Resources available from the University of Melbourne, Bloomberg Philanthropies Data for Health Initiative

**CRVS course prospectuses**
These resources outline the context, training approach, course content and course objectives for the suite of CRVS trainings delivered through the Bloomberg Philanthropies Data for Health Initiative. Each course focuses on a specific CRVS intervention or concept, and is designed to support countries to strengthen their CRVS systems and data.

**CRVS Fellowship reports and profiles**
The CRVS Fellowship Program aims to build technical capacity in both individuals and institutions to enhance the quality, sustainability and health policy utility of CRVS systems in Fellows’ home countries. *Fellowship reports* are written by Fellows as a component of the program, and document, in detail, the research outcomes of their Fellowship. *Fellowship profiles* provide a summary of Fellows’ country context in relation to CRVS, an overview of the Fellowship experiences, the research topic and the projected impact of findings.

**CRVS analyses and evaluations**
These analytical and evaluative resources, generated through the Initiative, form a concise and accessible knowledge-base of outcomes and lessons learnt from CRVS initiatives and interventions. They report on works in progress, particularly for large or complex technical initiatives, and on specific components of projects that may be of more immediate relevance to stakeholders. These resources have a strong empirical focus, and are intended to provide evidence to assist planning and monitoring of in-country CRVS technical initiatives and other projects.

**CRVS best-practice and advocacy**
Generated through the Initiative, CRVS best-practice and advocacy resources are based on a combination of technical knowledge, country experiences and scientific literature. These resources are intended to stimulate debate and ideas for in-country CRVS policy, planning, and capacity building, and promote the adoption of best-practice to strengthen CRVS systems worldwide.

**CRVS country reports**
CRVS country reports describe the capacity-building experiences and successes of strengthening CRVS systems in partner countries. These resources describe the state of CRVS systems-improvement and lessons learnt, and provide a baseline for comparison over time and between countries.

**CRVS technical guides**
Specific, technical and instructive resources in the form of quick reference guides, user guides and action guides. These guides provide a succinct overview and/or instructions for the implementation or operation of a specific CRVS-related intervention or tool.

**CRVS tools**
Interactive and practical resources designed to influence and align CRVS processes with established international or best-practice standards. These resources, which are used extensively in the Initiative’s training courses, aim to change practice and ensure countries benefit from such changes by developing critical CRVS capacity among technical officers and ministries.

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Melbourne School of Population and Global Health
Building 379
207 Bouverie Street
Carlton, VIC 3053
Australia

CRVS-info@unimelb.edu.au
www.mspgh.unimelb.edu.au/dataforhealth

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Assessing the quality of death certificates: Guidance for the rapid tool

This document provides guidance on how to use the Medical certification of cause of death (MCCOD): Rapid assessment tool. Information generated from the assessment is useful for ministry of health staff, hospital administrators, health information officers or medical records officers to determine the quality of death certificates. The rapid tool can be used by a doctor who is trained in death certification practices and who understands the ICD-10 death certification rules. The MCCOD rapid assessment tool is available on the CRVS Knowledge Gateway at: https://crvsgateway.info/file/13737/3269

Please note that this is Version 3 of Assessing the quality of death certificates: Guidance for the rapid tool. This document has been updated to reflect revisions made to the MCCOD rapid assessment tool and replaces all previous versions (Version 1, March 2018 and Version 2, February 2019) of the guidance document.

Preface: The importance of assessing the quality of death certificates

Evaluation studies have shown that medical certificates of cause of death (referred to as ‘death certificates’) are often of poor quality, even when the cause of death has been certified by a doctor. In many countries, doctors do not get adequate opportunities to learn about death certification as part of their medical training. In addition, some hospitals lack the basic diagnostic facilities that are needed to determine accurately the cause of death. In general, healthcare institutions cannot achieve accurate and complete death certification if the medical records department is not functioning well. Doctors will not be able to locate supporting information, which will lead to low-quality certification.

The best way to obtain high-quality mortality statistics is to have deaths certified by a qualified medical doctor. Death certification by doctors is the gold standard for producing cause of death data. How well a doctor diagnoses the diseases or conditions that led to a person’s death depends on several factors, such as the doctor’s training and experience in death certification, support from the hospital (for clinical records and diagnostic equipment), and whether the medical certificate is correctly filled in.

