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Tata Memorial Centre

CENTRE FOR CANCER EPIDEMIIOLOGY, NAVI MUMBAI
SERVICE
RESEARCH
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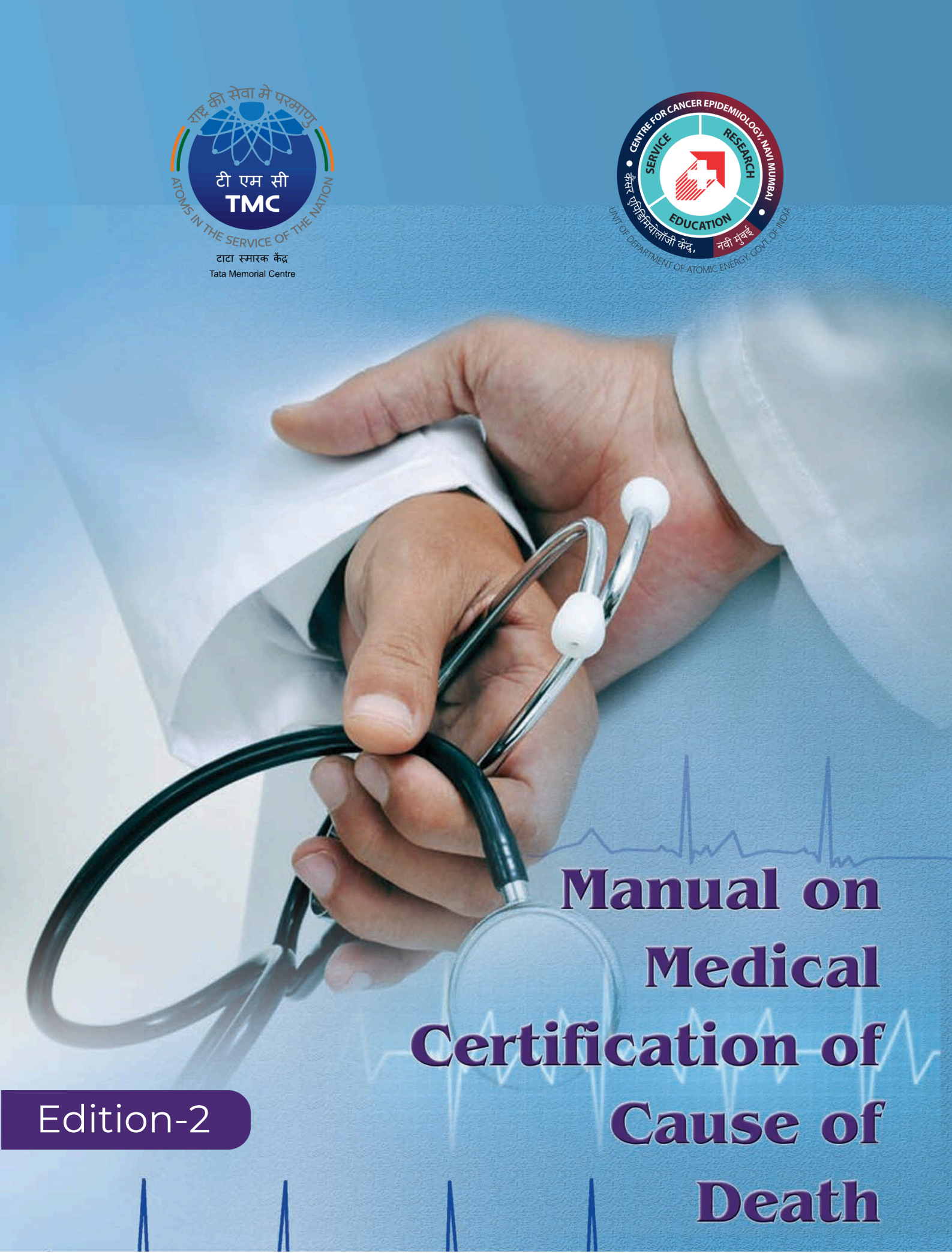
कैंसर एपिडेमियोलॉजी केंद्र, नवी मुंबई
UNIT OF DEPARTMENT OF ATOMIC ENERGY, GOVT. OF INDIA



