
1. Introduction

The problem of infectious diseases and emerging infections is one of the major obstacles facing the health care industry in the new millennium.

1.1 Study relevance

A high incidence of needlestick injury in a society with high prevalence of HIV, hepatitis B and other blood-borne diseases¹ combine to make the health care profession a hazardous one.

Part Three

Minimizing the occurrence of accidental needlestick injuries must always be accompanied by a comprehensive policy, which includes management of

Policies, Practices and Impact of Measures Against Personnel Exposures

This study, by providing an audit for infection control of blood contamination, will play a very useful role in assisting health facility managers to evaluate in a comprehensive manner, where they stand on this important aspect of personnel management.

1.2 Study question

A. To what extent are the different categories of CDC recommendations met in the seven elements of personnel health service infection control in district and regional hospitals in Gauteng Province.

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1.1 Study relevance

A high incidence of needlestick injury in a society with high prevalence of HIV¹⁷, Hepatitis B², and other blood-borne diseases¹² combine to make the health care profession a hazardous one.

Efforts to prevent occurrence of accidental needlestick injuries must always be accompanied by a comprehensive policy, which includes management of accidental needlestick injuries before, and when they occur.

This study, by providing an audit for infection control of blood-borne infections, will play a very useful role in assisting health facility managers to evaluate in a comprehensive manner, where they stand on this important aspect of personnel management.

1.2 Study question

A. To what extent are the different categories of CDC recommendations met in the seven elements of personnel health service infection control in district and regional hospitals in Gauteng Province.

B. and What is the incidence of reported and unreported accidental needlestick injuries in the district and regional hospitals?

1.3 Study population

This study was conducted amongst staff in all the 19 district and regional Hospitals in Gauteng Province (6 district and 13 regional hospitals). Study was conducted in secondary level facilities because of the government's move towards decentralization and a district based primary health care as envisioned in the White Paper for the Transformation of the Health System in South Africa.³¹ This shift from tertiary to lower levels of care, with the necessary referral chains, entails that there be improved emphasis on these facilities. Unfortunately, lack of capacity at these levels has resulted in many instances, to neglect of occupational health functions.

Gauteng province was chosen for this study because the researcher's contacts, resources and experience are based in this province. Furthermore, it does not appear that the experience in this subject in Gauteng Province will be markedly different from the rest of the country.

1.4 Study design

Questionnaires were administered to the heads of the personnel health service in each hospital or the head of infection control team where there is no personnel health service unit. This policy and practices interview has 8 questions in category

IA and 44 questions in category IB. Annexure 1. Attached. The chairperson of health and safety committee, or anyone in charge of personnel health services in a particular facility could also be interviewed if there is no other staff responsible for personnel health and safety. The Occupational Health and Safety Act 85 of 1993 specifies that one health and safety representative should be appointed for every fifty employees, and a health and safety committee in each work place where two or more safety representatives have been designated. A health and safety representative is among others, supposed to review the effectiveness of health and safety measures.³² To substantiate the claims made about health policies and practices, this study also entailed accessing documents in the facilities that are relevant to the policy and practice questions asked in the interview. A total of 12 policy documents and records were sought. (Annexure 2). The questionnaires were interviewer administered. The principal researcher, Dr. Jude Ugwu was the interviewer in all cases.

Table 1: Individuals interviewed in the different hospitals

Hospital	Individuals responsible for personnel health and safety/Infection Control
NATALSPRUIT	Chairperson Health & Safety Committee
SEBOKENG	Head of Infection Control
GERMISTON	Head of Infection Control
KALAFONG	Head of Infection Control
SOUTH RAND	Head of Infection Control
TEMBISA	Head of Infection Control
PRETORIA WEST	Head of Infection Control
HEIDELBERG	Chairperson Health & Safety Committee
CORONATION	Head of Infection Control
CARLETONVILLE	Head of Infection Control
FAR EAST RAND	Chairperson Health & Safety Committee
KOPANANG	Head of Infection Control
LERATONG	Head of Infection Control
PHOLOSONG	Head of Infection Control
TAMBO MEMORIAL	Head of Infection Control
YUSAF DADOO	Head of Infection Control
MAMELODI	Superintendent
EDENVALE	Head of Infection Control
HELEN JOSEPH	Head of Personnel health and safety

The number of institutions without health and safety committees as required by the Occupational Health and Safety Act³² was noted.

