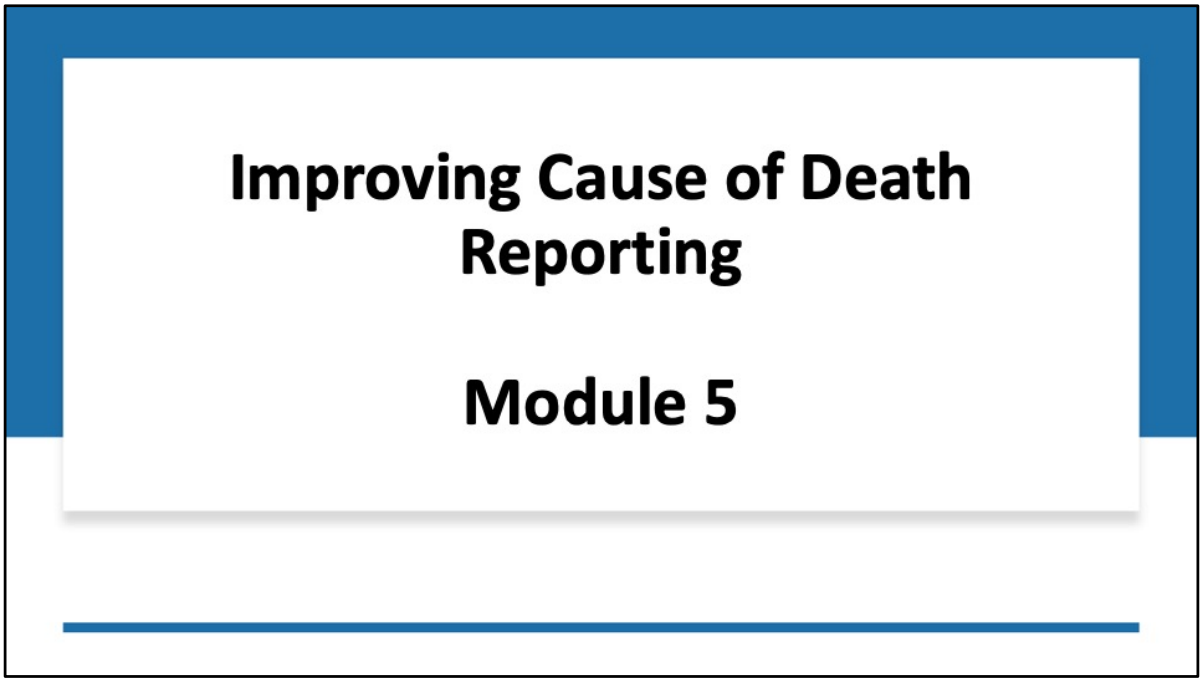


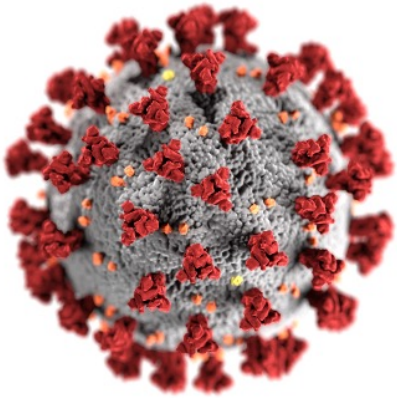
Welcome to Module 5 of Improving Cause of Death Reporting.

Competencies at end of this module

Understand guidelines for:

