



Improving Medical Death Certification in Tennessee

Disclosure to Learners

Commercial Support: There was no commercial support obtained for CME activity offered for this program.

Credit Information:

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The Tennessee Medical Association designates this enduring activity for a maximum of 1.5 **AMA PRA Category 1 Credit(s)**[™]. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

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Planners and Speakers Disclosures:

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

Amy Hawes, MD
Adele Lewis, MD
Kathleen Caillouette

The following speakers had a financial relationship or disclosure that has been resolved in relation to their presentation.

None

IMPROVING MEDICAL DEATH CERTIFICATION IN TENNESSEE SPEAKER BIOS

ADELE LEWIS

Adele Lewis received her MD at the University of Alabama. After completing a trauma/critical care fellowship at Vanderbilt, she entered the anatomic pathology residency program, followed by a one-year fellowship at the Metropolitan Nashville/Davidson County medical examiner's office where she served as the Deputy Chief Medical Examiner. In 2016, she was appointed to fill the newly-created role of Deputy State Chief Medical Examiner, becoming the State Chief Medical Examiner in 2019. Dr. Lewis is active in organized medicine, serving as a Delegate to the Tennessee Medical Association House of Delegates since 2011 and as chair of the TMA Public Health Committee since 2015. She is the only person to have served two terms as Chairman of the Board of the Nashville Academy of Medicine and was awarded the Tennessee Medical Association Distinguished Service Award in 2017. She lives in Nashville with her husband, Dr. Rodney Lewis, and their three children.

AMY HAWES

Dr Amy Hawes currently serves as the TN State Deputy Medical Examiner. She has approximately 20 years' experience in forensic pathology. She received her medical degree at Meharry Medical College, completed residency in anatomic and clinical pathology at Vanderbilt University Medical Center, and completed a fellowship in forensic pathology at the Dade County Medical Examiner's Office in Miami, Florida. She is board certified by the American Board of Pathology in anatomic, clinical, and forensic pathology. She has served as assistant medical examiner, deputy medical examiner, and chief medical examiner in local and state jurisdictions in Tennessee.





MEDICAL EXAMINER JURISDICTION, CAUSE AND MANNER OF DEATH, AND DEATH CERTIFICATION

Adele Lewis, MD

State Chief Medical Examiner

A version of this presentation is available at
[https://www.tn.gov/content/dam/tn/health/documents/officeofthestatechiefmedical
examinersoffice/resourcesforthemedicalexaminer/DS_101_DCs.pdf](https://www.tn.gov/content/dam/tn/health/documents/officeofthestatechiefmedicalexaminersoffice/resourcesforthemedicalexaminer/DS_101_DCs.pdf)

All sample death certificates are real.



Death Certifier Needs Assessment



- March 2020: survey deployed via email to 5579 listed as certifiers in Tennessee's electronic death registration system
- Received 785 responses, 93% of which were from physicians and 4% from county medical examiners

Death Certifier Needs Assessment: Results

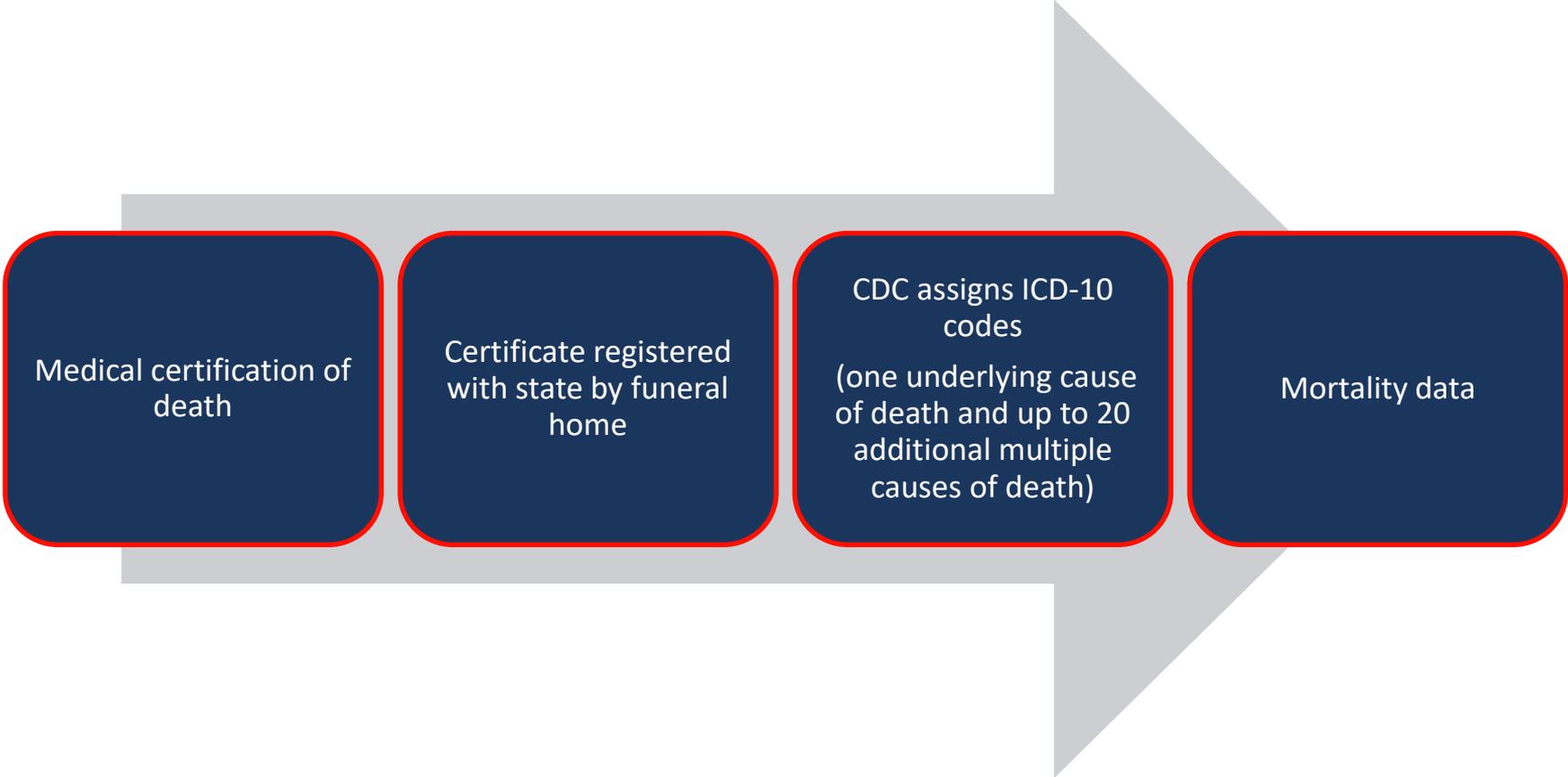
- Nearly half (46%) of respondents indicated they had never received formal training on death certification
- Nearly 90% of respondents indicated a need for training in the death certification process in Tennessee
- Between 20% to 36% indicated they had **no confidence** in their ability to describe the death certification process, identifying what qualifies as a disaster, determining if a death is related to a disaster, and reporting a death related to a disaster

Death Certifier Needs Assessment: Results

- Majority (70% to 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

Accuracy and Timeliness in Death Certification

- 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
- Significant implications in death benefits paid to families (for example, 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



Medical certification of death

Certificate registered with state by funeral home

CDC assigns ICD-10 codes
(one underlying cause of death and up to 20 additional multiple causes of death)

Mortality data

MEDICAL CERTIFICATION	28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) 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	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. METABOLIC ENCEPHALOPATHY (OR A CONSEQUENCE OF)	
		b. SEVERE SEPSIS (OR A CONSEQUENCE OF)	
		c. SEPTIC SHOCK (OR A CONSEQUENCE OF)	
		d. LACTIC ACIDOSIS (OR A CONSEQUENCE OF)	

MEDICAL CERTIFICATION	28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) 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	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. CARDIOPULMONARY (OR A CONSEQUENCE OF)	
		b. (OR A CONSEQUENCE OF)	
		c. (OR A CONSEQUENCE OF)	
		d. (OR A CONSEQUENCE OF)	

MEDICAL CERTIFICATION	28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) 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	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. CARDIAC ARREST (OR A CONSEQUENCE OF)	
		b. ACIDOSIS (OR A CONSEQUENCE OF)	
		c. LEUKOCYTOSIS (OR A CONSEQUENCE OF)	
		d. (OR A CONSEQUENCE OF)	

Jurisdiction: 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

Jurisdiction: Who Should Complete and Sign the Death Certificate?