The records of reported needlestick injuries were collated and the number of reported incidents among staff analysed.

A survey to validate the reporting rate of needlestick injuries was done amongst doctors and nurses in the hospitals since these professional categories perform the majority of procedures involving needles and are also in contact with patients most.¹⁹

Questionnaire for this interview is attached (Annexure 3). Questionnaire was interviewer administered.

A pilot test of questions was done with the head of Pretoria Academic Hospital occupational health service in order to test the user friendliness and comprehensibility of questions.

1.5 Sampling strategy

A list of doctors and nurses in a particular hospital was obtained from the personnel unit. Staff were selected on a systematic random sample basis. A number is chosen from the telephone directory by blindly opening it around the middle pages and selecting the last number of the telephone number appearing on the top of the right page. The selected number became the number on which systematic random sampling is based. If a staff member was selected but was not on duty, the next on duty on the list was selected.

The number of doctors and nurses selected from any particular facility was weighted on the number of doctors and nurses in those facilities. However, a minimum of 3 doctors and 5 nurses was selected in each hospital.

A sample size of 100 doctors and 100 nurses was estimated on the whole. This sample size is able to,

- a. Estimate approximately the prevalence of accidental needlestick injury in

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2. each group to within plus minus 10%
 - b. Logistics dictate that this is the maximum sample size that will not compromise the quality of the data by not stretching the resources of researcher to the point that results become inaccurate

An assumption of 30% chances of accidental needlestick injury per year was made in the sample size calculations since studies in different centres placed occurrence between 16% and 80%.^{16, 18 and 19}

1.6 Analysis

Epi-Info 6 software package was used to calculate sample sizes and all other statistical analysis.

Analysis and presentation of results are performed in aggregates, and the identity of specific hospitals are not disclosed in the results.

2. Results

2.1 Hospitals and individuals in the study

19 hospitals participated in the study, 6 district and 13 regional.

One of the hospitals participating in the study had no Health and Safety Committee at the time of the study.

To accommodate non-responders in the needlestick injury survey, 100 doctors and 130 nurses were selected for the study. 201 respondents were obtained (75 doctors and 126 nurses), giving a response rate of 87%.

14% of respondents work in the outpatient department, 48% in in-patient, 26% in both in-patient and outpatient and 11% in other departments.

57% of respondents have more than 7 years of practice experience in their respective professions, 23% have 3 - 7 years experience and 20% have 2 years or less practice experience.

2.2: Accidental Needlestick Injuries in the preceding 12 months among respondents

There were a total of 211 ANI. among respondents. The mean ANI. per person per year is 1.050 (CI. 0.666 - 1.434). About 34% (CI. 27.23% - 40.43%) of staff interviewed had at least one ANI in the preceding one year, with values ranging from one to 30.

The mean number of ANI per person per year in the regional hospitals was 0.92 and 1.49 in the district hospitals, with no statistically significant difference.

Doctors had slightly higher injuries (mean ANI = 1.16) than nurses (mean ANI = 0.98). Also the proportion of doctors incurring ANI was higher (37.33%) than that of nurses (33.83%), however, the differences were not statistically significant.

32.47% of respondents in the regional hospitals had ANI while 38.30% in the district hospitals had, but the difference was not statistically significant.

2.3: Reporting of ANI

All hospitals had underreporting, with a ratio ranging from 1:9 to 1: 234.

Overall, the mean estimated number of ANI per hospital was 382 (CI. 174.437 - 588.739) and the mean reported number was 14.6 (5.473 - 23.684). In effect, 1 in 26 was reported in the hospital records and consequently treated as needlestick injuries according to protocol (3.8% of ANI were reported). The reporting rate using claims made by respondents rather than figures on reported incidents in hospital records however, is 14.43%. The reporting claims that are not captured on records would most probably not have been treated according to protocol in terms of the necessary laboratory investigations, possible treatment and documentation etc. As such, they are as good as not reported as far as the occupational health purpose of reporting is concerned. Reporting in this work therefore refers to cases captured in hospital records.

The mean reporting rate in the regional hospitals is 3.5% and in the district hospitals it is 5.9%.

The ratio of estimated: reported was compared using Mann-Whitney test for ranks. There is slight evidence ($p=0.0956$) that reporting is better in the district.

