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# CRVS technical guide

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

June 2020





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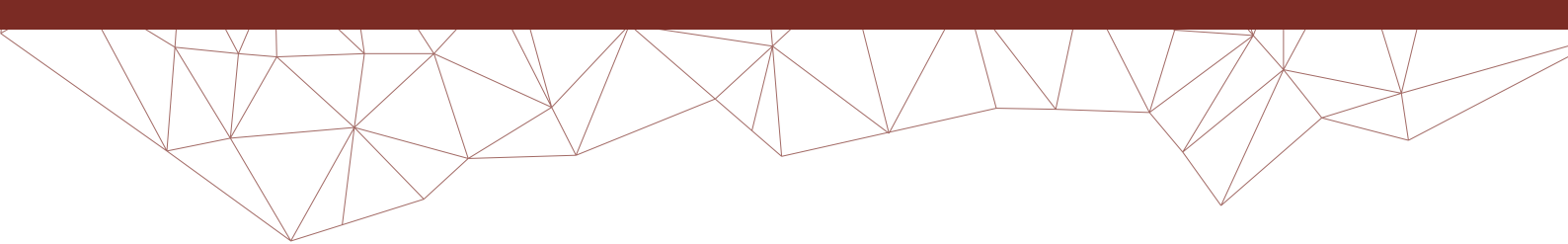
Melbourne School of Population and Global Health  
Building 379  
207 Bouverie Street  
Carlton, VIC 3053  
Australia

CRVS-info@unimelb.edu.au  
[www.mspgh.unimelb.edu.au/dataforhealth](http://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 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.<sup>1</sup> In many countries, doctors do not get adequate opportunities to learn about death certification as part of their medical training.<sup>2</sup> 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

1 Rampatige R, Mikkelsen L, Hernandez B, Riley I, Lopez AD (2014). Hospital cause-of-death statistics: what should we make of them? *Bulletin of the World Health Organization* 92:3-3A; doi:10.2471/BLT.13.134106.  
2 Rampatige R, Wainiqolo I, Singh S, Riley I (2013). Engaging physicians in improved cause of death certification: Evaluation of an education intervention (meeting abstract). *The Lancet* 381(S122):22; doi:10.1016/S0140-6736(13)61376-8.

# 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**

<b>Frame A: Medical data: Part 1 and 2</b>			
<b>1</b> Report disease or condition directly leading to death on line a  Report chain of events in due to order (if applicable)  State the underlying cause on the lowest used line			<b>Cause of death</b>
		a	
		b	Due to:
		c	Due to:
		d	Due to:
<b>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</b>			

The death certificate is divided into three sections:

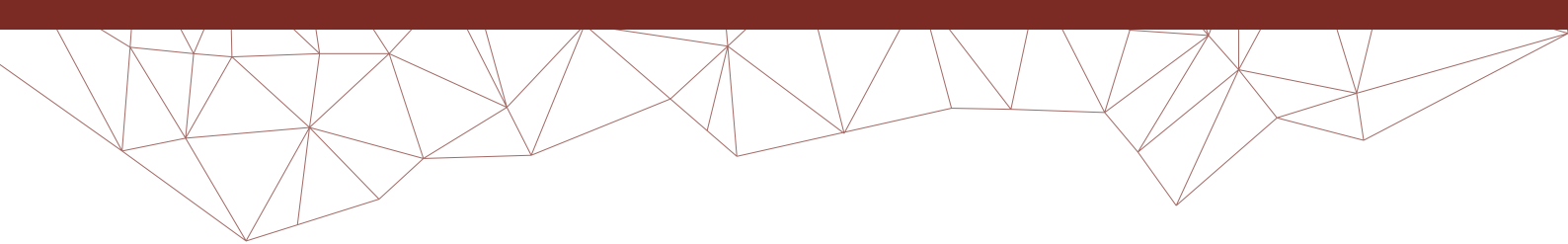
1. Part 1—diseases or conditions directly leading to death and antecedent causes
2. Part 2—other significant conditions
3. A column to record the approximate interval between the onset of the condition and death.

