

Improving Medical Death Certification in Tennessee

- **Part 1: Medical Examiner Jurisdiction, Cause & Manner of Death, and Death Certification**
- **Part 2: Guidance for Certification of Disaster-Related Deaths**

Dr. Adele Lewis, State Chief Medical Examiner
Dr. Amy Hawes, Deputy State Medical Examiner



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The following planners or speakers have no financial relationship to disclose:

Dr. Adele Lewis

Dr. Amy Hawes



Part 1: Medical Examiner Jurisdiction, Cause and Manner of Death, and Death Certification

Introduction

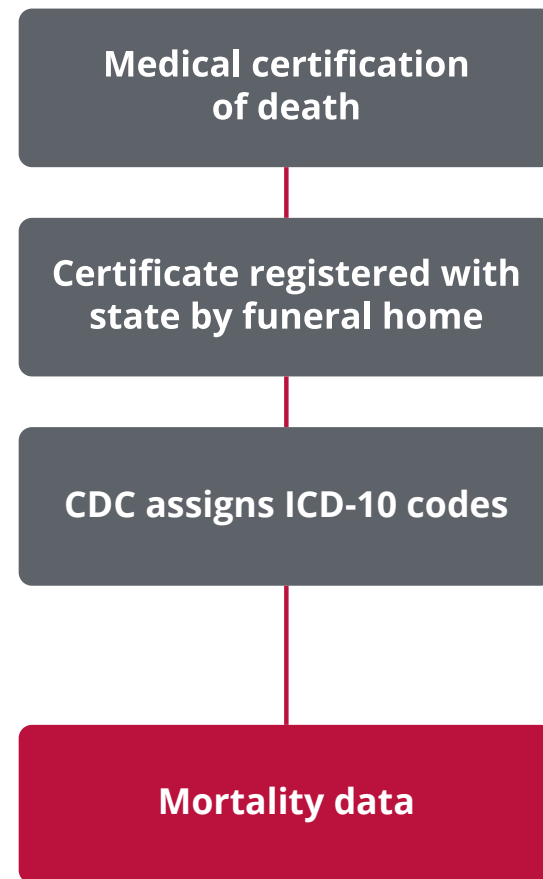
In March 2020, a survey from the National Network of Public Health Institutes was deployed via email to 5,579 people listed as certifiers in Tennessee's electronic death registration system. The survey received 785 responses, 93% of which were from physicians and 4% from county medical examiners.

- Nearly half (46%) of respondents indicated they had never received formal training on death certification.
- Nearly 90% indicated a need for training in the death certification process in Tennessee.
- Between 20% and 36% indicated they had no confidence in their ability to describe the death certification process, identify what qualifies as a disaster, determine if a death is related to a disaster, and report a death related to a disaster.
- The majority (70%-86%) were unsure of processes related to certification of deaths related to disasters.
- Of the 54% that had received formal training on death certification, only 3% had received training regarding disaster-related deaths.

Clearly, more training is needed.

The importance of death certificates

- The death certificate must be completed **before final disposition** of the body; delay in completing and signing may interfere with funeral arrangements and in settling estates.
- Death certificates have significant implications in **death benefits** paid to families (i.e., workers' compensation claims; double indemnity payments in cases of accidental death; FEMA burial benefits)
- The death certificate is the source of information for regional, state and national **mortality data**, which in turn is used for funding and directing research and public health efforts.



This chart shows how death certificates can contribute to overall mortality data.

Who should complete and sign the death certificate?

In most **natural** deaths, a treating physician is responsible for the medical certification of death, including deaths which occur outside of health care facilities or in which the physician is not physically present. The medical examiner may assume jurisdiction only under certain circumstances.

Non-medical examiner cases will be signed by “the physician in charge of the patient’s care for the illness or condition that resulted in death. In the absence of the physician, the certificate may be completed and signed by another physician designated by the physician” (TCA 68-3-502).

Note that the certifier is immune from civil suit if the death certificate is completed in good faith. However, failure to do so is subject to disciplinary action on their medical licenses.



KNOWLEDGE CHECK

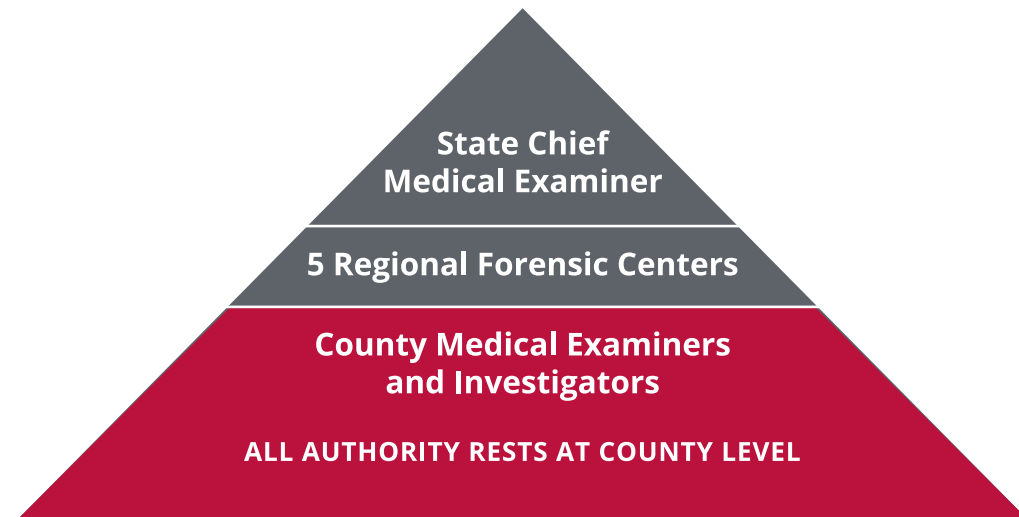
How long how long do you have to complete the death certificate?

- A. 30 days
- B. 5 days
- C. 48 hours
- D. 96 hours

The correct answer is C. 48 hours

Tennessee Medical Examiner System

The medical examiner system has three tiers:



In essence, all of the authority in Tennessee rests at the county level. The State Chief Medical officer doesn't decide who gets and who doesn't get an autopsy and has no jurisdiction over the regional forensic centers or the county medical examiners and their investigators.

The medical examiner for the county in which the death occurred should be notified in "any case involving a homicide, a suspected homicide, a suicide, or a violent, unnatural, or suspicious death" (TCA 38-7-106). Examples include:

- Deaths due or related to acute overdose of legal or illegal drugs and/or alcohol
- Deaths due to drowning
- Deaths due to thermal or chemical burns, or smoke inhalation
- Death by disease, injury or toxicity resulting from employment
- Deaths due to hypo- or hyperthermia

In such cases, the county medical examiner "shall investigate and certify the death certificate" (TCA 68-3-502-d).



Tennessee Medical Examiner System

(continued)

If any external force or entity is related **in any way** to death, the manner of death **cannot** be considered natural. **All non-natural deaths fall under medical examiner jurisdiction.** Jurisdiction is based on the county in which death was pronounced. **The interval of time elapsed between injury and death is irrelevant.**

Examples of delayed deaths include:

- An elderly person who dies months after becoming bedridden after a fall
- A person who dies of pneumonia due to paraplegia resulting from a car accident years before
- A person who dies a week after an anoxic brain injury caused by choking on food

Other deaths that should be reported to the medical examiner (TCA 38-7-108) include:

- Deaths of prisoners or those in state custody
- Sudden, unexpected deaths of infants and children
- Deaths of adults lacking a medical diagnosis which could reasonably result in death
- Deaths due to hypo- or hyperthermia
- Death of a fetus greater than 20 weeks' gestation or weighing at least 350 grams resulting from maternal trauma or acute drug use
- Deaths due to suspected abuse or neglect of residents of long-term care facilities
- Unidentified human remains



Physician (non-ME) certifiers

Primary care physicians provide death certification for their patients who die of natural, diagnosed causes, **even if the physician was not present at the time of death** (TCA 68-3-502 (c)(1)).

If the patient has not been seen by the physician in the four months leading up to death, the physician may still certify the death, or may refer the case to the county medical examiner. Other physicians knowledgeable of patient history, such as cardiologists, oncologists and emergency room physicians, may also certify deaths.



Specifying when and where death occurs

According to T.C.A. 68-3-501 (Uniform Determination of Death Act), death occurs when either:

- Irreversible cessation of cardiac and respiratory systems occurs, or
- Irreversible cessation of function of entire brain occurs. Brain death = death.

Per T.C.A. 68-3-502, when a body is discovered dead, the place, date and time of death are when and where the body was found.



Completing the death certificate

PARENTS		18. FATHER'S NAME (First, Middle, Last)		19. MOTHER'S NAME PRIOR TO FIRST MARRIAGE (First, Middle, Last)	
DISPOSITION		20a. INFORMANT'S NAME		20b. RELATIONSHIP TO DECEDENT	
		20c. MAILING ADDRESS (Street and Number, City, State, Zip Code)			
		21a. METHOD OF DISPOSITION <input type="checkbox"/> Burial <input type="checkbox"/> Cremation <input type="checkbox"/> Donation <input type="checkbox"/> Entombment <input type="checkbox"/> Removal from State <input type="checkbox"/> Other (Specify) _____		21b. PLACE OF DISPOSITION (Name of cemetery, crematory, other place)	
		21c. LOCATION - City or Town and State			
		22a. SIGNATURE OF FUNERAL DIRECTOR		22b. LICENSE NUMBER	
		22c. SIGNATURE OF EMBALMER		22d. LICENSE NUMBER	
		23a. NAME AND ADDRESS OF FUNERAL HOME			23b. LICENSE NUMBER OF FUNERAL HOME
REGISTRAR		24. REGISTRAR'S SIGNATURE		25. DATE FILED (Month, Day, Year)	
CERTIFIER		26. CERTIFIER (Check only one) 26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated. 26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.			
PHYSICIAN OR MEDICAL EXAMINER EXECUTING CAUSE OF DEATH MUST COMPLETE AND SIGN WITHIN 48 HOURS.		27a. SIGNATURE OF CERTIFIER		27b. LICENSE NUMBER	
				27c. DATE SIGNED (Month, Day, Year)	
		27d. NAME AND ADDRESS			
MEDICAL CERTIFICATION		28. PART I. Enter the chain of events (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line. IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. _____ Due to (or as a consequence of) _____ Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST } b. _____ Due to (or as a consequence of) _____ c. _____ Due to (or as a consequence of) _____ d. _____ PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.			
				29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No	
				29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No	
30. MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined		31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input type="checkbox"/> Unknown		32. IF FEMALE <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within the past year	
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____		34a. DATE OF INJURY (Month, Day, Year)	34b. TIME OF INJURY	34c. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No	34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify)
		34e. DESCRIBE HOW INJURY OCCURRED		34f. LOCATION OF INJURY (Street and Number, City or Town, State)	

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The section of the death certificate in red must be completed by a physician. In addition to this form, you can also use the online VRISM system, **Health.VRISM@tn.gov**. For help with VRISM, call the help line: (855) 874-7686 or (855) VRISM TN.

Properly completing the Cause of Death in Part 1 is a critical step. This section is read from **top to bottom**: Cause A is due to Cause B is due to Cause C is due to Cause D. Certifiers may complete only one line or up to all four if necessary. The last diagnosis listed will be coded as the **underlying cause of death**. Therefore, **the bottom line is the bottom line**.

