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DISCLAIMER

The contents of the guidelines are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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A copy of this resource is available on the internet at:

www.mrc.ac.za/intramural-research-untis/BurdenofDisease-resource-materials

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Medical Certification of Cause of Death

1. Important Definitions

Causes of death

“all those diseases, morbid conditions or injuries which either resulted in or contributed to death and the circumstance of the accident or violence which produced any such injuries.”¹

Underlying cause of death (UCOD)

“the disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury.”²

2. International Form of Medical Certificate of Cause of Death (SA version)

- The Medical Certificate (for all deaths excluding stillbirths and deaths of babies under 1 week of age) has 2 parts for the causes of death.
- Part 1 has four lines for reporting the **causal sequence/chain of events leading to death**; these lines are labelled a), b), c) and d).
- **Other significant conditions** that contributed to the death but do not fit into the causal sequence are entered in Part 2.

G.1 FOR DEATHS OCCURRING AFTER ONE WEEK OF BIRTH		
Instructions: Section G.1 is to be completed for all deaths that occurred after one week of birth		
77. CAUSES OF DEATH		
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	Approximate interval between onset and death (Days / Months / Years)
IMMEDIATE CAUSE (final disease or condition resulting in death)	a) _____ Due to (or as a consequence of)	_____
Sequentially list conditions, if any, leading to immediate cause.	b) _____ Due to (or as a consequence of)	_____
Enter UNDERLYING CAUSE last (Disease or injury that initiated events resulting in death)	c) _____ Due to (or as a consequence of)	_____
	d) _____	_____
Part 2	Other significant conditions contributing to death but not resulting in underlying cause given in Part 1 _____	
78. If a female, was she pregnant at the time of death or up to 42 days prior to death? (<input checked="" type="checkbox"/>)		
	<input type="checkbox"/> 82.1 Yes	<input type="checkbox"/> 82.2 No

¹ Twentieth World Health Assembly, 1967

² World Health Organization, 1994

3. Completing the Medical Certificate of Cause of Death

Part 1: Causal sequence leading to death

- The direct cause of death is entered in Part 1 a). This line must always be filled in.
- If the direct cause of death was a consequence of another disease or condition, this antecedent cause should be entered in Part 1 b), and so forth.
- If more than one line is completed, each condition must be a cause of the condition above it. There must be a pathophysiological *causal* sequence.
- The initiating cause in the sequence is the underlying cause of death and should be reported on the lowest used line in Part 1.
- Always use consecutive lines, starting at Part 1 a). Never leave blank lines between filled in lines. If there is only one cause of death, it is entered at Part 1 a) and the subsequent lines are left blank.
- Enter only one disease, condition, event, or injury per line.

Part 2: Other significant conditions contributing to death

- Other significant conditions that contributed to the death but do not fit into the causal sequence are entered in Part 2. More than one condition can be entered on this line.

Duration between onset of disease and death

- The column on the righthand side of Part 1 and Part 2 is to record the approximate interval between onset of the condition and death. If the time interval is unknown, write unknown (**enter 999 in the VA review form**).
- If more than 1 condition is entered in Part 2, insert the duration in brackets after each condition.

4. Terminology and guidelines

- Give as full a description of disease conditions as possible to help the classification and coding process for each medical certificate of cause of death.
- Do not use **abbreviations**, except for HIV and AIDS, TB or PTB, which are acceptable.
- **HIV**
 - Where a person died of HIV-related conditions, it is important to include HIV/AIDS on the death certificate. Do not use terms such as RVD, retroviral disease, immunodeficiency, etc.
 - Where a person was known to be HIV positive and died from an opportunistic infection, HIV must be reported as **the underlying cause of death in Part 1**. Refer to the WHO clinical staging of HIV disease for a comprehensive list of opportunistic infections and AIDS defining conditions.
 - Often, a person with HIV/AIDS may have multiple conditions (e.g. cancer, opportunistic infections) at the time of death. In this case, the condition most likely to have resulted in death must be reported in Part 1 a) with HIV/AIDS reported in the

line below. The other conditions that do not fit into the causal sequence must be reported in Part 2.

