The medico-legal investigation of unexplained deaths in Pretoria, South Africa: the role of death investigators as a new professional subgroup.

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DISSERTATION

THE MEDICO-LEGAL INVESTIGATION OF UNEXPLAINED DEATHS IN PRETORIA, SOUTH AFRICA: THE ROLE OF DEATH INVESTIGATORS AS A NEW PROFESSIONAL SUBGROUP.

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MAGISTER SCIENTIAE in **Medical Criminalistics**

DECLARATION

I hereby declare that this document is my own work. It is being submitted for the degree **Magister Scientiae** in **Medical Criminalistics** at the Department of Forensic Medicine at the University of Pretoria.

It has not been submitted before for any degree or examination at this or any other university.

Opinions or statements expressed in this dissertation do not necessarily reflect that of the University of Pretoria, the supervisor of the dissertation, or that of the external examiners.

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Lorraine Oliever

Date:_____

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Executive Summary

In 2009, the South African population was estimated at 49.32 million. The Department of Home Affairs had 612 462 registered deaths in 2006, with approximately 122 492 of these being due to other than natural causes. It is estimated that this number may have remained fairly constant or increased slightly over the past few years. During 2009 and 2010 there were only 35 practising forensic pathologists in South Africa. Furthermore , according to the South African Police Service, over 2 million serious crimes were reported over the 2008-2009 period, whilst there were approximately 153 981 police officers in service. When it is considered that these cases fall within the realm of the forensic pathologists, it should be of great concern that so few qualified specialists exist within the country.

South Africa not only has a high occurrence of deaths amongst young adults which can be attributed to trauma and other non-natural causes as well as HIV/AIDS, but urbanisation, an influx of foreigners and an increase in unemployment may also have an influence on the mortality rate of young, working age adults. However, there appears to be a discrepancy in mortality statistics between data released by Statistics South Africa, and the National Population Registry which is maintained by the Department of Home Affairs.

This study was undertaken in order to bring about the realisation that professionals are needed in order to bridge a gap in the medico-legal investigation of deaths in South Africa.

Approximately half of the cases of sudden unexpected deaths that were reviewed over the fifteen months from January 2009 until March 2010 were due to natural causes, with approximately 37% being signed out as under investigation. In approximately 50% of the

cases reviewed, the forensic pathologist was contacted to attend the scene of death, with only half of these scenes being attended by the forensic pathologist on call. Attendance of the post-mortem by the Investigating Officer in charge of the case was poor, with approximately 80% of the post mortem examinations being conducted without the Investigating Officer present.

It is believed that medico-legal death investigators would greatly improve the investigation of sudden deaths in South Africa. The institution of medico-legal death investigators would minimise the case load of all the role players, as well as reducing the confusion related with the medico-legal significance of deaths. It is also believed that medico-legal death investigators would minimise and eventually eliminate the gap that currently exists between the departments that are involved with the investigation of deaths. It would thus be advantageous for medico-legal death investigators to fall under the jurisdiction of both the Department of Health and the South African Police Service.

Opsomming

In 2009 was die Suid Afrikaanse bevolking geskat op 49.32 miljoen, in 2006, was daar 612 462 sterftes wat by die Departement van Binnelandse Sake geregistreer is, ongeveer 122 492 was as gevolg van ander dan natuurlike oorsake. Dit kan beraam word dat hierdie getal onveranderd gebly het of effens toegeneem het oor die afgelope paar jaar. Daar was egter net 35 forensiese patoloë wat praktiserend was in Suid Afrika in 2009 en 2010. Verder het die Suid-Afrikaanse Polisiediens berig dat meer as 2 miljoen ernstige misdade gerapporteer was vir die tydperk 2008-2009, terwyl daar net sowat 153 981 poliesiebeamptes in diens was. Wanneer dit beskou word dat hierdie gevalle in die gebied van die forensiese patoloog val, moet dit n groot bekommernis wees dat daar so min bekwaamde spesialiste in die land bestaan.

Suid Afrika het ‘n hoë voorval van sterftes onder jong volwassenes te danke aan trauma en ander onnatuurlike oorsake sowel as MIV en vigs. Verstedeliking, ‘n infloei van binnelanders en ‘n toename in werkloosheid kan almal ‘n invloed op die sterftesyfer van die jong verkende volwassenes hê. Daar is ‘n verskil in mortalitiet statistieke tussen Statistieke Suid Afrika, en die Nasionale Bevolking Register wat in stand gehou word deur die Departement van Binnelandse Sake.

Hierdie studie was aangeneem om die verwesenliking uit te voer dat beroepspelers nodig is om die gaping oor te brug wat in die geregtelike mediese ondersoek van sterftes in Suid Afrika plaas vind.

Ongeweer halfte van die gevalle van skielike onverwagse sterftes wat vanaf Januarie 2009 oor vyftien maande hersien is, is as gevolg van natuurlike oorsake, terwyl ongeveer 37% onder ondersoek was. In ongeveer die helfte van die gevalle wat hersien was, was die forensiese patoloog gekontak om ‘n sterftoneel by te woon, en omtrent net die halfte van hierdie tonele is bygewoon deur die forensiese patoloog. Die bywooning van nadoodse ondersoeke deur die ondersoekbeapte wat toesig oor die geval het was treurig, met ongeveer 80% nadoodse ondersoeke wat gedra was sonder dat die ondersoekbeampte teenwoordig was.

Dit is oortuig dat geregtelike mediese doodsondersoekbeamptes die ondersoek van sterftes in Suid Afrika baie sou verminder, die instelling van geregtelike mediese doodsondersoekbeamptes sou die werklos van die rolspelers verminder, sowel as die verrwarring wat verband hou met die geregtelike mediese ondersoek van sterftes verminder. Dit is oortuig dat geregtelike mediese doodsonderdoekbeamptes die gaping wat tans plaasvind met ondersoeke na die sterftes uiteindelik sou uitskakel of verminder, dit sou dus voorledig wees as geregtelike mediese doodsondersoekbeamptes onder die regsgebied van albei die Departement van Binnelandse Sake en die Suid Afrikanse Poliesiediens sou wees.

List of Abbreviations

AAFS: American Academy of Forensic Sciences

ABC: American Board of Criminalistics

ABFA: American Board of Forensic Pathology

ABMLDI: American Board of Medico-Legal Death Investigators

ABP: American Board of Pathology

BI-1663: Document number on death notification form

CAC: California Association of Criminalistics

CRC: Criminal Record Centre

DHA: Department of Home Affairs

DNA: Deoxyribonucleic Acid

FBI: Federal Bureau of Investigation

FPS 180: Document number on scene attendance form

FPS 380: Document number on body handover form

FPS: Forensic Pathology Service

FSAA: Forensic Specialists Accreditation Association

HPCSA: Health Professions Council of South Africa

IAFS: International Association of Forensic Sciences

ICD: Independent Complaints Directorate

INPALMS: Indo-Pacific Association of Law, Medicine and Sciences

NAME: National Association of Medical Examiners

NPA: National Prosecuting Authority

NPR: National Population Registry

PMLL: Pretoria Medico-Legal Laboratory

SAMLS: South African Medico-Legal Society

SAPS: South African Police Services

SIDS: Sudden Infant Death Syndrome

SIS: Strategic Investigations and Seminars

SANDF: South African National Defence Force

SUDI: Sudden Unexplained Death in Infants

USA: United States of America

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Chapter One

Background and Study Objectives

1.1. Introduction

Medico-legal death investigation is the fusion of medicine and law; it describes the collection and interpretation of information regarding the circumstances surrounding a death, as well as determination of the cause and manner of death of an individual. [(1)] According to the Regulations Regarding the Rendering of Forensic Pathology Services in South Africa, which is governed by the National Health Act (61 of 2003), in order to facilitate in the administration of justice a medico-legal investigation into a death due to other than natural causes includes the circumstances and cause of death, but it is however not limited to [(2)]:

- Acquiring significant information and evidence at the scene where necessary
- Performing a post mortem examination which may include an autopsy
- Requesting any special investigations, and
- Liaising with relevant parties where necessary.

In South Africa the statutory definition of an "other than natural death" is found within the National Code of Guidelines for Forensic Pathology Services in South Africa; and is defined as any death [(3)] :

- Due to the application of force, direct or indirect, and its complications;
- Due to the effects of any chemical or toxic substance, or drug, or any death due to an electrical effect;
- Where another person, by negligent act or omission can be held responsible for the death;

- Occurring whilst the deceased was under the influence of a general or local anaesthesia, and
- That is sudden or unexpected, unexplained or unattended.

The World Health Organisation however defines a sudden death as any death occurring within twenty four hours of the onset of symptoms. [4]

The investigation of sudden unexplained deaths entails the determination of whether such a death is due to natural or other than natural causes. The investigation may reveal that a homicide has occurred, which could otherwise go unnoticed and thus not be thoroughly investigated. The sudden and unexplained death of an individual is also of great concern to family members, as they might need closure as to why the person died, but more importantly, the death may have been caused by an underlying familial disease, which would not be detected if the death goes remains unexamined.

A medico-legal investigation into a death involves a post-mortem examination in order to determine the mechanism and circumstances of the death. [3] [4] During this investigation information and evidence is collected and examined which may be necessary in subsequent civil or criminal proceedings. [4]

A medico-legal investigation consists of three basic components [5] :

- A preliminary investigation, including the scene of death investigation and collection the of evidence;
- Examination of the body, where an autopsy may or may not be necessary, and
- The follow-up investigation.

The preliminary investigation of any death involves the determination of whether the death is due to other than natural causes and thus falls under the jurisdiction of the medico-legal services. [5] The scene investigation plays an important role in this determination and should be conducted by a medico-legal death investigator, as these professionals have received training in crime scene investigation and evidence collection, as well as in determining the preliminary cause and manner of death. [1]

The basic purpose and procedures of such a death scene investigation include [6] [7] :

- Obtaining relevant background information and medical history of the deceased;
- Making observations regarding the overall scene and reconstruction of the circumstances leading up to the death;
- Taking photographs or making sketches of the body, the scene and the surroundings;
- Taking note of the position of the body, particularly livor mortis, and the degree of rigor mortis;
- Noting the presence or absence of a weapon;
- Examining the clothing for tears, missing pieces, stains, etc;
- Requesting additional photographs of the body if necessary, and

- Ensuring that the body is moved as little as possible, and that the necessary precautions such as bagging the hands, are taken as evidence may be dislodged.

The objective of an autopsy examination is to determine the cause and mechanism of death, as well as the manner of death. [7] The cause of death is described as any disease or injury producing a physiological derangement in the body, resulting in the death of an individual. For example, a gunshot wound to the head, or coronary atherosclerosis. [8] The mechanism of death is described as the physiological derangement that is produced by the cause of death. For example, haemorrhage, cardiac arrhythmia. [8] The manner of death describes how the cause of death came about, for example, natural, homicide, suicide, accident, or undetermined. [8]

A complete autopsy includes, but is not limited to [3] :

- A positive identification of the body, including assessment of size, physique and nourishment;
- Determining the time of death where possible;
- Recording external and internal injuries, abnormalities or diseases;
- Acquiring samples for toxicological analysis, microbiological, and histological examination, or any other necessary examinations;
- Preserving relevant organs and tissues as evidence;
- Taking photographs and video recordings for evidentiary and teaching purposes;
- Presenting a full written report of the findings along with an interpretation thereof, and

- Restoration of the body to the best possible cosmetic condition before release to the family.

Radiological examination prior to the internal examination may be advantageous, as any broken bones, shrapnel, bullets, or bullet fragments will be detected and as such, recorded. This early detection also eliminates or reduces the risk of injury to the individual performing the dissection. [4] [6]

Also involved within the medico-legal investigation into a death are the ancillary or special examinations that may be conducted. Special investigations may include, but are not limited to [5] [7] [9] :

- *Forensic toxicology*, which examines body fluids and organs to determine the presence of drugs and/or poisons.
- *Serology*, (the study of serums); is the biological and biochemical analysis of body fluids such as blood, semen, sweat, urine, saliva and rectal swabs. Included in serology is the performance of DNA profiling from such stains, once the stain has been identified.
- *Forensic odontology* involves the assessment and identification of injuries to the teeth, inspection, evaluation and registration of bite marks; as well as the identification of unknown individuals, especially decomposed remains. [10]
- *Dactyloscopy* is the morphological study of fingerprints for identification purposes. Ridge patterns of fingerprints, as well as palm prints are studied in order to identify, and connect an individual to the scene of a crime. [11]

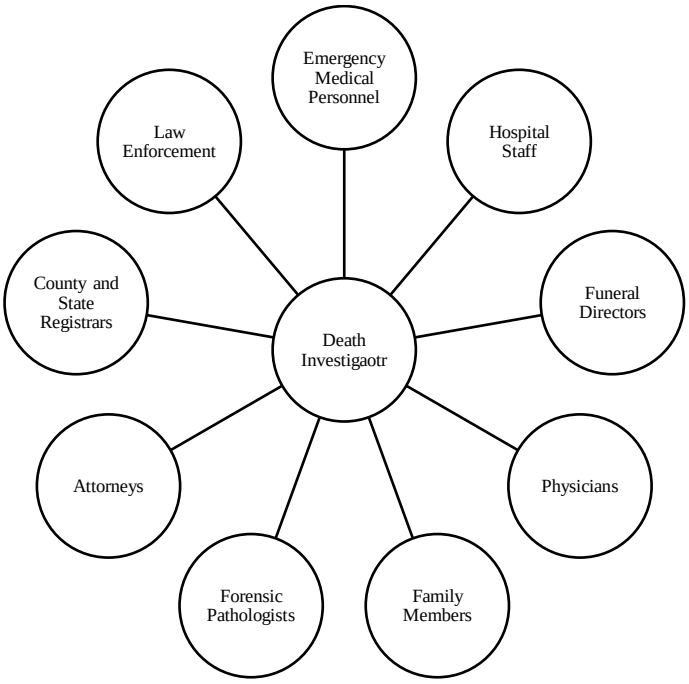
- *Examination of firearms, tool marks and prints*. Ballistics is concerned with determining whether two specimens of bullets, fragments or cartridges are identical, and thus have the same origin. It also involves the determination of whether a given bullet originated from a suspected gun, as well as the matching of cartridges or bullets from different incidents to the same gun and thus the possible suspect. [(12)] Shoe prints and tyre tracks may also be examined by making casts of the prints and comparing them to suspect samples. [(12)]
- *Examination of disputed documents* involves the examination of handwriting or typewriting on documents in order to determine the authenticity and source of the document, as well as the paper and ink.
- *Trace evidence* involves the examination, identification and evaluation of trace evidence, such as hair, fibres, paint and glass fragments, etc.
- *Forensic anthropology* is concerned with the identification and examination of human and skeletal remains.
- *Forensic entomology* is the study of insects that invade the body once decomposition commences. Through the study of these insects, it is possible to determine the post-mortem interval.

However, before interpreting autopsy findings, all relevant circumstances must be considered. Ante-mortem history that accompanies bodies for post mortem examinations is often incomplete. [(13)] Additional information must be acquired to correlate with the autopsy findings in order to complete the final report. [(13)] Such information is gathered from family members and friends of the deceased, the police, medical professionals, etc. [(5)]

In many developed countries, there are medico-legal death investigators that assist the medical examiners and coroners in their investigations. The role of these professionals is to determine the protocol to be followed in specific cases after a review of the preliminary death report, the procurement of medical records and the interpretation thereof, as well as conducting the scene investigation where appropriate. [1] [14] [15] [16]

Brad Randall explained that the medico-legal death investigator is the central entity in the investigation of a death. [17] In the diagrammatic representation below, it can be seen that the death investigator is the co-ordinator of the investigation of a death, and that they are the link between all the departments and role players involved within the medico-legal death investigation.

Figure 1: The death investigation team. [17]



The manner in which a death investigation is conducted may determine the degree of co-operation from the family and friends of the deceased, as well as instilling or reducing confidence in the community or public as to the effectiveness and capabilities of the death investigation system. Where important steps have been overlooked in the investigation, there may be a lack of arrests and convictions of those responsible for the death of an individual. (16)

1.2. Overview of medico-legal investigation of deaths in South Africa

In South Africa, the medico-legal investigation into a death involves the cooperation of different government departments. These include the South African Police Service (SAPS), the Forensic Pathology Service (FPS) and the Department of Justice and Constitutional Development. Each department has a specific role and responsibility in the medico-legal investigation of death.

The function of the SAPS within the medico-legal investigation of a death is to investigate any instance or circumstance where criminal intent has been suspected. According to the Vision and Mission Statement of the SAPS, the SAPS have a responsibility to (18) :

- Prevent and investigate crime;
- Uphold and enforce the law;
- Prevent any threat to the safety and security of any community;
- Investigate any crimes that may threaten the safety or security of any community;
- Ensure that criminals are brought to justice, and

- To participate in efforts that address the causes of crime.

From this vision and mission statement and the Inquests Act (Act 58 of 1959), it is clear that the SAPS have an obligation to investigate any death where there are suspicious circumstances. In order to fulfil this function, they are required to liaise with other government departments, such as the Forensic Pathology Service and the Department of Justice and Constitutional Development. The SAPS officers must thus have a professional relationship with forensic pathologists, forensic scientists, as well as lawyers.

In 1994, the interim constitution established a single national Police Service. [19] There are currently 153 981 police officers in South Africa, excluding all civilian staff, such as administrative and cleaning staff. [20] The ratio of police officers to the population is 1:310. [20] The latest data from the United States of America to which one may compare the above statistic indicates that the ratio of police officers to the population is 1:400. [21] Since this data is from 2003, it can be assumed that this ratio has decreased with time, and that there are now more police officers in the United States of America, which may explain the decrease in crime statistics that is discussed later.