The cause of death is defined as “the anatomic disease or injury that initiated the train of morbid events leading directly to death.” The cause of death statement on the death certificate represents the medical opinion (“more likely than not”) of the certifier.



KNOWLEDGE CHECK


When we say “more likely than not,” what degree of certainty does the certifier need to have?

- A. 75%
- B. 99%
- C. 100%
- D. 51%
- E. 33%

The correct answer is D. 51%. The death certificate even uses the phrase “to the best of my knowledge.”


What not to do

Before we provide examples of properly completed death certificates, let's start with some examples of what not to do.




<p>28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.</p>		Approximate Interval: Onset to death
<p>IMMEDIATE CAUSE (Final disease or condition resulting in death)</p>	a. Metabolic encephalopathy	_____
<p>Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST</p>	b. Severe sepsis	Due to (or as a consequence of) _____
	c. Septic shock	Due to (or as a consequence of) _____
	d. Lactic acidosis	Due to (or as a consequence of) _____

We don't really know what happened to this person. It could be anything from a gunshot wound to spontaneous bacterial peritonitis.



<p>28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.</p>		Approximate Interval: Onset to death
<p>IMMEDIATE CAUSE (Final disease or condition resulting in death)</p>	a. Cardiopulmonary	Due to (or as a consequence of) _____
<p>Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST</p>	b. _____	Due to (or as a consequence of) _____
	c. _____	Due to (or as a consequence of) _____
	d. _____	Due to (or as a consequence of) _____

Details are insufficient.



<p>28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.</p>		Approximate Interval: Onset to death
<p>IMMEDIATE CAUSE (Final disease or condition resulting in death)</p>	a. Cardiac arrest	_____
<p>Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST</p>	b. Acidosis	Due to (or as a consequence of) _____
	c. Leukocytosis	Due to (or as a consequence of) _____
	d. _____	Due to (or as a consequence of) _____

Again, insufficient detail. We really have no idea of what this person died from.



What not to do (continued)

24. REGISTRAR'S SIGNATURE		25. DATE FILED (Month, Day, Year)		
26. CERTIFIER (Check only one) 26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated. 26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.				
PHYSICIAN OR MEDICAL EXAMINER EXECUTING CAUSE OF DEATH MUST COMPLETE AND SIGN WITHIN 48 HOURS.	27a. SIGNATURE OF CERTIFIER	27b. LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)	
	27d. NAME AND ADDRESS			
MEDICAL CERTIFICATION	28. PART I. Enter the chain of events (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.		Approximate Interval: Onset to death	
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a. Exact cause unknown		
	Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST	b. Probable cardiac arrest	Due to (or as a consequence of)	
		c. _____	Due to (or as a consequence of)	
d. _____		Due to (or as a consequence of)		
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I. Diabetes mellitus		29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No		
		29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No		
30. MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined	31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown	32. IF FEMALE <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within the past year		
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____	34a. DATE OF INJURY (Month, Day, Year)	34b. TIME OF INJURY	34c. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No	
34e. DESCRIBE HOW INJURY OCCURRED		34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify)		
		34f. LOCATION OF INJURY (Street and Number, City or Town, State)		

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“Exact cause unknown” — This almost looks like the certifier was unsure that the person was actually dead. Also, everyone will die of a cardiac arrest. It’s not helpful to include that on a death certificate.

What not to do (continued)

24. REGISTRAR'S SIGNATURE		25. DATE FILED (Month, Day, Year)	
26. CERTIFIER (Check only one) 26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated. 26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.			
PHYSICIAN OR MEDICAL EXAMINER EXECUTING CAUSE OF DEATH MUST COMPLETE AND SIGN WITHIN 48 HOURS.	27a. SIGNATURE OF CERTIFIER		27b. LICENSE NUMBER
	27c. DATE SIGNED (Month, Day, Year)		
MEDICAL CERTIFICATION	27d. NAME AND ADDRESS		
	28. PART I. Enter the chain of events (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line. IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. <u>Acute on chronic respiratory failure</u> Due to _____ (sequence of) b. <u>Chronic obstructive pulmonary jerseys</u> Due to _____ (or as a consequence of) c. _____ Due to _____ (or as a consequence of) d. _____ Sequitentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST		
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I. <u>Dementia; Diabetes mellitus type two</u>			29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No
			29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No
30. MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined	31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input type="checkbox"/> Unknown	32. IF FEMALE <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within the past year	
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____	34a. DATE OF INJURY (Month, Day, Year)	34b. TIME OF INJURY	34c. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No
34e. DESCRIBE HOW INJURY OCCURRED			34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify)
			34f. LOCATION OF INJURY (Street and Number, City or Town, State)

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Spelling counts. We are assuming the certifier meant to write "disease" instead of "jerseys." An error like this can occur when you use transcription technology and don't proof the certificate before submitting.



What not to do (continued)

23a. NAME AND ADDRESS OF FUNERAL HOME		23b. LICENSE NUMBER OF FUNERAL HOME		
24. REGISTRAR'S SIGNATURE		25. DATE FILED (Month, Day, Year)		
26. CERTIFIER (Check only one) 26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated. 26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.				
PHYSICIAN OR MEDICAL EXAMINER EXECUTING CAUSE OF DEATH MUST COMPLETE AND SIGN WITHIN 48 HOURS.	27a. SIGNATURE OF CERTIFIER	27b. LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)	
	27d. NAME AND ADDRESS			
MEDICAL CERTIFICATION	28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.		Approximate Interval: Onset to death	
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a. Autopsy		
	Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST	b.		
		c.		
d.				
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.		29a. WAS AN AUTOPSY PERFORMED? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Dementia; Diabetes mellitus type two		29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
30. MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input checked="" type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined	31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown	32. IF FEMALE <input checked="" type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within the past year		
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____	34a. DATE OF INJURY (Month, Day, Year)	34b. TIME OF INJURY	34c. INJURY AT WORK? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
34e. DESCRIBE HOW INJURY OCCURRED		34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify)		
		34f. LOCATION OF INJURY (Street and Number, City or Town, State)		

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Never list autopsy as the cause of death. Hopefully the person was dead before the autopsy was performed.



What not to do (continued)

MEDICAL CERTIFICATION	28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.		Approximate Interval: Onset to death	
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a. Withdrawal of care (per patient wishes)		
	Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST	b. CPR in progress	Due to (or as a consequence of)	
		c.	Due to (or as a consequence of)	
		d.	Due to (or as a consequence of)	

Here, withdrawal of care per patient was according to patient wishes. Hopefully the patient made that wish known before CPR was in progress.

MEDICAL CERTIFICATION	28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.		Approximate Interval: Onset to death	
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a. Acute hypoxic respiratory failure		
	Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST	b. Ventilator-associated pneumonia	Due to (or as a consequence of)	
		c.	Due to (or as a consequence of)	
		d.	Due to (or as a consequence of)	

Being on a ventilator is not an underlying cause of death. We want to know why they were on a ventilator in the first place.

Conditions that require additional information

In many cases, simply mentioning a condition on the death certificate is not sufficient. The CDC provides a list of conditions that require additional information on the death certificate:

- Abscess
- Abdominal hemorrhage
- Adhesions
- Adult respiratory distress syndrome
- Acute myocardial infarction
- Altered mental status
- Anemia
- Anoxia/anoxic encephalopathy
- Arrhythmia
- Ascites
- Aspiration
- Atrial fibrillation
- Bacteremia
- Bedridden
- Biliary obstruction
- Bowel obstruction
- Brain injury
- Brain stem herniation
- Carcinogenesis
- Carcinomatosis
- Cardiac arrest
- Cardiac dysrhythmia
- Cardiomyopathy
- Cardiopulmonary arrest
- Cellulitis
- Cerebral edema
- Cerebrovascular accident
- Cerebellar tonsillar herniation
- Chronic bedridden state
- Cirrhosis
- Coagulopathy
- Compression fracture
- Congestive heart failure
- Convulsions
- Decubiti
- Dehydration
- Dementia (when not otherwise specified)
- Diarrhea
- Disseminated intravascular coagulopathy
- Dysrhythmia
- End stage liver disease
- End stage renal disease
- Epidural hematoma
- Exsanguination
- Failure to thrive
- Fracture
- Gangrene
- Gastrointestinal hemorrhage
- Heart failure
- Hemothorax
- Hepatic failure
- Hepatitis
- Hepatorenal syndrome
- Hyperglycemia
- Hyperkalemia
- Hypovolemic shock
- Hyponatremia
- Hypotension
- Immunosuppression
- Increase intracranial pressure
- Intracranial hemorrhage
- Malnutrition
- Metabolic encephalopathy
- Multiorgan failure
- Multisystem organ failure
- Myocardial infarction
- Necrotizing soft tissue infection
- Old age
- Open (or closed) head injury
- Pancytopenia
- Paralysis
- Perforated gallbladder
- Peritonitis
- Pleural effusions
- Pneumonia
- Pulmonary arrest
- Pulmonary edema
- Pulmonary embolism
- Pulmonary insufficiency
- Renal failure
- Respiratory arrest
- Seizures
- Septic shock
- Shock
- Starvation
- Subdural hematoma
- Subarachnoid hemorrhage
- Sudden death
- Thrombocytopenia
- Uncal herniation
- Urinary tract infection
- Ventricular fibrillation
- Ventricular tachycardia
- Volume depletion



Properly completed death certificates





Here are some better examples of the cause-of-death statement. This is a 56-year-old person with high blood pressure who has a hemorrhagic stroke:

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a.	HEMORRHAGIC CEREBROVASCULAR ACCIDENT Due to (or as a consequence of)	<input type="text"/>
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.		
b.	ESSENTIAL HYPERTENSION Due to (or as a consequence of)	<input type="text"/>
c.	<input type="text"/> Due to (or as a consequence of)	<input type="text"/>
d.	<input type="text"/>	<input type="text"/>

This clearly states that the cause of death was a hemorrhagic cerebrovascular accident due to essential hypertension.

Properly completed death certificates (continued)

What about someone who gets a bone marrow transplant and develops C. difficile colitis?

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a.	<input type="text" value="CLOSTRIDIUM DIFFICILE COLITIS"/> 	<input type="text"/>
Due to (or as a consequence of)		
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.		
b.	<input type="text" value="IMMUNOSUPPRESSION"/> 	<input type="text"/>
Due to (or as a consequence of)		
c.	<input type="text" value="BONE MARROW TRANSPLANT"/> 	<input type="text"/>
Due to (or as a consequence of)		
d.	<input type="text" value="ACUTE MYELOGENOUS LEUKEMIA"/> 	<input type="text"/>

This tells us what the specific cause of death was — C. difficile colitis. And the underlying cause, AML, set into motion the train of events that led to death.

Properly completed death certificates

(continued)





Sometimes it may not be possible to identify the precise physiologic sequence (mechanism) leading up to death. In such cases, the known diagnosis which could reasonably account for death should be listed as the cause. For example, this patient is in hospice with metastatic lung cancer:

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a.	ADENOCARCINOMA OF LUNG WITH METASTASES TO BRAIN ABC	<input type="text"/>
Due to (or as a consequence of)		
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.		
b.	<input type="text"/> ABC	<input type="text"/>
Due to (or as a consequence of)		
c.	<input type="text"/> ABC	<input type="text"/>
Due to (or as a consequence of)		
d.	<input type="text"/> ABC	<input type="text"/>

We take the known diagnosis that could reasonably account for their death and list it as a cause of death. Specify details if you know them, such as the cell type and even the site of the brain where the metastases was.