Manual on Medical Certification of Cause of Death

Edition-2

Bloomberg Philanthropies
DATA FOR HEALTH INITIATIVE
CDC Foundation
Together our impact is greater

crsorgi.gov.in

Birth & Death Registration

Office of the Registrar General & Census Commissioner, India

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Registrar

Registrars have been appointed for each local area under Section 7 of the RBD Act, 1969 for registration of births and deaths occurred under their jurisdictional area. Registrars may belong to a municipality, Panchayat, Government health institution or other local authority appointed by the State Government

Institutions

As per the registration of Births and Deaths Act, 1969 in respect of births and deaths in a hospital, health center, maternity or nursing home or other like institutions, responsibility of informing the events to the registrar....

Public

In case of Birth and Death, Citizen should inform about the event within 21 days to the registrar of their jurisdiction. In case Death, citizen should place Doctor's certificate in original form along with burial/cremation....

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Registered Death

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NEW Provision to Registrar to filter Pending applications on basis of

Compatible with updated version of Google Chrome & Mozila Firefox.

Reference Manual on Medical Certification of Cause of Death

Unit for Strengthening Cause of Death Data,
Centre for Cancer Epidemiology,
Tata Memorial Centre, Mumbai, India

August 2023

Contents

Introduction

In India, the Births and Deaths Registration Act 1969 requires that all deaths be certified by a medical practitioner. Deaths are certified through the process of identifying the cause of death and reporting it on forms 4 and 4A (Appendices A & B). These forms are legal documents that families use to register deaths but they also serve a greater purpose. These results on the underlying causes of death inform policy makers and program managers in identifying where funds should be allocated. Therefore, the physician responsibility of correctly identifying and reporting the cause of death is very important for health policy and planning.

In January 2016 the Registrar General of India implemented an online birth and death registration system at www.csorgi.gov.in (Appendix C) that medical practitioners can use to register birth or death instead of using the 4 or 4A paper forms. With this online registration system, the correct documentation of the cause of death is even more important because of the automated coding of the underlying cause of death.Even a small mistake in entering the cause of death may affect the countof the main causes of death in your state and in India. This can have crucial implications to policy makers and program managers.

The **Unit for Strengthening Cause of Death Data (USCOD)**, was established by the **Centre for Cancer Epidemiology**, **Tata Memorial Centre, Mumbai on the 6th August 2021**. With a vision to support, promote, and advocate for best practices on cause of death data quality in the civil registration and vital statistics in India and the Asia Pacific region, the unit offers a range of resources to build capacity in improving the quality of cause of death data, such as training of doctors for correct certification of cause of death and of mortality coders in production of vital statistics.

Purpose

This handbook is designed to acquaint physicians and medical students to meet some of the requirements and data quality standards of the vital registration system in India.This manual will explainthe importance of and provide instructions for meeting a primary responsibility of physicians- the correct completion of death reporting forms 4, 4A, and www.csorgi.gov.in.

Importance of Death Reporting

- According to Registration of Birth and Death Act 1969, it is mandatory to document the cause of death before burial or cremation of the deceased. The cause of death is a permanent record of the fact of deaththat provides important information about the deceased, such as age, sex, date of death, and cause of death. This information allows the public health department to issue a death certificate and a burial or cremation order.
- The death certificate is a permanent and legal record. It isused for the settlement of the estate, application for insurance benefits, and settlement of pension claims. It also provides family members with closure of matters and peace of mind.
- Death reportingis a source of statistical information on mortality and causes of death that is needed for several purposes, including:
    1. Evaluating, monitoring, and improving the health of the population.
    2. Informing decisions on health policy and strategy.
    3. Comparing health across different regions.
- Mortality data supports medical and health research such as disease etiology and the evaluation of diagnostic and therapeutic techniques. The result of thisresearch is important in informing advancement ofclinical practice.

Because statistical data derived from death reporting on forms 4, 4A and www.csorgi.gov, death reportingdepends on the accuracy of the information on the certificate,it is very important that all persons concerned with the registration of deaths strive not only for **complete**registration of events, but also to accurately and timely reportdeath events.