In 1996, a proposal was put forth to review the aspects of medico-legal services in South Africa. Along with this proposal, it was recommended that the medico-legal services in South Africa, then under the jurisdiction of the SAPS, be transferred to the individual provincial Departments of Health. This change however only came about in 2006. [22]

The Department of Health claimed in 2007, that the transfer of the Forensic Pathology Service from the SAPS to the provincial Departments of Health was significant progress in

strengthening the Forensic Pathology Service. [23] This need for a change was recognised due to the following reasons [22] :

- It was believed that the police should not be the guardians over criminal evidence as well as the deceased;
- The medico-legal investigation of death is in fact a scientific discipline that involves medical and biological evidentiary presentation in court;
- The socio-medical duty of interacting with the next-of-kin of the deceased and members of the public that occurs at the state mortuaries should not be carried out by police officers, and
- The individuals responsible for interviewing the family members should have a medical background, as there may be pertinent medically oriented histories that may be obtained.

It was recommended that appropriate staffing be acquired for the offices of so called forensic medical examiners, which included laboratory scientists and technicians, radiographic assistants, medical investigators, autopsy assistants and photographers. [22] With the change from the SAPS to the provincial Departments of Health, there were many positions in the medico-legal mortuaries that needed to be filled, and due to the nature of the time-frame in which these posts needed to be filled, there was very little concern as to the qualifications of the applicants. Thus none of the qualified professionals specified here are currently employed at most of the medico-legal mortuaries. There are also no set qualifications or training programs that are required or instituted for the appropriate staffing of the medico-legal mortuaries, thus leading to mortuaries being staffed by members with no qualifications in the medico-legal investigation of death.

Within the large cities and surrounding areas in South Africa, forensic pathologists are employed to conduct medico-legal post-mortem examinations.

The function of a forensic pathologist within the medico-legal investigation of a death is to investigate and determine the primary medical cause of death, as well as investigate the circumstances that surround the death. Moar defines forensic pathology as being "the study of the effects of violence, traumatic injury or non-natural disease conditions on the human body, in the context of criminal, accidental and suicidal deaths". [7]

In March of 2011, there were 36 practising forensic pathologists in South Africa, who were registered with the Health Professions Council of South Africa (HPCSA). [24] As of July 2011, there were 35 practising forensic pathologists registered with the HPCSA. [24] Table 1 depicts the number of practising forensic pathologists per province.

Table 1 Number of practising forensic pathologists as per province in South Africa [24]

Province	**March 2011**	**September 2011**
Gauteng	12	11
Western Cape	8	9
Free State	6	5
Kwa-Zulu-Natal	4	4
Eastern Cape	2	2
Mpumalanga	2	2
North West	1	1
Limpopo	1	2
Total	**36**	**36**

According to the Inquests Act (Act 58 of 1959), the district surgeon or any medical practitioner may perform a post mortem examination in order to ascertain the primary cause of death. [25] There are however no longer district surgeons and this perhaps needs to be rectified in the legislation.

In rural areas where there are no forensic pathologists or where there may be no access to a forensic pathologist, post mortem examinations are conducted by a medical practitioner, if they are conducted at all. This is merely speculation, as no data pertaining to the number of autopsies performed by forensic pathologists versus medical practitioners is collected.

Statistics South Africa has shown an under-reporting of deaths to the Department of Home Affairs; in that statistics collected by them were 8.7% higher than that recorded in the National Population Registry (NPR) in 2007. [26]

The reasons given by Statistics South Africa as to this difference in numbers include [26] :

- The quality of data captured on death registration forms i.e. errors and omissions in data;
- Under registration of deaths, especially amongst children and in rural areas;
- Incorrect reporting on cause of death, and
- The fact that details as to the cause of death may not be sufficient.

In a personal correspondence with the Department of Home Affairs (DHA), requesting data or the whereabouts of data regarding the number of autopsies performed by forensic

pathologists as compared to medical practitioners, the DHA admitted that no such statistics are available.

Throughout the medico-legal investigation into a death, biomedical forensic scientists may be involved behind the scenes. Forensic scientists are specifically trained in the application of techniques and principles of the physical and natural sciences, as well as in the analysis of evidence collected in criminal proceedings. [9] As of August 2011, there were 5 467 individuals who were employed at the Criminal Records Centre (CRC) and the forensic science laboratories throughout South Africa, including scientists, as well as police officers and civilians. This number includes the following specialists, but is not limited to those listed below [27]:

- Biologists;
- Ballistics specialists;
- Chemists and biochemists;
- Explosives experts;
- Fingerprinting or dactyloscopy experts, and
- Questioned documents analysts.

In South Africa, the forensic toxicology laboratories fall under the jurisdiction of the Department of Health, whilst the forensic DNA laboratories and the Forensic Science Laboratories both fall under the jurisdiction of the SAPS. This complicates or hampers the medico-legal investigation of a death, as these laboratories all play a significant role in the medico-legal investigation of a death; however they fall under the jurisdiction of two very

different departments. Each department may have differing priorities as to the services rendered by the laboratories in terms of post-mortem and ante-mortem cases.

In February 2011, The Mail and Guardian reported concerns about the three state-run Forensic Toxicology Laboratories. An article written by a member of the Justice Project at the University of Witwatersrand (WITS) in Johannesburg, brought to attention the fact that there was a country-wide back log of approximately 20 000 samples, leaving the laboratories in a ten year back-log. [28] A response to this article was authored by an associate of the Director General of Health. The author stated that "forensic science has become an increasingly important element of the police investigation and justice process and requires improved co-operation between the forensic chemistry laboratories, forensic mortuaries, the police and the justice system". [29] Also mentioned in the article is that medico-legal death investigation professionals "play an important role in determining the cause and manner of death". [29] Reasons for this backlog range from shortage of staff to outdated testing methods and old instruments. [29] However, it may be argued that there are tests which are requested that are in fact not necessary, and are only requested, as a result of poor communication or the poor quality of information with regards to post-mortem examinations and procedures. One would think that the realisation of the importance of forensic science and thus medico-legal death investigation would bring about more focus on the improvement and number of forensic toxicology laboratories country-wide.

The final stage of any medico-legal investigation into a death is the submission of a report to the magistrate who then must determine the manner of the death.

This report containing details of the circumstances surrounding a death must be provided to the public prosecutor by the investigating officer for that particular case. [25] By revising the relevant documentation and additional information, the public prosecutor may then request further information, which must be submitted to the magistrate of the district involved upon receipt thereof. If the magistrate, upon examination of the documents, is reasonably convinced that the death is not due to natural causes, he must take the adequate steps to ensure that an inquest into the death is held in order to determine the circumstances and the manner of death. [25]

According to the Inquests Act (Act 58 of 1959) of South Africa stipulates that any death that is the result of unnatural causes must be investigated thoroughly and an inquest into a death be held. [25] The purpose of such an inquest is to [25] :

- Validate the identity of the deceased;
- Make a finding as to the cause of death;
- Confirm the date of death, and
- Make a finding as to whether the death was as a result of an act of commission or an omission on the part of any person, resulting in a criminal offence.

If the evidence reveals that a criminal offence has been committed, the inquest is concluded, the guilty party is charged, and a criminal trial commences. [25]

1.2.1. The legal framework within South Africa

South Africa has an adversarial legal system, which allows opposing parties to call upon witnesses to present evidence in court; witnesses are then also cross-examined by opposing

parties. Once all evidence has been presented and all arguments raised, the judge or magistrate must make a decision on whether the case against the accused has been proven beyond a reasonable doubt. [30] It is only then that a person may be charged and subsequently sentenced.

In order to understand that medico-legal death investigation facilitates the administration of justice, it must be understood that the statutory framework pertaining to the medico-legal investigation into a death is not static, as can be seen in the United Kingdom (UK) when Dr Harold Shipman was convicted for murdering approximately 236 of his patients over a span of 24 years. [9] [31] [32] [33] Once it was discovered that Dr Shipman had performed these crimes, three separate inquiries into the effectiveness, as well as the problems regarding the legislation pertaining to the medico-legal investigation of deaths were held. [31] [32] [33]

There are many forms and documents which need to be completed in any death; of particular importance is the Death Certificate. In South Africa, there have been several versions of the death certificate, as it has been recognised that more information is required for adequate recordkeeping. Between 1990 and 1992, the death certificate in use was referred to as a BI-12 and this document consisted of two pages. In 1993, a new death certificate was brought into use, the BI-1663 which consisted of four pages. In 2010, the latest edition of the death certificate was brought into use, the DHA-1663, containing ten pages. These changes were made as the required details regarding decedent information, underlying diseases and cause and mechanism of death have been extended.

When one considers the non-static nature of legislation pertaining to medico-legal investigations, the progress that the field has achieved, as well as the continuous changes in death certificates, one would expect to see a change in the legislation which governs medico-legal investigations.

In South Africa there are currently at least five statutes which govern the medico-legal investigation into a death, these include but are not limited to:

- The Inquests Act (Act 58 of 1959);
- The Births, Marriages and Deaths Registration Act (Act 51 of 1992);
- The National Health Act (Act 61 of 2003);
- The Health Professions Amendment Act(Act 29 of 2007), and
- The Correctional Services Act (Act 111 of 1998)

The Inquests Act (Act 58 of 1959) allows for the holding of inquests in cases where a death has occurred from other than natural causes. [25] It states that if any person has any reason to believe that the death of another person has occurred and that such death is due to other than natural causes, that they must report such a death to a policeman. Furthermore, any policeman who has reason to believe that a person has died due to other than natural causes, must investigate the circumstances of the death, or bring about such an investigation. He must also report such a death to the magistrate of the district involved. The body of any person who has died from other than natural causes must then be examined by the district surgeon or any medical practitioner who may examine any internal organ, or any part or substance of the body in order to ascertain the cause of death. If a body has already been interred, written permission from the magistrate of the district involved may allow for the exhumation thereof in order for a post mortem examination to be conducted. [25]

The investigating officer must then submit a report as to the circumstances of the death, including all relevant documents, information, photographs and statements to the public prosecutor who may request any additional information. The public prosecutor subsequently submits this docket to the magistrate, who must take the appropriate steps to ensure that an inquest is held, if he or she is convinced that the death is due to other than natural causes. (25)

The Births, Marriages and Deaths Registration Act (Act 51 of 1992) regulates the registration of births, marriages and deaths within South Africa. (34) According to the act, any person who is present at the time of a death due to natural causes must give such notice to the director general who must then endorse a burial order. If, however, the director general has reasonable doubt as to whether the death was due to natural causes, he may refuse to endorse a burial order, and as such, must inform a police officer of the death. An inquest into the death must thus be opened and held. Where a medical practitioner attended the deceased prior to the death, and is satisfied that the death was due to natural causes must issue a death certificate stating the cause of death. If the deceased was not attended by a medical practitioner, but if the corpse was examined and the medical practitioner is content that the death is due to natural causes, he must complete and issue a death certificate stating the cause of death. However, if the medical practitioner is of the opinion that a death is due to other than natural causes, they may not issue a death certificate and must report their doubt to a police officer, who must then ensure that an inquest is opened. If a medical practitioner is present at a still birth or has examined the corpse of a newborn and is satisfied that the infant was still born, he shall issue a prescribed death certificate. If there is doubt as to the still birth, the medical practitioner may not issue a death certificate and thus must inform a police officer as to their concern, and an inquest opened. (34)

Once an investigation into the circumstances of an unnatural death has been conducted, and the medical practitioner involved is of the opinion that the body of the deceased is no longer needed for the purposes of the inquest, he may issue a prescribed certificate allowing the release of the body from the facility.

The National Health Act (Act 61 of 2003) which includes The Regulations Regarding the Rendering of Forensic Pathology Services in South Africa, provides for and regulates medico-legal mortuaries and medico-legal services. (35)

Section 48 of *the Health Professions Amendment Act (Act 29 of 2007)* stipulates that the death of any person whilst undergoing a palliative, therapeutic, or diagnostic procedure, or where any aspect of the procedure may have been a contributory cause to the death of a patient, will not be considered to be due to natural causes, and will thus be investigated as per the Inquests Act (Act 58 of 1959); as well as the Births, Marriages and Deaths Registration Act (Act 51 of 1992). (36)

The Correctional Services Act (Act 111 of 1998) stipulates that if a prisoner dies within the custody of the correctional services, and a medical practitioner cannot certify the death as being due to natural causes, the prison warden must report such death in terms of the Inquests Act (Act 58 of 1959). (37)

1.2.2. Mortality data for South Africa

In order to fully grasp the functionality and efficiency of the medico-legal system of investigations into deaths in South Africa, one must look at the statistics related thereto.

In 1997, a total of 317 131 deaths were registered in the National Population Registry (NPR). This number was almost doubled to 612 462 in 2006. The majority of the deaths that occurred during 2006 and 2007 were due to natural causes (approximately 80%). Statistics have shown this proportion has increased over time, with a decrease in non-natural deaths during the same time period.

In 1997, the percentage of natural versus non-natural deaths were 82.94% and 17.06% respectively, whilst in 2007, 90.98% of deaths were due to natural causes, with the remaining 9.02% being due to non-natural causes. The age group mostly affected by non-natural causes of death were those aged between 15 and 19 years of age (44%). The leading cause of death amongst this group was tuberculosis, influenza and pneumonia. [26]

The estimated population in South Africa in 2009 was 49.32 million people. There are however many factors which contribute to mortality in South Africa which may have an effect on the population. It is estimated that 5.6 million people in South Africa are living with HIV/AIDS, and that 17.8% are between the ages of 15 and 49 years of age. [38] [39] However, young adults between the ages of 19 and 35 are more easily affected by HIV and AIDS which may be attributed to risky behaviour such as having promiscuous intercourse, and using drugs and subsequent sharing of needles.

In South Africa, it is not unusual for one or both parents to die from AIDS whilst the children are still young. According to reports the number of untimely deaths due to HIV and AIDS has increased over the past ten years, from 39% in 2000 to 75% in 2010. The Department of Health's study amongst antenatal clinics found that the majority of HIV was spread through intercourse, followed by transmission from mother to infant. Thus, there are many HIV infected children that are born into a family that is already affected by the virus. Where this is the case, the family may have already been affected in terms of health, income, productivity and thus, the ability to care for each other. For the period 2009 and 2010, there was an estimated 1.9 million AIDS orphans in South Africa. It is unclear as to whether these orphans themselves were infected with HIV, however, an estimated 40 000 children in South Africa are infected with HIV per year. [39]

Further contributing to the high mortality rate seen in South Africa is the fact that the country is alleged to have one of the highest violent crime rates in the world, second only to Columbia. [40] The SAPS annual Crime Report for the period from April 2010 to March 2011 reported that 2 071 487 serious crimes were registered with the SAPS nationwide. [41] This number was reduced by 1.29% statistics for the period 2008 to 2009. [41] In 2008/2009, 32.7% of the serious crimes that were reported were contact crimes; including murder, sexual offences and assault. [42] In 2010/2011, only 30.8% of serious crimes reported to the SAPS were contact crimes. [41] When this is compared to the United States of America (USA), where the estimated population in 2008 was 303.5 million people, and with 1 382 012 violent crimes registered with the Federal Bureau of Investigation (FBI) in that same year, [43] [44] South Africa has almost twice the amount of serious or violent crimes during the same time period. As can be seen with these statistics, medical personnel in South Africa require a

greater knowledge and understanding of medico-legal investigations and thus necessitating a superior understanding of forensic pathology.

Massive urbanisation, an influx of foreigners, unemployment and moral decay may all contribute towards the large number of deaths amongst young adults.

With immigrants from neighbouring countries living in the large cities in order to gain employment, many of them do not have family in South Africa who will care for them were they to fall ill. Many of these immigrants are also of a low socio-economic class, earning a minimum wage, and as such are unable to afford proper medical care should they fall ill.

No official statistics on the number of illegal immigrants in South Africa is available. Statistics from 2003 indicated 16 165 immigrants lived in South Africa, although the report was only concerned with the number of self declared immigrants in South Africa. [45] Many individuals who move to the larger cities from the surrounding rural areas seem to "get lost" in the cities and cannot fend for themselves if they fall ill, and thus end up being destitute.

It is required that all deaths in South Africa be reported to the Department of Home Affairs. In South Africa however, there are only provincial Departments of Home Affairs in the larger cities, with no such offices in the small towns and rural settlements in the rural areas. As such many deaths may go unreported. Where the local community does not suspect foul play, the sudden unexplained death of an individual does not warrant travelling into the closest city in order to report or register the death at the Department of Home Affairs. There are therefore no definite mortality statistics, with all the reviewed documents merely indicating

"estimates", due to the incompleteness of records or where the cause of death is incorrectly stated or not stated at all. [26]

1.2.3. Process of medico-legal investigation of deaths in South Africa

When a death occurs and it is reported to the SAPS, the SAPS officer who receives the report must attend the scene of death and is thus the first officer on the scene. It is up to the SAPS officer to determine whether the death is of medico-legal significance, and if so, to contact the investigating officer on call. This officer will not necessarily be the investigating officer to whom the case is assigned; however, as he may be the highest ranking officer on the scene, he or she is automatically assigned the role of scene manager. It must be noted that no distinction is made between a death scene and a crime scene in any legislation or protocol.

There are ten basic steps or guidelines that have been set out in the SAPS policy 2 of 2005: Crime Scene Management: Crime Scene Management, as to the investigation of a crime scene [46] :

a) Reporting and activation: this is the initial complaint of a crime to the SAPS.
b) Responding: the officer to whom the crime has been reported must attend to the crime scene, he or she thus is the "first officer".
c) Controlling: the first officer must determine the physical parameters of the scene and make arrests where necessary, as well as remove unauthorised persons.

d) Hand-over: the crime scene manager, who is the detective on call, attains responsibility of the crime scene. The detective who attends the scene may not necessarily be the detective who investigates the case.
e) Planning: this is where the scene is evaluated and it is determined whether further action or expertise is required.
f) Investigation and processing: this refers to the gathering of information with respect to the crime.
g) Debriefing: this is the review of the scene, to ensure that nothing is missed.
h) Restoring: the crime scene is cleared with respect to equipment used and an inventory of all evidence is made.
i) Releasing: the crime scene is handed over to the owner of the premises
j) Evaluation: all involved individuals in the SAPS assess the procedure followed and make recommendations.

