paper also alludes to the fact that while poverty is not confined to any one racial group in South Africa, it is concentrated among blacks, particularly Africans 52% of whom were reportedly poor (SARPN, 2004).

8.4 Discussion of findings in respect of cluster analysis and the QOL index

Cluster analysis is a statistical procedure used to group cases or variables with similar characteristics together (Marija, 1994: 83). According to Marija (1994) one important step before embarking on cluster analysis is the determination of variables, which will serve as the basis for cluster formation. Van Ryzin (1977: 18) says that clustering can be derived systematically from the data which may be multivariate data, proximity data or clustering data. Selecting the variables for inclusion in an analysis is crucial, as exclusion of important variables will yield poor and misleading findings. Central to attempting to identify clusters of observations which may be present in the data, is knowledge of how "close" individual observations are to each other, or how far apart they are.

In the context of this study cluster analysis was applied to classify households into groups on the basis of the multiple response variables which served as the QOL indicators. From this point of view, interest was and still is in identifying and defining groups rather than individual households. As a result, the approach adopted was one where a group of households can be described by a representative observation through a

summary statistic for each QOL indicator; the inter-group proximity being defined as the proximity between the representative observations.

Findings of this study indicate that there has been a gradual increase in the number of household clusters or QOL groups as a result of the changes in household access to goods, services and facilities. The changes in household access to goods, services and facilities are reflected through household access to QOL indicators considered in the study. The changes in household access to selected QOL indicators reflect changes in the objective conditions which households experience. Results indicate that the number of household clusters or groups of households experiencing different QOL conditions, increased from five in 1996 to eight in 1999. While the increase in household clusters has been noticed, there is a need to try and establish the cause of such an increase. Given the number of indicators of quality of life involved in the study, the increase in the number of household clusters could be due to a number of factors. Firstly, classifying households using different QOL indicators–which could not be avoided in this case due to improvements in data collection in years subsequent to 1996–could affect the classification process, leading to a different number QOL groups. Secondly the number of household clusters could increase due to an increase in the number of households being classified provided the households differ in access to the considered QOL indicators. Thirdly the increase in the QOL clusters could be due to an increase in differential access to the selected QOL indicators.

Before getting into a scrutiny of which of the three possibilities could be responsible for the increase in the number of clusters, it is important to once again put across the thinking behind the study's expectation with regard to clustering households into QOL groups. In applying cluster analysis during the current study, the thinking was that the outcome of the clustering process (i.e. the number of clusters and characteristics thereof) would be the same for all four datasets (OHS1999-OHS1996) provided the contents of the data are similar. If all sampled households in a particular year access the same indicators equally (a very simplistic and naive view), the outcome would be one cluster of households because the characteristics of the households are the same, irrespective of how many

households are sampled. This would hold for all four datasets relating to the period under review. The reality however, is far from this because household characteristics differ even within one year. So there is no way cluster analysis would yield one group of households. If households are classified into QOL groups on the basis of the same indicators throughout the reference period (OHS1996-OHS1999), different clusters would emerge because of the differences inherent in the household characteristics. This is what the current study would have expected but the experience during data analysis is different. A few QOL indicators were common in all four datasets. As a result cluster analysis (and indeed discriminant function analysis) were applied to different indicators during this study although the common indicators (eight in number) were consistently incorporated. Sticking to the eight common indicators would have enhanced analysing the changes in QOL clusters throughout the reference period but the eight indicators are insufficient to operationalise quality of life. As a result, additional indicators present in the datasets were considered for incorporation even though this made comparison rather difficult. This borne in mind, one can look at what could be the plausible cause of the increase in the QOL groups.

The first possible cause mentioned above (i.e. classifying households using different QOL indicators) cannot be ruled out completely in this study but attempt was made to minimise its effects. For instance for OHS 1997, the indicator *Toilet facility used by household* was captured in such a way that it could not be used in conjunction with other variables in the analysis. This is because households using specific toilet types were captured separately. Households using a flush toilet for example were captured alone, the same applies to households using other types of toilets. As a result this indicator was left out in cluster and, discriminant analysis for this particular dataset. However, it was included in the description of QOL conditions experienced by the resultant household clusters.

Another crucial indicator that has been inconsistent in the analysis for the period referred to relates to medical aid cover; not all four data sets had this variable captured. This is likely to have a potential impact on household access to health care services and of

course to quality of life. Similar inconsistencies in the indicators used for different datasets relate to what comprises durable items. In some of the datasets, possession of items like a car, radio, television, etc. were not captured, a situation that forced recourse to the use of proxy indicators in the study. For instance, the mode of transport used by households to get to work was used as a way of establishing possession of a vehicle by households. This in itself has its own weaknesses because the requirement for transport when going to work could be influenced by several factors, distance being one, parking space and safety of the vehicle being another. Besides some of these cases, basically the same indicators were used for OHS 1996 through OHS 1999 which enhances comparability.

The second possible cause of the increase in clusters is not likely to come into the picture given the fact that these are samples of households. Even though the sample sizes fluctuated substantially, in terms of actual sampled households and due to some cases being eliminated because of missing data, the fluctuation should not adversely affect the number of household clusters particularly if samples are judiciously selected and hence representative. Representativity is taken as given because the samples are nationally representative (see description of samples in chapter three, section 3.4.3 and the metadata in Appendix J). All in all the number of sampled households increased in the final analysis, from 15, 328 in 1996 to 24, 583 with the largest sample size of around 28, 639 having been selected in 1997. So the increase in the number of clusters cannot be attributed to the changes in sample size.

With the first two possibilities ruled out, the most probable explanation of the observed increase in household clusters is due to an increase in differential access to the selected QOL indicators. This is backed by the way the number of QOL groups was determined (i.e. using Mahlanobis's distance). That being the case, what needs to be focused upon then are the changes in cluster composition.

Findings in respect of cluster composition reveal changes in socioeconomic and demographic composition of the household clusters.

With regard to socioeconomic composition, results indicate some inconsistencies with regard to households in clusters with the best and poorest QOL conditions (see Table 8.1). For instance in 1996 the cluster or group with the best access to the selected indicators (QOL2) has 1365 households out of the 15370 households studied. This constitutes 8.9% as compared with 1984 or 12.9% households in QOL3 with the poorest access to the said indicators. For OHS 1997, close to 38% of the 28639 households involved in the study are found in QOL7, the group with the best access to the selected QOL indicators as compared to 6.4% in QOL3 with the poorest access to the same indicators. As for 1998, 16.7% of the 18005 households are in QOL1, the best QOL group while 13.3% are in QOL2, the poorest QOL group. For OHS 1999, 8.3% of the households involved in the study belong to QOL4, experiencing the best QOL as compared with 13.8% in QOL5, a group with the poorest QOL. It is important to remember that data for 1996 were classified into five groups whereas the classification process yielded seven QOL groups in the case of data for 1997 and 1998. Cluster analysis yielded eight QOL groups in the case of OHS 1999.

Perhaps focusing on the extremes is rather too restrictive. Attention needs to be paid to the entire distribution of QOL groups (i.e. the four QOL indices) for the period under review. The summarised quality of life index is displayed in Table 8.1. Details of each QOL index have been documented as a separate chapter from chapter four to chapter seven. As a reminder the QOL index is an array of groups of households experiencing different QOL conditions. A typical household in a group with the best QOL indicators is one accessing most of the considered QOL indicators like using electricity for cooking and lighting, it has piped water in the dwelling, the household head is educated with tertiary qualifications an, employed on a full time basis, etc. On the poor side of the index, one finds a typical household having to fetch water from a stream, it uses wood as fuel, the head is uneducated or functionally literate and unemployed, relying on public health services due to having no medical aid, etc.

Table 8.1: **Summary distribution of QOL groups (1999-1996)**

Year	Number of QOL groups	Distribution of size QOL groups (percentage)							
Best →									poorest
1999	8	8.3 QOL4	3.6 QOL5	21.5 QOL1	18 QOL 7	10.4 QOL 8	13.7 QOL 3	10.8 QOL 6	13.8 QOL 2
1998	7		16.7 QOL1	9.1 QOL4	27 QOL 3	8.5 QOL 7	9.5 QOL 6	15.9 QOL5	13.3 QOL 2
1997	7		37.5 QOL 7	15.1 QOL2	15.5 QOL 1	7.6 QOL4	9.0 QOL6	8.8 QOL 5	6.4 QOL 3
1996	5				8.9 QOL2	34.5 QOL4	21.5 QOL 5	22.2 QOL1	12.9 QOL3

From Table 8.1 one should be in a better position to talk about not only the worst and best QOL conditions, but all the changes in the composition of the QOL groups constituting the QOL indices. Information in Table 8.1 shows an increase in the number of QOL groups from 1996 to 1999. The increase in the number of QOL groups or clusters is in itself indicative of an increase in differential access to the QOL indicators, having ruled out, to a fair extent, the other possible causes in the previous discussions. The increase in the number of QOL groups partly answers the main question of this study; has QOL in South Africa improved?

While the increase in the number of QOL groups could be described as gradual and in some instances contested, a peculiar finding pertains to the distribution of households in the QOL groups. Just like in the case where focus was on the extreme QOL groups, inconsistencies are observable when one looks at the entire array of QOL indices. One logical way of assessing the QOL indices on an annual basis would be to examine a composite of QOL groups in each index (i.e. to compare groups with better and poor QOL conditions). Information pertaining to the distribution of the top and bottom composite groups is shown in Table 8.2 below. The QOL index for OHS 1996 consists of five QOL groups. A comparison of the top two and bottom two QOL groups reveals that 43.4% of the households fall in QOL2 and QOL4 as compared to 35.1% in QOL1 and QOL3-the bottom two QOL groups. For OHS 1997 and OHS 1998 with seven groups, it suffices to compare the top three and bottom three QOL groups.

If this approach is taken, we find that 68.1% of the households are found in QOL7, QOL2, and QOL1 as compared to 24.2% found in QOL6, QOL5, and QOL3–the bottom three QOL groups. A similar result is obtained for OHS 1998 with 52.8% of the households falling in the top three QOL groups compared to 38.7% found in the bottom three QOL groups (i.e. QOL6, QOL5, and QOL2).

Table 8.2: Distribution of the top and bottom composite groups (1999-1996)

Year	Best groups	Percentage	Poorest groups	Percentage
1999	QOL4, QOL5, QOL1	33.4	QOL2, QOL46, QOL43	38.3
1998	QOL1, QOL4, QOL3	52.8	QOL2, QOL5, QOL6	38.7
1997	QOL7, QOL2, QOL1	68.1	QOL3, QOL5, QOL6	24.2
1996	QOL2, QOL4	43.4	QOL3, QOL1	35.1

In the case of OHS 1999 with eight QOL groups, the top and bottom three QOL groups could be considered in the comparison, leaving the two centrally located QOL groups out (i.e. QOL7 and QOL8). In this case, 33.4% of the households are found in the top three groups (i.e. QOL4, QOL5, and QOL1) as compared to 38.3% found in the bottom three groups (i.e. QOL3, QOL6, and QOL2).

A comparison of the poorer composite QOL groups shows the percentage of households to have varied between 38.7% (recorded in 1998) and 24.2% (recorded in 1997) as shown in Table 8.2. On the better side of the QOL index, one observes more fluctuations than on the poorer side of the index. The better composite QOL groups show the percentage of households to increase from 43.4% in 1996 to 68.1% in 1997 but dropping substantially to 33.4% in 1999.

These observations particularly on the better side of the QOL index are not only peculiar but also contrary (in certain instances) to the expected empirical trend of events as will be discussed later on. All in all one aspect this finding highlights is that there have been changes in measurable socio-economic conditions during the reference period in spite of the observed inconsistencies.

One other observation in the context of this study pertains to the racial and sex composition of households in the various QOL groups. For all the datasets reviewed, the groups with the poorest QOL conditions consist of Africans as the majority, with Coloureds in most cases, complementing the small remaining portions. Table 8.3 provides information in respect of the distribution of the African/Black population in the four extreme QOL groups for the period 1996-1999. A closer look at the distribution of the bottom two QOL groups shows African households dominating the groups. As for the poorest QOL groups at least 95% of the households are African throughout the reference period, with the highest figure (98.2%) being recorded in 1996. The proportion of African households differs somehow (with fluctuations in some cases) when it comes to the second poorest QOL groups. The concentration of African households in the second poorest groups shows substantial declines in 1999 and 1996 but not in the two years that lie in between.

Table 8.3: Percentage distribution of African/Black population in the top two and bottom two QOL groups (1999-1996)

Year	Best group	Percentage	Second best group	Percentage	Second poorest group	Percentage	Poorest group	Percentage
1999	QOL4	46.4	QOL5	59.9	QOL6	81.5	QOL2	95.8
1998	QOL1	76.2	QOL4	93.5	QOL5	97.6	QOL2	97.0
1997	QOL7	48.0	QOL2	93.7	QOL5	98.5	QOL3	96.3
1996	QOL2	36.4	QOL4	55.2	QOL1	90.0	QOL3	98.2

As for groups with the best measurable conditions, African households seem to be making inroads with percentages nearing 50% in 1997 and 1999 as in indicated in Table 8.3. While African households are dominant in groups with the poorest QOL, the situation is rather different when it comes to groups with the best QOL conditions. Households from all population groups do appear in these groups, of course in varying proportions. For instance results for OHS 1999 indicate that 41.7% of the households in group four – the group with the best measurable conditions - are white while African households constitute 46.4%. Coloured households account for 7.2% while 4.2% are Indian households. As for OHS 1998, 76.2% of the households in group one - with the best access to the selected indicators - are African while 14.7% are Coloured.

White households make up 7.1% while 2% are Asian households. In OHS 1997 African households constitute the majority (48%) in QOL7, followed by white households (26.4%). One in five households in this group is coloured while 5.4% are Asian/Indian households. As for OHS 1996 White households dominate QOL2, the group with the best QOL conditions at 44.4% followed by African households at 36.4%. Coloured households make up 8.7% and Asian or Indian households constitute 7.4%.

The changes in the demographic composition of QOL groups are quite evident when groups with the second best QOL conditions are considered. All of these groups are dominated by African households with the lowest percentage (55.2%) observed in 1996.

For OHS 1999, six out of ten households in group five, the second best QOL group, are African while a quarter are belong to Whites. Coloured households constitute 12.1% and Asian or Indian households make up 2.5%.

In 1998 close to 94% of the households in QOL4 are African while 6.1% are coloured. White and Indian households are minute. The situation in 1997 is quite similar to that in1998 with 93.7% of the households in QOL2 being African or Black (see Table 8.3 above).

The finding in respect of the racial profile of the QOL index highlights changes that have occurred during the period 1996-1999. The results above indicate that while African or Black households still dominate the poor QOL groups and, by implication are still living in poverty, several Black households are gradually moving into better QOL groups hence living better than before.

When it comes to the sex composition of household heads, findings reveal women to be in the majority of household headship in all groups with the poorest quality of life except for OHS 1997 (see Table 8.4). In OHS 1999 for instance, 53.3% of the households in QOL2, the group with the poorest quality of life, are headed by females. In the case of OHS 1998, 59% of the households in QOL2 are headed by females, just as 53.2% of the

households in QOL3 in OHS 1996. The only exception to this pattern is in OHS 1997 where QOL3 is the poorest group in terms of access to the selected indicators and, male headship is in the majority (52.3%).

Table 8.4: Percentage distribution of female household headship in the extreme QOL groups (1999-1996)

Year	Best group	Percentage	Poorest group	Percentage
1999	QOL4	25.5	QOL2	53.3
1998	QOL1	25.1	QOL2	59.0
1997	QOL7	28.0	QOL3	47.7
1996	QOL2	22.2	QOL3	53.2

As for groups with the best QOL, male headship dominates throughout the period under review. As indicated in Table 8.4, males head at least 75% of the households in groups with the best measurable living conditions. In other words, a typical household belonging to the best QOL group on the QOL index is male headed. This finding highlights women to be carrying disproportionately high socio-economic burdens by heading households in environments where aspects pertaining to quality of life are poor.

The results in respect of cluster analysis and the QOL index highlight changes that have taken place in respect of household access to selected QOL indicators. Most of the indicators (as reflected upon in chapters four to seven) relate to basic human needs. While a substantial number of households still experience poor socio-economic conditions, results indicate substantial progress to have been made. As indicated earlier on when dealing with the results of the QOL index, findings of the current study have yielded mixed results. This is particularly the case when one looks at the QOL index where results (as shown in Tables 8.1 and 8.2) are in conflict with the expected empirical trend of events.

As indicated in Chapter two dealing with the literature review, assessing changes in households' living conditions is not new in South Africa. One institution that has worked considerably in measuring changes in household living conditions in South Africa is the South African advertising research foundation (SAARF).

SAARF (2002) developed a measure of living standards referred to as the SAARF AMPS™ Living Measure. This is a measure that was initiated in 1988/89 and has evolved to become a universal measure of living standards. The SAARF Universal LSM™ is a scale used to indicate the socio-economic status of an individual or group (SAARF, 2002:3). Households are grouped on the basis of access to specific household variables such that households accessing similar variables are grouped together forming one LSM group. Prior to the establishment of the SAARF Universal LSM, and its publication in 2002, households in South Africa used to be grouped into seven LSM groups. Due to socio-economic development and market – specific needs, the LSM scale was extended beyond the seven segments. Currently the SAARF Universal LSM™ scale is divided into ten segments. Households of least status form the segment referred to as 'SAARF Universal LSM™ 1', and households of highest status form 'SAARF Universal LSM™ 10' (SAARF, 2002; SAARF 2004). SAARF indicates that as the South African society develops, the SAARF Universal LSM has the ability to be extended beyond group 10, and 11, 12, etc. will be added as time goes by but up to now, ten LSM groups prevail. The whole scale from LSM 1 to LSM 10 constitutes the SAARF Universal LSM™.

As far as the group with the least status is concerned, SAARF (2002: 16) indicates that virtually everyone in this group - SAARF Universal LSM™ 1 - are rural dwellers (99%), with females being more numerous, as are people aged 50 and older. The level of education is low with hardly anyone with more than high school education, and 27% having had no formal schooling. Most likely as a result of the low education level, average income for this group is low (R 777), and unemployment is high (46%). Most of these households (74%) are concentrated in KwaZulu Natal (KZN hereafter) and Eastern Cape (EC hereafter). With Zulu and Xhosa being the main languages spoken, one is inclined to infer that the majority of these households are African or Black. Three quarters live in traditional huts with only 4% having piped water on their property. Eleven percent of the households have electricity from the mains but about 4% cook with electricity. Though toilets are frequent, 64% use long-drops or non-flushing designs. Virtually none owns a vehicle or cell phone.

On the best side of the scale - SAARF Universal LSM™ 10, – 55% of the households are English speakers and 48% speak Afrikaans. The group is generally middle-aged with 35% of the people falling in the 35-49 age category and 18% falling in the 25 – 34 category. Forty percent have gone on to post-matric studies-15% at university. The group has many professional/technical people with household income averaging over R13788 a month. It should not be surprising then, that unemployment in this group is low at 4%. The majority of households in this group (96%) reside in conventional houses, with flats making up the difference. Cell phone ownership is 74%, while vehicle ownership is 82% (SAARF, 2002: 53).

SAARF cautions people not to confuse LSM's with income. The LSM is a wealth measure based on standard of living rather than income - in fact, income does not appear anywhere within the LSMs at all. An example is given of a student, who lives in his parents' up market home in Sandton. The student might live in an LSM 10 home, and yes, he will be different from a person living in, say, an LSM 4 home, but if his only income is derived from a part-time job while he is studying, his disposable income will be low. So one needs to think clearly when interpreting and applying the LSM index.

SAARF's findings emanate from data consisting of a wide array of household goods (including numerous household appliances), services and amenities. A number of variables used in their analysis differ from those used in the current study (SAARF, 2002: 62). The current study makes use of secondary data which was never collected for its own purpose. This could have contributed to some of the differences in the findings of the current study as compared to those of SAARF, like the number of groups experiencing different socio-economic conditions.

Secondly, the time at which data were collected also differs and definitely, socio-economic conditions are not static. This could also have contributed to the differences observed between the SAARF's findings and those of the current study. Thirdly, the SAARF Universal LSM as a measure of socio-economic status, was developed partly to address issues relating to marketing and market segmentation; the latter necessitated the

investigation into the possibility of splitting the top two LSM groups. Never the less, the findings of SAARF (2002) have a lot in agreement with the findings of the current study. This is particularly so when one looks at the characteristics of the poorest and the best QOL groups in the current study.

What is disturbing though, as far as the current QOL index is concerned, is the suggestion that QOL has deteriorated when one looks at the proportion of households in better QOL groups which on the contrary, have increased (see Table 8.1)! This looks contrary to other empirical findings, some of which arise from the use of the same data. For example, in reporting on the changes that took place in South Africa's households between 1995 and 1999, Stats SA (2001: 75) indicated that there had been a gradual increase in the proportion of households that had access to clean water (piped water in the dwelling or on site, communal tap or public tanker). While the proportion of households using water from boreholes is reported to have dropped during the reference period, the proportion of households obtaining water from rivers, streams and dams remained approximately constant, hovering around 12%, possibly indicating that improved access to clean water had not significantly affected previously disadvantaged households in deep rural areas (see also census results in Stats SA, 1996; Stats SA, 2001).

When one analyses the kind of situation highlighted by Stats SA (2001) above, one is inclined to say that the current QOL index may not be as flawed as one might have thought in that the benefits of socio-economic development may not have filtered through to all households as fast as expected. All in all more work may be required improve on the current QOL index if triangulation is to be achieved through its application.

8.5 Discussion of findings in respect of perceived quality of life

One of the issues this study set out to establish relates to the assertion that improved household material conditions influence perceived quality of life. Much as this was not put across as a hypothesis for this study to test, interest in examining the interrelationships between the two [objective and subjective] conditions exists, given the existing literature that relates to them (Moller *et al*., 1987; Moller, 1996; Diener &

Suh.,1997; Hagerty *et al*.,2001). Findings of this study reveal mixed responses as far as subjective assessment of QOL is concerned. It is important to note first of all that a consistent comparison of the findings is possible in the case of the results for OHS 1998 – OHS 1996. This is because households were consistently asked to indicate how satisfied they were, taking everything into account. The question addressing this particular issue was phrased differently for OHS 1999. For OHS 1999, households had to compare life in 1999 with life in 1998. In both cases, interesting findings emanate from the analysis as indicated below in a rather summarized manner; the details are provided in chapters four to seven.

In reference to the conceptual model, the assertion is, objective living conditions influence perceived household quality of life; households experiencing satisfactory living conditions are likely to report similarly when it comes to the subjective QOL assessment, the reverse expected to hold. In the case of OHS 1999, this pattern is evident with proportionately more households in QOL groups with better living conditions, reporting improvements in their subjective assessments. Findings in this respect have been summarised in Table 8.5 below. Proportionately more households in QOL groups with better access to the considered indicators reported their life to have improved than households belonging to groups with poor access to the selected indicators. For instance 35.6% of the households in QOL 4 (ranked number one) reported their life to have improved compared with 13.9% in QOL2 (with the poorest QOL). Looking at the three groups experiencing the best QOL, 19.3% of the households in QOL5 (ranked number two) reported an improvement in life while 26.4% of the households in QOL1 (ranked third) reported an improvement in life. The percentages of households who reported life to have worsened in the groups with better access to the selected indicators vary between 21.6% in QOL4 through 24.2% in QOL1 to 31.1% in QOL5. In poor QOL groups (groups ranked sixth to eight) one finds proportionately more households which feel that their life worsened than those which feel that life improved (see Table 8.5).

A point worthy noting is the consistency in the proportions of households which felt that things had not changed after all, irrespective of the grouping of households. There is minimum variation in this category which is substantial, fluctuating between 42.7% in QOL4 and 49.6% in QOL6.

Table 8.5: A comparison of subjective assessment of QOL groups for OHS 1999 (percentage)

	Best → Poorest							
	QOL4	QOL5	QOL1	QOL7	QOL8	QOL3	QOL6	QOL2
Life has improved	35.6	19.3	26.4	15.6	18.3	15.8	16.5	13.9
Things are the same	42.7	49.6	49.3	46.3	49.9	45.1	49.6	47.0
Life is worse than 1998	21.6	31.1	24.2	38.1	31.7	39.1	33.9	39.1

In the case of OHS 1998 to OHS 1996, households indicated how satisfied they were at the time of the survey, taking everything into account. Table 8.6 provides a summary of the findings in this regard. The expected association between the objective QOL results and the subjective response is evident in the results for 1998 and 1997; it is not as clear in 1996. For 1998 and 1997, the percentages of households reporting to be satisfied with life are generally higher in QOL groups with the best access to the selected QOL indicators than in QOL groups with generally poor access to the same indicators. The inverse holds when it comes to the dissatisfied categories. Although there are fluctuations in the results for OHS 1996, a similar situation described for OHS 1998 and OHS 1997 is evident. When it comes to households which felt that things had not changed, there is almost same variation – around 6% difference- in the percentages for these groups than what is revealed in OHS 1999.

Table 8.6: **A comparison of subjective assessment of QOL groups for OHS 1998 to OHS 1996 (percentage)**

	Best → Poorest						
1998	QOL1	QOL4	QOL3	QOL7	QOL6	QOL5	QOL2
Satisfied with life	69.9	49.8	73	58.1	61	51.5	50.4
Neither satisfied nor dissatisfied	15.5	22.3	14.1	21	20	20	22
Dissatisfied	14.6	27.8	13	20.4	18.9	28.4	26.8
1997	QOL7	QOL2	QOL1	QOL4	QOL6	QOL5	QOL3
Satisfied with life	73.7	64.9	68	57	52.1	52.1	55.2
Neither satisfied nor dissatisfied	16	20.2	19.2	21	24.8	27.6	23
Dissatisfied	9.8	14.9	12.9	21	22.7	20.3	21.8
1996			QOL2	QOL4	QOL5	QOL1	QOL3
Satisfied with life			67.4	61.8	47.5	50.4	40.5
Neither satisfied nor dissatisfied			20	20.2	26	26.7	32
Dissatisfied			12.5	18	26.3	22.5	27.3

The findings highlighted above have a lot in common with the findings from similar studies conducted before. Moller (1996) analysed secondary data on QOL, data that had been collected by South African Labour and Development Research Unit (SALDRU). Among the questions that Moller's analysis attempted to address was whether high levels of satisfaction are related to high levels of household income and expenditure. A related question was whether lower income levels are associated with basic needs to a greater degree than higher income levels. Yet another question that her analysis focused on dealt with *"the relationship between perceived financial achievement ("past satisfaction"), current satisfaction, and expectations of satisfaction in future ("future satisfaction").*

With regard to the relationship between income and satisfaction, Moller's findings revealed a consistent pattern emerging between the two: income and expenditure levels co-varied with levels of satisfaction with living standards. This finding suggested that income levels might influence expressions of present satisfaction with QOL. However, future satisfaction was not income-linked.

According to Moller (1996: 241), recent cross-cultural studies shed more light on the significance of income and fulfillment of basic needs in relation to happiness. Moller (1996) indicates that cross-national studies show that material wealth is a consistent and important predictor of QOL. Money has increasingly become a global value and universal goal. Income straddles the material and non-material divide in that it confers social standing and begets influence in most societies. It allows individuals to fulfill a wide range of personal goals including non-material ones.

As for the relation between "past satisfaction" and "future satisfaction", future satisfaction indicators highlighted the raised expectations for a future beyond apartheid which was most pronounced among black South Africans. When present and future satisfactions were combined, the future winners (current dissatisfaction and optimist for the future) and lower income earners expressed the need for basics such as food, shelter, infrastructure and income-providing jobs. Current satisfaction and higher income regardless of future outlook were linked to needs for stability, peace and income maintenance. Higher- and lower - income groups shared to a certain degree the need for peace, which may be viewed as a prerequisite for the provision of basic needs.

Moller indicates that these findings support the hypothesis that *satisfaction is not relative but linked to basic needs and income especially in the case of poorer populations*. The effect of income on satisfaction was stronger in lower - income families at the bottom of the racial hierarchy (Blacks) but still had an effect when basic needs were met. This in a way suggests that income continues to influence satisfaction beyond basic needs.

Diener and Suh (1997) indicate the importance of combining objective and subjective indicators if QOL is to be comprehended. Objective or social indicators are societal measures that reflect people's objective circumstances in a given culture or geographic unit. According to Diener and Suh (1997:192), the hallmark of social indicators is that they are based on objective, quantitative statistics rather than on individuals' subjective perceptions of their social environment.

Under the conceptual umbrella of social indicators, variables representing a wide range of societal domains have been identified, and measured. In the health domain for example, these include indices like infant mortality and life expectancy, doctors per capita, and bed occupancy ratio. Indicators related to crime, like police per capita, incidence of rape, suicide and homicide rates, have been established to assess crime–related quality of life. Other commonly used social indicators include literacy rates, unemployment rates and income per capita. Income and wealth in general, are found to significantly influence quality of life but it is not an accurate predictor of good or satisfactory quality of life (Diener & Suh, 1997:193). If wealth was the sole determinant of satisfactory quality of life, nationals of the oil rich countries will be reporting satisfactory quality of life. Along that thinking, one would expect the wealthy people in developed nations like the US, Europe, and Japan to be reporting good and satisfactory quality of life but this is not the case. Despite some deviations from the norm, material welfare plays a great deal in influencing people's perception of their quality of life.

On the qualitative side of QOL are the subjective indicators of wellbeing. According to Diener and Suh (1997) subjective well-being is concerned with the respondents' own internal judgment of well-being. It is a concept that reflects on how people internally react to and experience the events and situations in their lives. Subjective well-being is a reflection of people's reactions to the conditions and experiences in life; how pleasant or unpleasant a job is, how satisfied or unsatisfied with the salary, working conditions, etc. If this is to go by, one would expect a strong relationship between social indicators-reflecting objective conditions – and subjective well-being measures, but it is not always the case. Diener and Suh (1997: 201) found small correlations between subjective well-being and objective resources. In the World Value Survey II of nationally representative samples of 43 nations and regions, Diener and Suh (1997) found subjective well-being correlating 0.13 with physical attractiveness, 0,10 with physician–related health, 0.12 with income, and 0.17 with intelligence. Several factors could arguably be responsible for such low correlations. One could be adaptability. People tend to rapidly adapt to their levels of resources and experiences.

As a result people who had reported to be unhappy at a certain level of material conditions could later report to be happy. Another reason for the low correlations could be the fact that well-being is influenced not only by external life conditions but also by stable dispositional characteristics. Different people may perceive the same life circumstances differently.

According to Diener and Suh (1997) people's psychological adjustment strategies to objective conditions appear to be remarkably flexible but the degree of flexibility seems to be limited by resource availability. People tend to aspire for, or set goals of achievements basing on the material resources at their disposal. People choose personal goals for which they have relevant resources, and the degree of congruence of individuals' goals with their resources predicts their subjective well-being (Diener & Suh, 1997: 202).

The issue of combining objective and subjective indicators as a way of comprehending QOL holistically has been advanced greatly in social indicator development. Hagerty *et al*. (2001) reviewed twenty two QOL indexes on the basis of fourteen criteria. The criteria were developed by a nine-man committee. A review of the twenty two QOL indexes showed that the current QOL indexes are playing a useful role in measuring quality of life. This said however, the committee found that different indexes conceptualise QOL differently, and in most cases, use different domains in the process. One of the criteria used in the review stated categorically that "Each domain must have the potential to be measured in both objective and subjective dimensions" (Hagerty *et al*., 2001:7). This was after realising that very often, objective indicators of QOL do not correlate highly with their subjective counterparts. Hagerty *et al*. (2001:8) go ahead to argue that subjective well-being is a necessary, but not sufficient, condition to capture the totality of life experience. A person may report a high level of subjective well-being, despite environmental conditions bad enough to significantly shorten life expectancy, hence affecting immediate future QOL. Similarly, objective conditions (like health and material possessions) of a person may have very little to do with subjective well-being.