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.<sup>3</sup>

<sup>3</sup> Pattaraarchachai J, Rao C, Polprasert W, Porapakham Y, Pao-in W, Singwerathum N, Lopez AD (2010). Cause-specific mortality patterns among hospital deaths in Thailand: Validating routine death certification. *Population Health Metrics* 8(1):12; doi:10.1186/1478-7954-8-12.



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

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

## 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**

Frame A: Medical data: Part 1 and 2			
1		Cause of death	Time interval from onset to death
Report disease or condition directly leading to death on line a	a	<i>Cerebrovascular bleed and community acquired pneumonia</i>	<i>unknown</i>
Report chain of events in due to order (if applicable)	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)		-----	

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

Frame A: Medical data: Part 1 and 2			
1		Cause of death	Time interval from onset to death
Report disease or condition directly leading to death on line a	a	<i>Cerebral compression</i>	<i>30 mins</i>
Report chain of events in due to order (if applicable)	b	Due to: <i>Extradural haemorrhage</i>	<i>3 hours</i>
	c	Due to: <i>Fractured temporal bone</i>	<i>3 hours</i>
	d	<i>Blunt trauma to head DUE TO car collided with a pick-up truck on public highway</i>	<i>3 hours</i>
2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)		-----	



## 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**

<b>Frame A: Medical data: Part 1 and 2</b>		Time interval not recorded	
<b>1</b>		Cause of death	Time interval from onset to death
Report disease or condition directly leading to death on line a		a <i>Pulmonary haemorrhage</i>	
Report chain of events in due to order (if applicable)		b Due to: <i>Advanced pulmonary tuberculosis</i>	
		c Due to:	
State the underlying cause on the lowest used line		d Due to:	
<b>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</b>			



**Figure 6. Example of an incorrectly filled-out death certificate with no time interval from onset to death in Part 1 and 2**

<i>Frame A: Medical data: Part 1 and 2</i>			
1		Cause of death	Time interval from onset to death
Report disease or condition directly leading to death on line a		a <i>Acute myocardial infarction</i>	
Report chain of events in due to order (if applicable)		b Due to: <i>Chronic ischemic heart disease</i>	
State the underlying cause on the lowest used line		c Due to:	
		d Due to:	
2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)		<i>Obesity, non insulin dependant, diabetes mellitus, hypertension</i>	

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

Frame A: Medical data: Part 1 and 2			
		Cause of death	Time interval from onset to death
<b>1</b> Report disease or condition directly leading to death on line a  Report chain of events in due to order (if applicable)  State the underlying cause on the lowest used line	a	..... <i>hypertension</i> .....	
	b	Due to: ..... <i>hypertension</i> .....	
	c	Due to: ..... <i>Life threatening condition</i> .....	
	d	Due to: .....	
<b>2</b> Other significant conditions contributing to death (time intervals can be included in brackets after the condition)			

## 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.

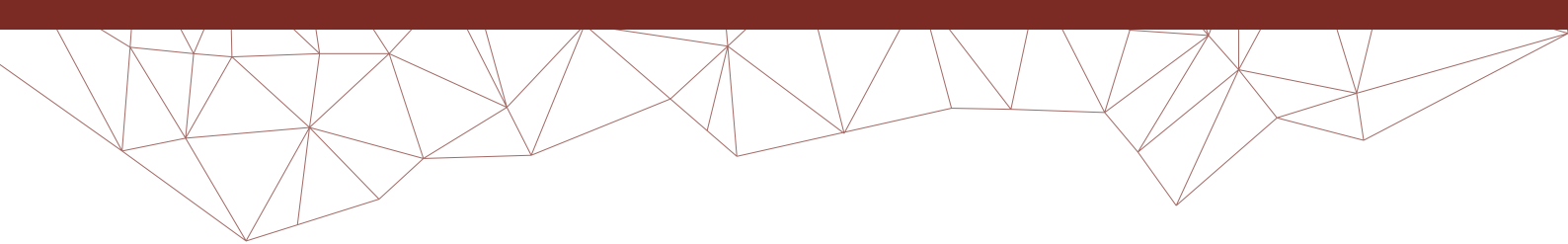
<b>Frame A: Medical data: Part 1 and 2</b>				
<b>1</b> Report disease or condition directly leading to death on line a  Report chain of events in due to order (if applicable)  State the underlying cause on the lowest used line			Cause of death	Time interval from onset to death
	↻	a	<i>Diabetes</i>	<i>20 years</i>
	↻	b	Due to: <i>Gangrene foot</i>	<i>2 years</i>
	↻	c	Due to: <i>Chronic bronchitis</i>	<i>5 years</i>
		d	Due to:	
<b>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</b>		-----		