- Where an HIV positive person had TB and it is likely that TB was the immediate cause of death, TB must be reported in Part 1 a, with HIV reported on the line below.
- HIV must only be entered in Part 2 where HIV is not part of the causal sequence leading to death, e.g. when an HIV positive person dies after being hit by a truck.
- **Infectious and parasitic diseases**
 - If the causative organism is known, it should be documented on the certificate.
 - Document the site of the infection, if known.
- **Diabetes mellitus**
 - If type I or type II known, specify. If unknown, can simply report diabetes mellitus.
 - Can be the **underlying cause of death or a risk factor** for another underlying cause of death
 - If patient dies from a **complication of diabetes mellitus**, e.g. diabetic nephropathy or diabetic ketoacidosis, document diabetes mellitus (type I or II) as the underlying cause of death in **Part 1**
 - If a patient dies from a **stroke or myocardial infarction**, document diabetes mellitus in **Part 2**, as it is a risk factor for cardiovascular disease
- **Hypertension**
 - Indicate whether essential or secondary, if known. If unknown, *hypertension* alone is acceptable.
 - If secondary, then the underlying cause needs to be part of causal sequence.
- **Chronic kidney disease**
 - Usually, there will be comorbid hypertension and/or diabetes mellitus, but it will not always be possible to know the underlying cause of the kidney disease. Where the underlying cause of kidney disease is not known for certain, but it is known that the person died from chronic kidney disease, put chronic kidney disease in Part 1 and put hypertension and/or diabetes mellitus (and/or other contributing factors) in Part 2.
 - Hypertension: if the kidney disease is due to hypertension, there will always be a longstanding history of hypertension with other target organ damage, such as left ventricular hypertrophy (hypertensive heart disease). Proteinuria is usually >2g/day but this information will not always be known. There should be no other possible cause for kidney disease. (If hypertension and kidney disease were diagnosed at the same time, it is more likely that the hypertension was caused by the kidney disease.)
 - Diabetes mellitus type 1: diabetic nephropathy in DM1 is preceded by a longstanding history of DM1 with other microvascular target organ damage, usually diabetic retinopathy. If a person does not have retinopathy, it is unlikely to be diabetic nephropathy, but rather chronic kidney disease in a diabetic (diabetes mellitus would therefore go in Part 2).
 - Diabetes mellitus type 2: this is trickier as DM2 is often diagnosed late and diabetic nephropathy is common. Hypertension is a common comorbidity and is often secondary to renal disease. These patients usually have serially increasing proteinuria, but this information will not always be known. Again, if the underlying cause of CKD is not certain, put diabetes (and hypertension) in Part 2.

- **Neoplasms**
 - Primary site of neoplasm must be stated if known – if unknown, this must be stated, e.g. *unknown primary malignant neoplasm*.
 - Benign or malignant
 - Histological type (if known)
- **Injuries, poisonings and external causes of death (Unnatural deaths)**
 - The circumstance of the injury or external cause that led to the death should always be reported as the underlying cause of death
 - Was it intentional or accidental?
 - Describe in as much detail as possible.
 - ***pedestrian hit by car***
 - ***suicidal death by hanging***
 - ***accidental gunshot wound to the head by child playing with father's firearm***

Example:

Part 1 a)	<i>Peritonitis</i>	6 hours
Part 1 b)	<i>Gastric perforation</i>	6 hours
Part 1 c)	<i>Intentional ingestion of liquid nitrogen</i>	7 hours
Part 1 d)		

- **Ill-defined conditions**
 - These are of no value, do not provide any information, and should not be reported on death certificate.
 - Organ failure (e.g. *heart, renal or liver failure*) - where possible, the condition causing organ failure should be entered as underlying cause. If unknown, state this.
 - *Septicaemia* – avoid using this term if the source of infection is known (e.g. *community-acquired pneumonia*). If the source of infection is unknown, *septicaemia, source unknown* may be reported.
 - *Symptoms and signs* are ill-defined terms and should not be reported on the medical certificate of cause of death.
 - Mode of dying (e.g. *cardio-pulmonary arrest; brain death*) – should not be reported.
 - *Senility* or *old age* – avoid. Always enter a specific cause, where possible.
- **Death due to surgical procedure**
 - The name of the procedure should include the condition for which it was performed, e.g. laparoscopy for elective bilateral tubal ligation.
- **Pregnancy**
 - If a woman dies during pregnancy or within 42 days of the end of pregnancy, even if the death was not related to the pregnancy, this should be included on the death certificate. This should be indicated in the pregnancy question on the relevant Kobotools record review forms.
- **Unknown cause of death**
 - Where there is insufficient information to be certain of the cause of death, it is acceptable to report the death as ***unknown cause of death***.

Verbal Autopsy Review Guidelines

It is important to read the narrative, as well as the answers to the specific VA questions (on the Excel spreadsheet), and to use the information obtained from both to decide on the most probable cause of death.

- Use only the information presented, and do not think of possible scenarios where there is not enough information to support such a possibility. Avoid making things up.
- The information from a verbal autopsy is obtained from a lay person. It may be necessary to interpret the information as a medical practitioner, and not to simply rely on the information word for word. For example, a lay person may speak of “*womb cancer*” - this could refer to cervical cancer; endometrial cancer; uterine sarcoma; etc.
- Remember, common diseases and conditions occur commonly.
- Try to be as specific as possible, but do not make things up. For example, it is acceptable to report *diabetes mellitus* without type, if unknown, or to report *meningitis* where the causative organism is unknown.