Properly completed death certificates (continued)

As we mentioned, it's acceptable to use terms like "probable," "possible" or "suspected." In this case, an 86 year old with a 7 cm aortic aneurysm was found dead at home with a distended abdomen:

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a.	<input type="text" value="PROBABLE RUPTURED AORTIC ANEURYSM"/> 	<input type="text"/>
Due to (or as a consequence of)		
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.		
b.	<input type="text" value="ATHEROSCLEROTIC CARDIOVASCULAR DISEASE"/> 	<input type="text"/>
Due to (or as a consequence of)		
c.	<input type="text"/> 	<input type="text"/>
Due to (or as a consequence of)		
d.	<input type="text"/> 	<input type="text"/>

The ruptured aneurysm was the probable cause of death, due to atherosclerotic cardiovascular disease.

Properly completed death certificates (continued)

Here we have aspiration pneumonia due to ALS:

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a.	ASPIRATION PNEUMONIA Due to (or as a consequence of)	
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.		
b.	AMYOTROPHIC LATERAL SCLEROSIS Due to (or as a consequence of)	
c.	 Due to (or as a consequence of)	
d.	 Due to (or as a consequence of)	

Most cases of aspiration pneumonia occur in neurologically compromised patients. The disease process causing the impairment (ALS in this case) should be listed as the underlying cause of death.

Properly completed death certificates (continued)

Here's an example of how to list interval of death:

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a.	<input type="text" value="HYPERKALEMIA"/> <small>ABC</small> Due to (or as a consequence of)	<input type="text" value="1 HOUR"/>
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.		
b.	<input type="text" value="END STAGE KIDNEY DISEASE"/> <small>ABC</small> Due to (or as a consequence of)	<input type="text" value="6 MONTHS"/>
c.	<input type="text" value="MEMBRANOUS GLOMERULONEPHRITIS"/> <small>ABC</small> Due to (or as a consequence of)	<input type="text" value="8 YEARS"/>
d.	<input type="text" value="SYSTEMIC LUPUS ERYTHEMATOSUS"/> <small>ABC</small>	<input type="text" value="23 YEARS"/>

You can be specific, or generally list “seconds,” “hours,” “months” or “years” if you don’t have more exact details. There’s no requirement to complete this section.

Part II: Contributory causes of death

In Part II, list conditions that contributed to death but did not directly lead to death. You can list as many as the box will hold, separated by semicolons.

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a.	HYPERTENSIVE CARDIOVASCULAR DISEASE Due to (or as a consequence of)	
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.		
b.		
Due to (or as a consequence of)		
c.		
Due to (or as a consequence of)		
d.		
28. PART II.		
Enter other <u>significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.		
Other Significant Conditions contributing to death		
CHRONIC OBSTRUCTIVE PULMONARY DISEASE; DIABETES MELLITUS		

In this case, a 75-year-old person with hypertension, diabetes and COPD was found dead at home without antecedent complaints. The death was probably due to a sudden cardiac event, so the COPD and diabetes would be listed in Part II.

Cause of death vs. mechanisms of death

The **cause of death** is the anatomic disease or injury that initiated the train of events that led to death. **Mechanisms of death** are more nonspecific physiologic processes, such as exsanguination, respiratory arrest, arrhythmia, anoxic brain injury and metabolic acidosis. They should not be listed as the sole or underlying cause of death. VRISM will give you a pop-up alert if you try.

Manner of death

There are several choices of manner of death that can be listed on the death certificate.

The image shows a portion of a death certificate form. Section 30, 'Manner of Death', has a dropdown menu open. The options listed are: Natural (highlighted with a red box), Accident, Suicide, Homicide, Pending Investigation, and Could not be determined. Section 31, 'Tobacco Use', asks 'Did tobacco use contribute to death?'. Section 32, 'If Female', asks 'If female, select one from list' with a dropdown menu.

Note that a non-medical examiner certifier is limited to natural and pending. If any discrete, identifiable injury or poisoning event contributed in any way to death, the death cannot be considered natural, regardless of the interval that has elapsed between that event and death. All non-natural deaths are to be reported to the medical examiner of the county in which death occurred. Only one manner of death may be selected.

“Pending” is reserved for those cases in which the cause of death can’t be determined within 48 hours after death, but further information or investigation is expected (e.g., autopsy results). If you do choose to list the manner of death as pending, it must be certified with an actual cause of death within six months.

Manner of death

(continued)

Non-natural causes of death include:

- **Accident:** death due to injury or poisoning without intent to cause harm
- **Homicide:** death resulting from a volitional act by another person intended to cause fear, harm or death
- **Suicide:** death from injury or poisoning as a result of an intentional self-inflicted act committed to cause self-harm
- **Could not be determined:** either too much or too little information is available to determine the manner of death to a reasonable degree of medical certainty. This choice should not be used in the absence of an autopsy.

For example, let's say an 83-year-old falls at home, is admitted to the hospital for ORIF of the left femur. The hospital course is complicated by pneumonia, MI and ARF. The patient dies two months later with a mucus plug in the trach.

The key here is to apply the "But for" Principle — but for that femur fracture, the person would not have died at the time they did and the complications would not have occurred. Or ask "did this patient return to their pre-injury level of function?" In this case, the answer is no, so it would be an accidental death certified by the county M.E. The cause of death would be complications of left femur fracture.

Note that a manner of death could be classified in various ways based on specific circumstances. For example, if a 53 year-old paraplegic dies of euro sepsis, the cause of death depends on the cause of the paraplegia:

- Paraplegia due to a ruptured spinal AVM: Manner of death is **natural**.
- Paraplegia due to injuries sustained in motor vehicle accident 10 years prior to death: Manner of death is **accident**.
- Paraplegia due to self-inflicted gunshot wound to chest three years prior to death: Manner of death is **suicide**.
- Paraplegia due to gunshot wound to spine after decedent discovered in *flagrante delicto* with a spouse not his own 30 years ago: Manner of death is **homicide**.



Manner of death

(continued)

24. REGISTRAR'S SIGNATURE		25. DATE FILED (Month, Day, Year)	
26. CERTIFIER (Check only one) 26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated. 26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.			
PHYSICIAN OR MEDICAL EXAMINER EXECUTING CAUSE OF DEATH MUST COMPLETE AND SIGN WITHIN 48 HOURS.	27a. SIGNATURE OF CERTIFIER	27b. LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)
	27d. NAME AND ADDRESS		
MEDICAL CERTIFICATION	28. PART I. Enter the chain of events (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.		Approximate Interval: Onset to death
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a. Failure to thrive-adult, Due to (or as a consequence of)	
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST	b. PT willed herself to die wanting Due to (or as a consequence of)		
	c. to go to heaven. Failed antidepressants Due to (or as a consequence of)		
	d. Hip FX Due to (or as a consequence of)		
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.		29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
		29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No	
30. MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined	31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown	32. IF FEMALE <input checked="" type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Unknown if pregnant within the past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death	
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____	34a. DATE OF INJURY (Month, Day, Year)	34b. TIME OF INJURY	34c. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No
34e. DESCRIBE HOW INJURY OCCURRED		34f. LOCATION OF INJURY (Street and Number, City or Town, State)	

PH-1659 (Rev. 9/2011) ROA 1399

Look at the Manner of Death in this example. A hip fracture is not natural unless it was caused by osteoporosis or was a pathological fracture due to a metastasis. Otherwise, the manner of death should be listed as an accident.

What about therapy-related deaths? Deaths occurring as the result of a foreseeable complication of accepted therapy for natural disease are classified as **natural**. An example would be someone who experiences Stevens-Johnson syndrome after sulfonamide therapy, or coronary artery dissection during catheterization.

On the other hand, deaths occurring as the result of improper use of medical equipment or of equipment malfunction are classified as **accidental**. An example would be inadvertent intravenous administration of enteral feedings.



Other required PRISM fields

The image shows a screenshot of a PRISM form with three dropdown menus. The first dropdown, labeled 'ME Contacted', is open and shows 'Yes'. The second dropdown, labeled '29. Autopsy', is open and shows 'Yes' and 'No'. The third dropdown is partially visible and shows 'select'.

ME Contacted	Was medical examiner contact?	Select	Yes
29. Autopsy	Was an autopsy performed?	Select	Yes No
	Were autopsy findings available to complete	select	

PRISM requires that you report whether or not a medical examiner was notified of a death, whether an autopsy was performed and if the autopsy findings were available to complete the cause of death. Note that sometimes it can be difficult to determine if the medical examiner was contacted. If you didn't notify a medical examiner yourself, and it's not your institution's policy to do so, you can feel fairly safe answering no.

Other required PRISM fields (continued)

30. Manner of Death
Manner of death

31. Tobacco Use
Did tobacco use contribute to death?

32. If Female
If female, select one from list

- Not pregnant within past year
- Pregnant at time of death
- Not pregnant, but pregnant within 42 days of death
- Not pregnant, but pregnant 43 days to 1 year before death
- Unknown if pregnant within last year

PRISM also requires information about whether or not a female was pregnant at the time of death or up to a year before the death occurred. This information helps identify pregnancy-related deaths and trends.

30. Manner of Death
Manner of death

31. Tobacco Use
Did tobacco use contribute to death?

32. If Female
If female, select one from list

- Yes
- No
- Probably
- Unknown

Completing tobacco field is also required for PRISM. It gives you the options of yes no, probably or unknown. Don't be afraid to determine that tobacco contributed to a death, especially when it's fairly obvious.



Other required PRISM fields (continued)

The certifier was remarkably consistent in assigning the cause of death on lines 28 b, c and d below:

22. REGISTRATION OF FUNERAL DIRECTOR		23a. LICENSE NUMBER		23b. SIGNATURE OF REGISTRATION		23c. LICENSE NUMBER	
23a. NAME AND ADDRESS OF FUNERAL HOME						23b. LICENSE NUMBER OF FUNERAL HOME	
24. REGISTRAR'S SIGNATURE				25. DATE FILED (Month, Day, Year)			
26. CERTIFIER (Check only one)							
26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated.							
26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.							
27a. SIGNATURE OF CERTIFIER				27b. LICENSE NUMBER		27c. DATE SIGNED (Month, Day, Year)	
				27d. NAME AND ADDRESS			
28. PART I. Enter the chain of events (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.							
IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. Lung cancer							
Approximate Interval: Onset to death							
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST							
b. Smoking Due to (or as a consequence of)							
c. Smoking Due to (or as a consequence of)							
d. Smoking Due to (or as a consequence of)							
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.							
29a. WAS AN AUTOPSY PERFORMED?						Approximate Interval: Onset to death	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No						2 years	
29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH?						10 years	
<input type="checkbox"/> Yes <input type="checkbox"/> No						10 years	
30. MANNER OF DEATH		31. DID TOBACCO USE CONTRIBUTE TO DEATH?		32. IF FEMALE			
<input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Probably		<input checked="" type="checkbox"/> Not pregnant within past year		<input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death	
<input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation		<input type="checkbox"/> No <input type="checkbox"/> Unknown		<input type="checkbox"/> Pregnant at time of death			
<input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined				<input type="checkbox"/> Not pregnant, but pregnant within 42 days of death		<input type="checkbox"/> Unknown if pregnant within the past year	
33. IF TRANSPORTATION INJURY, SPECIFY:		34a. DATE OF INJURY (Month, Day, Year)		34b. TIME OF INJURY		34c. INJURY AT WORK?	
<input type="checkbox"/> Driver/Operator						<input type="checkbox"/> Yes <input type="checkbox"/> No	
<input type="checkbox"/> Passenger						34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify)	
<input type="checkbox"/> Pedestrian							
<input type="checkbox"/> Other (Specify) _____							
34e. DESCRIBE HOW INJURY OCCURRED						34f. LOCATION OF INJURY (Street and Number, City or Town, State)	

PH-1659 (Rev. 9/2011) ROA 1399

But then in box 31, for some reason they selected "probably."