Table 2: Reasons for not reporting ANI

Reasons	No. of Individuals	Percent
Applied basic first aid.	3	6.25%
Does not have time to report	4	8.33%
Too common to report	3	6.25%
Makes no difference in outcome	2	4.17%
Sterile needle	8	16.67%
Small/light exposure	14	29.17%
Reluctant/Scared	2	4.17%
Injury due to carelessness	1	2.08%
Patient HIV Negative	7	14.58%
Reporting too cumbersome	4	8.33%
Total	48	100.0%

The commonest reasons given for not reporting are sterile needle 16.67%, small/light exposure 29.17%, and patient was HIV Negative 14.58%.

2.4: Activities preceding ANI and suggested preventive solutions

Table 3: Contribution of different activities to occurrence of ANI

Activity	No. Of ANI	Percent
Recapping	11	11.5
Disposal of Needle	12	12.6
Venepuncturing	15	15.8
Admin. Of Inj. Or IV	30	31.6
Suturing	25	26.3
Others	2	2.1
Total	95	100.0%

Table 4: Suggested preventive solutions for ANI

Preventive Solutions	Freq.	Percent
Availability of appropriate equipment	8	12.9%
Proper disposal of Needles	8	12.9%
Unavoidable	11	17.7%
Proper restraint of patients	9	14.5%
Adhering to acceptable technique	19	30.6%
Better workload/work distribution	7	11.3%
Total	62	100.0%

2.5 Occurrence of Skin and Mucous Membrane Exposures (MCE) in the past 12 months

Table 5: Intact skin exposures

No. Of Exposures	No. Of Persons	Percent
None	73	36.32%
Infrequent (1-10)	61	30.35%
Mod. frequent (11-50)	24	11.94%
Highly frequent >50	43	21.39%
Total	201	100.0%

About 64% of respondents reported at least one intact skin exposure.

Table 6: Non-Intact skin exposures

No. Of Exposures	No. Of Persons	Percent
0	167	86.53
1	7	3.63
2	3	1.55
3	3	1.55
4	2	1.04
5	1	0.52
6	1	0.52
9	1	0.52
10	1	0.52
12	4	2.07
15	1	0.52
24	1	0.52
Daily	1	0.52
Total	193	100.00

13% of respondents had non-intact skin exposure at least once in the past year.

Number of exposures per person range from 1 to 24, except for one individual claiming to have exposures on a daily basis.

Table 7: Mucous membrane exposures

No. Of Exposures	No. Of Persons	Percent
0	165	82.50
1	10	5.00
2	14	7.00
3	3	1.50
4	2	1.00
5	2	1.00
6	1	0.50
10	1	0.50
12	1	0.50
20	1	0.50
Total	200	100.00

18% of respondents had mucous membrane exposures, while the average number of exposures per person is 0.57.

2.6: Reporting of skin and mucous membrane exposures

Of a total of 61 individuals who had non-intact skin and mucous membrane exposures, only 5 persons (8%) of respondents reported non-intact skin and mucous membrane exposures in terms of claims made by respondents.

Table 8: Reasons given for not reporting skin and mucous membrane exposures by respondents

Reasons	Freq.	Percent
Skin was intact	47	25.4%
Thinks it is of negligible risk	32	17.3%
Not aware it should be reported	11	5.9%
Not Applicable	57	30.8%
Too common to be reported	10	5.4%
Makes a difference in outcome	2	1.1%
Reluctant/Scared	1	0.5%
Injury due to carelessness	4	2.2%
Did basic first aid.	12	6.5%
Did not have time to report	5	2.7%
Patient was HIV Negative	4	2.2%
Total	185	100.0%

2.7 Contribution of different activities to Skin and Mucous Membrane exposures and suggested preventive solutions

Of a total of 176 individuals indicating various activities preceding exposures, only one individual (0.57%) implicated recapping of used needle, 7 individuals (3.98%) implicated disposal of used needles, 34 individuals (19.32%) implicated venepuncturing, 41 individuals (23.30%) implicated suturing, 45 individuals (25.57%) implicated administration of injection and I.V. fluid, while 48 individuals (27.27%) implicated other activities.

Table 9: Suggested preventive solutions for Skin and Mucous Membrane exposures

Preventive solutions	Individuals	Percent
Wearing gloves	51	26.8%
Availability of gloves	17	8.9%
Wearing other PPE. E.g. Masks	35	18.4%
Unavoidable	11	5.8%
Do not know	55	28.9%
Proper restraint	1	0.5%
Better workload/work distribution	5	2.6%
Adhering to acceptable procedures	14	7.4%
Total	189	100.0%

The highest proportion (26.8%) of respondents who proffered solutions identified wearing gloves as the preventive measure that would avoid their exposures.