-Deaths due to COVID-19

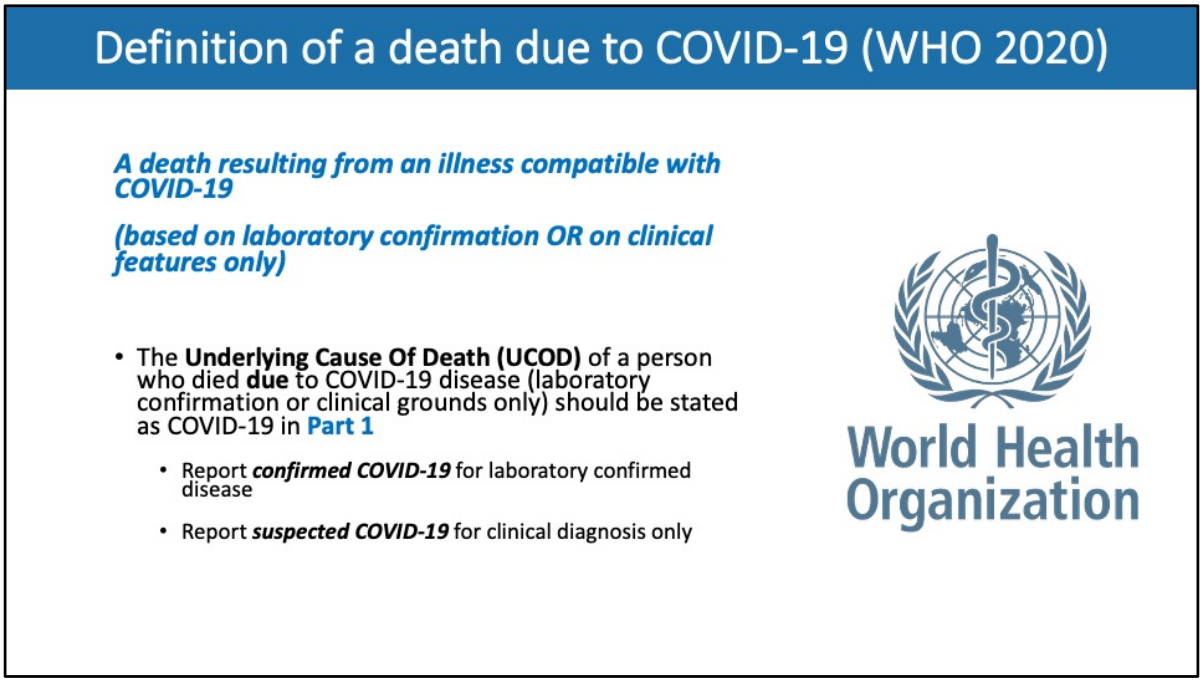
-COVID-19 related deaths



You now know all the role players involved in the process of recording the cause of death and how the information is used. You know how to complete a death certificate, including cases involving perinatal and maternal deaths, injury or other external causes, and when to refer to Forensic Pathology Services. You also know how to correctly certify deaths due to HIV, diabetes mellitus, hypertension, infectious and parasitic conditions, cancer, deaths in the elderly and deaths on arrival.

At the end of this module, you should be able to demonstrate the competencies to accurately complete a death certificate for:

