

# **Cause of Death Certification**

## ***A Guide for completing the Death Notification Form (DNF) – BI-1663***

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# **1. Background**

## **1.1. Purpose of the Booklet**

Medical certification of the cause of death is part of the death notification process. It involves the certification of the event and nature of death on the Death Notification Form (DNF), also known as the BI-1663, see pages 6 and 7. This is done in Section D on page 1, while the detailed section on the cause of death is completed in section G on page 2 of the Death Notification Form (DNF).

The aim of this booklet is to assist medical practitioners in the accurate completion of the Medical Certificate of cause of death (section G). The booklet will also be a useful resource for medical students and others who work with cause of death information. While the DNF encompasses additional details required for registration purposes and health statistics, the emphasis of this booklet is directed towards the certification of medical information, the primary responsibility of the medical practitioner.

The booklet outlines the process of death notification and gives details on medical certification with examples and problem areas with the aim of improving the quality of such information. Section G of the DNF uses the international format developed by the WHO to ascertain the underlying cause of death. Sufficiently detailed cause of death information will ensure that accurate cause of death statistics are available to data users and is therefore a critical piece of information on the DNF.

## **1.2. Importance of death registration**

The DNF is a permanent record of the fact of death that allows the Department of Home Affairs to issue a death certificate. For the purpose of death registration, the DNF provides important personal information about the decedent and about the circumstances and cause of death. The death certificate has many uses related to the settlement of the estates and provides family members with closure, peace of mind and documentation of the cause of death.

The DNF is also a source of statistical information on mortality that is needed for several purposes, including:

- Evaluating, monitoring and improving the health of the population;
- Informing decisions on health policy and strategy
- Comparing health across different regions.

Because statistical data derived from death certificates can be no more accurate than the information on the DNF, it is very important that all persons concerned with the registration of deaths strive not only for complete registration of events, but also for accuracy and promptness in reporting these events.

## **2. Process of Notification of death/stillbirth in South Africa**

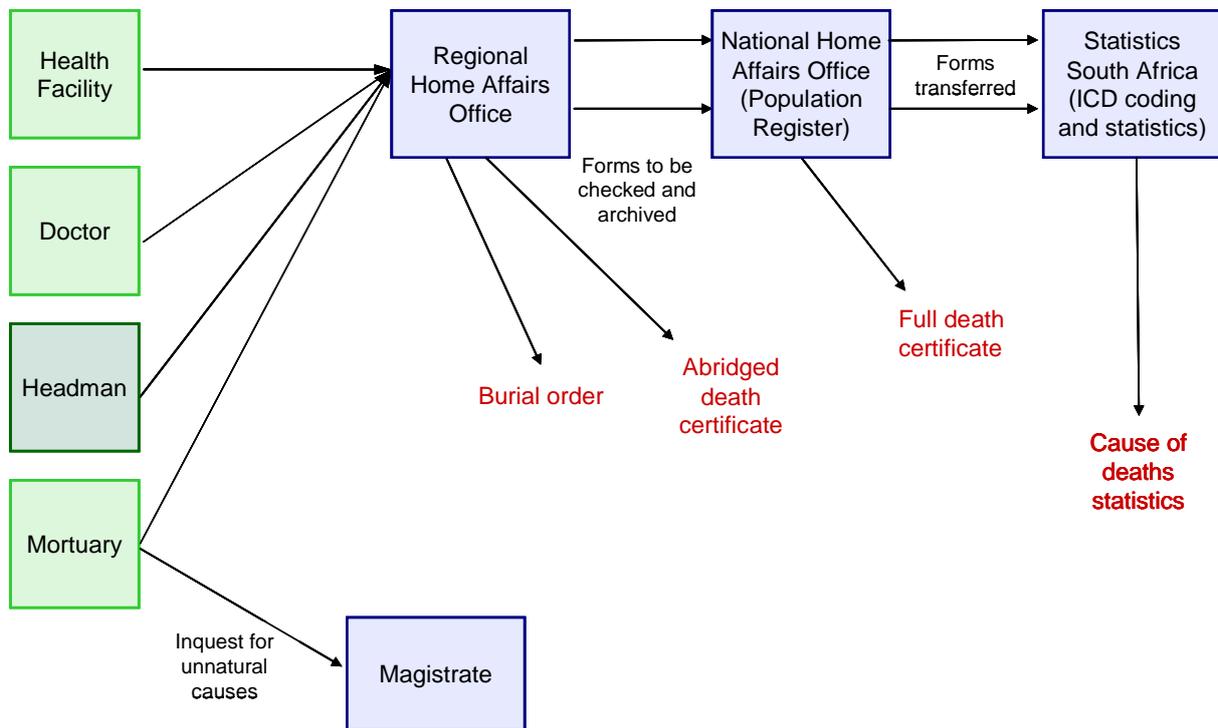
Death registration is part of vital registration, the administrative system to maintain information on all births and deaths of the population. In South Africa, the information is gathered by the Department of Home Affairs on the BI-1663, an official form. In the case where it is not possible for a doctor to certify the death, it is possible for somebody designated by the Department of Home Affairs eg. a registered professional nurse or a headman, to certify the event of death.

Once the notification of death has been accepted by the Department of Home Affairs, a burial order will be issued. No corpse can be buried without this order. In South Africa, it is the responsibility of the next of kin/informant/funeral undertaker to ensure that a death is registered with the Regional Department of Home Affairs. It is the responsibility of the health professional to complete the forms and to ensure that confidentiality is maintained.

Thus, after any death or stillbirth, the process to be followed is:

- Completion of the Notification/Register of Death/Stillbirth Form (BI-1663) as soon as possible by the attending doctor/doctor on duty/professional nurse in case of stillbirth where the death/stillbirth occurred.
- After completion, page 2 of the form should be folded and sealed in an envelope to ensure confidentiality and attached to page 1.
- The document should thereafter be handed to the informant (relative of deceased or other) or person in charge of the funeral for purposes of arranging for registration of death and a burial order.
- The Regional Home Affairs office will check that the correct information is recorded on both pages of the form and, if necessary, fill in any missing particulars before issuing the burial order.
- After registration of the death, the form will be forwarded to Statistics South Africa who will then collate, code and classify the data, perform analysis and produce reports on deaths occurring in the country. These statistical reports are made available to the public.

# Official Mortality System



## 2.1. Confidentiality

The maintenance of confidentiality of patient information is a legal and ethical duty of medical practitioners imposed by common law, the Bill of Rights of the Constitution of the Republic of South Africa (Act 108 of 1996), statute (National Health Act, No 61 Of 2003), ethical rules of the Health Professions Council of South Africa (HPCSA) and international medical ethical principles. In terms of the HPCSA rules and international medical ethical declarations, the duty to maintain patient confidentiality also applies after the patient's death. There are times when it is legally justifiable to breach patient confidentiality and these include where the patient (or the deceased's next-of-kin) gives consent, there is a statutory duty to disclose (e.g. Births and Deaths Registration Act, No 51 of 1992) or there is a moral, legal or social duty to disclose. StatsSA employees are also legally required to maintain confidentiality of patient information according to the Statistics Act, No.6 of 1999).

In principle the confidentiality of the cause of death stated on page 2 of the death notification form (DNF) should be maintained as this page is required to be sealed in an envelope. The level of security provided by this method is minimal and in practice the information on the second page of the form is frequently accessed by various persons who are not entitled to do so. For this reason many medical practitioners are reluctant to fulfil the legal requirement of accurately stating the cause of death on the DNF. This is particularly so in cases where HIV infection and AIDS are the underlying cause of death.

Any failure to accurately state the cause of death will result in inaccuracy in the national statistics of causes of death.

The Births and Deaths Registration Act places a legal obligation on medical practitioners to state the cause of death on the DNF. The making of a false statement on the DNF is a criminal offence and on conviction a practitioner would be liable to a fine or imprisonment or both. The HPCSA ethical rules also recognise that statutory duty may require a practitioner to disclose information about the deceased's health status. It would therefore not be unethical to disclose the cause of death on the DNF as long as the practitioner carries out the instructions to maintain confidentiality, however imperfect the safeguards may be.

An expert in medical law, Professor David McQuoid-Mason, has concluded "Whatever the shortcomings regarding confidentiality caused by the BI-1663 form, medical practitioners are obliged to complete it properly and to indicate the medical cause of death on the second page for statistical purposes."