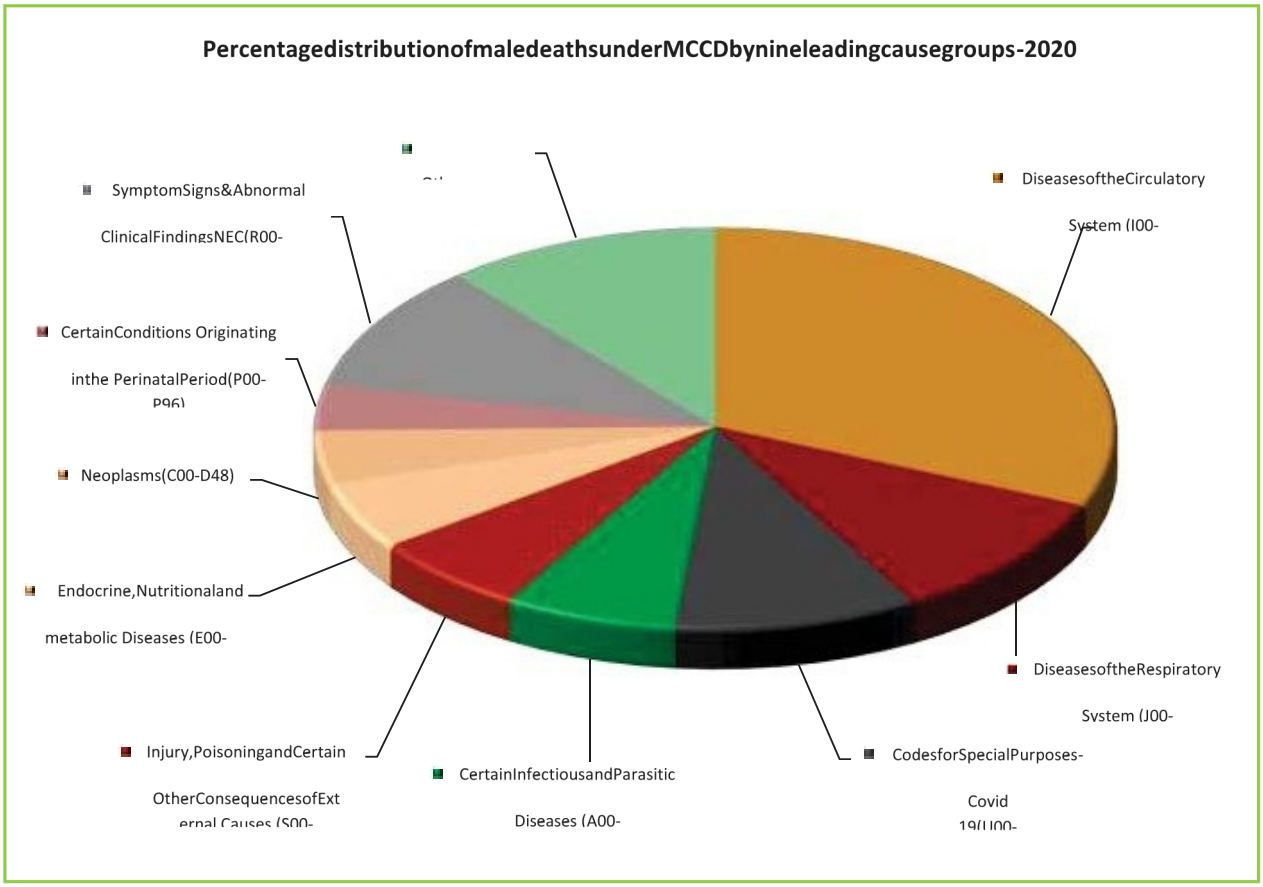
Public health importance of mortality data

Mortality data collected through death reports- forms 4, 4A, and www.csorgi.gov.in-are analyzed to produce essential statistics required by countries to monitor health status of populations. These include indicators to track the Millennium Development Goals such as under-5 mortality rate, infant mortality rate, and maternal mortality ratio as well as other important indices such as the life expectancy.