Throughout this phase of the investigation, it is at the discretion of the crime scene manager as to who must be notified to attend the scene. It is the duty of the crime scene manager to determine whether the death was natural or other than natural and thus whether it is necessary to have a forensic pathologist attend the scene.

It is the responsibility of the scene manager to contact the Forensic Pathology Service (FPS) and inform them of the death and request the dispatch of an FPS officer to collect the body of the deceased. It is at the discretion of the forensic officer attending the scene as to whether the forensic pathologist on call is contacted to attend the scene. The forensic pathologist may

then decide whether to attend the scene, based on the description and information given by the forensic officer.

The body of the deceased is then taken to the medico-legal laboratory where a post-mortem examination is done. Documentation accompanying the body, and that is required for the post-mortem examination, includes the police docket and respective FPS forms that are required for administrative purposes. Scene photographs and sketches are rarely included in the docket, and as such, if the forensic pathologist did not attend the scene, they barely have a vague concept of the circumstances of the case and the body *in situ*. Witness and relative statements may often be included in the police docket, but these may not necessarily be helpful or informative to the forensic pathologists' investigation. Furthermore, very few investigating officers or photographers attend post-mortem examinations, and as such, the forensic pathologist is at a disadvantage if they did not attend the scene. If a photographer attends the post-mortem examination, it is usually at the request of the forensic pathologist. If any evidence is found on or in the body, the forensic pathologist collects it and it is relinquished via the proper procedure to the respective forensic sciences laboratories. If the forensic pathologist requires additional information e.g. medical records, these must be requested from the investigating officer upon completion of the post-mortem examination, as the investigating officer may not know what the forensic pathologist requires or deems necessary for their component of the medico-legal investigation.

In South Africa however there is a lack of dissemination of information between investigating officers and the forensic pathologist. This is particularly seen in certain cases where the investigating officers show very little interest in the case. Cases of sudden

unexplained deaths that occur in hospitals within twenty four hours of admission and without a clinical diagnosis having been made, or where the decedent had died en route to the hospital after showing symptoms at home are not investigated adequately due to insufficient knowledge on the part of the investigating officer. It seems that where there is no gross evidence of an omission or an act of commission on the part of any person, that the investigating officer may see this as troublesome and may not show great interest in such cases, and as such, these cases are treated as being less important.

In South Africa it seems as if all the departments or role players involved with the medico-legal investigation into deaths function within silos. There is no cooperation between these parties and, as such, information may be lost or important information is not gathered. Each department requires its own expertise, knowledge and background, which does not often overlap. Police officers have experience and training in law enforcement, forensic pathologists are educated in medicine, human anatomy and physiology, and forensic scientists have training and education in the natural and biological sciences, whilst lawyers are educated in the laws of the country. Police officers and lawyers are not educated in medicine or the natural and biological sciences, whilst forensic pathologists and forensic scientists have no experience with law enforcement. Each profession requires the expertise of the others as they cannot function properly or effectively on their own.

In order to bridge this gap in the professional network of the medico-legal investigations of deaths, there should be a professional who is educated and knowledgeable in all of these fields. These professionals should be able to function in any of the fields within the realm of medico-legal investigation of deaths, and as such, would be the interconnections that are necessary. These professionals are medico-legal death investigators.

The medico-legal investigator would be responsible for attending every death scene, including those where it is mandatory for the forensic pathologist to attend, such as [3] :

- Deaths that occur in custody;
- Suspected Sudden Infant Death Syndrome (SIDS);
- The death of a child which is suspected non-accidental injury or neglect;
- The unnatural death of any member of the South African National Defence Force (SANDF), or the South African Police Service (SAPS);
- Where a death may involve sexual assault, and
- The death of any person in a state or a private institution, such as a psychiatric facility, drug and addiction rehabilitation facilities, refugee facilities and older person facilities.

Medico-legal death investigators should conduct the scene investigation, as they receive training in determining the manner and cause of death, as well as in crime scene investigation and evidence collection. [1] The medico-legal death investigator would be responsible for taking photographs and making sketches of the scene and the body, as well as interviewing attending physicians, family members and witnesses. They would also have the power to subpoena medical records where necessary. [17]

At the post mortem examination, it would be ideal that the medico-legal death investigator aid the forensic pathologist in the performance of the autopsy. Currently in South Africa forensic officers aid in the performance of autopsies, however these individuals have no knowledge or education in human anatomy and physiology. Forensic officers receive “in-

house" training in basic dissection techniques, but altogether, receive no formal training in any medico-legal investigation techniques. Medico-legal death investigators on the other hand have an extensive knowledge and background in human anatomy and physiology, and are thus in a better position to aid in the autopsy and procedures that need to be performed.

1.3. The history of medico-legal investigation of death - a brief overview

Legal medicine was described in 1788 by Samuel Far as "a kind of medical knowledge which is not so much concerned with the cure of disease as the detection of error and the conviction of guilt". [47] This portrayal of forensic medicine is quite fitting as it describes that it is in fact used in the administration of justice. The history of forensic medicine however dates back further, with the first medico-legal professional to have been documented, Imhotep (2980 BC), who served as a chief physician and architect in Egypt. [47] The first text book of legal medicine was published in 1532, which was entitled *Constitutio Criminalis*, however, there is a text that was established prior to this (in 1507) known as the *Bamberg Code*. [47] [48]

The modes of proof of innocence or guilt in medieval Europe and Britain were often thought of as semi-magical or divine intervention. These included trial by battle, immersion in water, or exposure to fire. All of these "ordeals" were attended by the coroner so that he could witness and record the outcomes thereof. [49] [50] [51]

The ordeal by combat allowed the aggrieved to challenge the alleged accused. The aggrieved had to appeal to the coroner for such an ordeal by combat and was allowed to hire a champion to fight in his place. This ordeal was abolished in the early nineteenth century. [49] [50] [51]

The ordeal of water involved the accused being thrown into water; those that sank were pronounced innocent, and those that floated here proclaimed guilty, only to be removed from the water and hung. [49] [50] [51]

The ordeal by fire had some variations. The suspect may have been made to carry a red-hot iron in his hands for nine marked paces, he may have been made to lick a red-hot iron or run barefoot over nine red-hot ploughshares. If there were no burns visible, the suspect was declared innocent, however if burns were noted, he would be found guilty and hung. This practice was based on the belief that the innocent healed quickly. [49] [50] [51]

Another ordeal was known as cruenation or the ordeal by the brier, in which it was believed that the slaughtered could reveal their killer. The suspect had to approach the brier where the deceased lay, if the wounds of the corpse began to bleed again, the suspect was found guilty of having murdered the deceased. [49] [50] [51]

These ordeals were abolished in England in 1215 and were replaced by the trial and jury system known today. The jury consisted of twelve local men, who were expected to have personal knowledge of the circumstances surrounding the crime and thus should be able to make a decision based on this knowledge. Between the twelfth and fifteenth centuries, the use of witness testimonies was first used in formal proceedings. [50]

In Europe, these ordeals were replaced by analytical methods of investigation, which descended from the institutions of Roman and Canon law, where fact finding was considered to be a skill. (50) The main features of this procedure were that the state prosecuted and professional judges mediated the trials and there were no juries. This was meant to secure the belief that judgements were made by reviewing acquired proof, and that the judges were impelled by rules that specified which certain evidence led to certain conclusions. Different types of evidence had numerical values which were added up at the end of the trial. Full proof was comprised of either a confession or two eyewitnesses; only one eyewitness was considered as a half proof. Testimonies from women, children and paupers, as well as physiognomy, common repute and circumstantial evidence were not considered as enough proof, but if they were combined, they may have been considered to be a half proof. If two male witnesses were not available, a half proof permitted the suspect to be tortured in order to elicit a confession. (50)

1.3.1. The coronial system

The coronial system originates from England; however it was first seen to be in existence in the pre-Norman era between AD 871 and 910, with the modern coroner dating back to 1194. (49)

Coroners were initially referred to as crowners, as their duties were to "keep the pleas of the crown" as is described in the Latin origin of the word "*custos placitorum coronas*". (49)

Shire-reeves were the King's law officers who were responsible for each shire or county, and sheriffs originated from these offices. Each county was subdivided and each subdivision was

governed by sergeants and bailiffs who were the auspices of the sheriff. The sheriff had the authority to control the legal system to his advantage, and as such, in 1195, the office of the Justices of the Peace was created. These individuals were an authority independent of the sheriffs, in order to keep the sheriffs in check. (49)

The *Articles of Eyre* is the statute that brought the office of coroner into existence. It stems from the *General Eyre* that were the King's migratory judges responsible for administering justice in his counties. There were three coroners appointed to each county, who were to "hold the pleas" or try a case in order to pass judgement. Only the very serious offences such as murder had to be tried by the migratory judges at each General Eyre; lesser offences were tried by sheriffs. (49)

The most significant responsibility of the coroner was his role in the investigation of sudden death. Also included in his duties was the investigation of crimes such as burglary, rape and theft. (49) In the twelfth Century, one of the major duties of the coroners was to secure a portion of the deceased's assets for the crown (52).

In 1877, legislation was changed to allow coroners to conduct an inquest where he had reason to suspect violent or unnatural death or where the cause of death was unknown, thus giving the coroner authority over the investigation of cases. (48) In 1926, the minimum requirements for the office of coroner were enacted, namely five years experience as a medical practitioner, barrister or a solicitor. (48)

The Committee on Death Certification and Coroners, also called the Broderick Committee reported in 1971 that there were approximately 40 forensic pathologists in England and Wales. The perspective of this committee was that police required the assistance of a "special kind of pathologist" however coroners did not require this same specialist, as the most part of pathology that the coroner deals with does not have forensic implications. The Committee recommended that a forensic pathology service within the National Health Service be available to assist the police in their investigation. [53]

Modern duties of the coroner include the detailed investigation of all deaths that fall into the categories of sudden, violent, or unnatural death. Coroners do not pro-actively examine deaths and then decide which should be examined further, but rather, cases are referred to the coroner. [31] [32] [33]

1.3.2. The medical examiner system

The medical examiner system, which originates from the English coroner system, seems only exist in the United States of America. [48] [16] [50] [54] In the 1950's medical examiners were a prestigious scientific profession, however, the political influence of medical examiners was much less than that of coroners, as medical examiners were appointed and coroners were elected. Medical examiners were authorised to investigate sudden or suspicious deaths, the inquest was nullified in order to eliminate any opportunities for corruption or scientific errors. [55] The dutues of the medical examiner was to state the cause and manner of death, whilst the police had to investigate any crimes, and duties of the district attorney were prosecuting

criminals in the subsequent court proceedings. When the medical examiner system was introduced, different duties for the different parties were established, whereas previously, all of these duties were performed by the coroner.

The first medical examiner system was founded in Massachusetts in 1877 and implemented when it was realised that appointed medical doctors would be more effective in the medico-legal investigation of death, as they had better scientific knowledge in the investigation of sudden and unnatural deaths than lay coroners. (55) (16)

1.3.3. The procurator fiscal

The procurator fiscal is an official found only in Scotland, with the earliest documentation thereof in August 1584 in Edinburgh. The fiscal was appointed by the sheriff and as such was under the authority of the sheriff. The role of the procurator fiscal was collection of fines and asisting the sheriff during criminal proceedings. (56)

During 1701, the procurator fiscal was included in legislation and was described as the "pursuers of criminal cases". By the nineteenth century, procurators fiscal were being appointed as public prosecutors and the authority over the procurators fiscal was switched from the sheriff to the Lord Advocate when it was recognised that the king required an advocate to represent him during criminal and civil proceedings. (56) The earliest references to the king's procurator fiscal appear in 1434 and 1457, and by 1579 to 1584 the king's

procurator fiscal was referred to as the chief public prosecutor. By the nineteenth century, it was recognised that the Lord Advocate had to appoint advocate deputies in order to assist in court proceedings at the High Court of Judiciary. The Crown Office was established in order to provide a link between the procurators fiscal and the Lord Advocate and the Crown Agent appointed as the head of the fiscal service. (56) (57)

Procurators fiscal are practised lawyers and are tasked with the investigation of all sudden and unexplained deaths, and deaths surrounded by suspicious circumstances. He may order a post mortem examination to be conducted to determine the cause of death where it is unclear. Deaths may be reported to the procurator fiscal by the police; a doctor; or the Registrar of Births, Deaths and Marriages. The function of the procurator fiscal's investigation is to determine whether there should be a criminal prosecution or a Fatal Accident Inquiry. (58) (59)

1.4. Medico-legal investigation of deaths in the international community – A brief overview

1.4.1. The medico-legal investigation of deaths in the United States of America

In the USA, post-mortem examinations are undertaken by either a coroner or medical examiner, depending on the jurisdiction in which the death occurred. Death investigation systems differ from state to state and municipality to municipality and there are approximately 2 000 jurisdictions in the USA that are accountable for investigating unnatural deaths. (60)

In 2002, a national survey revealed the following death investigation systems in the USA (60) :

- 22 states had medical examiners, of which 19 utilised a state medical examiner, 2 used county medical examiners and 1 had a district medical examiner;
- 18 states had a mixed medical examiner and coroner system, of which 11 had a combination of a county medical examiner and coroner system, and 7 used a state medical examiner and county medical examiners and coroners, and
- 11 states utilised a coroner system, of which 9 had county coroners, and 2 had district coroners.

1.4.1.1. The coronial system

Between 1820 and 1840, many governmental offices that were previously appointive were changed to be elective, including the office of the coroner. Professional skills were not considered when electing a coroner, but rather, political skills were in high demand. Where a coroner has jurisdiction of the medico-legal investigations into deaths, he is elected into office for a four year term. [48] [55] In order to become a coroner in the USA the following is required [48] [55] :

- The person must be 18 years of age or older;
- A citizen of the USA, and
- A resident of the county whilst in officer as the coroner, as well as at least one year prior to election.

The coroner may appoint a deputy, who is accountable for the decision on the cause of death for cases that have undergone a post-mortem examination. These cases consist of [48] [55] :

- Violent deaths;
- Sudden and unexplained deaths;
- Suspicious deaths;
- Deaths involving drugs and toxic substances;
- Deaths during medical treatment;
- Deaths during employment;
- Deaths during interaction with law enforcement agencies, and
- Deaths where a physician was not present at the scene.

The coroner has the choice of consulting a physician, and the decision to conduct an autopsy lies with the coroner, and he may or may not agree with the autopsy findings. The coroner also has the authority to conduct a coroner's inquest which investigates the cause and manner of death, as well as the circumstances surrounding a death, where such a death has resulted from violence or where a death may have been caused by a criminal act or criminal negligence. An inquest is also held if an individual has died through an interaction with the law, during incarceration or whilst detained in a mental hospital. An inquest may also be held to determine the cause of a fire, where a person's life may have been put in jeopardy or lost, or where any property may have been damaged or destroyed. The Attorney General may however order an inquest to be held wherever he deems it necessary. [48] [55]

1.4.1.2. The medical examiner system

Each state in the USA has differing requirements as to the appointment of medical examiners, but generally, the Director of Health appoints the state medical examiner for a five year term and the county medical examiner for a three year term. Specifically, the chief medical examiner must be a licensed physician and an agent of the American Board of Pathology (ABP) specialising in anatomic and forensic pathology with experience in forensic medicine and pathology. The deputy chief medical examiner must also be a licensed physician and must have completed a fellowship in forensic pathology which is approved by the ABP. A county medical examiner must be qualified to practise in the field of medicine or be a physician, nurse, physician's assistant, paramedic, or other licensed emergency medical technician; must have completed a training course in the field of medico-legal death investigation and must be certified with the American Board of Medico-Legal Death Investigators (ABMLDI). [48]

1.4.1.3. Death scene investigation in the United States of America

According to a document published by the US Department of Justice, the following are guidelines as to the procedure to follow when investigating a death scene [61] :

1. Arrival at the scene:
    1.1. Introduce and identify self and role;
    1.2. Exercise scene safety ;
    1.3. Confirm and pronounce death;
    1.4. Participate in scene meeting;

1.5. Perform scene walk through;

1.6. Establish chain of custody, and

1.7. Follow laws pertaining to the collection of evidence.

2. Recording and evaluating the scene:

2.1. Photograph the scene;

2.2. Develop descriptive documentation of the scene;

2.3. Establish probable location of injury or illness;

2.4. Collect, inventory and safe-guard property and evidence, and

2.5. Interview witnesses at the scene.

3. Documentation and evaluating the body:

3.1. The body, evidence and surroundings should be photographed prior to movement as well as after removal;

3.2. Conduct external body examination;

3.3. Preserve evidence on the body;

3.4. Establish decedent information;

3.5. Document post-mortem changes;

3.6. Participate in scene debriefing;

3.7. Determine notification procedures, and

3.8. Ensure security of remains.

4. Establishing and recording decedent profile information:

4.1. Document the discovery history;

4.2. Determine terminal episode history;

4.3. Document decedent medical history;

4.4. Document decedent mental health history, and

4.5. Document social history.

5. Completing the scene investigation:

5.1. Maintain jurisdiction over the body;

5.2. Release jurisdiction of the body;

5.3. Perform exit procedures, and

5.4. Assist the family.

1.4.2. Medico-legal investigation of deaths in Canada

Canada consists of 10 provinces and 2 territories, with 4 provinces making use of the medical examiner system whilst the remaining 6 provinces and 2 territories utilise coroners. The death investigation services fall under the jurisdiction of provincial Departments of Justice or the Attorney General. [62] [63]

Deaths that require investigation in all of the above jurisdictions include violent or unnatural deaths, sudden unexplained deaths and custodial deaths. Only in some jurisdictions are

maternal deaths, deaths due to malpractice or negligence and work related deaths investigated. [62] [63]

It is required by law that the chief medical examiners are qualified pathologists, or licensed medical practitioners. Qualifications of coroners, however varies between jurisdictions; some require them to be physicians or lawyers, whilst in other jurisdictions, they may be lay persons or merely require experience in administration. It is not a statutory requirement that medical examiners receive training in death investigation. [62] [63]

1.4.3. Medico-legal investigation of deaths in the United Kingdom

England, Wales and Northern Ireland have the same legal system. Coroners perform detailed investigations of all deaths that fall into the categories of sudden, violent, or unnatural deaths. [31] [32] [33]

Coroners do not pro-actively examine all community and hospital deaths and then decide which should be examined further, but rather, cases are referred to the coroner. [31] [32] [33] Legislation stipulates that where a deceased individual was attended in their last illness by a registered medical practitioner, the practitioner must sign a death certificate stating the cause of death and deliver such a certificate to the Registrar of Births, Marriages and Deaths. [31]

It is the duty of the Registrar to report a death to the coroner where [31] :

- The deceased was not attended during their last illness by a registered medical practitioner;
- The Registrar is unable to obtain a correctly completed certificate of the cause of death;
- The Registrar receives a certificate where it appears to him that the deceased was not seen by a certified medical practitioner either after a death or fourteen days prior to the demise;
- The cause of death is unknown;
- The Registrar has reason to believe that the death was due to unnatural causes where it is due to violence, neglect or abortion or where it may have been accompanied by suspicious circumstances;
- Where the death occurred during an operation or before the recovery from the effects of anaesthesia, and
- Where it appears that that death may be a result of industrial disease or poisoning.