2.8: Association between ANI and number of Policies and Practices in Category IA

There is no statistically significant association between number of needlestick injuries and the number of policy and practice recommendations implemented in category IA

(coef. -107.486, conf. Interval -271 to 56, $t = -1.40$, $p = 0.182$). The association was however on the expected side, with more policies in place, the less ANI.

2.9: Association between ANI and number of written policy documents or records

There is no significant association between the number of written policy documents or records in place and number of ANI. In fact, the association was in the opposite direction, with higher numbers of written policy documents and records in place being associated with higher ANI.

(Coef. 58.38856, $t = 1.11$, $p = 0.283$, CI = -53.48011 to 170.2572).

2.10: Association between number of beds per doctor or nurse and incidence of needlestick injuries

There is no statistically significant association between number of beds per doctor and the incidence of needlestick injuries among doctors. Coefficient of association = 0.516, $t = 0.51$, $p = 0.608$.

There is also no statistically significant association between number of beds per nurse and the incidence of needlestick injuries among nurses. Coefficient of association = 0.460, $t = 0.71$, $p = 0.477$.

2.11: Presence of the category IA recommendations in the facilities studied

Table 10: Facilities with measures to ensure that health care personnel are familiar with precautions to prevent occupational transmission of blood-borne pathogens

Measures	No. Of Hosps.	Percent
Present	18	94.7%
Absent	1	5.3%
Total	19	100.0%

Table 11: Facilities where Hepatitis B vaccine is administered to personnel who perform tasks involving routine and inadvertent contact with blood and other body fluids

Vaccination	No. Of Hosps.	Percent
Yes	18	94.7%
No	1	5.3%
Total	19	100.0%

Table 12: Facilities where routine serologic screening is performed before vaccinating for hepatitis B

Screening	No. Of Hosps	Percent
No	15	78.95
Yes	4	21.05
Total	19	100.00

It should be noted that the appropriate response here is no. The practice of routinely performing serological screening before hepatitis B is not recommended. This can only be justified if the health care organisation considers screening to be cost-effective or the potential vaccinee requests it.

Table 13: Facilities where post-vaccination screening for immunity to hepatitis B is performed within 1 to 2 months after the third dose of vaccine for hepatitis B

Screening	No. Of Hosps.	Percent
Yes	4	21.1%
No	14	73.7%
Not sure	1	5.3%
Total	19	100.0%

Table 14: Facilities where both passive and active immunisation are used for post-exposure prophylaxis in susceptible persons who have needlestick injuries, percutaneous, or mucous membrane exposure to blood known or suspected to be at high risk for being HBsAg seropositive

Immunisation	No. Of Hosps.	Percent
Yes	5	31.6%
No	9	47.4%
Not sure	4	21.1%
Total	19	100.0%

Table 15: Facilities using appropriate recommendation for post-exposure prophylaxis after percutaneous or mucous membrane exposure to blood and body fluid that is known or suspected to be at high risk for being HbsAg seropositive

Recommendation	No. Of Hosps.	Percent
Yes	12	63.2%
No	6	31.6%
Don't Know	1	5.3%
Total	19	100.0%

Table 16: Facilities that ensure that emergency-response employees are routinely notified of infectious diseases in patients they have cared for or transported

Notify	No. Of Hosps.	Percent
Yes	9	47.4%
No	10	52.6%
Total	19	100.0%

Table 17: Facilities with policies that ensure that health care professionals are familiar with hospital rules to prevent occupational transmission of blood-borne pathogens

Policy	No. Of Hosps.	Percent
Yes	18	94.7%
No	1	5.3%
Total	19	100.0%

2.12 Implementation of confidentiality and latex allergy policies

2.12.1 Confidentiality

Table 18: Facilities that ensure that updated health record for all personnel are kept, maintain the confidentiality of their records while providing appropriate management for occupational illnesses or exposures

Policy	No. Of Hosps.	Percent
Present	12	63.2%
Absent	7	36.8%
Total	19	100.0%

Table 19: Facilities with policies that ensure that when data on personnel health are made public, the individual's confidentiality is maintained, for example, by releasing only aggregate numbers

Policy	No. Of Hosps	Percent
Yes	19	100.0%
Total	19	100.0%

2.12.2 Latex allergy

Only 5 facilities (26%) had measures for managing latex allergy, while 3 facilities (16%) had a written protocol for managing latex allergy. 7 facilities (37%) had a surveillance mechanism for identifying and managing latex allergies. 14 facilities (74%) had a non-latex glove supply program. 3 facilities (16%) assess the impact of their latex allergy prevention activities. 10 facilities (53%) had educational activities on latex allergy.