Information on the leading causes of death provides insight into the health problems of the population. For example,. This data can also be presented by gender, area of residence, socio-economic status to assess differences between groups. It can also be assessed over time to evaluate changes in the major causes of death over, for example, 10 or 20-year periods.

The nine leading cause groups of deaths viz., *Diseases of the Circulatory System* (I00-I99),*Diseases of the Respiratory System* (J00-J98), *Codes for Special Purposes (Covid 19 deaths) (U00-U49), Certain Infectious and Parasitic Diseases* (A00-B99), *Endocrine, Nutritional and MetabolicDiseases* (E00-E89), *Injury, Poisoning and Certain Other Consequences of External Causes* (S00-T98), *Neoplasms* (C00-D48), *Certain Conditions Originating in the Perinatal Period* (P00-P96) and*Symptoms, Sign and Abnormal Clinical & Laboratory Findings Not Elsewhere Classified* (R00-R99)taken together account for about 88.9 per cent of the total medically certified deaths

These statistics have a broad audience. Politicians may use this data to



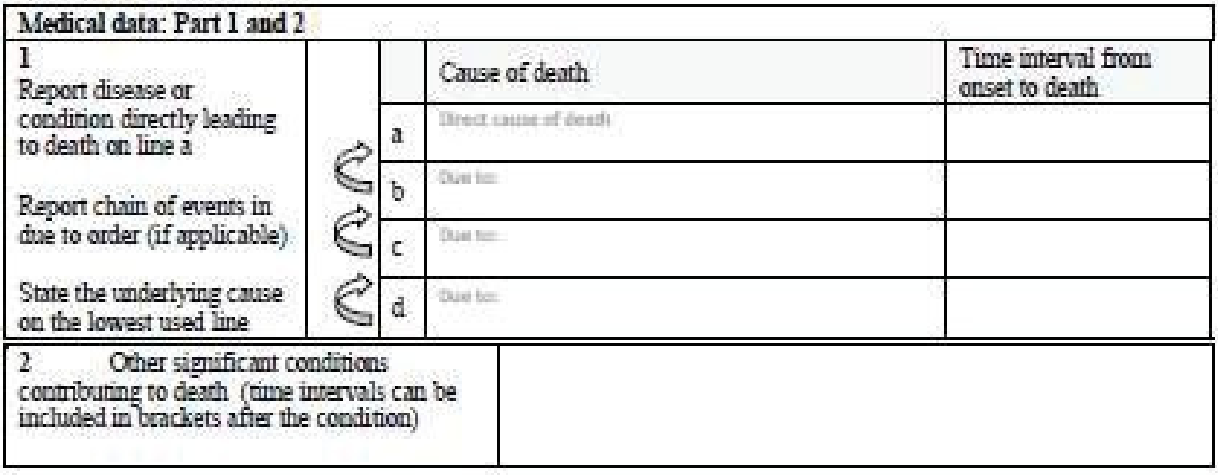
determine the health issues to prioritize in health policy and support through health programs. Hospitals may use this data to determine which services need to be expanded. Journalists may be interested in these results to notify the public of changes in the past decade.

Data timeliness is important since policymakers, health facilities, and communities want to respond to health issues as quickly as possible. That is why reporting of events, analysis of data, and dissemination of results is important to do in a reasonable time frame.

Background on cause of death reporting form

Since 1948, the World Health Organization (WHO) has established recommendations in reporting cause of death to allow for international comparison of mortality statistics. These recommendations include the International Form of Medical Certification of Cause of Death which countries use in their death reporting forms to meet WHO mortality reporting standards.