## **2.2. Completion of the Death Notification Form by Interns**

A question often arises as to whether it is permissible for an intern or community service medical officer to complete a Death Notification Form (DNF). The Births and Deaths Registration Act, No 51 of 1992 refers to a 'medical practitioner' completing the DNF. In terms of the Health Professions Act, No 56 of 1974, a medical practitioner is a person registered as such by the statutory body, the Health Professions Council of South Africa (HPCSA). A community service medical officer is a registered medical practitioner and may therefore complete a DNF. An intern is not a registered medical practitioner. However, section 36(2) of the Health Professions Act allows an intern to perform any function or issue any certificate or other document which in terms of any law other than the Health Professions Act itself, may be or is required to be performed by a medical practitioner. It is therefore legally permissible for an intern to complete and issue a DNF.





## 2.4. International Statistical Classification of Diseases and Related Health Problems (ICD-10)

The International Classification of Diseases is published by the World Health Organization and is the most widely used statistical classification system of diseases in the world. It is used for morbidity and mortality statistics, reimbursement systems and automated decision support in medicine. The system is designed to promote international comparability in the collection, processing, classification, and presentation of these statistics. The ICD is a core classification of the WHO Family of International Classifications (WHO-FIC) (<http://who.int/classifications/en/>), which is revised periodically and is currently in its tenth revision. It provides a framework for certifying the cause of death and the collection of internationally standardised mortality statistics. It provides for the coding and classification of diseases and injuries and a wide variety of signs, symptoms, abnormal findings, complaints and social circumstances. Clinical coding can be described as the translation of diseases, health related problems and procedural concepts from texts to alphanumeric codes for storage, retrieval and analysis. All member states of the United Nations, including South Africa, have agreed to use this standard classification system. Organised into chapters covering communicable diseases, other diseases that may affect the whole body, localised diseases by site, developmental diseases, injuries and external causes, it is presented in 3 volumes: Volume 1 is the tabular list of alphanumeric codes, Volume 2 is the instruction manual, and Volume 3 the alphabetical index.

In order to ensure the comparability of mortality data between places and over time, the ICD provides rules and guidelines for mortality coding (assigning an ICD code to a cause of death) and classification (selecting or identifying the single underlying cause of death from those listed on the medical certificate of death). In a large proportion of deaths, a sequence of morbid events will have led to death. From the standpoint of prevention, the objective is to break the sequence as early as possible. Thus, the underlying cause of death, rather than the immediate cause, is of particular interest from a public health point of view. According to the ICD-10:

The **Immediate Cause** is the final disease, injury or complication directly causing the death. It should be noted that the mechanism of death or terminal event (for example, cardiac arrest or respiratory arrest) is not considered to be a cause of death. The mechanism of death should not be reported as the immediate cause of death as it is a statement not specifically related to the disease process, and it merely attests to the fact of death.

The **Underlying Cause of Death** is the disease or injury that started the sequence of events leading directly to death or the circumstances of the accident or violence that produced the fatal injury. In the case of a violent death, the form of external violence or accident is antecedent to the injury entered, although the two events may be almost simultaneous.

*Example: A 56 year old female with carcinoma of the breast develops severe pain in her right thigh and is unable to walk. She is admitted to hospital where investigations reveal a metastasis to the right femur with a pathological fracture. Later that day she develops pain in her chest and severe shortness of breath due to a pulmonary fat embolus. She dies early the next morning.*

*The immediate cause of death is the pulmonary fat embolus caused by the pathological fracture of her femur caused by the metastasis from the primary carcinoma of the breast. Carcinoma of the breast is the underlying cause of death in this patient.*

The international form of medical certificate of cause of death is designed to indicate the sequence of morbid events leading to the immediate cause of death, and thus facilitates the selection of the underlying cause of death when more than one cause of death is listed. The international form was adopted by South Africa in 1998 with the implementation of the new DNF (BI-1663). Statistics South Africa codes every condition on the death certificate using ICD-10 codes. The ICD-10 selection rules are then applied to classify the underlying cause of death which is used for statistical purposes.

### **3. Medical Certification of Death**

#### **3.1. Introduction**

The medical practitioner's primary responsibility in death registration is pronouncing the death and reporting the cause of death. Important facts regarding the death that should be recorded in the DNF include:

- Date of death
- Place of death
- Whether the Cause of death was Natural or Unnatural
- Residential address of patient for geo-coding
- Health information including tobacco use, and females' pregnancy status.
- Certifier section with name, address and signature
- Cause of death information

In most cases, medical practitioners both pronounce death and notify the cause of death. If the medical practitioner or appointed health professional feels that he/she is not in a position to certify that the deceased died exclusively due to natural causes, then he/she will contact a police officer who will then open a docket and ensure transportation of the body to the government mortuary, where a forensic pathologist / forensic medical practitioner is required to conduct a medico-legal post-mortem examination on the body.

The remaining items that require the medical practitioner's certification relate to the manner of determination of cause of death, eg. autopsy, opinion of attending doctor, opinion of doctor on duty or interview of family member.

### 3.2. Medical Certificate of Cause of Death

#### G MEDICAL CERTIFICATE OF CAUSE OF DEATH

**PART I** Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure. **List only one cause on each line.**

Approximate interval  
between onset and Death  
(Days / Months / Years)

FOR OFFICE USE ONLY		
ICD-10		

IMMEDIATE CAUSE (Final disease or condition resulting in death) (a).....  
Due to (or a consequence of) .....

Sequentially list conditions, if any, leading to immediate cause. Enter UNDERLYING CAUSE last (Disease or injury that initiated events resulting in death) (b).....  
Due to (or a consequence of) .....

(c).....  
Due to (or a consequence of) .....

(d).....  
Due to (or a consequence of) .....

**PART 2** Other significant conditions contributing to death but not resulting in the underlying cause given in **Part I** .....

### 3.3. Instructions for completion of the cause-of-death section

The cause-of-death section consists of two parts. **Part I** is for reporting a chain of events leading directly to death, with the **immediate cause** of death (the final disease, injury or complication directly causing death) on line (a) and the **underlying cause** of death (the disease, injury that initiated the chain of events that led directly and inevitably to death) on the lowest used line. If only one line is used, only line (a) should be completed. **Part II** is for reporting all other significant diseases, conditions, or injuries that contributed to death but which did not result in the underlying cause of death given in **Part I**.

**The cause-of-death information should be the medical practitioner’s best medical OPINION.**

Report on each disease, abnormality, injury, or poisoning that the medical practitioner believes adversely affected the decedent. In the case of injury or poisoning the case should be referred to Forensic Pathology Services. A condition can be listed as “probable” if it has not been definitely diagnosed. If an organ system failure such as congestive heart failure, hepatic failure, renal failure or respiratory failure is listed as a cause of death, it must always be followed by details on its etiology on the line(s) beneath it (for example, renal failure **due to** Type I diabetes mellitus).

When indicating neoplasms as a cause of death, include 1) primary site *or* that the primary site is unknown, 2) benign or malignant, 3) cell type *or* that the cell type is unknown, 4) grade of neoplasm, and 5) part or lobe of organ affected. (For example, a primary well-differentiated squamous cell carcinoma, lung, left upper lobe).

For each fatal injury (for example, stab wound of chest), always report the trauma (for example, transection of subclavian vein) and impairment of function (for example, air embolism) that contributed to death. If known, the manner of the injury (i.e. homicide, suicide) should be included:

E.g. Air embolism *due to*

Transection of internal jugular vein, *due to*

Stab wound of the neck, (*due to*)

Alleged homicide.

### 3.4. Part I of the cause of death section

Only **one** cause is to be entered on each line of Part I. For each cause, indicate in the space provided the approximate interval between the date of *onset* (not necessarily the date of diagnosis) and the date of death. For clarity, do not use parenthetical statements and abbreviations when reporting the cause of death. The underlying cause of death should be entered on the LOWEST LINE USED IN PART I.

- **Line (a) immediate cause**

In Part I, the immediate cause of death is reported on line (a). This is the final disease, injury or complication directly causing the death. An immediate cause of death must always be reported on line (a). It can be the sole entry in the cause-of-death section if that condition is the only condition causing the death. **If conditions such as cardiac arrest, respiratory failure, chronic renal failure, shock etc. are entered on line I (a) always enter the underlying cause(s) on I(b), I(c) etc. to indicate the sequence of events leading to death.**

- **Lines (b), (c), and (d) due to (or as a consequence of)**

On line (b) report the disease, injury, or complication, if any that gave rise to the immediate cause of death reported on line (a). If this in turn resulted from a further condition, record that condition on line (c). If this in turn resulted from a further condition, record that condition on line (d). For as many conditions as are involved, write the full sequence, one condition per line, with the most recent condition on the top, and the underlying cause of death reported on the lowest line.