According to this argument both subjective and objective indicators are necessary conditions, but neither is sufficient to encompass the totality of life experiences. Quality of life is perceived to be an end state of being, but knowledge and evaluations of that state have a lot to do with the objective conditions (i.e. level of living) one experiences. Quality of life should be assessed through subjective indicators, but the level of living has to be assessed using objective indicators. Thus, both subjective and objective indicators are needed to capture the totality of the means and ends of QOL (Hagerty *et al*., 2001:8).

Given the above revelations by Diener and Suh (1997), Hagerty *et al*. (2001), and Moller's findings, it suffices to say that objective conditions greatly shape people's expression of what they report with regard to well-being and satisfaction, bearing in mind that people adapt psychologically to any level of material circumstances at a given time. Looking at the findings of the current study, the reviewed literature in conjunction with the way QOL has been conceptualised in the model (see chapter three), the assertion put across still holds, at least in the main; objective living conditions influence perceived household quality of life. In other words a household's ability to satisfy its needs (i.e. access to QOL indicators) influences the material living conditions and, the living conditions shape its response to reported (i.e. subjective) QOL; this is the contention of the conceptual model.

8.6 **Discussion of findings in respect of the indicators differentiating between quality of life groups – discriminant analysis**

Chapters four to seven provided the study's results. One of the aspects the findings focused upon pertains to the indicator(s) differentiating between the quality of life conditions experienced by the groups of households. The discriminating indicators for the entire study (OHS 1999 – OHS 1996) are summarised as follows:

- Time taken by households to get to the nearest telephone;
- Distance from water source;
- Refuse disposal services available to households;
- Type of toilet used by the household;
- Household's main water source

- Main transport used by household heads to get to work;
- Type of dwelling occupied by a household;
- Highest level of education completed by the household head and;
- Employment status of household head.

The first four indicators emanate from discriminant function analysis for OHS-1999. The four indicators reflect the differences in ability to communicate by telephone, access to sanitation and water among the eight groups of households involved in the study. The point is, the eight QOL groups experience different QOL conditions mainly because of the difference in access to telephone, water, toilet, and refuse disposal. The differences in living conditions among these groups could be reduced or eliminated if household access to these indicators is improved. With regard to access to water and by implication, distance traveled to get water, it was revealed in chapter four that this particular indicator "distance from water source" differentiates groups two and three from the rest of the OQL groups. Groups two and three constitute 27.5% of the sampled households in OHS 1999. Results in chapter four (section 4.4.5) show that at least 7% of the households in each of these groups, travel over a kilometer to fetch water.

Reporting on the changes that took place in South Africa's households between 1995 and 1999, Stats SA (2001: 75) indicated that there had been a gradual increase in the proportion of households that had access to clean water (piped water in the dwelling or on site, communal tap or public tanker). While the proportion of households using water from boreholes is reported to have dropped during the reference period, the proportion of households obtaining water from rivers, streams and dams remained approximately constant, hovering around 12%, possibly indicating that improved access to clean water had not significantly affected previously disadvantaged households in deep rural areas. This finding is in line with the findings of the current study. This should not come as a surprise since the data used is the same. What needs to be highlighted is the locality of the households wherein access to safe water is still a problem so that the issue is addressed. Results of this study indicate that the majority of households in groups two and three belong to QOL groups (in OHS 1999) ranked

eighth and sixth respectively. The majority of these households are found in the rural areas of KwaZulu Natal, Eastern Cape, Mpumalanga and Limpopo province (See section 4.4.5).

One other factor highlighted in differentiating household QOL is access to telephone, with the resultant distance that households have to travel in order to make a telephone call. In the context of this study, access to a telephone is a problem to households belonging to groups with generally poor QOL. This is applicable to the entire reference period (i.e. 1996 – 1999). In the case of OHS 1999 where distance to a telephone emerges as one of the discriminating factors, this indicator differentiates three groups from the rest, namely group two, three and eight (see section 4.4.6, Table 4.13). These three groups are ranked eighth, sixth and fifth on the QOL index respectively (See Table 8.1 above). The three groups account for 37.9% of the households studied.

Stats SA (2001:84) reports that household surveys of 1995 to 1999 show the proportion of households with a telephone in the dwelling or a mobile telephone to have increased from 29.1% to 34.9% over the reference period. It is further revealed that the proportion of households which had to seek telephone services outside the home environment had consequently decreased. For OHS 1999, it is reported that 36.2% of the households were 15 minutes or less away from the nearest telephone and, 29% were 16 minutes or more away from the nearest telephone. Stats SA's results report an improvement in respect of this particular indicator for the period 1995 – 1999.

On further scrutinizing the data for OHS 1999, cluster analysis results show that much as 34.9% of the households reportedly have a telephone or a mobile telephone in the dwelling, only 2.2% of these households are found in the group with the poorest QOL (i.e. QOL2). So access to a telephone remains a critical factor in the context of this study.

A third factor highlighted in differentiating household QOL for OHS 1999 relates to refuse disposal services available to households.

Results in respect of access to sanitation show groups two, three and eight to be distinctively different in this respect from the rest of the QOL groups (see section 4.4.4, Table 4.11). In each of these groups, less than 15% of the households have their refuse removed by local authorities on a regular basis. This is in contrast with households in better QOL groups which rely mostly on local authorities to remove their refuse.

The difference in the method of refuse disposal generally relates to the rural - urban situation of households. The majority of households relying on rubbish pits are clustered in groups in which households are mostly rural based. Most of such areas have poor access to basic services which in turn, impacts negatively on the QOL conditions for households in the groups concerned. On the other side households with access to refuse disposal belong to QOL groups with better living conditions. Most of these households belong to QOL groups with a strong urban bias. Such areas often have refuse removal services organised by urban local communities. This pattern is consistent throughout the study's findings for the period under review.

At the aggregated level Stats SA (2001: 83) indicates that throughout the five years from 1995 to 1999, no marked change was evident in terms of the proportions of households which have access to formal refuse removal services. It is reported that on average, more than half of the households in South Africa live in areas where refuse is removed at least once a week by local authorities. The report further indicates that in areas where no coordinated system for refuse removal is in place, some households make use of a rubbish dumps to dispose of household refuse. Between 1995 and 1999, the trend depicted is that of a steadily increasing proportion of households using rubbish dumps to dispose of household refuse (rising from 31% in 1995 to 37.7% in 1999). Finally, it is reported that the proportion of households with no systematic method of refuse removal consequently decreased from 13.3% in 1995 to 6.9% in 1999. These findings are in the main, in agreement with the findings of the current study.

The fourth and last indicator highlighted in differentiating household QOL for OHS 1999 is *type of toilet used by the household*.

Results in chapter four (see Table 4.11) reinforce this indicator as differentiating between groups with better off living conditions (QOL4, QOL5, QOL6, QOL1, and QOL7), and the groups with rather poor living conditions (QOL2, QOL3, and QOL8). The former category consists of groups with urban households mainly relying on the flush toilet (over 50%), and less reliance on the pit latrine. The latter category consists of groups with mostly rural households relying on pit latrines (50% and above) and, several households relying on bucket toilets.

This finding reveals that sanitation is still a problem to quite a number of households in South Africa. Stats SA (2001: 88) indicates that between 1995 and 1999, there is a possibility that the proportion of households with access to flush or chemical toilets decreased. This source indicates the percentage of households with a flush or chemical toilet to have stood at 56.9% in 1995. This percentage is reported to have risen to 62.1%, only to decline to 55.8% in 1999. As for households relying on pit latrines, 29.7% of the households sampled in OHS 1995 were found to be relying on pit latrines, a figure that rose with some fluctuations in between, to 30.3% in 1999. When it comes to households using other toilet types or having no access to toilet, the percentage rose from 8.3% in 1995 – fluctuating between 11% and 13.1% - to 10.6% in 1999. As one would expect, the poor toilet types (i.e. other or no toilet at all) are associated generally with poor dwellings. For instance, 46.2% of the households living in traditional dwellings in 1999 reportedly made use of “other” toilet facility or, they had no access to a toilet. As for households living in informal dwellings, one in ten households made use of “other” toilet facility or, it had no access to a toilet. For households living in formal dwellings, close to six out of ten households (59.7%) had access to a flush or chemical toilet. All in all, 48.5% of the sampled households in OHS 1999 in South Africa made use of a flush or chemical toilet while 35.8% used a pit latrine and 12.4% used “other” toilet or no toilet at all (Stats SA, 2001: 89). These findings share several commonalities with the findings of the current study.

The remaining discriminant indicators emanate from the analysis of data for OHS 1998 – OHS 1996. Indicators which featured in more than one year will be discussed once to avoid tautology. These are *Highest level of education completed by a household head* and, *Employment status of household head.* Before discussing the former, attention needs to be given to the discussion of the latter – Employment status – because of its relatedness to another indicator (*Main transport used by household heads to get to work*) which was also highlighted in chapter five as one of the discriminating factors in discriminant function analysis.

Results emanating from discriminant function analysis (OHS 1998) revealed *Main transport used by household heads to get to work* as an indicator having a strong linkage with *Employment status of household head,* in differentiating between QOL groups. Groups with working household heads include QOL1, QOL4, and QOL7 while the rest (QOL 2, QOL3, QOL5, and QOL6) have large proportions of unemployed household heads, with unemployment levels ranging between 89% and 95.6%.

In OHS1998, for households in groups where household heads are working (QOL1, QOL4, and QOL7) the head of household either walks to work or uses public transport. For instance 33% of the households in QOL1 – ranked number one on the index – walk to the work place while half of the household heads in QOL 4 walk to the work place. Some 65% of the household heads in QOL7 walk to the work place. For household heads that use public transport to get to work, the majority rely on minibus taxis and buses, with relatively small proportions relying on trains. For example 31.2% of the household heads in QOL1 use mini bus taxis while 20% use a bus to get to work. Trains are used by 8.7% of the household heads as transport to get to the work place. For households in group four, 23% of the household heads use minibus taxis while 13% use a bus and 5.5% rely on trains to get to work. In QOL7, 11% of the household heads use minibus taxis while 12% use buses and 6.4% use lorries to get to work.(See section 5.4.6).

The information above was derived from a variable addressing the issue of transport used by households when getting to work. The variable was used as a proxy indicator for possession of a vehicle by households. A further scrutiny of the results showed an interrelatedness between transport used by households and employment status of household heads. Groups of households where unemployment is high showed less need for transport as well as possession of a vehicle. In contrast, groups of households where most household heads are working showed a higher need for transport whether by own car or not. In the final analysis it was found that the discriminating effect of this particular indicator (*Main transport used by household heads to get to work)* in a way underpins the influence of unemployment on household QOL. Thus the real issue that needs to be addressed is unemployment if the inherent group differences are to be minimised.

The findings of this study highlight unemployment in a rather subtle way, given the fact that analysis was based on head of household. Even then, the disaggregated findings highlight the seriousness of unemployment as a problem. Statistics South Africa (Stats SA) conducts labour force surveys on a regular basis. In its findings for 2004, Stats SA reports that South Africa's unemployment rate stood at 26,2% in September 2004 as compared to 27,9% in March 2004. The decrease is reportedly statistically significant. In September 2004, 11 643 000 persons were employed as compared to 11 392 000 persons in March 2004. However, this change was not statistically significant. The increase in employment has largely been in construction at 25% and in trade at 8%. The number of unemployed people (estimated at 4,1 million in September 2004, based on the official definition) slightly declined compared with 4.4 million in March 2004. Black women continue to be the most affected by unemployment, more than seven times than white males (Stats SA, 2004)

Results of OHS 1999 indicate that unemployment in South Africa stood at 23.3%. This figure however, obscures crucial information regarding for instance, the sex and racial distribution of unemployment. For instance, while unemployment is generally higher among African people, African females are more exposed to unemployment than their male counterparts.

Stats SA (2001: 45) reveals that 24.5% of the economically active African males were unemployed in 1999 as compared with 35% of the their female counterparts. In fact unemployment was highest among African females at 35% and lowest among white males (4.4%). For white females unemployment stood at 5.1%. Looking at the labour absorption rate (i.e. the proportion of the working age population that is employed), 41.2% of the African males sampled in 1999 were employed as compared with 73% of the white males. In the case of females, 26.3% of the African females were employed as compared with 56.3% of the white females. For South Africa as a whole, the absorption rate stood at 39.7%.

A comparison of labour market statistics for the period 1995 to 1999 reveals that the number of economically active people – employed and unemployed – increased steeply from 11.4 million in 1995 to 12.8 million in 1999. This is indicative of an increase in the number of labour market entrants. The findings of this survey also reveal that the number of employed people (both in formal and informal sectors) increased gradually over the reference period from 9.6 million to 10.4 million. Furthermore, the number of unemployed people increased over time, from 1.8 million in 1995 to 3.2 million in 1999. This reportedly implies that new job creation in both the formal and the informal sectors was unable to keep pace with the demand for work (Stats SA, 2001: 48).

Stats SA (2003: 54) provides a rather more current situation regarding unemployment in South Africa. A comparison of the findings from the 2001 census and the Labour Force Survey (LFS) 2001 is shown. The census results indicate the unemployment level to be 41.6%, a figure that differs substantially from 29.5% emanating from LF September 2001. Incidentally, both surveys (i.e. census 2001 and the Labour force survey) use the official definition of unemployment (see definition of terms). It should be noted that there is a slight difference in the definition of unemployment, in part (b) for both surveys. In census 2001, part (b) reads as "*want to work and are available to start work within a week of census night*". In the Labour force survey, part (b) reads as "*want to work and are available to start work within two weeks of the interview*". In other words, there is a week's difference in the reference period.

As to whether this could explain the difference in the recorded unemployment levels emanating from the two surveys could not be established beyond the identified difference in the definition. In spite of the differences in definition and recorded unemployment figures, both datasets indicate that unemployment levels differ at provincial level, with Eastern Cape experiencing the highest unemployment (54.6%) and Western Cape recording the lowest (26.1%) as per Census 2001. Disaggregated statistics by race indicate that unemployment is highest among Africans (50.2%), followed by unemployment among coloureds (27%). The lowest unemployment is recorded among whites at 6.3% according to census figures. Introducing a sex dimension shows that unemployment is highest among African females (57.8%) followed by unemployment among coloured females (28.6%). Unemployment is lowest among white females at 6.6%. As for males, unemployment is highest among African males (43.3%) followed by that of coloureds (25,7%). The lowest unemployment level is among white males, recorded at 6.1%.

The problem of unemployment and job creation is not entirely new in South Africa. Loots (1996) looks at the relationship between these two issues and her findings indicate that although economic growth had taken place in the 1990's, unemployment remains significant and in fact increasing due to a number of factors. Firstly Loots (1996: 321 – 322) indicates that unemployment in South Africa is higher among women than among men on average. Loots' findings indicate that 37.3% of all economically active women are unemployed compared to 24.6% for economically active men. For African women, unemployment is as high as 46.9%. With regard to unemployment and race, the highest unemployment occurs among Africans, where approximately 40% on average are without any formal or informal employment; while those for coloreds, Asians and whites are 23.4%, 16% and 7.2% respectively.

The findings of this study do agree with the reviewed literature as far as unemployment in South Africa is concerned. Even though there is a difference in terms of time regarding the reference period and where we are today, unemployment remains a crucial factor in differentiating between households' living conditions in the country.

The indicator *Highest level of education completed by a household head* featured as a discriminating factor for the years 1996 to 1998. This in itself needs to be paid attention to given the multidimensional effect education has on QOL, but above all its effect on employment prospects. Loots (1996) says that education plays a crucial role in improving employment prospects especially through skills development. Much as this has been empirically outstanding for long, Loots (1996: 323) indicates that most unemployment in South Africa occurs mainly among the young and unskilled workers. Close to seventy percent (i.e. 68% to be precise) of the unemployed are younger than 34 years. Of the total, 51% are functionally illiterate; i.e. they have a qualification below grade nine. Further more, Loots (1996) indicates that 87% are not trained or skilled for a specific job, and 69% have no previous experience. Because these people cannot enjoy the benefits of rapid acquisition of skills, experience and the habits of work which young people normally learn before the age of thirty, they will be virtually unemployed in future. Most have abandoned all hope of finding jobs, becoming the so-called "discouraged workers". UNFPA (1994:7) indicates that when it comes to the economic emancipation of women, education is viewed globally as the key to access to economic resources; education undoes the most of the socio-economic and socio-political injustice against women.

8.7 Summary

Chapter eight has provided a discussion of the findings which were presented in chapters four to seven seven. Discussions in respect of changes in the age composition of household heads indicate that the changes are in line with the national pattern reflected by the census figures for 1996 and 2001. The sex distribution of household heads has been discussed, reflecting a dominance of females among households headed by people in the 15 – 19 age group as well as households headed by people over seventy years. The revealed situation in the two age groups has a negative impact on QOL given the fact that the household head is either too young to be well equipped with the skills required for gainful employment or she is retired. Changes in cluster composition have been discussed, reflecting not only an increase in the number of QOL

groups but also changes in respect of socio-economic status as well as race and sex composition of the households. The QOL index has been discussed and, an increase in the number of QOL groups is deemed to reflect an improvement in QOL due to a diversification of households accessing the selected QOL indicators. However, the shortcomings of the QOL index have also been noted particularly where the index is in contrast with existing literature.

Findings regarding changes in subjective perception of QOL have been discussed. These findings have been found to be in line with existing literature regarding the association between material living conditions and perceived quality of life.

Results emanating from discriminant function analysis highlight the key indicators that differentiate between the QOL groups. These results have been discussed with reference to the existing literature. The discriminating indicators provide a basis for addressing the differences in QOL between existing groups of households. Chapter 9 will provide the conclusion and, recommendations based on the study's findings.

CHAPTER NINE: OVERVIEW, CONCLUSION, RECOMMENDATIONS AND LIMITAIONS

9.1 **Introduction**

Having discussed the research findings and their interpretations with reference to the related literature in chapter eight, this chapter will provide an overview of the study as well as the conclusion and recommendations arising from the analysis and interpretation of the research findings. Attempt will be made to identify and recommend areas for further study in order to improve the living conditions of households in South Africa. Below is a brief overview of the study.

This study set out to measure quality of life and, to analyse the changes in household quality of life between 1996 and 1999. The analysis focused on changes in household access to selected indicators of quality of life, QOL having been conceptualised in terms of households' ability to satisfy basic needs. The most pertinent question this study sought to answer was; has quality of life in South Africa improved? Answers to this question were sought in reference to the period 1996-1999. Results from the analysis of the data pertaining to the reference period indicate an improvement in household QOL in certain respects. For instance an increase in the number of groups of households (i.e. QOL groups) accessing the selected QOL indicators has been noted. The increase in the number of QOL groups is indicative of an increase in differential access to the selected quality of life indicators. On the other hand however, proportions of households belonging to QOL groups with relatively better access to the selected QOL indicators have been found to fluctuate. In fact the proportions have substantially gone down in some instances particularly in 1999. This has left the study's response to the pertinent question, inconclusive and certainly not definite. The study has also found that despite the improvement in QOL, a number of factors (indicators) differentiate between the living conditions experienced by households in the various QOL groups. These include amongst others, unemployment, level of education completed by household heads, access to toilet and piped water, type of dwelling and, access to transport and telephone services.

These indicators interact in various ways and, at different levels to impact on household QOL as indicated in the study's findings and discussions.

9.2 Conclusions arising from the analysis and interpretation of the research findings

The following conclusions arise from the findings of the study. They throw light on critical areas, which if paid attention to, could further improve QOL in South Africa.

- The age distribution of household heads reveals a dominance of females in the young age group (15-19) and the old age category (over 70 years). A household headed by someone aged 15-19 arguably qualifies to be classified as a child headed household given the fact such a person is not yet adequately skilled to meet the needs of the household in question. That substantial proportions of households headed by people aged 15-19 have been identified in this study, needs to be taken seriously particularly in the current era of the HIV/AIDS pandemic (see HSRC, 2002; Rosa, 2003). Such substantial proportions of "child headed" households might be symptoms of the equally substantial proportions of female headed households in the old age categories (70 years and older).

  The prevalence of female headed households among the elderly is not entirely strange given the fact females generally have a higher life expectancy than males. Stats SA (2006:2) estimates male and female life expectances at 49 and 52.5 years respectively in 2006. Life expectancy for both sexes is estimated at 50.7 years. What needs to be treated with caution though, is the emerging pattern of the rise in female headed households in two age categories (i.e. 15-19 and 70 years and older). This needs to be viewed particularly in the context of the socio-economic implications as both categories constitute a dependency group. As a matter of fact a rise in the dependency ratio has severe socio-economic implications for the households concerned but most importantly for government due to the increase in the demand for services like health, child support grants and social pension.

Males have been found to dominate household headship in the 30 - 49 category. These have been identified to be households where better access to the selected indicators of QOL is concentrated. While this is not bad in any way, attention needs to be paid to this finding when it comes to improving household QOL.

- The study's findings have revealed that poor QOL among households is not related to the sex of the household head. The findings have shown that although female headed households are predominant in groups of households with poor QOL conditions, adjacent to these groups are households in groups with almost equally poor and, sometimes worse QOL conditions. Such household groups have been found to be dominated by male headed households. The focus in improving QOL needs to bear this in mind if genuine improvements in QOL are to be realised.

- Cluster analysis provided an index which enabled the study to assess the differences in household access to the selected QOL indicators. This index shows that households' access to selected indicators increased during the 1996-1999 period resulting in an increase in the number of QOL groups or clusters. From a socio-economic point of view, there has been a marked improvement in access to the selected indicators as reflected by the increase in the number of QOL groups. What needs to be pointed out however, are the conditions experienced by households in the poorer QOL groups for all the four years reviewed. There is still a big difference in living conditions for households in these groups as compared to households in groups with better access to the indicators considered. The markedly different conditions in these poor QOL groups are in the main, responsible for the emergence of the discriminant indicators sited in the overview above. Much as the these households may be proportionately fewer than those in better off QOL groups (in fact they fluctuate), neglecting them will be a contravention of the vision of the South African policy – " … to contribute towards the establishment of a society that provides a high and equitable quality of life for all South Africans …." (Department of Welfare, 1998: 35).

One other motivation for urgent attention to improving the living conditions in these groups is the fact that most households belonging to the poorest QOL groups are rural based (found in Eastern Cape, Limpopo, KwaZulu Natal and Mpumalanga), with poor access to basic services identified under discriminant function analysis. This is particularly the case with regard to piped water. Much as substantial inroads have been made in providing piped water particularly via public taps, most households in the QOL groups identified as the poorest have no access to clean water. These QOL groups are dominated by female headed households in whereby household heads are either illiterate or functionally literate and, the majority are unemployed. This puts such households in a very critical situation when it comes to meeting household needs.

- Results emanating from discriminant function analysis are interrelated with the findings from cluster analysis. The difference is that cluster analysis provides a basis to classify households into groups, which enables the study to describe the conditions in the resultant groups. Discriminant function analysis enabled the study to identify the indicators which differentiate between the identified groups. The interrelatedness of the two models (cluster and discriminant analysis) used in the study can result in tautology when providing concluding remarks and this has to be avoided. Among the crucial findings not yet referred to in conclusion include household access to toilets and refuse disposal services. These two indicators play a crucial role in households' sanitation yet the majority of households in the study do not have access to the two, particularly the former. This study attempted to look in detail at how households differ in access to selected QOL indicators. The fact that only 15 households out of a total of 3005 (i.e. 0.5%) in group two (with the poorest QOL) in 1999 have a flush toilet in the dwelling reveals the magnitude of the challenges with regard to sanitation; this group constitutes 13.8% of the sampled households in 1999. Access to sanitation – toilet and refuse disposal– reportedly differs on rural-urban dichotomy (Stats SA, 2001: 24; Stats SA, 2004: 23).

No matter how one looks at it, whether in aggregated form like Statistics South Africa or in disaggregated form like the current study, access to sanitation particularly the toilet is a challenge.

- Another indicator emanating from discriminant function analysis which needs to be noted relates to the type of transport used by households to get to work. A deeper look into this indicator reveals the indicator to discriminate between QOL groups on the basis of employment status rather than the type of transport used. The level of unemployment has been found to be high among household heads in most of the groups emanating from cluster analysis. Several households in better off QOL groups have been found to be headed by unemployed people. Much as a household could have other working members while the head is not working, unemployment is a reality and one of the top priorities for provincial and national government (Limpopo Provincial Government, 2004)

9.3 Recommendations emanating from the analysis and interpretation of the research findings

Improving quality of life in South Africa is an on going process. As such most of the recommendations being made here will just serve to emphasise what is mainly being done. For instance the need to improve people's level of education does not need any more emphasis given the study's results. A sustainable improvement in household QOL will require that households are capable of meeting their needs. Achieving this requires intervention from several angles one of which is acquiring education. Successful completion of education – tertiary as opposed to functional literacy- opens channels for households to lead a better life. Achieving this level of education requires time, which from a demographic point of view, the currently uneducated household heads may not have. This brings in another angle in the form of government intervention through the provision of basic needs like housing and water.

Sustaining government's efforts to improve QOL requires for instance, that households are capable of paying for the services like electricity and water.

This is where education, skills development and employment come in the equation. Improvement in completed level of education is likely to reduce unemployment while at the same time increasing entrepreneurial capacity; it is a long term goal. Attaining this goal will go a long way in reducing the burden arising from people relying on public services (particularly health) which has been found to cater for over eighty percent of the population's health needs.

Closing the gaps identified through discriminant analysis will require more of household efforts as opposed to government intervention. For instance household access to sanitation in form of a flush toilet will require households to access dwellings with such facilities. This will require households to move from the level of free houses built by the government. This calls for a shift in household income which is greatly determined by households' initiatives to improve their living conditions – human capital development. So improvement in personal education is a key to sustainable improvement in household QOL provided a mismatch between acquired skills and labour market needs is avoided.

Access to housing as a basic need has taken on a new dimension when one considers government's assistance in addressing the housing needs in South Africa. While providing low cost houses has improved the living conditions and QOL in that respect, this move calls for a revision in the way information on type of dwelling occupied by a household is collected. The current format of collecting data on this particular indicator-dwelling type- makes it difficult to assess certain critical dimensions in housing since many houses differing in size and amenities occupy separate stands. For example, a four roomed house built on a separate stand in an area which is not serviced by municipal authorities differs from a similar house built in a serviced area (i.e. with refuse removal services, water and toilet in dwelling). Future surveys should consider the current developments while dealing with housing and, more research is needed in this respect.

The current study has identified the existence of substantial proportions of households headed by teenagers which qualify to be child headed households. The study has also found that female headed households outnumber male headed households among child

headed households as well as among households headed by elderly people. Child headed households as a concept is relatively new with limited literature. It is a concept whose emergence is mainly related to the scourge HIV/AIDS. More studies are needed to investigate the real causes of the increase in the number of households headed by teenagers and child headed households in general in order to mitigate the socio-economic consequences thereof.

Access to telephone came out of this study's analysis as one of the factors discriminating between groups of households in 1999. Access to telephone is problematic in terms of the distance traveled to get hold of a telephone. Addressing this issue of access to telephone will require information on access to cellular phones separated from information on access to landline telephones. This was not addressed in the process of data collection for some of the data used for this study, yet the two types of telephones most likely differ in terms of operating cost and physical availability. Although discriminant function analysis identified distance traveled to get hold of a telephone as the main factor, information on distance traveled and the proportion of the population with one of the two telephone types will be imperative in addressing telecommunication problems.

This study found an improvement in the measurable quality of life conditions based on selected indicators of QOL. On the subjective aspect of life satisfaction, the study found patterns which fairly fit the explanations in the available literature regarding the relationship between material living conditions and life satisfaction. What is not clear though is the rather high and consistent proportion of indifference in subjective life satisfaction in spite of improvements observed in household living conditions. This calls for some in depth analysis on the qualitative side of quality of life. This study strongly recommends this avenue in order to achieve congruence between the monitoring of progress on the indicator side and what people actually feel.

Last but not least, it is recommended that more studies make use of this approach in measuring QOL with the inclusion of relevant indicators addressing current QOL issues.

It will be interesting and obviously crucial to know for instance how many households have access to the internet at home, how many households access the internet at work, how many households access it via internet cafes and, how many enjoy all of these options. This is important given the evolutions taking place with regard to the search for information. Some of the homework in primary schools today requires connection to the electronic world of information. This makes “access to the internet” a necessity rather an a luxury. These are relatively new developments and information pertaining to such indicators should be incorporated in the current studies.

9.4 Problems and limitations of the study

It will be inconceivable to wind up this study without acknowledging the weakness and problems encountered in the whole process. One of the problems encountered in the study relates to the fact that analysis of aspects was based on “head of household”. This is likely to obscure some information regarding a household’s access to issues impacting on QOL. For instance, a household where the household head is unemployed but there are other working members could misrepresent reality, with the said household accessing indicators which do not relate to the employment status of the household head. This in a way links to the issue of income declaration. Information on this particular indicator is quite unsatisfactory; the response rate was rather low in all the data used in this study. This restricted the use of this indicator to descriptive purposes yet it is a crucial discriminant factor.

Leaving out household income in the analysis is likely to have affected the QOL index as depicted by the QOL clusters. The effect is likely to be at least two fold. Firstly leaving out household income can affect the real grouping of household clusters. This could be quite problematic given the highly monetised system in South Africa when it comes to accessing the considered QOL indicators. On the contrary, the Living standards measure (LSM) no longer considers income because it does not add to its strength (SAARF, 2002; SAARF, 2004). Under such circumstances, one cannot exactly tell what the outcome could have been had household income been responded to sufficiently in the OHS data.

All in all, the first problem then leads to the second problem which is epistemic in nature; to what extent are the QOL clusters real? How could a household with an unemployed head occupy a duplex for instance? How come such a household possesses a car and, has access to medical aid cover? These are some of the questions this study had to grapple with particularly when interpreting the study's findings. The solution to this limitation has mainly been through triangulation but even then, omission of income in the analysis remains a serious limitation.

Another limitation relates to the data that was used. Assessing the changes in QOL has been affected by the fact that some indicators were not consistently included in the surveys during the reference period. While several indicators relating to basic household needs were consistently covered, some equally basic indicators like medical aid cover were not. This had an impact on the analysis of the QOL changes.

One ought to appreciate the fact that although the indicators kept on changing in the datasets subsequent to OHS 1996, the changes were for the better. By the time the OHS-1999 survey was conducted, several indicators had become consistent both in number and internally in terms of the components used. That is one reason the analysis for OHS 1999 applied seventeen QOL indicators - the largest in the whole study. It would be interesting to see the outcome of applying the same methodology to the data collected in more recent years, like the Community survey-2007 which is currently underway; it has most of the indicators in OHS 1999. This is highly recommended.