- 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)
- Certifier is immune from civil suit if completed in good faith; failure to do so may result in discipline of medical license

The medical certification of death is to be completed within _____ of death

A. 30 days

C. 48 hours

B. 5 days

C. 48 hours

D. 96 hours

Tennessee Medical Examiner System

State Chief Medical Examiner
(education and training of
county MEs and MDIs;
record-keeping; mass
fatalities/public health
threats)

Regional Forensic Centers (five; staffed
by board-certified forensic
pathologists; autopsy performance)

County Medical Examiners and Investigators (county
ME must be licensed MD or DO; MDI must be RN,
PA, EMS, or ABMDI registry or diplomate)

ALL AUTHORITY RESTS AT THE COUNTY LEVEL

Medical Examiner Certification of Death

- The county 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)

Medical Examiner Certification of Death: Delayed Non-natural Deaths

- 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

Major Take-Home Points

- If any discrete, identifiable external force, object, or substance contributed *in any way* to death, the death cannot be considered natural and must be reported to the county medical examiner, regardless of the interval elapsed between the inciting event and death
- The BOTTOM LINE is THE BOTTOM LINE

Other Deaths Which Should Be Reported to the Medical Examiner (TCA 38-7-108)

- 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

- One of the responsibilities of a primary care physician is to provide death certification for his or her 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 case to the county medical examiner
- Other physicians knowledgeable with patient history may also certify deaths
 - Examples: cardiologist, oncologist, emergency room physician

When and Where Death Occurs: Brain Death Equals Death

- 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
- 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

Has Death Even Occurred?

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) that directly caused the death, 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). 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. EXACT CAUSE UNKNOWN	(OR A CONSEQUENCE)
}	b. PROBABLE CARDIAC ARREST	(OR A CONSEQUENCE)
	c.	(OR A CONSEQUENCE)
	d.	(OR A CONSEQUENCE)

PART II. Other significant conditions contributing to death but not resulting in the underlying cause
DIABETES MELLITUS

30. MANNER OF DEATH
NATURAL

31. DID TOBACCO USE
CONTRIBUTE TO
DEATH? UNKNOWN

32. IF FEMALE:
N/A

Spelling Counts

<p>28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) 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.</p>		<p>Approximate interval: Onset to death</p>
<p>IMMEDIATE CAUSE (Final disease or condition resulting in death)</p> <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>	<p>a. <u>ACUTE ON CHRONIC RESPIRATORY FAILURE</u> Due to (or as a consequence of)</p> <p>b. <u>CHRONIC OBSTRUCTIVE PULMONARY DISEASES</u> Due to (or as a consequence of):</p> <p>c. _____ Due to (or as a consequence of):</p> <p>d. _____ Due to (or as a consequence of):</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.</p> <p><u>DEMENTIA; DIABETES MELLITUS TYPE TWO</u></p>		<p>29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>



TENNESSEE DEPARTMENT OF HEALTH
CERTIFICATE OF DEATH

STATE FILE NUMBER

DECEDENT	1. DECEDENT'S LEGAL NAME (First, Middle, Last, Suffix)				2. SEX	3. DATE OF DEATH (Month, Day, Year)
	4. TIME OF DEATH (Approx.)	5a. AGE - Last Birthday (Years)	5b. UNDER 1 YEAR (Months, Days)	5c. UNDER 1 DAY (Hours, Minutes)	6. DATE OF BIRTH (Month, Day, Year)	7. BIRTHPLACE (City and State or Foreign Country)
TYPE PRINT IN PERMANENT BLACK INK NAME OF DECEDENT (If or use by Physician or Institution)	8. PLACE OF DEATH (Check only one)					
	IF DEATH OCCURRED IN A HOSPITAL <input type="checkbox"/> Inpatient <input type="checkbox"/> ER/Outpatient <input type="checkbox"/> D.O.A.			IF DEATH OCCURRED SOMEWHERE OTHER THAN A HOSPITAL <input type="checkbox"/> Hospice facility <input type="checkbox"/> Nursing home/Long term care facility <input type="checkbox"/> Decedent's home <input type="checkbox"/> Other residence <input type="checkbox"/> Other (Specify) _____		
	9b. FACILITY NAME (If not institution, give street and number)			9c. CITY OR TOWN		9d. COUNTY OF DEATH
	9. MARITAL STATUS <input type="checkbox"/> Married <input type="checkbox"/> Married, but separated <input type="checkbox"/> Widowed <input type="checkbox"/> Divorced <input type="checkbox"/> Never married <input type="checkbox"/> Unknown		10. SURVIVING SPOUSE (If wife, give name prior to first marriage)		11a. DECEDENT'S USUAL OCCUPATION	
12. SOCIAL SECURITY NUMBER		13a. RESIDENCE-STATE OR FOREIGN COUNTRY		13b. COUNTY		
13c. STREET AND NUMBER		13a. INSIDE CITY LIMITS <input type="checkbox"/> Yes <input type="checkbox"/> No		13c. ZIP CODE		
15. DECEDENT'S EDUCATION (Check the box that best describes the highest degree or level of school completed at the time of death)		16. DECEDENT OF HISPANIC ORIGIN? (Check the box that best describes whether the decedent is Spanish/Hispanic/Latino. Check the "No" box if decedent is not Spanish/Hispanic/Latino)		17. DECEDENT'S RACE (Check one or more races to indicate what the decedent considered himself or herself to be)		
<input type="checkbox"/> 8th grade or less <input type="checkbox"/> 9th - 12th grade, no diploma <input type="checkbox"/> High school graduate or GED completed <input type="checkbox"/> Some college credit, but no degree <input type="checkbox"/> Associate degree (e.g., AA, AS) <input type="checkbox"/> Bachelor's degree (e.g., BA, AB, BS) <input type="checkbox"/> Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA) <input type="checkbox"/> Doctorate (e.g., PhD, EdD) or Professional degree (e.g., MD, DDS, DVM, LL.D., JD) <input type="checkbox"/> Unknown		<input type="checkbox"/> No, not Spanish/Hispanic/Latino <input type="checkbox"/> Yes, Mexican, Mexican American, Chicano <input type="checkbox"/> Yes, Puerto Rican <input type="checkbox"/> Yes, Cuban <input type="checkbox"/> Yes, other Spanish/Hispanic/Latino (Specify) _____ <input type="checkbox"/> Unknown		<input type="checkbox"/> Male <input type="checkbox"/> Black or African American <input type="checkbox"/> American Indian or Alaska Native (Name of the enrolled or principal tribe) _____ <input type="checkbox"/> Asian Indian <input type="checkbox"/> Chinese <input type="checkbox"/> Filipino <input type="checkbox"/> Japanese <input type="checkbox"/> Korean <input type="checkbox"/> Native Hawaiian <input type="checkbox"/> Guamanian or Chamorro <input type="checkbox"/> Samoan <input type="checkbox"/> Other Pacific Islander (Specify) _____ <input type="checkbox"/> Other (Specify) _____ <input checked="" type="checkbox"/> Unknown		
18. FATHER'S NAME (First, Middle, Last)			19. MOTHER'S NAME PRIOR TO FIRST MARRIAGE (First, Middle, Last)			
20a. INFIRMIARY'S NAME		20b. RELATIONSHIP TO DECEDENT		20c. MAILING ADDRESS (Street and Number, City, State, Zip Code)		
21a. METHOD OF DISPOSITION <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		22e. SIGNATURE OF EMBALMER		22f. 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)		
CERTIFIER PHYSICIAN OR MEDICAL EXAMINER EXPOSING ESCALATOR CASKET DEATH MURDER COMPLIANCE AND/OR WITHIN HOURS	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 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.						
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) _____				Approximate interval Onset to death		
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"/> 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"/> Diver/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)		



CERTIFIER

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

**MEDICAL
CERTIFICATION**

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 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.					Approximate interval: Onset to death
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. _____ Due to (or as a consequence of): _____					
PART II. <u>Other significant conditions contributing to death</u> 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"/> 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)		



VRISM



TENNESSEE VRISM

The purpose of the Tennessee VRISM system is to support the registration of Tennessee vital events for the Tennessee Department of Health and other users such as funeral directors, attending physicians, medical examiners and birthing facilities. This system may be used only for the purpose for which it is provided. Any attempt to file fraudulent certificates of live birth, death or reports of fetal death is punishable in accordance with Tennessee statutes.

By accessing this system, I agree to use this system only for the purpose of registering a Certificate of Live Birth, Certificate of Death or Report of Fetal Death for events occurring in the State of Tennessee.

I understand that failure to adhere to the above agreement will result in loss of access to the VRISM system. Any unauthorized access, misuse and/or disclosure of information may result in disciplinary action including, but not limited to, suspension or loss of individual or facility access privileges, an action for civil damages, or criminal charges.