### 3.5. Approximate interval between onset and death

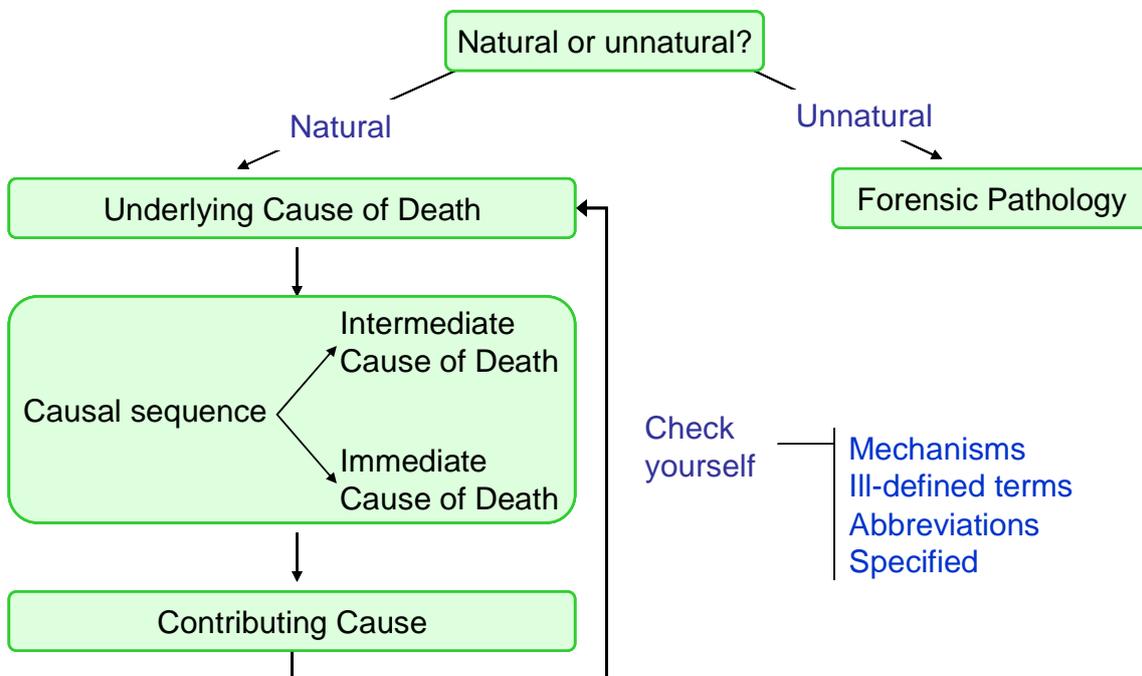
Space is provided to the right of lines (a), (b), (c), and (d) for recording the interval between the presumed onset of the condition (not the diagnosis of the condition) and the date of death. This should be entered for all conditions in Part I. These intervals usually are established by the medical practitioner on the basis of available information. In some cases the interval will have to be estimated. The terms “unknown” or “approximately” may be used. General terms, such as minutes, hours, or days, are acceptable, if necessary. If the time of onset is entirely unknown, state that the interval is “Unknown”. Do not leave these items empty. This information is useful in classification of certain diseases (ie. Selecting the underlying cause) and also provides a useful check on the accuracy of the reported sequence of conditions.

### 3.6. Part II of the cause-of-death section (other significant conditions)

All other important diseases or conditions that were present at the time of death and that may have contributed to the death, but did not lead to the underlying cause of death in Part I or were not reported in the chain of events in Part I, should be recorded on these lines. (More than one condition can be reported per line in Part II). Multiple conditions and sequences of conditions resulting in death are common, particularly among the elderly. When there are two or more possible sequences resulting in death, or if two conditions seem to have added together, choose and report in Part I the sequence thought to have the greatest impact. Other conditions or conditions from the other sequence should be reported in Part II.

### 3.7. Cause of death classification process

The following thought process is suggested before pen is put to paper, in completion of the DNF. If the cause of death is unnatural or suspicious, the case should immediately be referred to Forensic Pathology Services. In order to decide whether the death is natural or unnatural one obviously needs to have a good idea of what the underlying cause of death is. The next step is to consider the rest of the causal sequence – whether there were any complications or diseases following on the original problem. Lastly contributing conditions can be included. Before the sequence is written down, ascertain that all the rules of completion have been followed: No abbreviations or mechanisms are used, and as much as possible detail is given.



### **3.8. Stillbirths**

According to the Births and Deaths Registration Act, No 51 of 1992, stillbirth with regards to an infant means that the foetus had at least 26 weeks of intra-uterine existence, but showed no signs of life after complete birth.

A doctor who was present at the stillbirth, or who examined the baby and is convinced that the baby was stillborn, must complete the death notification form (BI-1663) accordingly. If no medical practitioner was present at the stillbirth, or no doctor examined the baby, any person who was present at the stillbirth can make a statement to that effect, and the (death of the) stillborn baby can be registered. A burial order is then issued to bury the stillborn baby.

When completing the BI-1663, the first line of Section A “Particulars of Stillborn Child” should be ticked, as opposed to “Particulars of Deceased individual”. The weight of the stillborn baby should be indicated in Section G. Otherwise the form is completed as per usual.

If a maternal condition has caused or initiated the stillbirth, it should be indicated as the underlying cause of death, while some fetal conditions may result from it, being the intermediate and immediate causes of death. “*Prematurity*” should never be entered without explaining the etiology of prematurity.

## 4. Examples of medical certification of cause of death

### Case Scenario 1

A 10 month old child is brought in by his mother because of a fever, which has been present for approximately 3 days. On examination the child is found to be severely malnourished, with a distended abdomen and loss of muscle mass, and with neckstiffness. A lumbar puncture led to the diagnosis of *H. Influenza* meningitis, and IV treatment was started. After one day in hospital, the child became tachypnoeic, with bilateral crepitations in the lungs. He died a few hours later.

G MEDICAL CERTIFICATE OF CAUSE OF DEATH		Approximate interval between onset and Death (Days / Months / Years)	FOR OFFICE USE ONLY ICD-10
<b>PART 1</b> Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure. <b>List only one cause on each line.</b>			
IMMEDIATE CAUSE (Final disease or condition resulting in death)  Sequentially list conditions, if any, leading to immediate cause. Enter UNDERLYING CAUSE last (Disease or injury that initiated events resulting in death)	(a).....	1 day	<input type="text"/>
	Due to (or a consequence of)		<input type="text"/>
	(b).....	3 days	<input type="text"/>
	Due to (or a consequence of)		<input type="text"/>
	(c).....		<input type="text"/>
	Due to (or a consequence of)		<input type="text"/>
	(d).....		<input type="text"/>
	Due to (or a consequence of)		<input type="text"/>
<b>PART 2</b> Other significant conditions contributing to death but not resulting in the underlying cause given in Part 1			<input type="text"/>
	Malnutrition		<input type="text"/>

### Notes on medical certification of cause of death:

*In this case, malnutrition was not considered to be the direct cause of the meningitis, but could have contributed to the child's poor reaction to the infection.*

## Case Scenario 2

A 75-year-old female had a 15-year history of non-insulin-dependent diabetes mellitus, a 13-year history of mild hypertension treated with thiazide diuretics, and an uncomplicated myocardial infarction 6 years prior to the present illness. She was found disoriented in her apartment and brought to hospital. On admission she was noted to be unresponsive, without focal neurologic signs, and severely dehydrated with a blood pressure of 90/60. Initial laboratory tests disclosed severe hyperglycemia, hyperosmolarity, azotemia, and mild ketosis without acidosis. A diagnosis of hyperosmolar nonketotic coma was made. The patient was treated with fluids, electrolytes, insulin and broad-spectrum antibiotics. Within 72 hours, the patient's hyperosmolar, hyperglycemic state was resolved. However, she remained anuric with progressive azotemia. Attempts at renal dialysis were unsuccessful, and the patient died on the 8<sup>th</sup> hospital day in severe renal failure.