The third limitation lies in the difficulty to isolate micro-level factors from meso-level and macro-level factors influencing QOL. For instance the type of fuel a household uses influences the QOL cluster that a household belongs to but, this *type of fuel* is to some extent, determined by the environment to which the household is exposed and whether the community (rural or urban at times) has access to various energy sources. A better off household living in a rural community may use gas for cooking because there is no electricity even though the said household could afford paying for electricity. In terms of the Systems theory structure of QOL - proposed by Hagerty *et al*. (2001)- using gas

instead of the preferred electricity (which is unavailable) “reflects the individual’s choice in response to the environment” (Hagerty *et al.*, 2001: 79). This response is, in most cases, enhanced by other factors (like education level, household income, etc.) which simultaneously enable the household to respond in a particular way to the environment. In terms of the current study, such a household ends up being classified in a poorer group or cluster than it actually should belong to. This kind of situation may affect the subjective assessment of life satisfaction in one way or another as well. Several factors impacting on household QOL operate at a level beyond the household itself and their impact is difficult to measure at household level. This has an impact on the authenticity of household QOL, the QOL index and of the study’s findings all together.

Finally, some weaknesses relating to cluster analysis results and, the ranking of QOL clusters need to be mentioned. In at least two cases (OHS 1999 and OHS 1998) adjacent clusters - in terms of ranking which was based on group centroids of first linear discriminant functions– showed inconsistencies when it comes to assessing the QOL conditions in such groups or clusters. Results could show that a group ranked as better off, experiences material conditions that are in reality poorer than the conditions in the following QOL group. This was particularly evident in groups three and four of OHS 1998 where the centers of the two groups were fairly close (1.03 and 1.58 units respectively). Although some clusters could stand on their own, their proximity seems to suggest that the two clusters could as well have been collapsed into one cluster in order to avoid the inconsistencies in the results. However, considering the high degree of fit between the results of cluster analysis and discriminant function analysis, one would rather highlight the weakness identified as an issue that could be looked into in subsequent studies using similar methodologies.

The other weakness which might have resulted into the observed inconsistencies in clusters relates to the weighting of the QOL indicators. While indicators were weighted as explained in chapter three (see also Appendix A), the statistical processes-cluster analysis and discriminant analysis- weighted the various QOL indicators equally. This might have compromised the relative importance of some indicators which could have

impacted on QOL more than the way the process unfolded. Avoiding this would have required that individual indicators are assigned particular weights on the basis of their perceived relative importance but this requires evidence. For instance, if the level of education completed by a household head is deemed to be more influential in a household's QOL than say medical aid cover, what weights should be assigned to the two indicators and, based on what grounds? This would require empirical evidence to avoid further subjective weighting. Remember that components within individual QOL indicators were assigned weights which could arguably be seen as subjective and therefore not entirely value-free. This on its own, has got its weaknesses in analytical terms. Take the "type of dwelling" occupied by a household as an example. A figure of "5" was assigned to a household occupying a traditional dwelling or a hut. A household living in a "Dwelling/house or brick structure on a separate stand/yard" was assigned a figure of "11" (see Appendix A). Should this be taken to imply that the QOL of a household living in a traditional dwelling is almost half as good as the QOL experienced by a household in a brick house on a separate stand, in as far as this indicator is concerned? These are some of the intricacies involved in the analytical processes which might result into the observed inconsistencies in the study's results. Taking all this into account, together with a consideration of the criteria developed by Hagerty *et al.* (2001), a further application of the developed QOL index (with an application of sensitivity analysis on the weights) is strongly recommended.

9.5 Summary

This chapter has provided a summary of the findings from the study. It has also provided conclusions arising from the analysis and interpretation of research findings. A number of recommendations emanating from the analysis and interpretation of the research findings have been made. The problems encountered in the research process have been cited, and the limitations of the study have also been identified. Although the data used in the study is relatively old, the findings are still quite in line with the current developmental challenges South Africa faces today. It is hoped that follow-up studies will contribute immensely to improving QOL by responding to the recommendations made, particularly where successful attempts are made to overcome the stated limitations.

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APPENDIX A: COMPONENTS OF THE INDICATORS OF QUALITY OF QUALITY OF LIFE

Indicator 1: Type of dwelling (Available for entire reference period)

Component	Original code	Value assigned in study
Dwelling/house or brick structure on a separate stand/yard	1	11
Traditional dwelling/hut/structure made of traditional materials	2	5
Flat or apartment in a block of flats	3	9
Town/cluster/semi- detached house (simplex, Duplex or triplex)	4	10
Unit in retirement village	5	8
Dwelling/house/flat/room in back yard	6	7
Informal dwelling/shack in back yard	7	3
Informal dwelling/shack not in back yard e.g. in squatter settlement	8	4
Room/flatlet	9	6
Caravan/tent	10	2
Other (specify)	11	1

Indicator 2: Status of ownership of dwelling (Available in OHS 1999, phrased differently elsewhere)

Component	Original code	Value assigned in study
Owned and fully paid off	1	5
Owned, but not yet fully paid off (e.g. with a mortgage)	2	4
Rented	3	2
Occupied rent-free as part of employment contract of family member	4	3
Occupied rent-free not as part of employment contract of family member	5	3
Other (specify)	6	1

Indicator 3: How far is the water source from dwelling? (Available for entire reference period)

Component	Original code	Value assigned in study
Less than 100 metres	1	5
100 M – Less than 200 M	2	4
200 M – Less than 500 M	3	3
500 M – Less than 1 KM	4	2
1 KM or more	5	1
Not applicable (water on site)	6	6
Water in dwelling	7	7

Indicator 4: Household's main water source (Available for entire reference period)

Component	Original code	Value assigned in study
Piped (Tap) water in dwelling	1	12
Piped (Tap) water, on site or in yard	2	11
Public tap	3	10
Water-carrier/tanker	4	8
Borehole on site	5	9
Borehole: off site/communal	6	6
Rain-water tank on site	7	7
Flowing water/stream	8	5
Dam/pool/stagnant water	9	2
Well	10	4
Spring	11	3
Other (specify)	12	1

Indicator 5: Household's main source of fuel for cooking (Available for entire reference period)

Component	Original code	Value assigned in study
Electricity	1	8
Gas	2	7
Paraffin	3	4
Wood	4	3
Coal	5	5
Animal dung	7	2
Solar energy	8	6
Other (specify)	@	1

Indicator 6: Household's main source of fuel for lighting (Available for entire reference period)

Component	Original code	Value assigned in study
Electricity	1	6
Gas	2	5
Paraffin	3	3
Candles	6	2
Solar energy	8	4
Other (specify)	@	1

Indicator 7: Household's main source of fuel for heating (Available for entire reference period)

Component	Original code	Value assigned in study
Electricity	1	8
Gas	2	7
Paraffin	3	4
Wood	4	3
Coal	5	5
Animal dung	7	2
Solar energy	8	6
Other (specify)	@	1

Indicator 8: Type of toilet facility available for the household (Available in OHS 1999 and OHS 1998; captured as constants in OHS 1997)

Component	Original code	Value assigned in study
Flush toilet in dwelling	11	13
Flush toilet on site	21	12
Flush toilet off site	31	11
Chemical toilet on site	22	10
Chemical toilet off site	32	9
Pit latrine with ventilation pipe on site	23	8
Pit latrine with ventilation pipe off site	33	7
Pit latrine without ventilation pipe on site	24	6
Pit latrine without ventilation pipe off site	34	5
Bucket toilet on site	25	4
Bucket toilet off site	35	3
None off site	36	2
Other (specify)	37	1

Indicator 9: Type How is refuse/rubbish of this household disposed of? (Available for entire reference-period)

Component	Original code	Value assigned in study
Removed by local authority at least once a week	1	8
Removed by local authority less often	2	7
Removed by community members at least once a week	3	6
Removed by community members less often	4	5
Communal refuse dump/communal container	5	4
Own refuse dump	6	3
No rubbish removal	7	1
Other (specify)	8	2

Indicator 10: Does this household have a telephone, either in the dwelling or regular use of a cellular telephone? (Landline and cellular phone data captured independently in OHS 1996-OHS 1998)

Component	Original code	Value assigned in study
Yes	1	2
No	2	1

Indicator 11: How many minutes do you have to travel to the nearest telephone you can use (by usual means of transport)? (Variable captured as "how far a household is from the nearest telephone)

Component	Original code	Value assigned in study
0 – 5 minutes	1	6
6 – 15 minutes	2	5
16 – 30 minutes	3	4
31 – 60 minutes	4	3
1 – 2 hours	5	2
Over 2 hours	6	1
In dwelling	@	7

Indicator 12: Does this household have a television? (Available only in OHS 1999)

Component	Original code	Value assigned in study
Yes	1	2
No	2	1

Indicator 13: Does this household own a motor vehicle (car, bakkie, van, station wagon, minibus) in running order? (Available only in OHS 1999)

Component	Original code	Value assigned in study
Yes	1	2
No	2	1

Indicator 14: What is the highest level of education has household head completed? (Available for entire reference period)

Component	Original code	Value assigned in study
No schooling	00	1
Grade 0	01	2
Sub A/Grade 1	02	3
Sub B/Grade 2	03	4
Grade 3/Standard 1	04	5
Grade 4/Standard 2	05	6
Grade 5/Standard 3	06	7
Grade 6/Standard 4	07	8
Grade 7/Standard 5	08	9
Grade 8/Standard 6/Form 1	09	10
Grade 9/Standard 7/Form 2	10	11
Grade 10/Standard 8/Form 3	11	12
Grade11/Standard 9/Form 4	12	13
Grade 12/Standard 10/Form 5/Matric	13	14
NTC I	14	15
NTC II	15	16
NTC III	16	17
Diploma/Certificate with less than Grade 12/STD. 10	17	18
Diploma/Certificate with Grade 12/STD. 10	18	19
Degree	19	20
Postgraduate Degree or Diploma	20	21
Other (specify)	21	20
Don’t know	22	0

Indicator 15: Is the household head covered by a medical aid or medical benefit scheme or other private insurance?

Component	Original code	Value assigned in study
Yes	1	3
No	2	2
Don't know	3	1

Indicator 16: Is the household's work (Available for entire reference period)

Component	Original code	Value assigned in study
Permanent	1	7
Fixed period contract	2	6
Temporary	3	5
Casual, or	4	3
Seasonal	5	4
Don't know	6	2
Not applicable; not working	@	1

Indicator 17: If anyone gets ill or injured and decides to seek medical help, where does the person usually go first?

Component	Original code	Value assigned in study
Public hospital	1	5
Public clinic	2	4
Other public facility	3	1
Private hospital	4	7
Private clinic	5	6
Private doctor/specialist	6	8
Traditional healer	7	3
Other (specify)	8	2

NB. This indicator is extracted from the questionnaire for OHS 1998; it was used in the analysis for the respective data. (It is available in OHS 1996-OHS 1998)

APPENDIX B: CLUSTER ANALYSIS RESULTS FOR OHS 1999

Initial Cluster Centers

	Cluster							
	1	2	3	4	5	6	7	8
Dwelling ownership	5	5	5	1	3	1	5	3
Recoded dwelling type	5	5	1	3	1	1	5	1
Does h/hold have a phone in house/cell - phone?	2	1	1	2	1	1	1	1
Household's fuel for cooking	5	3	2	5	3	5	5	3
Household's fuel for heating	5	3	2	5	3	5	1	2
Household's fuel for lighting	5	5	1	5	2	5	5	2
Highest education level completed	8	0	10	22	22	0	18	1
Is person covered by medical aid?	2	2	1	1	2	2	2	2
Occupation of employee/self employed	1	12	12	1	9	9	12	1
H/hold's time to travel to telephone	7	5	1	7	4	2	3	6
How is refuse removed?	1	1	7	1	5	6	1	7
Household access to TV?	1	2	1	1	2	2	1	2
Toilet type	11	1	6	11	1	11	11	1
Recoded water distance	5	4	1	5	4	5	5	4
Recoded h/h water source	5	4	1	5	4	5	5	4
Did person work for pay during past 7 days?	1	4	4	1	1	1	4	2
Household own a vehicle?	2	2	2	1	2	2	2	2

ITERATION HISTORY (OHS 1999)

Change in Cluster Centers								
Iteration	1	2	3	4	5	6	7	8
1	5.8755	6.1830	6.3137	5.0232	5.8972	6.6126	7.3168	6.9819
2	0.6323	1.7162	0.6168	0.4522	1.3610	1.5994	1.3098	1.2017
3	0.1469	0.4160	0.2928	0.1818	0.6666	0.3272	0.4061	0.5379
4	0.0827	0.1082	0.1304	0.1227	0.7773	0.1179	0.2172	0.3981
5	0.0435	0.0897	0.0748	0.1292	1.2909	0.0708	0.2736	0.3841
6	0.1204	0.0673	0.1039	0.1877	1.9612	0.1275	0.4292	0.3305
7	0.1068	0.0654	0.0655	0.4085	1.0497	0.2111	0.2823	0.2903
8	0.0894	0.0639	0.1148	0.2732	0.6988	0.1804	0.1713	0.3906
9	0.0797	0.0900	0.1510	0.0572	0.1371	0.1395	0.0965	0.4839
10	0.0777	0.1412	0.2025	0.0109	0.0266	0.1015	0.0590	0.6006

Comment: Iterations stopped because the maximum number of iterations was performed. Iterations stopped to converge. The maximum distance by which any center has changed is .578. The current iteration is 10. The minimum distance between initial centers is 13.820.

Final cluster centers (OHS 1999)

	Cluster number							
	1	2	3	4	5	6	7	8
Dwelling type occupied by h/hold	4.19	3.73	3.59	4.68	4.26	3.91	4.21	3.22
Ownership of dwelling	3.55	4.49	4.45	3.81	4.17	3.71	3.87	3.88
Nature of contract/Employment status	1.13	3.36	3.38	1.06	2.93	2.59	3.28	1.27
H/hold fuel for cooking	4.72	2.74	3.19	4.84	4.34	4.12	4.54	3.41
H/hold fuel for heating	4.45	2.39	2.68	4.66	3.93	3.63	4.11	2.86
H/hold fuel for lighting	4.81	2.97	3.14	4.84	4.44	4.51	4.67	3.34
Time taken to nearest phone	6.26	3.97	4.36	6.59	5.97	5.68	6.14	4.54
Does h/hold have a phone/cell-phone in house?	1.57	1.06	1.09	1.80	1.53	1.28	1.49	1.10
Highest qualification for h/h head or acting h/h head	11.23	0.97	9.18	18.59	19.94	1.99	9.60	6.89
Is person covered by medical aid?	1.63	1.98	1.97	1.29	1.72	1.94	1.85	1.94
Occupation of employee/self employed	5.23	11.13	11.29	2.83	10.54	10.11	11.37	6.75
Household own a vehicle?	1.57	1.92	1.92	1.29	1.59	1.89	1.75	1.89
Toilet facility accessed by h/hold	10.41	5.50	5.43	10.36	9.32	10.14	10.43	6.31
Household access to TV?	1.23	1.65	1.58	1.10	1.26	1.47	1.29	1.60
H/hold's main water source	4.66	3.34	3.38	4.74	4.42	4.39	4.62	3.63
Distance from water source	4.93	3.66	3.69	4.89	4.69	4.92	4.97	4.08
How h/hold refuse is disposed of	1.72	5.63	5.31	1.84	2.50	1.83	1.35	5.28

Analysis of variance

ANOVA						
	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Dwelling ownership	377.7680	7.0	1.4153	21853.00	266.9231	0.00
Recoded dwelling type	474.5005	7.0	2.2157	21853.00	214.1501	0.00
Does h/hold have a phone in house/cellphone?	186.2062	7.0	0.1694	21853.00	1099.0974	0.00
Household's fuel for cooking	1785.7999	7.0	0.8842	21853.00	2019.6824	0.00
Household's fuel for heating	2099.4529	7.0	1.5923	21853.00	1318.5020	0.00
Household's fuel for lighting	1865.4820	7.0	1.9397	21853.00	961.7529	0.00
Highest education level completed	86321.6179	7.0	4.2637	21853.00	20245.6562	0.00
Is person covered by medical aid?	127.8156	7.0	0.1226	21853.00	1042.1594	0.00
Occupation of employee/self employed	28684.7800	7.0	3.4559	21853.00	8300.1726	0.00
H/hold's time to travel to telephone	2810.7143	7.0	1.6106	21853.00	1745.1422	0.00
How is refuse removed?	10370.3759	7.0	2.9188	21853.00	3552.9249	0.00
Household access to TV?	106.0997	7.0	0.2061	21853.00	514.7789	0.00
Toilet type	15852.6484	7.0	2.5875	21853.00	6126.5515	0.00
Recoded water distance	988.5786	7.0	0.6533	21853.00	1513.2914	0.00
Recoded h/h water source	1031.4512	7.0	0.7235	21853.00	1425.7054	0.00
Did person work for pay during past 7 days?	3243.2344	7.0	1.0349	21853.00	3133.9591	0.00
Household own a vehicle?	117.8471	7.0	0.1538	21853.00	766.4652	0.00

NB. The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in the different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

Number of cases in each cluster

Cluster	
1	4701
2	3005
3	2995
4	1811
5	793
6	2349
7	3936
8	2271
Valid number of cases in analysis (N)	21861
Excluded due to missing data	4273
TOTAL	**26134**

APPENDIX C: DISCRIMINANT ANALYSIS RESULTS FOR OHS 1999

Summary of canonical discriminant functions (OHS 1999)

Function	Eigenvalue	Percentage of Variance	Cumulative %	Canonical Correlation
1	8.6340	66.4131	66.4131	0.9467
2	2.4699	18.9990	85.4121	0.8437
3	1.7425	13.4037	98.8157	0.7971
4	0.1308	1.0059	99.8216	0.3401
5	0.0120	0.0923	99.9139	0.1089
6	0.0077	0.0592	99.9732	0.0874
7	0.0035	0.0268	100.0000	0.0590

NB. The first canonical discriminant functions were used in the analysis

Wilks' lambda and chi square results (OHS 1999)

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 7	0.0094	101903.3126	119	0.00
2 through 7	0.0908	52412.2076	96	0.00
3 through 7	0.3151	25230.8738	75	0.00
4 through 7	0.8642	3189.3177	56	0.00
5 through 7	0.9772	504.3023	39	0.00
6 through 7	0.9889	243.7435	24	0.00
7	0.9965	76.1087	110	0.00

Standardized canonical discriminant function coefficients (OHS 1999)

	Function						
	1	2	3	4	5	6	7
Dwelling ownership	-0.0123	0.0706	0.0289	0.0129	0.1751	0.1726	-0.0693
Recoded dwelling type	0.0284	0.0076	0.0157	-0.2274	0.0326	-0.0580	-0.3220
Does h/hold have a phone in house/cellphone?	-0.0143	0.0606	-0.0669	-0.2336	0.3211	-0.5171	0.5446
Household's fuel for cooking	0.0247	-0.0985	0.0447	0.2529	-0.6484	0.0362	0.4759
Household's fuel for heating	0.0558	-0.0518	-0.0232	-0.1079	-0.1470	-0.4860	-0.2312
Household's fuel for lighting	0.0641	-0.0667	0.0037	-0.0355	0.2030	0.2089	-0.5054
Highest education level completed	0.7888	0.5686	0.2663	0.1105	0.0425	0.0479	-0.0337
Is person covered by medical aid?	0.0124	-0.0316	0.1060	0.4337	-0.1027	-0.2420	0.0620
Occupation of employee/self employed	-0.2927	0.1634	0.8539	0.4040	0.3283	-0.3225	-0.1738
Household own a vehicle?	0.0429	-0.0387	0.0451	0.1599	-0.3135	0.2373	0.1340
H/hold's time to travel to telephone	0.0762	-0.1341	0.0792	0.1915	-0.3205	0.4213	-0.2098
How is refuse removed?	-0.2972	0.4517	-0.2386	0.1054	0.2213	-0.0277	0.3850
Household access to TV?	0.0024	-0.0016	-0.0161	0.0011	0.1572	0.3795	-0.0644
Toilet type	0.3780	-0.6211	0.2141	0.0081	0.2886	0.1208	-0.0325
Recoded water distance	0.0626	-0.0920	0.0062	0.1074	0.3865	0.3533	0.5823
Recoded h/h water source	-0.0412	0.0620	0.0021	-0.0416	0.0581	-0.3495	0.1994
Did person work for pay during past 7 days?	-0.0471	0.0651	0.0974	-0.7930	-0.4616	0.4219	0.3490

Structure matrix – correlations between functions and predictors (OHS 1999)

	Function						
	1	2	3	4	5	6	7
Type of toilet facility	0.3439	-0.5906*	0.2110	-0.0841	0.3550	-0.0308	0.0885
Highest education level completed	0.8098*	0.5633	0.1501	0.0260	0.0009	-0.0017	0.0197
Occupation of employee/self employed	-0.3733	0.0992	0.9063*	0.0200	0.0778	-0.0554	-0.0043
Household own a vehicle?	-0.1566	0.0230	0.0756	0.3963*	-0.2778	0.3661	0.0024
Does h/hold have a phone in house/cell-phone?	0.1865	-0.1154	0.0238	-0.3515	0.1042	-0.4078*	0.3416
Is person covered by medical aid?	-0.1766	0.0200	0.1286	0.5140*	-0.1451	-0.0630	0.0241
Household's distance from water source	0.1690	-0.2965	0.0984	0.1293	0.2605	0.1817	0.5324*
Household's fuel for lighting	0.1488	-0.2095	0.0691	-0.0202	-0.0275	-0.0336	-0.2373*
Household access to TV?	-0.1287	0.0749	-0.0283	0.1867	0.1268	0.4820*	-0.0434
Did person work for pay during past 7 days?	-0.2029	0.1223	0.5670	-0.6192*	-0.2436	0.2088	0.1950
Dwelling ownership	-0.0629	0.1263	0.0487	-0.2396*	0.1405	0.0571	-0.1184
Household's fuel for cooking	0.2377	-0.2416	0.0761	0.0910	-0.4972*	-0.2438	0.2663
Household's fuel for heating	0.1948	-0.1891	0.0347	-0.093	-0.3099	-0.5169*	-0.0324
How is refuse removed?	-0.2549	0.4388*	-0.2384	0.1134	0.2670	-0.0232	0.1808
Household's water source	0.1836	-0.2482	0.0832	-0.0478	0.1345	-0.2521	0.3513*
Type of dwelling	0.0680	-0.0506	0.0444	-0.3739*	0.1316	-0.1799	-0.2154
H/hold's time to travel to telephone	0.2180	-0.2325*	0.0906	-0.0703	-0.1414	-0.0161	0.1779

NB. Pooled within correlations between discriminating variables and standardized canonical discriminant functions. Variables ordered by absolute size of correlation within function.
*Largest absolute correlation between each variable and any discriminant function.

Functions at group centroids (OHS 1999)

	Function						
Cluster Number of Case	1	2	3	4	5	6	7
1	2.3501	-0.9733	-0.9594	0.0848	-0.0517	-0.0902	-0.0516
2	-4.7840	0.3724	-0.5428	-0.5042	0.0921	-0.0758	0.0009
3	-1.5797	2.4874	0.6594	0.0610	-0.1630	0.0555	-0.0461
4	5.4938	0.9524	-1.2775	-0.6557	0.0274	0.1270	0.0535
5	4.2957	2.7734	2.5435	0.3796	0.3982	-0.0191	-0.1061
6	-2.1363	-2.7998	0.2985	0.0881	0.0430	0.1674	-0.0494
7	0.7290	-0.8356	2.0028	0.0016	-0.0368	-0.0431	0.0736
8	-1.3860	0.8577	-1.8150	0.7078	0.0584	0.0207	0.0844

NB. Un standardised canonical discriminant functions evaluated at group means

Prior probabilities for groups (OHS 1999)

	Prior probability	Cases Used in Analysis	
Cluster Number of Case		Un weighted	Weighted
1	0.125	4701	4701
2	0.125	3005	3005
3	0.125	2995	2995
4	0.125	1811	1811
5	0.125	793	793
6	0.125	2349	2349
7	0.125	3936	3936
8	0.125	2271	2271
Total	1.000	21861	21861

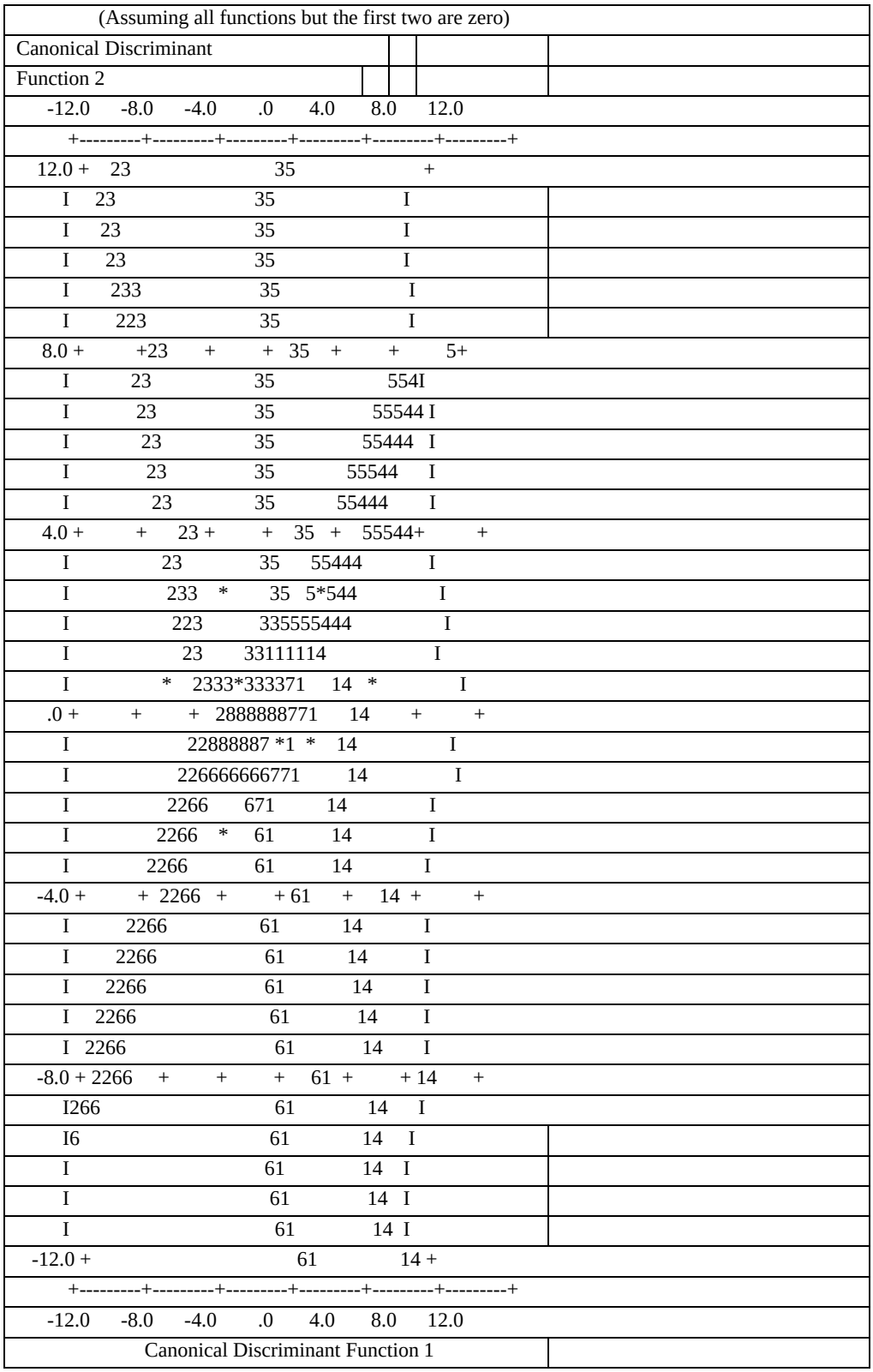
Classification function coefficients - Fsher's linear discriminant functions (OHS 1999)

	Cluster Number of Case							
	1	2	3	4	5	6	7	8
Dwelling ownership	3.8853	4.0627	4.1748	3.9885	4.2558	3.9049	3.9831	4.0429
Recoded dwelling type	1.2291	1.1857	1.1834	1.3791	1.2962	1.1387	1.2144	1.0317
Does h/hold have a phone in house/cell - phone?	8.2568	9.1334	8.3905	8.8304	8.1929	7.6912	8.0173	8.5684
Household's fuel for cooking	3.0698	2.5307	2.7598	2.7436	2.6395	3.1496	3.1863	2.9038
Household's fuel for heating	1.2108	0.8508	0.8232	1.2278	0.9839	0.9532	1.0433	0.8524
Household's fuel for lighting	0.4031	0.0305	0.0651	0.4796	0.4111	0.3390	0.2958	0.1086
Highest education level completed	3.2766	0.9466	2.9369	4.9321	5.5309	1.2301	3.0722	2.2792
Is person covered by medical aid?	16.9481	15.9280	16.8899	15.7173	17.9131	17.1340	17.6572	17.0781
Occupation of employee/self employed	1.2600	2.5829	2.8760	0.5937	3.0283	2.3561	2.8526	1.7391
Household own a vehicle?	16.0768	14.8823	15.6608	15.9967	16.1082	15.9927	16.2519	15.6684
H/hold's time to travel to telephone	2.1874	1.5139	1.7589	2.0758	2.0905	2.2513	2.2391	1.7968
How is refuse removed?	0.9254	2.4578	2.2808	0.9168	1.1513	1.0560	0.8544	2.2604
Household access to TV?	12.5378	12.5331	12.5295	12.7512	12.6345	12.7237	12.4505	12.6545
Toilet type	3.6900	1.5722	1.6365	3.6676	3.2554	3.5446	3.6533	2.0196
Recoded water distance	4.9977	4.3300	4.3233	5.1296	4.9950	5.0277	4.9861	4.7754
Recoded h/h water source	2.6408	3.1304	3.0225	2.6053	2.8029	2.6289	2.7517	2.9166
Did person work for pay during past 7 days?	-0.7294	0.1446	-0.0397	-0.1146	-0.6674	-0.4562	-0.2413	-0.9643
(Constant)	-129.58	-105.65	-122.23	-151.01	-175.64	-122.53	-142.69	-108.64

Classification results (OHS 1999)

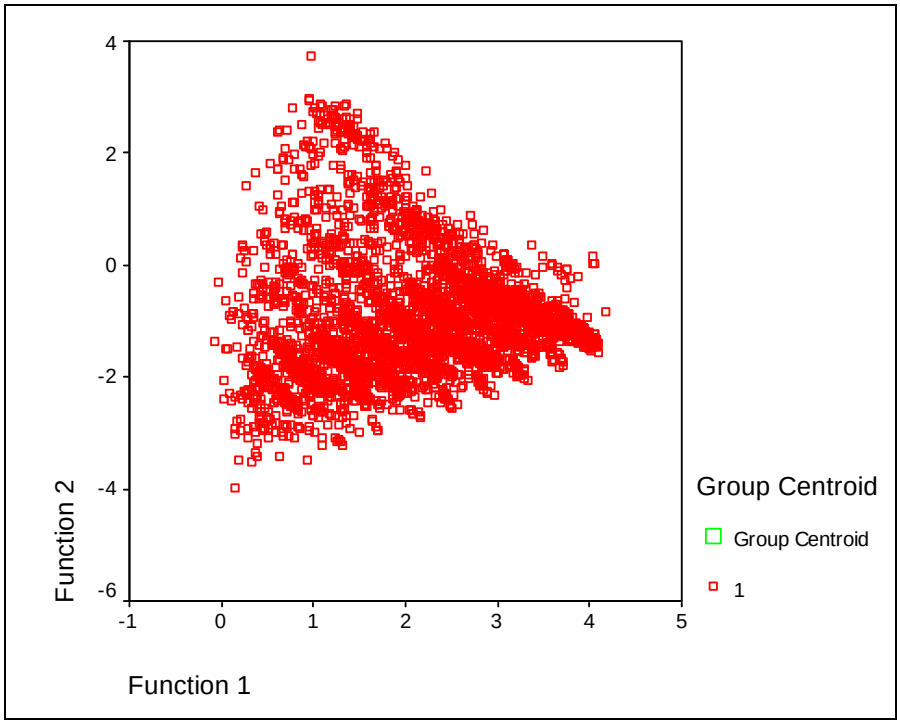
		Predicted Group Membership								
	Cluster Number of Case	1	2	3	4	5	6	7	8	Total
Original Count	1	**4383**	0	7	6	1	7	125	172	**4701**
	2	0	**2878**	76	0	0	43	0	8	**3005**
	3	0	11	**2714**	0	0	1	46	223	**2995**
	4	11	0	1	**1757**	42	0	0	0	**1811**
	5	0	0	6	1	**785**	0	1	0	**793**
	6	2	22	5	0	0	**2278**	37	5	**2349**
	7	82	0	25	0	0	10	**3808**	11	**3936**
	8	38	69	9	0	0	80	10	**2065**	**2271**
	Percentages									
	1	**93.2**	0	0.15	0.13	0.02	0.15	2.66	3.66	**100**
	2	0	**95.8**	2.53	0	0	1.43	0	0.27	**100**
	3	0	0.37	**90.6**	0	0	0.03	1.54	7.45	**100**
	4	0.61	0	0.06	**97.0**	2.32	0	0	0	**100**
	5	0	0	0.76	0.13	**99.0**	0	0.13	0	**100**
	6	0.09	0.94	0.21	0	0	**97.0**	1.58	0.21	**100**
	7	2.08	0	0.64	0	0	0.25	**96.8**	0.28	**100**
	8	1.67	3.04	0.40	0	0	3.52	0.44	**90.9**	**100**