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.

<b>Frame A: Medical data: Part 1 and 2</b>				
<b>1</b> Report disease or condition directly leading to death on line a  Report chain of events in due to order (if applicable)  State the underlying cause on the lowest used line			<b>Cause of death</b>	<b>Time interval from onset to death</b>
		a	<i>Uraemia</i>	
		b	Due to: <i>Cataract</i>	
		c	Due to: <i>Ischaemic heart disease</i>	
	d	Due to:		
<b>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</b>				

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

<b>Frame A: Medical data: Part 1 and 2</b>				
<b>1</b> Report disease or condition directly leading to death on line a  Report chain of events in due to order (if applicable)  State the underlying cause on the lowest used line			<b>Cause of death</b>	<b>Time interval from onset to death</b>
		a	<i>Polycystic kidney</i>	
		b	Due to: <i>Renal failure and hypertension</i>	
		c	Due to: <i>Ischaemic heart disease</i>	
	d	Due to:		
<b>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</b>				



## 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. septicaemia, 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, **septicaemia** 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**

<b>Frame A: Medical data: Part 1 and 2</b>			
<b>1</b>		<b>Cause of death</b>	<b>Time interval from onset to death</b>
Report disease or condition directly leading to death on line a		a <i>Cardio-respiratory failure</i>	<i>30 mins</i>
Report chain of events in 'due to' order (if applicable)		b Due to:	
State the underlying cause on the lowest used line		c Due to:	
		d Due to:	
<b>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</b>			

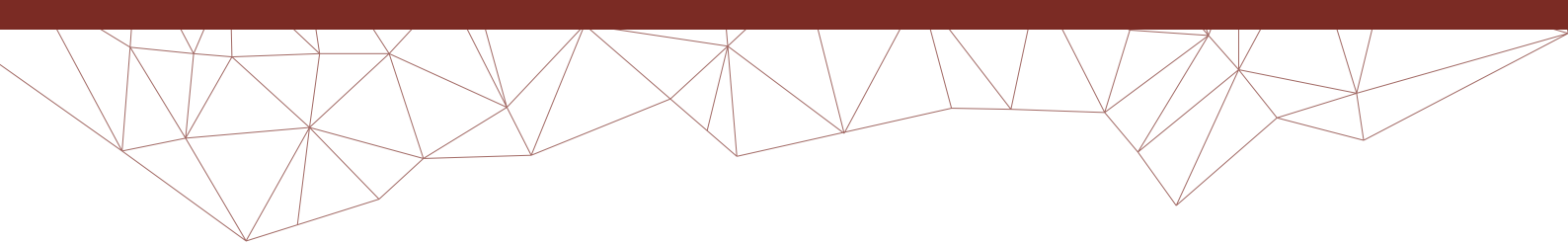
<b>Frame A: Medical data: Part 1 and 2</b>			
<b>1</b>		<b>Cause of death</b>	<b>Time interval from onset to death</b>
Report disease or condition directly leading to death on line a		a <i>Chest pain</i>	<i>10 hours</i>
Report chain of events in 'due to' order (if applicable)		b Due to:	
State the underlying cause on the lowest used line		c Due to:	
		d Due to:	
<b>2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)</b>			