Deaths that occur in police custody, in prison or in a mental institution are reported directly to the coroner by the police. (31)

When a case is referred to the coroner, it is at his discretion whether a post-mortem examination is to be conducted. The coroner has a statutory duty to hold an inquest where the deceased died a violent or unnatural death; where the death was sudden and unexplained and where the death occurred in prison. Once the coroner decides that the death falls within his jurisdiction, he must investigate the death. (31)

Since the conviction of Dr Harold Shipman in 2000, there have been three separate inquiries into the aspects of investigation and certification of sudden deaths in particular, one of which is the Luce Review. [31] [32] [33] The Luce Review identified "critical weaknesses of the death certification and coronial proposals". It pointed out that the certification and investigation systems were separate in that there was no way to guarantee that a death which should be reported to the coroner is in fact made in all instances. The coroner may not investigate a death which is not reported to him and thus many crucial cases may go un-investigated.

The review also stated that there is no medical assistance to the death certification and investigation processes, as well as a lack of training for all professionals working within the death investigation system. The coronial system was also shown to lack leadership, accountability and quality assurance; something that may be attributed to the fact that the majority of the coroners were employed on a part time basis. [31] [32] [33]

A draft Coroner's Bill was published in 2006 and covered the following aspects [31] [33] :

- The appointment of body of full time coroners and review of the jurisdictions to create a smaller number thereof;
- Establishment of a chief coroner and a coronial adversarial committee;
- Determination of the jurisdiction of the coroner by the location of the body;
- Distinguishing the duties to hold inquests and investigations;
- The power of the coroner to obtain information during the course of the investigation and which will be of assistance, and
- Arranging for the training of coroners and their assistants by the chief coroner.

1.4.4. Medico-legal investigation of deaths in Scotland

Common law in Scotland requires that all deaths be referred to the procurator fiscal. The procurator fiscal is an appointed public prosecutor who undertakes preliminary investigations and has the power to direct the police in their investigation. (56) (58) (64)

The Registrar of Births, Deaths and Marriages Act (1965) states that a registered medical practitioner who attended the deceased during their last illness must complete a medical certificate stating the cause of death. If no doctor attended the deceased during the final illness, any doctor who knows the cause of death may issue the death certificate. It is the duty of the police practitioner to report deaths to the procurator fiscal that are suspicious or unexplained, or where a medical practitioner is unable to determine the precise cause of death, the procurator fiscal then directs the police in their subsequent investigation. (64)

Inquiries are held in private, unless the relatives influence the fiscal to hold a public enquiry. The procurator fiscal may order a post-mortem examination, only when there are suspicious circumstances and when the procurator fiscal deems it necessary. Where the death has occurred in custody, or was caused by an accident during the course of employment, the procurator fiscal must hold a Fatal Accident Inquiry in public before the sheriff. (64)

It is not common practise for physicians to receive formal training in establishing the cause and manner of death. Throughout the doctor's career, there is no review of the quality of their death certification. It is not included in undergraduate training, clinical governance, audits, or continuing professional development. (64) A recent study revealed that general practitioners

issue less than five death certificates in a year, giving the impression that they have very little experience concerning the procedures of death certification. (64)

1.4.5. Medico-legal investigation of deaths in Australia and New Zealand

Both Australia and New Zealand employ the coroner system in the medico-legal investigation of deaths. (63)

In Australia, it is seen as a criminal offence for a medical practitioner to fail to provide a certificate of death when obliged to do so, or to knowingly provide false or misleading particulars on such a certificate. If a doctor signs any certificate which he knows to contain false information or which shows gross carelessness in completeness, he or she will be liable to disciplinary proceedings for professional misconduct. (63) Each state or territory in Australia has a different procedure in death certification; however deaths that are required to be reported to the coroner are the same throughout the country. (63) These deaths include but are not limited to (65) :

- Unexpected deaths or where the cause of death is unknown;
- Where the death was violent or due to unnatural causes;
- Where the deceased died during or as a result of anaesthesia;
- Where the death occurred in custody or *in care*, such as in a mental health and rehabilitation institutions, institutions for the elderly, etc;
- Where a medical practitioner is unable to certify a death certificate and state the cause of death, and

- Where the identity of the deceased is unknown.

In New Zealand, a doctor may sign a death certificate where the cause of death is due to natural causes, after having reviewed all medical records and externally examining the body. Where the decedent is over seventy years of age, the doctor may complete a death certificate, however, where the death is a result of an accident or an act of omission, the death must be reported to the coroner. [63] Deaths that are reported to the coroner include [66] :

- Deaths as a result of suicide, violence, unnatural causes or where the cause is unknown;
- Deaths where no doctor's certificate is given;
- Deaths that occur during medical or surgical treatment, dental surgery, etc, and
- Deaths that occur in official custody or care.

1.4.6. Medico-legal investigation of deaths in Uganda

Uganda consists of four regions with more than 76 administrative districts. The medico-legal investigation of death system was derived from the British systems in that it utilises coroners. The difference is however found in the fact that police officers perform the duties of the coroner and thus are responsible for requesting post-mortem examinations. All medico-legal cases reported to the police are subject to forensic investigation. [67]

Medico-legal post-mortems are routinely conducted in the following circumstances [67] :

- Violent deaths;
- Where the death may have occurred in hospital, within twenty-four hours of admission, and where no clear diagnosis has been made;
- Deaths that occur in police custody;
- Deaths that occur within twenty-four hours of administration of local anaesthesia for surgery, and
- Deaths that occur as a result of therapeutic misadventures or malpractice.

All medico-legal services in Uganda include clinical forensic medicine and forensic pathology. These services are delivered through medical officers or anatomical pathologists employed by the police, a university or the Ministry of Health, as well as the medical doctors in regional and district hospitals as well as clinics. Medical doctors are given police ranks, depending on the duration of their service to the police. [67] At present, an anatomical pathologist is the assistant commissioner of the police, and is an honorary lecturer at Makerere University in the Department of Pathology. Police doctors, as well as anatomical pathologists do not receive any training in forensic medicine, including any postgraduate qualifications or continuing education courses. The police may however decide to sponsor the post graduate training in anatomical pathology of doctors who have applied for positions within the police service. Medical schools in Uganda however do not have Forensic Medicine Departments and as such do not offer any courses or postgraduate degrees in forensic medicine. [67]

1.4.7. Medico-legal investigation of deaths in Malaysia

The death investigation system used in Malaysia originated from the British colonisation. [68]

Malaysian legislation requires that a policeman must investigate a death where [68] :

- A suicide has occurred;
- The decedent was killed by another person, animal, by machinery or in an accident;
- Where the circumstances are suspicious, or when an offence may have been committed;
- Where the cause of death is unknown, and
- Where the death is sudden.

It is the responsibility and the discretion of the police officer as to whether a post-mortem investigation is conducted. The police conduct all death investigations, whilst the magistrate plays the role of the coroner. The magistrate who holds an inquiry may [68] :

- Order a post-mortem examination;
- Order an exhumation;
- View a body;
- Determine who, when, where, how and the manner to which the decedent died, and
- Determine whether any person is criminally concerned in the cause of death.

There is no full time coroner or coroner's court in Malaysia. The magistrate is the acting coroner and it is the responsibility of the police to conduct death investigations. Malaysian legislation makes reference to deaths that resulted from or have been accelerated by an

unlawful act or omission on the part of any person, and must be subjected to an inquest. Due to the ambiguity of this statement, deaths that occur due to surgery or any therapeutic procedure may not necessarily be subjected to an inquest and thus the body is released with the probable cause of death being satisfactory to the police. (68)

Post-mortem examinations and inquests in Malaysia include negligence on the part of doctors or institutes. These post-mortems are instead educational rather than medico-legal. As in South Africa, the treating physician of the decedent may issue a death certificate if he deems the death to be due to natural causes, and the doctor who performs the post-mortem examination for an inquest case must issue a death certificate as well as the burial permit. Deaths that occur in police custody, prison or a mental institution must be subjected to a post-mortem examination and a thorough medico-legal death investigation, as in other countries around the world. (68)

1.4.8. Medico-legal investigation of deaths in Japan

The death investigation system in Japan closely resembles that of the European-Continental system in which the public prosecutor is authorised under the Criminal Procedure Code to inspect or examine any obvious or suspected criminal death. The prosecutor has power over the police to investigate such a case. Death investigation falls under the jurisdiction of local prefectural police forces. The so-called “death investigators” have knowledge and training in the investigation of all unnatural deaths. In practise, the public prosecutor thus becomes a

facade, as the police investigate suspicious criminal cases as a substitute to the prosecutor under the Code of Criminal Procedure. (69)

The medical examiner in Japan focuses mainly on the medical and statistical investigation of noncriminal cases. There are no medical examiners found outside the major cities, rather, an administrative autopsy is done for noncriminal cases. These autopsies can only be done with the consent of close relatives, in reality; these cases are treated as suspicious and thus are examined by judicial autopsy. (69)

Any death that is reported to the police is classified into one if three categories (69) :

- Criminal;
- Suspicious, and
- Non-criminal

Criminal and suspicious cases are investigated by judicial inspection, and an autopsy done when necessary. Noncriminal cases are investigated by administrative inspection, with autopsies only being conducted when necessary, after the receiving consent from the family. (69)

Sudden unexpected deaths, deaths where the cause of death is unknown or deaths that occur during or shortly after any medical intervention are required to be reported to the police. All

such deaths are examined by criminal autopsy in order to determine whether there was involuntary manslaughter due to malpractice. [70]

1.5. Training of medico-legal investigation of deaths

In the USA, when it was recognised that the medico-legal death investigator had a critical role within the medical examiner and coroner offices, there were many surveys and studies undertaken with regards to the training of these professionals. Between 1995 and 1997, research showed inconsistencies in the background knowledge and experiences, and well as the expanded roles of death investigators. These factors raised concerns and formed a renewed interest in the development and training of medico-legal death investigators. Some of the problems highlighted by the research included low pay, poor educational standards, lack of educational funding, job dissatisfaction and low professional standing. [14] [15] [71] In 1995, 46% of employees within the medico-legal death investigation systems required no formal training, whilst 33% required continued education, but offices failed to enforce this requirement. [71]

As of 2005, there has been a great improvement in the training offered for death investigators in the United States. Saint Louis University offers a five day course that runs three times a year. This course aims to instruct the attendees as to how to conduct thorough scientific and systematic death scene and telephonic investigations in the medical examiner and coroner offices, as well as teaching the 29 national guidelines for death scene investigations set out by the National Institute of Justice in 1999. The course is available to death investigators, police

officers, physicians, nurses, emergency medical personnel, attorneys and forensic scientists. The training objectives of the National Association of Medical Examiners (NAME) are carried out during the annual meeting which lasts a week. It is aimed at the advancement of administratively efficient and cost effective death investigation systems; and includes individual presentations of scientific studies and research, providing a platform for a peer review setting. The training of death investigators is however governed by medical examiner and coroner offices country wide, with courses ranging from forty hours to five days. [72] [73]

In South Africa, the realisation in recent years of the need for formal training courses within the field of forensics has brought about a change in the education and training of forensic professionals. There are various institutions and technicons that have established short courses for diplomas in forensic science or crime scene investigation. The University of Pretoria and the University of Cape Town offer post graduate degrees in Medical Criminalistics at Masters and Honours levels. These degrees are offered by the departments of Forensic Medicine at the respective universities. As of yet, individuals who have attained an honours or masters degree in medical criminalistics have not been able to practise as medico-legal death investigators, but have had to acquire jobs with the forensic science laboratories. This is due to the lack of recognition for the expertise of the medico-legal death investigator.

In 2005, if one intended to follow a career in forensic science, one had to attain a bachelor's degree in either Medical Sciences or in one of the Biological Sciences, such as chemistry or genetics. Upon completion of the degree, one had to acquire an apprenticeship with the Forensic Science Laboratories and receive in house training for a further three years.

Other qualifications currently on offer include a twelve month course in Introduction to Crime Scene Investigation, as offered by INTEC. The course includes [74] :

- Crime scene investigation;
- Handling of physical evidence;
- Forensic medicine;
- Basics of certain forensic sciences, and
- Clean-up of the crime scene.

Strategic Investigations and Seminars (SIS) through College SA offers a national certificate via its Forensic Investigation School. The available courses include [75] :

- Crime scene reconstruction;
- Forensic entrepreneurship;
- Forensic science and the community;
- Forensic biology and DNA, and
- Investigating fraudulent documents.

All of these courses may however take between twelve and twenty-four months to complete. The SIS also offers national certificates in Resolving of Crime and Forensic Science. [75]

As of 2012, the University of Cape Town is offering a Masters degree in Biomedical Forensic Science. This course will include subjects such as [76] :

- Forensic pathology;

- Forensic anthropology and archaeology;
- Forensic toxicology;
- Molecular forensics, and
- Applied forensic science.

The training of crime scene technicians is governed the SAPS policy 4 of 2003: Training Procedure for Criminalistics Experts and involves the completion of a basic police training course, followed by a two week in-service training where students are exposed to the organisational and operational procedures at the local Criminal Records Centre (CRC). The next step in the training is a ten week advanced crime scene course. Upon successful completion thereof the individual is a qualified crime scene technician and can thus take up duties at the local Criminal Records Centre, for a minimum of one year, under the supervision and regular assessment by the commander. Once qualified, the crime scene technician is required to attend refresher courses every five years. (46)

In many expertises involved in the medico-legal investigation of death there are governing bodies. The Internal Complaints Directorate (ICD) governs the SAPS, when a person is killed during a confrontation with the law for example, the ICD conducts its own investigation into the death. The Health Professions Council of South Africa (HPCSA) requires all professionals within the medical field, ranging from emergency service personnel to psychiatrists, to be registered. It is thus the medical governing body. In the USA there are many governing bodies for coroners and medical examiners, namely:

- The American Academy of Forensic Science (AAFS);

- The National Association of Medical Examiners (NAME);
- The American Board of Criminalistics (ABC), and
- The American Board of Medico-Legal Death Investigators (ABMLDI).

The ABMLDI is an independent certification board that aims to support the standards of practise of medico-legal death investigators. it certifies those professionals who have substantiated knowledge and skills required to perform medico-legal investigations of deaths as have been set out in a publication by the National Institutes of Justice in 1999. The ABMLDI is accredited by the Forensic Specialists Accreditation Association (FSAA), and maintains a list of individuals who have obtained certification. It is also responsible for the re-certification of individuals every five years in order to supervise continuing education and work verification. [77]

NAME was established in 1966, and is the professional organisation of physician medical examiners, medical death investigators and death investigation administrators in the United States. Members have expertise in medico-legal death investigations that is necessary for the effective functioning of the criminal and civil justice systems. They aim to enhance the everyday investigation of cases as well as the interaction with other agencies and political entities within the USA. NAME has an accreditation program for medico-legal death investigators and provides consultative services for jurisdictions that aim to establish medico-legal death investigation system. [48] [72]

The AAFS was established in 1948, with the intent of aiding in the advancement of science and its application to law. There are various sections in which one may become a member of the AAFS, namely [48] [78] :

- Criminalistics;
- Digital and multimedia sciences;
- Engineering sciences;
- Jurisprudence;
- Odontology;
- Pathology;
- Biology;
- Physical anthropology;
- Psychiatry and behavioural sciences, and
- Questioned documents
- Toxicology

The Indo-Pacific Association of Law, Medicine and Sciences (INPALMS) was established in 1986 in order to incorporate regions outside of the USA and Europe. It was originally known as the Asian Pacific Association of Law, Medicine and Sciences, and changed its name upon the inclusion of Africa. The association was established to promote national and international cooperation in education and research in the fields of legal medicine, forensic science and law enforcement, as well as organising and sponsoring conferences, workshops and seminars. [79]

It can thus be seen that it would be necessary, once medico-legal death investigators have been established in South Africa, to establish a governing body. However these professional may also be governed and registered or accredited with the HPCSA. Be that as it may, it may be beneficial, once the field is properly established, with enough members to make it possible and worthwhile, to create a board of governing bodies that encompass all fields of the forensic sciences.

The South African Medico-Legal Society (SAMLS) is a non-profit organisation which arranges and organises activities involved in the correspondence, delivery of paper, debate and education within the medical and legal fields, in order the promote excellence in medico-legal practise. The mission is "to advance the inter-relationship between medicine and law as a medico-legal science". [80]

1.6. Aims of the study

In view of the literature, it can be seen that there is has been a shift of the medico-legal investigation of deaths from those of clear homicide to the sudden unexplained deaths. This shift has come about due to the realisation of the medico-legal importance of sudden unexplained deaths, as there may be many occasions where a sudden unexplained death is in fact due to unnatural causes, but may go unnoticed due to poor investigation. There is more concern and attention focused on the training of medico-legal death investigators as their importance in the medico-legal investigation of deaths has been realised.