COVID-19 related deaths

In April of 2020, the CDC issued guidance for certifying deaths due to COVID-19, specifying that COVID-19, SARS-CoV-2 or novel coronavirus 19 should be included in Part I of the death certificate if the death was felt to be due to novel coronavirus infection.

So if a person with severe chronic medical conditions dies with novel coronavirus 19, and it's felt that the infection hastened their demise, the death should be attributed to COVID-19. Any pre-existing conditions which may have made the decedent more susceptible to death due to novel coronavirus-19 infection should be listed in Part II.

Again, you can use "presumed," "likely," "probable" or "suspected" if testing wasn't performed or if you feel that there's a strong clinical suspicion that the person was infected but they had a negative test.

Note that there are many coronaviridae species — some even cause the common cold. The death certificate must indicate that death was due to infection with SARS-CoV-2 or novel coronavirus-19 or to the disease COVID-19 for the correct ICD code to be assigned.

Even if the decedent had a chronic disease that accelerated the demise, COVID-19 language should still be on the last line in Part I because it is the underlying cause that set into motion the chain of events that eventually led to that person's death. The other illnesses or underlying processes that exacerbated the SARS-CoV-2 infection, such as diabetes or cardiovascular disease, should be listed in Part II.

COVID-19 related deaths

(continued)

23a. NAME AND ADDRESS OF FUNERAL HOME		23b. LICENSE NUMBER OF FUNERAL HOME	
24. REGISTRAR'S SIGNATURE		25. DATE FILED (Month, Day, Year)	
26. CERTIFIER (Check only one) 26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated. 26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.			
27a. SIGNATURE OF CERTIFIER		27b. LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)
		27d. NAME AND ADDRESS	
28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line. IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. COVID-19 Due to (or as a consequence of) _____ b. _____ Due to (or as a consequence of) _____ c. _____ Due to (or as a consequence of) _____ d. _____ Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST			Approximate Interval: Onset to death
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I. Hypertension; Hyperlipidemia; Diabetes mellitus type 2			29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No
30. MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined	31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown	32. IF FEMALE <input checked="" type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within the past year	
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____	34a. DATE OF INJURY (Month, Day, Year)	34b. TIME OF INJURY	34c. INJURY AT WORK? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
34e. DESCRIBE HOW INJURY OCCURRED			34f. LOCATION OF INJURY (Street and Number, City or Town, State)

PH-1659 (Rev. 9/2011) ROA 1399

Here's an example of a properly completed death certificate listing COVID-19 as the sole cause of death. Contributing conditions, including hypertension, hyperlipidemia and diabetes mellitus, are included in Part II.



COVID-19 related deaths

(continued)

23a. NAME AND ADDRESS OF FUNERAL HOME		23b. LICENSE NUMBER OF FUNERAL HOME	
24. REGISTRAR'S SIGNATURE		25. DATE FILED (Month, Day, Year)	
26. CERTIFIER (Check only one) 26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated. 26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.			
27a. SIGNATURE OF CERTIFIER		27b. LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)
		27d. NAME AND ADDRESS	
28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line. IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. Acute respiratory distress syndrome Due to (or as a consequence of) _____ b. COVID-19 with guillain-barre type illness Due to (or as a consequence of) _____ c. _____ Due to (or as a consequence of) _____ d. _____ SEQUENTIALLY list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST			Approximate Interval: Onset to death
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I. Hypertension; Hyperlipidemia			29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No
30. MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined	31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input type="checkbox"/> Unknown	32. IF FEMALE <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within the past year	
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____	34a. DATE OF INJURY (Month, Day, Year)	34b. TIME OF INJURY	34c. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No
34e. DESCRIBE HOW INJURY OCCURRED		34f. LOCATION OF INJURY (Street and Number, City or Town, State)	

PH-1659 (Rev. 9/2011) ROA 1399

Here's an example of someone who died of ARDS due to COVID-19 with Guillain Barre type illness. Again, this is a proper certification of death, with hypertension and hyperlipidemia again listed in Part II.



COVID-19 related deaths

(continued)

23a. NAME AND ADDRESS OF FUNERAL HOME		23b. LICENSE NUMBER OF FUNERAL HOME	
24. REGISTRAR'S SIGNATURE		25. DATE FILED (Month, Day, Year)	
26. CERTIFIER (Check only one)			
26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated.			
26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.			
27a. SIGNATURE OF CERTIFIER		27b. LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)
		27d. NAME AND ADDRESS	
28. PART I. Enter the chain of events (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.		Approximate Interval: Onset to death	
IMMEDIATE CAUSE (Final disease or condition resulting in death)		a. Acute hypoxic respiratory failure	7-10 days
Sequitentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST		b. Bilateral pneumonia Due to (or as a consequence of)	10-12 days
		c. COVID-19 Due to (or as a consequence of)	10-14 days
		d. _____	
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.		29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Obesity		29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No	
30. MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined	31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown	32. IF FEMALE <input checked="" type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within the past year	
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____	34a. DATE OF INJURY (Month, Day, Year)	34b. TIME OF INJURY	34c. INJURY AT WORK? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
34e. DESCRIBE HOW INJURY OCCURRED		34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify)	
		34f. LOCATION OF INJURY (Street and Number, City or Town, State)	

PH-1659 (Rev. 9/2011) ROA 1399

In this example, a sequence of acute hypoxic respiratory failure and pneumonia led to COVID-19 as the underlying cause of death. Obesity is listed as a significant contributing condition.



COVID-19 related deaths

(continued)

23a. NAME AND ADDRESS OF FUNERAL HOME		23b. LICENSE NUMBER OF FUNERAL HOME	
24. REGISTRAR'S SIGNATURE		25. DATE FILED (Month, Day, Year)	
26. CERTIFIER (Check only one) 26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated. 26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.			
27a. SIGNATURE OF CERTIFIER		27b. LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)
		27d. NAME AND ADDRESS	
28. PART I Enter the chain of events (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line. IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. Acute subdural hematoma Due to (or as a consequence of) b. Fall Due to (or as a consequence of) c. _____ Due to (or as a consequence of) d. _____ SEQUENTIALLY list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST			Approximate Interval: Onset to death
PART II Other significant conditions contributing to death but not resulting in the underlying cause given in PART I. Recent history of COVID-19 infection, hypertensive and atherosclerotic cardiovascular disease, history of pulmonary embolism with current			29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
30. MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined			29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No
31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown		32. IF FEMALE <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within the past year	
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____	34a. DATE OF INJURY (Month, Day, Year) Found 04/12/2020	34b. TIME OF INJURY Unknown	34c. INJURY AT WORK? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
34e. DESCRIBE HOW INJURY OCCURRED Fall			34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify) Nursing home/Long term care 34f. LOCATION OF INJURY (Street and Number, City or Town, State)

PH-1659 (Rev. 9/2011) ROA 1399

So what happens if the decedent has COVID but it not the underlying cause of death? Here we have a person who died of a fall due to an acute subdural hematoma, which is listed in Part I of the death certificate. The certifier chose to include a recent history of COVID-19 infection in Part II, but the manner of death here is listed as an accident.



KNOWLEDGE CHECK: FICTIONAL SCENARIOS

Scenario 1:

An 80 year-old man was seen by a nurse practitioner two months ago for routine follow-up of his hypertension, diabetes mellitus and chronic obstructive pulmonary disease. He was found dead at home without any signs of trauma, foul play or drug overdose.

Who should sign the death certificate?

- A. The nurse practitioner
- B. The county medical examiner, as the death was unwitnessed
- C. The county medical examiner, because the cause of death cannot be determined to a reasonable degree of medical certainty
- D. The physician supervising the nurse practitioner

The correct answer is D. The physician supervising any health care extender providing the patient's care for the illness which results in death should sign the death certificate. In this case, the cause of death in Part I could be listed as "hypertensive cardiovascular disease," with diabetes mellitus and chronic obstructive pulmonary disease listed in Part II as other significant conditions.

KNOWLEDGE CHECK: FICTIONAL SCENARIOS

Scenario 2:

An elderly woman complained of left-sided chest pain and tightness shortly before collapsing. She was transported to the emergency department, where she was pronounced dead. Her family relates a history of multiple myocardial infarctions and high cholesterol, which were confirmed by the staff at her local physician's office.

Who should sign the death certificate?

- A. The patient's primary care doctor
- B. The emergency room physician
- C. The patient's out-of-town cardiologist
- D. Any of the above

The correct answers are A and B. It can't be the cardiologist because they don't have a Tennessee license to practice medicine. However, the emergency room doctor, the patient's regular physician or another physician who has treated the patient for the illness causing death (for example, a cardiologist) may sign the death certificate. If none of these is available, the chief medical officer of the institution in which death is pronounced is to sign the death certificate (TCA 68-3-502).

KNOWLEDGE CHECK: FICTIONAL SCENARIOS

Scenario 3:

I am a primary care physician in a small rural community. One of my long-time patients, an elderly man with multiple medical problems, has been found dead at home. I have not seen the patient in eight months.

Who will sign the death certificate?

- A. The primary care doctor, even though it has been more than four months since the patient was last seen
- B. The county medical examiner, as the patient had not been seen by the primary care doctor within four months
- C. Either A or B may sign

The correct answer is C. The primary care physician, as the person most familiar with the decedent's medical history, is the most appropriate person to complete the death certificate. A physician treating a patient for the disease process accounting for death is obligated by statute to complete and sign the death certificate if the patient has been seen within the four months prior to death. However, if the treating physician has not seen the patient in the four months before death, and the death occurs outside of a healthcare facility, the case may be referred to the county medical examiner in the county in which death occurred. The county medical examiner may then review medical records and issue the death certificate.

KNOWLEDGE CHECK: FICTIONAL SCENARIOS

Scenario 4:

I am a pediatrician. I cared for an 8-year-old with profound developmental delays requiring mechanical ventilation who was found dead at home a few days after I diagnosed her with pneumonia.

Who should sign the death certificate?

- A. The county medical examiner, as the pneumonia should have been resolving with appropriate therapy
- B. The pediatrician
- C. The decedent's neurologist, as the pneumonia was the result of developmental delays requiring mechanical ventilation
- D. It depends on the underlying cause of the developmental delays

The correct answer is D. If the developmental delay is the result of a natural cause (for example, birth asphyxia resulting from a nuchal cord), the pediatrician or another physician attending to the patient will sign the death certificate. If the developmental delay is due to a non-natural event (for example, remote abusive head trauma), the county medical examiner should be notified, as such a death is properly classified as homicide.

KNOWLEDGE CHECK: FICTIONAL SCENARIOS

Scenario 5:

I am the medical director of a nursing home. I will be out of the country for two weeks on a medical mission trip.

How should death certificates be handled in my absence?