Territorial Map (OHS 1999)

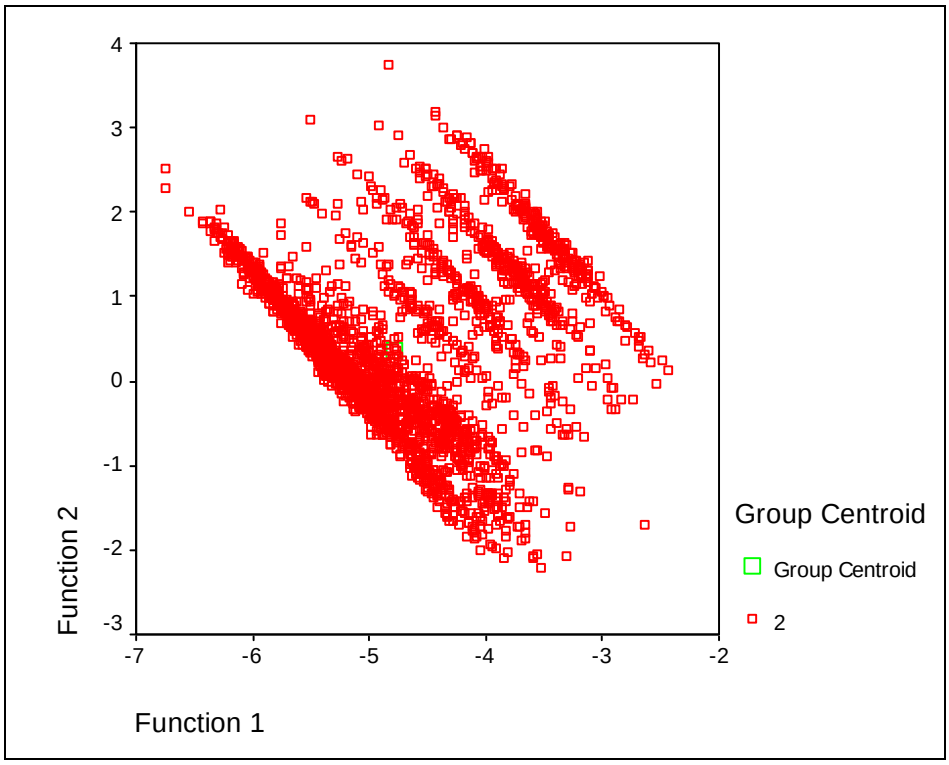


NB. * Indicates a group centroid

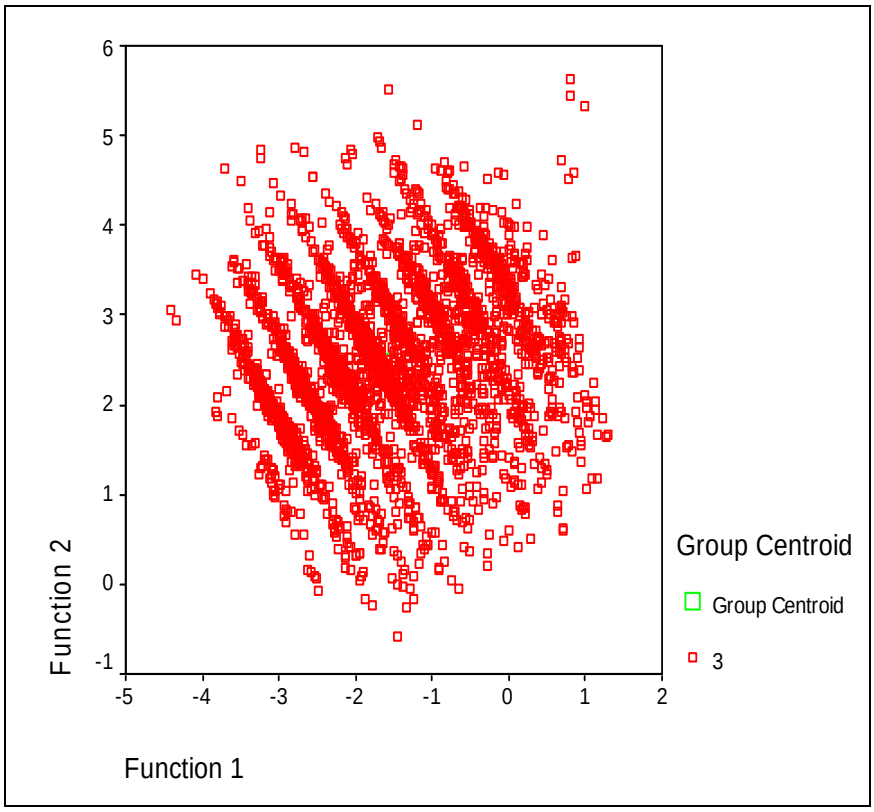
Canonical discriminant function plot - QOL 1 (OHS 1999)



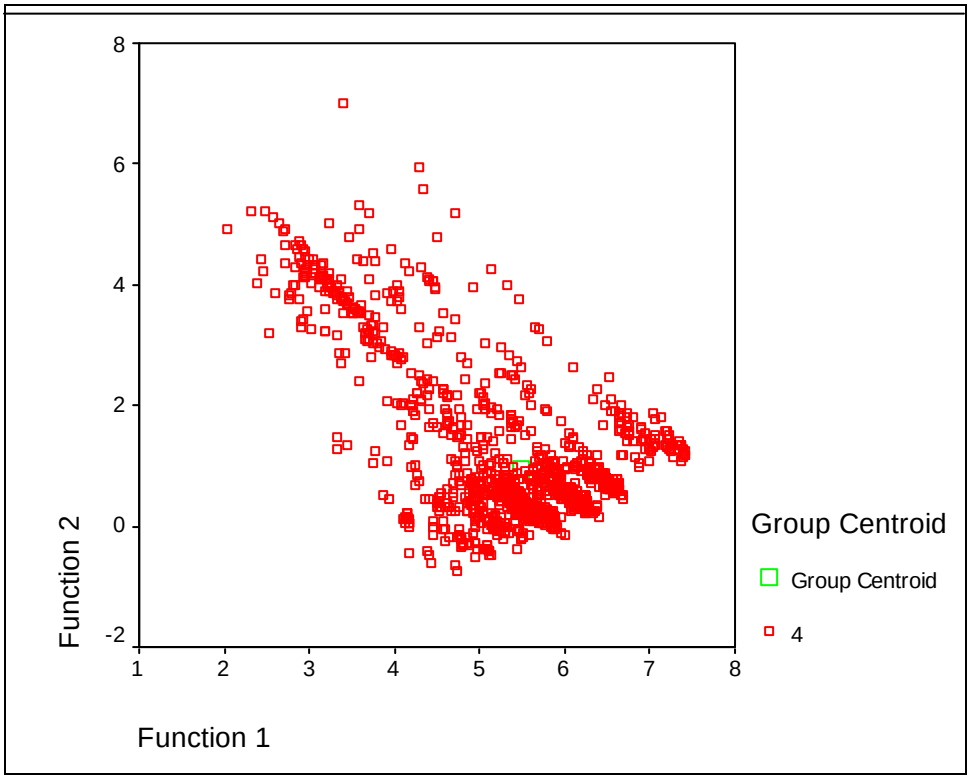
Canonical discriminant function plot - QOL 2 (OHS 1999)



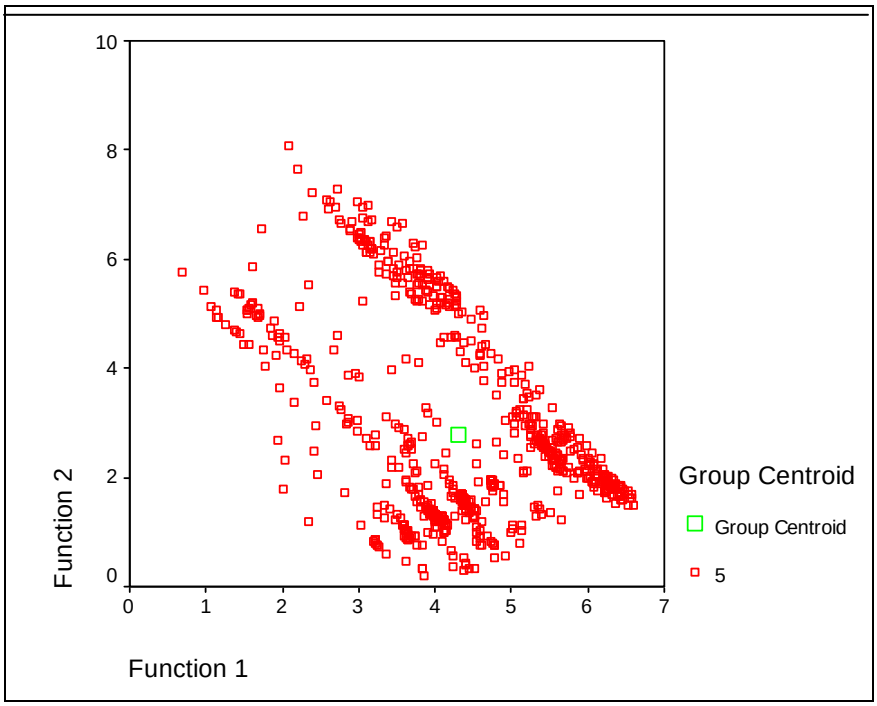
Canonical discriminant function plot - QOL 3 (OHS 1999)



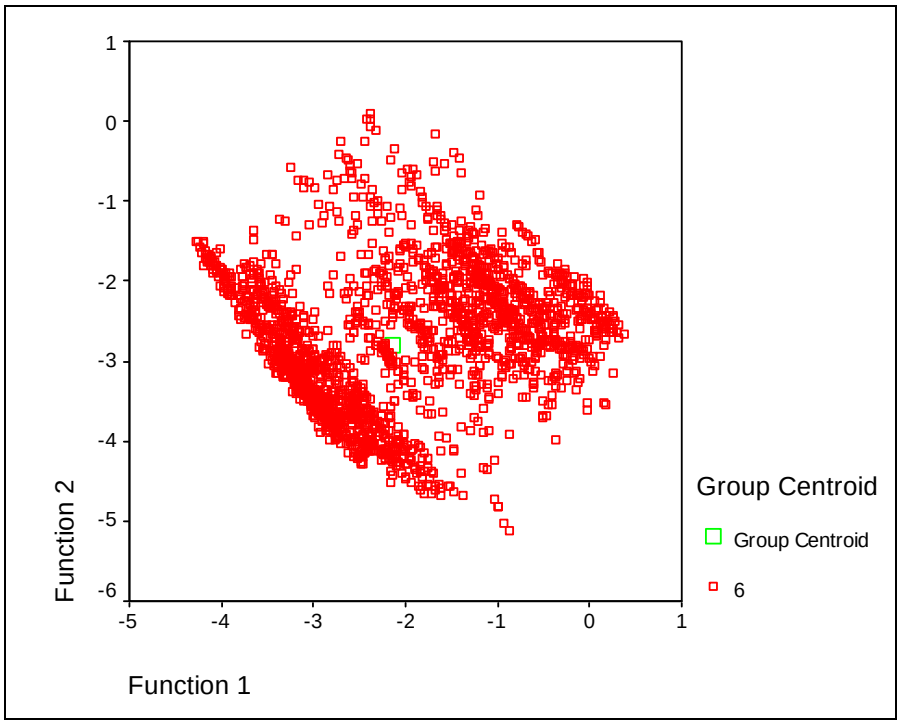
Canonical **discriminant function plot - QOL 4 (OHS 1999)**



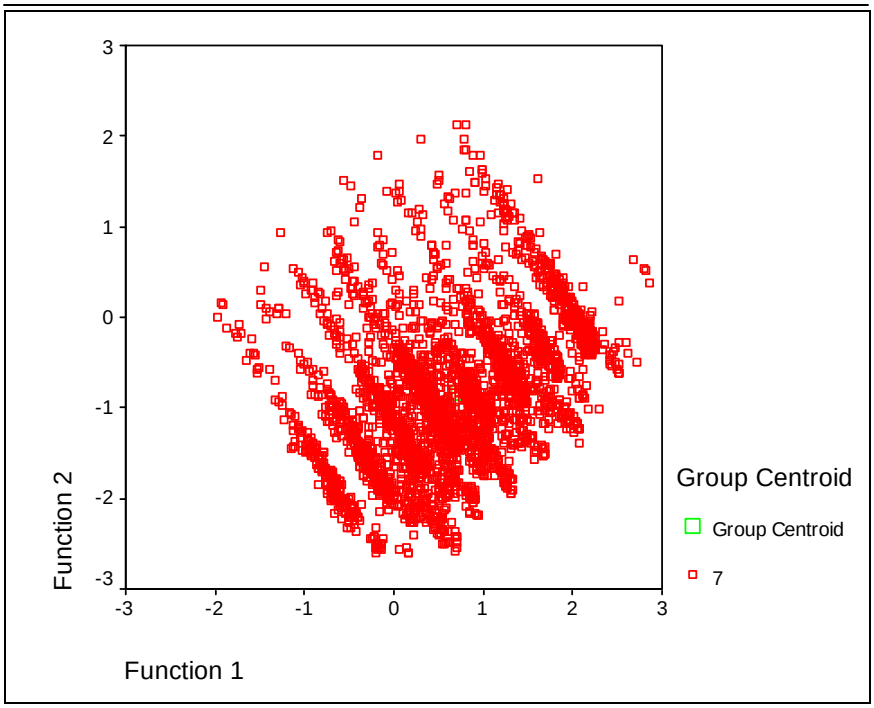
Canonical discriminant function plot - QOL 5 (OHS 1999)



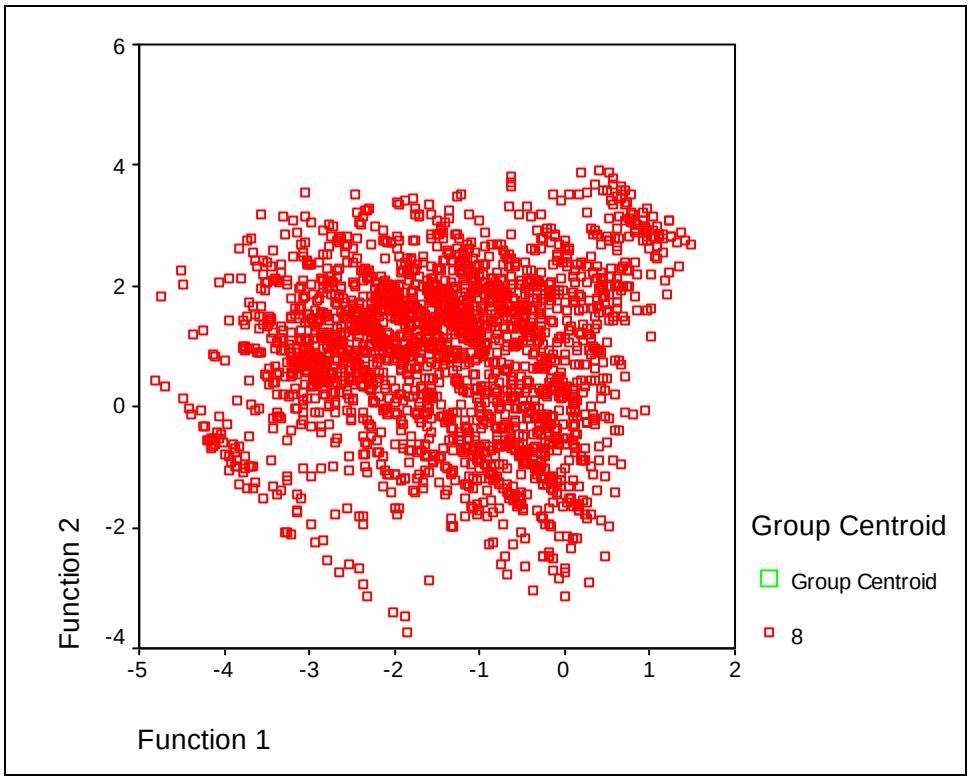
canonical discriminant function plot - QOL 6 (OHS 1999)



Canonical discriminant function plot - QOL 7 (OHS 1999)



Canonical discriminant function plot - QOL 8 (OHS 1999)



APPENDIX D: CLUSTER ANALYSIS RESULTS FOR OHS 1998

Initial cluster centres

	Cluster number						
	1	2	3	4	5	6	7
Does h/h have a cellular phone?	1	1	2	1	1	1	1
Did person work for pay during past 7 days?	1	1	5	5	1	1	5
H/hold's main fuel for cooking	8	2	8	3	3	8	8
H/hold's main fuel for lighting	6	2	6	2	2	6	6
H/hold distance from medical facility	5	1	1	1	4	5	3
Highest education level completed	14	1	14	7	13	1	1
Is there a phone in the dwelling?	1	1	2	1	1	2	1
Does person have access to medical aid?	1	1	2	1	1	2	1
Usual facility for h/hold medical help	3	3	5	3	3	5	3
How is h/hold refuse disposed of?	5	1	5	2	1	5	5
Type of toilet facility used by h/hold	2	1	5	1	1	5	5
Dwelling's main water source	4	1	5	1	1	5	5
Dwelling's distance from water source	6	1	7	1	2	7	7
Main transport used to work	1	13	11	1	13	13	1

Iteration history - change in cluster centers (OHS 1998)

Iteration	1	2	3	4	5	6	7
1	5.495797	4.163744	4.023505	4.907639	4.818541	4.194124	4.423231
2	0.932112	0.361558	0.495372	0.585587	0.41573	0.403728	0.689356
3	0.887953	0.168309	0.496257	0.900858	0.217264	0.242858	0.916883
4	0.487319	0.109176	0.320532	0.600568	0.111634	0.133874	0.54449
5	0.137247	0.098188	0.044005	0.295131	0.124068	0.056478	0.177615
6	0.077987	0.084084	0.018957	0.179209	0.091558	0.02963	0.056011
7	0.034015	0.068291	0.012098	0.081926	0.065287	0.027729	0.045309
8	0.021663	0.019378	0.007139	0.059635	0.019063	0.0268	0.027021
9	0.011972	0.024821	0.006191	0.04604	0.011588	0.038	0.031245
10	0.004454	0.006249	0.001498	0.016167	0.006278	0.016491	0.013625

Comment: Iterations stopped because the maximum number of iterations was performed. Iterations stopped to converge. The maximum distance by which any center has changed is 0.01518. The current iteration is 10. The minimum distance between initial centers is 12.247.

Final cluster centers (OHS 1998)

	Cluster number						
	1	2	3	4	5	6	7
Does h/h have a cellular phone?	1.10409	1.009224	1.278075	1.014042	1.019237	1.036109	1.014314
Did person work for pay during past 7 days?	4.846691	1.151363	2.941382	4.702076	1.287163	1.400116	4.757319
H/hold's main fuel for cooking	7.716994	3.403774	7.886261	3.877289	3.981112	7.133372	5.322056
H/hold's main fuel for lighting	5.923512	3.133753	5.965652	3.300977	3.428471	5.860804	4.45283
H/hold distance from medical facility	3.720652	3.039832	3.773139	3.222833	3.2312	3.892254	3.22056
Highest education level completed	11.24044	1.472956	12.55594	9.311966	9.462399	3.631334	2.271308
Is there a phone in the dwelling?	1.321583	1.012159	1.651172	1.021978	1.033228	1.281305	1.064411
Does person have access to medical aid?	1.252744	1.008805	1.415878	1.049451	1.018888	1.036109	1.055303
Usual facility for h/hold medical help	3.778849	3.103145	4.085561	3.297924	3.132564	3.359348	3.461939
How is h/hold refuse disposed of?	4.271367	1.971908	4.678527	2.559829	2.320042	4.150844	2.856213
Type of toilet facility used by h/hold	4.618557	2.342138	4.802756	2.738706	2.681007	4.138614	3.227716
Dwelling's main water source	4.519122	2.821384	4.800905	3.407814	3.043722	4.34537	3.83149
Dwelling's distance from water source	6.398736	3.754298	6.765323	4.567766	4.01469	6.167734	5.446975
Main transport used to work	4.476887	12.88973	11.54216	3.593407	12.80133	12.70938	2.664932

Analysis of variance(ANOVA) (OHS 1998)

	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Does h/h have a cellular phone?	37.13242	6	0.079805	17998	465.2912	0
Did person work for pay during past 7 days?	6767.214	6	1.593701	17998	4246.226	0
H/hold's main fuel for cooking	10697.15	6	1.399699	17998	7642.467	0
H/hold's main fuel for lighting	4699.946	6	1.443455	17998	3256.039	0
H/hold distance from medical facility	288.3963	6	1.457077	17998	197.9279	0
Highest education level completed	54000.55	6	4.304242	17998	12545.89	0
Is there a phone in the dwelling?	199.864	6	0.133008	17998	1502.651	0
Does person have access to medical aid?	86.09215	6	0.113338	17998	759.6046	0
Usual facility for h/hold medical help	450.5824	6	0.695169	17998	648.1627	0
How is h/hold refuse disposed of?	3482.673	6	1.426557	17998	2441.313	0
Type of toilet facility used by h/hold	2998.758	6	1.008373	17998	2973.857	0
Dwelling's main water source	1775.037	6	0.924131	17998	1920.765	0
Dwelling's distance from water source	4330.347	6	1.535568	17998	2820.03	0
Main transport used to work	50174.98	6	3.058439	17998	16405.42	0

NB. The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in the different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

Number of cases in each cluster (OHS 1998)

Cluster	Number of cases
1	3007
2	2385
3	4862
4	1638
5	2859
6	1717
7	1537
Valid N	18005

APPENDIX E: DISCRIMINANT ANALYSIS RESULTS FOR OHS 1998

Summary of canonical discriminant functions (OHS 1998)

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	6.153385	45.18755	45.18755	0.927473
2	5.484341	40.27441	85.46196	0.919664
3	1.837121	13.49095	98.95291	0.804693
4	0.114439	0.840386	99.7933	0.320449
5	0.022761	0.167149	99.96045	0.149181
6	0.005386	0.039551	100	0.073191

NB. First 6 canonical discriminant functions were used in the analysis.

Wilks' lambda chi square results (OHS 1998)

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 6	0.006631	90255.3	84	0
2 through 6	0.047434	54851.55	65	0
3 through 6	0.30758	21214.67	48	0
4 through 6	0.872643	2451.233	33	0
5 through 6	0.972507	501.6165	20	0
6	0.994643	96.64968	9	7.48E-17

Standardized canonical discriminant function coefficients (OHS 1998)

	Function number					
	1	2	3	4	5	6
Did person work for pay during past 7 days?	0.123173	0.009051	0.011334	0.380523	-0.06124	0.542736
Does h/h have a cellular phone?	-0.13605	0.08986	0.086785	0.290353	0.020577	-0.23777
H/hold's main fuel for cooking	0.339046	0.239373	0.484761	-0.21179	-0.29927	-0.16465
H/hold's main fuel for lighting	0.114256	0.109542	0.215995	-0.24238	-0.03026	-0.03198
Highest education level completed	0.483699	0.536369	-0.71991	-0.13821	0.05099	-0.07155
Is there a phone in the dwelling?	0.00644	0.094111	0.066601	0.445762	0.180605	0.086941
H/hold distance from medical facility	0.033158	-0.05348	-0.04355	-0.1276	0.137522	0.258956
Usual facility for h/hold medical help	-0.00878	0.039393	0.055924	0.198175	-0.05908	-0.27102
Does person have access to medical aid?	-0.07991	0.022585	0.076523	0.312227	-0.45184	0.075408
How is h/hold refuse disposed of?	0.167191	0.074586	0.172402	-0.04164	0.389536	0.601381
Type of toilet facility used by h/hold	0.080539	0.063245	0.088629	-0.11667	-0.54443	0.219979
Dwelling's distance from water source	0.076699	0.117933	0.197872	0.116502	0.456536	-0.55459
Dwelling's main water source	-0.00351	-0.04558	-0.00813	0.105419	0.363081	-0.00816
Main transport used to work	-0.64618	0.740174	0.047387	0.128389	-0.0182	0.217233

Structure matrix – correlations between functions and predictors (OHS 1998)

	Function number					
	1	2	3	4	5	6
Main transport used to work	-0.6864	0.682987	0.068466	-0.16033	0.047042	0.118462
Highest education level completed	0.539554	0.554161	-0.62008	0.062512	-0.02103	-0.07196
H/hold's main fuel for cooking	0.432205	0.370835	0.589395	-0.1955	-0.25135	-0.14082
H/hold's main fuel for lighting	0.267156	0.230184	0.435144	-0.26051	-0.0358	-0.09262
Type of toilet facility used by h/hold	0.277708	0.245169	0.318501	0.008794	-0.14968	0.236677
Is there a phone in the dwelling?	0.138275	0.229916	0.171816	0.581099	0.144737	0.065155
Does person have access to medical aid?	0.124079	0.143308	0.057925	0.560875	-0.40267	0.032613
Did person work for pay during past 7 days?	0.433492	-0.20398	-0.00308	0.513003	-0.12259	0.325348
Does h/h have a cellular phone?	0.070876	0.128794	0.046474	0.503698	-0.04753	-0.18062
Usual facility for h/hold medical help	0.130656	0.11237	0.094003	0.464073	-0.15772	-0.25006
Dwelling's distance from water source	0.27923	0.194696	0.362681	0.180584	0.538947	-0.28972
Dwelling's main water source	0.231358	0.171678	0.276621	0.16413	0.496013	-0.10268
How is h/hold refuse disposed of?	0.238949	0.230553	0.300046	0.02471	0.40517	0.579406
H/hold distance from medical facility	0.057888	0.067548	0.090748	-0.16307	0.263449	0.330271

NB. Pooled within correlations between discriminating variables and standardized canonical discriminant functions. Variables ordered by absolute size of correlation within function.
*Largest absolute correlation between each variable and any discriminant function

Functions at group centroids (OHS 1998)

Cluster Number of Case	Function number of case					
	1	2	3	4	5	6
1	3.49213	-0.67447	0.16007	-0.3277	-0.19458	0.040543
2	-4.3309	-1.37889	0.372702	0.280978	-0.17525	0.074736
3	1.02984	2.902404	0.255441	0.320337	0.028387	-0.01188
4	1.583169	-3.0311	-2.07958	0.183866	0.27353	0.102981
5	-2.13949	0.853418	-1.98711	-0.35011	-0.01095	-0.08016
6	-1.80967	0.568637	2.535151	-0.55684	0.234457	0.038028
7	0.944725	-4.7144	1.380912	0.26914	0.029767	-0.16083

Unstandardized canonical discriminant functions are evaluated at group means

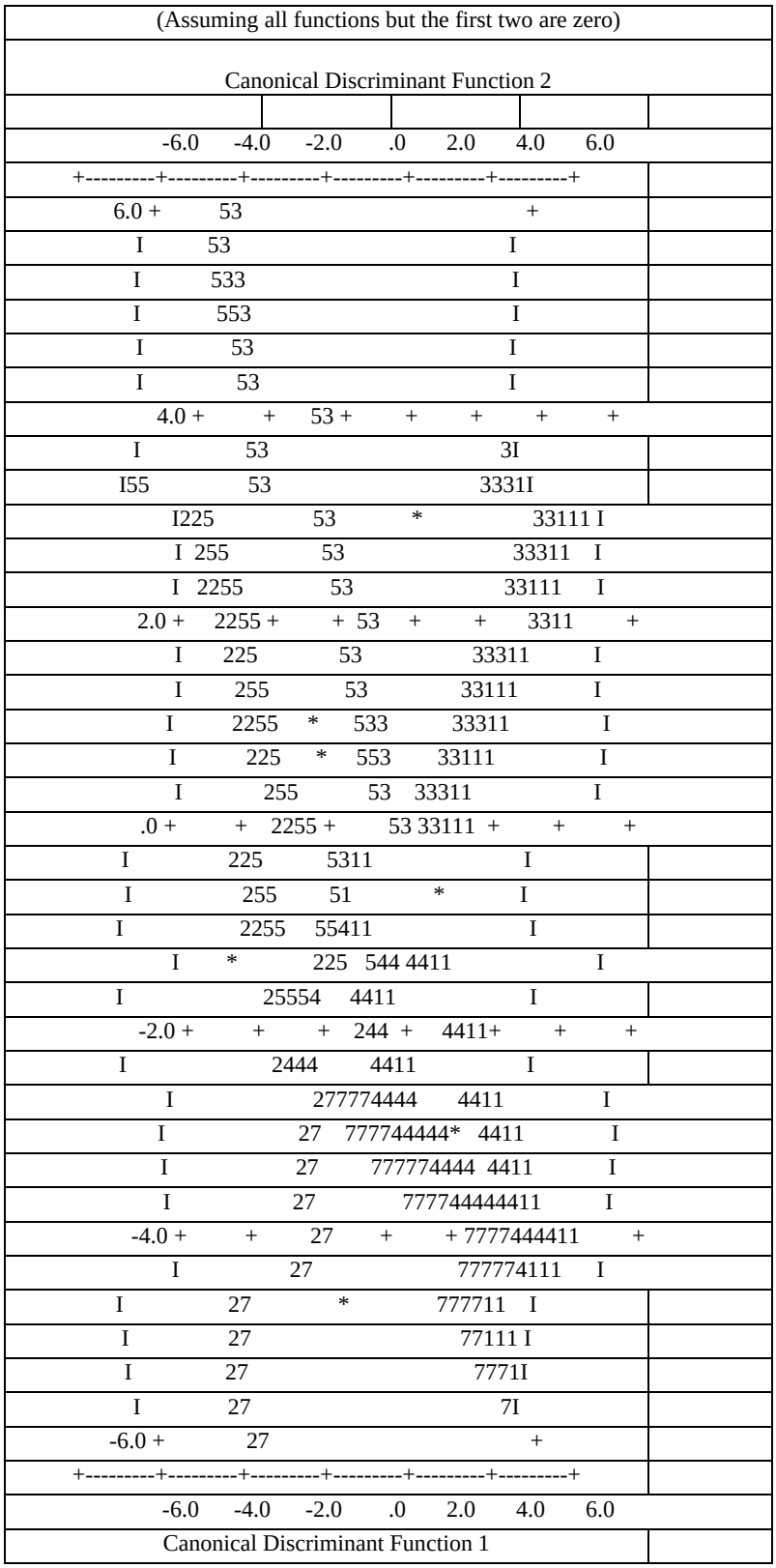
Classification function coefficients - fisher's linear discriminant functions (OHS 1998)