2.13 Cumulative number of recommendations practised in the 19 facilities

Table 20: Frequency table of category IA recommendations (Annexure 1) practised in the studied hospitals

No. Of Recs.	No. Of Hosps.
3	3
4	2
5	7
6	3
7	3
8	1
Total	19

5% of hospitals (1 hospital) had all the category IA

recommendations in place, 31% (6 hospitals) had 75% of the recommendations and 47% (9 hospitals) had 50% to 60% of the recommendations. The rest 16% (3 hospitals) had less than 50% of the recommended policies and practices.

Table 21: Frequency table of category IB recommendations (Annexure 1) practised in the studied hospitals

No. Of Recs.	No. Hosps.
15	1
19	1
23	1
24	2
25	2
26	2
28	1
30	1
31	3
33	4
36	1
Total	19

About 90% (17) of all hospitals met 50% and above of the category IB recommendations.

2.14: Existence of appropriate written policy documents or records

Table 22: Frequency table of number of written policy documents or records (annexure 2) for the relevant recommendations in the 19 hospitals studied

Written policies and records	No. Of Hosps.	% of Hosps.
0	2	10.53
1	2	10.53
2	3	15.79
3	5	26.32
4	3	15.79
5	2	10.53
6	2	10.53
Total	19	100.00

Only 2 hospitals (10%) had up to 6 of the 12 policy documents or records recommended. One hospital had none. Only 3 out of the total of 19 hospital had a written protocol on managing latex allergy.

3. Discussion

Accidental needlestick injury is a major occupational health risk in the hospital and health care environment.^{1, 2, 3} The rising incidence of emerging infections, drug resistance and pandemics such as HIV/AIDS has made the problem an even more worrisome one.¹⁷

3.1 Incidence and reporting of needlestick injuries

This study shows an incidence rate of 1.050 needlestick injuries per person per year, with 34% of respondents having had at least one needlestick injury in the 12 months preceding the study. It appears that work habits, systems and practices have not resulted in rigorous needlestick preventive measures following the rising prevalence of the HIV/AIDS problem. Some studies performed in Africa in the late eighties to early nineties showed proportion of study participants incurring needlestick injuries in one year of 27% in Nigeria¹⁸ and 41% in the Democratic Republic of Congo.³³ It should be noted that these studies were among all health workers, while this thesis was among doctors and nurses only. It is difficult to draw a conclusion here regarding trend over time with needlestick injury results using findings from different sites in different countries. Results from different environments often vary significantly.^{34, 35} This study and another South African study performed three months apart, showing percutaneous exposure to HIV infected blood in 33% of interns in one year¹⁹, at least show that there is no evidence of abatement of the problem of needlestick injuries.

Some studies in the United States indicate a preponderance of needlestick injuries in nurses.^{36, 37} Another study conducted in Nigeria suggests that doctors are more affected.¹⁸ There is no statistically significant difference in the injury rates among doctors and nurses and among the different levels of hospitals in this study. Local and regional factors in health care delivery may affect the relative occurrence of needlestick injuries in doctors and nurses. More information is needed to explain the equal occurrence of needlestick injuries in this study, and whether there is a pattern of doctors sustaining more injuries relatively in developing country environments.

In this study, administration of intravenous therapy or injections (32%) and venepuncturing (16%), suturing or assisting in suturing (26%) are the most important activities preceding needlestick injuries. This finding is consistent with those of previous studies cited.^{18, 34, 35, 36, 37} Needle recapping plays a much less role in this study and the Nigerian study, with the proportions of needlestick injuries preceded by recapping being 12% and 18% respectively, compared to figures ranging from 25% to 60% in the other studies. Differences in spatial and temporal circumstances surrounding injuries highlight the need for ongoing local and facility surveys for prevention and monitoring of measures. The role of unexpected patient movement in the occurrence of needlestick injury has been described.¹⁸ It is interesting that this study shows that a good proportion of respondents (15%) think that proper restraint of patients or procedure sites would have prevented their needlestick injuries. The role of restraint devices in

developing countries where patients might not understand and appreciate instructions prior to needlestick procedures needs to be investigated further.