The fact that South Africa has a crime rate almost double that of the USA means that there is a problem. It is known that not all crimes are reported, along with which, deaths are also under-reported. It is hypothesised that the number of sudden unexplained deaths are grossly under-reported, and thus, the problem may be bigger than originally thought. Along with this problem of under-reporting of deaths, is the very real problem of the actual medico-legal investigation of deaths, in that there is no meshing or interweaving between all the departments concerned.

The major objective of this study is to bring about the realisation that a profession needs to be instigated in order to bridge this gap in the medico-legal investigation of deaths, this profession being medico-legal death investigators. The medico-legal death investigators would be the intermediates between all the departments involved in the investigation into a death. They would thus be the links between the silos.

As seen in the literature review, the number of police officers in the SAPS is not nearly enough to support the large amount of crime that occurs in South Africa. This high case load may help to explain the apparent lack of interest in the cases of sudden unexplained deaths that occur in South Africa. This may also explain why there is such a large amount of natural deaths that are recorded in South Africa, as there are not enough police officers to investigate such deaths, due to the sometimes non-violent nature of these deaths, it is easy to overlook minor details in order to lessen the case load of personnel involved in the medico-legal investigation of deaths.

The research included the qualitative assessment of the information that the forensic pathologists receive, and how this information influences their investigation. It is hypothesised that the employment of medico-legal death investigators would improve the quality of information received by the forensic pathologists, as well as all other departments, and as such, improve the overall investigation into a death.

In the interests of the economy, unnecessary autopsies and special laboratory investigations should be avoided. This is not currently the case as individuals who attend the scene of death are unsure as to the medico-legal significance of cases. Medico-legal death investigators however have the knowledge that would minimise the number of unnecessary cases that are admitted to the medico-legal laboratories.

Chapter Two

Research Methodology

2.1. Study design

This study was conducted in two parts:

- A retrospective investigative study
- A prospective study.

2.2.Study Setting

A retrospective review of post mortem dockets was conducted at the Pretoria Medico-Legal Laboratory for the period of 2009 and the first three months of 2010. It was decided to review these dockets as they would reveal the most recent and most accurate depiction of the death investigation system as it stands at present.

A prospective questionnaire-based review was conducted, involving feedback from the forensic pathologists, forensic pathology registrars, as well as medical examiners at the Pretoria Medico-Legal Laboratory and the University of Pretoria.

2.3.Subject selection

Inclusion criteria

The study included decedents admitted to the Pretoria Medico-Legal Laboratory for a medico-legal post-mortem examination; where the death fell into the following categories:

- Sudden death;
- Unexplained death;
- Death that occurred in a hospital within 24 hours of admission, without a clear clinical diagnosis, and
- Where the death occurred en route to the hospital after onset of symptoms.

Exclusion criteria

Cases that were excluded from this study were deaths that were clearly the result of:

- The effects of any chemical or toxic substance, or electrical effect, or any direct or indirect force;
- The obvious result of an act of negligence or omission on the part of any person, and
- Any death that may have been the result of suicide.

2.4.Study population

Post-mortem dockets at the Pretoria Medico-Legal Laboratory were reviewed retrospectively from 1 January 2009 to 30 March 2010, amounting to approximately 15 months. This time frame was chosen as it was considered to be the most accurate depiction of the most recent

investigative procedures and processes within the medico-legal setting. Concurrently, the post-mortem dockets at the Pretoria Medico-Legal Laboratory were reviewed for the time from 10 June to 9 September 2010 in order to obtain the quality of the investigative procedures and processes as a prospective component to the study.

2.5.Sampling frame

The documents reviewed in this study included post-mortem pathology reports, FPS 180 and FPS 380 forms, as well as any medical reports present in the post-mortem dockets. The individual dockets were reviewed in order to assess the quality of the information contained within. Included in the prospective study was a personal opinion of the forensic pathologist conducting the specific autopsies as to the scope and nature of the information provided in the docket to them prior to the post-mortem examinations.

2.6.Research procedures

For the retrospective component of the study, the death registry at the Pretoria Medico-Legal Laboratory was reviewed to identify cases that were classified as “found dead. The individual case files were reviewed and relevant data was recorded as per Annexure A.

For the prospective component of the study, post-mortem dockets were reviewed early in the morning prior to the commencement of the post mortem examination. Death registry numbers of cases that fit the criteria of the study were recorded; Annexure B given to the forensic

pathologists who were allocated the cases of interest and requested to complete the form accordingly.

2.7.Ethical considerations

- Consent to review the post-mortem dockets was acquired from the facility manager of the Pretoria Medico-Legal Laboratory, as well as the Chief Executive Officer of Gauteng Forensic Pathology Service;
- Names and personal information of decedents, forensic pathologists, South African Police Service officers and any other personnel involved in the investigation were not recorded;
- A case study number was assigned to cases to avoid repetition of review, as well as to avoid disclosure of personal information and reports;
- Only the investigator has access to the correlation of research case numbers and post-mortem reports, and
- Approval for the conduction of the research was also obtained from the Research Ethic Committee of the University of Pretoria.

2.8.Data and Documentation

2.8.1. Confidentiality

Case reference numbers were assigned to the cases reviewed in order to reduce the risk of disclosing personal information. Information itself was not recorded from the post-mortem dockets, only the presence or absence thereof.

2.8.2. Processing of data

Data analysis consisted of frequency tables as descriptive measures and the analysis thereof by Chi-square tests or log linear modelling, as well as calculating of proportions for specific outcomes and comparison of proportions. This component was done in conjunction with the Department of Statistics of the University of Pretoria.

2.9.Funding

No additional funding was required, as the minor administrative costs incurred, including telephonic calls, faxes and stationary, were carried by the Department of Forensic Medicine/Gauteng Forensic Pathology Service research fund.

2.10. Time Frame

The review of files and cases was done over a period of approximately three months from 7 June 2010 to 19 September 2010.

This represented the time frame needed to review 100 cases prospectively. The retrospective review of the post mortem dockets was carried out at the same time.

2.11. Reporting

It is intended to submit the final results to a peer-reviewed scientific journal with the intent of publication, as well as possible presentation at scientific conferences.

Chapter Three

Results

Cases under investigation had to fit the following criteria:

- The decedent had to have been found dead with no external injuries such as gunshot wounds or stab wounds. No evidence of an act of commission on the part of any person must have been present;
- The death was sudden and unexplained, i.e.:
    - The decedent may have been healthy and suddenly dropped dead;
    - There may have been no medical history to explain the death.
- The decedent may have died en route to hospital;
- The decedent was admitted to a hospital with the onset of symptoms and died before a full clinical workup could be done, and thus no clinical diagnosis was formulated;
- Infants who fit the criteria of Sudden Infant Death Syndrome (SIDS) or Sudden Unexpected Death in Infants (SUDI) were included.

The retrospective study entailed the review of 500 cases admitted to the Pretoria Medico-Legal Laboratory (PMLL) between 1 January 2009 and 13 March 2010. The reason for including the first few months of 2010 and not the last few months of 2008 was to gain the most recent depiction of the quality of data. The prospective study was conducted over a period of three months, from 10 June 2010 to 9 September; during which time 100 that matched the study criteria were admitted to the PMLL.

The demographic data of the decedents were not recorded as it was found to be irrelevant to current the study. The study focuses on the quality of data received by forensic pathologists for sudden unexplained deaths, and not the occurrence and demographics of such sudden unexplained deaths.

3.1. Seasonal variation

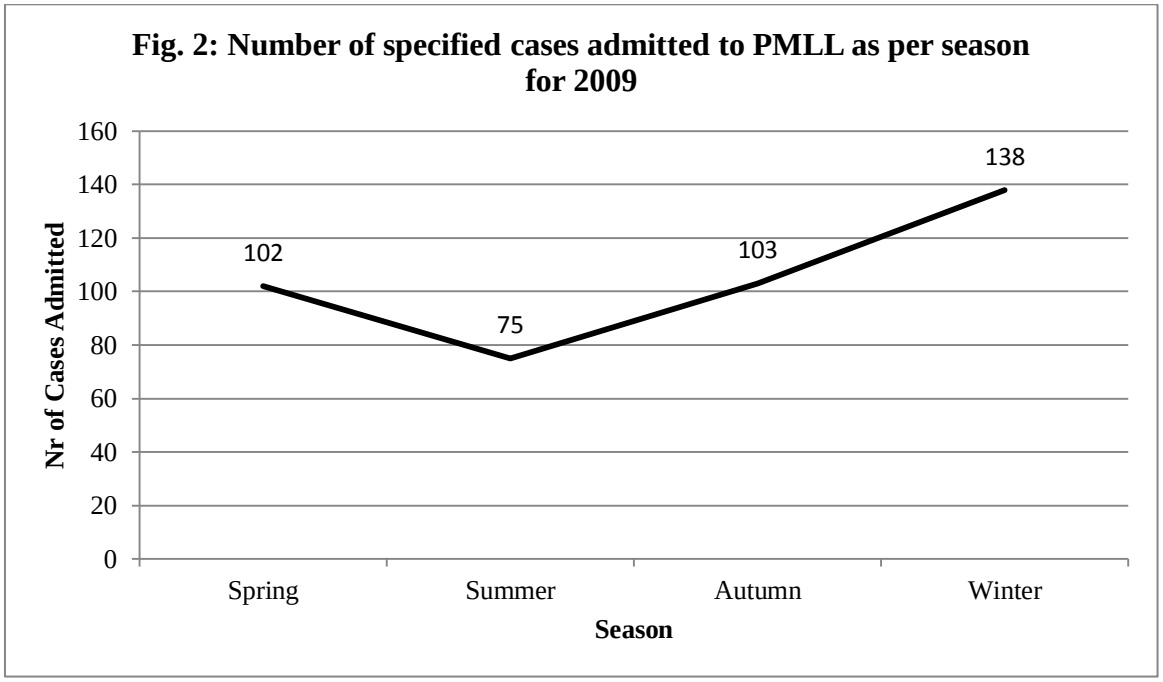
As the retrospective study covers the entire year of 2009, seasonal relationship with the number of cases admitted to the PMLL may be seen. In South Africa the seasons are generally divided as shown in Table 2:

Table 2: Categorisation of seasons according to months

Spring	**Summer**	**Autumn**	**Winter**
September	December	March	June
October	January	April	July
November	February	May	August

From Figure 2, it can be seen that there does seem to be a relationship between the season and the number of specified cases admitted to the PMLL, with an increase in the number of sudden unexplained deaths during the winter months. An explanation for this may be that

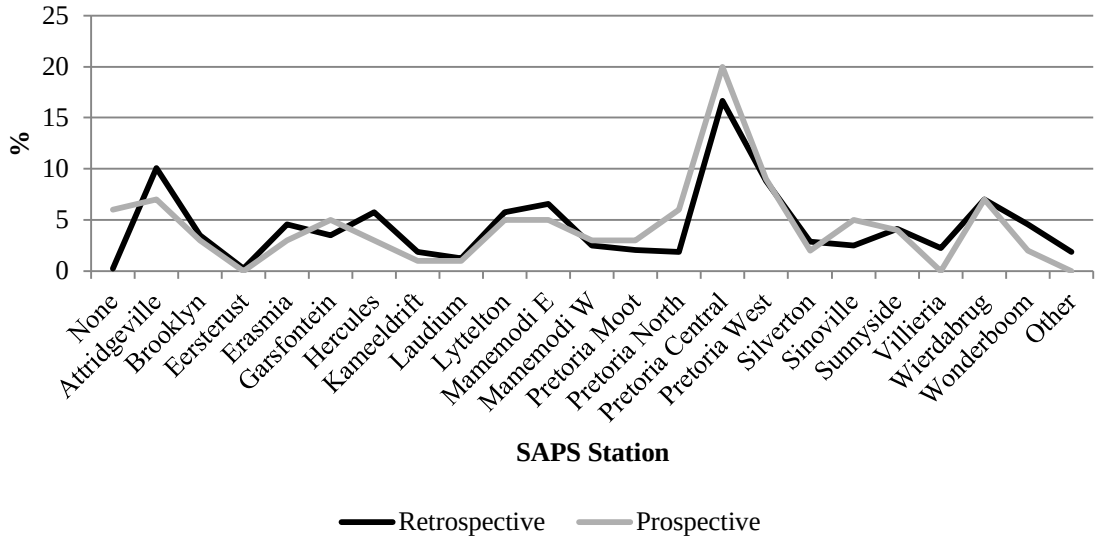
many of the decedents were in fact homeless and may have died due to exposure to the cold during the winter months.



During the retrospective study, 418 of the 500 cases were admitted to the PMLL in 2009. Of these 418 cases, 24.40% were admitted during spring, 17.94% during summer, 24.64% during autumn, and 33.01% during winter. Of the 102 cases that were admitted in spring, 48.04% were deemed to be due to natural causes, 53.33% of the cases admitted in summer were deemed to be due to natural causes, 60.19% and 15.72% of the cases were deemed to be due to natural causes during autumn and winter respectively.

3.2. SAPS station distribution

Fig. 3: The percentage cases handled by respective SAPS police stations



Just as a matter of interest, it can be seen from Figure 3 that the majority of the specified cases that were admitted to the PMLL during the periods of January 2009 until March 2010 and June 2010 until September 2010 for the retrospective and prospectively studies respectively were reported through Pretoria Central Police Station, followed by Attridgeville and Pretoria West Police Stations. It must be noted that these figures only represent those cases concerned with this study.

3.3. Medical intervention

Fig. 4: Hospitalisation and emergency medical service treatment for retrospective and prospective data

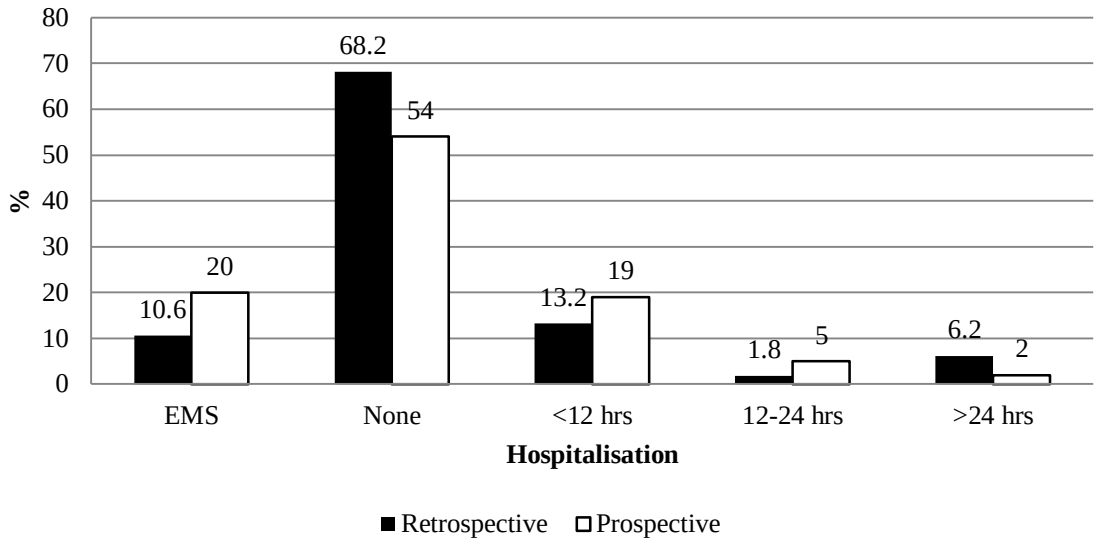
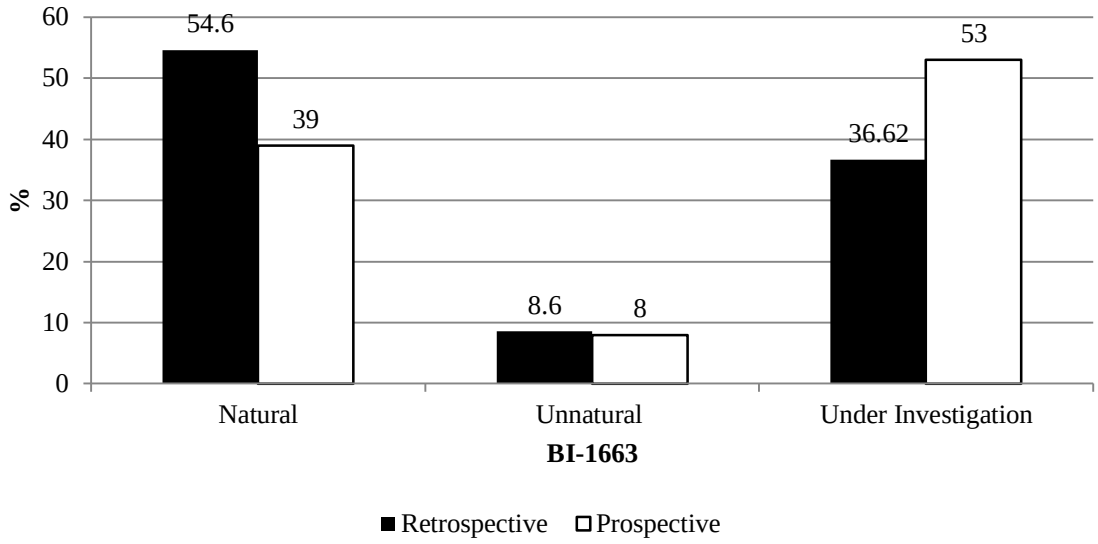


Figure 4 shows in both the prospective and retrospective components of the study that in the majority of the cases the decedents had dies without having been taken to the hospital, were simply found dead. Those that were recorded as having been admitted to the hospital and having died within 12 hours of admission also included those decedents that were "dead on arrival" or "DOA", thus there may be a relationship between emergency medical services at the scene and death within 12 hours of admission, however this cannot be proven here. There may be many explanations for the small number of cases having survived more than 12 hours (including more than 24 hours). It may be that a clinical diagnosis was made within 12 or 24 hours, or that many of these individuals do in fact pass away within 12 hours of admission to the hospital. Another reason, which is purely speculation, is that many decedents that did not pass away within 12 hours of admission were in fact signed out by the treating physician as having died of natural causes and thus these cases were not referred to the PMLL as medico-

legal cases. The question therefore stands, how many of these so-called cases were in fact natural and not merely disguised homicides?