G MEDICAL CERTIFICATE OF CAUSE OF DEATH			Approximate interval between onset and Death (Days / Months / Years)	FOR OFFICE USE ONLY	
PART 1 Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure. List only one cause on each line.				ICD-10	
IMMEDIATE CAUSE (Final disease or condition resulting in death)	(a).....	Acute renal failure	5 days		
	Due to (or a consequence of)				
	(b).....	Hyperosmolar non-ketotic coma	8 days		
	Due to (or a consequence of)				
Sequentially list conditions, if any, leading to immediate cause. Enter UNDERLYING CAUSE last (Disease or injury that initiated events resulting in death)	(c).....	Diabetes mellitus, non-insulin dependant	15 years		
	Due to (or a consequence of)				
	(d).....				
	Due to (or a consequence of)				
PART 2 Other significant conditions contributing to death but not resulting in the underlying cause given in Part I		Hypertension, previous myocardial infarction			

### Notes on medical certification of cause of death

*In this case, hypertension and a previous myocardial infarction would both be considered factors that contributed to the death. However, they would not be the direct causal sequence of Part I, so they would be placed in Part II. It is acceptable to list a mechanism (acute renal failure) as an immediate cause of death if it is followed by an underlying disease that could be considered the cause of death.*

### Case Scenario 3

Female aged 80 years, stumbled and fell over while vacuuming at home and sustained a fracture of the neck of the left femur. She had an operation for insertion of a pin the following day. Four weeks later her condition deteriorated, she developed hypostatic pneumonia and died two days later.

G MEDICAL CERTIFICATE OF CAUSE OF DEATH		Approximate interval between onset and Death (Days / Months / Years)	FOR OFFICE USE ONLY		
PART 1 Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure. List only one cause on each line.			ICD-10		
IMMEDIATE CAUSE (Final disease or condition resulting in death)	(a) Terminal hypostatic pneumonia Due to (or a consequence of)	2 days			
Sequentially list conditions, if any, leading to immediate cause. Enter UNDERLYING CAUSE last (Disease or injury that initiated events resulting in death)	(b) Fracture neck of Left femur (pinned) Due to (or a consequence of)	4 weeks			
	(c) Accidental Fall while vacuuming at home Due to (or a consequence of)	4 weeks			
	(d) ..... Due to (or a consequence of)				
PART 2 Other significant conditions contributing to death but not resulting in the underlying cause given in Part I					

Notes on medical certification of cause of death:

**THIS CASE SHOULD BE REFERRED TO FORENSIC PATHOLOGY SERVICES, BECAUSE IT IS AN UNNATURAL DEATH.** Where the underlying cause of death is due to external causes, information regarding the circumstances is required. Details of **PLACE OF OCCURRENCE** (e.g. ‘at home’, ‘in a hospital’, etc.) and the **ACTIVITY** (e.g. ‘While washing car’, “while walking to the bathroom” etc.) at the time of injury should be stated.

## Case Scenario 4

This 75-year –old male was admitted to the hospital complaining of severe chest pain. He had a 10-year history of atherosclerotic heart disease with EKG findings of myocardial ischemia and several episodes of congestive heart failure controlled by digitalis preparations and diuretics. Five months before this admission, the patient was found to be anemic, with a hematocrit of 17, and to have occult blood in the stool. A barium enema revealed a large polypoid mass in the cecum diagnosed as carcinoma by biopsy. Because of the patient’s cardiac status, he was not considered to be a surgical candidate. Instead, he was treated with a 5-week course of radiation therapy and periodic packed red cell transfusions. He completed this course 3 months before his hospital admission. On this admission the EKG was diagnostic of an acute anterior wall myocardial infarction. He died 2 days later.

G MEDICAL CERTIFICATE OF CAUSE OF DEATH		Approximate interval between onset and Death (Days / Months / Years)	FOR OFFICE USE ONLY	
PART 1 Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure. List only one cause on each line.			ICD-10	
IMMEDIATE CAUSE (Final disease or condition resulting in death)  Sequentially list conditions, if any, leading to immediate cause. Enter UNDERLYING CAUSE last (Disease or injury that initiated events resulting in death)	(a).....	Acute myocardial infarction	2 days	<input type="text"/>
	Due to (or a consequence of)			<input type="text"/>
	(b).....	Atherosclerotic heart disease	10 years	<input type="text"/>
	Due to (or a consequence of)			<input type="text"/>
	(c).....			<input type="text"/>
	Due to (or a consequence of)			<input type="text"/>
	(d).....			<input type="text"/>
	Due to (or a consequence of)			<input type="text"/>
PART 2 Other significant conditions contributing to death but not resulting in the underlying cause given in Part I	Carcinoma of the cecum, Congestive heart failure			<input type="text"/>

### Notes on medical certification of cause of death:

*Acute myocardial infarction, listed in Part I line (a) as the immediate cause of death, is a direct consequence of atherosclerotic heart disease, the underlying cause listed in Part I line (b)*

*Carcinoma of cecum is listed in Part II because it caused anemia and weakened the patient, but it did not cause atherosclerotic heart disease, nor did it cause an acute myocardial infarction.*

*Congestive heart failure is listed in Part II because it also weakened the patient. Although it was caused by the atherosclerotic heart disease, it was not part of the causal sequence leading to the acute myocardial infarction.*

## Case Scenario 5

A 34 year-old male was admitted with severe shortness of breath. He had a 9 month history of unintentional weight loss, night sweats and diarrhoea. An Elisa test and confirmatory Western Blot test for HIV were positive. T-lymphocyte tests indicated a low T helper-suppressor ratio. A lung biopsy was positive for *Pneumocystis carinii* pneumonia (PCP), indicating a diagnosis of acquired immunodeficiency syndrome (AIDS).

The patient's pneumonia responded to therapy, and he was discharged. The patient had two additional admissions for PCP. Seventeen months after the patient was first discovered to be HIV positive, he again developed PCP but did not respond to therapy. He died 2 weeks later.

G MEDICAL CERTIFICATE OF CAUSE OF DEATH		Approximate interval between onset and Death (Days / Months / Years)	FOR OFFICE USE ONLY	
PART 1 Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure. List only one cause on each line.			ICD-10	
IMMEDIATE CAUSE (Final disease or condition resulting in death)  Sequentially list conditions, if any, leading to immediate cause. Enter UNDERLYING CAUSE last (Disease or injury that initiated events resulting in death)	(a).....	Pneumocystis Carinii pneumonia	2 weeks	<input type="text"/>
	Due to (or a consequence of)			<input type="text"/>
	(b).....	Acquired immunodeficiency syndrome	17 months	<input type="text"/>
	Due to (or a consequence of)			<input type="text"/>
(c).....	Human immunodeficiency virus infection	More than 17 months	<input type="text"/>	
Due to (or a consequence of)			<input type="text"/>	
(d).....			<input type="text"/>	
Due to (or a consequence of)			<input type="text"/>	
PART 2 Other significant conditions contributing to death but not resulting in the underlying cause given in Part 1 .....				<input type="text"/>

### Notes on medical certification of cause of death:

*It is important to mention HIV infection as the underlying cause of death, if appropriate. Currently, a large percentage of HIV deaths are certified inappropriately as being due to the terminal cause of death, and not the underlying cause of death.*

## 5. Common Problems

Often several acceptable ways of writing a cause-of-death statement exist. At best, a certifier will be able to provide a simple description of the process leading to death that is etiologically clear and be confident that this is the correct sequence of causes. However, realistically, description of the process is sometimes difficult because the certifier is not certain.

In this case, the certifier should think through the causes about which he/she is confident and what possible etiologies could have resulted in these conditions. The certifier should select the causes that are suspected to have been involved and use words such as “probable” or “presumed” to indicate that the description provided is not completely certain. If the initiating condition reported on the death certificate could have arisen from a pre-existing condition, but the certifier cannot determine the etiology, he/she should state that the etiology is unknown, undetermined or unspecified, so it is clear that the certifier did not have enough information to provide even a qualified etiology. Reporting a cause of death as unknown should be a last resort. However, this should be shown only after all efforts have been made to determine the cause of death, including the performance of an autopsy, if possible.

The elderly decedent should have a clear and distinct etiological sequence for cause of death, if possible. Terms such as *senescence*, *infirmity*, *old age* and *advanced age* have little value for public health or medical research. Age is recorded elsewhere on the certificate. When a number of conditions resulted in death, the physician should choose the single sequence that, in his or her opinion, best describes the process leading to death, and place any other pertinent conditions in Part II. “Multiple system failure” could be included in Part II, but the systems need to be specified to ensure that the information is captured.

The infant decedent should have a clear and distinct etiological sequence for cause of death, if possible. “*Prematurity*” should not be entered without explaining the etiology of prematurity. Maternal conditions may have initiated or affected the sequence that resulted in infant death, and such maternal causes should be reported in addition to the infant causes on the infant’s death certificate (e.g., hyaline membrane disease *due to* prematurity, 28 weeks, *due to* placental abruption *due to* blunt trauma to mother’s abdomen).