[LOGIN](#)

MAILING . ADDRESS

Tennessee Office of
Vital Records

Andrew Johnson Tower, 1st Floor
710 James Robertson Parkway
Nashville, TN 37243

PHONE

1-(855) -VRISM TN

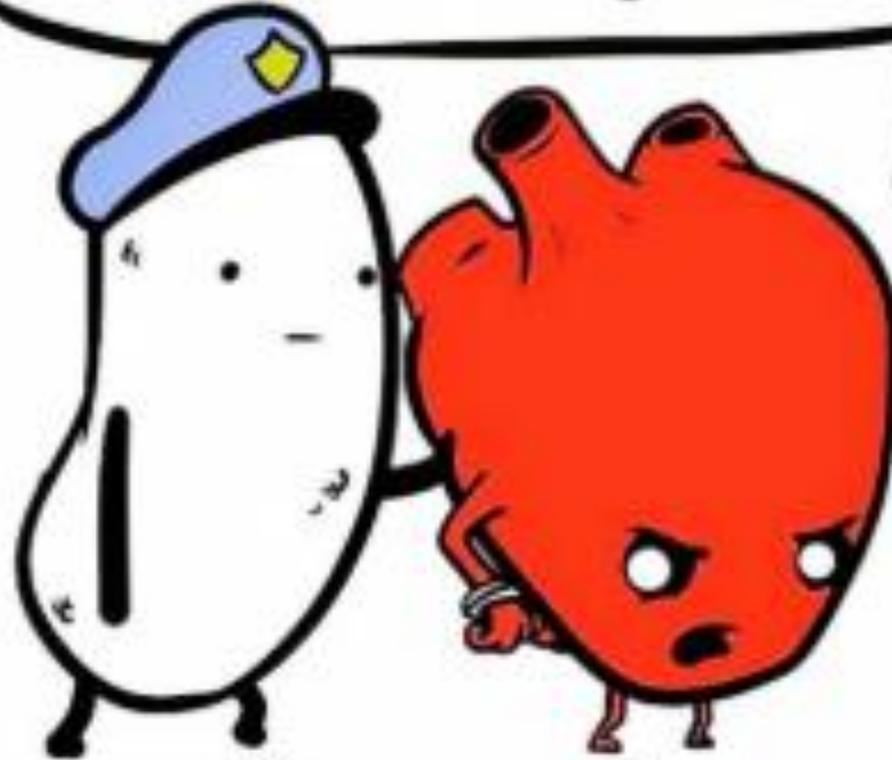
VRISM Help

- Health.VRISM@tn.gov
- (855) 874-7686
- (855) VRISM TN

VRISM: Fields for Medical Certifier

CERTIFIER PHYSICIAN OR MEDICAL EXAMINER EXECUTING CAUSE OF DEATH MUST COMPLETE AND SIGN WITHIN 48 HOURS.	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 <div style="border: 1px solid black; padding: 5px; display: inline-block;">10 **Certifier**</div>		LICENSE NUMBER	27c. DATE SIGNED (Month, Day, Year)
MEDICAL CERTIFICATION	28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) 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.			Approximate interval: Onset to death
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a. <div style="border: 1px solid black; padding: 5px; display: inline-block;">8 **Cause of Death**</div>	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. <div style="border: 1px solid black; padding: 5px; display: inline-block;">8 **Cause of Death**</div>	consequence of):	
		c. <div style="border: 1px solid black; padding: 5px; display: inline-block;">8 **Cause of Death**</div>	Due to (or as a consequence of):	<div style="border: 1px solid black; padding: 5px; display: inline-block;">7 **Time/Autopsy**</div>
PART II. <u>Other significant conditions contributing to death</u> 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	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, but pregnant within 42 days of death <input type="checkbox"/> Unknown if pregnant within the past year	<div style="border: 1px solid black; padding: 5px; display: inline-block;">9 **Manner/Details/Injury**</div>	
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)

...and I would've gotten away with it too, if it weren't for that meddling defibrillator!



Cardiac Arrest

DepressedAlien.com

Part I: Cause of Death Statement

- Read from top to bottom: Cause A is due to Cause B is due to Cause C is due to Cause D
- Can use only one line, or two, or three, or all four
- Last diagnosis listed will be coded as underlying cause of death, therefore:
- THE BOTTOM LINE IS THE BOTTOM LINE

IMMEDIATE CAUSE (Final disease or condition resulting in death)

a. ABC ✓

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. ABC ✓

Due to (or as a consequence of)

c. ABC ✓

Due to (or as a consequence of)

d. ABC ✓

Cause of Death Statement

- 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* of the certifier
- *More likely than not*

I should be _____% certain that my diagnosis in the cause of death statement is correct

A. 75%

B. 99%

C. 100%

D. 51%

E. 33%

D. 51%

More likely than not

“To the best of my knowledge...”

- PHYSICIAN**-To the best of my knowledge, death occurred at the date, time, and place, and due to the cause(s) and manner stated.
- MEDICAL EXAMINER**-On the basis of examination, and/or investigation, in my opinion, death occurred at the date, time, and place, and due to the cause(s) and manner stated.

- Tennessee code grants civil immunity to certifying physicians acting in good faith (TCA 68-3-513)
- Physicians who refuse to or consistently fail to comply with rules and laws regarding death certification are subject to disciplinary action on their medical licenses for “unprofessional, dishonorable, or unethical conduct” Rule 0880-02-.14(13); TCA 68-3-502 and 63-9-108

Cause of Death Statement: Examples

- 56 year old with hypertension suffers a hemorrhagic stroke

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a.	<input type="text" value="HEMORRHAGIC CEREBROVASCULAR ACCIDENT"/> <small>ABC</small> ✓	<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="ESSENTIAL HYPERTENSION"/> <small>ABC</small> ✓	<input type="text"/>
Due to (or as a consequence of)		
c.	<input type="text"/> <small>ABC</small> ✓	<input type="text"/>
Due to (or as a consequence of)		
d.	<input type="text"/> <small>ABC</small> ✓	<input type="text"/>

Cause of Death Statement: Examples

- 43 year old receives a bone marrow transplant and develops *C. difficile* colitis

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a. 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. IMMUNOSUPPRESSION		<input type="text"/>
Due to (or as a consequence of)		
c. BONE MARROW TRANSPLANT		<input type="text"/>
Due to (or as a consequence of)		
d. ACUTE MYELOGENOUS LEUKEMIA		<input type="text"/>

Cause of Death Statement: Examples

- 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
- Example: patient in hospice with metastatic lung cancer

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a.	<input type="text" value="ADENOCARCINOMA OF LUNG WITH METASTASES TO BRAIN"/> 	<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"/> 	<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"/>

Cause of Death Statement: Examples

- It is acceptable to use the terms “probable”, “possible”, or “suspected”
- Example: 86 year-old with 7 cm abdominal aortic aneurysm found dead at home with 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"/>

Aspiration Pneumonia

- Most cases of aspiration pneumonia occur in neurologically compromised patients
- The underlying disease process causing the impairment should be listed as the cause of death

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a.	<input type="text" value="ASPIRATION PNEUMONIA"/> 	<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="AMYOTROPHIC LATERAL SCLEROSIS"/> 	<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"/>

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) 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.

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. **AUTOPSY**

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?**

Yes No

29b. **WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH?** Yes No

30. MANNER OF DEATH

- Natural Homicide
 Accident Pending Investigation
 Suicide Could not be determined

31. DID TOBACCO USE CONTRIBUTE TO DEATH?

- Yes Probably
 No Unknown

32. IF FEMALE:

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

Interval: Onset to Death

- Underlying cause of death is listed last
- Shortest interval at top, longest at bottom, in sequential order

IMMEDIATE CAUSE (Final disease or condition resulting in death)	APPROXIMATE INTERVAL: Onset to death
a. <input type="text"/> 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. <input type="text"/> 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"/>

Interval: Onset to Death: Examples

IMMEDIATE CAUSE (Final disease or condition resulting in death)

APPROXIMATE INTERVAL:
Onset to death

a. HYPERKALEMIA



1 HOUR

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. END STAGE KIDNEY DISEASE



6 MONTHS

Due to (or as a consequence of)

c. MEMBRANOUS GLOMERULONEPHRITIS



8 YEARS

Due to (or as a consequence of)

d. SYSTEMIC LUPUS ERYTHEMATOSUS



23 YEARS

Interval: Onset to Death: Examples

IMMEDIATE CAUSE (Final disease or condition resulting in death)

APPROXIMATE INTERVAL:
Onset to death

a. VENTRICULAR FIBRILLATION



SECONDS

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. MYOCARDIAL INFARCTION



HOURS

Due to (or as a consequence of)

c. CORONARY ARTERY THROMBOSIS



HOURS

Due to (or as a consequence of)

d. ATHEROSCLEROTIC CARDIOVASCULAR DISEASE



YEARS

Major Take-Home Points

- If any discrete, identifiable external force, object, or substance contributed *in any way* to death, the death cannot be considered natural and must be reported to the county medical examiner, regardless of the interval elapsed between the inciting event and death
- The BOTTOM LINE is THE BOTTOM LINE

Part II: Contributory Causes of Death

28. PART II.

Enter other significant conditions contributing to death but not resulting in the underlying cause given in PART I.