This study shows a very low reporting of needlestick injuries, with only 3.8% of all injuries reported in the relevant hospital records. The reporting rate using claims made by respondents rather than figures on hospital records for reported incidents which stands at 14.43% is slightly higher, but yet very low for the purpose of effective prevention and post-exposure prophylaxis and immunisation measures. A much higher needlestick injury reporting rate of 64% was observed in a study among interns in Chris Hani Baragwanath and Johannesburg Hospitals.¹⁹ In the Baragwanath and Johannesburg study however, needlestick injuries were from patients known to be HIV-positive, and reporting is according to respondents' claim and not using hospital reporting records. It appears that some respondents do not understand the reporting procedure in the hospitals, and would consider something like simply telling a superior about needlestick injury as reporting. This would explain the disparity between reporting rate of 3.8% (using reported incidents on record) and 14.43% (using claims of reporting). Other studies conducted in the United States showing that up to 70%³⁵ to 75%³⁸ of needlestick injuries are not reported (under-reporting of 25% – 30%), while equally poor, represent much better results than the finding of this study. This is particularly so, if consideration is given to the fact that the prevalence of HIV is higher in South Africa.

Various reasons such as not having enough time; ignorant of the reporting procedure; under-estimation of the occupational risk of exposure; breach in confidentiality; discrimination; fear or anxiety over knowing ones HIV status, and sterile needle are important reasons for not reporting.^{35, 38} This study revealed similar reasons, however, an interesting result that did not feature in the other studies was patients' was HIV negative status (15% of respondents) being the reason given for not reporting. The danger here is that other blood-borne infections are over-looked, especially, hepatitis B, which is more infectious, but fortunately has effective passive and active immunisation regimens. It appears that most of the reasons for not reporting can be easily clarified through staff education.

The rate of approximately one needlestick injury per person per year, assuming a risk of 0.3%^{3, 13} after needlestick injury and HIV prevalence of 50%³⁹ among Gauteng hospital patients, translates into about 5% lifetime risk (30-year career) of nosocomial HIV acquisition for doctors and nurses.

Applying the above model to hepatitis B, and assuming a seroconversion rate of 12%⁶ and prevalence of Hepatitis B surface antigen of approximately 9.6%², lifetime risk (30-year career) of nosocomial HIV transmission will stand around 35%. Active Hepatitis B virus immunization will improve this outlook by more than 95%, leaving only about 4% of susceptible individuals at risk if the necessary policies and programs for hepatitis B immunization are in place.⁷

3.2 Incidence and reporting of other exposures

Accidental inoculation, not only with needlestick injuries, but also with mucous membrane exposures and non-intact skin exposures are recognised modes of transmitting blood-borne infections.^{40, 41} Skin, non-intact skin and mucous membrane exposures were also very frequent in this study. About 64% of respondents reported at least one intact skin exposure, 13% had non-intact skin exposure and 18% had mucous membrane exposures. Of a total of 61 individuals who had non-intact skin and mucous membrane exposures, only 5 persons (8% of respondents) reported non-intact skin and mucous membrane exposures in terms of claims made by respondents. The above results represent worse findings than the mucous membrane exposure rate of 10.46% among housestaff; and reporting rate of 38% in some San Francisco teaching hospitals, with a HIV prevalence of only 15% among patient population.³⁵

3.3 Health policies, protocols and practices

Articulate health policies in the broader health system are known to impact positively on health status.^{42, 43} The differences in efficiency and quality of care between Central and Eastern Europe where there is lower health system performance compared to Western Europe has been attributed partly to the national health policies in the two regions.⁴⁴ Comparing the primary health care policies of Botswana, Cote d' Ivoire, Zimbabwe and Ghana, despite lower per capita GNPs, both Zimbabwe and Ghana outperformed Cote d' Ivoire in health

sector using under 5 mortality rate, infant mortality rate and life expectancy as indicators.⁴⁵

The assemblage of plans, procedures and practices as policies or guidelines to solve health problems assist in realising health and occupational health objectives. At the facility level, personnel health policies or guidelines incorporating the different elements of personnel health and safety is essential for reducing the incidence of needlestick injuries and prevention of blood-borne infection among hospital personnel.⁴⁶