-Deaths due to COVID-19, and
-COVID-19 related deaths

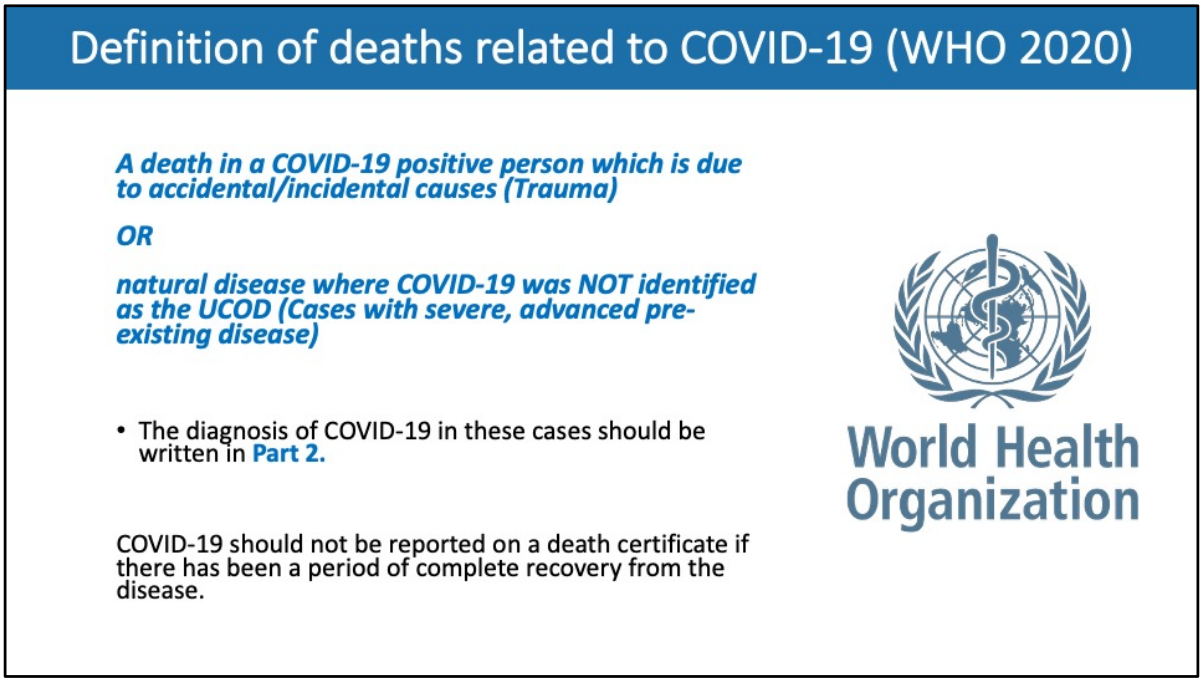


In 2020, the World Health Organisation published international guidelines for the certification and coding of COVID-19 as a cause of death.
The definition of a death due to COVID-19, based on these guidelines, is as follows:

“a death resulting from an illness compatible with COVID-19, (based on laboratory confirmation OR on clinical features only)”

- The underlying cause of death of a person who has been diagnosed with COVID-19 (either on the basis of laboratory confirmation OR on clinical grounds alone) should be written as COVID-19, in Part 1 of the medical certificate of cause of death, unless there is a clear alternative or unrelated supervening medical cause of death (such as trauma or pre-existing severe co-morbidity).
    - If there is laboratory confirmation of the disease, then the certifier should record the cause of death as “Confirmed COVID-19".
    - But if the diagnosis was made on clinical grounds alone, the certifier should record the cause of death as “Suspected COVID-19".

It should be noted, where there are pre-existing controlled chronic conditions, these are recorded in Part 2.



A COVID-19 related death is defined as:

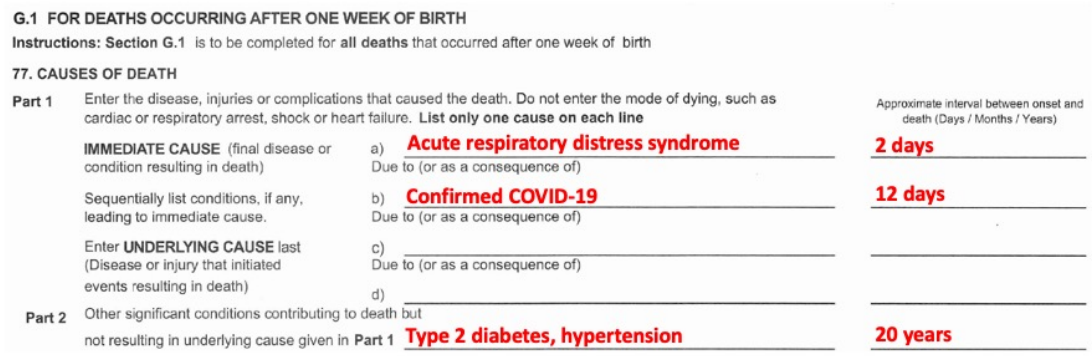
A death in a COVID-19 positive person that is due to accidental/incidental causes (such as trauma or poisoning) OR natural causes where COVID-19 was NOT identified as the underlying cause of death (for example, a person with severe, advanced pre-existing disease such as cancer).

- The diagnosis of COVID-19 in these instances, is recorded on the death certificate in Part 2.

Note that COVID-19 should NOT be reported on a death certificate if there has been a period of complete recovery from the disease.

Example of death due to COVID-19

A 58-year-old male, with a history of hypertension and type 2 diabetes since age 38, presented with a 1-week history of anosmia, cough and myalgia, and a 3-day history of dyspnoea. In hospital he deteriorated over the course of 3 days, was diagnosed with ARDS and admitted to the ICU. His COVID swab taken on admission returned positive. In ICU his respiratory status continued to deteriorate. He died 2 days later.