3.4. Cause of death

Fig. 5: Percentage distribution of certification of BI-1663 forms for retrospective and prospective data



From Figure 5 it can be seen that in the retrospective study, half of the cases reviewed over the fifteenth month period were deaths that were in fact due to natural causes. The proportion of natural deaths that were admitted throughout the three month period of the prospective study is slightly less than that in the retrospective study. There may be many reasons as to why there is such a large number of natural causes cases being admitted to the PMLL which will be discussed later.

For each classification of death; natural, unnatural or under investigation, completed in the BI-1663, further investigation into additional tests conducted was made. The results thereof are depicted in Tables 3 and 4.

Table 3: Tests requested as according to BI-1663 for the retrospective data

	Natural (54.60%)	**Unnatural (8.60 %)**	**Under Investigation (36.80%)**
Alcohol	14.29%	55.81%	51.01%
Illicit Drugs	0.37%	4.65%	16.30%
Organic Phosphates	0.00	4.65%	4.89%
Carbon Monoxide	0.37%	0.00	1.63%
DNA	0.00	6.98%	6.52%

Within the retrospective study, those cases that were signed out as being due to natural causes was calculated as 54.60% of the total, with 14.29% having toxicological tests performed for alcohol, 0.37% for illicit drugs, and 0.37% for carbon monoxide. Eight point six zero percent of cases in the retrospective study was signed out as due to unnatural causes, with 55.81% of these cases tested for alcohol, 4.65% tested for illicit drugs, 4.65% tested for organic phosphates, and in 6.98% samples for DNA analysis were collected.

Thirty-six point eight percent of the retrospective data was signed out as under investigation, with 5.1% of cases tested for alcohol, 16.30% tested for illicit drugs, 4.89% tested for organic phosphates, and in 6.52% of cases samples for DNA analysis were collected.

Table 4: Tests requested according to BI-1663 for the prospective data

	Natural (39.00%)	**Unnatural (8.00)**	**Under Investigation (53.00%)**
Alcohol	17.95%	75.00%	60.38%
Illicit Drugs	0.00	12.50%	5.66%
Organic Phosphates	0.00	0.00	0.00
Carbon Monoxide	0.00	0.00	1.89%
DNA	0.00	0.00	1.89%

As can be seen, of the 39 cases that were deemed to be due to natural causes, requests for alcohol toxicological tests to be done were made in 17.95% of cases. Of the 8 cases deemed to be unnatural deaths, 75% were subjected to alcohol toxicological tests, and in 12.5% of cases it was requested that the presence of the derivatives of illicit drugs be tested for. The remainder of the cases had no additional tests requested.

In sixty point three six percent of the 53 cases “under investigation” toxicological tests for alcohol were requested, in 5.66% of cases it was requested to test for illicit drugs, 1.89% for carbon monoxide poisoning and in 1.89% a sample of DNA for analysis was collected. In the remainder of cases no toxicological tests were conducted, however the tissues may have been microscopically examined to determine with certainty the cause of death, or in the case of infants, there may have been virology tests requested.

In the prospective component of the study there were 3 cases which were tested for both alcohol and illicit drugs; 5 cases which were tested for a combination of alcohol, paracetamol, aspirin and sedatives; and 2 cases which were tested for alcohol and anti-depressant drugs.

In the retrospective component of the study, 30 cases were tested for alcohol and illicit drugs, whilst 4 were tested for alcohol and carbon monoxide, and 8 tested for alcohol and organophosphates. Other toxicological tests frequently requested together with alcohol include sedatives, hypnotics, carbamates, anti-depressants, heavy metals and analgesics.

3.5. Scene attendance

Fig. 6: Percentage distribution of whether forensic pathologists were contacted or not

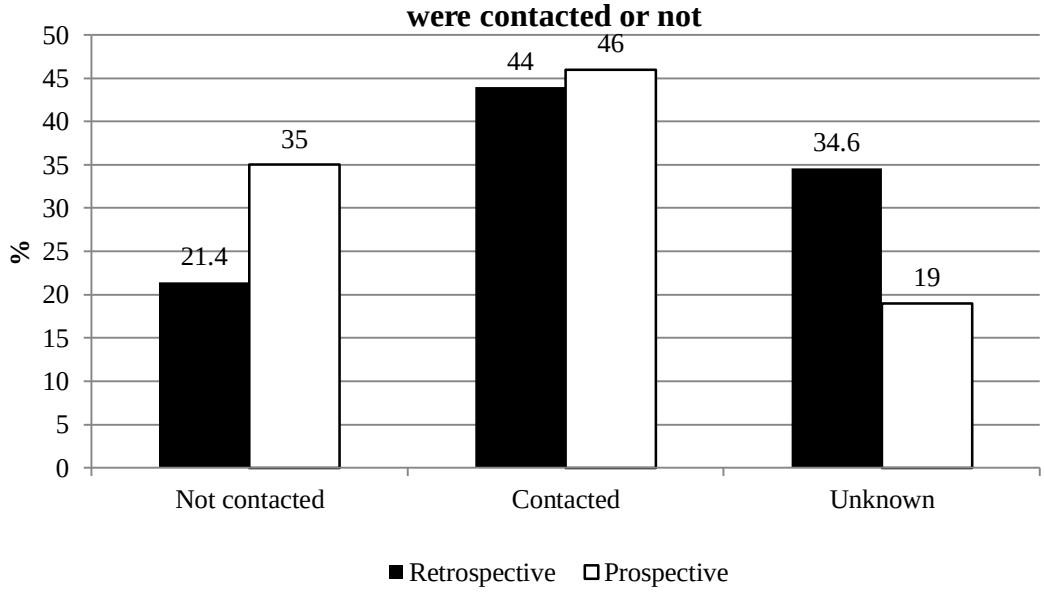


Figure 6 depicts the proportion of cases in which the forensic pathologist was contacted, not contacted, or where it is unknown whether the forensic pathologist was contacted. As can be seen, in both studies, the forensic pathologist was contacted in approximately 50% of the

cases. Table 5 shows the percentage of cases where the forensic pathologist attended the scene of death for the prospective study. Unfortunately, such data was not recorded in the files in the retrospective study, thus, further investigation into the relationships between whether the forensic pathologist was contacted or attended the scene, and ultimately how the BI-1663 was completed can only be done for the prospective study.

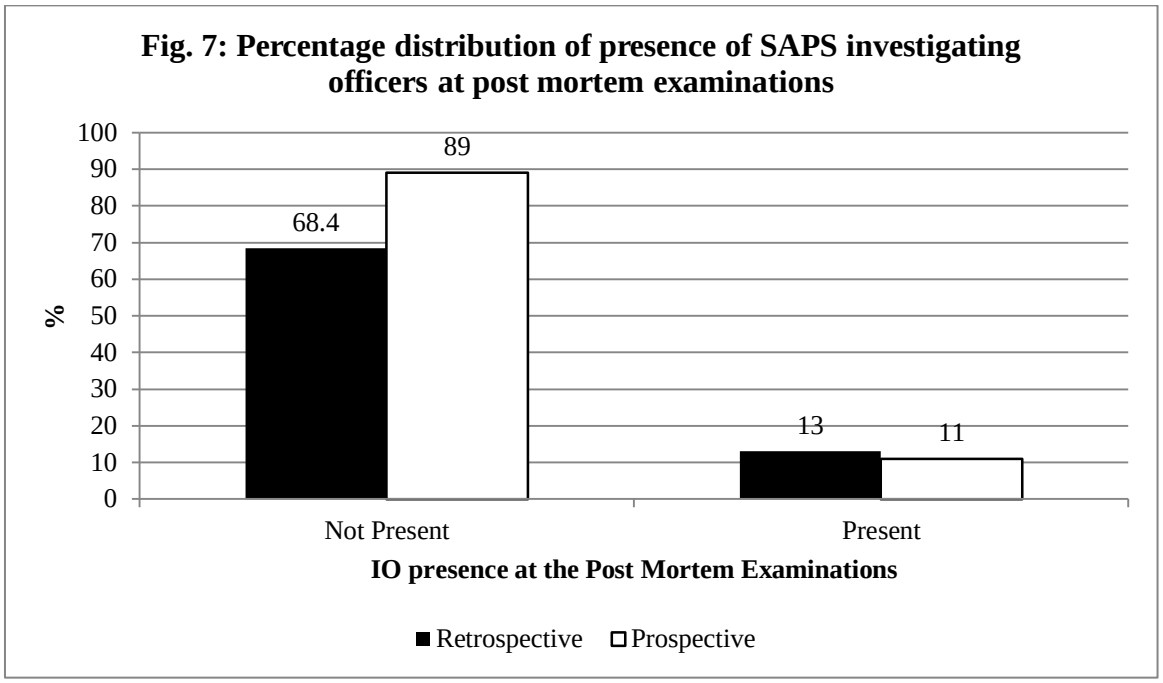
Table 5: Attendance of the scene by the forensic pathologist for the prospective data

Attended	Not attended	Unknown
6%	46%	48%

In the 100 cases reviewed in the prospective study, where the forensic pathologist was contacted and subsequently attended the scene amounts to 6%. Of these, 2% were signed out as being due to natural causes, and 4% as under investigation. In 20% of the cases, the forensic pathologist was contacted and did not attend the scene. Of these, 8 were signed out as being due to natural causes, 11 due to other than natural causes, and 1 under investigation.

From Figure 6 and Table 5, it is seen that for 35% of the cases, the forensic pathologist was not contacted, with 14 of these cases deemed to have died from natural causes, 4 cases due to other than natural causes and 17 cases under investigation. For 19% of the cases it was unknown whether the forensic pathologist attended the scene. Nine of these cases were due to natural causes, and 10 cases were signed out as under investigation.

3.6. Post-mortem examination attendance by Investigating Officers



From Figure 7, it can be seen that in both the retrospective and prospective studies that the SAPS investigating officers very rarely attend the post-mortem examination for their specific cases. In the retrospective study it was unknown whether the investigating officer was present at the post-mortem examination for 18.60% of the data.

3.7. Quality of information

In the prospective study, the forensic pathologists were asked to provide an opinion with regards to the case in terms of the scope and nature of the information provided. It must be pointed out here that the forensic pathologist who may have been contacted to attend the death scene may not necessarily have performed the post-mortem examination on the specific case. The results thereof revealed that in 73% of cases, insufficient information was available, of which 3 cases had no docket present at the time of the post-mortem examination. In 9% of the cases had adequate information been received after the completion of the post-mortem

examination, either from personal communication with the attending physician, the family or the investigating officer. In only 13% of the cases had adequate information been received prior to the post-mortem examination. One case was deemed a natural death that should not have been admitted. It was stated that the investigating officer was unsure whether the case was medico-legally significant or not, in this particular case, the forensic pathologist was contacted to do so, but did not attend the scene. There was also one case in which the forensic pathologist stated that there was too much worthless information contained in the docket, such as credit card details. Another case involved a decedent who had been admitted into the Emergency Room of a hospital and subsequently died. He was admitted at the PMLL as a sudden unexplained death, however at the post-mortem examination, two gunshot wounds were discovered which were not noticed by the casualty doctor, investigating officer, nor the forensic officer.

Fig. 8: Percentage distribution of forensic pathologists' opinions and BI-1663 certification

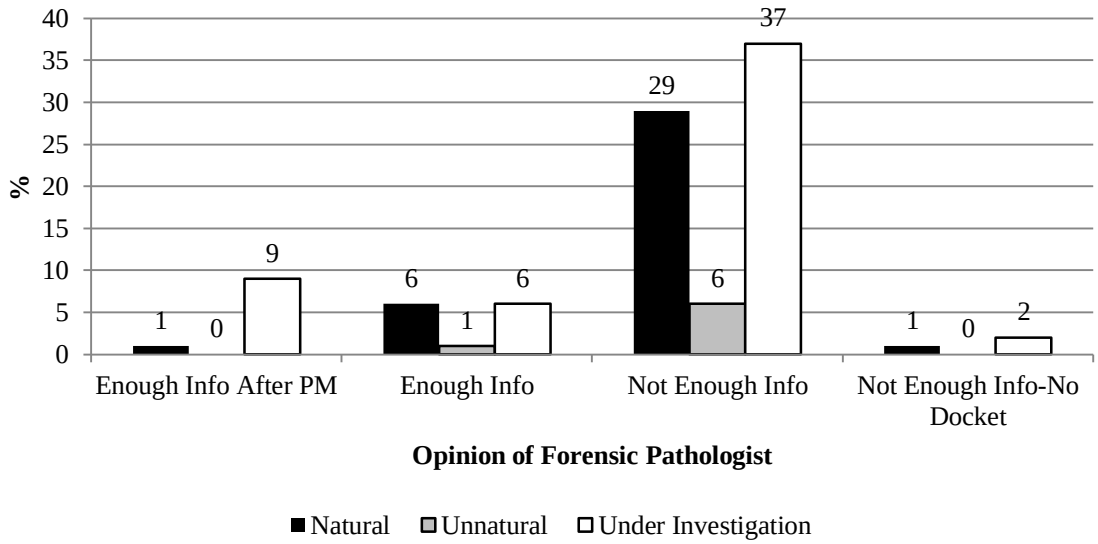
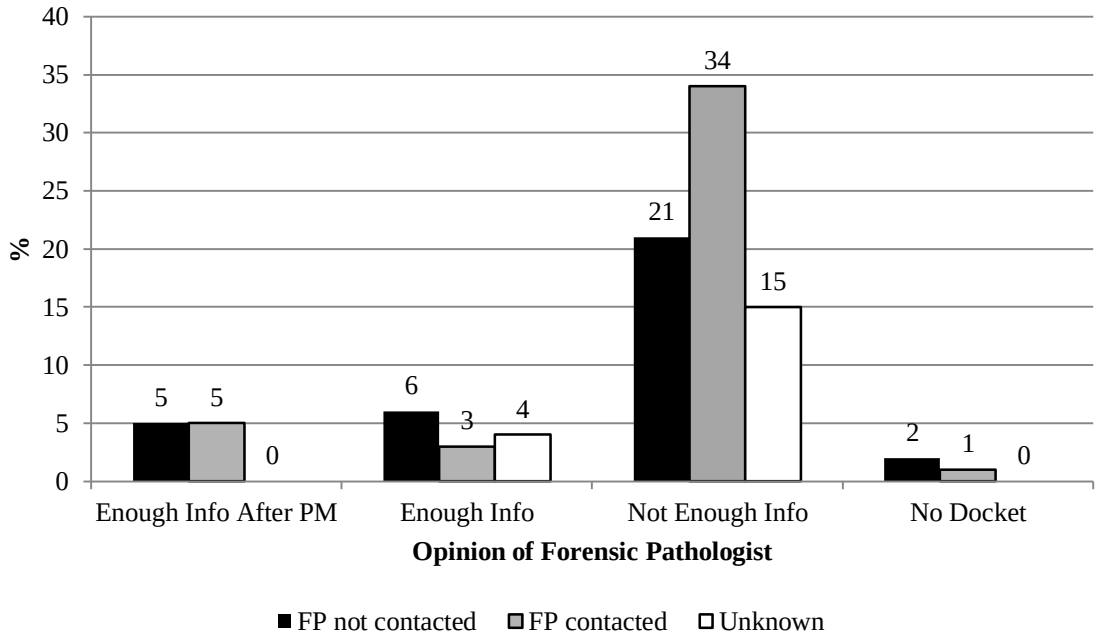


Figure 8 compares the opinions of forensic pathologists with the certification of death on the BI-1663 form. In 29% of the cases which did not have enough information prior to the post-

mortem examination, the deaths were deemed to be due to natural causes, and 37% of these cases are still under investigation. As it can be seen, these two observations form the largest proportion within the graph, and thus should raise some concern. Those cases where additional information was obtained after the post-mortem examination had been conducted are also more than the number of cases where enough information was provided prior to the post-mortem examination.