- A. Give the nursing supervisor your sign-in credentials for VRISM
- B. Another physician should be designated as the responsible party for death certification in the absence of the medical director
- C. Any deaths occurring during the absence of the medical director may be certified on his or her return to the country

The correct answer is B. Do not share your VRISM sign-in information. Your signature on the death certificate avers, "To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated." The medical certification of death is to be completed within 48 hours of death. You must designate another physician to sign death certificates during your absence, just as you would do for medical emergencies.

KNOWLEDGE CHECK: FICTIONAL SCENARIOS

Scenario 6:

A patient was dependent on parenteral nutrition because of multiple enterocutaneous fistulae. She died in the intensive care unit after developing sepsis due to infection of an indwelling central venous catheter. Which cause of death certification is most appropriate?

The correct answer is A. The classification of cause of death is precise, sequentially plausible, and lists a specific anatomic process, Crohn's disease, as the underlying cause of death.

Conversely, "Hypotension due to septic shock due to Staphylococcus aureus infection," as indicated in example B, provides multiple mechanisms of death without listing a true cause of death.

A

IMMEDIATE CAUSE (Final disease or condition resulting in death)

a. SEPTIC SHOCK

Due to (or as a consequence of)

Sequentially list conditions, if any, leading to the cause listed on line a.

Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.

b. CENTRAL VENOUS CATHETER INFECTION

Due to (or as a consequence of)

c. DEPENDENCE ON PARENTERAL NUTRITION

Due to (or as a consequence of)

d. CROHN'S DISEASE

B

IMMEDIATE CAUSE (Final disease or condition resulting in death)

a. HYPOTENSION

Due to (or as a consequence of)

Sequentially list conditions, if any, leading to the cause listed on line a.

Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST.

b. SEPTIC SHOCK

Due to (or as a consequence of)

c. STAPHYLOCOCCUS AUREUS INFECTION

Due to (or as a consequence of)

d.

KNOWLEDGE CHECK: FICTIONAL SCENARIOS

Scenario 7:

Here are two death certificates to compare and contrast. Which one is an appropriate certification of death?

The correct answer is A. The cause-of-death statement follows a logical sequence, lists the underlying disease process responsible for death last and includes hypertensive cardiovascular disease as a contributory cause of death. On the other hand, example B implies that hypertension is the result of metabolic acidosis, and fails to indicate the etiology of the varices.

A

IMMEDIATE CAUSE (Final disease or condition resulting in death)	
a.	METABOLIC ACIDOSIS Due to (or as a consequence of)
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST .	
b.	BLEEDING GASTROESOPHAGEAL VARICES Due to (or as a consequence of)
c.	CIRRHOSIS Due to (or as a consequence of)
d.	HEPATITIS B VIRUS INFECTION

B

IMMEDIATE CAUSE (Final disease or condition resulting in death)	
a.	HYPERTENSIVE CARDIOVASCULAR DISEASE Due to (or as a consequence of)
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST .	
b.	METABOLIC ACIDOSIS Due to (or as a consequence of)
c.	BLEEDING GASTROESOPHAGEAL VARICES Due to (or as a consequence of)
d.	

KNOWLEDGE CHECK: FICTIONAL SCENARIOS

Scenario 8:

Which is an appropriate certification of death? Hint: consider the manner of death.

The correct answer is A. If the precise physiologic mechanism of death is unclear, it is acceptable to use the term "complications of" a known disease process which could reasonably account for death. In example B, although "urosepsis due to paraplegia due to gunshot wound to torso, remote," is an accurate and specific cause of death, the manner of death cannot be considered natural, and the case should be referred to the county medical examiner. The interval of time elapsed between the injury and death does not affect or change the manner of death.

A

28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.		Approximate Interval: Onset to death
IMMEDIATE CAUSE (Final disease or condition resulting in death)	a. Complications of multiple sclerosis Due to (or as a consequence of)	Years
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST	b. _____ Due to (or as a consequence of)	
	c. _____ Due to (or as a consequence of)	
	d. _____ Due to (or as a consequence of)	
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.		29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No
30. MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined	31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown	32. IF FEMALE <input checked="" type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within the past year

B

28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.		Approximate Interval: Onset to death
IMMEDIATE CAUSE (Final disease or condition resulting in death)	a. Urosepsis Due to (or as a consequence of)	Days
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST	b. Paraplegia Due to (or as a consequence of)	32 years
	c. Gunshot wound to torso, remote Due to (or as a consequence of)	32 years
	d. _____ Due to (or as a consequence of)	
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.		29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No
30. MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined	31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown	32. IF FEMALE <input checked="" type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within the past year



Part 2: Guidance for Certification of Disaster-Related Deaths

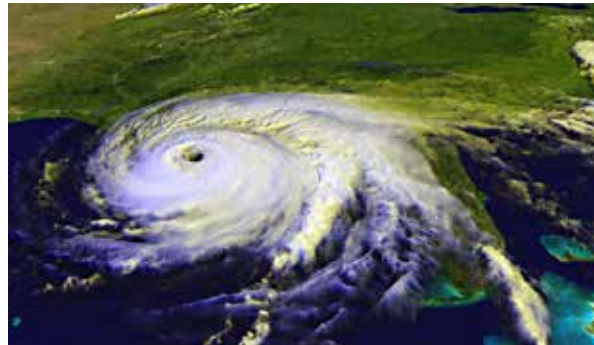
Introduction

This training is based on guidance from the National Center on Health Statistics and the Disaster Epidemiology Response Team, which provides support and develops guidelines for state and local jurisdictions for management of natural and human-induced disasters.

Published in 2017, this guidance aims to improve the accuracy of disaster-related mortality reporting by alleviating some of the inconsistencies in determining disaster-related deaths.

This training is modified from Dr. Tesfaye Bayleyegn with the CDC and from Dr. Katherine Cochrane who collected and presented the information about the deaths that occurred in the Gatlinburg Wildfires.

What is a disaster?



A disaster is defined as

a serious disruption of the functioning of society, causing widespread human, material or environmental losses that exceed the local capacity to respond and calls for external assistance.

Disasters can be natural, including hurricanes, forest fires, floods, tornados, earthquakes, landslides and ice storms. There are also human-induced disasters such as industrial explosions or chemical release, chemical or biological contamination of the environment such as oil spills, transportation incidents and disasters like the Flint Water Crisis. Complex emergencies are those that can be slow to take effect and can extend over a long period such as war, drought and famine.

Why it's important to recognize a disaster for death certification

From a public health perspective, disasters are defined by what they do to people. Mortality tracking measures the effect of a disaster on a population, and the best source of mortality data is the death certificate. So including the disaster type and name on the death certificate is critical for accurate disaster-related mortality surveillance. Without the disaster type or name on the death certificate, mortality data may be incomplete.

Death certificates play an important role in our understanding of disaster-related mortality by providing information on the different ways disasters can directly and indirectly lead to death. Mortality data is needed in near real-time during a disaster response.

Urgent uses for disaster mortality data include identifying main causes and circumstances of death to inform immediate public health interventions and response efforts. Non-urgent uses involve more in-depth analyses, which provide information on deaths for future planning and mitigation efforts.

Death certificates are also needed by families recovering from a disaster to receive certain disaster relief resources from FEMA, Red Cross and other organizations, and to complete other legal aspects of death.

Inconsistencies in reporting a death as disaster-related on the death certificate make it difficult to generate reliable and accurate mortality statistics and to identify the most frequent causes of death associated with the disaster. If the disaster is not noted on the death certificate, we may miss counting that death as disaster-related.

Using complete and accurate information, statistics at the national, state and local levels can be generated, and we can better understand contributors to disaster-related deaths and implement targeted interventions to mitigate risk during disaster response and recovery.

The purpose of this training is to help improve the accuracy and completeness of information on the death certificate.



The role of physicians



Physicians play an integral and active role in identifying disaster-related deaths because you are responsible for completing death certificates — which include the disaster type and name — and for correctly identifying which cases must be reported to the county medical examiner. This allows public health officials to identify deaths related to disaster incidents which, in turn, provides key situational awareness and lessons learned. So you are integral to disaster preparedness, response and recovery efforts.

What qualifies as a disaster?



Here are some recent examples of disasters in Tennessee:

- Tornadoes in Davidson, Wilson and Putnam counties — March 2020
- The Great Smoky Mountain wildfires — November 2016
- Nashville flood — May 2010
- Jefferson County bus crash — October 2013
- Historic flooding in 14 counties in East TN — February 2019
- Coal ash spill — December 2008

How do we know when a disaster occurs? It's usually fairly obvious, but disasters are typically defined by:

- Clinical history, EMS reports
- Official alerts — EMA, county, state, federal, Tennessee Hospital Association, etc.
- Work-related/industrial accidents — death-scene investigation, autopsy, lab findings, medical examiner personnel

Awareness of the disaster may be more difficult when patients are admitted or transferred to hospitals for care outside of the disaster region, or if a death is investigated by Regional Forensic Centers outside of the disaster area.

The issue of reporting discrepancies

Unfortunately, disaster-related death reporting can vary from county to county in Tennessee. Here's are two examples.

Jefferson County

- 86-year-old man with history of lung cancer was in his home.
- Ice storm caused electrical loss to home.
- He was unable to use supplemental home oxygen for respiratory insufficiency.
- He became unresponsive and was transferred to local hospital where he was pronounced dead.
- Cause of death was lung cancer, and manner of death was natural.
- No mention of relation of death to ice storm.

Rutherford County

- 67-year-old woman with emphysema was in her home.
- Ice storm caused electrical loss at home.
- She was unable to use supplemental home oxygen.
- Cause of death was complications of emphysema.
- Relation of death to ice storm documented.

So what is the difference between these two deaths? Why was one deemed to be related to the ice storm and the other was not? Both of these deaths are indirectly related to the ice storm because of the patient's inability to use home oxygen as prescribed. The disaster type, disaster name and circumstance of death need to be documented on the death certificate to ensure they are captured for disaster-related mortality surveillance.

The issue of reporting discrepancies (continued)

Discrepancies in reporting disaster-related deaths by different sources

Disaster	Red Cross	FEMA (Approved Funeral Expenses)	NOAA-NWS Storm Data	Other Agency (EOC, ME)	Vital Stats (Search w/o names)
Hurricane Harvey TX (2017)	75	70	60	94	69
Hurricane Sandy NJ (2012)	34	61	12	75	24
Tornado GA (April 27, 2011)	15	9	15	15	6
Hurricane Ike TX (2008)	38	104	20	74	4



This table shows the vast discrepancies in the death tolls reported by different agencies for hurricanes and tornadoes over the past several years. Which is the “correct” number of deaths for each disaster? The most striking difference is 104 vs. 4 for Hurricane Ike between Vital Statistics and FEMA counts; however, at that time the death reporting system in Texas was mostly paper-based.

Types of disaster-related deaths

Directly related disaster deaths are caused by the forces of the disaster, such as strong wind during a hurricane, or the direct consequences of these forces like structural collapse, flying debris or radiation exposure. An example would be someone drowning during a flood.

Indirectly related disaster deaths occur when the disaster leads to unsafe or unhealthy conditions, such as hazardous roads, or a loss or disruption of usual services, like a power outage or loss of access to medical services and medications that may have contributed to the death. These deaths are often harder to identify as disaster-related because they can be due to injuries, poisonings or natural causes of death. An example would be a person who died after missing dialysis for several days because their local dialysis facility was closed after being affected by a disaster.