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

				Approximate interval between onset and death (Days / Months / Years)
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**			
	IMMEDIATE CAUSE (final disease or condition resulting in death)	a)	**Acute respiratory distress syndrome**	**2 days**
		Due to (or as a consequence of)		
	Sequentially list conditions, if any, leading to immediate cause.	b)	**Confirmed COVID-19**	**12 days**
		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**		**Type 2 diabetes, hypertension**	**20 years**

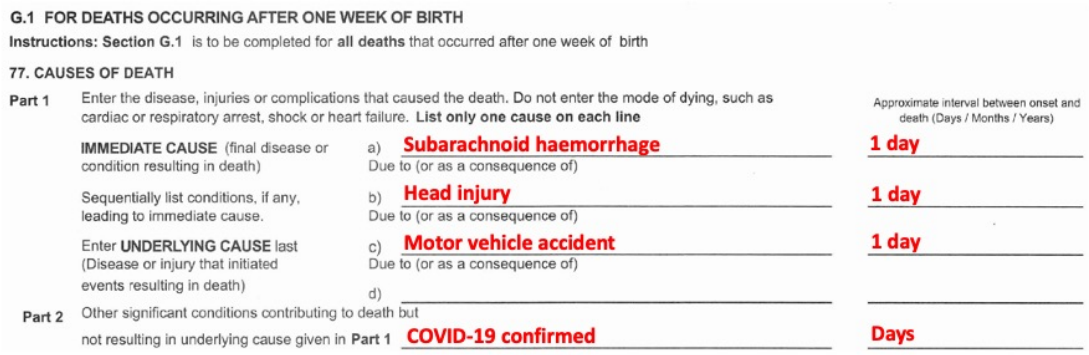
Let's look at an example of a death due to COVID-19.
"A 58-year-old male patient, known with a past medical history of hypertension and type 2 diabetes, since age 38, presented with a 1-week history of anosmia, cough and myalgia, and a 3-day history of dyspnoea. In hospital he deteriorated over the course of 3 days, was diagnosed with Acute respiratory distress syndrome and admitted to the ICU. His COVID swab from admission at this point, returned positive. In ICU, his respiratory status continued to deteriorate. He died 2 days later.

In this case,

- The immediate cause of death is Acute respiratory distress syndrome, reported in Part 1, line a.
- The diagnosis of COVID-19 is confirmed with laboratory testing and is clearly the underlying cause of death, so it reported on the lowest used line of Part 1.
- The chronic pre-existing illnesses of diabetes and hypertension are considered to have contributed to the death but since they do not form part of the causal sequence reported in Part 1, they are reported in Part 2 as contributing conditions.

Example of COVID-19 related death

A 20-year-old male, COVID-19 PUI was admitted with a severe head injury due to an MVA, which occurred on his way home from the testing site. He was admitted to the ICU for stabilisation where he developed a subarachnoid haemorrhage and died 24 hours later. During the admission his COVID-19 test returned positive.



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

				Approximate interval between onset and death (Days / Months / Years)
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**			
	IMMEDIATE CAUSE (final disease or condition resulting in death)	a)	**Subarachnoid haemorrhage**	**1 day**
			Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b)	**Head injury**	**1 day**
			Due to (or as a consequence of)	
	Enter **UNDERLYING CAUSE** last (Disease or injury that initiated events resulting in death)	c)	**Motor vehicle accident**	**1 day**
			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**		**COVID-19 confirmed**	**Days**

Here is an example of a COVID-19 **related** death.

A 20-year-old male, who was a COVID-19 person under investigation, was brought to hospital with a severe head injury due to a Motor Vehicle Accident, which occurred on his way home from the testing site. He was admitted to ICU for stabilisation, where he developed a subarachnoid haemorrhage and died 24 hours later. His admission COVID-19 test returned positive."

In this case,

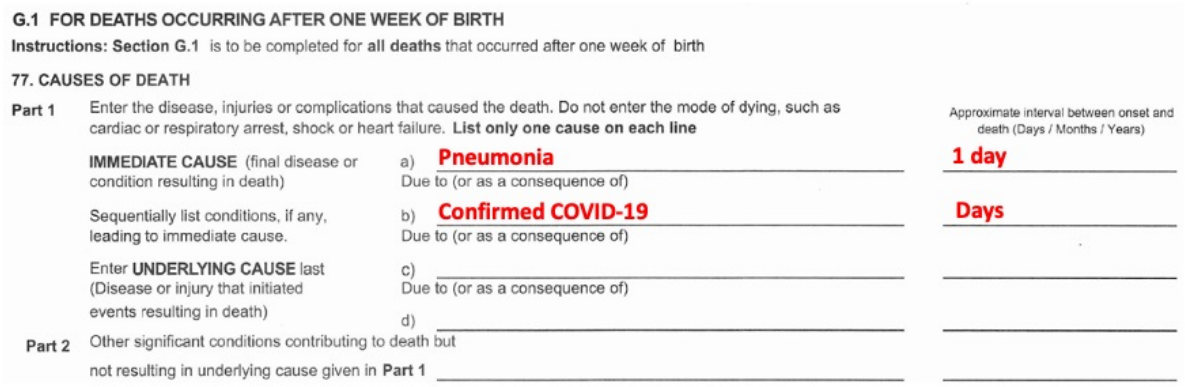
- The underlying cause of death was clearly due to trauma. The immediate cause of death is Subarachnoid haemorrhage, reported in Part 1, line a.
- This was caused by the Head injury reported in Part 1, line b.
- The underlying cause of death is the Motor vehicle accident, reported on the lowest used line of Part 1.