Other Significant Conditions contributing to death



Part II: Contributory Causes of Death

- Conditions which *contributed to* but did *not directly lead to* death
- May list more than one contributory cause of death
- 75 year-old with hypertension, diabetes, and chronic obstructive pulmonary disease found dead at home without antecedent complaints

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a.	<input type="text" value="HYPERTENSIVE CARDIOVASCULAR DISEASE"/> 	<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"/> 	<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"/>
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		
<input type="text" value="CHRONIC OBSTRUCTIVE PULMONARY DISEASE; DIABETES MELLITUS"/> 		

Cancer-Related Deaths

- Include:
 - Primary site
 - Cell type, if known
 - Site(s) of metastases, if applicable

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a.	<input type="text" value="OSTEOSARCOMA OF LEFT FEMUR, METASTATIC TO LUNGS"/> <small>ABC</small>	<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"/> <small>ABC</small>	<input type="text"/>
Due to (or as a consequence of)		
c.	<input type="text"/> <small>ABC</small>	<input type="text"/>
Due to (or as a consequence of)		
d.	<input type="text"/> <small>ABC</small>	<input type="text"/>

Cause versus Mechanism of Death

- Recall that the *cause* of death is the *anatomic* disease or injury that initiated the train of events leading to death
- *Mechanisms* of death are non-specific *physiologic* processes
- Mechanisms of death should not be listed as the sole or underlying cause of death
- Examples: exsanguination, respiratory arrest, arrhythmia, asphyxia, anoxic brain injury, metabolic acidosis

Non-specific Mechanisms of Death: Examples: More Information is Required

Unlikely Underlying Cause

The condition you reported on the lowest box in Part I HYPERKALEMIA usually develops as a complication of another more specific condition.

IMMEDIATE CAUSE (Final disease or condition resulting in death)

APPROXIMATE INTERVAL:
Onset to death

a. LETHAL DYSRHYTHMIA

ABC

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. VENTRICULAR FIBRILLATION

ABC

Due to (or as a consequence of)

c. HYPERKALEMIA

ABC

Due to (or as a consequence of)

d.

ABC

Non-specific Mechanisms of Death: Examples: More Information is Required

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) 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.

IMMEDIATE CAUSE
(Final disease or condition resulting in death) → a. MULTISYSTEM ORGAN FAILURE
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 I.** Enter the chain of events (diseases, injuries, or complications) 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.

IMMEDIATE CAUSE
(Final disease or condition resulting in death) → a. WITHDRAWAL OF CARE (PER PATIENT WISHES)
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. CPR IN PROGRESS
Due to (or as a consequence of):

c. _____
Due to (or as a consequence of):

d. _____

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) 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.

IMMEDIATE CAUSE
(Final disease or condition resulting in death) → a. ACUTE HYPOXIC RESPIRATORY FAILURE
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. VENTILATOR-ASSOCIATED PNEUMONIA
Due to (or as a consequence of):

c. _____
Due to (or as a consequence of):

d. _____

Non-specific Mechanisms of Death: Examples: More Information is Required

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) 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

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. METABOLIC ENCEPHALOPATHY (OR A CONSEQUENCE OF)

{ b. SEVERE SEPSIS (OR A CONSEQUENCE OF)

{ c. SEPTIC SHOCK (OR A CONSEQUENCE OF)

{ d. LACTIC ACIDOSIS

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) 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

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. CARDIOPULMONARY (OR A CONSEQUENCE OF)

{ b. (OR A CONSEQUENCE OF)

{ c. (OR A CONSEQUENCE OF)

{ d. (OR A CONSEQUENCE OF)

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) 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

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. CARDIAC ARREST (OR A CONSEQUENCE OF)

{ b. ACIDOSIS (OR A CONSEQUENCE OF)

{ c. LEUKOCYTOSIS (OR A CONSEQUENCE OF)

{ d. (OR A CONSEQUENCE OF)

CDC: Additional Information Required

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

Source: CDC, Physicians Handbook on Medical Certification of Death

Manner of Death

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

- Natural
- Accident
- Suicide
- Homicide
- Pending Investigation
- Could not be determined

Manners of Death: Natural

- If a discrete injury or poisoning event contributed *in any way* to death, *regardless of time elapsed between the event and death*, the manner of death cannot be considered to be natural
- 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
- **The non-medical examiner certifier of death is limited to “Natural” and “Pending” as choices for manner of death**

Manners of Death: Pending

- “Pending” is reserved for those cases in which the cause and/or manner of death cannot be determined within the 48 hours after death, but further information or investigation is expected (e.g., autopsy results)
- The record must be amended in VRISM with the definitive cause and manner of death completed and certified within six months of the death

Main – Death
Delayed Diagnosis

Manners of Death: Non-Natural; Reserved for County Medical Examiner

- **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 resulting 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 to determine manner of death to a reasonable degree of medical certainty
- **The period of time elapsed between the injury and the death does not alter the manner of death**

Manners of Death: Examples

- 83 year old falls at home; admitted to hospital for ORIF of left femur; hospital course complicated by pneumonia, MI, ARF; dies two months later with mucus plug of trach
 - Manner of death: accident; cause of death: complications of left femur fracture
 - Apply the “but-for” principle: “but-for” the fall, the above-listed complications would not have occurred; or
 - Ask, “Did the patient return to their pre-injury level of function?”
 - Time elapsed between injury and death is irrelevant to manner of death

Manners of Death: Examples

- 53 year-old paraplegic dies of urosepsis
 - Paraplegia is due to ruptured spinal AVM: manner of death is natural
 - Paraplegia is due to injuries sustained in MVA ten years prior to death: manner of death is accident
 - Paraplegia is due to self-inflicted gunshot wound to chest three years prior to death: manner of death is suicide
 - Paraplegia is due to gunshot wound to spine after decedent discovered *in flagrante delicto* with a spouse not his own thirty years ago: manner of death is homicide

What's Wrong With This Picture?

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) 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.

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

PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.

29a. **WAS AN AUTOPSY PERFORMED?** Yes No

29b. **WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH?** Yes No

30. **MANNER OF DEATH**
 Natural Homicide
 Accident Pending Investigation
 Suicide Could not be determined

31. **DID TOBACCO USE CONTRIBUTE TO DEATH?**
 Yes Probably
 No Unknown

32. **IF FEMALE:**
 Not pregnant within past year Not pregnant, but pregnant 43 days to 1 year before death
 Pregnant at time of death Unknown if pregnant within the past year
 Not pregnant, but pregnant within 42 days of death

55

Manners of Death: Therapy-Related Deaths

- Deaths occurring as the result of a foreseeable complication of accepted therapy for natural disease are classified as **natural**
 - Examples: Stevens-Johnson syndrome after sulfonamide therapy; coronary artery dissection during catheterization
- Deaths occurring as the result of improper use of medical equipment or of equipment malfunction are classified as **accident**
 - Example: inadvertent intravenous administration of enteral feedings

Other Required Fields: ME notification and autopsy information

ME Contacted

Was medical examiner contacted?

29 Autopsy

Was an autopsy performed?

Were autopsy findings available to complete the cause of death?

Other Required Fields: Pregnancy

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

Other Required Fields: Tobacco

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

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) 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.

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. LUNG CANCER
Due to (or as a consequence of)
- 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):

Approximate interval: Onset to death
2 YEARS
10 YEARS
10 YEARS
10 YEARS

PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.

29a. **WAS AN AUTOPSY PERFORMED?**
 Yes No

29b. **WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH?** Yes No

30. **MANNER OF DEATH**

Natural Homicide
 Accident Pending Investigation
 Suicide Could not be determined