Disaster-related deaths can occur before the disaster incident, during, and after the disaster.

- Before the disaster — A trauma from a car crash while evacuating
- During the disaster — Being hit by flying debris, loss of access to medical treatment
- After the disaster — Carbon monoxide poisoning from using indoor generators during power outage, electrocution

Deaths may also occur among emergency responders and recovery workers during the course of providing services in the disaster. Documenting fatal occupation-related injuries and health conditions is equally important.

Types of disaster-related deaths

(continued)

PHYSICIAN OR MEDICAL EXAMINER EXECUTING CAUSE OF DEATH MUST COMPLETE AND SIGN WITHIN 48 HOURS.

MEDICAL CERTIFICATION

25a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated.		25b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.	
27a. SIGNATURE OF CERTIFIER		27b. LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)
27d. NAME AND ADDRESS			
28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.			Approximate Interval: Onset to death
IMMEDIATE CAUSE (Final disease or condition resulting in death)			
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST		a. _____ Due to (or as a consequence of)	_____
		b. _____ Due to (or as a consequence of)	_____
		c. _____ Due to (or as a consequence of)	_____
		d. _____	_____
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.			29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No
			29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No
30. MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined	31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input type="checkbox"/> Unknown	32. IF FEMALE <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death	<input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Unknown if pregnant within the past year
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____	34a. DATE OF INJURY (Month, Day, Year)	34b. TIME OF INJURY	34c. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No
34e. DESCRIBE HOW INJURY OCCURRED		34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify)	
		34f. LOCATION OF INJURY (Street and Number, City or Town, State)	

PH-1659 (Rev. 9/2011) ROA 1399

Use the “Describe how injury occurred” box, the “Place of Injury” box, and “Injury at work” box on the death certificate to capture work-related injuries.

Deaths from exposure to hazardous chemicals can be indirectly or directly related to disasters. The physical forces of a disaster can lead to the release of harmful chemicals by damaging hazardous chemical storage containers and pipelines.

Natural deaths can also be disaster-related. Chronic conditions may be exacerbated by an acute disaster incident. Disaster-related evacuations, power outages and infrastructure damage can cause loss of access to routine medical services and medications. Power outages, evacuations and poor road or weather conditions can cut off access to treatment centers, medical offices, and pharmacies. Cardiovascular incidents have been associated with hurricanes. Examples of such natural deaths include asthma-related deaths associated with wildfires and diabetic ketoacidosis from loss of access to insulin due to the disaster incident.



Common causes of directly related disaster deaths

- Fire or smoke inhalation
- Burns
- Crushing
- Drowning
- Electrocution
- Falls
- Hyperthermia (heat)
- Hypothermia (cold)
- Radiation or chemical poisoning
- Suffocation
- Traumatic injury
- Blunt-force trauma
- Penetrating injury



**Not an exhaustive list*

These directly related deaths are fairly easy to identify and not natural deaths, so they should be reported to your county medical examiner since by law they fall under medical examiner jurisdiction.

The concept of indirectly related disaster deaths is important, but it also can be a point of confusion and uncertainty for cause-of-death determination. As certifiers you should not necessarily focus on distinguishing between indirectly and directly related disaster deaths. These two types of disaster-related deaths are presented for you to familiarize yourself with the variety of disaster-related circumstances so you can use your awareness to decide if a death is disaster-related.

Common causes of indirectly related disaster deaths

Indirectly related disaster deaths can be difficult to determine. Here is a list of common circumstances leading to indirectly related disaster deaths:

- Loss/disruption of public utilities
- Loss/disruption of transportation-related services
- Loss/disruption of usual access to medical or mental health care
- Preparation for disaster
- Social disruption, including riots or anarchy
- Return to unsafe, unhealthy structures or environment
- Use of temporary sheltering or provisions; displacement
- Acute exacerbation of chronic condition(s)
- Cleanup after disaster
- Escaping or fleeing the disaster
- Evacuation
- Exposure to industrial or chemical hazards
- Psychosocial stress or anxiety

**Not an exhaustive list*

Remember to use the “But for” Principle. If you are unsure whether or not a death is disaster-related, but it’s likely or probable that it might be, then still document the disaster type and name and the circumstance of death on the death certificate, such as a person who died from carbon monoxide poisoning (cause of death) while using a fireplace during a power outage (circumstance of death) after Hurricane Sandy (disaster type and name).

Determining the cause of a disaster death

Example 1:

Elderly person has heart attack after evacuating to shelter after train wreck carrying hazardous material.

Could the stress associated with evacuation have contributed to the onset of the heart attack? It's possible. If the certifier's opinion is that the disaster contributed to the death, then the certifier should indicate the contribution of the disaster on the death certificate.

Example 2:

Death resulting from a car crash that occurred while evacuating a storm.

A pileup on the freeway after an evacuation notice has been issued can be indirectly related to the disaster because the evacuation led to an increase in motorists and potentially frantic driving, which are contributing factors to the accident. The disaster should be documented on the death certificate.

28. PART I. Enter the cause of death (disease, trauma, or complication) that directly caused the death. Do NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.		28b. Enter the date (month, day, year) of death.
MEDICAL CERTIFICATION IMMEDIATE CAUSE (Final disease or condition resulting in death) Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST	a. _____ Due to (or as a consequence of)	
	b. _____ Due to (or as a consequence of)	
	c. _____ Due to (or as a consequence of)	
	d. _____ Due to (or as a consequence of)	
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.		29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No
		29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No
30. MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined	31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input type="checkbox"/> Unknown	32. IF FEMALE <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within the past year
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____	34a. DATE OF INJURY (Month, Day, Year) _____	34b. TIME OF INJURY _____
34e. DESCRIBE HOW INJURY OCCURRED _____		34c. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No
		34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify) _____
		34f. LOCATION OF INJURY (Street and Number, City or Town, State) _____

PH-1659 (Rev. 9/2011) ROA 1399

For example, in Part II you could record the type and name of the storm as a contributing condition of the death, as well as in the "Describe how injury occurred" box.



Determining the cause of a disaster death

(continued)



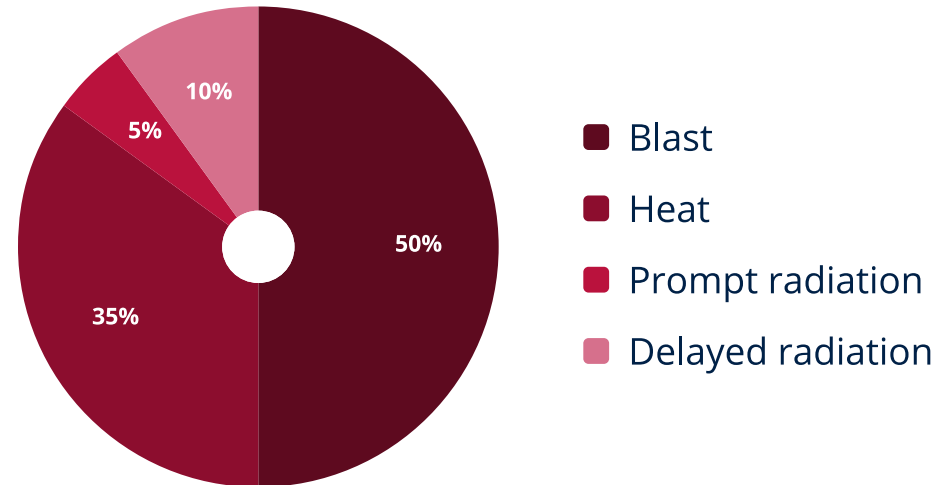
Example 3:

Person dies after not receiving dialysis for several days because of power outages after a tornado.

This death is indirectly related. But for the disaster, the person may not have died when they did, had they been able to receive treatment.

Complex disasters

Certainly, a plane crash is a disaster — a small plane crash would likely only directly impact the plane passengers. But what happens if a plane hits the Browns Ferry nuclear plant? This would likely lead to widespread direct and indirect-related deaths.



For radiation incidents, understanding how radiation injuries can occur is important. Energy from the detonation of a nuclear weapon is released as blast (50%), extreme heat (35%), prompt or acute radiation (5%), and delayed radiation in fallout (10%).

- Initial deaths would occur at or near ground zero from blast injuries, heat or thermal injury, or prompt radiation injury.
- Delayed deaths may occur from initial blast injuries or acute radiation syndrome.
- There may also be blast injuries due to direct blast wave peak overpressure and indirect blast wind drag forces.
- There may be heat or thermal injuries due to direct absorption or direct transmission of thermal energy, causing flash burns or flame burns.
- And there may be prompt radiation injuries — the Initial detonation could result in acute radiation syndrome.

How to certify disaster-related deaths

The most useful principle for disaster-related mortality determination is the “but for” principle.

“BUT FOR the disaster, would the person not have died at that time?”

Let’s use a scenario where a person experiencing symptoms of a heart attack dialed 911. However, EMS was unable to immediately respond due to several large trees blocking the road after a tornado, and the person was found dead in their home once EMS was able to reach them the next day.

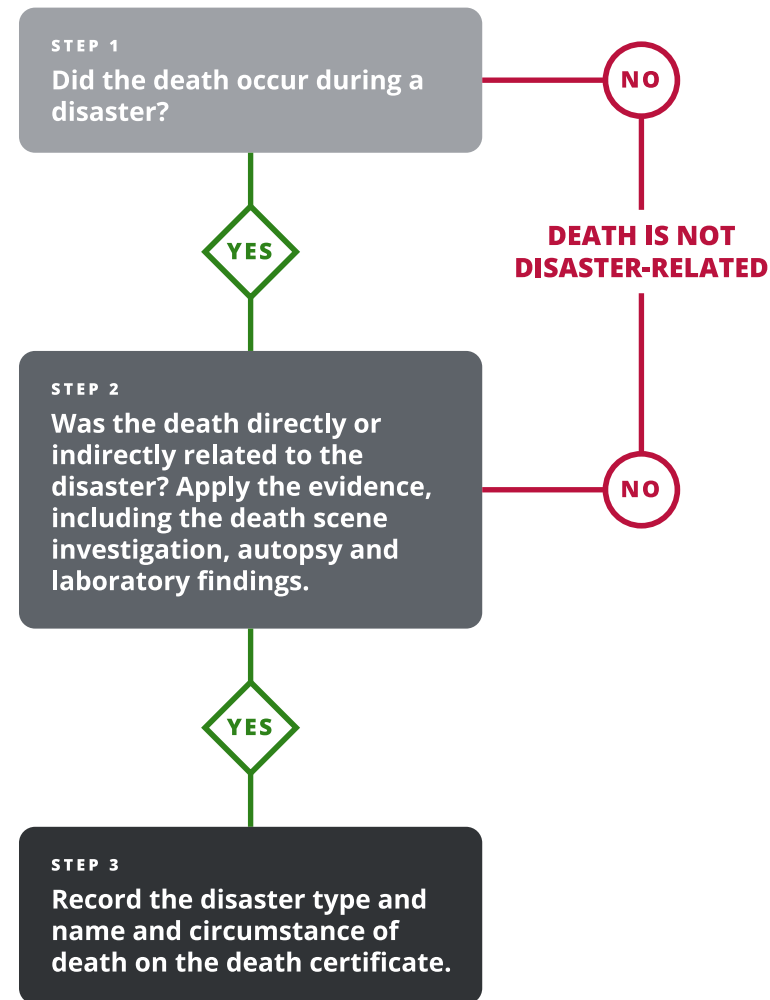
If the ambulance was able to reach the person earlier, it’s possible they would still be alive. This possibility is enough to report the death as disaster-related and document the disaster type and name, such as Putnam County tornado, on the death certificate.