When Sudden Infant Death Syndrome (SIDS) is suspected, a complete investigation should be conducted, typically by a Forensic Pathologist. If the infant is under 1 year of age, no cause of death is determined after scene investigation, review of clinical history, and a complete autopsy, the death can be reported as SIDS by the forensic medical practitioner.

Most certifiers will find themselves at some point, in the circumstance in which they are unable to provide a simple description of the process of death. In this situation, the certifier should try to provide a clear sequence, qualify the causes about which he/she is uncertain, and be able to explain the certification chosen.

If a body is brought to a hospital for completion of the DNF, after death has occurred, some effort on the part of the certifier can have great value. Often family members of the deceased or ambulance personnel accompany the body, and they should be questioned about the circumstances surrounding the death and the previous medical history of the deceased. The individual may have been a patient of that specific hospital, in which case the folder should be retrieved and perused for more clinical information. The unclothed body of the deceased must be examined for any signs of injury or natural disease. If any concerns arise regarding the manner of death, the case should be discussed with, or referred to Forensic Pathology Services. On the other hand, if all the available evidence points towards a specific cause of death, the death may be certified on the DNF. At this time, a note may be made in the hospital folder of the deceased, stating the information obtained, and the sources of information that were used to determine the cause of death.

## 6. Terms requiring additional information about etiology

When processes such as the following are reported, additional information about the etiology should be reported:

<b>Term</b>	<b>Additional information required</b>
<b>Abscess</b>	Site Cause / organism
<b>Adhesions</b>	If following an operation, the underlying condition for which surgery was performed and length of time since surgery.
<b>Agranulocytosis</b>	Cause. If due to drug therapy, specify condition for which drug given.
<b>Airways disease (chronic)</b>	Nature of disease (eg. obstructive)
<b>Anaemia</b>	Primary (specify type) Secondary (specify underlying cause)
<b>Aneurysm</b>	Site (eg. cerebral, aortic) Cause (eg. arteriosclerotic) Ruptured or dissecting
<b>Antepartum haemorrhage</b>	Cause (eg. coagulation defects, placenta praevia)
<b>Anoxia (fetal)</b>	If occurred before or during labour
<b>Appendicitis</b>	Whether acute or chronic With peritonitis or abscess
<b>Arteriosclerosis, Atheroma</b>	If associated with hypertension, specify type (eg. benign, malignant)
<b>or Atherosclerosis</b>	Arteries involved (eg. coronary, cerebral)
<b>Arteritis</b>	Arteries involved (eg. coronary, cerebral) Cause (eg. arteriosclerotic, syphilitic)
<b>Arthritis</b>	Type (rheumatoid, juvenile) Cause (eg. traumatic) Site
<b>Asphyxia (fetal)</b>	If occurred before or during labour
<b>Aspiration of vomitus</b>	Cause (eg. acute alcoholic toxicity, drug overdose, chronic alcohol abuse, or circumstances of drug use ie. addict, occasional user)
<b>Asthma</b>	Allergic or late onset

<b>Atelectasis</b>	Underlying cause
<b>Birth injury</b>	Site Type of injury Cause
<b>Bronchitis</b>	Type: acute or chronic With: asthma, emphysema etc.
<b>Bronchopneumonia</b>	Primary, hypostatic or aspiration Causative agent and underlying cause if any contributing disease or condition
<b>Burns</b>	Site Percentage and degree of burns.
<b>Cachexia</b>	(See <b>Malnutrition</b> )
<b>Calculus</b>	Site and if with obstruction
<b>Cancer, carcinoma</b>	(See <b>Neoplasms</b> )
<b>Cardiac failure</b>	}
<b>dilation</b>	
<b>hypertrophy</b>	
<b>Cardiovascular disease</b>	Specific disease condition eg. hypertensive
<b>Carditis</b>	Site: myocardium endocardium pericardium Type: acute rheumatic meningococcal or viral
<b>Cerebral degeneration</b>	Underlying cause
<b>Cerebral effusion</b>	Underlying cause
<b>Cerebral sclerosis</b>	Atherosclerosis or disseminated sclerosis
<b>Cerebrovascular disease</b>	Nature of disease (eg. atherosclerosis causing infarction, haemorrhage, occlusion - thrombotic/embolic)
<b>CVA</b>	Cause: infarction, haemorrhage, thrombotic/embolic Avoid abbreviation
<b>Chorea</b>	Type: rheumatic with heart involvement without heart involvement Huntington's gravidarum

<b>Cirrhosis of liver</b>	Cause (eg. alcoholic)
<b>Cor pulmonale</b>	Underlying cause, and whether acute or chronic
<b>Coryza</b>	Complication leading to death
<b>Curvature of spine</b>	Type: acquired (eg. tuberculous) congenital With: heart disease and/or hypertension
<b>Cytomegalic inclusion disease</b>	If due to AIDS or other HIV illness
<b>Debility</b>	Underlying cause
<b>Deep venous thrombosis</b>	If following an operation, condition for which operation performed If due to inactivity, the condition causing the inactivity
<b>Dementia</b>	Cause (eg. senile, alcoholic, atherosclerotic, Alzheimer's or multi-infarct)
<b>Dermatitis</b>	Type Cause eg. drug induced (state condition necessitating drug therapy)
<b>Diabetes mellitus</b>	Type: insulin dependent or non-insulin dependent diabetes With: complication(s) eg. nephropathy, peripheral vascular disease
<b>Diarrhoea</b>	Underlying cause (if unknown, whether believed infectious or not)
<b>Dysentery</b>	Type: amoebic (and, if so, whether acute or chronic) bacterial other protozoal
<b>Embolism</b>	Site If following an operation: condition for which surgery performed If due to inactivity: underlying condition causing the inactivity
<b>Encephalitis</b>	Type: acute viral late effect of viral postvaccinal idiopathic meningococcal suppurative tuberculous
<b>Endocarditis</b>	Acute or chronic Site: mitral valve, aortic valve Cause: rheumatic, bacterial

<b>Failure, Renal</b>	Acute or chronic Cause: analgesic, diabetes etc. (Renal Failure)
<b>Fatty degeneration</b>	Site eg. of heart or liver
<b>Fractures</b>	Site Pathological or traumatic (if due to trauma, state circumstances of trauma)
<b>Gangrene</b>	Site Type: atherosclerotic, diabetic, due to gas bacillus etc.
<b>Gastro-enteritis</b>	Cause: infectious or non-infectious
<b>Goitre</b>	Type: simple toxic diffuse uninodular multinodular
<b>Haematemesis</b>	Cause: gastric ulcer, adverse effects of medication etc.
<b>Haemorrhage</b>	Site Cause (if due to trauma, state circumstances of trauma)
<b>Hemiplegia</b>	Cause and duration (eg. spinal cord injury from MVA - 20 years previously)
<b>Hepatitis</b>	Type: acute or chronic alcoholic of newborn of pregnancy, childbirth or puerperium viral (and if so, whether Type A, B, C, D, E)
<b>Hydrocephalus</b>	Congenital or if acquired, and if so, the underlying cause
<b>Hypertension</b>	With: heart involvement cerebrovascular involvement renal involvement pregnancy If secondary, specify underlying cause
<b>Immaturity</b>	Cause Complication leading to death
<b>Influenza</b>	With: pneumonia other manifestation (specify)
<b>Injury</b>	Site and type of injury circumstances surrounding the injury(s) and if due to accident, suicide, homicide
<b>Intestinal infection</b>	Causative organism