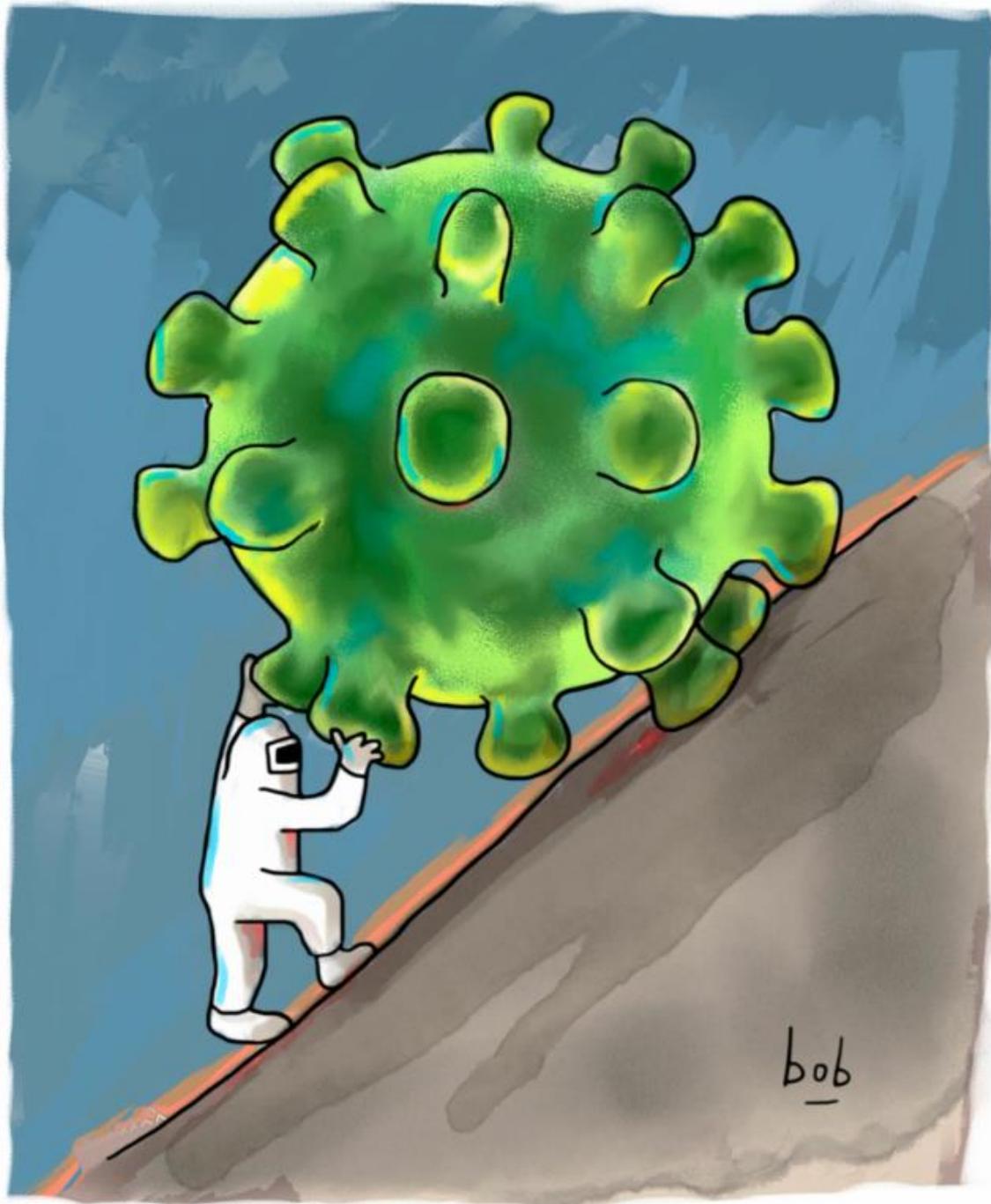
31. **DID TOBACCO USE CONTRIBUTE TO DEATH?**

Yes Probably
 No Unknown

32. **IF FEMALE:**

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





Vital Statistics Reporting Guidance

Report No. 3 • April 2020



Guidance for Certifying Deaths Due to Coronavirus Disease 2019 (COVID-19)

Deaths Caused by or Related to COVID-19

- “COVID-19”, “SARS-CoV-2”, or “novel coronavirus 19” should be included in Part I of the death certificate if death was felt to be due to novel coronavirus infection
- If a person with chronic severe medical conditions dies with novel coronavirus-19 infection and it is 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
- “Presumed”, “likely”, “probable” or “suspected” may be used in cases in which testing was not performed or was negative, but there is a strong clinical suspicion that death was due to novel coronavirus infection

COVID-19 Language Goes Here

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.			
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			
	28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) 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.			
MEDICAL CERTIFICATION	IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. _____ Due to (or as a consequence of)			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) → 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. <u>Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.</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"/> 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)	

Other Illnesses Exacerbating SARS-CoV-2 Infection Go Here

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.					
MEDICAL CERTIFICATION	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)	
PHYSICIAN OR MEDICAL EXAMINER EXECUTING CAUSE OF DEATH MUST COMPLETE AND SIGN WITHIN 48 HOURS.		27d. NAME AND ADDRESS				
28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) 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.						Approximate interval: Onset to death
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). → b. _____ Due to (or as a consequence of): _____						
c. _____ Due to (or as a consequence of): _____						
d. _____ Due to (or as a consequence of): _____						
28. 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?		32. IF FEMALE:		
<input type="checkbox"/> Natural <input type="checkbox"/> Homicide		<input type="checkbox"/> Yes <input type="checkbox"/> Probably		<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"/> 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"/> Unknown if pregnant within the past year		
<input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined				<input type="checkbox"/> Not pregnant, but pregnant within 42 days of death		
33. IF TRANSPORTATION INJURY, 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)	
<input type="checkbox"/> Driver/Operator		34e. DESCRIBE HOW INJURY OCCURRED			34f. LOCATION OF INJURY (Street and Number, City or Town, State)	
<input type="checkbox"/> Passenger						
<input type="checkbox"/> Pedestrian						
<input type="checkbox"/> Other (Specify) _____						

MEDICAL CERTIFICATION	28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) 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		Approximate interval: Onset to death
	IMMEDIATE CAUSE <small>(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</small>	→ a. COVID-19 _____ (OR A CONSEQUENCE OF)	
	}	b. _____ (OR A CONSEQUENCE OF)	
		c. _____ (OR A CONSEQUENCE OF)	
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? NO	
		29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH?	
30. MANNER OF DEATH NATURAL	31. DID TOBACCO USE CONTRIBUTE TO DEATH? NO	32. IF FEMALE: NOT PREGNANT WITHIN PAST YEAR	

MEDICAL CERTIFICATION

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) 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

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. ACUTE RESPIRATORY DISTRESS SYNDROME

(OR A CONSEQUENCE OF)



b. COVID-19 WITH GUILLAIN-BARRE TYPE ILLNESS

(OR A CONSEQUENCE OF)

c.

(OR A CONSEQUENCE OF)

d.

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?

NO

29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH?

MEDICAL CERTIFICATION	28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) 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		Approximate interval: Onset to death
	IMMEDIATE CAUSE → <small>(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</small>	a. SEVERE SEPSIS <small>(OR A CONSEQUENCE OF)</small>	FEW DAYS
		b. BILATERAL PNEUMONIA <small>(OR A CONSEQUENCE OF)</small>	FEW DAYS
		c. CORONA VIRUS DISEASE 19 <small>(OR A CONSEQUENCE OF)</small>	FEW DAYS
		d. _____ <small>(OR A CONSEQUENCE OF)</small>	
PART II. <u>Other significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I. DIABETES TYPE 2; HYPERTENSION; SUBACUTE STROKE; HYPEROSMOLAR STATE _____		29a. WAS AN AUTOPSY PERFORMED? NO	29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH?
30. MANNER OF DEATH NATURAL	31. DID TOBACCO USE CONTRIBUTE TO DEATH? UNKNOWN	32. IF FEMALE: N/A	



When COVID-19 is NOT the underlying cause of death

MEDICAL CERTIFICATION	28. PART I. Enter the chain of events (diseases, injuries, or complications) 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				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. ACUTE SUBDURAL HEMATOMA	_____	(OR A CONSEQUENCE OF)	
		{	b. FALL	_____	(OR A CONSEQUENCE OF)	
		{	c.	_____	(OR A CONSEQUENCE OF)	
{		d.	_____	(OR 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?		
RECENT HISTORY OF COVID-19 INFECTION,				HYPERTENSIVE AND ATHEROSCLEROTIC	NO	
CARDIOVASCULAR DISEASE, HISTORY OF PULMONARY EMBOLISM WITH CURRENT				29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH?		
30. MANNER OF DEATH ACCIDENT		31. DID TOBACCO USE CONTRIBUTE TO DEATH? NO		32. IF FEMALE: N/A		
33. IF TRANSPORTATION INJURY, SPECIFY:		34a. DATE OF INJURY FOUND 04/12/2020	34b. TIME OF INJURY UNKNOWN	34c. INJURY AT WORK? NO	34d. PLACE OF INJURY NURSING HOME/LONG TERM CARE	
		34e. DESCRIBE HOW INJURY OCCURRED FALL				



SCENARIOS

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.

Answer: 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.

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a.	<input type="text" value="HYPERTENSIVE CARDIOVASCULAR DISEASE"/> 	<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"/> 	<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"/>
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		
<input type="text" value="DIABETES MELLITUS; CHRONIC OBSTRUCTIVE PULMONARY DISEASE"/> 		

An elderly person 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 cardiologist.
- D.** Any of the above.

Answer: D.

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 does so, the chief medical officer of the institution in which death is pronounced is to sign the death certificate (TCA 68-3-502).

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.

Answer: 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 health care 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.

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.

Answer: 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.

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.

Answer: 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.

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?

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.

Answer: 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

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

"Hypotension due to septic shock due to Staphylococcus aureus infection" provides multiple mechanisms of death without listing a true cause of death.

Which is an appropriate cause of death statement?

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

28. PART II.

Enter other significant conditions contributing to death but not resulting in the underlying cause given above.

Other Significant Conditions contributing to death

HYPERTENSIVE CARDIOVASCULAR DISEASE

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

Answer: A.

IMMEDIATE CAUSE (Final disease or condition resulting in death)		APPROXIMATE INTERVAL: Onset to death
a. METABOLIC ACIDOSIS	<input type="checkbox"/> 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. BLEEDING GASTROESOPHAGEAL VARICES	<input type="checkbox"/> ABC	<input type="text"/>
Due to (or as a consequence of)		
c. CIRRHOSIS	<input type="checkbox"/> ABC	<input type="text"/>
Due to (or as a consequence of)		
d. HEPATITIS B VIRUS INFECTION	<input type="checkbox"/> ABC	<input type="text"/>
28. PART II.		
Enter other significant conditions contributing to death but not resulting in the underlying cause given in PART I.		
Other Significant Conditions contributing to death		
<input type="text" value="HYPERTENSIVE CARDIOVASCULAR DISEASE"/>		

The cause-of-death statement above follows a logical sequence, lists the underlying disease process responsible for death last, and includes hypertensive cardiovascular disease as a contributory cause of death.