As such, assessing completed death certificates is important to identify how well doctors are filling in the certificates, and to highlight gaps in hospital support or training programs.

Box 1. Important concepts

The causes of death recorded in the International Form of Medical Certificate of Cause of Death are:

- 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

Twentieth World Health Assembly, 1967

The underlying cause of death is:

- 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

World Health Organization, 1994

---

The International Form of Medical Certificate of Cause of Death

The World Health Organization (WHO) recommends using the International Form of Medical Certificate of Cause of Death for the certification of death in all countries. Health departments or ministries of health can use the certificate as a framework that will help to organise clinical diagnoses in such a way that they can be used to improve public health. Figure 1 shows Frame A of the death certificate, which was introduced with the adoption of the International classification of diseases, version 10 (ICD-10). An example of the full, updated death certificate introduced by WHO in 2016, which includes demographic and other medical data, is in Annex 1.

Figure 1. Frame A of the International Form of Medical Certificate of Cause of Death

<table>
<thead>
<tr>
<th>Frame A: Medical data: Part 1 and 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Report disease or condition directly leading to death on line a</td>
</tr>
<tr>
<td>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</td>
</tr>
<tr>
<td>Cause of death</td>
</tr>
<tr>
<td>a</td>
</tr>
<tr>
<td>b</td>
</tr>
<tr>
<td>c</td>
</tr>
<tr>
<td>d</td>
</tr>
</tbody>
</table>

The death certificate is divided into three sections:

1. Part 1—diseases or conditions directly leading to death and antecedent causes
2. Part 2—other significant conditions
3. A column to record the approximate interval between the onset of the condition and death.

Before reviewing the sections in detail, it is essential to understand the following concepts:

- the sequence/chain of events leading to death
- the contributory cause(s) of death.

To fill in the medical certificate of cause of death (‘death certificate’) correctly, the doctor must first identify the disease leading directly to death, then trace the sequence of events back to the underlying cause of death. Other diseases contributing to death are entered in a second part of the form (Figure 2). This is different from the logic that the doctor uses to make the clinical diagnosis, which forms the basis for patient management. Reviews of the accuracy of death certificates in hospitals from around the world have shown that the underlying cause of death is often misclassified, because many doctors have not been trained in death certification.³

**Figure 2. Example of a death certificate filled-in correctly**

<table>
<thead>
<tr>
<th>Frame A: Medical data: Part 1 and 2</th>
<th>Cause of death</th>
<th>Time interval from onset to death</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Report disease or condition directly leading to death on line a</td>
<td>a Renal failure</td>
<td>1 year</td>
</tr>
<tr>
<td>Report chain of events in due to order (if applicable)</td>
<td>b Due to: Nephritic syndrome</td>
<td>3 years</td>
</tr>
<tr>
<td>State the underlying cause on the lowest used line</td>
<td>c Due to: Diabetes mellitus</td>
<td>20 years</td>
</tr>
<tr>
<td>d Due to:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</td>
<td>Ischaemic right foot (3 months)</td>
<td></td>
</tr>
</tbody>
</table>

**About the rapid assessment tool**

The tool is designed to assess quickly the quality of death certification practices, by looking for common errors on filled-in death certificates. The tool can be used to:

- assess the quality of death certification as part of a routine assessment
- assess the training needs of doctors in designing cause of death certification training
- evaluate the effectiveness of death certification training.

The rapid tool is a checklist of the most common errors seen on death certificates, presented as a table. The errors are based on real examples taken from a collection of death certificates reviewed between 2010 and 2013 in several countries.

**Who should use the tool?**

This document provides guidance on how to use the rapid assessment tool. Information generated from the assessment would be helpful for ministry of health staff, hospital administrators, health information officers or medical record officers to determine the quality of death certificates.

The tool can be used by a doctor who is trained in death certification practices and understands the ICD-10 death certification rules. This tool can also be used by a well-trained coder. However, in the absence of properly trained mortality coders in many countries, coders may need to refer to the Mortality Medical Data System tables or consult a doctor to confirm the correct cause of death sequence.