COVID-19 does not fit into the causal sequence leading to death but may have contributed. Thus,

- **Confirmed COVID-19** is recorded in Part 2 of the death certificate as a contributing condition.

Example of death due to COVID-19

A 1-month-old male infant weighing 3450 g was brought to the ER by his mother with no signs of life. On examination, there was no respiratory effort, no heartbeat and pupils were fixed and dilated. CPR was commenced but child was unresponsive. He was born at term via normal vaginal delivery weighing 3045g, and HIV unexposed according to mother. Mother was Rhesus positive and rapid plasma reagin (RPR) negative for syphilis.
There was a 1-day history of cough and runny nose. Mother noted fever in the early hours before presentation at the ER. However, baby developed difficulty breathing during the night and was found to be unresponsive during the early hours of the next day. Post-mortem COVID-19 swab done was SARS-CoV-2 positive.



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

			Approximate interval between onset and death (Days / Months / Years)
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**		
	IMMEDIATE CAUSE (final disease or condition resulting in death)	a) **Pneumonia**	**1 day**
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) **Confirmed COVID-19**	**Days**
		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**		

Let's have another look at a case scenario where the underlying cause of death was COVID-19.

A 1-month-old male infant weighing 3450g was brought to the ER by his mother with no signs of life. On examination, there was no respiratory effort, no heartbeat and pupils were fixed and dilated. CPR was commenced but the child was unresponsive. He was born at term via normal vaginal delivery weighing 3045g, and HIV unexposed according to mother. The mother was Rhesus positive and rapid plasma reagin (PRP) negative for syphilis.
There was a 1-day history of cough and runny nose. The mother noted fever in the early hours before presentation at the ER.
However, baby developed difficulty breathing during the night and was found to be unresponsive during the early hours of the next day. Post-mortem COVID-19 swab done was SARS-CoV-2 positive.

The immediate cause of death in this patient is

- Pneumonia, reported in Part 1 line a.
- COVID-19 is the underlying cause of death, so it is reported on the lowest used line of Part 1.

Confirmed COVID-19 should be reported on the death notification form when laboratory confirmation is available.

Example of death due to COVID-19

A 34-year-old female, with no underlying previous medical conditions, presented with a 3-day history of progressive dyspnoea, myalgia, cough, and anosmia. She was admitted to hospital and COVID-19 was diagnosed by PCR. She required high flow nasal oxygen to maintain adequate oxygenation. Five days after admission, she developed a large right hemiplegia. A CT brain confirmed an ischaemic stroke. Work-up for other secondary causes were negative. Her mental state deteriorated 2 days later. A repeat CT scan showed significant oedema around the site of her infarction, with 2cm midline shift. She demised that night.

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

			Approximate interval between onset and death (Days / Months / Years)
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**		
	IMMEDIATE CAUSE (final disease or condition resulting in death)	a) **Ischaemic stroke**	**2 days**
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) **Confirmed COVID-19**	**10 days**
		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**		

Let's have a look at another case scenario

A 34-year-old female, with no underlying previous medical conditions, presented with a 3-day history of progressive dyspnoea, myalgia, cough, and anosmia. She was admitted to hospital and COVID-19 was diagnosed by PCR. She required high flow nasal oxygen to maintain adequate oxygenation. Five days after admission, she developed a large right hemiplegia. A CT of the brain confirmed an ischaemic stroke. Work-up for other secondary causes were negative. Her mental state deteriorated 2 days later. A repeat CT scan showed significant oedema around the site of her infarction, with a 2cm midline shift. She demised that night.