The alternative example reads, from top to bottom, “Hypertensive cardiovascular disease due to metabolic acidosis due to bleeding gastroesophageal varices”, which implies that hypertension is the result of metabolic acidosis, and fails to indicate the etiology of the varices.

Which is an appropriate certification of death? (hint: manner)

<p>28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) 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.</p>		<p>Approximate interval: Onset to death</p>
<p>IMMEDIATE CAUSE (Final disease or condition resulting in death)</p> <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>	<p>a. <u>COMPLICATIONS OF MULTIPLE SCLEROSIS</u></p> <p>Due to (or as a consequence of)</p>	<p>YEARS</p>
	<p>b. _____</p> <p>Due to (or as a consequence of):</p>	_____
	<p>c. _____</p> <p>Due to (or as a consequence of):</p>	_____
	<p>d. _____</p> <p>Due to (or as a consequence of):</p>	_____
<p>PART II. <u>Other significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.</p>		<p>29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>30. MANNER OF DEATH</p> <p><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</p>	<p>31. DID TOBACCO USE CONTRIBUTE TO DEATH?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> Probably <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown</p>	<p>32. IF FEMALE:</p> <p><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</p>

<p>28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) 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.</p>		<p>Approximate interval: Onset to death</p>
<p>IMMEDIATE CAUSE (Final disease or condition resulting in death)</p> <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>	<p>a. <u>UROSEPSIS</u></p> <p>Due to (or as a consequence of)</p>	<p>DAYS</p>
	<p>b. <u>PARAPLEGIA</u></p> <p>Due to (or as a consequence of):</p>	<p>32 YEARS</p>
	<p>c. <u>GUNSHOT WOUND TO TORSO, REMOTE</u></p> <p>Due to (or as a consequence of):</p>	<p>32 YEARS</p>
	<p>d. _____</p> <p>Due to (or as a consequence of):</p>	_____
<p>PART II. <u>Other significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.</p>		<p>29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>
<p>30. MANNER OF DEATH</p> <p><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</p>	<p>31. DID TOBACCO USE CONTRIBUTE TO DEATH?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> Probably <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown</p>	<p>32. IF FEMALE:</p> <p><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</p>

Answer: A.

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) 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.

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. **COMPLICATIONS OF MULTIPLE SCLEROSIS**

Due to (or as a consequence of)

b.

Due to (or as a consequence of):

c.

Due to (or as a consequence of):

d.

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.

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.



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GUIDANCE FOR CERTIFICATION OF DISASTER-RELATED DEATHS

Dr. Amy Hawes
Deputy State Medical Examiner
Office of the State Chief Medical
Examiner

Thought provoking questions

- Physicians in Tennessee may sign death certificates for which manner of death?
- Why is it important to accurately identify and report a potential disaster-related death?
- What are the different types of disaster-related deaths?
- To whom should I report a potential disaster-related death?
- What are some common causes of a directly-related disaster death?
- What are some common causes of an indirect-related disaster death?

Vital Statistics Reporting Guidance



Report No. 1 • October 2017

A Reference Guide for Certification of Deaths in the Event of a Natural, Human-induced, or Chemical/Radiological Disaster

Executive Summary

Death certificates are the fundamental and primary source of official mortality statistics in the United States. Disaster-

Federal disaster declarations and other notifications, such as local National Weather Service extreme weather warnings or watches and emergency management alerts, can be used to determine whether a disaster has occurred in a jurisdiction. Once a disaster is recognized, determining whether a death is disaster-

Available at

- <https://www.cdc.gov/nchs/data/nvss/vsrg/vsrg01.pdf>

Based on guidance from the National Center on Health Statistics

- **Modified from**
- **Tesfaye Bayleyegn, MD**
- Senior Service Fellow
Team Lead, Disaster Epidemiology and Response Team
- Center for Disease Control and Prevention
- **Dr. Katherine Cochran**, presentation at annual meeting of National Association of Medical Examiners 2018

Contact information

- Death certificate assistance and training, via phone on on-site
- Dr. Amy Hawes
 - Amy.hawes@tn.gov
 - 615-495-9472
- Office of the State Chief Medical Examiner

What qualifies as a disaster?

- Kingston coal ash spill December 2008
- Nashville flood of May 2010
- Jefferson County bus crash October 2013
- ***The Great Smoky Mountain Wildfires November 2016***
 - injured 134 people
 - ultimately caused 14 fatalities
- Historic flooding in 14 counties in East TN in February 2019
- TORNADOS March 2020

Disasters

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

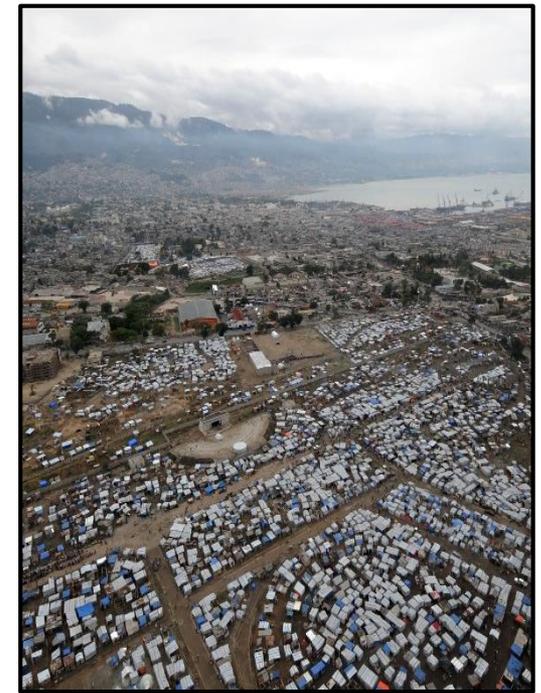
Natural Hazards



Human-Induced



Complex Emergencies



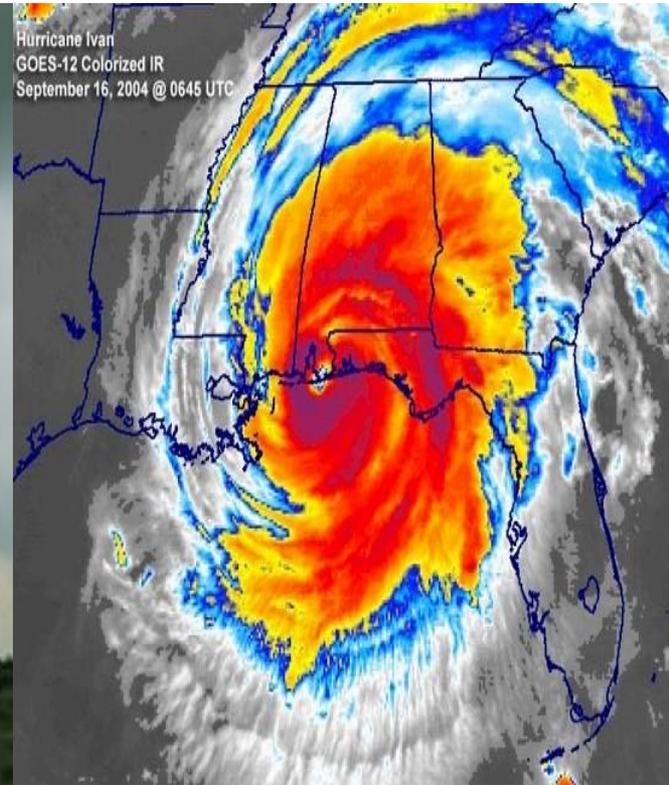
How do we know when a disaster occurs?

- Usually obvious...
- Clinical history, EMS reports
- Official alerts from EMA, county, state, or federal; Tennessee Hospital Association
- Work-related/industrial accidents
 - Death scene investigation, autopsy, lab findings, medical examiner personnel

Why do we care?

Best source of mortality data is the DEATH CERTIFICATE

Accurate disaster-related mortality surveillance



The Role of Death Certificates

- Needed by families recovering from a disaster
- Provide information on the different ways disasters can lead to death
- Provide critical, actionable data during response and recovery activities
- Help develop future prevention strategies to reduce morbidity and mortality from disasters



Urgent



Response



Non-Urgent



Research

Discrepancies between Different Counties:



- An 86-year-old man with lung cancer in Jefferson County at home
- Loss of electricity due to ice storm.
- Unable to use supplemental home oxygen.
- Put on partially functioning ventilator in a hospital.
- Cause of death: Lung cancer
- No mention of relation of death to ice storm.