	Cluster Number of Case						
	1	2	3	4	5	6	7
Did person work for pay during past 7 days?	3.440137	2.870941	3.388372	3.375209	2.814782	2.862117	3.256028
Does h/h have a +-cellular phone?	6.598102	10.80524	9.677453	6.587149	9.228654	10.07442	7.71421
H/hold's main fuel for cooking	3.415805	0.99989	3.307837	1.255564	1.205617	3.05396	2.233042
H/hold's main fuel for lighting	2.114671	1.220512	2.08882	1.198963	1.335505	2.186298	1.602858
Highest education level completed	1.899383	-0.22167	2.181075	1.597481	1.736645	0.186426	-0.18992
Is there a phone in the dwelling?	2.027603	2.508198	3.814538	1.848731	1.965078	2.620286	1.955649
H/hold distance from medical facility	1.507591	1.261428	1.223708	1.653008	1.360073	1.293756	1.491808
Usual facility for h/hold medical help	3.12374	3.319273	3.480326	2.950399	3.132096	3.31355	3.232994
Does person have access to medical aid?	1.548219	3.952482	2.684349	1.194333	2.205162	2.641076	2.366691
How is h/hold refuse disposed of?	0.632083	-0.47398	0.548276	0.060696	-0.37086	0.45704	0.150406
Type of toilet facility used by h/hold	0.797847	0.0711	0.626399	-0.00091	0.129488	0.454004	0.211754
Dwelling's distance from water source	1.879103	1.410857	2.248875	1.371653	1.452654	2.186158	1.760786
Dwelling's main water source	0.459749	0.59367	0.454048	0.82977	0.493937	0.537012	0.802182
Main transport used to work	2.928538	5.575434	5.393525	2.616225	5.579299	5.456391	2.209483
(Constant)	-71.8577	-61.867	-103.158	-43.4955	-69.7301	-82.4071	-43.0192

Classification results for OHS 1998

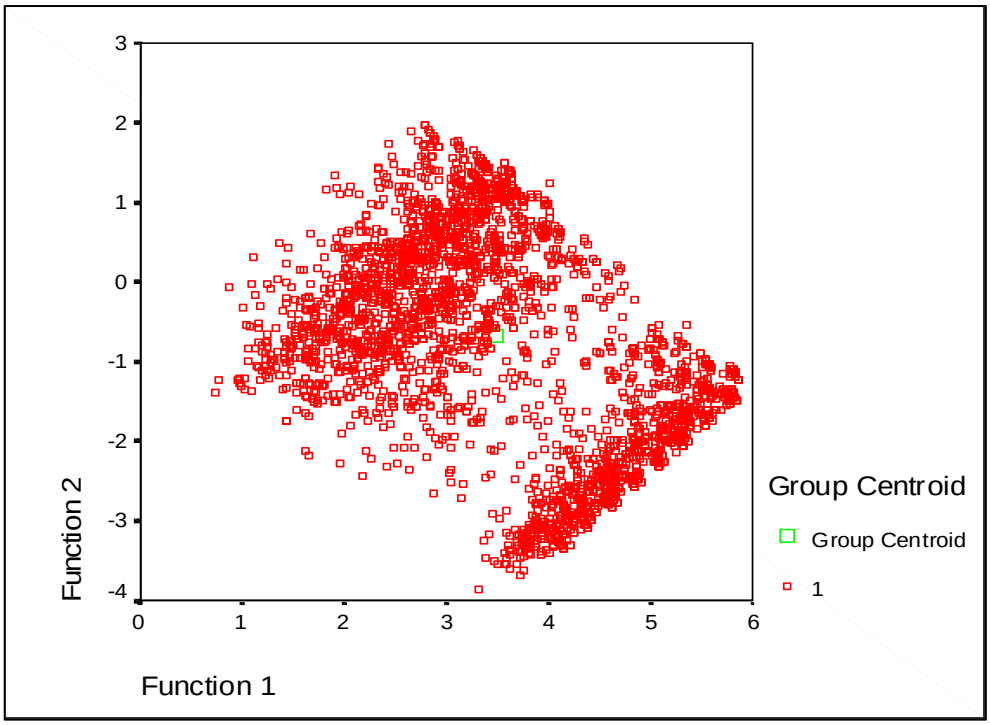
Cluster Number of Case	Predicted Group Membership							Total
	1	2	3	4	5	6	7	
Original count 1	2807	0	77	119	1	1	2	3007
2	0	2355	0	0	0	30	0	2385
3	14	0	4759	0	87	2	0	4862
4	51	0	0	1566	8	0	13	1638
5	0	5	121	1	2690	42	0	2859
6	4	74	28	0	38	1573	0	1717
7	77	5	0	43	0	8	1404	1537
(%) 1	93.4	0	2.6	4.0	0.03	0.03	0.1	100
2	0	98.7	0	0	0	1.3	0	100
3	0.3	0	97.9	0	1.8	0.04	0	100
4	3.1	0	0	95.6	0.5	0	0.8	100
5	0	0.2	4.2	0.04	94.1	1.5	0	100
6	0.2	4.3	1.6	0	2.2	91.6	0	100
7	5.0	0.3	0	2.8	0	0.5	91.4	100
95.3% of original grouped cases correctly classified.								

Territorial Map (OHS 1998)

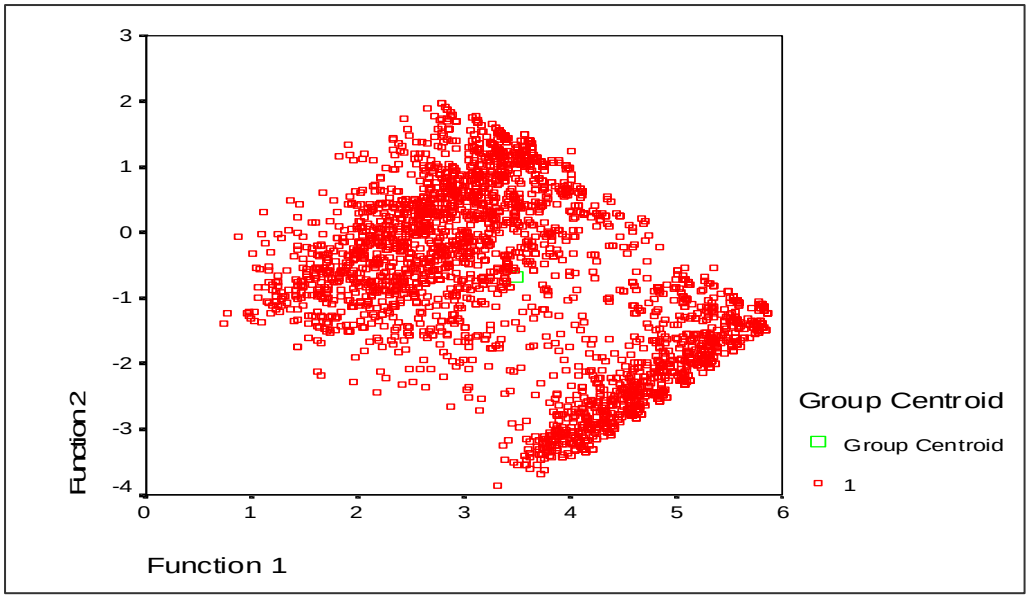


NB. * Indicates a group centroid

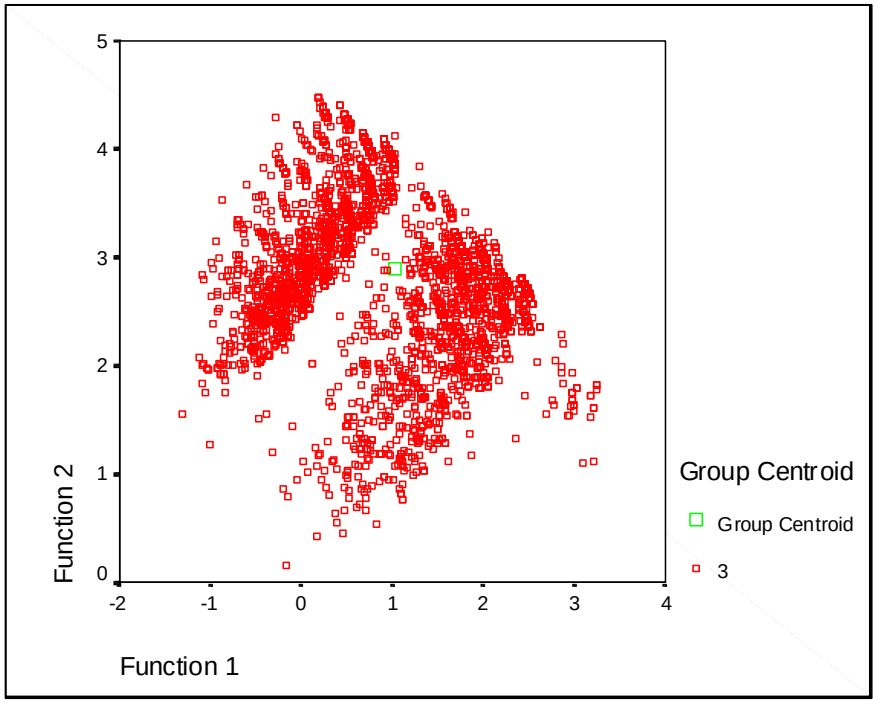
Canonical discriminant function plot - QOL 1 (OHS 1998)



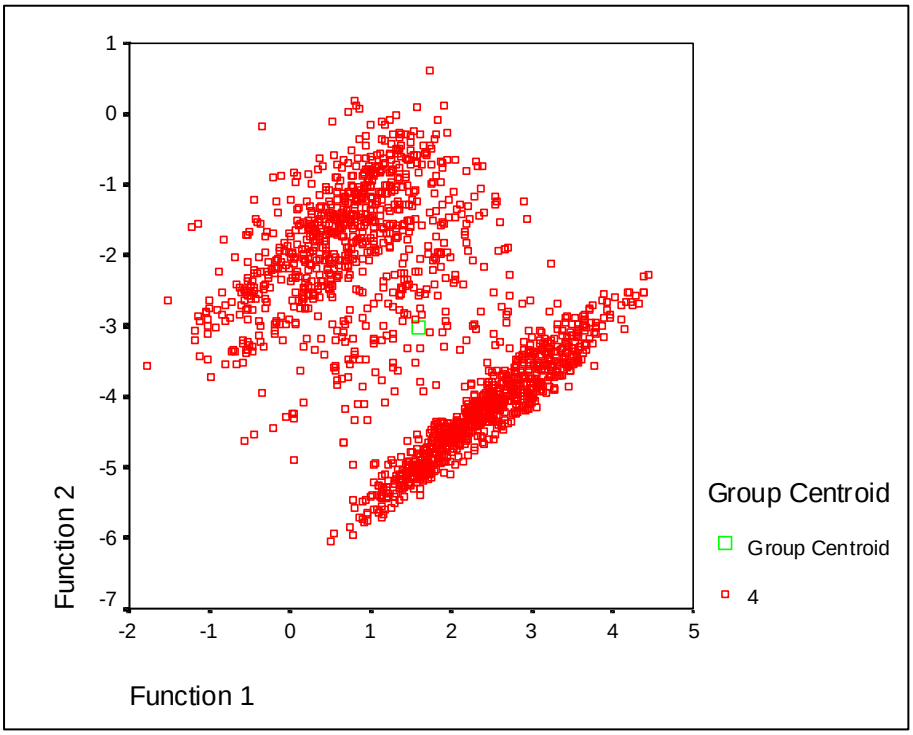
Canonical discriminant function plot - QOL 2 (OHS 1998)



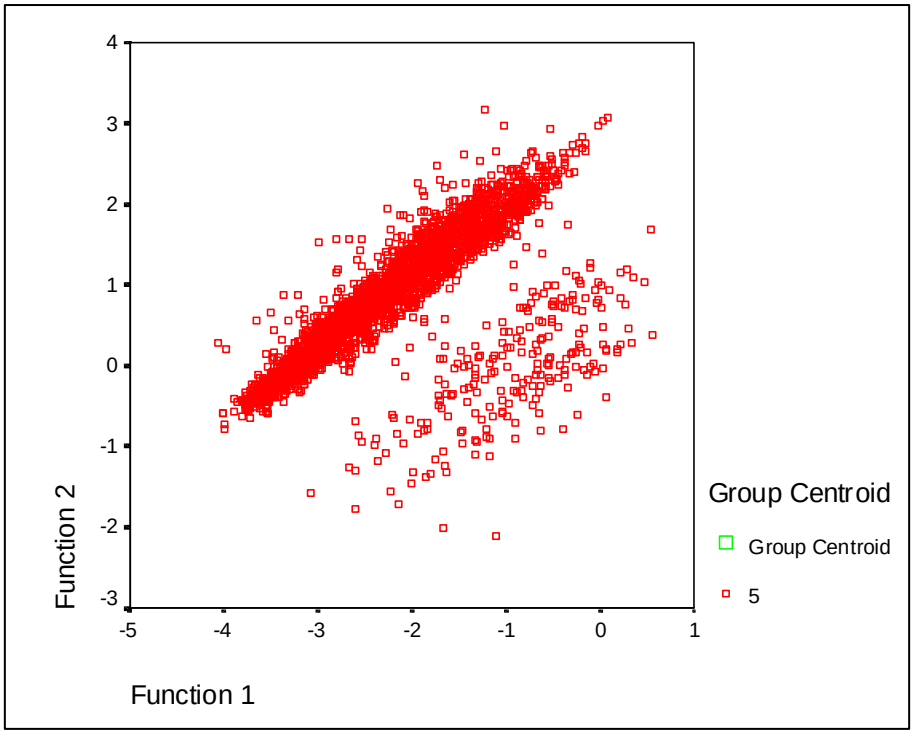
Canonical discriminant function plot - QOL 3 (OHS 1998)



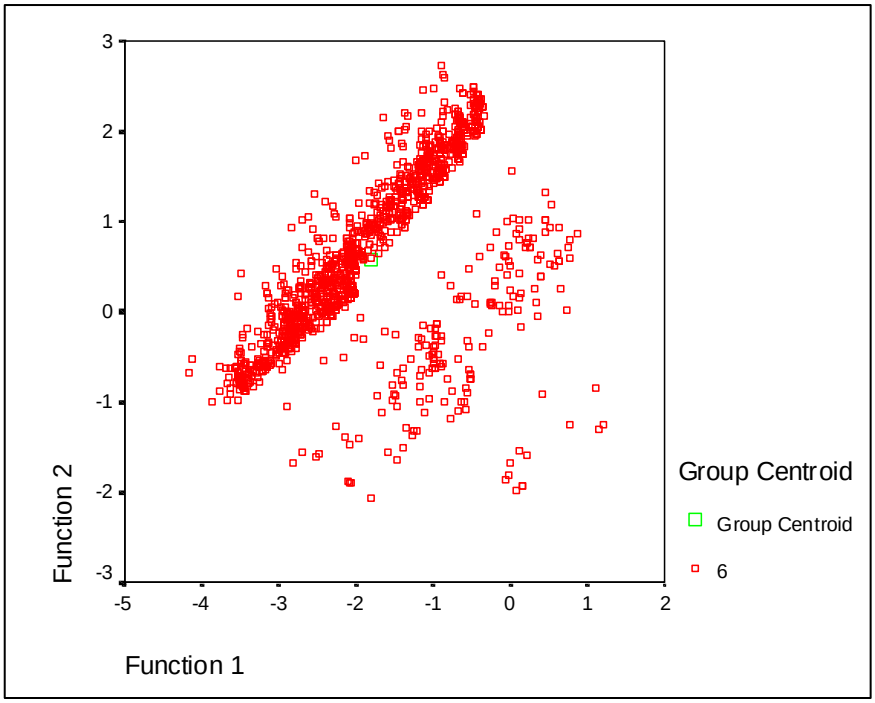
Canonical discriminant function plot - QOL 4 (OHS 1998)



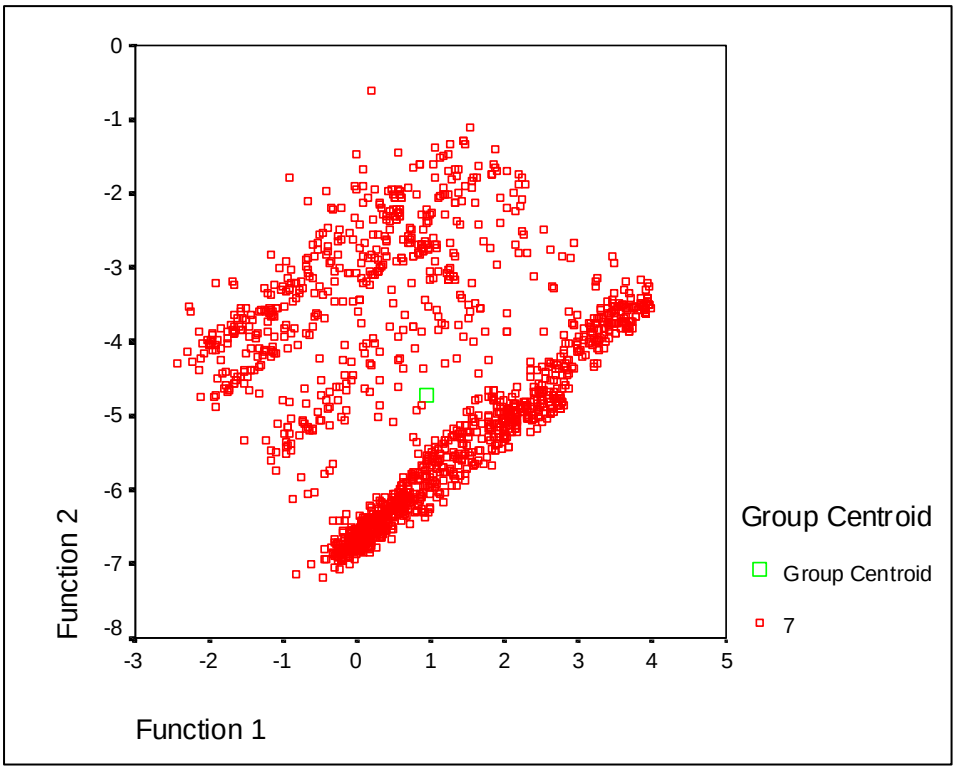
Canonical discriminant function plot - QOL 5 (OHS 1998)



Canonical discriminant function plot - QOL 6 (OHS 1998)



Canonical discriminant function plot - QOL 7 (OHS 1998)



APPENDIX F: CLUSTER ANALYSIS RESULTS FOR OHS 1997

Initial cluster centers (OHS 1997)

Cluster number	1	2	3	4	5	6	7
Variables in analysis							
Did person work for pay during past 7 days?	1	1	5	1	5	5	5
Type of dwelling occupied by h/hold	11	11	1	1	11	4	11
Does anyone in h/hold hace a cellular phone?	1	1	1	1	1	1	2
H/hold's main fuel for cooking	5	3	8	8	8	4	8
H/hold's main fuel for heating	5	3	8	8	8	4	8
Hhold's main fuel for lighting	2	2	6	6	6	2	6
Highest class/standard completed	1	13	1	14	1	10	14
Does h/hold have to pay for water?	5	1	1	5	5	5	5
Is there a land line phone in h/hold?	1	1	1	2	1	1	2
H/hold distance from health facility	5	5	2	1	4	4	5
H/hold transport to health facility	6	2	1	7	5	5	7
Facility the h/hold usually seeks medical help	4	8	4	8	8	5	1
How h/hold refuse is disposed of	8	1	3	2	1	8	8
H/hold's main water source	12	10	11	12	1	1	12

ITERATION HISTORY (OHS 1997)

	Change in Cluster Centers						
Iteration	1	2	3	4	5	6	7
1	5.646375	6.172811	7.491693	7.375107	8.532221	7.766147	6.30712
2	1.473118	0.829005	1.579565	1.974878	2.15213	1.208434	0.335069
3	0.228822	0.757111	0.613308	0.598341	0.712927	0.895488	0.051323
4	0.096191	0.318376	0.204439	0.128305	0.246733	0.551279	0.046622
5	0.047663	0.088464	0.170766	0.223865	0.147658	0.421402	0.017544
6	0.016795	0.027044	0.104178	0.201992	0.102272	0.277509	0.001468
7	0.022449	0.017646	0.040174	0.111459	0.067757	0.119881	0.005838
8	0.017436	0.007087	0.015032	0.031693	0.040752	0.047662	0.002559
9	0.010425	0.005159	0.005719	0.016677	0.016414	0.017161	0.001531
10	0.010965	0.001659	0	0.003629	0.002507	0	0.00337

Comment: Iterations stopped because the maximum number of iterations was performed. Iterations stopped to converge. The maximum distance by which any center has changed is 0.006496. The current iteration is 10. The minimum distance between initial centers is 14.765

Final cluster centers (OHS 1997)

Variables in analysis	Cluster number						
	1	2	3	4	5	6	7
Did person work for pay during past 7 days?	2.280524	2.518689	2.309783	3.478957	1.53373	2.307336	3.573198
Type of dwelling occupied by h/hold	10.86256	10.94855	4.447283	4.054437	7.41627	4.694981	10.70879
Does anyone in h/hold have a cellular phone?	1.028887	1.01269	1.018478	1.051693	1.002778	1.004633	1.1477
H/hold's main fuel for cooking	5.684044	4.295801	4.16087	6.215005	3.292857	3.619305	7.857515
H/hold's main fuel for heating	5.684044	4.295801	4.16087	6.215005	3.292857	3.619305	7.857515
Hhold's main fuel for lighting	4.736177	3.49377	3.569565	4.798719	2.668254	2.836293	5.945986
Highest class/standard completed	2.027308	9.580295	1.643478	10.06313	1.945238	9.26139	11.79987
Does h/hold have to pay for water?	2.961634	1.970005	2.186957	3.113449	1.298413	1.441699	4.35705
Is there a land line phone in h/hold?	1.145114	1.032072	1.011957	1.069076	1.005159	1.006178	1.540697
H/hold distance from health facility	3.608441	3.305722	3.511957	3.807868	2.85873	3.118919	3.770441
H/hold transport to health facility	3.459264	3.659898	3.571196	3.763495	3.85873	3.876062	4.959955
Facility the h/hold usually seeks medical help	4.830964	4.70766	4.714674	5.106587	4.595635	4.717375	6.27128
How h/hold refuse is disposed of	5.06432	3.315874	4.057609	7.000915	2.578175	2.708494	7.414695
H/hold's main water source	10.88829	8.900323	10.32228	10.69808	4.300794	7.655212	11.72444

Analysis of variance (ANOVA) (OHS 1997)

	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Did person work for pay during past 7 days?	2341.561	6	3.359134	28632	697.0729	0
Type of dwelling occupied by h/hold	34848.33	6	1.344579	28632	25917.65	0
Does anyone in h/hold have a cellular phone?	19.07554	6	0.059018	28632	323.2148	0
H/hold's main fuel for cooking	14794.42	6	1.911298	28632	7740.512	0
H/hold's main fuel for heating	14794.42	6	1.911298	28632	7740.512	0
Hhold's main fuel for lighting	7387.661	6	1.7702	28632	4173.348	0
Highest class/standard completed	83991.81	6	4.722481	28632	17785.53	0
Does h/hold have to pay for water?	6534.139	6	2.5033	28632	2610.21	0
Is there a land line phone in h/hold?	273.0123	6	0.123711	28632	2206.858	0
H/hold distance from health facility	434.4783	6	1.561638	28632	278.2195	0
H/hold transport to health facility	1924.967	6	3.285003	28632	585.9864	0
Facility the h/hold usually seeks medical help	2572.029	6	2.342037	28632	1098.202	0
How h/hold refuse is disposed of	18420.9	6	3.359004	28632	5484.037	0
H/hold's main water source	23000.54	6	2.651159	28632	8675.655	0

NB. The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in the different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

Number of cases in each cluster (OHS 1997)

Cluster	Number of cases
1	4431
2	4334
3	1840
4	2186
5	2520
6	2590
7	10738
Valid number of cases in analysis (N)	28639
Cases excluded due to missing data	1172
Total	29811

APPENDIX G: DISCRIMINANT ANALYSIS RESULTS FOR OHS 1997

Summary of canonical discriminant functions (OHS 1997)

Function	Eigenvalue	Percentage of Variance	Cumulative percentage	Canonical Correlation
1	7.955331	59.13761	59.13761	0.942515
2	3.462589	25.73988	84.87749	0.88086
3	1.558264	11.58368	96.46117	0.780455
4	0.408872	3.039439	99.50061	0.538714
5	0.063325	0.470741	99.97135	0.244037
6	0.003854	0.028647	100	0.061958

NB. The first six canonical discriminant functions were used in the analysis.

Wilks' lambda and chi square values (OHS 1997)

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 6	0.006504	144151.8	78	0
2 through 6	0.058245	81392.12	60	0
3 through 6	0.259924	38572.39	44	0
4 through 6	0.664954	11681.28	30	0
5 through 6	0.936836	1867.896	18	0
6	0.996161	110.1094	8	3.62E-20

Standardized canonical discriminant function coefficients (OHS 1997)

	Function					
	1	2	3	4	5	6
Did person work for pay during past 7 days?	0.027108	0.020369	0.080322	0.071392	-0.16301	0.451964
Does anyone in h/hold hace a cellular phone?	-0.02574	-0.06226	0.057031	0.061691	0.088559	0.161893
Type of dwelling occupied by h/hold	0.732565	-0.61987	-0.27467	-0.03789	-0.08376	0.059763
H/hold's main fuel for cooking	0.287452	0.091832	0.295403	0.333299	-0.02892	-0.57274
Hhold's main fuel for lighting	0.073202	0.020489	0.147335	0.060214	-0.06907	-0.11361
Is there a land line phone in h/hold?	0.016212	-0.03738	0.01798	0.270603	0.610989	-0.12304
H/hold distance from health facility	-0.01301	-0.02095	0.023482	-0.01771	0.054069	0.297411
H/hold transport to health facility	0.005533	-0.01186	0.052003	0.112972	0.273314	0.387438
Highest class/standard completed	0.391152	0.73394	-0.58935	-0.15081	-0.04492	-0.05993
Does h/hold have to pay for water?	0.046707	0.026952	0.072247	0.110106	0.216852	0.056503
Facility the h/hold usually seeks medical help	0.056008	-0.04299	0.06414	0.19108	0.239969	0.242026
H/hold's main water source	0.318427	0.129332	0.482779	-0.79284	0.223283	0.018319
How h/hold refuse is disposed of	0.202565	0.151866	0.266823	0.348567	-0.6875	0.35239

Structure matrix – correlations between functions and predictors (OHS 1997)

	Function					
	1	2	3	4	5	6
Type of dwelling occupied by h/hold	0.697359*	-0.6368	-0.31813	-0.03265	-0.05138	0.034272
Highest class/standard completed	0.430405	0.728697*	-0.51558	-0.00141	0.087633	0.051874
Does h/hold have to pay for water?	0.221095	0.10366	0.254515*	0.215422	0.117628	0.165587
H/hold's main water source	0.350137	0.176661	0.598602	-0.65222*	0.192126	0.105202
Is there a land line phone in h/hold?	0.204864	0.086067	0.119414	0.364739	0.644643*	0.001456
How h/hold refuse is disposed of	0.281039	0.222583	0.429564	0.347692	-0.4335*	0.346238
H/hold transport to health facility	0.087516	0.079806	0.002498	0.259326	0.431395*	0.367858
Facility the h/hold usually seeks medical help	0.136675	0.099287	0.07689	0.261094	0.394199*	0.348552
H/hold's main fuel for cooking	0.382561	0.201877	0.399942	0.402631	-0.00441	-0.54178*
H/hold's main fuel for heating	0.382561	0.201877	0.399942	0.402631	-0.00441	-0.54178*
Did person work for pay during past 7 days?	0.100796	0.127798	0.068485	0.022097	-0.08	0.45106*
Hhold's main fuel for lighting	0.281144	0.112408	0.3411	0.221415	-0.05078	-0.35309*
Does anyone in h/hold have a cellular phone?	0.074868	0.05049	0.050461	0.138754	0.185318	0.278441*
H/hold distance from health facility	0.059741	0.041347	0.118356	-0.05501	-0.11582	0.140249*

NB. Pooled within correlations between discriminating variables and standardized canonical discriminant functions. Variables ordered by absolute size of correlation within function.
*Largest absolute correlation between each variable and any discriminant function.