**How many certificates should be assessed?**

The number of death certificates that should be assessed using this tool will depend on the objectives of the assessment and availability of the resources to carry out the study. If a large sample (ie more than 500) of death certificates can be assessed, the results would be quite robust. However, if resources are limited, for a periodic assessment in one hospital, even 100 death certificates would be enough to generate evidence on current death certification practices.
Associated documents

Two versions of the rapid assessment tool are available – a print and Microsoft Excel version.

Assessment tool - print version

The print version of the medical certification rapid assessment tool is used for manual data entry. This version may be useful in places where the certifiers and/or assessors do not have ready access to computers. It may also be useful when the sample of death certificates available for assessment is small. With the print version, the data must be entered into a spreadsheet and analysed manually.

Available at:
https://crvsgateway.info/file/13737/3269

Assessment tool - Microsoft Excel version (and accompanying user guide)

The medical certification of cause of death rapid assessment tool is available in Microsoft Excel format. This version enables users to enter assessment data into an excel work sheet. Assessment results are available in table and graphic formats. This version is useful when the certifiers and/or assessors have ready access to a computer. It is especially useful when large numbers of death certificates are assessed for certification quality. This version can analyse the data automatically as they are entered into the Excel spreadsheet. Automatic generation of tables and graphs is an added benefit.

Available at (Excel tool and user guide):
https://crvsgateway.info/file/13475/3634

Quick reference guide to the rapid assessment tool

The quick reference guide contains guidelines on how to assess the errors commonly recorded on Frame A (Part 1 and Part 2) of the death certificate.

Available at:
https://crvsgateway.info/file/13924/3535

Items on the death certificate assessment tool

The death certificate assessment tool looks at eight features/characteristics of a death certificate that are often incorrectly filled out:

1. Multiple causes of death recorded in any of the lines of Part 1
2. Missing time interval from disease onset to death in any of the lines
3. Abbreviations used in entries in any of the lines
4. Illegible handwriting in any of the lines
5. Incorrect or clinically improbable sequence of events leading to death in Part 1
6. Impossible underlying cause entered in the lowest used line of Part 1
7. For deaths due to external causes (i.e. accident, violence, poisoning), circumstances are missing
8. For deaths due to neoplasms, additional details are missing (site, morphology, behaviour).
1. Multiple causes of death recorded in any of the lines of Part 1

The WHO ICD guidelines state that only one cause should be recorded per line in a death certificate. When more than one cause is reported on a single line, it makes it difficult for coders to establish the sequence of events leading to death, thus selecting the correct underlying cause of death would be more difficult (see Figure 3).

An exception to this guideline may be permissible in cases where there are multiple causes in the sequence leading to death, and not enough blank lines to record them on. If this is the case, it is important that the certifier clearly demonstrates the sequence, by writing ‘due to’ in between conditions written on the same line (see Figure 4).

Instructions for completing the assessment table

Mark with a tick or cross in the ‘Yes’ column if there is more than one cause reported on one line (this is an error). If there is one cause per line, mark the ‘No’ column.

If there is more than one cause reported on one line, and the certifier has clearly demonstrated the sequence by writing ‘due to’ (or other acceptable term such as ‘secondary to’, ‘as a result of’, or ‘as a consequence of’) in between causes, mark with a tick or cross in the ‘No’ column.

If there is more than one cause reported on one line and the certifier has not used ‘due to’ in between causes and the sequence is unclear, mark with a tick or cross in the ‘Yes’ column (this is an error).

Figure 3. Example of an incorrectly filled-out death certificate with multiple causes of death per line

<table>
<thead>
<tr>
<th>Frame A: Medical data: Part 1 and 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Report disease or condition directly leading to death on line a</td>
</tr>
<tr>
<td>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</td>
</tr>
</tbody>
</table>

- **Figure 4. Example of a correctly filled-out death certificate with multiple causes of death per line**

<table>
<thead>
<tr>
<th>Frame A: Medical data: Part 1 and 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Report disease or condition directly leading to death on line a</td>
</tr>
<tr>
<td>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</td>
</tr>
</tbody>
</table>
2. Missing time interval from disease onset to death in any of the lines

The column on the right-hand side of Part 1 of the death certificate is for recording the approximate time interval between the onset of the condition and the time of death. The time interval should be entered for all conditions reported on the death certificate, in both part 1 and part 2. For conditions listed in Part 2, the time interval can be written in brackets after the condition, for example, ‘obesity (15 years)’. These intervals are usually established by the doctor based on available information in the clinical records. In some cases, the time interval will have to be estimated. Time periods such as minutes, hours, days, weeks, months or years can be used.