<b>Intestinal obstruction, occlusion, stenosis or stricture</b>	Cause
<b>Kaposi's sarcoma</b>	If due to AIDS or other HIV illness
<b>Leukaemia</b>	Acute, sub-acute or chronic Type eg. lymphatic myeloid monocytic
<b>Liver failure; hepatic failure</b>	Cause (eg. acute infective, post-immunisation, post-transfusion, toxaemia of pregnancy or of puerperium)
<b>Lung disease (chronic)</b>	Nature of disease (eg. obstructive)
<b>Infarction - cerebral</b>	If due to occlusion, stenosis, embolism/thrombosis
<b>Infarction – myocardial</b>	Site Acute, healed or old
<b>Lymphadenitis</b>	Cause (eg. tuberculous, septic wound)
<b>Lymphoma</b>	Type (eg. Hodgkin's disease; Non-Hodgkin's lymphoma, mixed-cell type)
<b>Malignant neoplasm</b>	(See <b>Neoplasms</b> )
<b>Malnutrition</b>	Type: congenital if due to deprivation or disease (specify) protein deficient, (specify type and degree of severity)
<b>Melaena</b>	Underlying cause eg. Primary carcinoma of transverse colon
<b>Meningitis</b>	Cause: meningococcal tuberculous haemophilus influenzae other organism (specify)
<b>Mental retardation</b>	Underlying physical condition
<b>Myocarditis</b>	Acute or chronic Cause (eg. rheumatic fever, atherosclerosis)
<b>Neoplasm</b>	Type: Benign, Malignant with site of primary growth
<b>Nephritis/ Glomerulonephritis</b>	Type: acute, sub-acute chronic with oedema infective or toxic (cause) If associated with: hypertension arteriosclerosis heart disease

	pregnancy
<b>Obstruction of intestine</b>	Cause If paralytic following operation, state condition for which surgery performed
<b>Obstructive airways disease</b>	Type: chronic acute lower respiratory infection acute exacerbation of asthma, bronchiectasis, emphysema etc.
<b>Occlusion – cerebral</b>	Site With: infarction, due to embolism, thrombosis etc.
<b>Oedema of lungs</b>	Type acute hypostatic secondary to heart disease with hypertension If hypostatic or terminal, specify conditions necessitating inactivity If chronic and due to external agents (specify cause)
<b>Paget's disease</b>	Of bone, breast, skin (specify site) or malignant
<b>Paralysis, paresis</b>	Cause (eg. due to birth injury, syphilis) Precise form (eg. infantile, agitans)
<b>Paralytic ileus</b>	Underlying cause
<b>Pelvic abscess, Parametritis, Peritonitis</b>	Cause, particularly whether due to puerperal or post-abortive infection
<b>Phlebitis, Peptic ulcer</b>	Site: stomach, gastric duodenum With: haemorrhage, perforation
<b>Peripheral vascular disease</b>	Cause (eg. atherosclerosis)
<b>Pleural effusion</b>	Cause, particularly whether tuberculosis
<b>Pneumoconiosis</b>	Whether:           silicosis anthracosilicosis asbestosis associated with tuberculosis other (specify)
<b>Pneumocystosis pneumonia</b>	If due to AIDS or other HIV illness
<b>Pneumonia</b>	Type of organism If hypostatic or terminal, specify underlying illness
<b>Pneumothorax</b>	Cause
<b>Prematurity</b>	Cause Complication leading to death

<b>Pulmonary embolism</b>	If following an operation, condition for which surgery performed If due to inactivity, the condition causing the inactivity
<b>Pulmonary oedema</b>	Cause
<b>Renal disease or failure</b>	Acute or chronic Underlying cause eg. diabetic nephropathy With: hypertension, heart disease, necrosis
<b>Respiratory failure</b>	Underlying cause
<b>Respiratory infection</b>	Nature, location and causative organism if known
<b>Rheumatic fever</b>	Active or inactive With: nature of heart disease hypertrophy, carditis, endocarditis
<b>Sclerosis</b>	Arterial: coronary, cerebral (specify whether disseminated or atherosclerosis) disseminated, spinal (lateral, posterior), renal
<b>Scoliosis</b>	Acquired (eg. tuberculous, osteoporosis) Congenital
<b>Senility</b>	With: dementia, Alzheimer's disease etc.
<b>Septicaemia</b>	Underlying illness Type of organism
<b>Septic infection</b>	If localised, specify site and organism
<b>Shock</b>	Type (eg. Septic, haemorrhagic, hypovolaemic etc) Underlying cause
<b>Silicosis</b>	If associated with tuberculosis
<b>Softening of brain</b>	Cause: embolic, arteriosclerotic etc.
<b>Spondylitis</b>	Whether: ankylosing deformans gonococcal sacro-iliac tuberculous
<b>Stenosis, stricture</b>	Site If congenital or acquired (specify cause)
<b>Syphilis</b>	Site affected Type: congenital early or late, primary, tertiary, secondary
<b>Tetanus</b>	If following minor injury (specify) If following major injury (specify) Puerperal, obstetric

<b>Thrombosis</b>	Arterial (specify artery) Intracranial sinus : pyogenic non-pyogenic late effect post-abortive puerperal venous (specify site) portal If post-operative or due to confinement in bed, specify condition which necessitated operation or immobilisation
<b>Toxaemia</b>	Underlying cause Pregnancy (specify): albuminuria eclampsia hyperemesis hepatitis hypertension pre-eclampsia
<b>Toxoplasmosis</b>	If due to AIDS or other HIV illness
<b>Tuberculosis</b>	Primary site Associated pneumoconiosis if present
<b>Tumours</b>	(See <b>Neoplasms</b> )
<b>Ulcer</b>	Site Perforated or with haemorrhage
<b>Ulcer, leg</b>	Nature (eg. peripheral, varicose) Cause (eg. atherosclerosis)
<b>Uraemia</b>	Cause Associated childbirth or pregnancy
<b>Urinary tract infection</b>	Primary: specify organism and precise location, eg. ureter or kidney Secondary: specify underlying disease, eg. diabetes
<b>URTI</b>	Complication leading to death Organism if identified Avoid abbreviation
<b>Valvular disease</b>	Valve(s) affected Acute or chronic If rheumatic: active or inactive If non-rheumatic: specify cause

**Vascular disease**

Nature (eg. hypertensive, peripheral)

Cause

**Wounds**

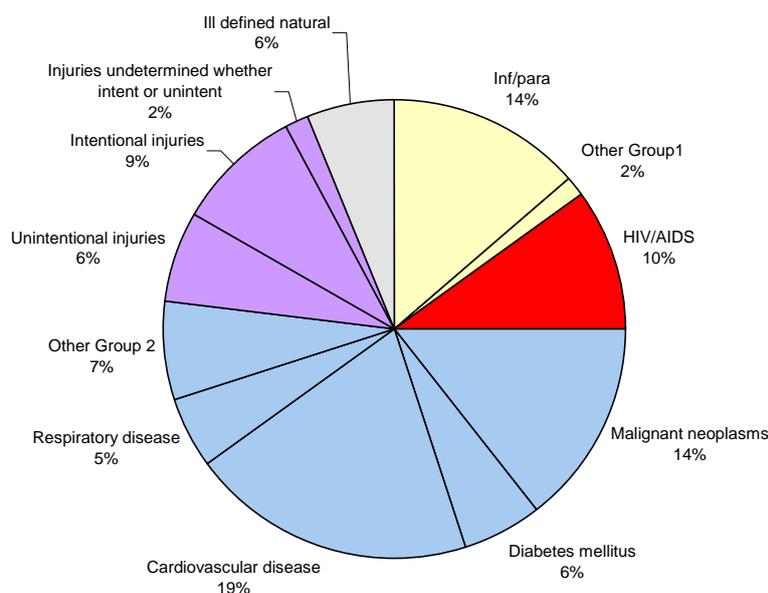
Site

Cause

Circumstances surrounding wounds (place of occurrence, activity etc.)

## 7. The use of medical cause of death information for Public Health

Cause of death analysis provides useful information on the age and sex distribution of deaths in a population and can be used to identify the leading causes of death in a population, estimate cause specific death rates and monitor trends in mortality rates over time. In addition inequities in health between geographical areas can be identified by comparing age standardized mortality rates. Some examples from the analysis of cause of death data collected by the City of Cape Town are demonstrated below.