## 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**

<b>Frame A: Medical data: Part 1 and 2</b>			
<b>1</b> Report disease or condition directly leading to death on line a  Report chain of events in due to order (if applicable)  State the underlying cause on the lowest used line			<b>Cause of death</b>
		a	<i>Traumatic shock</i>
		b	Due to: <i>Multiple fractures</i>
		c	Due to: <i>Pedestrian hit by truck</i>
		d	Due to:
<b>2</b> Other significant conditions contributing to death (time intervals can be included in brackets after the condition)			



**Figure 9.2: A correctly completed certificate for an external cause of death due to poisoning**

<b>Frame A: Medical data: Part 1 and 2</b>			
<b>1</b> Report disease or condition directly leading to death on line a  Report chain of events in due to order (if applicable)  State the underlying cause on the lowest used line		Cause of death	Time interval from onset to death
	a	<i>Carbon monoxide poisoning</i>	<i>30 mins</i>
	b	Due to: <i>Suicidal inhalation of automobile exhaust fumes</i>	<i>2 hours</i>
	c	Due to:	
	d	Due to:	
<b>2</b> Other significant conditions contributing to death (time intervals can be included in brackets after the condition)			

## 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**

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

# 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

$$\frac{\text{Number of death certificates without any errors}}{\text{Total Number of death certificates assessed}} \times 100$$

### Calculate the percentage of death certificates with two or more errors

$$\frac{\text{Number of death certificates with two or more errors}}{\text{Total Number of death certificates assessed}} \times 100$$

### Calculate the percentage of death certificates with a major error

$$\frac{\text{Number of death certificates with one or more major errors}}{\text{Number of death certificates with one or more errors (major and minor)}} \times 100$$

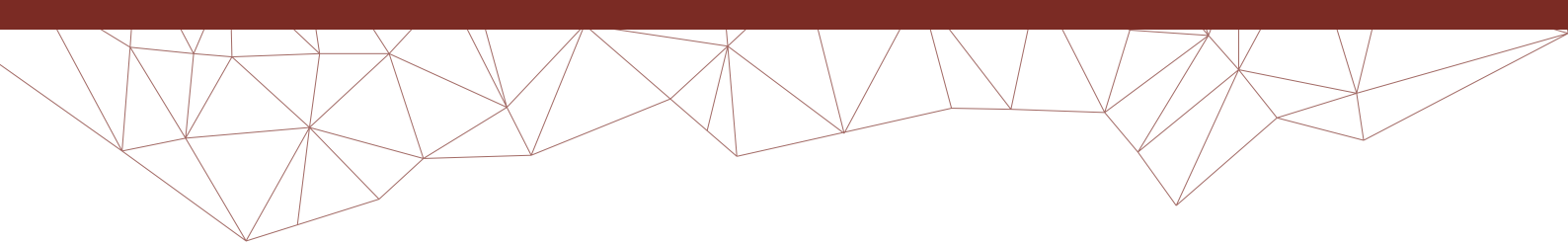
### Calculate the percentage of errors in each category out of the total number of death certificates with errors

Error category	Number of certificates with error*	Percentage (%)
1. Multiple causes of death recorded in any of the lines of Part 1		
2. Missing time interval from onset to death in any of the lines		
3. Abbreviations used in the 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.a. Was the death due to an accident, violence, poisoning or other external cause?		
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)**		
8.a. Was the death due to a neoplasm?		
8.b. For deaths due to neoplasms, additional details were missing (site, morphology, behaviour)***		
<b>Total number of certificates with at least one error*</b>		

\*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.<sup>4</sup>

## 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.

<sup>4</sup> Rampatige R, Wainiqolo I, Singh S, Riley I (2013). Engaging physicians in improved cause of death certification: Evaluation of an education intervention (meeting abstract). *The Lancet* 381(S122):22; [https://doi.org/10.1016/S0140-6736\(13\)61376-8](https://doi.org/10.1016/S0140-6736(13)61376-8)