If the time of onset is unknown or cannot be determined because of a lack of information, it can be written as ‘unknown’. Time intervals are very important for correctly coding certain diseases and provide a check on the accuracy of the reported sequence of conditions. Therefore, doctors should complete the time intervals.

Instructions for completing the assessment table

Mark with a tick or cross in the ‘Yes’ column if the time interval between onset and death has been left blank for any condition (i.e. not completed) (this is an error; see Figures 5 & 6). If the time interval has been filled out for all conditions, mark the ‘No’ column.

Figure 5. Example of an incorrectly filled-out death certificate with no time interval from onset to death in Part 1

<table>
<thead>
<tr>
<th>Frame A: Medical data: Part 1 and 2</th>
<th>Cause of death</th>
<th>Time interval from onset to death</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Report disease or condition directly leading to death on line a</td>
<td>Pulmonary haemorrhage</td>
<td></td>
</tr>
<tr>
<td>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a Due to:</td>
<td>Advanced pulmonary tuberculosis</td>
<td></td>
</tr>
<tr>
<td>b Due to:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c Due to:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d Due to:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Time interval not recorded
3. Abbreviations used in the entries in any of the lines

Doctors should not use abbreviations when certifying deaths, because abbreviations can mean different things to different people. Any abbreviations used in Part 1 or Part 2 would be considered an error. Coders may misinterpret the abbreviation and code the death to a non-relevant code.

Below are examples of common abbreviations that should not be used:

- MI
- HT
- HONK
- ESRD
- K/C/O
- HTN
- DM
- IHD
- AAA
- DEH
- BHP.

Instructions for completing the assessment table

Mark with a tick or cross in the ‘Yes’ column if abbreviations are used in certifying the death (this is an error).

If abbreviations are not used, mark the ‘No’ column.
4. Illegible handwriting

Death certificates need to be completed clearly so that coders and other users can read the information provided in the death certificate. Illegible handwriting makes it hard for coders to correctly identify the stated condition even if the death certificate contains no other errors.

Instructions for completing the assessment table

Mark with a tick or cross in the ‘Yes’ column if the handwriting on the certificate is illegible (this is an error; see Figure 9).

If the handwriting is legible, mark the ‘No’ column.

Figure 9. Examples of illegible handwriting on filled-in death certificates

The handwriting on this certificate is very difficult to interpret
5. Incorrect or clinically improbable sequence of events leading to death in Part 1

Mortality statistics are based on the underlying cause of death, which is the condition or injury that initiated the sequence of events that led directly to death. For example, when a person dies of acute renal failure caused by hyperosmolar non-ketotic coma, caused by type 2 diabetes mellitus - acute renal failure is the direct cause of death. Hyperosmolar non-ketotic coma is the intervening cause and the underlying cause of death is type 2 diabetes mellitus. Reporting the direct cause of death as the underlying cause is one of the most common errors seen on death certificates.

The guidelines state that the certifying doctor should identify a sequence of events leading to death, and document these in the death certificate. When a clinically improbable sequence of events is recorded, it is impossible to select the correct underlying cause of death.

Instructions for completing the assessment table

Mark with a tick or cross in the ‘Yes’ column if the sequence of events recorded are not clinically correct or are clinically improbable (this is an error; see Figures 7.1, 7.2 and 7.3).

If the sequence is correct, mark the ‘No’ column.

Figure 7.1, 7.2 and 7.3: Examples of clinically improbable sequences of events or causes of death on filled-in death certificates

This shows a clinically improbable sequence of events leading to death, as chronic bronchitis does not cause gangrene or diabetes. It is likely that the diabetes caused the gangrene, which led to death, and that chronic bronchitis was a significant condition. This certificate also does not state if it was Type I or Type II diabetes.