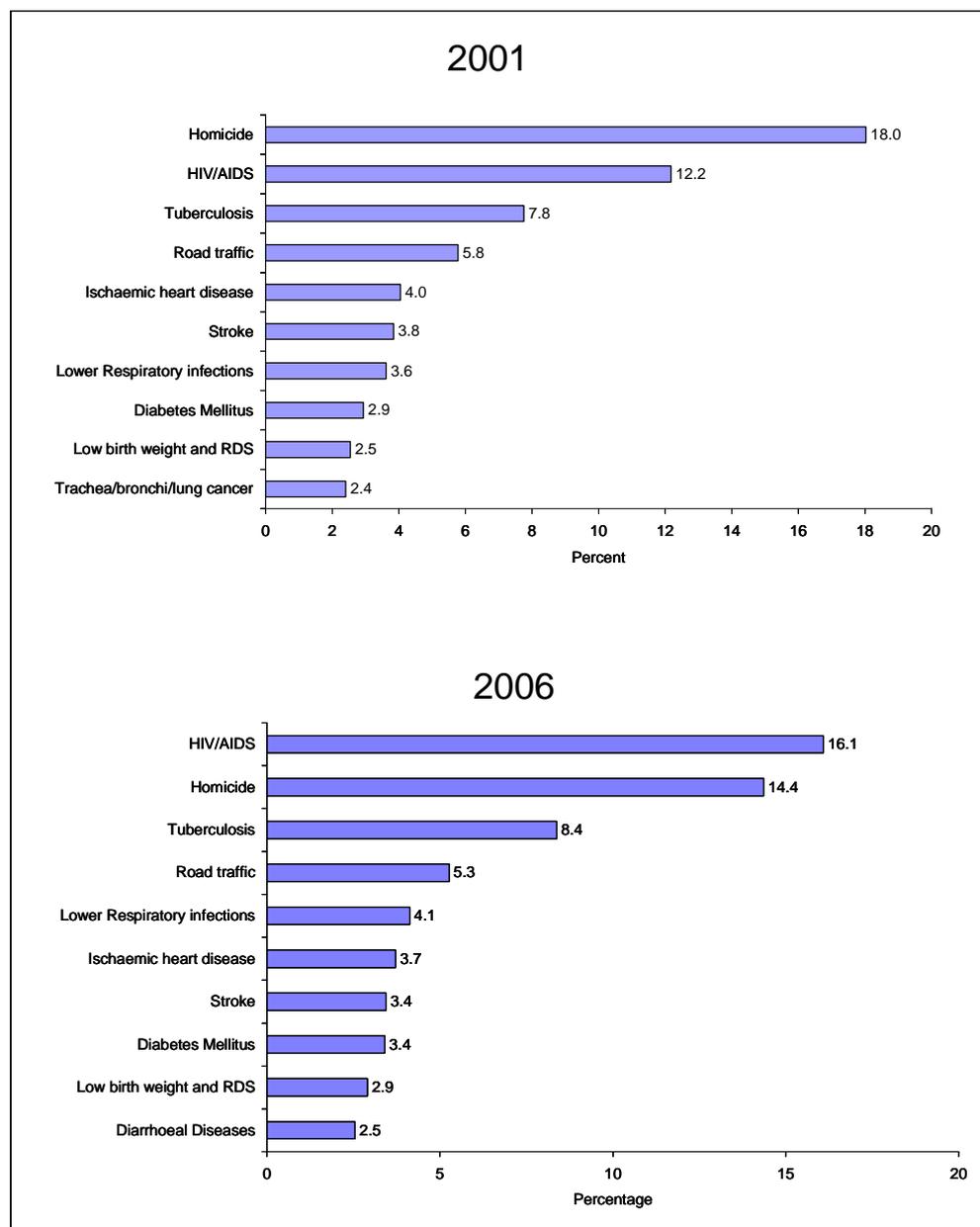
**Figure 1: Mortality profile by cause group, Cape Town 2006**

The mortality profile in Cape Town in 2006 is shown in Figure 1 by cause groups classified according to the Global Burden of Disease classification:

- Group I:** the pre-transitional causes (yellow) - communicable diseases, maternal causes, perinatal conditions, and nutritional deficiencies. (HIV/AIDS (red) is part of Group I but is kept separate due to the size of the burden that it contributes in South Africa.)
- Group II:** the non-communicable causes (blue).
- Group III:** the injuries (purple)

Figure 1 shows the quadruple burden of disease being experienced in Cape Town in 2006 with non-communicable diseases accounting for 52% of deaths, injuries for 17%, HIV for 10%, other group I cause for 15% and deaths with an ill-defined underlying cause accounting for 6% of deaths.

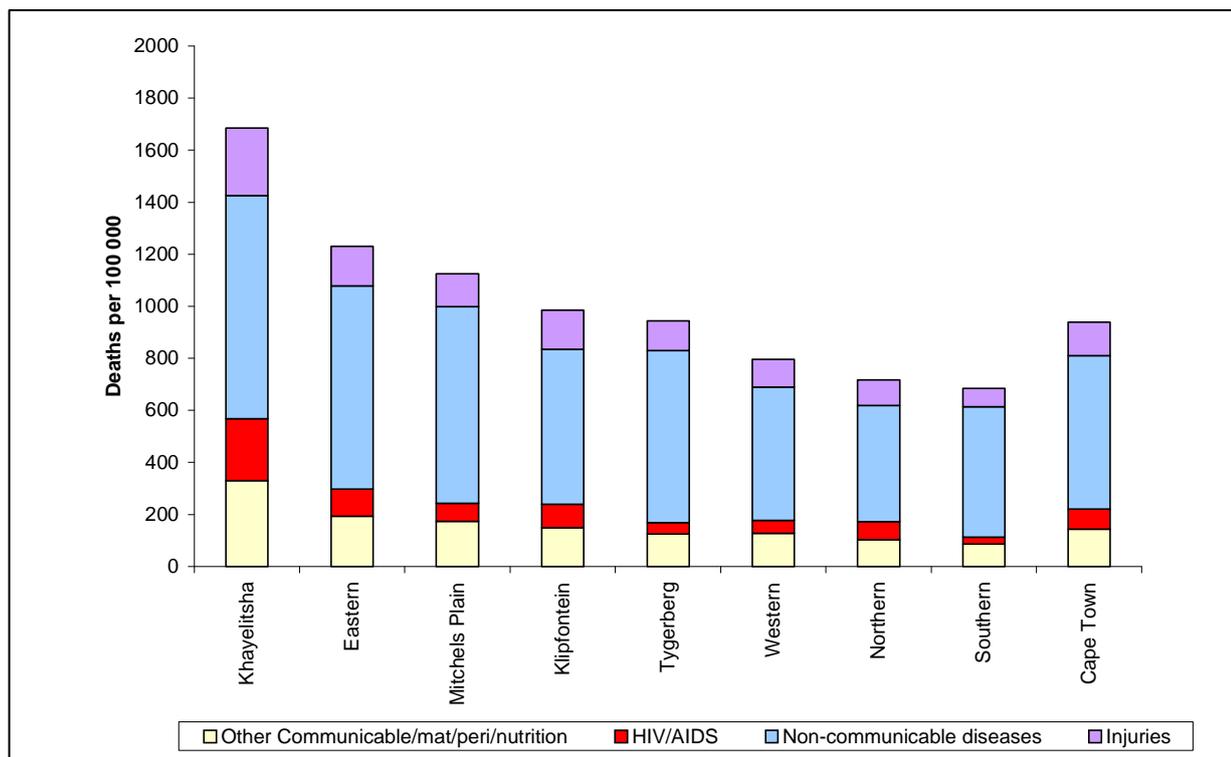
There were differences between males and females with young adult males experiencing much larger numbers of deaths than females, mainly due to injuries. HIV/AIDS accounted for a large proportion of deaths in young women. The older age deaths were mostly due to non-communicable causes.



**Figure 2: Top 10 causes of premature mortality (YLLs) for persons in Cape Town, 2001 and 2006**

The top four causes of death in Cape Town have remained the same between 2001 and 2006. However, the ranking has changed with HIV taking over from homicide as the leading causes of death.

Approximately 40% of the premature mortality in Cape Town is due to the top four causes namely: HIV/AIDS, homicide, tuberculosis and road traffic injuries.



**Figure 3: Age-standardised mortality rate for broad cause groups by sub-district, 2006**

Figure 3 shows the age-standardised mortality rate by sub-district. The mortality rate was lowest in Southern sub-district, which is relatively affluent, and highest in Khayelitsha sub-district, which has the worst socio-economic indicators, by a factor of nearly 2.5. This suggests that there are large inequities in health between these sub-districts.

## 8. Further sources of information and resources

**WHO, 1992.** International statistical classification of diseases and related health problems – tenth revision. Volume 2.

**Department of Health. 1999.** *South African Training Manual for the death notification form (BI 1663).*  
<http://www.doh.gov.za/nhis/vital/docs/deathmanual.html>

**National Centre for Health Statistics. 2004.** *Physician's Handbook on Medical Certification of Death. 2003 Revision.* U.S. Department of Health and Human Services, Centers for Disease Control, National Center for Health Statistics. Hyattsville, Maryland.