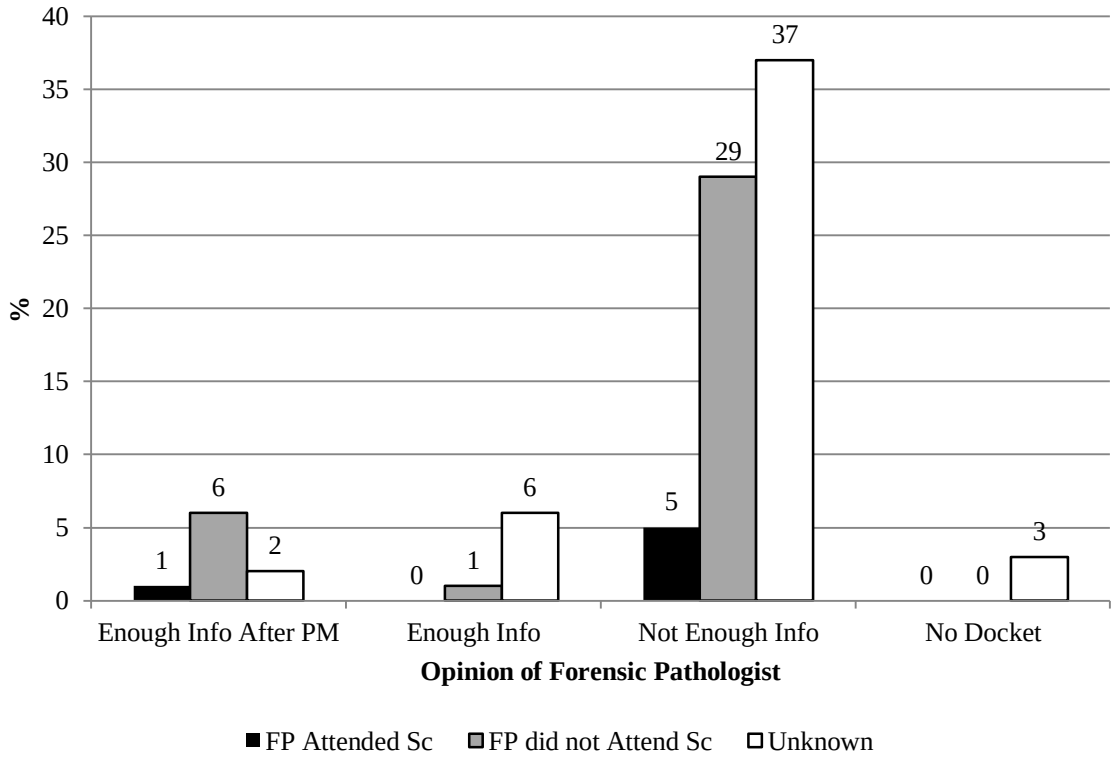
Fig. 9: Percentage distribution of forensic pathologists' opinion when compared to whether they were contacted



Figures 9 and 10 compare the opinions given by the forensic pathologists and whether a forensic pathologist was contacted to attend the scene of the death and whether a forensic pathologist attended the scene respectively. It is interesting to note that for the majority of the cases where insufficient information was provided prior to the post-mortem examination; the forensic pathologist was in fact contacted to attend the scene but in only 5 cases was the scene actually attended. Additionally, the gunshot wound case was not telephonically referred

to the forensic pathologist, whilst the case docket containing useless information was telephonically discussed with the forensic pathologist. It is however unknown whether the death scene was attended. The case that was admitted due to confusion on the part of the investigating officer was telephonically communicated with the forensic pathologist; the scene however was not attended. Another interesting observation is that where a forensic pathologist was of the opinion that there was not enough information prior to the post-mortem examination, the death scene was in fact not attended by the forensic pathologist.

Fig.10: Percentage distribution of forensic pathologists' opinions when compared to whether they attended the scene



It must however be taken into consideration that information normally contained in the SAPS docket such as family or witness statements, scene photographs or sketches, as well as inventories of what was found at the scene are not present in the post-mortem dockets stored at the PMLL, and as such, it is unknown whether this additional information was in fact

present at the time of the post-mortem examination. No record of what was present and what was provided at the time that the post-mortem examination is available, and thus, for the retrospective component of the study, this could not be investigated.

Chapter Four

Discussion

The sudden unexplained death of an individual raises many questions with regards to the cause of death and the manner of death and investigators are put under a lot of pressure by family who want speedy results. There are however, many factors that contribute towards a less than ideal system of medico-legal investigations into deaths in South Africa.

When one looks at the seasonal distribution of sudden unexplained deaths in Pretoria throughout 2009, the majority of the cases were admitted during the winter months. An explanation for this may be that many of the decedents on whom medico-legal post-mortem examinations were performed were in fact homeless people who did not have any identification documents on their person, nor was any medical history obtainable. The majority of these individuals were admitted as having died of exposure, the coldest temperatures recorded in 2009 in Pretoria were 10.9^0C and 11^0C within the month of June. [81] At the post-mortem examination, it may have been discovered that the decedent had an underlying disease such as pneumonia or tuberculosis, which may have contributed to their demise. When one considers the correlation between the seasons and the categories of death i.e. natural versus unnatural versus under investigation, it is seen that approximately half of the cases admitted to the PMLL each season died of natural causes, which makes one wonder whether there is a significance in the large number of sudden unexplained deaths that occur in the colder months and the category of death.

A disturbing observation is the large proportion of deaths that occur due to natural causes and that are still admitted to the PMLL for post-mortem examination. There may be many explanations for this, one of which is the fact that the legal definition for an "other than natural death" is found only within the National Code of Guidelines for Forensic Pathology Services for South Africa. This document is not readily available to persons who are not part of the Forensic Pathology Services and therefore confusion as to the definition of an unnatural death may exist. Medical doctors may also not know or understand what is classified as a unnatural death and thus may inform the SAPS unnecessarily of the death. At the same time, the responding SAPS officer may also not know or understand what it means for such a death to be considered medico-legally significant. As such, there are many cases that are admitted to the PMLL for medico-legal investigation that do in fact not fit the criteria of unnatural death as the death would be due to natural causes. With the under-reporting of deaths, as well as the inexperience or uncertainty of the investigating officers, medical practitioners and forensic officers, there are no definite mortality statistics. This can be seen with the discrepancy in data between Statistics South Africa and the National Population Registry of the Department of Home Affairs, with mortality statistics ranging from 54 740 in 1997 to 46 360 in 2008. There is a decrease in the difference between these statistics, however the large discrepancy between these numbers is still disturbing and one wonders as to what may cause this difference. This discrepancy may indicate a lack of governance or maintenance of the reporting of deaths, or even of the records or archives themselves where death certificates are held.

In this study, deaths that occurred in hospital included those where the demise occurred within twenty-four hours of admission, with no diagnosis after a complete clinical workup. However a major concern is those cases that are classified as procedure related deaths, as

defined in section 48 in the Health Professions Amendment Act (Act 29 of 2007). Section 48 replaced section 56 of the Health Professions Act (Act 56 of 1974). In 2008, this amendment was effected when it was recognised that there needed to be a greater protection of the patient by the health professionals whilst under their care. The promulgated section 48 allows for a larger range of deaths to be eligible for medico-legal enquiry which may otherwise not have been investigated under the old section 56 of the Health Professions Act (Act 56 of 1974). [82]

In 2006, 94% of "anaesthetists" in South Africa admitted to drug administration error, a significant number amounted to death, thus revealing that there should be a greater awareness and reporting mechanisms in order to identify and manage risks. One may be inclined to include maternity deaths in these procedure related deaths, as approximately 67% of maternal deaths in 1998 were directly as a result of the anaesthesia. [82]

In South Africa, the reporting of an unnatural death within a hospital setting seems reliant on the sophistication of the reporting system, the amount of complex surgical procedures managed, as well as the knowledge and discretion of the medical practitioner. The inadequate legislative guidelines for the reporting of such deaths make it difficult to apply the law to specific and individual cases. [82]

When a body is admitted to the PMLL, there are still many administrative formalities that must be undertaken, even though the death may be due to natural causes is referred back to the treating physician to complete the death certificate. On admittance to the PMLL, each corpse is assigned a death registration number. Once this number is assigned the necessary

administrative procedures must be followed regardless of the outcome of the post-mortem examination.

One might say that this could be remedied by contacting the forensic pathologist. Research has however shown that in many cases, the forensic pathologist on duty is contacted, but, it is not known as to what information is supplied to them during the brief telephonic communication that they may have with the contacting individual. This may either be the forensic officer on duty or an SAPS investigating officer who responded to the death scene.

One may then argue that, as shown in the research, forensic pathologists do not often attend these death scenes, and if it were made mandatory to do so, there would be less unnecessary natural deaths admitted to the PMLL for medico-legal post-mortem examinations. This would however not be ideal, as there are time and fiscal constraints that prevent this. The duties of the forensic pathologist are many, namely, conducting post-mortem examinations, administrative duties, perusal of cases on behalf of the National Prosecuting Authority (NPA) or private companies, as well as court appearances as expert or professional witnesses. It is thus not possible for them to attend each and every death scene.

Whilst forensic pathologists cannot attend every death scene, the SAPS investigating officers can also not attend every post-mortem examination. As shown in the research, these investigating officers very seldom attend post-mortem examinations, and there may be many reasons for this. It may be that the case load of the investigating officers are so heavy that it does not allow them the brief hour or two at the PMLL to witness the post-mortem

examination. Another reason may be that the individual investigating officers may not be comfortable around the corpses of the deceased, either due to personal reasons such as superstition, or the inability to stomach the sights, sounds and smells that permeate the mortuary environment. There is also a sensationalism of death by the media through television shows such as CSI and NCIS, as well as news programs that mostly report gruesome deaths. This publicity of death may cause that where a death scene is not gruesome or is "uninteresting" or where there is no clear evidence of foul play, that there is very little interest in the case, and as such, very little effort is put into the investigation.

When considering the statement made in the Mail and Guardian as to the importance of medico-legal death investigators and also the requirement of improved co-operation amongst the forensic toxicology laboratories, forensic mortuaries, the police and the justice system, it can be seen that a problem has been recognised, though yet not addressed. There is mention of medico-legal death investigators, but in what context? Are they referring to all the professionals involved within the medico-legal investigation of a death, such as forensic pathologists, police officers, forensic scientists? There should be a clear distinction here, as it should also be understood that specially trained death investigators are necessary in order to the lack of co-operation amongst the departments.

An observation that was made during the review of the post-mortem dockets, both retrospectively and prospectively was the lack of medico-legally relevant data to the forensic pathologist for assistance in the approach to the post-mortem examination. This refers to sketches and photographs of the scene, which are only available after the post-mortem examination, if at all. Descriptions of the scene as well as of the body, such as degree of rigor

mortis, body temperature and environmental temperature, insect activity, etc are also not included. If the forensic pathologist did not attend the scene personally, this information which may have relevance to the post-mortem examination or even to determine whether the case is in fact medico-legally significant is lost.

In the prospective component of the study, the opinions of the forensic pathologists with regards to the scope and nature of the information provided in the post mortem docket revealed that they believe that they did not receive adequate information prior to the post-mortem examination. In some cases, pathologists had to contact the investigating officer in order to gain more information or to request the procurement of medical records, this is however only done after the post-mortem examination is completed. This is not good practise, as it may be necessary to conduct special investigations, such as histological or toxicological investigations in order to detect an underlying disease or any drugs or poisons that may not have a distinctive odour or appearance; and thus may be missed at the time of the autopsy. This may have medico-legal significance, as well as health implications for family members. The presence of medical records prior to the commencement of the post-mortem examination aid the forensic pathologist in conducting the investigation, as these may indicate as to where any special investigations need to be conducted, and if so, which ones. On the other hand, this may also reduce the amount of unnecessary special investigations that are conducted in instances of sudden unexpected death. Sometimes specimens are collected and special investigations are requested in case there may be something of importance which would later be necessary in legal proceedings.

At the post-mortem examination, it may be thought necessary to conduct specific toxicological tests in order to confirm the use of any drugs; the majority of which is requested is the concentration of alcohol in the decedent's blood. Less commonly tested in cases of sudden unexplained deaths is the presence or absence of the metabolites of illicit drugs, organophosphates and carbon monoxide. It may be that friends or family members hide drug paraphernalia prior to the arrival of the police at the death scene so as not to taint the image of the deceased. This obstructs the forensic pathologists' investigation as they may not know that the deceased was a drug user and thus may not request any toxicological tests. If the family reveals after the post-mortem examination that the deceased did in fact have a history of drug use, it may be too late to acquire any samples from the body for confirmatory testing, and thus, the cause of death may never be established. There may also be many occasions where unnecessary toxicological tests are requested and these serve to further delay the toxicological laboratories in testing, which is struggling with a backlog of many years. This backlog also causes some investigations to be halted and delayed, resulting in some frustration for the investigators as well as the family members of the deceased.

When looking back at the incidence of deaths among young adults, and the correlation thereof with HIV/AIDS, there may be many cases that are overlooked, due to the nature of the disease and also the uncertainty as to whether the death falls within the realm of medico-legal death investigation. Many medical practitioners and police officers are uncertain as to whether a death is natural or unatural when an individual may have died of an opportunistic disease, as they may believe that the deceased would not have gotten the opportunistic disease, had they not had HIV/AIDS. On the other hand, there may be those deaths that are in fact other than natural deaths which are signed out as natural, where the deceased may have been poisoned or the like.

When one looks at the system of medico-legal investigations into deaths in South Africa, one must consider too, the difference between coroners and medical examiners.

The major differences between coroner and medical examiner systems are shown in Table 6;

Table 6: Major differences between coroners and medical examiners

Coroner	**Medical Examiner**
Elected into office for a four year term	Appointed, until there is reason to terminate employment
May be non-physicians such as lawyers	Trained medical professionals with board certification
May request an autopsy to be done	May perform autopsies

Coroners have greater political bearing as they are elected into office, whereas medical examiners are not politically inclined as they are appointed into the post. For a coroner, this may be advantageous, as they may have a say as to the changing of statutes with regards to the medico-legal investigation of deaths. In South Africa, the forensic pathologist is similar to the medical examiner in that they are appointed into posts, and they are trained medical professionals with a Masters degree in Medicine. Legislation also provides that forensic pathologists must perform post-mortem examinations where the death has been reported to the SAPS and where the investigating officer deems it necessary. It is of concern that the police officer is in fact in the position to determine whether a death requires a post-mortem

examination, as the police officer may not have the required medical knowledge in some cases to be able to determine whether a death is in fact natural or unnatural.

Within the coroner and medical examiner systems, the forensic pathologist, or medical examiner who performs a post-mortem examination must determine the cause and manner of death; whereas in South Africa, the forensic pathologist must determine the cause and mechanism of death. The magistrate, on reviewing all the relevant data and information must then make a finding as to the manner of death. The magistrate may be ill-equipped and inexperienced in death investigation and thus unable to make the decision as to the manner of death. Such a magistrate only receives the final docket at the end of the investigation, and as such may not understand some of the medical jargon contained within and may also not be aware of some of the implications of injuries and appearances of the death.

Another difference found between the coroner and medical examiner systems, as seen in the rest of the world, and South Africa, is that there are specially trained professionals who oversee or coordinate the death investigation within the coroner and medical examiner offices. These professionals are the medico-legal death investigators. When the respective office is contacted by the police officer on the scene, the death investigator receives the call and attends the scene on behalf of the coroner or medical examiner. It must howeer be noted that the coroner or medical examiner may attend the scene personally if they deem it necessary.

In South Africa, there is no individual, professional or otherwise, who administrates the process of death investigation. The forensic officer at the medico-legal laboratory receives the police docket and compiles their own post-mortem docket which contains the police docket and administrative forms. Should additional information be required, the forensic pathologist must contact the investigating officer after the post-mortem examination has been conducted, as the investigating officer handling the case is not necessarily the investigating officer who attended the death scene. It is here that there may sometimes be a loss of information from one investigating officer to another. There may also be important information or observations that go unrecorded and that are thus not investigated, which could prove to be essential in the case.

It is thus clear that South Africa will benefit greatly from medico-legal death investigators, who would attend the death scene where they may make notes, take photographs or make sketches, and also instruct the police officer as to whether the forensic laboratories need to be contacted, what evidence needs to be collected as well as what evidence must accompany the body to the mortuary; such as medication found, or household cleaners, etc. The medico-legal death investigator would also aid the investigating officer in determining whether the case is of medico-legal significance, the investigating officer may be uncertain.

The death investigator has the authority to interview family members and witnesses at the scene of the death, as well as the power to subpoena medical records and the like. Once the death investigator believes that he or she has as much relevant information as possible, he or she compiles a case file for the medical examiner or coroner, which will accompany the post-mortem docket and the police docket to the post-mortem examination. In other words, the death investigator manages the case before handing it over to the coroner or coroner's

pathologist or medical examiner for post-mortem examination, with all relevant information contained in the file complied by them.

Personal communications with two individuals within the NPA revealed an opinion that the utilisation and employment of medico-legal death investigators would indeed be valuable in the medico-legal investigation into deaths. They believe that these professionals would aid in the settlement of cases, with specific reference to those that are classified as unnatural according to section 48 of the Health Professions Act (Act 29 of 2007) or procedure related deaths, as well as those cases where they are currently unable to make any findings and as such are being rejected by the courts. Cases where a post-mortem does not sufficiently reveal a cause of death, or where toxicological reports are outstanding are particularly challenging, as these usually result in rejection from the court. It is believed that with the institution of medico-legal death investigators the amount of these cases that are rejected will decrease, as there will be a professional with medical knowledge to guide the NPA in their understanding of the medical terminology and technicalities. There would also be fewer cases where the cause of death remains undetermined as the death investigator would aid the forensic pathologist in their investigation, and thus, it could be presumed that the NPA would be agreeable to the institution of medico-legal death investigators.

It was intended to conduct a study at the Pretoria Inquest Court, in order to qualitatively review cases where the decedent was found dead, as well as deaths that were described as procedure related deaths. Also included in this study would have been cases in which the court was unable to make any findings. The data which would be reviewed included the extent of the information that was contained in the docket, and the presence or absence of

important information, such as medical records. It was intended that the results of the proposed study be correlated with the study undertaken at the PMLL.

When one considers that the population of South Africa was 49.32 million in 2009, and the number of deaths in 2006 was 612 462, of which approximately 122 492.4 were due to other than natural causes, it can be seen that is a large number. If one assumes that approximately the same numbers of cases i.e. 122 492.4 or more were accepted at medico-legal mortuaries in South Africa in 2010, as there are many natural deaths that are also admitted to the medico-legal laboratories country-wide, it is a large number of autopsies to be handled by 35 practicing forensic pathologists. Not all of the autopsies are conducted by forensic pathologists however; in rural areas; autopsies may be conducted by medical practitioners. For example, in 2009 more than 3 300 post-mortem examinations were conducted at the Pretoria Medico-Legal Laboratory, by the four forensic pathologists, four forensic pathology registrars and one medical examiner employed there, thus, amounting to approximately 350 to 400 post-mortem examinations to be performed by each individual.

The quoted number of 5 467 personnel who are employed at the Criminal Records Centre (CRC) and forensic laboratories include administrative staff. These people are divided amongst all the forensic laboratories country-wide e.g. chemistry laboratories, ballistics, etc. Along with the 153 981 police officers within South Africa, this may be seen as a large amount, however the number of serious crimes reported over the 2008-2009 period was over 2 million. These individuals are thus clearly overwhelmed by the sheer numbers of cases. From these figures and comparisons, it can be seen that there is a drastic shortage of man-power. It is thus understandable that role players do not involve themselves with the other

departments, as they may be overwhelmed by their own workload. Thus, with the addition of medico-legal death investigators, it is believed that, where there are deficiencies on the part of all the role players, that medico-legal death investigators would pick up the slack in the chain of the investigation, as well as contribute vital expertise towards the investigation which are otherwise absent. In essence, the medic-legal death investigators are the missing link within the death investigation system in South Africa.