The broad South African policy directives place the importance of health of workers very high. The Occupational Health and Safety Act of 1993 requires every employer to provide and maintain as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees.³²

This Act further states that it is the employers' duty to provide such information, instruction, training and supervision as is necessary to ensure the health and safety of its employees. The Constitution of South Africa sums up the priority accorded to health of the citizenry in the bill of rights, which enshrined that everyone has the right to have access to health care services.⁴⁷ This primacy attached to occupational health in the broad government policies and legislative documents does not seem to have filtered through to the health facilities. Comparing with eight category IA recommendations for hospitals, based on findings of well-designed experimental or epidemiological studies²⁸, 5% of

hospitals (1 hospital) had all the category IA recommendations in place, 31% (6 hospitals) had 75% of the recommendations and 47% (9 hospitals) had 50% to 60% of the recommendations. The rest 16% (3 hospitals) had less than 50% of these strongly recommended policies and practices. These findings are based on claims made by the hospitals that they had the respective policies or practices in place.

The category IB recommendations are strongly recommended for all hospitals and reviewed as effective by experts in the field and a consensus of Hospital Infection Control Practices Advisory Committee members on the basis of strong rationale and suggestive evidence, even though definitive scientific studies have not been done.²⁸ In this category, About 90% (17) of hospitals met 50% and above of the recommendations. These findings are also based on claims made by the hospitals that they had the respective policies or practices in place.

When all the recommendations were grouped into a list of 12 policy documents or records. Only 2 hospitals (10%) had up to 6 of the 12 policy documents or records recommended. One hospital had none. Only 3 out of the total of 19 hospital had a written protocol on managing latex allergy.

The association between policies and health outcome has been traced. Articulating appropriate personnel health and safety policies on blood-borne infections impact on the occurrence of occupational diseases and injuries, such as

needlestick injuries. Policies also help to clarify how they are managed in the facilities, like instituting the necessary post-exposure prophylaxis and immunisation as needed. As a cross-sectional study, this work cannot credibly make a direct association between the needlestick injuries and the policies in the facilities. However, some of the findings provide corroborative evidence that are in agreement with the claim that the presence of the relevant personnel health policies reduce occurrence of injuries in facilities.⁴⁶ There is no statistically significant association between number of policies and practices in the category IA in the respective hospitals and the incidence of needlestick injuries. However, the correlation was on the expected side, with more policies in place, the less ANI.

Justifiable. Well defined policies and protocols that are effectively marketed and monitored to ensure compliance with recommendations, is an essential to reducing the incidence of needlestick injuries and other exposures to body fluid of patients.

4.1 Accidental Needlestick Injury Prevention Measures

An intensive structured education of staff is needed to address compliance with recommended protocols and practices while performing procedures involving needles and sharps. This educational programme on infection control with special emphasis on blood-borne infections and needlestick injuries should encompass all categories of hospital workers, including doctors and nurses. The hospitals should keep records of persons who have attended the programmes, the objective being to ensure that every worker who comes in contact with patients attend and serve in for a minimum of one infection control session per year. The different facilities

4. Recommendations

The importance of personnel health infection control being articulated in the form of policy documents with implementation targets cannot be over-emphasised. The results from this study show that most hospitals do not have the necessary policies and systems to deal with the issues. Lack of the necessary policies and records could pose a major problem in the fight against blood-borne infections, particularly the HIV/AIDS epidemic. The incidence of ANI is too high, especially in our high HIV prevalence environment. Reporting rate of needlestick injuries in the hospitals is extremely low, and the reasons given for not reporting are not justifiable. Well defined policies and protocols that are effectively marketed and monitored to ensure compliance with recommendations are essential to reducing the incidence of needlestick injuries and other exposures to body fluid of patients.

4.1 Accidental Needlestick Injury Prevention Measures

An intensive structured education of staff is needed to address compliance with recommended protocols and practices while performing procedures involving needles and sharps. This educational programme on infection control with special emphasis on blood-borne infections and needlestick injuries should encompass all categories of hospital workers, including doctors and nurses. The hospitals should keep records of persons who have attended the programmes, the objective being to ensure that every worker who comes in contact with patients attends and signs in for a minimum of one infection control session per year. The different facilities

should be made to report to the provincial authority on their infection control education program twice a year.