Medical Record Review Guidelines

Before starting to review medical records, please ensure that you have deleted any downloaded narratives and excel spreadsheets from the verbal autopsies, as these are confidential documents.

1. Confidentiality

- Please remember to maintain **confidentiality** when reviewing the medical records. While we have tried to ensure patient identifying information has been blocked out, the hospital names and healthcare workers names have not been blocked out.
- Please **do not download any files that have patient identifiers visible**, notify the QA team immediately so that we can remove and anonymise the record.
- It is preferable to **view the pdf documents on Teams** rather than downloading them as they are confidential medical documents. If you do download one of the pdfs, please delete it as soon as you have finished with it and please do not share the information contained within them.

2. Concern about medical malpractice

- If there is anything that you come across within the medical records you are concerned about, such as patient neglect; medical malpractice; etc., please let Pam Groenewald know so that she can pass it on to the principal investigator. **Do not contact the healthcare worker or the hospital directly.**

3. Microsoft Teams

- Medical records will only be reviewed by **one certifier** who will be allocated his/her own individual team on Teams. Batches of medical records will be placed into the certifier's Team as required.
- The medical records are saved as a pdf under the USID number. Unfortunately, the pages are **not** always in chronological order, so be sure to **scroll through all the pages** to be sure to not miss any information.

4. Date of birth and date of death information

- On many of the medical records, these dates have been blocked out with the identifying information. If these dates are not obvious on the notes, **do not spend time looking for them.** You can skip these questions on the KoboTools form. We have also included another item where you can indicate if this person was an infant, child or adult, if the specific age is not available. However, if you do need these dates for diagnostic purposes (and the patient's age is not mentioned in the notes), please let us know and we will get the dates from the raw data for you.

5. Laboratory Results

- We are still in the process of getting all results from the NHL. Once available, you will be able to view the results of any tests the decedent had within 6 months of his/her death.

- *For now, flag any cases where you need the results in order to make a diagnosis so that you can go back to these once the results are available. We will keep you posted regarding the availability of results.*

6. Submitting Medical Record review on KoboCollect

- Download the Medical Record form using KoboCollect on your tablet. This can be found under “**Get new form**”.
- Select **Medical record review form_20190626** and “**get selected**”.
- **Go through the form before reviewing any cases** so that you are familiar with the information required.
 - You will be required to briefly summarise the medical history and relevant findings.
 - You will also be required to indicate how the diagnosis was confirmed for each cause listed in your cause of death sequence. For this question, you can select multiple options used to confirm diagnosis.
 - You are then required to **specify main tests and results** – here, you need to type the relevant main tests and results used to make the diagnosis. Do not type out all tests and results, **only those that are most relevant**.

7. Quality Assurance

- If the cause of death is **unknown**, there needs to be good reason as to why you were unable to make a diagnosis and this needs to be substantiated on the KoboTools Medical record review form. Any cases where **unknown** has been put as the cause of death, but upon review by the quality assurance team it is felt there is enough information to make a diagnosis, will be sent back to you for resubmission and you will not be paid for the resubmission.
- Any cases where the **causal sequence is problematic or incorrect**, will be sent back to you to be reviewed and resubmitted.
- The quality assurance team will randomly sample several cases and submissions from each batch to check the quality of reviews being submitted. If it is felt the quality of reviews are not satisfactory and incorrect diagnoses are consistently being made, you will not be sent further batches to review.

Forensic Record Review Guidelines

Before starting to review forensic records, please read through the SOP below. It is important to note that these cases are to be reviewed with your best medical opinion – they are not legal documents.

1. Confidentiality

- Please remember to maintain **confidentiality** when reviewing the forensic records. While we have tried to ensure patient identifying information has been blocked out, the hospital names and healthcare workers names have not been blocked out. We have also tried to give each reviewer batches outside of their area of practice to ensure that you do not review your own records. Please notify us if you come across any records from your province so that we can reallocate those to another reviewer. There are a few batches with records from a number of provinces where this might be an issue.
- Please **do not download any files that have patient identifiers visible**, notify the QA team immediately so that we can remove and anonymise the record.
- It is preferable to **view the pdf documents on Teams** rather than downloading them as they are confidential medical documents. If you do download one of the pdfs, please delete it as soon as you have finished with it and please do not share the information contained within them.