If it is probable or likely that the disaster itself or the circumstances it created may have led or contributed to the death, then document the disaster type and name (if there is one) on the death certificate.

For medical certifiers, the key determination is whether or not the death is disaster-related. Whether a death is directly related or indirectly related doesn’t need to go on the DC, but knowing and understanding both types of disaster-related deaths, especially indirectly related disaster deaths, can aid you in determining if a death is, in general, disaster-related. It will also assist you in understanding which cases should be referred to the county medical examiner.

Flowchart for determining disaster-related deaths

This flowchart can be used to help you determine if a death is disaster-related:



Some disasters may not have official names. In those situations, include the disaster type, location and date — for example, “the January 2014 Atlanta ice storm,” also known as “Snowmageddon” or “Snowpocalypse.” Use the disaster type, date and location, and official name, if there is one, rather than a nickname so terms are searchable in the future.

Who should certify disaster-related deaths?

- **Medical examiners** certify deaths directly related to the disaster and deaths that are indirectly related to disasters and due to injuries, poisonings and complications thereof.
- **Non-medical examiner physicians** certify deaths that are indirectly related to disasters and due to natural causes. Sudden or unexpected deaths may need to be referred to the ME. When in doubt, consult the medical examiner.

Other significant conditions that may have contributed to the death, but were not part of the causal sequence reported in Part I, should be recorded in Part II. Contributing conditions also do not have to be diseases. You can include non-clinical information in Part II, such as the circumstance of death and the disaster type and name.

For injury deaths, a clear, brief statement indicating the circumstances surrounding the injury or external cause of death should be reported in the “Describe how injury occurred” box. This would include disaster type and name. Be sure to document the place of injury.

If the injury occurred at work — including injuries among emergency response and recovery personnel — select “Yes” in the “Injury at work?” box.

Who should certify disaster-related deaths?

(continued)

18. FATHER'S NAME (First, Middle, Last)		19. MOTHER'S NAME PRIOR TO FIRST MARRIAGE (First, Middle, Last)	
20a. INFORMANT'S NAME		20b. RELATIONSHIP TO DECEDENT	20c. MAILING ADDRESS (Street and Number, City, State, Zip Code)
21a. METHOD OF DISPOSITION <input type="checkbox"/> Burial <input type="checkbox"/> Cremation <input type="checkbox"/> Donation <input type="checkbox"/> Entombment <input type="checkbox"/> Removal from State <input type="checkbox"/> Other (Specify)		21b. PLACE OF DISPOSITION (Name of cemetery, crematory, other place)	
21c. LOCATION - City or Town and State			
22a. SIGNATURE OF FUNERAL DIRECTOR		22b. LICENSE NUMBER	22c. SIGNATURE OF EMBALMER
22d. LICENSE NUMBER			
23a. NAME AND ADDRESS OF FUNERAL HOME			23b. LICENSE NUMBER OF FUNERAL HOME
24. REGISTRAR'S SIGNATURE		25. DATE FILED (Month, Day, Year)	
26. CERTIFIER (Check only one)			
26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated.			
26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.			
27a. SIGNATURE OF CERTIFIER		27b. LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)
27d. NAME AND ADDRESS			
28. PART I. Enter the chain of events (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.			Approximate Interval: Onset to death
IMMEDIATE CAUSE (Final disease or condition resulting in death)			
a. _____ Due to (or as a consequence of)			
b. _____ Due to (or as a consequence of)			
UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST			
c. _____ Due to (or as a consequence of)			
d. _____ Due to (or as a consequence of)			
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.			29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No
			29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No
30. MANNER OF DEATH		31. DID TOBACCO USE CONTRIBUTE TO DEATH?	
<input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined		<input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input type="checkbox"/> Unknown	
32. IF FEMALE		<input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Unknown if pregnant within the past year <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death	
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify)		34a. DATE OF INJURY (Month, Day, Year)	34b. TIME OF INJURY
		34c. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No	34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify)
		34e. DESCRIBE HOW INJURY OCCURRED	
		34f. LOCATION OF INJURY (Street and Number, City or Town, State)	

PH-1659 (Rev. 9/2011) ROA 1399

As with any death, the cause-of-death diseases or conditions should be reported as precisely as possible in Part I of the death certificate, with the most recent condition listed on line A and the initiating condition on the lowest used line. Certifiers should report a single incident on each line, even when the incidents occurred simultaneously. Avoid using abbreviations or acronyms. The disaster type and name can be included in Part I as a cause of death condition.



Who should certify disaster-related deaths?

(continued)

18. DECEASED'S NAME (Last, First, Middle, Initial)		19. DECEASED'S NAME (Last, First, Middle, Initial)	
20a. INFORMANT'S NAME		20b. RELATIONSHIP TO DECEASED	20c. MAILING ADDRESS (Street and Number, City, State, Zip Code)
21a. METHOD OF DISPOSITION <input type="checkbox"/> Burial <input type="checkbox"/> Cremation <input type="checkbox"/> Donation <input type="checkbox"/> Entombment <input type="checkbox"/> Removal from State <input type="checkbox"/> Other (Specify) _____		21b. PLACE OF DISPOSITION (Name of cemetery, crematory, other place)	21c. LOCATION - City or Town and State
22a. SIGNATURE OF FUNERAL DIRECTOR		22b. LICENSE NUMBER	22c. SIGNATURE OF EMBALMER
22d. LICENSE NUMBER		23a. NAME AND ADDRESS OF FUNERAL HOME	
23b. LICENSE NUMBER OF FUNERAL HOME		24. REGISTRAR'S SIGNATURE	
25. DATE FILED (Month, Day, Year)		26. CERTIFIER (Check only one)	
26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated.		26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.	
27a. SIGNATURE OF CERTIFIER		27b. LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)
27d. NAME AND ADDRESS		28. PART I. Enter the chain of events (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.	
IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. Asphyxia		Due to (or as a consequence of)	
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST		b. Smoke inhalation from Woosley Wildfire	
		Due to (or as a consequence of)	
		c. _____	
		Due to (or as a consequence of)	
		d. _____	
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.		29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Asthma		29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No	
30. MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined	31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input type="checkbox"/> Unknown	32. IF FEMALE <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Unknown if pregnant within the past year	
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____	34a. DATE OF INJURY (Month, Day, Year)	34b. TIME OF INJURY	34c. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No
34e. DESCRIBE HOW INJURY OCCURRED		34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify)	
		34f. LOCATION OF INJURY (Street and Number, City or Town, State)	

PH-1659 (Rev. 9/2011) ROA 1399

Conditions do not have to be diseases. You can include non-clinical information, like circumstance of death, in Part I as a causal condition. Here you can see how the disaster type and name and circumstance of death are recorded in Part I. In this example, the death was directly related to the wildfire. The manner of death is "accident," so this example would have more details of the circumstance of death documented in the "Describe how injury occurred" box.

Other significant conditions that may have contributed to the death, but were not part of the causal sequence reported in Part I, should be recorded in Part II. Contributing conditions do not have to be diseases. You can include non-clinical information in Part II, such as the circumstance of death and the disaster type and name.



Who should certify disaster-related deaths?

(continued)

18. DECEASED'S NAME (Last, First, Middle, Initial)		19. MOTHER'S NAME PRIOR TO FIRST MARRIAGE (Last, First, Middle, Initial)	
20a. INFORMANT'S NAME		20b. RELATIONSHIP TO DECEASED	20c. MAILING ADDRESS (Street and Number, City, State, Zip Code)
21a. METHOD OF DISPOSITION <input type="checkbox"/> Burial <input type="checkbox"/> Cremation <input type="checkbox"/> Donation <input type="checkbox"/> Entombment <input type="checkbox"/> Removal from State <input type="checkbox"/> Other (Specify) _____		21b. PLACE OF DISPOSITION (Name of cemetery, crematory, other place)	21c. LOCATION - City or Town and State
22a. SIGNATURE OF FUNERAL DIRECTOR		22b. LICENSE NUMBER	22c. SIGNATURE OF EMBALMER
22d. LICENSE NUMBER		23a. NAME AND ADDRESS OF FUNERAL HOME	
23b. LICENSE NUMBER OF FUNERAL HOME		24. REGISTRAR'S SIGNATURE	
25. DATE FILED (Month, Day, Year)		26. CERTIFIER (Check only one)	
26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated.		26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.	
27a. SIGNATURE OF CERTIFIER		27b. LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)
27d. NAME AND ADDRESS		28. PART I. Enter the chain of events (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.	
IMMEDIATE CAUSE (Final disease or condition resulting in death)		Approximate Interval: Onset to death	
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST		a. Right parietal epidural hematoma Due to (or as a consequence of)	
		b. Right parietal skull fracture Due to (or as a consequence of)	
		c. Blunt impact to head Due to (or as a consequence of)	
		d. _____ Due to (or as a consequence of)	
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.		29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Moore tornado		29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No	
30. MANNER OF DEATH <input type="checkbox"/> Natural <input type="checkbox"/> Homicide <input checked="" type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined		31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input type="checkbox"/> Unknown	
32. IF FEMALE <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Unknown if pregnant within the past year		33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____	
34a. DATE OF INJURY (Month, Day, Year)		34b. TIME OF INJURY	34c. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No
34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify) Home		34e. DESCRIBE HOW INJURY OCCURRED Attempt to escape Moore tornado, fell down 15 wooden stairs in home	
34f. LOCATION OF INJURY (Street and Number, City or Town, State)			

PH-1659 (Rev. 9/2011) ROA 1399

This is an example of an indirectly related disaster death that shows how you can include the disaster type and name in Part II. The manner of death for this example is "accident." The circumstance of death and disaster type and name should be documented in the "Describe how injury occurred" box.



Who should certify disaster-related deaths?

(continued)

18. FATHER'S NAME (Last, Middle, First)		19. MOTHER'S NAME PRIOR TO FIRST MARRIAGE (Last, Middle, First)	
20a. INFORMANT'S NAME		20b. RELATIONSHIP TO DECEDENT	20c. MAILING ADDRESS (Street and Number, City, State, Zip Code)
21a. METHOD OF DISPOSITION <input type="checkbox"/> Burial <input type="checkbox"/> Cremation <input type="checkbox"/> Donation <input type="checkbox"/> Entombment <input type="checkbox"/> Removal from State <input type="checkbox"/> Other (Specify) _____		21b. PLACE OF DISPOSITION (Name of cemetery, crematory, other place)	21c. LOCATION - City or Town and State
22a. SIGNATURE OF FUNERAL DIRECTOR		22b. LICENSE NUMBER	22c. SIGNATURE OF EMBALMER
22d. LICENSE NUMBER		23a. NAME AND ADDRESS OF FUNERAL HOME	
23b. LICENSE NUMBER OF FUNERAL HOME		24. REGISTRAR'S SIGNATURE	
25. DATE FILED (Month, Day, Year)		26. CERTIFIER (Check only one)	
26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated.		26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.	
27a. SIGNATURE OF CERTIFIER		27b. LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)
27d. NAME AND ADDRESS		28. PART I. Enter the chain of events (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.	
IMMEDIATE CAUSE (Final disease or condition resulting in death)		Approximate Interval: Onset to death	
Sequentially list conditions, if any, leading to the cause listed on line a. Enter the UNDERLYING CAUSE (disease or injury that initiated the events resulting in death) LAST		a. Chronic kidney failure Due to (or as a consequence of)	
		b. Type II Diabetes Due to (or as a consequence of)	
		c. _____ Due to (or as a consequence of)	
		d. _____ Due to (or as a consequence of)	
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.		29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Dialysis inaccessible due to Nashville floods		29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No	
30. MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined		31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input type="checkbox"/> Unknown	32. IF FEMALE <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Unknown if pregnant within the past year
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____	34a. DATE OF INJURY (Month, Day, Year)	34b. TIME OF INJURY	34c. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No
34e. DESCRIBE HOW INJURY OCCURRED		34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify)	
34f. LOCATION OF INJURY (Street and Number, City or Town, State)			

PH-1659 (Rev. 9/2011) ROA 1399

This is an example of an indirectly disaster-related natural death that shows the disaster type and name and circumstance of death in Part II.