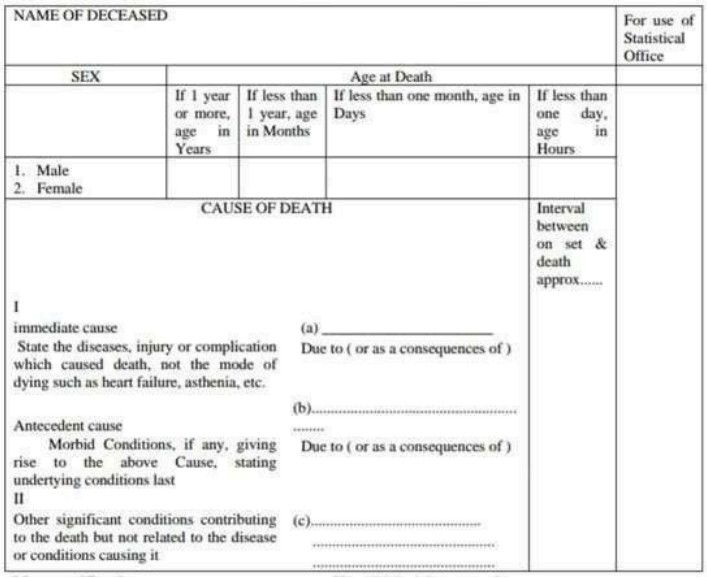
Figure 2. World Health Organization recommended form 2016



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

In India, the reporting of deaths is a state function supported by individual state laws and the Registration of Birth and Death Act 1969. The standard reporting formbased on the WHO reporting form is revised periodically to ensure that the data collected relate to current and anticipated needs. In the revision process, stakeholders review and evaluate each item on the standard certificate for its registration, legal, genealogical, statistical, medical, and research value.**The current forms (forms 4 and 4A) do not match the current WHO reporting form since they only havethree rather than four lines in Part I for the cause of death sequence.** This manual trains on the WHO International Form with four lines since India will modify its form to meet this standard.

Figure 3. Current Medical Certification of Cause of Death reporting section



NAME OF DECEASED					For use of Statistical Office
SEX	Age at Death				
	If 1 year or more, age in Years	If less than 1 year, age in Months	If less than one month, age in Days	If less than one day, age in Hours	
1. Male 2. Female					
CAUSE OF DEATH				Interval between on set & death approx.....	
I immediate cause State the diseases, injury or complication which caused death, not the mode of dying such as heart failure, asthenia, etc. (a) _____ Due to (or as a consequences of) (b)..... ..... Due to (or as a consequences of) Antecedent cause Morbid Conditions, if any, giving rise to the above Cause, stating undertying conditions last II Other significant conditions contributing to the death but not related to the disease or conditions causing it (c).....					

Minor modifications are sometimes necessary to comply with state laws or regulations to meet specific information needs or to meet modifications made to the WHO reporting form.The collection of similar information promotes uniformity of data and comparability of statistics nationally and internationally. Uniformity of death reporting formsamong the states also increases their acceptability as legal records.For this reason the Government of India was able to launch a single site for registration of births and deaths at www.crsorgi.gov.in. Currently, deaths can be reported by paper-based 4 and 4A forms and through electronic portals such as the www.crsgi.gov.inportal developed by the RGI. We will describe both processes in this manual.

Overview of cause of death reporting form:

The cause of death reporting section consists of two parts. **Part I**is for reporting a chain of events leading directly to death, with the **immediate cause of death** (the final disease, injury, or complication directly causing death) on **line 1 (a)** and the tentative **underlying cause of death** (the disease or injury that initiated the chain of events that led directly to death) on the **lowest used line (can be 1 a, 1b, 1c, or 1d depending on how many causes listed)**.

Part IIis for reporting all **other significant diseases, conditions, or injuries** that contributed to death but which did not directly result in the underlying cause of death given in **Part I.**

Figure 4. World Health Organization recommended form

INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

Cause of death		Approximate interval between onset and death
I Disease or condition directly leading to death*	(a)	.....
	due to (or as a consequence of)	
Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	(b)	.....
	due to (or as a consequence of)	
	(c)	.....
	due to (or as a consequence of)	
	(d)	.....
II Other significant conditions contributing to the death, but not related to the disease or condition causing it	.....	.....
	.....	.....

*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury, or complication that caused death.

The Cause of Death information should be the physician's best medical OPINION.

Completing Part I:

Line (a) immediate cause:

In Part I, the immediate cause or the direct cause of death is reported on line 1(a). This is the final disease, injury, or complication directly causing the death. An immediate cause of death must always be reported on line 1 (a).