- 67-year-old woman with emphysema in Rutherford County at home
- Loss of electricity due to ice storm.
- Unable to use supplemental home oxygen.
- Cause of death: Complications of emphysema.
- Relation of death to ice storm documented.

Disaster-related Mortality Surveillance

Getting it right

- Disaster mortality surveillance uses death certificate data to
 - Assess the scope of a disaster incident
 - Identify common risk factors for disaster-related deaths
 - Develop evidence-based public health interventions

- Challenges from inconsistent reporting
 - Difficult to generate accurate and reliable mortality stats
 - Difficult to identify the most frequent COD in a disaster incident
 - Difficult to estimate the disaster-related death toll overall

Discrepancies in Reporting Disaster-related Deaths by Different Sources

Disaster	Red Cross	FEMA (Approved Funeral Expenses)	NOAA- NWS Storm Data	<u>Other</u> 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
April 27 Tornado, GA (2011)	15	9	15	15	6
Hurricane Ike, TX (2008)	38	104	20	74	4

How do we identify disaster-related deaths accurately?



Types of Disaster-related Deaths

Direct and Indirect Disaster-related Deaths

- **Directly-related disaster death**
 - Caused by the forces of the disaster (e.g., strong wind) or direct consequences of these forces (e.g., structural collapse, flying debris, or radiation exposure)
- **Indirectly-related disaster death**
 - Disaster led to unsafe or unhealthy conditions (e.g., hazardous roads) or a loss or disruption of usual services (e.g., power outage) that contributed to the death

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

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



Plane hits Browns Ferry nuclear plant...



Determining a Disaster-related Death

“But for” Principle

“But for the <disaster>, would they have died when they did?”

Determination of Disaster-related Deaths Flowchart

- National Weather Service
- Emergency management official warnings or watches
- Official alerts (e.g., state of emergency, FEMA declaration)

Step 1: Consider whether the death occurred during a disaster.

Step 2: If yes to Step 1, explore whether the death was directly or indirectly related to the disaster. Apply the evidence, including the death scene investigation, autopsy, and laboratory findings.

- Traumatic injury
- Burn or smoke inhalation
- Chemical or toxic exposure
- Drowning
- Electrocution
- Hyperthermia or hypothermia
- Radiation effects
- Suffocation
- Evacuation
- Loss or disruption of: health, utilities, or transportation
- Preparation for disaster
- Repair or cleanup activities
- Returning to unsafe or unhealthy environments or structures

This can be done in Part I, Part II, or in the Describe How Injury Occurred field (e.g. Hurricane Sandy, Joplin Tornado).

Step 3: If yes to Step 2, record the disaster type and name and circumstance of death on the death certificate

Physicians: Report all suspected non-natural deaths, including disaster-related deaths, to county ME

Wildfires of 2016

- Deadliest in the Eastern United States since 1947⁵
- One of the largest natural disasters in Tennessee's history⁵



Figure 3. Great Smoky Mountain Wildfires. Adapted from "Gatlinburg Area Fire Update," retrieved from <https://www.google.com/GreatSmokyMountains-gatlinburg-area-fire-update-sevier-county-city-of-gatlinburg-and-great-smoky-mountains>

The Fires Start

- The fire was started on the Chimney Tops trail⁶
- Area was considered to be in an exceptional drought⁷
- During Thanksgiving holiday



Figure 5. Chimney Tops trail. Adapted from "Chimney Tops Hike, Great Smoky Mountains," retrieved from <https://www.romanticasheville.com/chimney-tops-smoky-mountains.jpg>

Wildfires

- Burned more than 16,000 acres⁵
- Pigeon Forge and Gatlinburg affected⁵
 - 14,000 people evacuated⁵



Figure 4. Chimney Tops Trail fire. Adapted from “Wildfires in Great Smokey Mountains National Park,” retrieved from <http://wildfiretoday.com/wp-content/uploads/2016/11/GRSM-fire-on-knob.jpg>

Summary of Fatalities

- 14 fatalities



Figure 14. House Fire. Adapted from “Another Gatlinburg Fire Victim,” retrieved from <https://i.dailymail.co.uk/i/pix/2016/12/10/image-a-60.jpg>

Key Questions for Disaster-related Consideration

- *Was the death caused by the actual forces of the disaster (e.g., wind, rain, flood, earthquake, or blast wave) or by the direct consequences of these forces (e.g., structural collapse, chemical spill, or flying debris)?*
 - If so, this is a **directly-related** disaster death

Charred remains in roadway

- 70 YO Male
- 27% CO
- Is this direct or indirect?



Direct death related to fire

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) 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.

Approximate interval:
Onset to death

IMMEDIATE CAUSE
(Final disease or condition resulting in death) → a. Smoke inhalation during Smoky Mtn Wildfires

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?**
 Yes No

29b. **WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH?** Yes No

30. **MANNER OF DEATH**
 Natural Homicide
 Accident Pending Investigation
 Suicide Could not be determined

31. **DID TOBACCO USE CONTRIBUTE TO DEATH?**
 Yes Probably
 No Unknown

32. **IF FEMALE:**
 Not pregnant within past year Not pregnant, but pregnant 43 days to 1 year before death
 Pregnant at time of death Unknown if pregnant within the past year
 Not pregnant, but pregnant within 42 days of death

33. **IF TRANSPORTATION INJURY, SPECIFY:**
 Driver/Operator
 Passenger
 Pedestrian
 Other (Specify) _____

34a. **DATE OF INJURY** (Month, Day, Year)
November 28, 2016

34b. **TIME OF INJURY**
11:16

34c. **INJURY AT WORK?**
 Yes No

34d. **PLACE OF INJURY** –at home, farm, street, factory, office, building, etc. (Specify)
Street

34e. **DESCRIBE HOW INJURY OCCURRED**
Smoke inhalation during wildfire

34f. **LOCATION OF INJURY** (Street and Number, City or Town, State)
Main Street, Gatlinburg TN

Charred remains found near car at home

- 61 YO female called 911 and said she couldn't get out because a tree had fallen on her car
- Autopsy showed 14% CO
- 0.131% ethanol
- Direct or indirect related death?

Key Questions for Disaster-related Consideration

- *Did the forces of the disaster lead to unsafe or unhealthy conditions that caused a loss or disruption of usual services (e.g., utilities, transportation, environmental protection, medical care, police/fire) AND did these losses or disruption contribute to the death?*
 - If so, this is an **indirectly-related** disaster death

79 YO male evacuating





- Autopsy showed Multiple blunt force injuries
- Carbon monoxide was 5%
- Is this a disaster-related death?
- Is it direct or indirect?

27a. SIGNATURE OF CERTIFIER		27b. LICENSE NUMBER 31292	27c. DATE SIGNED (Month, Day, Year)
		27d. NAME AND ADDRESS Amy Hawes 2761 Sullins Street, Knoxville, TN 37919	
28. PART I. Enter the <u>chain of events</u> (diseases, injuries, or complications) 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. IMMEDIATE CAUSE (Final disease or condition resulting in death) → a. <u>Blunt force injuries</u> 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. <u>Motor vehicle collision</u> Due to (or as a consequence of): _____ c. _____ Due to (or as a consequence of): _____ d. _____			Approximate interval: Onset to death _____ _____ _____ _____
PART II. <u>Other significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I. <u>Evacuating from Smoky Mountain Wildfires</u>			29a. WAS AN AUTOPSY PERFORMED? <input checked="" 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 checked="" 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 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 checked="" 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) November 28, 2016	34b. TIME OF INJURY 11:16	34c. INJURY AT WORK? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
34e. DESCRIBE HOW INJURY OCCURRED MVA during evacuation from wildfires			34d. PLACE OF INJURY –at home, farm, street, factory, office, building, etc. (Specify) Street 34f. LOCATION OF INJURY (Street and Number, City or Town, State) Main Street, Gatlinburg TN



Key Questions for Disaster-related Consideration

- *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?*
 - If so, this is an **indirectly-related** disaster death

DC Part II: Wildfire ??? Manner of Death

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) that directly caused the death. DO NOT enter terminal events such as respiratory arrest, or ventricular fibrillation without showing the etiology. Enter only one cause on a line.