2. Concern about medical malpractice

- If there is anything that you come across within the medical records you are concerned about, such as patient neglect; medical malpractice; etc., please let Pam Groenewald know so that she can pass it on to the principal investigator. **Do not contact the forensic pathologist or forensic mortuary directly.**

3. Microsoft Teams

- Forensic records will only be reviewed by **one certifier** who will be allocated his/her own individual team on Teams. Batches of forensic records will be placed into the certifier's Team as required.
- The forensic records are saved as a pdf under the USID number. Unfortunately, the pages are **not** always in chronological order, so be sure to **scroll through all the pages** to be sure to not miss any information.

4. Completing the Medical Certificate of Cause of Death

The same certification rules apply as per the VAs. Please refresh yourselves with the terminology and guidelines in the Medical Certificate of Cause of Death Guideline.

Use all the information available in the forensic records to decide the most probable cause of death sequence and underlying cause of death. Do not simply use the diagnosis provided by the forensic pathologist. If you feel the underlying cause of death differs from that which was reported in the forensic records, certify the cause of death based on your best medical opinion.

5. Date of birth and date of death information

- On many of the forensic records, these dates have been blocked out with the identifying information. If these dates are not obvious on the notes, **do not spend time looking for them**. You can skip these questions on the KoBoToolbox form. We have also included another item where you can indicate if this person was an infant, child or adult, if the specific age is not available. However, if you do need these dates for diagnostic purposes (and the patient's age is not mentioned in the notes), please let us know and we will get the dates from the raw data for you.

6. Forensic Laboratory Results

- We are still in the process of getting all results from the Forensic laboratories. Those that are already available can be found in TEAMS_FPS_LAB RESULTS in the General folder. At this stage we only have blood alcohol results.
- Search for the result using the seal number in the FPS records or using the mortuary reference number (DR number)
- *For now, flag any cases where you need the results in order to make a diagnosis so that you can go back to these once the results are available. We will keep you posted regarding the availability of results.*

7. Submitting Forensic Record review on KoboCollect

- Download the Forensic Record form using KoboCollect on your tablet. This can be found under “**Get new form**”.
- Select **Forensic record review_18062019** and “**get selected**”.
- **Go through the form before reviewing any cases** so that you are familiar with the information required. There are a few changes from the VA form that you may be familiar with;
 - You will be required to briefly summarise the events leading to the death in sequence from the medical history and relevant findings.
 - You will also be required to indicate if the findings are consistent and rate the quality of the information.
 - There are added questions regarding alcohol and toxicology.
 - You are then required to specify how each line of the sequence was confirmed. If you have used medical history or clinical findings from the notes to make a diagnosis, please specify this. Please do not simply put “autopsy findings” as an explanation.

8. Quality Assurance

- If the cause of death is **unknown/undetermined**, there needs to be good reason as to why you were unable to make a diagnosis and this needs to be substantiated on the KoBoToolbox forensic record review form.
- Cases where the **causal sequence is problematic or incorrect**, *may* be sent back to you to be reviewed and resubmitted.
- The quality assurance team will randomly sample several cases and submissions from each batch to check the quality of reviews being submitted. If it is felt the quality of reviews are not

satisfactory and incorrect diagnoses are consistently being made, you will not be sent further batches to review.

9. Notes specific to Forensic Records

- It is very important that the circumstances of the injury are recorded in the lowest completed line in Part 1 as the coding software will not consider the manner if not included in the Part 1 or Part 2 sequencing. For example; if there is a homicide due to assault with a hammer to the head, the sequencing will read as follows: Part 1a) Traumatic brain injury 1b) Hit with a hammer 1c) Assault. Or in a suicide case by hanging, the sequencing will read as; Part 1a) Hanging Part 1b) Suicide.
- Report only one condition per line even if there were multiple factors, contributing to the death. Choose with the information given, which of the causes most likely contributed most to the death. Also make sure that the causal sequence for natural causes makes sense.
- Consider that ICD coding guidelines will by default code an undetermined cause to accidental, so as much as possible, with the information given, try to come up with a UCOD.
- Note that the case number of the teams folder and the name of the documents themselves may differ but may still be the same case. If you feel that the documents do not match for a case, please inform us.
- If you come across any records that do not have forensics reports, please inform us. If you come across any records labeled “checklists” with personal information of the decedents, please inform us.

10. Blood results

- There are toxicology and alcohol level results available. To find these go into the teams folder “TEAMS_FPS_LAB RESULTS” under the “Files” tab. Currently there is a folder labeled “FPS Blood_Alcohol analysis results” with excel sheets separated by province. Please download these to your own devices and save them under a different name to make sure you don’t accidentally adjust information on the shared excel sheets. You can then search for the ‘PMK’ number under the FCL_SEAL_NUMBER column. There are still outstanding alcohol levels for EC and KZN, as well as toxicology results. You will be updated once these become available.