<table>
<thead>
<tr>
<th>Frame A: Medical data: Part 1 and 2</th>
<th>Cause of death</th>
<th>Time interval from onset to death</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Report disease or condition directly leading to death on line a</td>
<td><strong>Diabetes</strong></td>
<td>20 years</td>
</tr>
<tr>
<td>b Due to: Gangrene foot</td>
<td></td>
<td>2 years</td>
</tr>
<tr>
<td>c Due to: <em>Chronic bronchitis</em></td>
<td></td>
<td>5 years</td>
</tr>
<tr>
<td>d Due to:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Due to the overall poor quality of death certification practices, we often do not see the time interval recorded on death certificates with clinically improbable sequences. This makes it harder for coders to correctly identify the underlying cause of death.

**Frame A: Medical data: Part 1 and 2**

<table>
<thead>
<tr>
<th></th>
<th>Cause of death</th>
<th>Time interval from onset to death</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Uraemia</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Cataract</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Ischaemic heart disease</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</td>
<td></td>
</tr>
</tbody>
</table>

As well as an improbable sequence, this certificate also has two causes recorded on line b (time intervals have also not been recorded).

**Frame A: Medical data: Part 1 and 2**

<table>
<thead>
<tr>
<th></th>
<th>Cause of death</th>
<th>Time interval from onset to death</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Polycystic kidney</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Renal failure and hypertension</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Ischaemic heart disease</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</td>
<td></td>
</tr>
</tbody>
</table>

CRVS technical guide
Assessing the quality of death certificates: Guidance for the rapid tool | Version 0318-03
6. Impossible underlying cause in the lowest line of Part 1

Entering ill-defined or vague conditions on death certificates are of no value for public health and do not provide any information for decision-makers to guide them in designing preventive health programs.

Such conditions are usually coded to unusable (or ‘garbage’) codes, which belong to four main types:

1. Symptoms and signs (e.g. fever, headache, backache, enlarged liver);
2. Intermediate causes (e.g. septicemia, pathological fracture, pneumonitis, secondary hypertension etc.);
3. Modes of dying (e.g. cardiac or respiratory arrest);
4. Unspecified causes within a larger death category (e.g. ill-defined site of cancer or injury, congenital heart disease, respiratory infection, cardiovascular disease etc.). Organ failure (e.g. heart or liver failure) is not acceptable as an underlying cause of death. The disease or condition causing the organ failure should be entered as the underlying cause, if possible.

Similarly, septicemia should not be used as an underlying cause. This is known as an ill-defined condition and should be avoided. Instead, the source of the infection (e.g. septic abortion, community-acquired pneumonia) should be identified whenever possible.

Symptoms and signs (e.g. chest pain, cough, fever) are not diseases or conditions, and should not be used on the death certificate. The disease or conditions that caused them should be reported.

Doctors should not report the mode of dying on the death certificate. This includes terms such as ‘cardiopulmonary arrest’ or ‘brain death’.

When reporting the death of an older person, do not use the terms ‘senility’ or ‘old age’. If possible, the doctor should enter a specific cause of death.

Instructions for completing the assessment table

The cause recorded on the lowest used line is considered the underlying cause of death for assessment. Mark with a tick or cross in the ‘Yes’ column if ill-defined conditions are entered as the underlying cause of death (this is an error; see Figures 8.1 and 8.2).

Also specify what type of ill-defined condition was listed. If the underlying cause of death is not ill-defined, mark the ‘No’ column.

If two or more causes are reported in the lowest used line, and each condition is separated by a space, comma or a similar punctuation, consider the first condition as underlying.

If two or more causes are reported on the lowest used line and the conditions are reported as ‘due to’, ‘secondary to’, ‘as a consequence of’ or a term having similar meaning, consider the last condition as underlying.
Figures 8.1 and 8.2: Examples of incorrectly filled-in death certificates with an ill-defined condition listed as the underlying cause of death

<table>
<thead>
<tr>
<th>Frame A: Medical data: Part 1 and 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Report disease or condition directly leading to death on line a</td>
</tr>
<tr>
<td>Cause of death</td>
</tr>
<tr>
<td>a</td>
</tr>
<tr>
<td>b</td>
</tr>
<tr>
<td>c</td>
</tr>
<tr>
<td>d</td>
</tr>
<tr>
<td>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</td>
</tr>
</tbody>
</table>

7a. Deaths due to an accident, violence, poisoning or other external cause

Instructions for completing the assessment table

Mark with a tick or cross in the ‘Yes’ column if the death was due to an accident, violence, poisoning or other external cause. Then go to question 7 b.