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

Administrative Data (can be further specified by country)																	
Sex	<input type="checkbox"/> Female				<input type="checkbox"/> Male				<input type="checkbox"/> Unknown								
Date of birth	D	D	M	M	Y	Y	Y	Y	Date of death	D	D	M	M	Y	Y	Y	Y
Frame A: Medical data: Part 1 and 2																	
1 Report disease or condition directly leading to death on line a			Cause of death									Time interval from onset to death					
Report chain of events in due to order (if applicable)		a															
State the underlying cause on the lowest used line		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?						<input type="checkbox"/> Yes		<input type="checkbox"/> No		<input type="checkbox"/> Unknown					
If yes please specify date of surgery						D	D	M	M	Y	Y	Y	Y		
If yes please specify reason for surgery (disease or condition)															
Was an autopsy requested?						<input type="checkbox"/> Yes		<input type="checkbox"/> No		<input type="checkbox"/> Unknown					
If yes were the findings used in the certification?						<input type="checkbox"/> Yes		<input type="checkbox"/> No		<input type="checkbox"/> Unknown					
Manner of death:															
<input type="checkbox"/> Disease			<input type="checkbox"/> Assault			<input type="checkbox"/> Could not be determined									
<input type="checkbox"/> Accident			<input type="checkbox"/> Legal intervention			<input type="checkbox"/> Pending investigation									
<input type="checkbox"/> Intentional self harm			<input type="checkbox"/> War			<input type="checkbox"/> Unknown									
If external cause or poisoning:						Date of injury		D	D	M	M	Y	Y	Y	Y
Please describe how external cause occurred (If poisoning please specify poisoning agent)															
Place of occurrence of the external cause:															
<input type="checkbox"/> At home		<input type="checkbox"/> Residential institution		<input type="checkbox"/> School, other institution, public administrative area				<input type="checkbox"/> Sports and athletics area							
<input type="checkbox"/> Street and highway		<input type="checkbox"/> Trade and service area		<input type="checkbox"/> Industrial and construction area				<input type="checkbox"/> Farm							
<input type="checkbox"/> Other place (please specify):						<input type="checkbox"/> Unknown									
Fetal or infant Death															
Multiple pregnancy						<input type="checkbox"/> Yes		<input type="checkbox"/> No		<input type="checkbox"/> Unknown					
Stillborn?						<input type="checkbox"/> Yes		<input type="checkbox"/> No		<input type="checkbox"/> 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															
<b>For women, was the deceased pregnant?</b>						<input type="checkbox"/> Yes		<input type="checkbox"/> No		<input type="checkbox"/> Unknown					
At time of death						<input type="checkbox"/> Within 42 days before the death									
Between 43 days up to 1 year before death						<input type="checkbox"/> Unknown									
Did the pregnancy contribute to the death?						<input type="checkbox"/> Yes		<input type="checkbox"/> No		<input type="checkbox"/> Unknown					



## Related resources and products

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

[crvsgateway.info/resources](http://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](http://crvsgateway.info/learningcentre)

Topic 4: Cause of death in CRVS systems.

Topic 6: CRVS tools – Medical certificate of cause of death assessment tool.

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

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

Analysis of Causes of (National) Deaths for Action (ANACONDA).

ICD-10 coding.

Medical certification of cause of death.



## Further reading

Aung E, Rao C, Walker S. Teaching cause-of-death certification: Lessons from international experience. *Postgraduate Medical Journal* 2010; 86: 143-152.

Khosravi A, Rao C, Naghavi M, Taylor R, Jafari N, Lopez AD (2008). Impact of misclassification on measures of cardiovascular disease mortality in the Islamic Republic of Iran: A cross-sectional study. *Bulletin of the World Health Organization* 86(9):688–696.

Rao C, Yang G, Hu J, Ma J, Xia W, Lopez AD (2007). Validation of cause-of-death statistics in urban China. *International Journal of Epidemiology* 36(3):642–651; doi:10.1093/ije/dym003.

Walker S, Rampatige R, Wainiqolo I, Aumua A. *Improving cause of death certification practices in the Pacific: findings from a pilot study of the World Health Organization web-based ICD training tool*. Brisbane, Australia: Health Information Systems Knowledge Hub, University of Queensland; 2011.

World Health Organization. *International classification of diseases and related health problems*, 10th revision. 5th ed. Geneva, Switzerland: WHO; 2016.

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

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