- The cause reported on 1 a can be the sole entry in the cause of death section if that condition is the only condition causing the death.
- The immediate cause does not mean the modeof death or terminal event (for example, cardiac arrest or respiratory arrest). The modeof death (for example, cardiac or respiratory arrest) should not be reported as the immediate cause of death as it is a statement not specifically related to the disease process, and it merely attests to the fact of death. Therefore, the modeof death provides no additional information on the cause of death.

Lines (b), (c), and (d) due to (or as a consequence of):

On line (b) report the disease, injury, or complication, if any, that gave rise to the immediate cause of death reported on line (a). If this in turn resulted from a further condition, record that condition on line (c). If this in turn resulted from a further condition, record that condition on line (d).

- For as many conditions as are involved, write the full sequence, **one condition per line**, with the most recent condition at the top, **and the underlying cause of death reported on the lowest line used in Part I.**
- If more than four lines are needed, add one additional line (writing "due to", 'secondary to', 'as a consequence of' etc. between conditions on the same line is the same as drawing an additional line) rather than using space in Part II to continue the sequence.

The following certification is an example in which an additional line was necessary.

Figure 5. Example Cause of Death reporting form

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Tuberculosis Meningitis	5 days
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Milliary Tuberculosis	1 year
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c) Acquired Immunodeficiency Syndrome	3 years
		Due to (or as a consequence of)	
		d)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Blood transfusion, HIV	4 years

The words “due to (or as a consequence of),” which are printed between the lines of Part I, apply tothe sequences with an etiological or pathological basis usually with a chronological time ordering.

If the immediate cause of death arose as a complication of or from an error or accident in surgery or other medical procedure or treatment, it is important to report thecondition that necessitated the surgery or medical treatment

The **underlying cause of death** should be entered on the **LOWEST LINE USED IN PART I**.

The **underlying cause of death** is the disease or injury that initiated the train or chain of events leading directly to death or the circumstances of the accident or violence that produced the fatal injury.

- The certifying physician should report each disease, condition, injury, or poisoning that the physician believes affected the deceased.

    - A condition can be listed as "probable" if it has not been definitively diagnosed.
- If an organ system failure such as congestive heart failure, hepatic failure, renal failure, or respiratory failure is listed as a cause of death, the certifier should always determine its etiology on the line(s) beneath it.
    - For example, renal failure due to Type I Diabetes Mellitus.
- When a neoplasm is a cause of death, report by anatomical site and include morphology and grade of neoplasm.
    - For example, a primary squamous cell carcinoma of lung left upper lobe
- For each external cause that results in a fatal injury always report the circumstance that caused the trauma as well as the anatomical site of injury.
    - For example, pedestrian hit by a car resulting in a fracture of femur or stab wound to the chest.

**More details provided in Table 1.*

Approximate interval between Onset and Death:

Space is provided to the right of lines (a), (b), (c), and (d) for recording the interval between the presumed onset of the condition (not the diagnosis of the condition) and the date of death.

This should be entered for allconditions in Part I. The time intervals are usually established by the physicians on the basis of available clinical information. In some cases the interval will have to be estimated. The terms "unknown" or "approximately" may be used.

- State time in intervals such as minutes, hours, days, or years.
- If the time of onset is entirely unknown, state that the interval is "Unknown."

- **Do not leave time interval blank**. This information is useful in coding certain diseases and also provides a useful check on the accuracy of the reported sequence of conditions.

Part II of the cause-of-death section (other significant conditions):

All other important diseases or conditions that werepresent at the time of death and that may have contributed to the deathbut was not related in the causal chain of events of conditions reported in part 1should be recorded in part 2 of the certificate.

More than one condition can be reported per line in Part II. Time intervals for significant conditions contributing to death can be included in brackets after each condition.Multiple conditions and sequences of conditions resulting in death are common, particularly among the elderly.

GENERAL KEY POINTS--forms 4, 4A, and on www.csorgi.gov.in:

- This cause of death reporting form (4, 4A, and the www.csorgi.gov.in portal)is to be completed by the attending physician or medical examiner or coroner certifying or reporting his or her opinion on the cause of death.
- In 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.
- **DO NOT ABBREVIATE**.
- Enter only **one** cause on a line. Add additional lines if necessary. The WHO International Form has four lines and the current forms, 4 and 4A, used in India have three lines.