The immediate cause of death in this patient is

- Ischaemic stroke, reported in Part 1, line a.

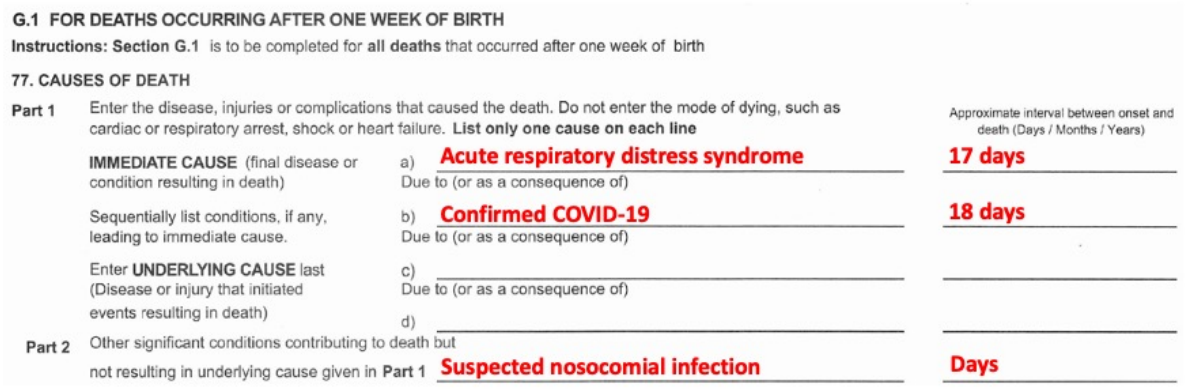
In this particular case, COVID-19 was thought to be the cause of the stroke, as the patient had no other risk factors for a cerebrovascular accident, and no other secondary cause was identified. COVID-19 has been shown to be associated with similar thrombotic complications.

- COVID-19 is thus the underlying cause of death and is reported on the lowest used line of Part 1.

Confirmed COVID-19 should be reported on the death notification form when laboratory confirmation is available.

Example of death due to COVID-19

A 3-week-old male neonate presented with acute gastroenteritis and severe dehydration. He was delivered at term via normal vaginal delivery (Apgars 9,10). He went into progressive respiratory distress on day 2 of admission and was intubated and placed on ventilation and inotropic support. COVID-19 swab was done, and the result was positive. CXR revealed bilateral infiltrates; arterial blood gas analysis was indicative of acute respiratory distress syndrome. Both parents were referred for COVID-19 testing and were confirmed positive for SARS-CoV-2. He remained in ICU for more than a week and was put on antibiotics for suspected nosocomial sepsis. However, his condition worsened, and he died on day 18 of admission.



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

			Approximate interval between onset and death (Days / Months / Years)
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**		
	IMMEDIATE CAUSE (final disease or condition resulting in death)	a) **Acute respiratory distress syndrome**	**17 days**
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) **Confirmed COVID-19**	**18 days**
		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**	**Suspected nosocomial infection**	**Days**

In this next case scenario, a 3-week-old male neonate presented with acute gastroenteritis and severe dehydration. He was delivered at term via normal vaginal delivery with Apgars of 9 and 10. He went into progressive respiratory distress on day 2 of admission and was intubated and placed on ventilation and inotropic support. COVID-19 swab was done, and the result was positive. CXR revealed bilateral infiltrates; arterial blood gas analysis was indicative of Acute respiratory distress syndrome.

Both parents were referred for COVID-19 testing and were confirmed positive for SARS-CoV-2. He remained in ICU for more than a week and was put on antibiotics for suspected nosocomial sepsis. However, his condition worsened, and he died on day 18 of admission.

The immediate cause of death in this patient is

- Acute respiratory distress syndrome, reported in Part 1, line a.
- COVID-19 is the underlying cause of death, so it is reported on the lowest used line of Part 1.

Confirmed COVID-19 should be reported on the death notification form when laboratory confirmation is available.

- Nosocomial sepsis could have contributed to the death but is not part of the causal sequence in Part 1. Thus, it is reported in Part 2 as a contributing condition.