Canonical discriminant function coefficients – unstandardised (OHS 1997)

	Function					
	1	2	3	4	5	6
Did person work for pay during past 7 days?	0.01479	0.011114	0.043825	0.038952	-0.08894	0.246598
Does anyone in h/hold hace a cellular phone?	-0.10595	-0.2563	0.234756	0.253939	0.364536	0.6664
Type of dwelling occupied by h/hold	0.631762	-0.53457	-0.23687	-0.03267	-0.07223	0.051539
H/hold's main fuel for cooking	0.207922	0.066425	0.213673	0.241085	-0.02092	-0.41428
Hhold's main fuel for lighting	0.055019	0.0154	0.110737	0.045257	-0.05192	-0.08539
Is there a land line phone in h/hold?	0.046093	-0.10629	0.051121	0.769357	1.737117	-0.34982
H/hold distance from health facility	-0.01041	-0.01677	0.018791	-0.01418	0.043267	0.237994
H/hold transport to health facility	0.003053	-0.00654	0.028692	0.062331	0.150798	0.213764
Highest class/standard completed	0.179995	0.337734	-0.2712	-0.0694	-0.02067	-0.02758
Does h/hold have to pay for water?	0.029521	0.017035	0.045663	0.069591	0.137059	0.035712
Facility the h/hold usually seeks medical help	0.036597	-0.02809	0.041911	0.124858	0.156804	0.158148
H/hold's main water source	0.195565	0.079431	0.296504	-0.48693	0.137132	0.011251
How h/hold refuse is disposed of	0.110525	0.082862	0.145585	0.190187	-0.37512	0.192273
(Constant)	-11.406	0.964979	-2.14652	0.667686	-2.50445	-2.22687

Unstandardised canonical discriminant functions at group centroids (OHS 1997)

	Function					
Cluster Number of Case	1	2	3	4	5	6
1	0.167742	-2.95065	1.340109	-0.3771	-0.09973	-0.07042
2	0.612545	-0.8507	-2.05634	-0.80893	-0.1468	0.051793
3	-4.5875	0.109745	2.147967	-0.64075	0.414633	0.141999
4	-2.37105	3.589431	1.204352	-0.06547	-0.65278	0.000832
5	-4.2617	-2.0545	-1.01084	1.552983	-0.08575	0.027039
6	-3.89918	2.175218	-1.197	-0.33418	0.341396	-0.12012
7	2.892946	0.768894	0.189672	0.321375	0.100023	0.006279

NB. Unstandardised canonical discriminant functions are evaluated at group means

Classification function coefficients - Fisher's (OHS 1997)

	Cluster Number of Case						
	1	2	3	4	5	6	7
Did person work for pay during past 7 days?	0.189489	0.088058	0.184935	0.29757	0.128874	0.025295	0.249069
Does anyone in h/hold have a cellular phone?	13.76021	12.33216	13.93139	12.24611	14.00807	12.42031	12.5494
Type of dwelling occupied by h/hold	8.556257	8.543025	3.707116	3.521776	5.776675	3.811918	8.528771
H/hold's main fuel for cooking	2.087935	1.440426	1.312798	2.02266	1.148794	1.062414	2.788258
Hhold's main fuel for lighting	0.947224	0.600388	0.765412	0.929957	0.535286	0.504737	1.041738
Is there a land line phone in h/hold?	2.153808	1.320734	2.267006	0.588848	3.209329	2.108541	2.682814
H/hold distance from health facility	2.338171	2.267683	2.428089	2.241012	2.32152	2.253544	2.24282
H/hold transport to health facility	0.915463	0.797737	1.010633	0.81227	0.971867	0.855276	0.956485
Highest class/standard completed	-0.22266	1.515312	-0.26226	1.553841	-0.21663	1.453833	1.781363
Does h/hold have to pay for water?	-0.42589	-0.56422	-0.41751	-0.4472	-0.50902	-0.51281	-0.25589
Facility the h/hold usually seeks medical help	1.552946	1.325909	1.408126	1.234065	1.525724	1.220437	1.630631
H/hold's main water source	3.796428	3.248354	3.550399	3.55238	1.367493	2.695003	3.971867
How h/hold refuse is disposed of	0.590332	0.278052	0.233716	1.112318	0.213333	0.029342	1.104912
(Constant)	-95.9824	-89.8407	-50.2554	-63.8377	-46.0811	-45.6299	-120.423

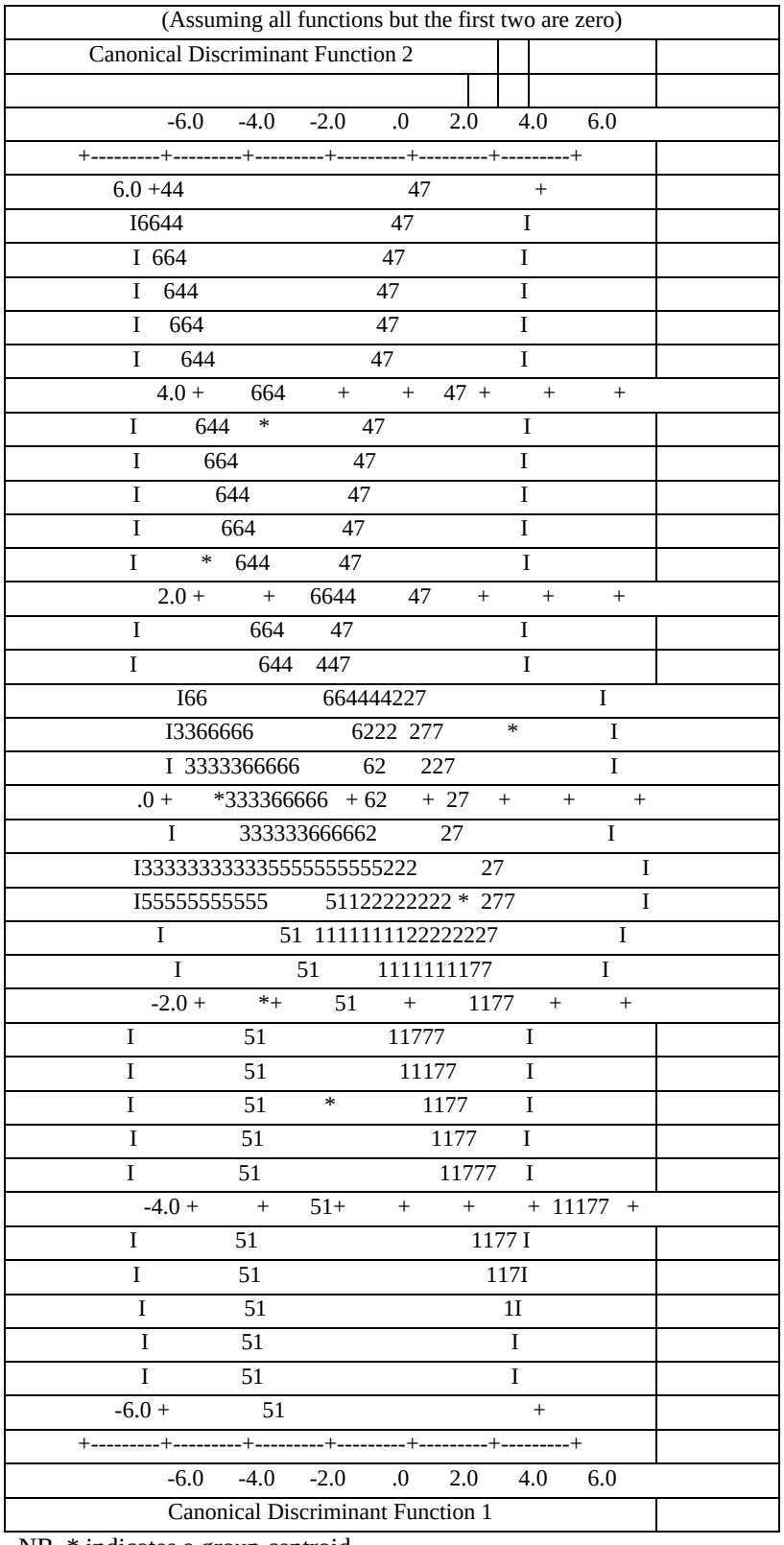
NB. Fisher's linear discriminant functions

Classification results (OHS 1997)

	Predicted Group Membership							Total
Cluster Number of Case	1	2	3	4	5	6	7	
Original count 1	4290	51	40	1	2	1	46	4431
2	57	4162	0	1	22	3	89	4334
3	11	0	1782	30	5	12	0	1840
4	0	3	17	2107	9	45	5	2186
5	109	109	20	0	2224	58	0	2520
6	0	3	41	25	24	2497	0	2590
7	63	130	0	102	0	0	10443	10738
(%)								
1	96.8	1.2	0.9	0.02	0.05	0.02	1.0	100
2	1.3	96.0	0	0.02	0.5	0.07	2.1	100
3	0.6	0	96.9	1.6	0.3	0.7	0	100
4	0	0.1	0.8	96.4	0.4	2.1	0.2	100
5	4.3	4.3	0.8	0	88.3	2.3	0	100
6	0	0.1	1.6	1.0	0.9	96.4	0	100
7	0.6	1.2	0	1.0	0	0	97.3	100

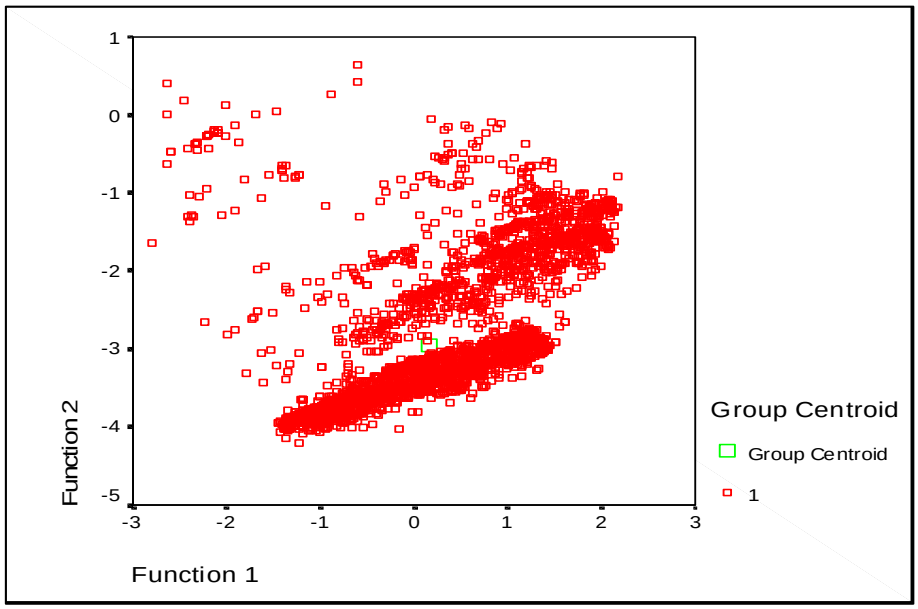
NB. 96.0% of original grouped cases correctly classified.

Territorial Map (OHS 1997)

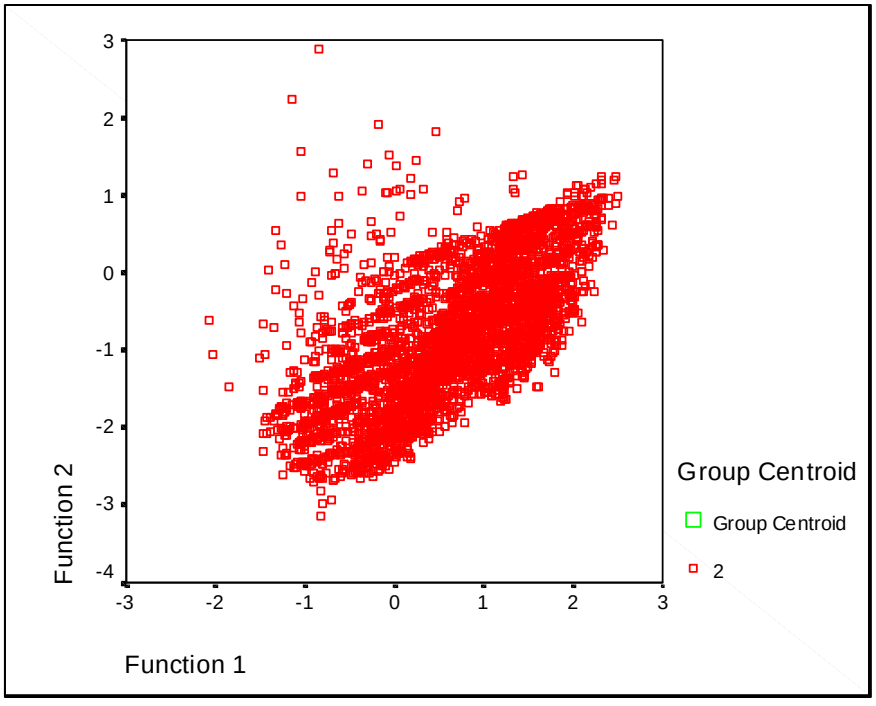


NB. * indicates a group centroid

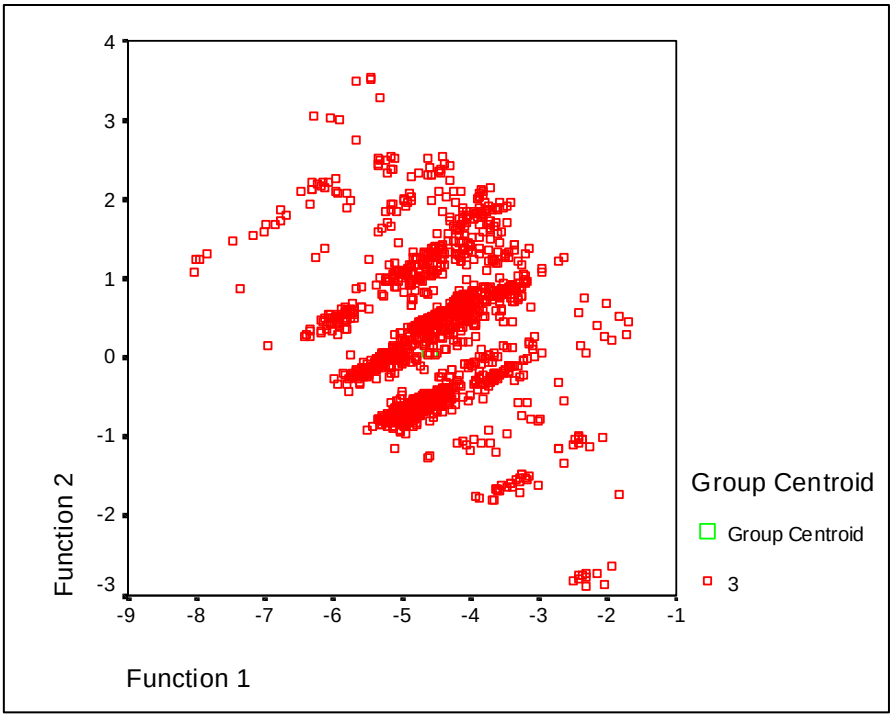
Canonical discrminant function plot – QOL 1 (OHS 1997)



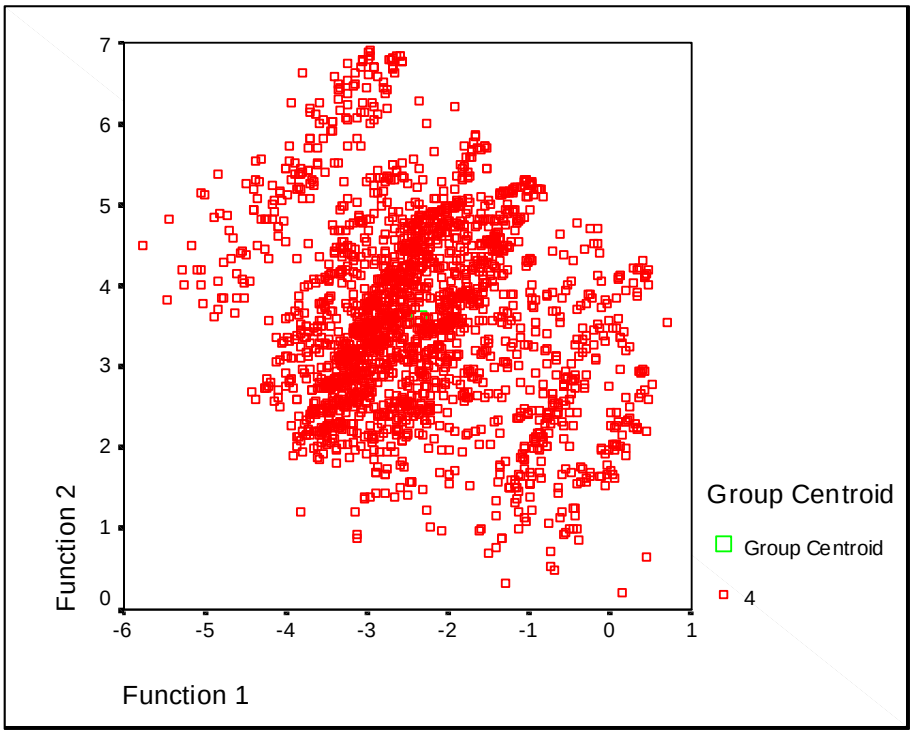
Canonical discrminant function plot – QOL 2 (OHS 1997)



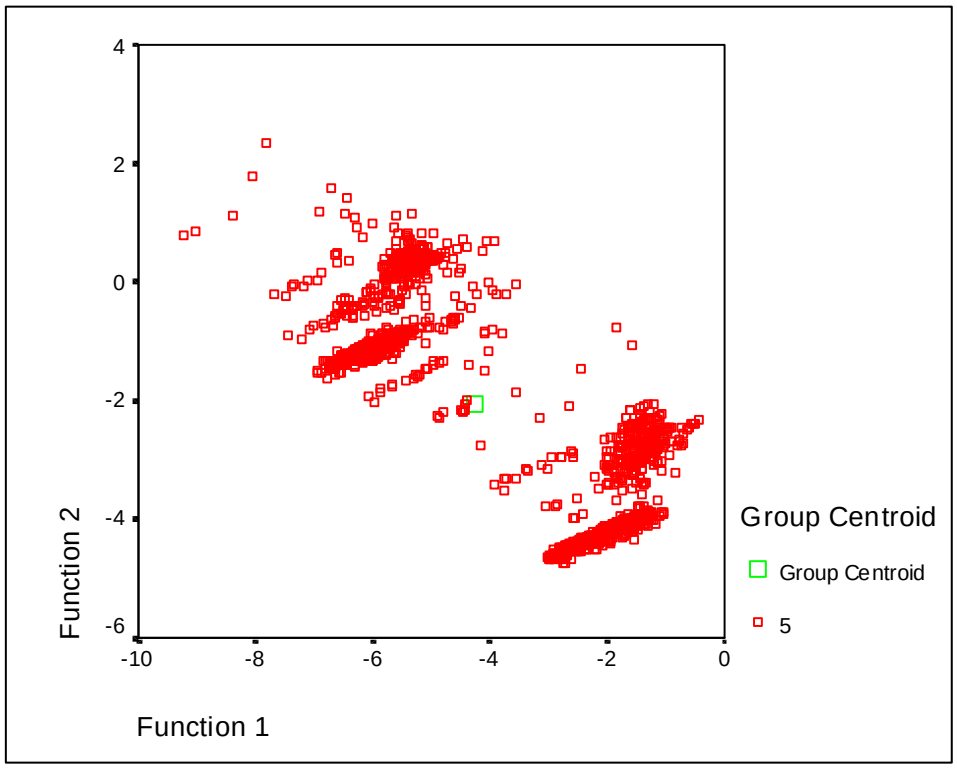
Canonical discrminant function plot – QOL 3 (OHS 1997)



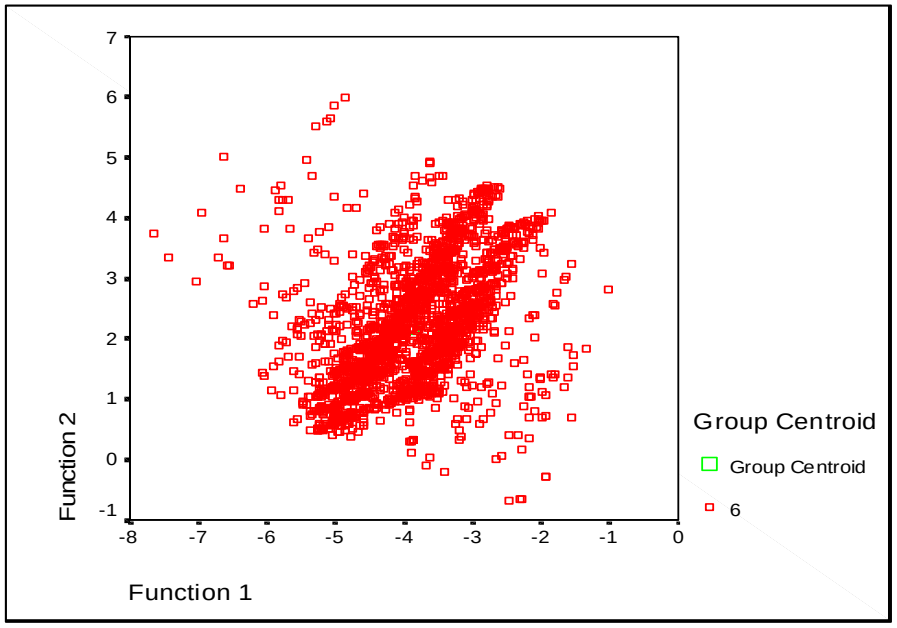
Canonical discrminant function plot – QOL 4 (OHS 1997)



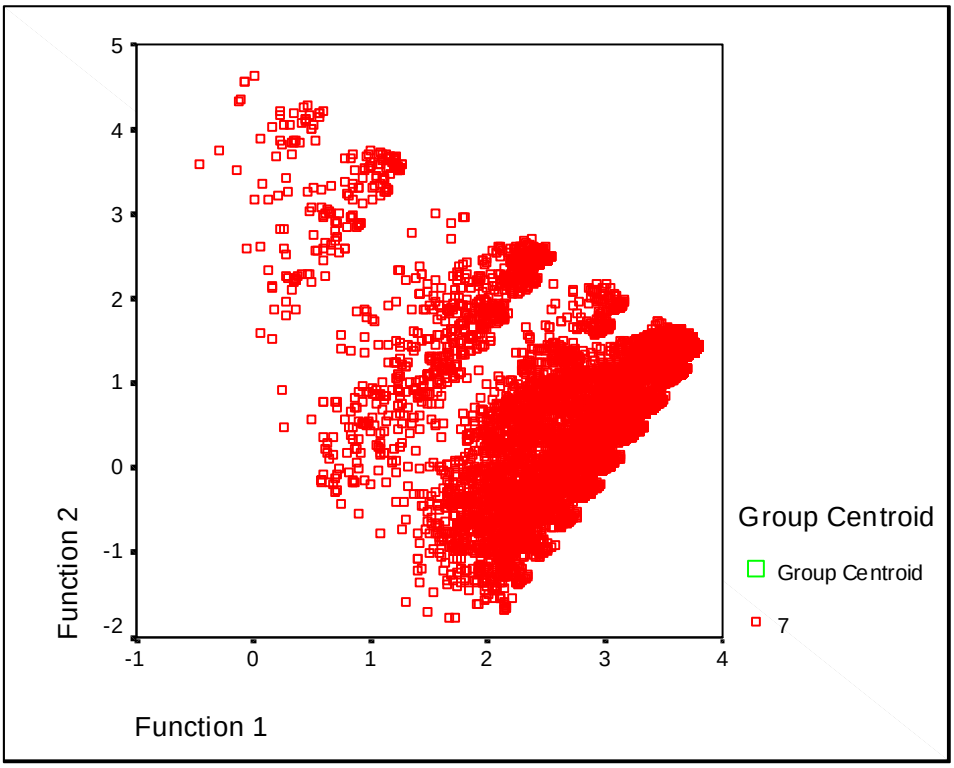
Canonical discrminant function plot – QOL 5 (OHS 1997)



Canonical discrminant function plot – QOL 6 (OHS 1997)



Canonical discrminant function plot – QOL 7 (OHS 1997)



APPENDIX H: CLUSTER ANALYSIS RESULTS FOR OHS 1996

Initial cluster centers (OHS 1996)

Variables in analysis	Cluster				
	1	2	3	4	5
Cell phone telephone	2	2	2	2	2
Type of dwelling occupied by h/hold	9	9	1	1	9
Worked past 7 days	1	3	3	1	3
H/hold's fuel for cooking	6	4	3	7	7
H/hold's fuel for heating	3	1	3	7	7
H/hold's fuel for lighting	5	2	2	5	5
Health facility usually visited by h/hold	4	4	4	7	4
Have access to the medical scheme	2	2	2	2	2
Telephone in dwelling	2	2	2	1	2
H/hold refuse disposal	2	8	3	8	3
H/hold's main water source	12	12	1	12	1
H/hold distance from medical facility	5	2	1	5	4
Highest education level completed	1	19	1	11	13

Iteration history (OHS 1996)

Iteration	Change in Cluster Centers				
	1	2	3	4	5
1	5.384404	7.313124	6.01805	6.506567	7.105921
2	0.836693	1.461003	0.842441	0.814986	2.191666
3	0.504257	0.489099	0.237249	0.29048	1.008549
4	0.279898	0.023059	0.117488	0.215667	0.63481
5	0.210649	0.019906	0.100396	0.184006	0.500061
6	0.077536	0.026797	0.158779	0.12041	0.304927
7	0.054228	0.019062	0.159452	0.0524	0.185547
8	0.042095	0.016914	0.092073	0.025694	0.103629
9	0.02544	0.006496	0.045069	0.012985	0.054929
10	0.021172	0	0.041051	0.004076	0.040534

Comment: Iterations stopped because the maximum number of iterations was performed. Iterations stopped to converge. The maximum distance by which any center has changed is 0.04054. The current iteration is 10. The minimum distance between initial centers is 14.318

Final cluster centers (OHS 1996)

Variables in analysis	Cluster				
	1	2	3	4	5
Cell-phone telephone	1.994149	1.798535	1.996472	1.936014	1.991831
Type of dwelling occupied by h/hold	6.652428	8.510623	5.972278	8.275953	5.467776
Worked past 7 days	2.329725	1.4	2.650202	1.802001	2.135855
H/hold's fuel for cooking	4.422762	6.786081	3.290323	6.764062	3.898033
H/hold's fuel for heating	4.384728	6.699634	3.276714	6.668177	3.902874
H/hold's fuel for lighting	3.573142	4.841026	2.688508	4.911665	2.947352
Health facility usually visited by h/hold	4.738444	6.947253	4.670867	5.962061	4.77882
Have access to the medical scheme	1.89175	1.317216	1.950101	1.650623	1.906203
Telephone in dwelling	1.915448	1.284249	1.99244	1.513401	1.982753
H/hold refuse disposal	4.693388	7.147985	2.789315	7.522084	3.859607
H/hold's main water source	10.66559	11.71575	4.346774	11.71744	9.165204
H/hold distance from medical facility	3.402575	3.542125	2.624496	3.780861	3.156732
Highest education level completed	2.066121	18.02198	3.0625	10.44281	9.259002

Analysis of variance (OHS 1996)

Variables in analysis	Cluster		Error		F	Sig.
	Mean Square	df	Mean Square	df		
Cell-phone telephone	12.10612	4	0.04299	15365	281.6023	0
Type of dwelling occupied by h/hold	5497.406	4	4.224343	15365	1301.364	0
Worked past 7 days	476.4146	4	0.836547	15365	569.5015	0
H/hold's fuel for cooking	7822.782	4	1.141174	15365	6855.032	0
H/hold's fuel for heating	7396.912	4	1.285877	15365	5752.428	0
H/hold's fuel for lighting	3226.886	4	0.932751	15365	3459.538	0
Health facility usually visited by h/hold	2184.542	4	2.478174	15365	881.5129	0
Have access to the medical scheme	132.9068	4	0.179426	15365	740.734	0
Telephone in dwelling	245.3864	4	0.12748	15365	1924.904	0
H/hold refuse disposal	12760.51	4	3.396257	15365	3757.229	0
H/hold's main water source	21716.23	4	1.876324	15365	11573.82	0
H/hold distance from medical facility	545.9762	4	1.54608	15365	353.1357	0
Highest education level completed	85660.14	4	4.321647	15365	19821.18	0

Number of cases in each cluster (OHS 1996)

Cluster	1	3418
	2	1365
	3	1984
	4	5298
	5	3305
Valid		15370
Missing		547

APPENDIX I: DISCRIMINANT ANALYSIS RESULTS FOR OHS 1996

Summary of canonical discriminant functions (OHS 1996)

Eigenvalues				
Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	7.60875	73.85602	73.85602	0.940127
2	1.884736	18.29461	92.15063	0.808299
3	0.751764	7.297168	99.4478	0.655093
4	0.056888	0.552199	100	0.232005

Note: First 4 canonical discriminant functions were used in the analysis

Wilks' lambda and chi square values (OHS 1996)

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1 through 4	0.021749	58800.61	52	0
2 through 4	0.187236	25733.93	36	0
3 through 4	0.540126	9461.03	22	0
4	0.946174	849.8541	10	0

Standardised canonical discriminant function coeeficients (OHS 1996)

	Function			
	1	2	3	4
Cell-phone telephone	0.014579	0.018508	-0.01615	0.452606
Type of dwelling occupied by h/hold	0.13965	0.169082	0.367191	-0.17385
Worked past 7 days	0.031515	0.014517	-0.0237	0.028117
Highest education level completed	0.780559	-0.59962	-0.24755	0.104058
H/hold's fuel for cooking	0.153427	0.159098	0.311091	0.192959
H/hold's fuel for heating	0.089041	0.039711	0.148851	0.205175
H/hold's fuel for lighting	0.057604	0.069482	0.196557	-0.09431
Health facility usually visited by h/hold	0.001363	-0.01118	0.122448	-0.21899
H/hold distance from medical facility	0.015495	0.012489	-0.06694	0.035866
Have access to the medical scheme	0.018067	-0.01713	-0.08223	0.491154
Telephone in dwelling	-0.02042	0.05775	-0.15976	0.346173
H/hold refuse disposal	0.133123	0.055385	0.442019	0.297809
H/hold's main water source	0.469412	0.661161	-0.66442	-0.11468

Structure matrix – correlations between functions and predictors (OHS 1996)

	Function			
	1	2	3	4
Highest education level completed	0.759*	-0.634	-0.097	-0.029
Worked past 7 days	-0.139*	-0.00581	-0.00079	0.082
H/hold's main water source	0.487	0.761*	-0.391	-0.088
H/hold's fuel for cooking	0.428	0.287	0.559*	0.215
H/hold's fuel for heating	0.393	0.260	0.503*	0.209
H/hold's fuel for lighting	0.288	0.265	0.427*	0.004
H/hold refuse disposal	0.311	0.269	0.370*	0.300
Type of dwelling occupied by h/hold	0.161	0.143	0.362*	-0.302
Have access to the medical scheme	-0.145	0.014	-0.135	0.588*
Cell-phone telephone	-0.082	0.039	-0.067	0.521*
Telephone in dwelling	-0.23	-0.05	-0.332	0.442*
Health facility usually visited by h/hold	0.159	-0.014	0.193	-0.370*
H/hold distance from medical facility	0.086	0.132	0.022	0.166*

NB. Pooled within correlations between discriminating variables and standardized canonical discriminant functions. Variables ordered by absolute size of correlation within function.
*Largest absolute correlation between each variable and any discriminant function.