When completing the cause of death it is suggested that before pen is put to paper (or hands to the keyboard) the reporting physician decides what initiated the sequence / chain of events that lead to death i.e. the underline cause of death. Usually the underlying cause of death determines whether the death was due to natural or unnatural causes.

- Immediately refer case to medico-legal post mortem if the cause is unnatural i.e. due to physical or chemical influences on the body; sudden unexpected death, due to omission or commission; or procedure related deaths.

If completed properly, the cause of death will representthe essential information that a case history would. For example, the following cause of death reportpresents causes from which a sequence of cause of death can be drawn from the underlying cause (line d) to the immediate cause (line a).

Part I a) Septic shock
b) Infected decubitus ulcers
c) Complications of cerebral infarction
d) Cerebral artery atherosclerosis
Part II Insulin-dependent diabetes mellitus

If not completed properly, information may be missing from the cause of death section. The example below demonstrates how it may be challenging to determine a sequence of cause of death from an incomplete reporting form.

Part I a) Pneumonia
b) Malnutrition
c)

Part II

This example does not explain what caused malnutrition. A variety of different circumstances could cause malnutrition, so **the statement is incomplete and ambiguous.**

Common problems in cause of death reporting:

A list of the common problems encountered when evaluating and coding cause of death data follows. The following should be avoided by the certifying physician:

a) **Abbreviations:** these could have more than one meaning and ICD cause of death coders cannot beexpected to know which meaning is correct, e.g. MI could mean myocardial infarction or mitral incompetence. AIDS and TB are acceptable abbreviations.

b) **Ambiguous terms and poorly defined causes of death:** Terms like hypoxia, cardio-respiratory arrest and respiratory failure as underlying causes of death do not contribute to useful statistics.

c) **Illegible handwriting on paper forms 4 & 4A**: make sure your handwriting is legible and use CAPITAL LETTERS. Avoid alterations and erasures. If unavoidable, they should be initialed.

d) **Incorrect sequencing of causes of death**: make sure that the causal sequence is logical whenconsidering pathophysiology and time sequence.

e) **Insufficient specificity about cause of death** e.g. primary site of cancer; organism causing infection etc.

f) **Insufficient details about circumstances of death** e.g. place of injury, manner of death.

g) **Incomplete socio-demographic data**: place of residence, age, gender, pregnancy status, smoking history are all important variables in the analysis of cause of death data.

h) **Outdated form -** Use the current form designated by the state or the online portal www.csorgi.gov.in since it will always be updated automatically.

i) **Spelling error of decedent's name**- Verify with the informant the spelling of names, especially those that have different spellings for the same sound (shital /Sheetal, siddque/siddki) or should be verified against the most recent identity document/passport if available

j) **Signatures and rubber stamps not obtained for paper forms 4 & 4A**- Obtain all signatures and rubber stamps before submitting forms to avoid delay with returned forms.

Additional considerations

Often several acceptable ways of writing a cause-of-death statement for a specific case may exist. At best, a certifier will be able to provide a simple description of the process leading to death that is etiologically clear and be confident that this is the correct sequence of causes. However, description of the process is sometimes difficult because the certifier may not be certain. In this case, the certifier should think through the causes about which he/she is confident and what possible etiologies could have resulted in these conditions. The certifier should select the causes that are suspected to have been involved and use words such as "probable" or "presumed" to indicate that the description provided is not completely certain.

If the initiating condition reported on the death certificate could have arisen from a pre-existing condition, but the certifier cannot determine the etiology, he/she should state that the etiology is unknown, undetermined or unspecified, so it is clear that the certifier did not have enough information to provide even a qualified etiology. A cause of death should only be reported as unknown if every effort has been made to determine the cause, including an autopsy.

The elderly decedent should have a clear and distinct etiological sequence for cause of death, if possible. Terms such as senescence, infirmity, old age and advanced age have little value for public health. Age is recorded elsewhere on the certificate. When a number of conditions result in death, the physician should choose the single sequence that, in his or her opinion, best describes

the process leading to death, and place any other Contributing conditions in Part II.