In South Africa, the forensic laboratories fall under the jurisdiction of the SAPS, however, the medico-legal laboratories are under the jurisdiction of the Forensic Pathology Service of the Department of Health. As the death investigators would be working in close conjunction with the forensic pathologists, it would seem best for these professionals to fall under the jurisdiction of the Department of Health, rather than that of the SAPS. It would however be appropriate for the medico-legal death investigators to fall under the jurisdiction of both the SAPS and the Department of Health, in order to connect these two departments who need to work together to obtain results during the medico-legal investigation of any death.

It was recognised that the medico-legal investigation of a death required a scientific knowledge and background, and as such the medico-legal laboratories were placed under the jurisdiction of Provincial Departments of Health in 2006. After this change however, professionals with the scientific knowledge base for medico-legal death investigations have still not been employed or utilised in any way or form within the medico-legal system.

It appears that in South Africa, the medico-legal investigation into deaths may benefit greatly from professionally trained medico-legal death investigators. This may lighten the case load of the investigating officers, as well as improve the quality of data that the forensic pathologists receive prior to the post-mortem examination, thus easing the burden on the forensic pathologists as well. The time frame in which cases are handled and signed out at the medico-legal laboratories may also be decreased, thus being advantageous to both the staff and the family members. The overall investigative process may also be sped up and qualitatively improved. The NPA will benefit from such professionals, as well as there will no doubt be less additional information required to close their cases. The medico legal death investigator must have the authority to procure any records, such as medical records from any person. They must thus have the power to subpoena such records. It may also be beneficial for these individuals to be commissioners of oaths in order to certify copies of the medical records that they would be procuring, in order to verify the authenticity of such records.

Medico-legal death investigators in South Africa should be specifically trained in death investigation with a history of and education in the health sciences, such as BSc graduates in medical or biological sciences, emergency medical care or nursing. These professionals need to have knowledge of human anatomy and physiology as a background or foundation to the medico-legal death investigation. The education and training of these professionals needs to be in the form of post-graduate degrees, which should include both theoretical and practical components of medico-legal death investigation.

Chapter Five

Conclusions and Recommendations

When one considers the extremely high death rate in South Africa, it would seem to be advantageous to all parties involved with the medico-legal investigation, if a medico-legal death investigator were to be incorporated into the investigation.

The medical examiner and coroner systems' utilisation of medico-legal death investigators prevents or decreases many of the problems that are experienced in the medico-legal investigation of deaths in South Africa.

Brad Randall's diagrammatic representation and description of medico-legal death investigators seems to be the perfect solution to this unspoken conundrum, as the duties of these medico-legal death investigators is to primarily receive the notice of a death and decide as to the medico-legal significance of the case. These professionals attend the death scenes and may photograph the scene and the body or make diagrammatic representation thereof for later use by the forensic pathologist. They may make notes that are relevant to the forensic pathologists' investigation, such as degree of rigor mortis, insect activity, body and environmental temperature, the presence or absence of sputum or vomit on or around the body; that may otherwise go unnoticed and may be of importance to the forensic pa'hologists' investigation. These professionals may interview witnesses or family members concerning medically relevant facts that would otherwise go unquestioned by the investigating officer, and may only be addressed after the post mortem examination.

The medico-legal death investigator should have the power to subpoena any records relevant to the medico-legal investigation, at the time of the scene investigation, so that these may be available for perusal prior to the post-mortem examination. The death investigator must then compile a file to accompany the post-mortem docket and the police docket for review by the forensic pathologist prior to the post mortem examination. This file must contain all relevant data pertaining to the case. This includes the circumstances that lead to the death, the decedent's medical history, and pertinent information about the death scene.

The novelist, Patricia Cornwell, is a graduate in journalism, the founder of the Virginia Institute of Forensic Science and Medicine, a founding member of the National Forensic Academy as well as a member of the Advisory Board for the Forensic Sciences Training Program at the Chief Medical Examiner of New York County, and has published numerous crime novels such as Post Mortem, The Body Farm and, Black Notice, to name a few. [(83)] In all her novels there is a character who she describes as being a death investigator, which leads one to believe that if a novelist knows about these professionals and thus utilises them in her novels, that they do in fact play a vital role within the death investigation system.

With the institution of medico-legal death investigators, the statutory framework concerning medico-legal death investigations would have to be reviewed. Due to the nature of this profession, the duties of these medico-legal death investigators would have to be included within the legislation, along with the governance of this profession.

The governance, duties and guidelines of the medico-legal death investigators would best be included within the Regulations Regarding the Rendering of Forensic Pathology Services, as well as the National Code of Guidelines for Forensic Pathology Services in South Africa, which are regulated by the National Health Act (Act 61 of 2003). These may also be included within the South African Police Service Policies concerning death investigation. It may be necessary for medico-legal death investigators to fall under the jurisdictions of both the SAPS and the Department of Health, thus allowing the medico-legal death investigators to be a part of both departments, and thereby eliminating and further preventing the "silo effect" that occurs between departments involved in the death investigation.

There are certainly a few challenges that are faced with the legislation with regards to medico-legal death investigation; namely:

- The Inquests Act (Act 58 of 1959) seems rather outdated in that it was written in 1959. For example there is still mention of district surgeons, who no longer exist in South Africa. There is also no mention of forensic pathologists who do in fact perform the post-mortem examinations in medico-legal cases. [25] Also stated in the act is that any medical practitioner may perform a post-mortem examination in order to ascertain the cause of death. The legislation needs to be changed in order to incorporate forensic pathologists, whilst removing the term "district surgeons" completely. There should also be a clearer distinction with regards to the medical practitioner performing a post-mortem examination. Where a medical practitioner is not a forensic pathologist, they must hold a post-graduate diploma in forensic medicine in order to perform a post-mortem examination. This would be relevant in those towns where there are no forensic pathologists.

- In the Inquests Act (Act 58 of 1959), it states that the policeman must report a death to the magistrate, thus implying that the magistrate gives permission for a post-mortem examination to be conducted. This is however not the normal everyday practise. [25] Once the SAPS receive a report of a death, it is at the discretion of the SAPS investigating officer at the death scene to determine the medico-legal significance of the case, and thus whether a post-mortem examination must be conducted.
- It is also stated in the Inquests Act (Act 58 of 1959) that the magistrate must determine the manner of death of any person whose death is reported to him. [25] This may however not be ideal, as the magistrate receives the docket at the end of the investigation, and thus may not grasp the entirety of the case. There may be medical jargon as well as physical concepts of the death scene or even of the body that the magistrate may not understand. In essence, as in the United States of America, the forensic pathologist, from evidence on or in the body and that obtained at the death scene, should make these findings or at least give a proposed manner of death. Through their forensic knowledge and experience, forensic pathologists are in a better position to interpret the manner of death of an individual.
- When one considers the debacle of Dr Harold Shipman in the United Kingdom, one becomes concerned with the Births, Marriages and Deaths Registration Act (Act 51 of 1992) of South Africa. According to this legislation, where a medical practitioner is satisfied that a death is due to natural causes, whether he attended the death, or whether he examined the corpse of the deceased person, and is satisfied that the death is due to natural causes, he may issue a death certificate. [34] One wonders how many of these so-called natural deaths are in fact other than natural deaths that are merely overlooked or missed due to either criminal intentions or inexperience within the field

of forensic medicine. Occasionally, it may happen that a corpse is referred to the medico-legal laboratory where the undertakers may have suspicions as to the manner of death, but by this time it is too late to procure any important specimens for toxicological or histological investigations as putrefaction may have set in. Perhaps if medico-legal death investigators were to be contacted to either attend a death, or to telephonically discuss the death, such "mistakes" would not occur, or would at least be lessened. The number of supposed unnatural deaths that are admitted to the medico-legal laboratories would also be lessened, as discussed previously, as many natural deaths are incorrectly admitted to the medico-legal laboratories.

- The Regulations Regarding the Rendering of Forensic Pathology Services in South Africa as well as the Code of Guidelines for Forensic Pathology Services in South Africa are regulated by the National Health Act (Act 61 of 2003). [35] These regulations would have to be altered in order to accommodate medico-legal death investigators. The duties of the medico-legal death investigator should be included in the procedures relating to the death scene within the operational protocol, and medico-legal death investigators should also be listed as being authorised to perform post-mortem examinations or as assistants to the forensic pathologists.

Ideally, medico-legal death investigators would attend all death scenes, however this, would not be practical. Initially, with the limited numbers of death investigators in South Africa, the scenes where the medico-legal death investigators would be of greatest use would be those where the death came about suddenly and where the death was unexplained, where the death may have occurred within twenty-four hours of admittance to a hospital without a diagnosis even after a complete clinical workup, or where the death may have occurred en route to the hospital after the onset of symptoms.

The opportune time for the medico-legal death investigator to be contacted to attend a death scene would be at the same time or soon after the investigating officer is contacted to attend the scene, this way, very little time is wasted at the death scene in waiting for the death investigator to arrive and conduct their investigation.

The duties of the medico-legal death investigators should include but not be limited to:

- Death scene investigation with subsequent identification and collection of evidence;
- Making sketches or taking photographs of the scene and the body *in situ*, as well as any other relevant details that may aid in determining the circumstances of the death;
- Interviewing family members, witnesses, friends, as well as emergency medical personnel or even medical practitioners if relevant;
- Where deemed necessary the procuring of medical records from a hospital or a private medical practitioner;
- Compilation of a docket which includes all of the above, as well as personal notes made throughout the investigation in order to submit to the forensic pathologist prior to the post-mortem examination;
- Attendance of the post-mortem examination to aid the forensic pathologist in dissection, as well as special dissection. It may however only be necessary for the death investigator to attend the autopsy to provide insight and an opinion as to the circumstances or mechanism of death, or maybe just to answer questions that the forensic pathologist might have;
- If necessary, the death investigator may act as a liaison between the forensic pathologist and the investigating officer;

- The death investigator would also be at the aid of lawyers such as those employed by the NPA, once they have received a docket, and have questions, which may not necessarily require the forensic pathologists' attention, and
- Expert testimony at criminal proceedings may also be required from the medico-legal death investigator.

As with other expertises, these professionals would have to be governed by an authority of peers so as to avoid professional malpractise etc. As seen in the United States of America, there is the American Board of Medico-Legal Death Investigators (ABMLDI), the American Board of Criminalistics (ABC), as well as other organisations who govern and maintain the professional bodies of death investigators within the United Stated of America. These committees also offer training for death investigators and opportunities to advance in the professional field.

In order to demonstrate the effectiveness of medico-legal death investigators within the South African medico-legal setting, a pilot study that will be conducted over a period of twenty-four months is proposed. This study will take place at 5 major medico-legal laboratories throughout South Africa, including Pretoria and Johannesburg. It will require that these laboratories employ a minimum of four medico-legal death investigators with a post graduate degree in death investigation. As seen in the study, there are approximately 100 cases of sudden unexplained deaths within 3 months that are investigated at the Pretoria Medico-Legal Laboratory and it is assumed that this number does not vary much country-wide. So for a given year, there may be between 400 and 500 cases, thus with employment of four death investigators, each investigator will have approximately 100 cases per year to investigate.

The structure of the employment hierarchy at the PMLL is as follows:

Deputy Director (1)

Assistant Director (1)

Chief Forensic Officer (2)

Senior Forensic Officer (9)

Forensic Officer II (13)

Forensic Officer I (3)

This list excludes the administrative and cleaning staff and; it also excludes the forensic pathologists, whilst the numbers in brackets indicate the number of existing positions at the PMLL. It is believed that medico-legal death investigators may occupy a role and post equal to that of a Senior Forensic Officer. The annual salary for a Senior Forensic Officer is approximately R132 000, however due to the qualifications of medico-legal death investigators, this may be an unfair salary for these professionals. As such, it is recommended that these professionals earn between R300 000 and R420 000 annually.

It is also recommended that a graduate degree in death investigation be established in conjunction with universities throughout South Africa, such as the University of Pretoria and the University of Cape Town. However, like the medical field which has limited openings for

training of doctors, a limitation should also be placed on the numbers of death investigators that are trained annually.

Annexures

Annexure A

Case No.	
DR No.	
CAS No.	

Date of pickup	
Date of PM	

SAP 380

Date of pickup	
Time of pickup	
Race of Decedent	
Sex of Decedent	
Place of Death	
Identity of FO	
IO on scene	
Signed	

SAP 180

Time of arrival at scene	
Time of Collection	
ID and Details of FO	
Name of Decedent	
Age of Decedent	
Race of Decedent	
Sex of Decedent	
Time of Death	
Date of Death	
Place of Death	
"Manner of Death"	
Comments	
SAPS Station	

Special Investigations	Histology		
	Toxicology	Alcohol	
		Drugs	
		CO	
		Organo-Ph	
		Other	1
			2
			3
	DNA		
	Other	1	
		2	
		3	

Specimens Collected	Blood	
	Tissue	
	Ocular Fluid	
	Other	1
		2
		3

EMS at scene		Hospitalisation	

Hospitalisation	< 12 hrs	12 - 24 hrs	>24 hrs

BI - 1663	Natural		Unnatural		Under Inv	

Outcome	

Annexure B

Dr:	

DR No.	
Case No. *	

Date of PM	
Date of pickup	

Was a forensic pathologist contacted to attend the scene?	Y	N	Unknown
Did a forensic pathologist attend the scene?	Y	N	Unknown
Was there personal communication prior to/after pme?	Y	N	
Did the IO attend the scene?	Y	N	Unknown
Did the IO attend the autopsy?	Y	N	
Did a photographer attend the scene?	Y	N	Unknown
Did a photographer attend the autopsy?	Y	N	

SAP 380

Date of pickup	Y	N
Time of pickup	Y	N
Race of decedent	Y	N
Sex of decedent	Y	N
Place of death	Y	N
Identity of FO	Y	N
Identity of IO	Y	N
Signed	Y	N

SAP 180

Time of arrival at scene	Y	N
Time of collection	Y	N
Identity of FO	Y	N
Name of decedent	Y	N
Age of decedent	Y	N
Race of decedent	Y	N
Sex of decedent	Y	N
Time of death	Y	N
Date of death	Y	N
Place of death	Y	N
"Manner of death"	Y	N
Comments	Y	N

SAPS Station	

EMS at scene		Hospitalisation	

Hospitalisation	<12 hrs	12-24 hrs	>24 hrs

BI-1663	Natural		Unnatural		Undr Inv	

Your Investigation

Full PM		Limited PM		Viewing	
Referred back to treating physician					

Special Investigations	Histology		
	Toxicology	Alcohol	
		Drugs	
		CO	
		Organo-Ph	
		Other	1
			2
			3
	DNA		
	Other	1	
		2	
		3	

Specimens collected	Blood	
	Tissue	
	Ocular Fluid	
	Urine	
	Gastric Contents	
	Bile	
	Other	1
		2
		3

Is there any further comment you would like to make regarding this case in terms of the scope and nature of the information provided?

Infants

Age	

Birth history	Natural		Caesarean	
	Complications		Unknown	

Was there a history of the mother's antenatal care?	Y	N	
Was there a history of the pregnancy?	Y	N	
High risk?	Y	N	Unknown
Was the mother a smoker?	Y	N	Unknown
Did the mother consume alcohol whilst pregnant?	Y	N	Unknown
Was the mother a drug addict?	Y	N	Unknown
Was there a detailed medical history of the mother?	Y	N	
Was there detailed past obstetric history of the mother?	Y	N	

Was there a detailed medical development of the infant?	Y	N
Was there information regarding:		
Gestation	Y	N
Birth weight	Y	N
Peri-natal/neonatal problems	Y	N
Type of feeding	Y	N
Growth development and past assessments	Y	N
Immunisation 24-48 hrs prior to death	Y	N
Known contact with infections	Y	N
Medications	Y	N
Twinning	Y	N
Deformities	Y	N

Was there a history of other children in the family?	Y	N
Was the information regarding the RTH chart?	Y	N

Was the following information contained in the docket?	Y	N
Feeding of infant (24-48 hrs prior to death)	Y	N
Vomiting	Y	N
Respiratory difficulties/ noisy breathing	Y	N
Excessive sweating	Y	N
Unusual activity	Y	N
Unusual behaviour	Y	N
Passage of stool or urine	Y	N
Consultation of a healthcare practitioner	Y	N
History of sudden deaths in family	Y	N

Was there a history as to the position that the infant was found?	Y	N
Was there a history as to the location of the death?	Y	N
Was there a history of dummy sucking?	Y	N
Was the infant breast feed or bottle feed?	Y	N
Was there a history of co-sleeping?	Y	N
Was there information regarding the bedding and clothing?	Y	N
Was there a history of the circumstances of death?	Y	N
Was there a history of allergies?	Y	N
Was there a history of symptoms 24-48 hrs prior to death?	Y	N
Was there history as to when the decedent was last seen alive?	Y	N
Was there a history sa to the activities 24-48 hrs prior to death?	Y	N

Adults

Was there a history of symptoms 24-48 hrs prior to death?	Y	N
Was there a history of allergies?	Y	N
Was there a history of alcohol addiction?	Y	N
Was there a history of drug addiction?	Y	N
Was there a history of previously diagnosed conditions?	Y	N
Was there a family history of any conditions?	Y	N
Was the decedent under the care of a healthcare practitioner?	Y	N
Was the decedent attended by a healthcare practitioner prior to death?	Y	N
Was it known that the decedent used any medications prior to death?	Y	N
Was there a clear history as to the circumstances surrounding the death?	Y	N
Was there a clear history as to incidents leading up to the death?	Y	N

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