If the death was not due to an accident violence, poisoning or other external cause, mark the ‘No’ column. Then go to question 8a.
7b. External causes of death

In certifying deaths due to injuries, poisoning and other external causes, the circumstances of death should be reported as the underlying cause of death. The external cause should be described in as much detail as possible. For example, ‘motor vehicle accident’ is too broad; instead, ‘pedestrian hit by motor car at night on a public highway while going to work’ is providing important details for prevention. In a case of suicide, simply entering ‘suicide’ is insufficient; the method of suicide should also be entered. For example, ‘suicidal death by hanging’ is a clear description.

For deaths due to injuries, the certifier should include details on (see Figure 9.1):

1. Site of the injury;
2. Type of injury (i.e. laceration, abrasion, fracture);
3. Intent of the injury (accidental, intentional, or undetermined);
4. Nature of the injury (i.e. suicidal death by hanging).

For deaths due to poisonings, the certifier should include details on (Figure 9.2):

1. Substance used;
2. Intent of the poisoning (accidental, intentional, or undetermined);
3. Adverse effect in therapeutic use.

Instructions for completing the assessment table

Mark with a tick or cross in the ‘Yes’ column if the circumstances of the accident, violence or poisoning were missing.

If the circumstances have been reported as the underlying cause, for deaths due to accident violence, poisoning or other external cause, mark the ‘No’ column. Then go to question 8a.

Figure 9.1. A correctly completed certificate for a death due to an injury

<table>
<thead>
<tr>
<th>Frame A: Medical data: Part 1 and 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Report disease or condition directly leading to death on line a</td>
</tr>
<tr>
<td>Report chain of events in due to order (if applicable)</td>
</tr>
<tr>
<td>State the underlying cause on the lowest used line</td>
</tr>
<tr>
<td>Cause of death</td>
</tr>
<tr>
<td>a</td>
</tr>
<tr>
<td>b Due to:</td>
</tr>
<tr>
<td>c Due to:</td>
</tr>
<tr>
<td>d Due to:</td>
</tr>
<tr>
<td>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</td>
</tr>
</tbody>
</table>
Figure 9.2: A correctly completed certificate for an external cause of death due to poisoning

<table>
<thead>
<tr>
<th>Frame A: Medical data: Part 1 and 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Report disease or condition directly leading to death on line a</td>
</tr>
<tr>
<td>a. Cause of death</td>
</tr>
<tr>
<td>b. Time interval from onset to death</td>
</tr>
<tr>
<td>b. Carbon monoxide poisoning</td>
</tr>
<tr>
<td>b. Suicidal inhalation of automobile exhaust fumes</td>
</tr>
<tr>
<td>c. Due to:</td>
</tr>
<tr>
<td>d. Due to:</td>
</tr>
<tr>
<td>2. Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</td>
</tr>
</tbody>
</table>

8a. Deaths due to neoplasm

Instructions for completing the assessment table
Mark with a tick or cross in the ‘Yes’ column if the death was due to neoplasm. Then go to question 8 b.

If the death was not due to neoplasm, mark the ‘No’ column.

8b. Deaths due to neoplasms where additional details are missing (site, morphology, behaviour)

When reporting deaths due to neoplasms, it is necessary to provide detailed information about the tumour (see Figure 10). This should include:

1. Site of the neoplasm (where appropriate);
2. Whether benign or malignant;
3. Whether primary or secondary (if known), even if the primary neoplasm had been removed long before death;
4. Histological type (if known)

If the primary site of a secondary neoplasm is known, it must be stated. For example: primary carcinoma of the lung.
If the primary site of a secondary neoplasm is unknown, ‘primary unknown’ must be stated on the death certificate.