Who should certify disaster-related deaths?

(continued)

Let's look at this scenario. A 39-year-old female died during Hurricane Sandy in her home. The storm caused a regional blackout, and she had used charcoal in her fireplace for heat. According to emergency medical services officials, high carbon monoxide levels were detected in the home. Is this death disaster-related? The answer is yes.

What disaster-related details would you include on the death certificate and where would you document them? Disaster type/name and circumstance of death should be included in Part II and in the "Describe how injury occurred" box.

When a carbon monoxide-related death is determined, the death certificate should identify the

- Source of carbon monoxide — Gas range, generator, charcoal grill, power washer or other
- Location of the source — Basement, outside near window, house, garage, automobile or other
- Circumstance(s) — Indicate if the carbon monoxide death is disaster-related and the circumstances — such as power outage, using alternative heat source during snowstorm, no smoke detector in home or other.
- Manner — Consider that the carbon monoxide poisoning might be intentional.

The disaster type and name and circumstance of death would be documented in Part II. All of the carbon monoxide poisoning notations also would be documented:

- Source of carbon monoxide — Fireplace
- Location of the source — Home
- Circumstance — Power outage after hurricane
- Manner — Unintentional (derived from circumstance)

The Great Smoky Mountain wildfires of 2016



For further discussion of both direct and indirect disaster deaths, let's look closer at The Great Smoky Mountain wildfires of 2016. These wildfires were the deadliest in the Eastern United States since 1947 and one of the largest natural disasters in Tennessee's history. The fire was originally reported on the Chimney Tops trail November 23 during the Thanksgiving holiday. The weather had been particularly dry in the preceding months, with the area classified as being in "exceptional drought conditions." The fires burned more than 16,000 acres both within the national park and in the surrounding areas. At least 14,000 people were forced to evacuate as the towns of Pigeon Forge and Gatlinburg were affected.

For each death we need to ask: was it caused by the actual forces of the wildfire (burns) or by the direct consequences of the fire (e.g., structural collapse, smoke inhalation)? Looking at the 14 fatalities, 10 were direct deaths and four were indirect. Direct deaths included the nine cases of smoke inhalation and a traumatic asphyxiation. Of the four indirect deaths, two were due to motor vehicle accidents and two to heart disease.

The Great Smoky Mountain wildfires of 2016

(continued)

Here are some examples of deaths similar to those from the wildfires.

Charred remains were found on the roadway. It was determined that it was a 70 year-old male with 27% carboxyhemoglobin. Is this direct or indirect?

It would be direct. The death certificate lists the immediate cause of death as smoke inhalation during the Smokey Mountain wildfires. And in describing how the injury occurred, the death certificate reads “smoke inhalation during wildfire.”

Charred remains were found near a car at home. It was determined that a 61 year-old female called 911 and said she couldn't get out of the area because a tree had fallen on her car. The autopsy showed 30% carboxyhemoglobin and 0.131% ethanol.

This is a direct-related disaster death. She died from smoke inhalation, as demonstrated by the elevated carboxyhemoglobin. And in describing how the injury occurred, the DC reads “smoke inhalation during wildfire.”

A 79-year-old male died while evacuating from the fire. His car was found on the side of the road with damage to the car and tires from the impact of the crash. The autopsy showed multiple blunt force injuries consistent with a motor vehicle crash. Carboxyhemoglobin tested at autopsy was 5%, which is considered not elevated.

Is this a disaster-related death? Is it direct or indirect? The key question is, did the forces of the disaster lead to temporary or permanent displacement, property damage or other personal loss or stress AND did these losses or disruptions contribute to the death? The answer is yes, so this is an indirectly related disaster death.

On the death certificate, the immediate cause of death is blunt-force injuries caused by a motor vehicle collision. And the description of how the injury occurred reads “motor vehicle accident during evacuation from wildfires.”

The Great Smoky Mountain wildfires of 2016

(continued)

25a. INFORMANT'S NAME		25b. RELATIONSHIP TO DECEDENT		25c. MAILING ADDRESS (Street and Number, City, State, Zip Code)	
21a. METHOD OF DISPOSITION <input type="checkbox"/> Burial <input type="checkbox"/> Cremation <input type="checkbox"/> Donation <input type="checkbox"/> Entombment <input type="checkbox"/> Removal from State <input type="checkbox"/> Other (Specify) _____		21b. PLACE OF DISPOSITION (Name of cemetery, crematory, other place)		21c. LOCATION - City or Town and State	
22a. SIGNATURE OF FUNERAL DIRECTOR		22b. LICENSE NUMBER	22c. SIGNATURE OF EMBALMER		22d. LICENSE NUMBER
23a. NAME AND ADDRESS OF FUNERAL HOME				23b. LICENSE NUMBER OF FUNERAL HOME	
24. REGISTRAR'S SIGNATURE			25. DATE FILED (Month, Day, Year)		
26. CERTIFIER (Check only one) 26a. <input type="checkbox"/> PHYSICIAN - To the best of my knowledge, death occurred at the date and place, and due to the cause(s) and manner stated. 26b. <input type="checkbox"/> MEDICAL EXAMINER - On the basis of examination, and/or investigation, in my opinion, death occurred at the date and place, and due to the cause(s) and manner stated.					
27a. SIGNATURE OF CERTIFIER		27b. LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)		
		27d. NAME AND ADDRESS			
28. PART I. Enter the chain of events (diseases, injuries, or complications) that directly cause the death. DO NOT enter terminal events such as cardiac arrest, respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.					
IMMEDIATE CAUSE (Final disease or condition resulting in death)					
a. Myocardial infarction					
Due to (or as a consequence of)					
b. Hypertension					
Due to (or as a consequence of)					
c. _____					
Due to (or as a consequence of)					
d. _____					
Approximate Interval: Onset to death					
PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.					
Chest pain during evacuation of Great Smoky Mt. wildfires					
29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No					
29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No					
30. MANNER OF DEATH <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide <input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation <input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined		31. DID TOBACCO USE CONTRIBUTE TO DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> Probably <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown		32. IF FEMALE <input type="checkbox"/> Not pregnant within past year <input type="checkbox"/> Pregnant at time of death <input type="checkbox"/> Not pregnant, but pregnant within 42 days of death <input type="checkbox"/> Not pregnant, but pregnant 43 days to 1 year before death <input type="checkbox"/> Unknown if pregnant within the past year	
33. IF TRANSPORTATION INJURY, SPECIFY: <input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____		34a. DATE OF INJURY (Month, Day, Year)	34b. TIME OF INJURY	34c. INJURY AT WORK? <input type="checkbox"/> Yes <input type="checkbox"/> No	34d. PLACE OF INJURY - at home, farm, street, factory, office, building, etc. (Specify)
34e. DESCRIBE HOW INJURY OCCURRED				34f. LOCATION OF INJURY (Street and Number, City or Town, State)	

PH-1659 (Rev. 9/2011) ROA 1399

Let's look at who should sign the death certificate. Take this case for example. This person died of a heart attack during the Great Smokey Mountains wildfires. The underlying cause was hypertension. Who should sign? Since this is considered a natural death, a non-medical examiner physician can sign the death certificate, as it does not necessarily fall under medical examiner jurisdiction.



The Great Smoky Mountain wildfires of 2016

(continued)

Of greater importance in this case is the effect of exposure to smoke in the context of the decedent's severe heart disease. Sudden cardiac death with heart disease is almost always a combination of vulnerability and a triggering event.

In cases of disasters such as fires or floods, the rate of sudden cardiac death often doubles for a month or so following the event. In these cases, exposure to smoke and fire represent exactly the kind of stress that would trigger a sudden cardiac death.

In several cases, the bodies were found outside. If they were attempting to flee the fire, this would place an older person with an enlarged and dilated heart at severe risk of sudden cardiac death. While a death due to exposure to gases other than carbon monoxide or even exposure to flame cannot be absolutely ruled out, it is most likely that these decedents died as a result of the cardiac stress associated with fleeing the fire and the respiratory effects of the intense smoke.



Fictional scenarios: Completing the death certificate

Scenario 1:

- 58-year-old male having chest pains
- EMS was called
- En route the ambulance was delayed by rioters blocking streets and burning cars in streets
- Eventually EMS arrived and took him to local hospital, pronounced DOA
- History of MI/ASCVD — Autopsy showed new acute myocardial infarction, toxicology is negative

Is this disaster-related? The answer is yes, since it occurred during a riot. It would be an indirectly related death since he died from natural causes, and his treatment was substantially delayed due to blocked streets. The cause of death is MI due to ASCVD.

Scenario 2:

- 15-year-old died after falling down steps while taking shelter in a basement during a tornado
- Taken by EMS to a local hospital
- CT showed epidural hemorrhage, skull fracture and contusions/lacerations of scalp.

The immediate cause of death was a right parietal epidural hematoma, caused by a right parietal skull fracture, caused by blunt force trauma of the head. The death certificate listed how the injury occurred as “fell down steps while sheltering from tornado.” This is another example of an indirectly related death, since the head injuries were caused by sheltering from the storm as opposed to the direct forces of the tornado.

Fictional scenarios: Completing the death certificate *(continued)*

Scenario 3:

- 72-year-old woman died when she couldn't get to dialysis because roads were washed out due to the Nashville flood
- Had history of renal failure due to diabetes

Her death certificate lists the immediate cause of death as chronic kidney failure, with an underlying cause of Type II diabetes. But in Part 2, under other significant conditions contributing to death, it says "Dialysis inaccessible due to Nashville floods." And the manner of death is natural.

Scenario 4:

- 85-year-old male with history of Alzheimer's disease and ASCVD died from hypothermia after he wandered away from his group care home for an hour
- This occurred during a severe ice storm

Is this death disaster-related? The answer is yes. The disaster type and name and circumstance of death should be included in Part I and the "Describe how injury occurred" box. In this case the description would be "Wandered away from group home during ice storm."

Conclusion: Key points for disaster-related death certification

- Be aware of natural and human-induced disaster incidents.
- Consider causes of death that can be directly or indirectly related to the disaster.
- Deaths can occur before, during and after a disaster.
- Record the disaster type/name and circumstance of death on the death certificate, using Part I, Part II or “Describe how injury occurred” box (if applicable).
- Report the death to the county medical examiner if the manner is other than “natural.”