**Australian Bureau of Statistics. 2001.** *Cause of death Certification Australia. A Booklet for the guidance of medical practitioners in completing medical certificates of cause of death.*

**WHO. 2007.** *Underlying cause of death: A guide on medical certification of the cause of death based on ICD-10 guideline. In: Verbal Autopsy standards: ascertaining and attributing cause of death. ISBN 978 92 4 154721 (NLM classification: WA 900).*

**State of Texas.** *Continuing education in vital statistics.*  
<http://www.dshs.dstate.tx.us/vs/field/funcred.htm>

*National Association of Medical Examiners online tutorial:*  
[http://www.thename.org/CauseDeath/COD\\_main\\_page.htm](http://www.thename.org/CauseDeath/COD_main_page.htm)

*The Virtual Autopsy* <http://www.le.ac.uk/pa/teach/va>

*South African Medical Association (SAMA) Website* <http://www.samedical.org>

*E-learning website for Death Certification* <http://ec.europa.eu/comm/eurostat/deathcert/>

McQuoid-Mason DJ. Disclosing the HIV status of deceased persons – ethical and legal implications. *S Afr Med J* 2007; 97: 920-923.

Dhai A, Dada MA, Kirk GM, McQuoid-Mason DJ. Confidentiality – a dying wish. *S Afr Med J* 2001; 91: 123-127.

Dada MA, McQuoid-Mason DJ. Medico-legal aspects of pathology – current dilemmas regarding confidentiality and disclosure. *S Afr Med J* 2005; 95: 875-877.

## **9. Appendix - Terminology**

### **Abortion (induced abortion)**

The purposeful interruption of pregnancy performed by a specialist, with the intention to remove the products of conception.

### **Accident in medical care**

A misadventure or poisoning occurring during surgery or other medical care.

### **Activity**

Description of what the decedent was doing while he/she sustained the injury when a death for external causes occurs. This is vital information for prevention of accidents purposes.

### **Amended death certificate**

A second certificate of death correcting the information provided for the same deceased in a previously issued certificate. The amended certificate takes into account new clinical findings thus modifying or completing the reported causes of death.

### **Antecedent cause**

Any cause involved in the train of events leading to death, with the exception of the immediate cause (for example: antecedent cause for the condition reported on line I(a), is the condition reported on line I(b)) or, if the certificate has not been filled out correctly, the condition that the certifier should have reported there.

### **Automated coding system**

Software tools-based systems on which assigns ICD codes to the entities (see item) reported on death certificates and, through the application of ICD rules, determines the underlying cause of death. The utilization of such tools allows avoiding biases in coding and allows reproducibility and comparability between countries.

### **Birth weight**

The first weight of the fetus or newborn obtained after birth. (WHO) (see low, very low and extremely low birth weight).

- Extremely low birth weight - Less than 1.000 g (up to and including 999 g) (WHO).
- Very low birth weight - Less than 1.500 g (up to and including 1.499 g) (WHO).
- Low birth weight - Less than 2.500 g (up to and including 2,499 g) (WHO).

### **Cause of death**

Any condition, which leads to or contributes to death and is classifiable according to the International Classification of Diseases (ICD) system.

**Circumstances of injury, poisoning or violence**

All the events surrounding and/or causing the injury, poisoning or violence.

**Coding rules**

Coding rules contained in the applicable revision of the ICD, published by the World Health Organization, allow to systematically select an underlying cause of death from all entity reported in the death certificate. These coding rules improve the usefulness and comparability of mortality statistics among countries by giving preference to certain categories and by consolidating conditions.

**Contributory cause**

Any cause of death that is neither the immediate, intervening, originating antecedent nor underlying is a contributory cause of death. (i.e. conditions that should be reported on part II).

**Death Certificates**

Official records of individual deaths including the cause of death certified by a physician, or other legally appointed professional and any other required identifying information as well.

**Duration of disease**

Time elapsed between the onset of the disease and the death.

**Entity**

A diagnostic term or condition entered on the certificate of death that constitutes a codable entry.

**Epidemiology**

The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems.

**External Causes of Death**

Deaths due to accidents and violence including environmental events, circumstances and conditions as the cause of injury, poisoning, and other adverse effects. Broad categories include accidents, suicides, medical misadventures or abnormal reactions, homicide, legal intervention, and injury from war operations.

**Family of classifications**

This concept, developed by WHO, suggests the idea that health - related problems may be classified with the use of several different classifications depending on the user needs and purposes; ICD10 forms the 'core' of this family, but it is now flanked by different adaptations for specific fields (oncology, psychiatry, etc&) based on diagnosis and by different classifications not based on diagnosis (ICF, medical procedures, etc&) that may be used coupled with ICD10 or autonomously.

### **Stillbirth (Fetal death or deadborn fetus)**

According to the Births and Deaths Registration Act, No 51 of 1992, stillbirth with regards to an infant means that the foetus had at least 26 weeks of intra-uterine existence, but showed no signs of life after complete birth. This differs slightly from the WHO definition as follows: Death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation, the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles).

### **Gestational Age**

The duration of gestation is measured from the first day of the last normal menstrual period in weeks.

- Gestational Age, Post-term - More than 42 completed weeks of gestation (WHO).
- Gestational Age, Term - From 37 completed weeks to less than 42 completed weeks of gestation (WHO).
- Gestational Age, Pre-term - Less than 37 completed weeks of gestation (WHO).

### **ICD-10 code**

A single ICD alphanumeric string representing a single disease or injury or the association of two of them.

### **Immediate cause of death**

Any disease or condition entered on line (a) in Part I of the death certificate directly leading to death and consequent to diseases entered on lower lines of part I. Also known as terminal, direct or final cause of death.

### **International Classification of Diseases (ICD)**

International Classification of Diseases. A widely used system of classifying diseases and injuries. Each disease or set of diseases has an ICD code or ICD group assigned to it.

### **Intervening cause**

Any cause between the originating antecedent cause and the immediate cause of death, or, if the certificate has not been filled out correctly, any condition that the certifier should have reported there. Also known as complication.

### **Late maternal death**

The death of a woman from direct or indirect obstetric causes more than 42 days but less than one year after termination of pregnancy (WHO).

### **Live birth**

The complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which after such separation, breathes or shows other evidence

of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered liveborn (WHO).

### **Manner of death**

Manner of death help to clarify the modality/intention surrounding the deceased. The most common option for the classification of this variable are: Natural, Accident, Suicide, Homicide and Undetermined.

### **Maternal death**

The death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes. (WHO)

### **Multiple Causes of Death**

All those diseases, morbid conditions or injuries which either resulted in or contributed to death and the circumstances of the accident or violence which produced any such injuries.

### **Neonatal period**

Begins at birth and ends 28 completed days after birth. Neonatal deaths (deaths among live births during the first 28 completed days of life) may be subdivided into early neonatal deaths, occurring during the first seven days of life, and late neonatal deaths, occurring after the seventh day but before 29 completed days of life (WHO).

### **One term entity**

A diagnostic entity that is classifiable to a single ICD-10 code. It can be one word or more than one word.

### **Originating antecedent cause**

This term indicates the condition entered on the lowest used line in Part I, or, if the certificate has not been filled out correctly, the condition that the certifier should have reported there. The originating antecedent cause is, from a medical point of view, the starting point of the train of events that eventually caused the death; in this manual it is commonly referred to as 'underlying cause of death'.

### **Perinatal period**

Begins at 26 completed weeks (154 days) of gestation (when birth weight is normally 500 g) and ends seven completed days after birth (WHO definition begins at 22 completed weeks).

### **Period of gestation**

See gestational age.

**Place of death**

The place where the death occurred.

**Place of injury**

Place where the injury took place.

**Pregnancy related deaths (see maternal death)**

A death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective to the cause of death. (WHO)

**Properly positioned**

Condition(s) placed in an appropriate order to form a sequence of events.

**Quality of death certificate completion**

A well completed death certificate should guarantee accuracy and the use of specific diagnostic terms for all items; the cause of death section should contain a single sequence in part I with the indication of duration; other possible contributing conditions should be reported in part II. Such death certificates result in a proper coding and in high quality statistical data.

**Query**

Request of information to the certifier by the vital statistics system due to difficulties to attribute appropriate codes to the death certificate provided.

**Selected underlying cause of death**

A condition which is chosen either temporarily or finally by the application of an international selection rule.

**Sequence**

Two or more conditions entered on successive lines of Part I, each condition being an acceptable cause of the one entered on the line above it.

**Transport accident**

Any accident involving a device designed primarily for, or being used at the time primarily for, conveying people or goods from one place to another.

**Trend**

Temporal evolution of a phenomenon.

**Underlying cause of death**

The disease or injury which initiated the train of morbid events leading directly to death or the circumstances of the accident or violence that produced the fatal injury (WHO).

**Vital statistics**

Data collected from continuous or periodic recording or registration of all 'vital events', such as births, deaths, marriages and divorces.

**Women of reproductive age (or women of childbearing age)**

Refers to all women aged 15 to 49 years (WHO).