Instructions for completing the assessment table
For deaths due to neoplasms, mark with a tick or cross in the ‘Yes’ column, if any of the above details about the neoplasm are missing (this is an error). If all the additional details are specified, mark the ‘No’ column.
Figure 10. A correctly completed certificate for a cause of death due to a neoplasm

<table>
<thead>
<tr>
<th>Frame A: Medical data: Part 1 and 2</th>
<th>Cause of death</th>
<th>Time interval from onset to death</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Report disease or condition directly leading to death on line a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Report chain of events in due to order (if applicable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>State the underlying cause on the lowest used line</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a</td>
<td><em>Pulmonary embolism</em></td>
<td>minutes</td>
</tr>
<tr>
<td>b</td>
<td>Due to: <em>Deep vein thrombosis</em></td>
<td>2 days</td>
</tr>
<tr>
<td>c</td>
<td>Due to: <em>Primary adenocarcinoma of the sigmoid colon</em></td>
<td>6 months</td>
</tr>
<tr>
<td>d</td>
<td>Due to:</td>
<td></td>
</tr>
</tbody>
</table>
How to assess and apply the data

Assessing the data

Once you have reviewed the death certificates, they can be assessed in many ways. The following measures useful and easy to apply.

Calculate the percentage of death certificates correctly completed

\[
\text{Percentage} = \left( \frac{\text{Number of death certificates without any errors}}{\text{Total Number of death certificates assessed}} \right) \times 100
\]

Calculate the percentage of death certificates with two or more errors

\[
\text{Percentage} = \left( \frac{\text{Number of death certificates with two or more errors}}{\text{Total Number of death certificates assessed}} \right) \times 100
\]

Calculate the percentage of death certificates with a major error

\[
\text{Percentage} = \left( \frac{\text{Number of death certificates with one or more major errors}}{\text{Number of death certificates with one or more errors (major and minor)}} \right) \times 100
\]

Calculate the percentage of errors in each category out of the total number of death certificates with errors

<table>
<thead>
<tr>
<th>Error category</th>
<th>Number of certificates with error*</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Multiple causes of death recorded in any of the lines of Part 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Missing time interval from onset to death in any of the lines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Abbreviations used in the entries in any of the lines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Illegible handwriting in any of the lines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Incorrect or clinically improbable sequence of events leading to death in Part 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Impossible underlying cause entered in the lowest used line of Part 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.a. Was the death due to an accident, violence, poisoning or other external cause?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.b. For deaths due to external causes, i.e. accident/violence/poisoning, were the circumstances missing? (details of the accident or violence including intent and activity [e.g. pedestrian knocked down by a car, assaulted with a knife] and place of occurrence)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.a. Was the death due to a neoplasm?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.b. For deaths due to neoplasms, additional details were missing (site, morphology, behaviour)***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total number of certificates with at least one error*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note that the total number of certificates with an error will likely be higher than the total number of certificates assessed, as each certificate can have more than one error

** Denominator is ‘number of deaths due to accidents, violence, poisoning and other external causes’

*** Denominator is ‘number of deaths due to neoplasms’
Applying the assessment results

The assessment results can be used in several ways, for example (see Box 2):

- to inform the quality of cause of death reporting to convince hospital administrators to request improvements to training and/or decide on training needs;
- a baseline and follow-up of medical certification of cause of death training;
- to periodically audit the quality of the death certificates and to provide feedback to the certifiers;
- for inclusion in hospital newsletters and presentation at review meetings.

Box 2. Country example – Fiji

A training curriculum, handbook and a set of teaching aids to train doctors in correct death certification practice were developed in 2012. These were used in interactive workshops with 38 doctors in Fiji. The impact of the training was evaluated by pre-intervention and post-intervention tests using a vignette approach. It was also evaluated by assessing the accuracy of death certification by these doctors five months after the workshops.

The findings suggested that the percentage of correctly entered death certificates increased from 33.3% (65 of 195) in pre-intervention to 66.7% (132 of 195) in post-intervention (P<0.0001). In certificates that had errors, clinically improbable sequences accounted for the highest proportion of errors both in pre-intervention and post-intervention tests.4

Limitations of the assessment tool

The tool is designed to identify common errors in death certification practices. It is a good measure of death certification quality and overall quality of mortality statistics. However, this tool cannot assess whether the underlying cause of death was misclassified. For example, the tool cannot determine if the cause of death reported in the death certificate was the actual cause of death of the person. When reviewing the death certificates, however, it may be possible to recognise such errors and include this information in the assessment report.