<p>IMMEDIATE CAUSE (Final disease or condition resulting in death)</p> <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>	<p>→</p> <p style="font-size: 3em;">{</p>	<p>a. Myocardial infarction</p>	<p>Due to (or as a consequence of)</p>
		<p>b. Hypertension</p>	<p>Due to (or as a consequence of):</p>
		<p>c.</p>	<p>Due to (or as a consequence of):</p>
		<p>d.</p>	

<p>PART II. <u>Other significant conditions contributing to death</u> but not resulting in the underlying cause given in PART I.</p>	29
<p>Chest pain during evacuation of Great Smoky Mt. wildfires</p>	29
	CC

<p>30. MANNER OF DEATH</p> <p><input checked="" type="checkbox"/> Natural <input type="checkbox"/> Homicide</p> <p><input type="checkbox"/> Accident <input type="checkbox"/> Pending Investigation</p> <p><input type="checkbox"/> Suicide <input type="checkbox"/> Could not be determined</p>	<p>31. DID TOBACCO USE CONTRIBUTE TO DEATH?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> Probably</p> <p><input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown</p>
--	---



Smoke inhalation and heart disease

- Combination of vulnerability and triggering event leading to cardiac events



Forest Burning. Adapted from “Heavy Smoke Hovers from Fires,” retrieved from <https://cbsnews1.cbsistatic.com/hub/gatlinburg-fire-tennessee-2016-11-30.jpg>



Smoke over Gatlinburg. Adapted from “Thick Smoke in Gatlinburg, Tennessee,” retrieved from <https://media4.s-nbcnews.com/j/newscms/2016-tennessee-fire-smoke-wbir-nc.fit-760w.jpg>

Sudden cardiac death and exertion

- Cardiac stress associated with fleeing



Figure 11. Fleeing Gatlinburg. Adapted from "Gatlinburg Fire Escape," retrieved from https://media.nbcnewyork.com/images/652*367/Gatlinburg+Wildfire.jpg

Summary of Fatalities

- 14 fatalities
- Direct deaths: 10
 - Smoke inhalation: 9
 - Falling debris: 1
- Indirect deaths: 4
 - MVC: 2
 - Heart disease: 2



Figure 14. House Fire. Adapted from “Another Gatlinburg Fire Victim,” retrieved from <https://i.dailymail.co.uk/i/pix/2016/12/10/image-a-60.jpg>

Disaster-related Deaths

- Disaster-related deaths may occur
 - before the incident
 - during the incident
 - immediately after the incident
 - months or years after the incident
- Fatal **occupation-related** injuries
 - occur during the course of providing services
 - need to be documented on the death certificate

Disaster-relatedness of Poisonings and Natural Deaths

- Chemical poisoning deaths can be disaster-related
 - Carbon monoxide poisoning associated with generator use during power outage
 - Exposure to chlorine gas released from hurricane-damaged storage tanks during repairs
- Natural deaths can also be disaster-related
 - Exacerbated chronic conditions
 - Asthma-related deaths associated with wildfires
 - Diabetic ketoacidosis from lack of insulin
 - Cardiovascular incidents associated with tornados, hurricanes, or any cause of evacuation

Examples of Indirectly-related Disaster Deaths

- An elderly person who has a heart attack after evacuating to a shelter after train wreck carrying hazardous material
- A death resulting from a car crash that occurred while evacuating a storm
- A person who dies after not receiving dialysis for several days because of power outages after a tornado

Record the disaster type and name and circumstance of death on the death certificate

Example: 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).

15-year-old fell down steps while taking shelter in basement during tornado

- Taken by EMS to local hospital
- CT showed epidural hemorrhage, skull fracture, and contusions/lacerations of scalp

DC Part II: Putnam County tornado

<p>28. PART I. Enter the chain of events (diseases, injuries, or complications) 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.</p>		<p>Approximate interval: Onset to death</p>	
<p>IMMEDIATE CAUSE (Final disease or condition resulting in death)</p> <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>	<p>a. <u>Right parietal epidural hematoma</u></p> <p>Due to (or as a consequence of)</p>	_____	
	<p>b. <u>Right parietal skull fracture</u></p> <p>Due to (or as a consequence of):</p>	_____	
	<p>c. <u>Blunt force trauma of the head</u></p> <p>Due to (or as a consequence of):</p>	_____	
	<p>d. _____</p> <p>Due to (or as a consequence of):</p>	_____	
<p>PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.</p> <p><u>Putnam county tornado</u></p>		<p>29a. WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>29b. WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH? <input type="checkbox"/> Yes <input type="checkbox"/> No</p>	
<p>30. MANNER OF DEATH</p> <p><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</p>	<p>31. DID TOBACCO USE CONTRIBUTE TO DEATH?</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> Probably <input checked="" type="checkbox"/> No <input type="checkbox"/> Unknown</p>	<p>32. IF FEMALE:</p> <p><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 checked="" type="checkbox"/> Not pregnant, but pregnant within 42 days of death</p>	
<p>33. IF TRANSPORTATION INJURY, SPECIFY:</p> <p><input type="checkbox"/> Driver/Operator <input type="checkbox"/> Passenger <input type="checkbox"/> Pedestrian <input type="checkbox"/> Other (Specify) _____</p>	<p>34a. DATE OF INJURY (Month, Day, Year) <u>March 3, 2020</u></p>	<p>34b. TIME OF INJURY <u>11:16</u></p>	
	<p>34c. INJURY AT WORK? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>	<p>34d. PLACE OF INJURY –at home, farm, street, factory, office, building, etc. (Specify) <u>Residence</u></p>	
	<p>34e. DESCRIBE HOW INJURY OCCURRED <u>Fell down steps while sheltering from tornado</u></p>		<p>34f. LOCATION OF INJURY (Street and Number, City or Town, State) <u>Main Street, Cookeville, TN</u></p>

Nashville Flood

- 72-year-old woman couldn't get to dialysis because roads were washed out due to flood
- History of renal failure due to diabetes

DC Part II: Floods...Manner of death?

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) that directly caused the death. DO NOT enter terminal event 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)

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.		

PART II. Other significant conditions contributing to death but not resulting in the underlying cause given in PART I.

Dialysis inaccessible due to Nashville floods

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 |

3



33. IF TRANSPORTATION
IN INDV SPECIFY:

34a. DATA
(Manner)

Extreme Winter Cold and Chronic Conditions

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

- Is this death disaster-related?
 - **Answer: Yes**
- What disaster-related details would you include on the death certificate and where would you document them?
 - **Answer: Disaster type and name and circumstance of death should be included in Part I and “Describe How Injury Occurred” box**

28. **PART I.** Enter the chain of events (diseases, injuries, or complications) 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.

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. Environmental hypothermia

Due to (or as a consequence of)

b. Knoxville ice storm of 2020

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.

Atherosclerotic cardiovascular disease, Alzheimer dementia

29a. **WAS AN AUTOPSY PERFORMED?**

Yes No

29b. **WERE AUTOPSY FINDINGS AVAILABLE TO COMPLETE THE CAUSE OF DEATH?** Yes No

30. MANNER OF DEATH

- Natural Homicide
 Accident Pending Investigation
 Suicide Could not be determined

31. DID TOBACCO USE CONTRIBUTE TO DEATH?

- Yes Probably
 No Unknown

32. IF FEMALE:

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

33. IF TRANSPORTATION INJURY, SPECIFY:

- Driver/Operator
 Passenger
 Pedestrian
 Other (Specify) _____

34a. **DATE OF INJURY**
(Month, Day, Year)

January 1, 2020

34b. **TIME OF INJURY**

11:16

34c. **INJURY AT WORK?**

Yes No

34d. **PLACE OF INJURY** –at home, farm, street, factory, office, building, etc.
(Specify)

Park

34e. **DESCRIBE HOW INJURY OCCURRED**

Wandered away from group home during ice s

34f. **LOCATION OF INJURY** (Street and Number, City or Town, State)

123 Main Street Knoxville, TN 37919



Who Should Certify Disaster-related Deaths?

- County medical examiners:
 - Deaths directly-related to disasters
 - Deaths indirectly-related to disasters and due to injuries, poisonings, and complications thereof
 - Anything that is not a natural death
- Physicians:
 - Deaths that are indirectly-related to disasters and due to ***natural causes***
 - Sudden or unexpected death may need to be referred to the ME.
 - When in doubt, consult the county ME or OSCME

Filling out Part I

- Cause of death **disease(s) or conditions(s)** reported as precisely as possible
 - Immediate cause (final disease or condition resulting in death) listed on **line a**
 - Sequentially list conditions leading to the immediate cause of death
 - Underlying cause (disease or injury that initiated the incidents resulting in death) on the **last line**
- Report one incident on each line even if incidents occurred simultaneously
- The disaster type and name can be included in Part I
 - “Condition” can be circumstance of death and disaster name and type

Filling out Part II

- Other significant **conditions** or incidents contributing to death but not resulting in the underlying cause
- Other conditions include clinical and non-clinical information
- Disaster type and name and circumstance can be included in Part II

Filling out Describe How Injury Occurred Box

- Circumstances surrounding the injury or external cause of death
- Details depend on the type of injury and disaster involved
 - Example: Drowned in a flooded residence during Hurricane Ike storm surge
- Work related injuries
 - Mark “Yes” in the “Injury at work?” field
- Enter “Place of Injury” if known
- Include disaster name and type and circumstance of death

In conclusion

- ***Key Points for Disaster-related Death Certification***
- Be aware of natural and human-induced disaster incidents
- Consider causes of death that can be indirectly-related to the disaster
- Identify all disaster-related deaths
 - Deaths can occur before, during, and after a disaster
- Record the disaster type and name and circumstance of death on the death certificate
 - 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”

Contact information

- Ad hoc training and death certificate assistance, via phone on on-site
- Dr. Amy Hawes
 - Amy.hawes@tn.gov
 - 615-495-9472
- Office of the State Chief Medical Examiner