The objectives of the educational program should be to:

- a. Provide information on the dangers of needlestick injury
- b. Provide information on the remedies available post needlestick injuries, especially in instances where there are exposures to HIV, hepatitis B and syphilis
- c. Inform participants on the statistics and epidemiology of needlestick injuries in the facilities concerned
- d. Provide information on the recommended practices, protocols and policies geared towards reducing the chances of accidental needlestick injuries, and the approved process when an injury occurs, particularly the reporting process for needlestick injuries
- e. Provide information on the requirements and processes for occupational compensation for nosocomial HIV infection among health workers

4.2 Skin and Mucous Membrane exposure prevention measures

The use of standard precautions which incorporates universal precautions, such as glove use and use of other personal protective equipment is poor among the study participants, hence the high incidences of cutaneous and mucous membrane exposures to patients' body fluid. Procedures that entail the possibility of contact with patients' body fluid must always be carried out with gloves, masks

and eye protection. Certain professional categories such as cleaners must use non-penetrable gloves at all times while performing their duty.

Each incident of contact with possible infected body fluids reported, if there is significant exposure and risk, must be fully investigated and discussed with the health care worker/s involved, and their supervisors, the occupational health practitioner and infection control staff. This exercise is primarily to have a debriefing session, to educate all involved, to promote compliance and to ensure the staff involved of the support of management.

The infection control nurse should conduct a structured inspection in different parts of the hospital to observe compliance among staff with the different recommendations on infection control. The items to check during the inspection should include use of gloves and other personal protective equipment. The inspection items will be agreed to by the health and safety committee. A report on compliance should be compiled monthly by the infection control nurse and submitted to the superintendent of the hospital. Compliance as contained in the report will be part of the epidemiology and statistics aspect of the educational program in the facility.

A careful evaluation should be made of the reasons for not reporting, especially now the reporting process could play a role in limiting recording of incidents. Given the high prevalence of HIV in our environment, including among health workers, the issue of confidentiality needs to be paid careful attention to. The goal should

4.3 Policy Recommendations

The Provincial Health Authority should workshop the issue of personnel health policies for the hospitals and co-ordinate the writing of a comprehensive policy and protocol to deal with occupational health issues in the health facilities. The necessity to include all essential elements of personnel health and safety in a concise form, possibly in a single document, requires that a co-ordinated approach is followed, and that the province plays a supervisory role in the draft of such a document.

An assessment of the incidence of needlestick injuries and audit of the policies and practices in place to deal with infection control in the health facilities should continue on an annual basis. This assessment should take the form of a survey to determine the incidence of needlestick injuries and to compare it with the reported numbers. Policy audit should comprise of an evaluation of the policy documents and records and the needlestick and infection control reports. The results of this survey and audit should be co-ordinated and collated by the province and appropriate reinforcements and support made to the different health facilities based on the findings and conclusions.

A careful evaluation should be made of the reasons for not reporting, especially, how the reporting process could play a role in limiting reporting of incidents. Given the high prevalence of HIV in our environment, including among health workers, the issue of confidentiality needs to be paid careful attention to. The goal should

be to ensure that no one who knows a staff member, or is likely to know somebody who knows a staff member gets to know the HIV status as part of the reporting process. In other words, absolute unanimity is essential, but impossible in the existing process. An innovative system design to ensure absolute unanimity from the screening to prophylactic treatment is required, and as such, blinded treatment should be considered.

4.4 Implementation structures, systems and cost

Health and safety committees have essentially been successfully constituted in facilities in the province. These committees, with a co-ordinating chairperson or infection control nurse, depending on the peculiar arrangements in the individual facilities, should serve as a vital implementation function for these recommendations. In fact, the result of this study makes it a legislative imperative for the committee to implement measures to mitigate against the very high incidence of accidental needlestick injuries. Members of committee are drawn from staff of the facilities and time spent on activities related to personnel health and safety is covered by hospital and as such, no significant additional costs, if any, will be incurred by the facilities to implement the systems and activities. It appears that what is needed is to define activities and agree on a set of priority programmes for the committees as well as for management, and this work and its results provide the information for prioritising the recommendations made here.

Zocherman J, Crowley G, Griffiths P. Et. al. Prevalence of hepatitis C and hepatitis B clinical health-care workers. *Lancet* 1994;343:1618-20