Canonical discriminant function coefficients (unstandardised) - OHS 1996

	Function			
	1	2	3	4
Cell-phone telephone	0.070313	0.089263	-0.07789	2.18291
Type of dwelling occupied by h/hold	0.067946	0.082266	0.178654	-0.08458
Worked past 7 days	0.034456	0.015872	-0.02591	0.030742
Highest education level completed	0.375475	-0.28844	-0.11908	0.050055
H/hold's fuel for cooking	0.143624	0.148932	0.291213	0.180629
H/hold's fuel for heating	0.078521	0.03502	0.131266	0.180936
H/hold's fuel for lighting	0.059644	0.071943	0.203519	-0.09765
Health facility usually visited by h/hold	0.000866	-0.0071	0.077783	-0.13911
H/hold distance from medical facility	0.012462	0.010044	-0.05383	0.028844
Have access to the medical scheme	0.042652	-0.04044	-0.19412	1.159511
Telephone in dwelling	-0.05719	0.161746	-0.44746	0.969554
H/hold refuse disposal	0.072236	0.030053	0.23985	0.161599
H/hold's main water source	0.342689	0.482674	-0.48505	-0.08372
(Constant)	-8.92532	-4.88665	1.354217	-8.76746

Functions at group centroids (OHS 1996)

Cluster Number of Case	Function			
	1	2	3	4
1	-2.27276	1.871857	-0.41482	-0.20362
2	4.947992	-1.598	-0.05577	-0.56844
3	-4.55066	-1.84169	1.280371	-0.04935
4	2.139196	0.633202	0.619699	0.180936
5	-0.39052	-1.18533	-1.30997	0.184933

NB. Unstandardised canonical discriminant functions evaluated at group means

Classification function coefficients - Fisher's linear discriminant functions (OHS 1996)

	Cluster Number of Case				
	1	2	3	4	5
Cell-phone telephone	44.8158	44.18944	44.52887	45.77433	45.59315
Type of dwelling occupied by h/hold	2.081538	2.381711	1.911071	2.431707	1.76514
Worked past 7 days	4.057451	4.230661	3.880844	4.174831	4.108918
Highest education level completed	1.518264	5.169296	1.539953	3.428177	3.232846
H/hold's fuel for cooking	1.856008	2.414967	1.497308	2.675921	1.480532
H/hold's fuel for heating	1.913274	2.339865	1.854796	2.421706	1.906809
H/hold's fuel for lighting	1.459075	1.748821	1.385986	1.806102	1.131274
Health facility usually visited by h/hold	3.173596	3.283163	3.30839	3.213184	3.073255
H/hold distance from medical facility	1.518531	1.543811	1.366035	1.51647	1.570678
Have access to the medical scheme	11.51995	11.47553	11.42276	12.00328	12.34816
Telephone in dwelling	20.3395	18.85095	19.26016	19.79679	20.51463
H/hold refuse disposal	0.186941	0.631422	0.342312	0.778691	0.079116
H/hold's main water source	6.077851	6.733905	2.669639	6.457925	5.648906
(Constant)	-143.747	-196.794	-112.756	-177.299	-147.439

Classification processing summary (OHS 1996)

Processed		15917
Excluded	Missing or out-of-range group codes	0
	At least one missing discriminating variable	547
Used in Output		15370

Prior probabilities for groups (OHS 1996)

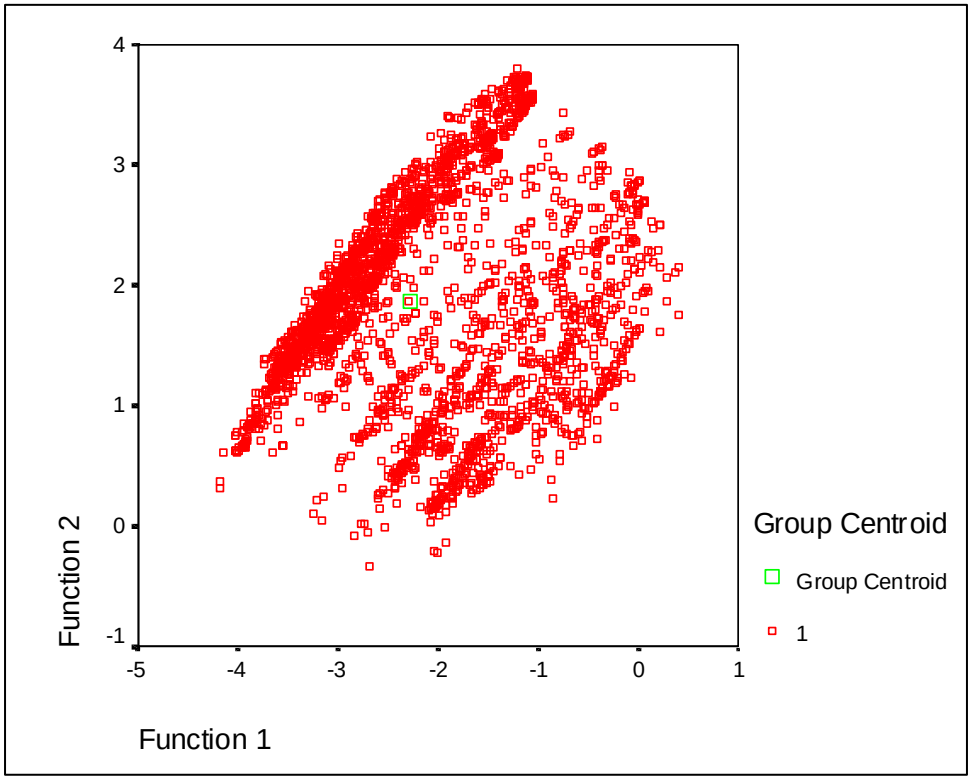
Cluster Number of Case	Prior	Cases Used in Analysis	
		Unweighted	Weighted
1	0.2	3418	3418
2	0.2	1365	1365
3	0.2	1984	1984
4	0.2	5298	5298
5	0.2	3305	3305
Total	1	15370	15370

Classification results (OHS 1996)

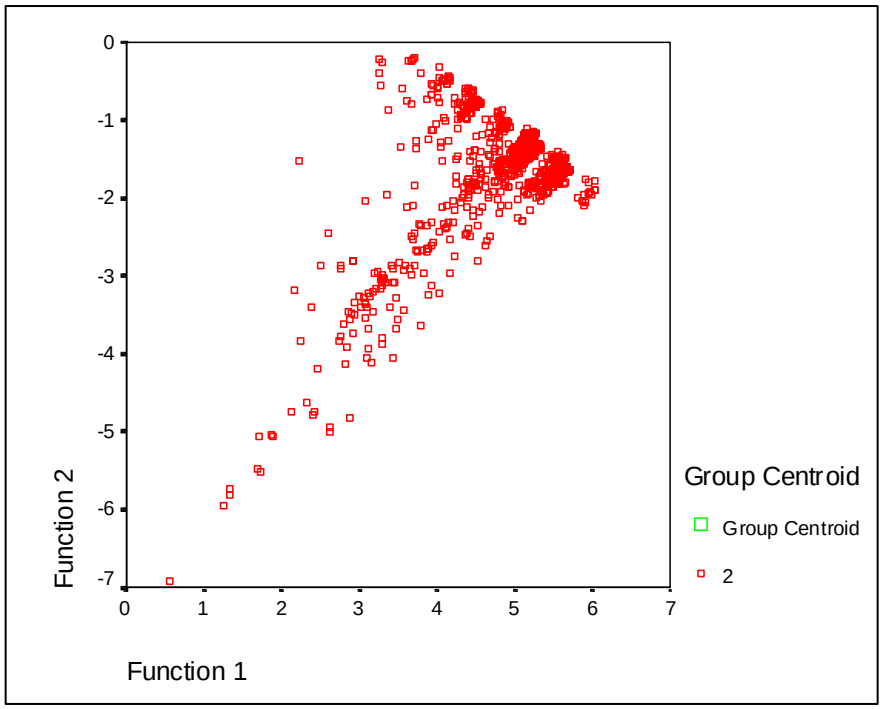
	Cluster Number of Case	Predicted Group Membership					Total
		1	2	3	4	5	
Original Count	1	3321	0	10	44	43	3418
	2	0	1343	0	8	14	1365
	3	32	0	1944	0	8	1984
	4	18	25	1	5180	74	5298
	5	22	1	292	96	2894	3305
%							
	1	97.2	0	0.3	1.3	1.3	100
	2	0	98.4	0	0.6	1.03	100
	3	1.6	0	98.0	0	0.4	100
	4	0.3	0.5	0.02	97.8	1.4	100
	5	0.7	0.03	8.8	2.9	87.6	100

NB. 95.5% of original grouped cases correctly classified.

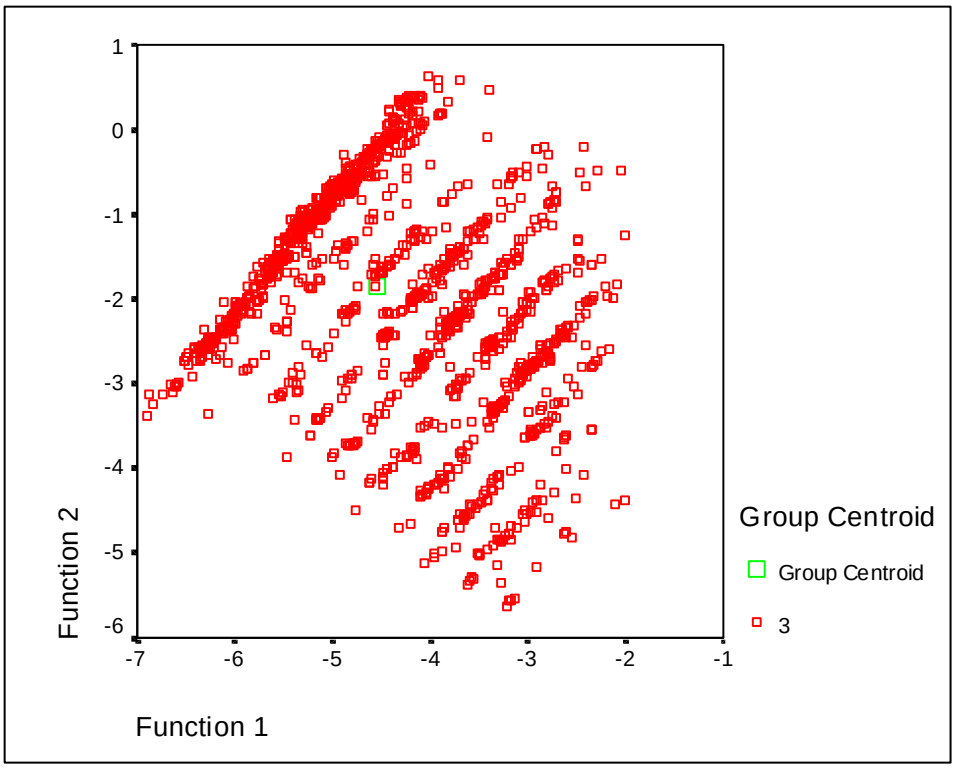
Canonical discrminant function plot – QOL 1 (OHS 1996)



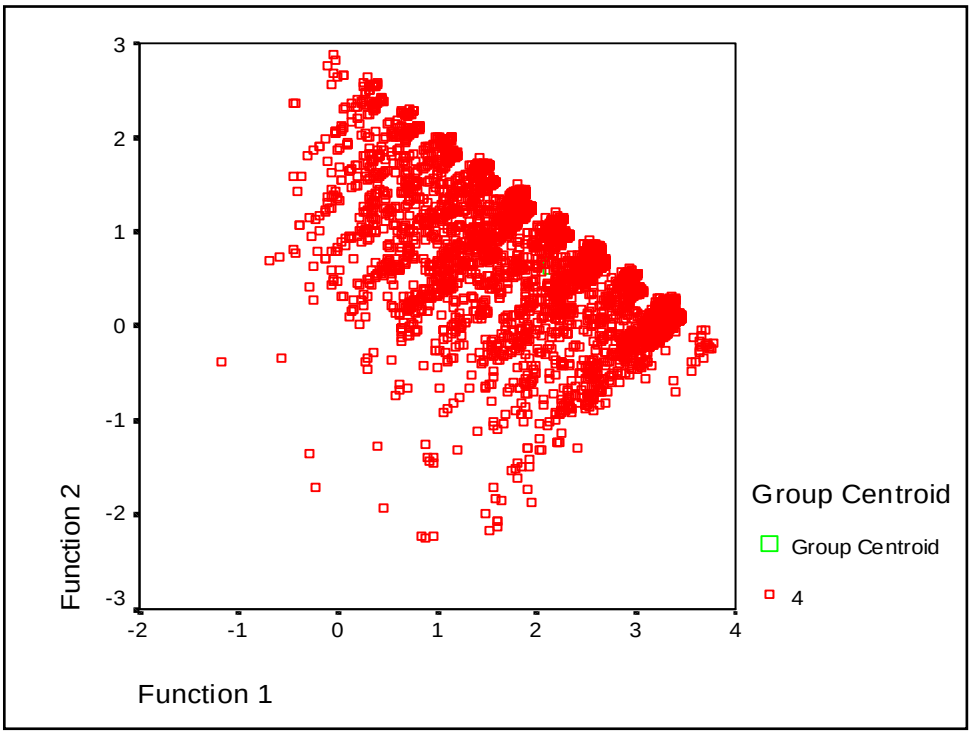
Canonical discrminant function plot – QOL 2 (OHS 1996)



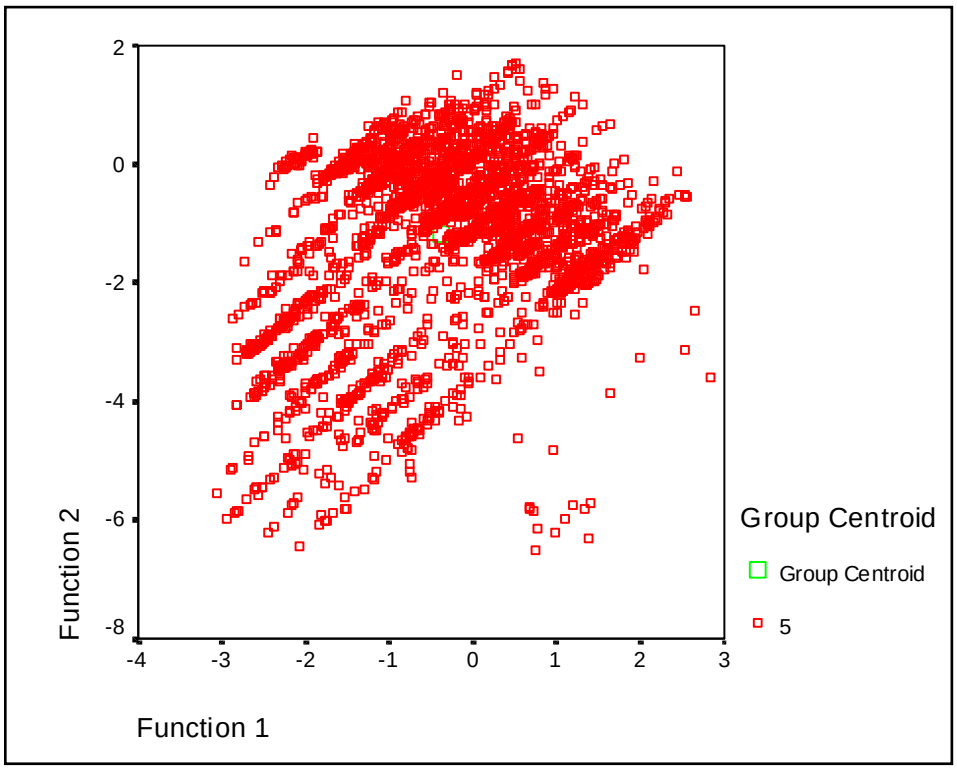
Canonical discrminant function plot – QOL 3 (OHS 1996)



Canonical discrminant function plot – QOL 4 (OHS 1996)



Canonical discrminant function plot – QOL 5 (OHS 1996)



APPENDIX J: OCTOBER HOUSEHOLD SURVEY 1999: METADATA

OCTOBER HOUSEHOLD SURVEY 1999: METADATA

GENERAL NOTES

The October household survey questionnaire consists of a number of sections. The data from the different sections is recorded in separate files as the sections refer to different entities or differ in their coverage. The files are flat, ASCII, fixed field files, with one line of given length per record. This format was chosen so as to make the data usable with as many programmes as possible, and thus accessible to as wide a range of people as possible.

The sections, and the corresponding files from which they are mainly drawn, are as follows. In addition, each file contains a number of variables from other sections of the questionnaire – and the flap in particular. Most files also contain a number of derived variables.

PERSON: Data from Section 1 and Section 4
BIRTHS: Data from Section 2
CHILDREN: Data from Section2
WORKER: Data from Section 3
MIGRANT: Data from Section 5
HOUSE: Data from Section 6
FARMING: Data from Section 7

The section on each file contains the following information:

- Nature of records in the file and population covered
- Description of variables

The description of variables contains the following information:

Descriptive name of the variable

This is a short English description plus the (usually eight-character) variable name in the original file used by Stats SA to construct the ASCII file
Position of the variable: The position of the data within the record, recorded in the format (@xxx y.). @xxx indicates that the data begins at position (i.e. column) xxx and y. indicates that it is y digits wide. All data is numeric. All data is right-justified.
Source: This is either the question in the questionnaire or, for derived variables, the method of derivation. Derived variables are usually found towards the end of a record.
Notes: Specific observations to be noted by users.
Valid range: The range of valid values for the variable. For continuous variables this reflects the upper and lower ranges as found in the data.

Not applicable
Where a variable is not applicable to a particular record, for example where the originating question is skipped, "@" is the standard symbol used to indicate inapplicability. The symbol is repeated to fill the maximum number of columns for the variable concerned.

Missing value
Where information was not available in respect of a particular field and record, "*" is the standard symbol used to indicate missing values. The symbol is repeated to fill the maximum number of columns for the variable concerned.

Most questions in the October household questionnaire are pre-coded i.e. there is a set number of choices from which one or more must be selected. For open-ended 'write-in' questions, the description will note

that post-coding occurred and explain how this was done. For most variables the coding is apparent from the questionnaire (available elsewhere in the documentation) and is not repeated in the variable description. Where the coding is not apparent, the description either provides the codes or indicates where code lists are to be found.

Linking files

The data from different files can be linked on the basis of a record identifier. The record identifier is the first field/s in each file. Each record contains a number (UQNR) which constitutes a unique household identifier. All records with a given household identifier, no matter which file they are in, belong to the same household. For individuals, a further two digits constituting the Person number (PERSONNR), when added to the household identifier, creates a unique individual identifier. Again, these can be used to link records from the PERSON and WORK files. The syntax needed to merge information from different files will differ according to the statistical package used.

Sample Design

A sample of 30 000 households was drawn in 3 000 enumerator areas (EAs) (that is 10 households per enumerator area). A two-stage sampling procedure was applied and the sample was stratified, clustered and selected to meet the requirements of probability sampling. The sample was based on the 1996 Population Census enumerator areas and the estimated number of households from the 1996 Population Census The sampled population excluded all prisoners in prisons, patients in hospitals, people residing in boarding houses and hotels (whether temporary or semi-permanent). The sample was explicitly stratified by province and area type (urban/rural).

Within each explicit stratum the EAs were stratified by simply arranging them in geographical order by District Council, Magisterial District and, within the magisterial district, by average household income (for formal urban areas and hostels) or EA. The allocated number of EAs was systematically selected with probability proportional to size in each stratum. The measure of size was the estimated number of households in Each EA. A systematic sample of 10 households was drawn.

Weights

The 1996 population Census was used as a basis for the weighting.

Household weights were calculated by using the reciprocal of the inclusion probabilities.
Since the sample selection was done in two stages
(i.e. first stage - selection of an EA,
second stage - selection of a household in the selected EA):

The inclusion probability of an EA (say p_1):
Since this was done with probability proportional to size
(size being the number of persons residing in the EA),

$$p_1 = m \cdot \frac{A_i}{S A_i}$$

m_i - number of EAs in the sample in the i-th stratum (where stratum is the District Council in a province)
A_i - number of persons residing in the selected EA
$S A_i$ - total number of persons in the population in the i-th stratum

The inclusion probability of the household (say p_2):
Since ten (10) households (per EA) were selected systematically,

$$p_2 = \frac{10}{\text{number of households in the selected EA}}$$

Household weight = $(1/p_1.p_2)$. Relative scaling was done on this weight. The 1996 Census figures (adjusted for growth) were used as benchmarks..

To calculate the person weight, the data was post-stratified by province, gender and age group (5 year age groups). The 1996 Census figures (adjusted for growth) were used as benchmarks. Relative scaling was also done on this weight to cater for the population group .

Other important information for users is found in the:
- Questionnaire file
- Additional code list (occupation, industry, provinces, education)
- Relevant publications
- Web-site

FLAP AND SECTION 1 AND SECTION 4 (PERSONS) Filename: PERSON

NOTES:
This file contains a record for every member of every household

FLAP:

Unique Number (UQNR) *(@1 13.)*
Unique household identifier (13 digits)

Person (PERSONNR) *(@14 2.)*
FLAP Column heading
Valid range: 1-XX
Note 1: The first two variables (fifteen digits) together create a unique person identifier which can be used to link individual information in this file with individual information in other files.
Note 2: If there were more than 10 individuals in a household, a second household questionnaire was completed.

Gender (B_GENDER) *(@16 1.)*
FLAP B. Is … (options provided)
Valid range: 1-2

Age (C1_AGE) *(@17 3.)*
FLAP C. Age in completed years
Valid range: 000-106

Year of birth (C2_YEAR) *(@20 4.)*
FLAP C. Year of birth
Valid range: 1893-1999

Population group (D_RACE) *(@24 1.)*
FLAP D. What population group does … belong to?
Valid range: 1-5

Person present (E_PRESEN) *(@25 1.)*
FLAP E. Is … present during the interview?
Valid range: 1-2

SECTION 1:

Relationship (Q1_1RELS) *(@26 1.)*
Q1.1 What is …'s relationship to the head of the household?
Valid range: 1-9

Marital status (Q1_2MARI) *(@27 1.)*
Q1.2 What is …'s present marital status?
Valid range: 1-6

Language (Q1_3LANG) *(@28 2.)*
Q1.3 Which language does … speak most often at home?
Valid range: 00-12

Highest education level (Q1_4AHIG) *(@30 2.)*
Q1.4a What is the highest level of education that … has completed?
Valid range: 00-22

Field of study (Q1_4BSTU) *(@32 2.)*
Q1.4b In what area of study was the diploma, certificate or degree?
Note 1: This question was only asked in respect of members for whom Highest education level was a diploma or degree.
Note 2: This question was write-in. The responses were postcoded .
Valid range: 01-15

01 Arts
02 Science
03 Law
04 Theology
05 Economics, Commerce and Management
06 Education
07 Medical Sciences
08 Engineering
09 Administration and Clerical
10 Protection
11 Building sciences
12 Technical
13 Computing
14 Veterinary science
15 Other

Skill training (Q1_5SKIL) *(@34 1.)*
Q1.5 Has … been trained in skills that can be used for work, e.g. book-keeping, security guard training, welding, child minding?
Valid range: 1-3

Duration of training (Q1_6TRAI) *(@35 1.)*
Q1.6 The last time … received this type of training, how long did it last?
Note: This and the following question were only asked for members who were said to have received skills training.
Valid range: 1-8

Field of training (Q1_7TRAI) *(@36 2.)*
Q1.7 In what field was the training?
Valid range: 01-13

Can read (Q1_8AREA) *(@38 1.)*
Can … read in at least one language?
Valid range: 1-2

Can write (Q1_8BWRI) *(@39 1.)*
Can … write in at least one language?

Valid range: 1-2

Current student (Q1_9EDU) *(@40 1.)*
Q1.9 Which of the following educational institutions, if any, does … attend?
Valid range: 1-8

Type of study (Q1_10STU) *(@41 1.)*
Q1.10 Is this full-time or part-time?
Note: This question was only asked for members who were said to attend an educational institution.
Valid range: 1-2

Pre-school attendance (Q1_11SCH) *(@42 1.)*
Q1.11 Which of the following institutions does … attend?
Note: This question was only asked in respect of people aged six years or younger.
Valid range: 1-6

School feeding (Q1_12FRE) *(@43 1.)*
Q1.12 Does … get free food through the school feeding scheme?
Note: This question was only asked in respect of people aged 15 years or younger.
Valid range: 1-4

Health card (Q1_13HEA) *(@44 1.)*
Q1.13 Does … have a Road to Health, immunisation or clinic card?
Note: This question was only asked in respect of people aged 24 months of younger.
Valid range: 1-3

Health status (Q1_14HEA) *(@45 1.)*
Q1.14 How would you describe …'s health?
Valid range: 1-5

Medical aid (Q1_15MED) *(@46 1.)*
Q1.15 Is … covered by a medical aid or medical benefit scheme or other private health insurance?
Valid range: 1-3

Health worker past month (Q1_16AVI) *(@47 1.)*
Q1.16a During the past month, did … go to any health worker such as a nurse, doctor or traditional healer as a result of illness or injury?
Valid range: 1-3

Type of health worker (Q1_16BTY) *(@48 1.)*
Q1.16b What kind of health worker was it?
Note: This and the following two questions were only asked in respect of persons who were said to have attended a health worker in the past month.
Valid range: 1-9

Place of consultation (Q1_17CON) *(@49 2.)*
Q1.17 Where did the consultation take place?
Note: If there was more than one consultation, the question was asked in respect of the most recent one.
Valid range: 01-12

Payment for service (Q1_18SER) *(@51 1.)*
Q1.18 Did … have to pay for this service?
Valid range: 1-3

Disability (Q1_19ADI) *(@52 1.)*
Q1.19a Is … limited in his/her daily activities (at home, at work or at school) because of a long-term physical or mental condition (lasting six months or more)?
Valid range: 1-2

Sight disability (Q1_19B1D) *(@53 1.)*
Hearing disability (Q1_19B2D) ` *(@54 1.)*
Communication disability (Q1_19B3D) *(@55 1.)*
Movement disability (Q1_19B4D) *(@56 1)*
Standing disability (Q1_19B5D) *(@57 1)*
Grasping disability (Q1_19B6D) *(@58 1)*
Intellectual disability (Q1_19B7D) *(@59 1)*
Emotional disability (Q1_19B8D) *(@60 1)*
Other disability (Q1_19B9D) *(@61 1)*
Q1.19b Describe the difficulty or difficulties that … has?
Note: These questions were only asked in respect of people who were said to be limited in their daily activities.
Valid range for Sight disability to Emotional disability: 1-2
Valid range for Other disability: 1

Water fetching (Q1_20FET) (@62 1.)
Q1.20 In the last seven days, did … fetch water for home use (not for sale)?
Valid range: 1-2

Wood fetching (Q1_21FET) (@63 1.)
Q1.21 In the last seven days, did … fetch wood/dung for home use as fuel (not for sale)?
Valid range: 1-2

SECTION 4:

Government old age pension (Q4_1GOVP) *(@64 1.)*
Q4.1 Old age pension from the government
Valid range: 1-3

Retirement benefit (Q4_2WRKP) *(@65 1.)*
Q4.2 Pension from his/her specific work/retirement benefits
Valid range: 1-3

Disability grant(Q4_3DISS) *(@66 1.)*
Q4.3 Disability grant from government
Valid range: 1-3

Compensation Fund (Q4_4WRKC) *(@67 1.)*
Q4.4 Compensation Fund
Valid range: 1-3

State child support (Q4_5STAT) *(@68 1.)*
Q4.5 State maintenance grant or child support grant
Valid range: 1-3

Private maintenance (Q4_6PRIV) *(@69 1.)*
Q4.6 Private maintenance from parent or former spouse
Valid range: 1-3

Care dependency grant (Q4_7DEPE) *(@70 1.)*

Q4.7 Care dependency (single care) grant
Valid range: 1-3

Foster care grant (Q4_8FOST) *(@71 1.)*
Q4.8 Foster care grant
Valid range: 1-3

UIF benefit (Q4_9INSF) *(@72 1.)*
Q4.9 Unemployment Insurance Fund
Valid range: 1-3

Support from outside household (Q4_10FIN) *(@73 1.)*
Q4.10 Remittance/financial support from persons not in the household
Valid range: 1-3

Gratuities (Q4_11LUM) *(@74 1.)*
Q4.11 Gratuities/other lump sum
Valid range: 1-3

Other income (Q4_12AOT) *(@75 1.)*
Q4.12 Other sources
Valid range: 1-3

Total income (Q1.13TOT) *(@76 2.)*
Q4.13 What was …'s total income in the last month, including money from work and all the sources mentioned?
Valid range: 01-11

Province (PROV) *(@78 1.)*
Derived variable: First digit of the unique household number.
Valid range: 1-9

1. Western Cape
2. Eastern Cape
3. Northern Cape
4. Free State
5. KwaZulu-Natal
6. North West
7. Gauteng
8. Mpumalanga
9. Northern Province

Rural/urban (EATYPE) *(@79 1.)*
Valid range: 1-2 : 1=urban; 2=rural

Enumeration area type is a classification of EAs according to (human) settlement. There were two principles guiding the assignment of an EA to a particular class or type. The first one was the EAs specific geographical location. The second principle was the kind of dwellings that were most common within the EA. These two principles led to locational and settlement types as follows:

Urban - EAs within municipal or local authority boundaries. These can be further classified as:
* Ordinary town or city area as well as vacant areas. Various formal structures can be found, e.g. houses, blocks of flats and businesses.
* Area with mainly informal dwellings (so-called 'squatter areas').

* Area with mainly hostels, e.g. mine, factory and municipal hostels.
* Area with mainly institutions e.g. prisons and hospitals.

Rural - EAs with population concentrations adjacent to a municipal border (an EA must have one common boundary with the municipal border) and EAs situated in rural areas (not sharing A common boundary with a proclaimed urban municipal area). These can be further classified as:
* Semi-town (i.e., a town without a local authority) with predominantly formal dwellings.
* Area with mainly informal dwellings.
* Area with mainly hostels.
* Area with mainly institutions.
* Semi-town (i.e. a town without a local authority) with predominantly formal dwellings such as mining, and industrial towns where housing for employees is provided by employers.
* Village/settlement without a local authority and which is not situated within a tribal area and with formal and semi-formal dwellings such as houses, huts and rondavels.
* Tribal authority area with villages.
* Area with mainly informal dwellings.
* Area with mainly hostels.
* Area with mainly institutions.
* Area with farms, agricultural holdings, holiday resorts, agricultural schools and colleges.
* Tribal authority area outside of villages.

Individual weight (WGT4) *(@80 8.)*
Derived variable: Based on projected population estimates for October 1998 by population group, gender, age group and province.

SECTION 2 (BIRTHS) Filename: BIRTHS

NOTES:
This file includes information for all women who have ever given birth. Only live births were recorded, excluding still births and children adopted by the mother.

Unique Number (UQNR) *(@1 13.)*
Unique household identifier (13 digits)

Person no (PERSONNR) *(@14 2.)*
FLAP Column heading. The respondent number of the mother.
Valid range: 01-31
Note: The first two variables (fifteen digits) together create a unique person identifier which can be used to link individual information in this file with individual information in other files.

SECTION 2:

Live births (Q2-1LIVE) *(@16 2.)*
Q2.1 How many children (live births) has … given birth to in the last 12 months?
Valid range: 1-2

Children still alive (Q2-2CHIL)) *(@18 2.)*
Q2.2 How many of these children are still living?
Valid range: 0-2

Weight (WGT4) *(@20 8.)*
Derived variable: The weight is the inclusion probability as described in the paragraph "*Weights*" under *"Sample design"*.

SECTION 2 (CHILDREN) Filename: CHILDREN

NOTES:
This file includes information for all children of all women who have ever given birth. Only live births were recorded, excluding still births and children adopted by the mother.

Unique Number (UQNR) *(@1 13.)*
Unique household identifier (13 digits)

Person no (PERSONNR) *(@14 2.)*
FLAP Column heading. The respondent number of the mother.
Valid range: 01-31
Note: The first two variables (fifteen digits) together create a unique person identifier which can be used to link individual information in this file with individual information in other files.

Birth order (Q2_3CHIL) *(@16 2.)*
Q2.3 List of children born in the last 12 months.
Note 1: The line number, which represents the birth order, was recorded.
Note 2: UQNR, PERSONNR and this variable together create a unique 17-digit identifier for every birth recorded.
Valid range: 01-02

Gender of child (Q2_4GEND) *(@18 1.)*
Q2.4 Is/was the child a boy or a girl?
Valid range: 1-2

Year of birth (Q2_5YEAR) *(@19 4.)*
Month of birth (Q2_5MONT) *(@23 2.)*
Day of birth (Q2-5DAYB) *(@25 2.)*
Q2.6 In what year, month and day was the child born?
Valid range:

Year of birth: 1998-1999
Month of birth: 01-12
Day of birth: 01-31

Place born (Q2_6BIRT) *(@27 1.)*
Q2.6 Where was the child born?
Valid range: 1-3

Child alive (Q2_7STIL) *(@28 1.)*
Q2.7 Is the child still alive?
Valid range: 1-2

Child living with household (Q2_8LIVI) *(@29 1.)*
Q2.8 Is the child currently living with this household?
Note: This question was only asked in respect of children who were said to be still living.
Valid range: 1-2

Year died (Q2_9YEAR) *(@30 4.)*
Month died (Q2_9MONT) *(@34 2.)*
Day died (Q2_9DAY) *(@36 2.)*
Q2.13 In what year, month and day did the child die?
Note: This question was only asked in respect of children who were said to have died.

Valid range:

Year died: 1998-1999
Month died: 01-12

Day died: 01-31

Weight (WGT4) *(@38 8.)*
Derived variable: The weight is the inclusion probability as described in the paragraph "*Weights*" under "*Sample design"*.