Example of COVID-19 related death

A 3-month-old male, presented with seizures to the hospital. He was admitted 1 month ago with ascites and renal failure and managed for severe acute malnutrition. A work-up for inborn error of metabolism was considered due to a family history of congenital nephrotic syndrome. During the previous admission, syphilis (TPHA) was negative, and HSV IgM result was equivocal. Urine protein:creatinine ratio indicated nephrotic range proteinurea. A coincidental SARS-CoV-2 swab sent on day 2 of admission was positive. He was transferred to COVID-19 ward in stable condition but developed an acute aspiration event on the day of transfer. He was successfully resuscitated but died 2 days later from pneumonitis.

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

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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**			
	IMMEDIATE CAUSE (final disease or condition resulting in death)	a)	**Aspiration pneumonitis**	**2 Days**
			Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b)	**Severe acute malnutrition**	**1 month**
			Due to (or as a consequence of)	
	Enter **UNDERLYING CAUSE** last (Disease or injury that initiated events resulting in death)	c)	**Congenital nephrotic syndrome**	**3 months**
			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**		**Confirmed COVID-19**	**Days**

Let's have a look at another case scenario where COVID-19 is a contributing condition.
A 3-month-old male, presented with seizures to the hospital. He was admitted a month ago with ascites and renal failure and managed for severe acute malnutrition. A work-up for inborn error of metabolism was considered due to a family history of congenital nephrotic syndrome. During the previous admission, a syphilis (TPHA) test was negative, and Herpes simplex virus IgM result was equivocal. Urine protein:creatinine ratio indicated nephrotic range proteinurea. A coincidental SARS-CoV-2 swab sent on day 2 of admission was reported positive on the same day. He was transferred to COVID-19 ward in a stable condition but developed an acute aspiration event on the day of transfer. He was successfully resuscitated but died 2 days later from pneumonitis.

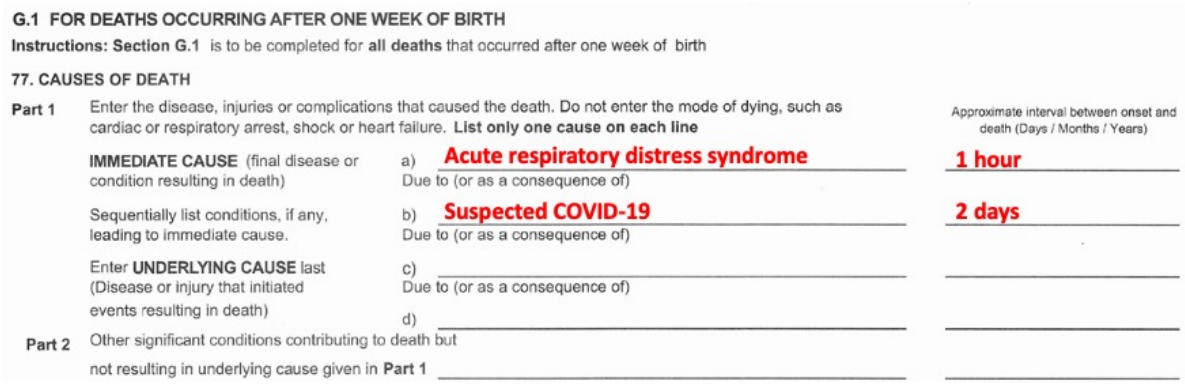
The immediate cause of death in this patient is

- Aspiration pneumonia, reported in Part 1 line a.
- Severe acute malnutrition due to Congenital nephrotic syndrome is reported as an intermediate cause in Part 1 line b.
- Congenital nephrotic syndrome is the underlying cause of death, so it is reported on the lowest used line of Part 1.
- COVID-19 may have contributed to the death but is not part of the causal sequence in Part 1. Thus, it is reported in Part 2 as a contributing condition.

Confirmed COVID-19 should be reported when laboratory confirmation of COVID is available.

Example of death due to COVID-19

A previously well 87-year-old female was admitted from a nursing home with 2 days' history of severe respiratory distress. Multiple people at her nursing home had recently been diagnosed with COVID-19. She was evaluated in the ER as having acute respiratory distress syndrome. Chest X-ray revealed bilateral symmetrical infiltrates with a lower zone predominance. She had profound hypoxia. At the time of admission, there was a severe shortage of available ventilators, and she was not thought to be eligible for further escalation of care. She passed away in the ER within an hour of admission. No COVID test was performed.