---

Annex 1: International Form of Medical Certificate of Cause of Death (WHO 2016)

### Administrative Data (can be further specified by country)

**Sex**
- □ Female
- □ Male
- □ Unknown

**Date of birth**
- D Y Y Y Y Y

**Date of death**
- D Y Y Y Y Y

### Frame A: Medical data: Part 1 and 2

1. **Report disease or condition directly leading to death on line a**

   a. Cause of death
   b. Due to:
   c. Due to:
   d. Due to:

2. **Other significant conditions contributing to death (time intervals can be included in brackets after the condition)**

### Frame B: Other medical data

**Was surgery performed within the last 4 weeks?**
- □ Yes
- □ No
- □ Unknown

**If yes please specify date of surgery**
- D Y Y Y Y Y

**Was an autopsy requested?**
- □ Yes
- □ No
- □ Unknown

**If yes were the findings used in the certification?**
- □ Yes
- □ No
- □ Unknown

### Manner of death:

- □ Disease
- □ Assault
- □ Accident
- □ Legal intervention
- □ Intentional self harm
- □ War
- □ Could not be determined
- □ Legal intervention
- □ Pending investigation
- □ Unknown

**If external cause or poisoning:**
- □ Yes
- □ No
- □ Unknown

**Date of injury**
- D Y Y Y Y Y

**Please describe how external cause occurred**

(If poisoning please specify poisoning agent)

### Place of occurrence of the external cause:

- □ At home
- □ Residential institution
- □ School, other institution, public administrative area
- □ Sports and athletics area
- □ Street and highway
- □ Trade and service area
- □ Industrial and construction area
- □ Farm
- □ Other place (please specify):
- □ Unknown

### Fetal or infant Death

**Multiple pregnancy**
- □ Yes
- □ No
- □ Unknown

**Stillborn?**
- □ Yes
- □ No
- □ Unknown

**If death within 24h specify number of hours survived**

**Birth weight (in grams)**

**Number of completed weeks of pregnancy**

**Age of mother (years)**

**If death was perinatal, please state conditions of mother that affected the fetus and newborn**

**For women, was the deceased pregnant?**
- □ Yes
- □ No
- □ Unknown

**At time of death**
- □ Within 42 days before the death

**Between 43 days up to 1 year before death**
- □ Unknown

**Did the pregnancy contribute to the death?**
- □ Yes
- □ No
- □ Unknown
Related resources and products

**University of Melbourne, D4H Initiative, CRVS Knowledge Gateway: Resources**

[crvsgateway.info/resources](crvsgateway.info/resources)

*Assessing the quality of death certificates: Rapid Assessment tool.* CRVS tools

*Assessment of quality of medical certification practices: A quick reference guide.* CRVS technical guides

*Death certificate assessment tool (Excel version): User guide.* CRVS technical guides

*Handbook for doctors on cause of death certification:* CRVS technical guides

*Medical certification of cause of death: Quick reference guide:* CRVS technical guides

*Intervention: Medical certification of cause of death.* CRVS best-practice and advocacy

*Intervention: Mortality coding.* CRVS best-practice and advocacy

*Reducing barriers to the accurate cause of death reporting by physicians.* CRVS best-practice and advocacy

*Training and education on medical certification of cause of death: Effective strategies and approaches.* CRVS best-practice and advocacy

**University of Melbourne, D4H Initiative, CRVS Knowledge Gateway: Learning Centre**

[crvsgateway.info/learningcentre](crvsgateway.info/learningcentre)

Topic 4: Cause of death in CRVS systems.


**University of Melbourne, D4H Initiative, CRVS Knowledge Gateway: Training**

[crvsgateway.info/training](crvsgateway.info/training)


ICD-10 coding.

Medical certification of cause of death.
Further reading


The program partners on this initiative include: The University of Melbourne, Australia; CDC Foundation, USA; Vital Strategies, USA; Johns Hopkins Bloomberg School of Public Health, USA; World Health Organization, Switzerland.

Civil Registration and Vital Statistics partners:

For more information contact:
CRVS-info@unimelb.edu.au
crvsgateway.info

CRICOS Provider Code: 00116K
Version: 0318-03

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