SECTION 3 (WORKERS) Filename: WORKER

NOTES:
This file contains a record for all individuals aged 15 years or older

Unique Number (UQNR) *(@1 13.)*
Unique household identifier (13 digits)

Person no (PERSONNR)) *(@14 2.)*
FLAP Column heading
Valid range: 01-31
Note: The first two variables (fifteen digits) together create a unique person identifier which can be used to link individual information in this file with individual information in other files.

Respondent to questions (Q3_0RESP) *(@16 1.)*
Q3.0 Who is responding to these questions?
Valid range: 1-2

Worked past 7 days (Q3_1WRKP) *(@17 1.)*
Q3.1 During the past seven days, did … do work for pay, profit, or family gain? For example
- formal work for a salary, wage or profit
- informal work such as making things for sale, selling things or providing a service
- work on a farm or land, whether for a wage or as part of the household's farming activities
- casual/seasonal work

Valid range: 1-4

Job although absent (Q3_2AHAV) *(@18 1.)*
Q3.2a During the past seven days, did … actually have a full time, part time, or a casual/seasonal job even though he/she was absent from work?
Note: This question was only asked in respect of persons who were said not to have worked in the past seven days.
Valid range: 1-2

Reason no job (Q3_2BCAT) *(@19 1.)*
Q3.2b In which of the following categories does … fall?
Note: This question was only asked in respect of persons who were said not to have a job to return to.
Valid range: 1-8

Reason absent from work (Q3_3RSNN) *(@20 2.)*
Q3.3 Why did …not work during the past seven days?
Note: This question was only asked in respect of persons who were said to have a job to return to.
Valid range: 01-12

Hours worked (Q3_4AHOU) *(@22 3.)*
Q3.4a How many hours did … actually work during the past seven days?
Note: This question and the questions which follow were only asked in respect of persons who were said to have worked in the past 7 days.
Valid range: 001-168

Hours usually worked (Q3_4BUSU) *(@25 3.)*

Q3.4b How many hours per week does … usually work?
Valid range: 001-168

Like more work (Q3_5MORE) *(@28 1.)*
Q3.5 Would … like to work more hours?
Valid range: 1-3

Type of employment (Q3_6WRKF) *(@29 1.)*
Q3.6 Who does … work for?
Valid range: 1-3

How many employers (Q3_7NREM) *(@30 1.)*
Q3.7 Does … work for? (options provided)
Note: This question and those which follow were asked in respect of persons who were working for someone else, whether or not they also worked for themselves.
Valid range: 1-2

Industry of employee (Q3_9FIRM) *(@31 3.)*
Q3.8 What is the name of …'s employer (firm, institution or private individual)?
Q3.9 What is the main activity of …'s employer (firm, institution or private employer)?
Note: These questions were both write-in. The responses were post-coded to three digits on the basis of the International Standard Industrial Classification of all Economic Activities (ISIC) 1993 (see elsewhere in documentation for codes).
Valid range: 010-990

Occupation of employee (Q3_10OCC) *(@34 4.)*
Q3.10 What kind of work is … doing at his/her main job?
Note: This question was write-in and post-coded to four digits on the basis of the International Standard Classification of Occupations (ISCO 88) (see elsewhere in documentation for codes).
Valid range: 1110-9390 and 0810-0850

Employment start year (Q3_11YEA) *(@38 4.)*
Employment start month (Q3_11MON) *(@42 2.)*
Q3.11 When did … start working with the employer mentioned above (firm, institution or private individual) State year and month
Valid range:
Employment start year: 1906-1999
Employment start month: 01-12

Nature of contract (Q3_12WRK) *(@44 1.)*
Q3.12 Is …'s work (options provided)
Valid range: 1-6

Written contract (Q3_13CON) *(@45 1.)*
Q3.13 Does … have any written contract with the employer?
Valid range: 1-3

Payer (Q3_14WHO) *(@46 1.)*
Q3.14 Who pays ….?
Valid range: 1-5

Pension contribution (Q3_15PEN) *(@47 1.)*
Q3.15 Does …'s employer contribute to a medical aid or health insurance scheme?
Valid range: 1-3

Medical aid contribution (Q3_16MED) *(@48 1.)*

Q3.16 Does …'s employer contribute to a medical aid or health insurance scheme?
Valid range: 1-3

Paid leave (Q3.17PAI) *(@49 1.)*
Q3.17 Does … get any paid leave?
Valid range: 1-3

Union membership (Q3_18TRA) *(@50 1.)*
Q3.18 Is … a member of a trade union?
Valid range: 1-3

Employment sector (Q3_19EMP) *(@51 1.)*
Q3.19 Is this employment in: (options provided)
Valid range: 1-2

Income of employee (Q3_20AEM) *(@52 6.)*
Time period of payment (Q3_20BEM) *(@58 1.)*
Income bracket (Q3_20CEM) *(@59 2.)*
Q3.20 What is …'s total salary/pay at the main job?
Note 1: This question asked for the actual amount, for the period of payment and in which of 14 brackets the amount fell. The first variables records the amount, the second the period and the third the bracket.
Note 2: The question was write-in for the amount.
Valid range for amount: 000001-920920
Valid range for period: 1-3
Valid range for bracket: 01-15

Additional work (Q3_21WRK) *(@61 1.)*
Q3.21 In the past seven days, did …do any work for him/herself, such as making things for sale, selling things or providing a service?
Note: This question was asked in respect of all persons who were said to have worked in the past 7 days.
Valid range: 1-2

Industry of self-employed (Q3_22EMP) *(@62 3.)*
Q3.22 What is the main activity of … or his/her business?
Note 1: This and the following questions were only asked in respect of people who were said to have done work for themselves in the past seven days.
Note 2: The question was write-in. Industry was post-coded to three digits on the basis of the International Standard Industrial Classification of all Economic Activities (ISIC) 1993 (see elsewhere in documentation for codes).
Valid range: 010-990

Occupation of self-employed (Q3_23EMP) *(@65 4.)*
Q3.23 Describe the work … does/did for him/herself or for his/her business?
Note: This question was write-in. Occupation was post-coded to four digits on the basis of the International Standard Classification of Occupations (ISCO 88).
(see elsewhere in documentation for codes).
Valid range: 1110-9390 and 0810-0850

Sector (Q3_24BUS) *(@69 1.)*
Q3.24 Now I would like to determine whether …'s job/business is/was formal (registered) or informal (unregistered)… Do you consider …'s work/business to be formal or informal?
Note: The ellipsis indicates a paragraph which the interviewer was required to read out, explaining different types of registration and nothing that "Many small businesses do not register at any of the above offices."
Valid range: 1-2

VAT number (Q3_25VAT) *(@70 1.)*

Q3.25 Does/did … have a VAT number:
Valid range: 1-3

Income of self-employed (Q3_26AEM) *(@71 6.)*
Time period of payment (Q3_26BSE) *(@77 1.)*
Income bracket (Q3_26CSE) *(@78 2.)*
Note: This question was write-in.
Q3.26 What is/was …'s total income (before deducting expenses) from his/her own activities/business?
Note: This question asked for the actual amount, for the period of payment and in which of 16 brackets the amount fell. The first variable records the amount, the second records the period and the third records the bracket.
Valid range for amount: 000001-500010
Valid range for period: 1-3
Valid range for bracket: 01-15

Unpaid employees (Q3_27ANR) *(@80 3.)*
Paid employees (Q3_27BNR) *(@83 3.)*
Q3.27 How many people are/were working for … (including unpaid and family workers) during the last month that he/she worked?
Valid range for unpaid employees: 000-011
Valid range for paid employees: 000-600

Payment method (Q3_28HOW) *(@86 1.)*
Q3.28 How is … being paid for the service/work that he/she provides or for the product that he/she sells?
Valid range: 1-3

Acceptance of job (Q3_29ACC) *(@87 1.)*
Q3.29 If a suitable job is offered, will … accept it?
Note: This and the following questions were only asked in respect of persons who were said not to have worked in the past seven days and did not have a job to return to.
Valid range: 1-3

When can start work (Q3_30STA) *(@88 1.)*
Q3.30 How soon can … start work?
Note: This and the following two questions were only asked in respect of persons who were said to be willing to accept a job.
Valid range: 1-5

Time seeking work (Q3_31TIM) *(@89 1.)*
Q3.31 How long has … been seeking work?
Valid range: 1-7

Work seeking first action (Q3_32AWH) *(@90 2.)*
Work seeking second action (Q3_32BWH) *(@92 2.)*
Work seeking third action (Q3_32CWH) *(@94 2.)*
Q3.32 In the past four weeks, what has … done to find work?
Note: Up to three workseeking activities were recorded in respect of any one individual.
Valid range: 01-10

Odd jobs (Q3_33ODD) *(@96 1.)*
Q3.33 Did … do any odd jobs during the past seven days?
Valid range: 1-2

Any previous work (Q3_34WRK) *(@97 1.)*
Q3.34 Has … ever worked for pay, profit or family gain, for example

- Formal work for a salary, wage or profit

- Informal work such as making things for sale, selling things or providing a service
- Work on a farm or land, whether for a wage or as part of the household's farming activities
- Casual/seasonal work

Valid range: 1-2

Time since last worked (Q3_35LST) *(@98 1.)*
Q3.35 How long ago was it since … last worked?
Note: This and the following question were only asked in respect of persons who were said to have worked previously.
Valid range: 1-7

Duration of last job (Q3_36WOR) *(@99 1.)*
Q3.36 How long did … work in his/her last job?
Valid range: 1-9

Reason not worked (Q3_37NOT) *(@100 2.)*
Q3.37 Why did … not work during the past seven days?
Valid range: 01-11

Means of support (Q3_38SUP) *(@102 1.)*
Q3.38 How does … support him/herself?
Valid range: 2-8

Gender (B_GENDER) *(@103 1.)*
FLAP B. Is … (options provided)
Valid range: 1-2

Age (C1_AGE) *(@104 3.)*
FLAP C. Age in completed years
Valid range: 015-106

Population group (D_RACE) *(@107 1.)*
FLAP D. What population group does … belong to?
Valid range: 1-5

Highest education level (Q1_4AHIG) *(@108 2.)*
Q1.10 What is the highest level of education that … has completed?
Valid range: 00-22

Field of training (Q1_7TRAI) *(@110 2.)*
Q1.7 In what field was the training?
Valid range: 01-13

Economic sector (INDUST) *(@112 2.)*
Derived variable: Derived from Industry of employee or, if this is missing or not applicable, Industry of self-employed.
Valid range: 01-11, 66 and 90
Values:
01=Industry codes 100-199 (Agriculture)
02=Mining codes 200-299 (Mining)
03=Industry codes 300-399 (Manufacturing)
04=Industry codes 400-499 (Utilities)
05=Industry codes 500-599 (Construction)

06=Industry codes 600-699 (Trade)
07=Industry codes 700-799 (Transport)
08=Industry codes 800-899 (Finance)
09=Industry codes 900-999 (Services)
10=Industry code 010 (Domestic Services)
11=Industry codes 020 and 030 extra-territorial organisations and foreign governments
66=Industry codes 060 not elsewhere classified
90= Industry code 090 not adequately defined

Occupation (OCCUP) *(@114 2.)*
Derived variable: Derived from Occupation of employee or, if this is missing or not applicable, Occupation of self-employed.
Valid range: 00-11
Values:
01=Occupation codes 1000-1999 (Managers)
02=Occupation codes 2000-2999 (Professionals)
03=Occupation codes 3000-3999 (Semi-professionals Technicians)
04=Occupation codes 4000-4999 (Clerks)
05=Occupation codes 5000-5999 (Salesperson and skilled service workers)
06=Occupation codes 6000-6999 (Skilled agricultural workers)
07=Occupation codes 7000-7999 (Artisans)
08=Occupation codes 8000-8999 (Operators)
09=Occupation codes 9000-9999 excluding code 9131 (Elementary, routine workers)
11=Occupation code 9131 (Domestic worker)

Official employment status (STATUS1) (@116 1.)

Derived variable: Derived from a logical series of steps involving Worked past 7 days, Job although absent, Work category, Reason absent from work, Acceptance of job, Time to start work, Work seeking action.

Note: The difference between this and the following variable is that, to qualify as unemployed, a person needs to be willing to accept work within a week and have taken action to find work during the past month. If these conditions are not satisfied, the person is classified as not economically active.
Valid range: 0-2
Values:
1=Employed
2=Unemployed
0=Not economically active

Expanded employment status (STATUS2) *(@117 1.)*
Derived variable: Derived from a logical series of steps involving Worked past 7 days, Job although absent,

Work category, Reason absent from work, Acceptance of job, Time to start work.

Note: See official employment status
Valid range: 0-2
Values:
1=Employed
2=Unemployed
0=Not economically active

Province (PROV) *(@118 1.)*
Derived variable: First digit of unique household identifier.
Valid range: 1-9
1. Western Cape
2 Eastern Cape
3 Northern Cape

4 Free State
5 KwaZulu-Natal
6 North West
7 Gauteng
8 Mpumalanga
9 Northern Province

Rural/urban (EATYPE) *(@119 1.)*
Valid range: 1-2 : 1=urban; 2=rural

Enumeration area type is a classification of EAs according to (human) settlement. There were two principles guiding the assignment of an EA to a particular class or type. The first one was the EAs specific geographical location. The second principle was the kind of dwellings that were most common within the EA. These two principles led to locational and settlement types as follows:

Urban - EAs within municipal or local authority boundaries. These can be further classified as:
* Ordinary town or city area as well as vacant areas. Various formal structures can be found, e.g. houses, blocks of flats and businesses.
* Area with mainly informal dwellings (so-called 'squatter areas').
* Area with mainly hostels, e.g. mine, factory and municipal hostels.
* Area with mainly institutions e.g. prisons and hospitals.

Rural - EAs with population concentrations adjacent to a municipal border (an EA must have one common boundary with the municipal border) and EAs situated in rural areas (not sharing A common boundary with a proclaimed urban municipal area). These can be further classified as:
* Semi-town (i.e., a town without a local authority) with predominantly formal dwellings.
* Area with mainly informal dwellings.
* Area with mainly hostels.
* Area with mainly institutions.
* Semi-town (i.e. a town without a local authority) with predominantly formal dwellings such as mining, and industrial towns where housing for employees is provided by employers.
* Village/settlement without a local authority and which is not situated within a tribal area and with formal and semi-formal dwellings such as houses, huts and rondavels.
* Tribal authority area with villages.
* Area with mainly informal dwellings.
* Area with mainly hostels.
* Area with mainly institutions.
* Area with farms, agricultural holdings, holiday resorts, agricultural schools and colleges.
* Tribal authority area outside of villages.

Individual weight (WGT4) *(@120 8.)*
Derived variable: Based on projected population estimates for October 1999 by population group, gender, age group and province.

SECTION 5 (MIGRANT WORKERS) Filename: MIGRANT

NOTES:
This file only includes data for households with response 1=Yes to:
Q5.1 Are there any persons who are regarded as members of this household, but who were away for a month or more because they are migrant workers?
For these households, there is one record for each migrant recorded for the household.

Unique Number (UQNR) *(@1 13.)*

Unique household identifier (13 digits)

Migrant no (MIGRANTN) *(@14 1.)*
SECTION 5 Column heading
Valid range: 1-9
Note: This variable added to the unique household identifier (UQNR) creates a unique migrant identifier.

SECTION 5:

Gender (Q5_3GEND) *(@15 1.)*
Q5.3 Is … (options provided)
Valid range: 1-2

Age (Q5_4AGE) *(@16 3.)*
Q5.4 How old is …?
Valid range: 008-081

Occupation (Q5_5OCCU) *(@19 4.)*
Q5.5 What type of work is … doing as a migrant worker?
Note: Note: This question was write-in and post-coded to four digits on the basis of the International Standard Classification of Occupations (ISCO 88).
Valid range: 0810-0850 and 1110-9390

Industry (Q5_6INDU) (@23 3.)
Q5.6 What is the main activity of …'s firm, institution or private employer?
Valid range: 010 – 990

Home visits (Q5_7COME) *(@26 1.)*
Q5.7 How often does … come home?
Valid range: 1-7

Money for household (Q5_8BRIN) *(@27 1.)*
Q5.8 How often does … sned or bring money to the household?
Valid range: 1-5

Weight (HHWGT) *(@28 8.)*

Derived variable: The weight is the inclusion probability as described in the paragraph "*Weights*" under *"Sample design"*

SECTION 6 (HOUSEHOLDS) Filename: HOUSE

Unique Number (UQNR) *(@1 13.)*

Unique household identifier (13 digits)

PSU Number (PSUNR) *(@14 7.)*
COVER: PSU number
These digits also constitute the first seven digits of the UQNR

Dwelling Number (DWELLNR) *(@21 4)*
COVER: Dwelling unit number
Valid range: 0001-1465
These digits also constitute the 8^{th}-11^{th} digits of the UQNR

Household Number (HHNR) *(@25 2.)*

COVER: Household number
Valid range: 01-14
These digits also constitute the 12th and 13th digits of the UQNR

Type of dwelling (Q6_1AMAI) *(@27 2.)*
Type of dwelling (Q6_1BOTH) *(@29 2.)*

Q6.1 Indicate the type of main dwelling and other dwelling(s) that the household occupies?
Note: The questionnaire states that more than one type can be marked for "other" dwellings. However, only one "other" type was recorded in the data for each household.
Valid range: 01-11

Main roof material (Q6_2AROO) *(@31 2.)*

Main wall material (Q6_2BWAL) *(@33 2.)*

Q6.2 What is the main material used for the roof and the walls of the main dwelling?
Valid range: 01-12

Ownership of dwelling (Q6_3HHOW) *(@35 1.)*
Q6.3 Is the dwelling (options provided)
Valid range: 1-6

Number of rooms (Q6_4ROOM) *(@36 2.)*

Q6.4 What is the total number of rooms in the dwelling(s) that the household occupies?
Note: Rooms excludes bathrooms and toilets.
Valid range: 01-23

Housing subsidy (Q6_5SUBS) *(@38 1.)*

Q6.5 Did this household receive a government housing subsidy to obtain this dwelling to any other dwelling?
Valid range: 1-3

Land grant (Q6_6LAND) *(@39 1.)*

Q6.5 Did this household receive a government land grant to obtain a plot of land for residence or for farming?
Valid range: 1-3

Main water source (Q6_7WATE) *(@40 2.)*

Q6.7 What is this household's main source of water?
Valid range: 01-12

Distance from water source (Q6_8FARW) *(@42 1.)*

Q6.8 How far is the water source from the dwelling?
Note: This question and the following two questions were asked of all households for which the response to the previous question was not 1.
Valid range: 1-6

Payment for water (Q6_9PAYW) *(@43 1.)*

Q6.9 Does the household pay for water?
Valid range: 1-2

Main energy source for cooking (Q6_10ACO) *(@44 2.)*

Main energy source for heating (Q6_10BHE) *(@46 2.)*

Main energy source for lighting (Q6_10CLI) *(@48 2.)*

Q6.10 What is the main source of energy/fuel for this household?
Note: The questionnaire provided separate columns for recording the main fuel for each of cooking, heating and lighting.
Valid range for cooking: 01-06; 08-11
Valid range for heating: 01-06; 08-11
Valid range for lighting: 01-04, 07, 09-11

Distance of fuel (Q6_11FAR) *(@50 1.)*

Q6.11 How far is the wood or dung if it has to be fetched?
Note: This question was only addressed to household's whose main source of fuel for cooking and/or heating was wood or animal dung.
Valid range: 1-5

Toilet (Q6_12TOI) *(@51 2.)*

Q6.12 What type of toilet facility is available for this household?
Note: The first digit of the code is used to indicate whether the toilet is in the dwelling (1), on site (2), or off site (3). The second digit corresponds to the options on the questionnaire. Households with no toilet, or none of the specified types, are indicated by code 36 for no toilet off site.
Valid range:
Toilet in dwelling: 11
Toilet on site: 21-25
Toilet off site: 31-37

Shared toilet (Q6_13SHA) *(@53 1.)*

Q6.13 Is the toilet facility shared with other households?
Valid range: 1-2

Distance from toilet (Q6_14FAR) *(@54 1.)*
Q6.14 How far is the nearest toilet facility to which the household has access?
Note: This question was asked if the toilet was not in the dwelling.
Valid range: 1-4

Removal of bucket toilet (Q6_15REM) *(@55 1.)*

Q6.15 How frequently is it removed?
Note: This question was asked if the household was using a bucket toilet.
Valid range: 1-4

Refuse disposal (Q6_16REF) *(@56 1.)*

Q6.16 How is the refuse or rubbish of this household disposed of?
Valid range: 1-8

Street lighting (Q6_17STR) *(@57 1.)*
Q6.17 Do you have any street lighting where you live?
Valid range: 1-2

Telephone (Q6_18TEL) *(@58 1.)*

Q6.18 Does this household have a telephone, either in the dwelling or regular use of a cellular telephone?
Valid range: 1-2

Distance from telephone (Q6_19FAR) *(@59 1.)*

Q6.19 How many minutes do you have to travel to the nearest telephone you can use (by your usual means of transport)?
Note: This question was only asked if the household did not have a telephone in the dwelling or regular use of a cellular telephone.
Valid range: 1-6

Receiving mail (Q6_20HOW) *(@60 1.)*
Q6.20 How does this household receive most of its mail/post?
Valid range: 1-9

Post office (Q6_21POS) *(@61 1.)*
Q6.21 Is there a post office or post office agent within a 30 minute (2km) walk of this dwelling?
Valid range: 1-2

Radio (Q6_22RAD) *(@62 1.)*
Q6.22 Does this household have a radio?
Valid range: 1-2

Television (Q6_23TEL) *(@63 1.)*
Q6.23 Does this household have a television?
Valid range: 1-2

Motor vehicle (Q6_24OWN) *(@64 1.)*
Q6.24 Does this household own a motor vehicle (car, bakkie, van, station wagon, minibus) which is in running order?
Valid range: 1-2

Train nearby (Q6_25A1T) *(@65 1.)*
Bus nearby (Q6_26A3B) *(@66 1.)*
Minibus nearby (Q6_26A2T) *(@67 1.)*
Q6.25a Are any of the following public transport services within a 15 minute (1 km) walk of this dwelling?
Note: This question was only asked if at least one of the three modes of transport was not within a 15 minute/1 km walk.
Valid range: 1-3

Train distance (Q6_25B1T) *(@68 1.)*
Bus distance (Q6_26B3B) *(@69 1.)*
Minibus distance (Q6_26B2T) *(@70 1.)*
Q6.25b If they are not, are any of them within a 30 minute (2 km) walk of this dwelling?
Valid range: 1-3

Primary school (Q6_26PRI) *(@71 1.)*
Secondary school (Q6_26SEC) *(@72 1.)*
Clinic (Q6_26CLI) *(@73 1.)*
Shop (Q6_26SHO) *(@74 1.)*
Q6.26 Are any of the following facilities within a 30 minute (2 km) walk of this dwelling?
Valid range: 1-3

Death (Q6_27ADE) *(@75 1.)*
Injury (Q6_27BIN) *(@76 1.)*
Job loss (Q6_27CLO) *(@77 1.)*
Loss of remittance (Q6_27DDE) *(@78 1.)*
Loss of grant (Q6_27EDE) *(@79 1.)*
Abandonment (Q6_27FDI) *(@80 1.)*
Theft (Q6_27AGDE) *(@81 1.)*
Bankruptcy (Q6_27HFA) *(@82 1.)*

Q6.27 Has any of the following events or situations occurred in this household over the past twelve months?
Valid range: 1-2

Sick with AIDS (Q6_28AID) *(@83 1.)*
Q6.28 Is there any member of this household who is sick with AIDS?
Valid range: 1-3

HIV positive (Q6_29HIV) *(@84 1.)*
Q6.29 Is there any member of this household who you know is HIV positive but is not sick?
Valid range: 1-3

AIDS death (Q6_30AID) *(@85 1.)*
Q6.30 Is three any member of this household who has died of AIDS?
Valid range: 1-3

Total expenditure: (Q6_31TOT) *(@86 2.)*

Q6.31 What was the total household expenditure in the last month?
Valid range: 01-10

Food expenditure: (Q6_32FOO) *(@88 2.)*

Q6.32 What was the household's expenditure on food (excluding non-food groceries) last month? Do not forget expenditures when people eat away from home e.g. at work or in a restaurant.
Valid range: 01-10

Transport expenditure: (Q6_33TRA) *(@90 2.)*

Q6.33 What was the household's expenditure on public transport (train, bus or minibus taxi) last month?
Valid range: 01-10

Afford to feed children (Q6_34NOF) *(@92 1.)*

Q6.34 In the past year, was there ever a time when children under 7 years of age went hungry because there was not enough money to buy food?
Note: This question was asked of households which included persons under 7 years of age.
Valid range: 1-2

Hunger (Q6_35NOF) *(@93 1.)*

Q6.35 In the past year, was there ever a time when (other) member of the household went hungry because there was not enough money to buy food?
Valid range: 1-2

Total income (Q6_36AMT) *(@94 2.)*
Q6.36 What was the total household income in the last month, including wage, salaries, government grants, private pensions and all other sources of income?
Valid range: 01-10

Savings account (Q6_37ASA) *(@96 1.)*
Stokvel savings (Q6_37BST) *(@97 1.)*
Pension savings (Q6_37CPE) *(@98 1.)*
Unit trust (Q6_37DST) *(@99 1.)*
Cash loans (Q6_37ELO) *(@100 1.)*
Life insurance (Q6_37FLI) *(@101 1.)*
Other savings (Q6_37GOT) *(@102 1.)*
Q6.37 Does this household, or a household member, own any of the following financial assets?

Valid range: 1-2

Family member (Q6_38AFA) *(@103 1.)*
Neighbour (Q6_38BNE) *(@104 1.)*
Dealer (Q6_38CSH) *(@105 1.)*
Cooperative (Q6_38ADCO) *(@106 1.)*
Bank (Q6_38ECO) *(@107 1.)*
Land Bank (Q6_38FLA) *(@108 1.)*
Government agency (Q6_38GGO) *(@109 1)*
Stokvel (Q6_38HST) *(@110 1.)*
NGO (Q6_38ING) *(@111 1.)*
Money lender (Q6_38JMO) *(@112 1.)*
Farmer (Q6_38KFA) *(@113 1.)*
Other lender (Q6_38LOT) *(@114 1.)*

Q6.38 Did the household, or a household member, receive cash loans or buy on credit from any of the following in the past 12 months?

Valid range: 1-2

Things compared with previous year (Q6_39LIF) *(@115 1.)*

Q6.39 Thinking back, how do you feel about your life now compared to twelve months ago?
Valid range: 1-3

Say in community (Q6_40COM) *(@116 1.)*
Q6.40 Do you think you have a say in decisions that affect your community?
Valid range: 1-2

Say in country (Q6_41COU) *(@117 1.)*
Q6.41 Do you think you have a say in decisions that affect the country?
Valid range: 1-2

Grow produce (Q6_42GRO) *(@118 1.)*
Q6.42 Does your household grow any produce, e.g. maize or other crops, cereals, vegetables or fruit, or keep any stock, such as cattle, sheep, goats, horses, even chickens or for own use?
Valid range: 1-2

Member owner (Q6_43ALA) *(@119 1.)*
Traditional allocation (Q6_43BLA) *(@120 1.)*
Allowed by owner (Q6_43CLA) *(@121 1.)*
Cash rent (Q6_43DLA) *(@122 1.)*
Provide worker (Q6_43ELA) *(@123 1.)*
Share cropping (Q6_43FLA) *(@124 1.)*
Right through work (Q6_43GLA) *(@125 1.)*
Free access (Q6_43HLA) *(@126 1.)*

Q6.43 What is the relationship between your household and the land or a member of the legal entity that owns the land?
Valid range: 1-2

Why grow produce (Q6_44WHY) *(@127 1.)*
Q6.44 Why does your household grow farm produce or keep stock?
Valid range: 1-4

Person who brings the most money into household (Q1_22MOS) *(@128 2.)*
Q1.22 Who is the person who usually brings the most money into the household?
Valid range: 01-34

Total cash value of everything produced (Q7_7AMOU)
What was the total cash value in Rand over the past 12 months of everything that this Household produced, whether to eat or to sell? (@130 7.)

Province (PROV) *(@137 1.)*

Derived variable: First digit of unique household identifier.
Valid range: 1-9

1. Western Cape
2. Eastern Cape
3. Northern Cape
4. Free State
5. KwaZulu-Natal
6. North West
7. Gauteng
8. Mpumalanga
9. Northern Province

Rural/urban (EATYPE) *(@138 1.)*

Derived variable: Enumeration area types 1-29 recorded as urban and enumeration area types 30-39 coded as rural.
Values: 1=urban; 2=rural

Population group (D_RACE) *(@139 1.)*

FLAP D. How would (the person) describe himself/herself?
Note: The value is taken from the data for the Head of the household
Valid range: 1-6

Individual weight (HHWGT) *(@140 8.)*

Derived variable: Weighted to (growth-adjusted) 1996 population Census on the basis of province and stratum.

SECTION 7 (FARMING) Filename: FARMING

NOTES:
This file contains a record for every member of each household where the response to Q6.44 was 1-3.

Unique Number (UQNR) *(@1 13.)*
Unique household identifier (13 digits)

Person no (PERSONNR)) *(@14 2.)*
FLAP Column heading
Valid range: 01-34
Note: The first two variables (fifteen digits) together create a unique person identifier which can be used to link individual information in this file with individual information in other files.

Farm last week (Q7_1HELP) *(@16 1.)*
Q7.1 In the past seven days did … help in growing farm produce or in looking after animals.
Valid range: 1-3

Large livestock in week (Q7_2AHEL) *(@17 1.)*
Small livestock in week (Q7_2BWEE) *(@18 1.)*
Milking in week (Q7_2CWEE) *(@19 1.)*

Dairy products in week (Q7_2DWEE) *(@20 1.)*
Other animal products in week (Q7_2EWEE) *(@21 1.)*
Cereals in week (Q7_2FWEE) *(@22 1.)*
Vegetables in week (Q7_2GWEE) *(@23 1.)*
Fruit in week (Q7_2HWEE) *(@24 1.)*
Q7.2 What did … help with?
Note: This question was only asked in respect of persons who were said to have done farm work in the past seven days.
Valid range: 1-2

Hours farming (Q7_3WEEK) *(@25 3.)*
Q7.3 How many hours during the past seven days did … actually spend on these activities?
Note: This question was only asked in respect of persons who were said to have done any of the eight activities in the previous question.
Valid range: 001-126

Farm past year (Q7_4HELP) *(@28 1.)*
Q7.4 In the past 12 month did … help in growing produce or look after animals?
Valid range: 1-3

Large livestock in year (Q7_5AYEA) *(@29 1.)*
Small livestock in year (Q7_5BYEA) *(@30 1.)*
Milking in year (Q7_5CYEA) *(@31 1.)*
Dairy products in year (Q7_5DYEA) *(@32 1.)*
Other animal products in year (Q7_5EYEA) *(@33 1.)*
Cereals in year (Q7_5FYEA) *(@34 1.)*
Vegetables in year (Q7_5GYEA) *(@35 1.)*
Fruit in year (Q7_5HYEA) *(@36 1.)*
Q7.2 What did … help with?
Note: This question was only asked in respect of persons who were said to have done farm work in the past 12 months.
Valid range: 1-2

Usual hours (Q7_6YEAR) (@37 3.)
Q7.6 How many hours per week did … usually spend on these activities in the past 12 months on average?
Note: This question was only asked in respect of persons who were said to have done at least one of the eight activities in the previous question.
Valid range: 001-168

Individual weight (WGT4) *(@40 8.)*
Derived variable: Based on projected population estimates for October 1999 by population group, gender, age group and province.