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77. CAUSES OF DEATH

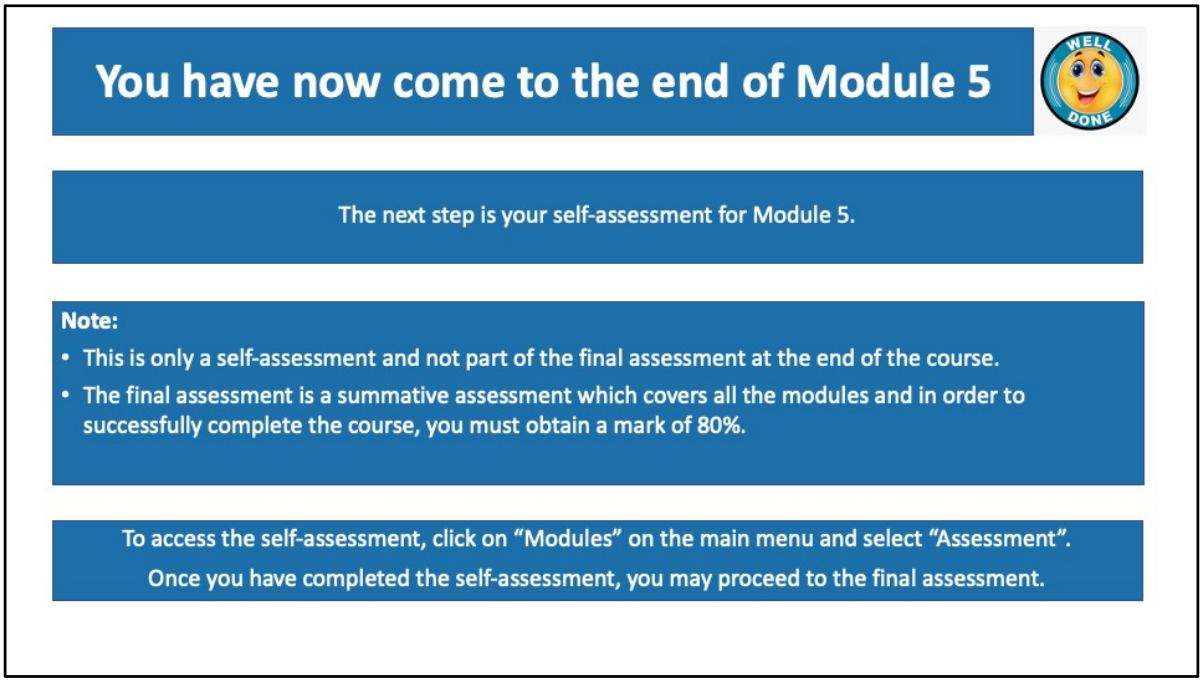
			Approximate interval between onset and death (Days / Months / Years)
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure. **List only one cause on each line**		
	IMMEDIATE CAUSE (final disease or condition resulting in death)	a) **Acute respiratory distress syndrome**	**1 hour**
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) **Suspected COVID-19**	**2 days**
		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**		

In this next case scenario, a previously well 87-year-old female was admitted from a nursing home with 2 days' history of severe respiratory distress. Multiple people at her nursing home had recently been diagnosed with COVID-19. She was evaluated in the emergency room as having Acute respiratory distress syndrome. Her chest X-ray revealed bilateral symmetrical infiltrates with lower zone predominance. She had profound hypoxia. At the time of admission, there was a severe shortage of available ventilators, and she was not thought to be eligible for further escalation of care. She passed away in the emergency room within an hour of admission. No COVID test was performed.

The immediate cause of death in this patient is

- Acute respiratory distress syndrome, reported in Part 1, line a.
- COVID-19 is the probable underlying cause of death, so it is reported on the lowest used line of Part 1.

Suspected COVID-19 should be written on the death notification form when laboratory confirmation is not available.



You have now come to the end of Module 5

The next step is your self-assessment for Module 5.

Note:
•This is only a self-assessment and not part of the final assessment at the end of the course.
•The final assessment is a summative assessment which covers all the modules and in order to successfully complete the course, you must obtain a mark of 80%.

To access the self-assessment, click on "Modules" on the main menu and select "Assessment".
Once you have completed the self-assessment, you may proceed to the final assessment.