The infant decedent (older than 7 days) should have a clear and distinct etiological sequence for cause of death, if possible. **"Prematurity"** should not be entered without explaining the etiology of prematurity. Maternal conditions may have initiated or affected the sequence that resulted in infant death, and such maternal causes should be reported in addition to the infant causes on the infant's death certificate (e.g., hyaline membrane disease due to prematurity, 28 weeks, due to placental abruption due to blunt trauma to mother's abdomen).

When **Sudden Infant Death Syndrome (SIDS)** is suspected, a complete investigation should be conducted, typically by a Forensic Pathologist. If the infant is under one-year of age, and no cause of death is determined after scene investigation, review of clinical history, and a complete autopsy, the death can be reported as SIDS by the forensic medical practitioner.

If a **death occurs at home** and the family brings the body to the hospital for the certification of death, the physician certifier's effort can have great value. Often family members of the deceased or ambulance personnel accompany the body, and they should be questioned about the circumstances surrounding the death and the previous medical history of the deceased. The individual may have been a patient of that specific hospital, in which case the folder should be retrieved and perused for more clinical information. The unclothed body of the deceased must be examined for any signs of injury or natural disease. If any concerns arise regarding the manner of death, the case should be discussed with, or referred to post mortem. On the other hand, if all the available evidence points towards a specific natural cause of death, the death may be certified on thecause of death certificate. At this time, a note may be made in

the hospital folder of the deceased, stating the information obtained, and the sources of information that were used to determine the cause of death.

If a transportation injury occurs,specify role of decedent (e.g., driver, passenger) in the transportation accident. "Driver/Operator" and "Passenger" should be designated for modes other than motor vehicles such as bicycles. "Other" applies to watercraft, aircraft, animal, or people attached to outside of vehicles (e.g., "surfers") but are not bonafide passengers or drivers.

Details will help assign deaths to categories that may be used to assess trends and effectiveness of safety programs.

Table 1. Terms requiring additional information about etiology

When processes such as the following are reported, additional information about the etiology should be reported:

Term	**Additional Information Required**
Abscess	Site
	Cause/organism
Adhesions	If following an operation, the underlying condition for which surgery was performed and length of time since surgery.
Agranulocytosis	Cause. If due to drug therapy, specify condition for which drug was given.
Airways disease (chronic)	Nature of disease (e.g. obstructive)
Anemia	Primary (specify type)
	Secondary (specify underlying cause)
Aneurysm	Site (e.g. cerebral, aortic)
	Cause (e.g. arteriosclerotic)
	Ruptured or dissecting
Antepartum hemorrhage	Cause (e.g. placentapraevia or abruption placentae)
Anoxia (foetal)	If occurred before or during labour Cause (e.g. obstructed labour with detail on cause of obstructed labour)
Appendicitis	Whether acute or chronic
	With peritonitis or abscess
Arteriosclerosis, Atheroma or Atherosclerosis	Arteries involved (e.g. coronary, cerebral)
Arteritis	Arteries involved (e.g. coronary,

	cerebral)
	Cause (e.g. arteriosclerotic, syphilitic)
Arthritis	Type (rheumatoid, juvenile)
	Cause (e.g. traumatic)
	Site
Asphyxia (foetal)	If occurred before or during labour Cause (e.g. obstructed labour with detail on cause of obstructed labour)
Aspiration of vomitus	Cause (e.g. acute alcoholic toxicity, drug overdose, chronic alcohol abuse, or circumstances of drug use i.e. addict, occasional user).
Asthma	Allergic or late onset
Atelectasis	Underlying cause
Birth injury	Site
	Type of injury
	Cause
Bronchitis	Type: Acute or chronic
	With: Asthma, emphysema etc.
Bronchopneumonia	Primary, hypostatic or aspiration
Burns	Site, Percentage and degree of burns
Cachexia	Circumstances
Calculus	Site and if with obstruction
Cardiac : failure	Underlying disease causing this condition

dilation hypertrophy	
Cardiovascular disease	Specific disease condition e.g. hypertensive.
Carditis	Site: Myocardium
	Endocardium
	Pericardium
	Type: Acute
	Rheumatic
	Bacterial or viral
Cerebral degeneration	Underlying cause
Cerebral sclerosis	Atherosclerosis or disseminated sclerosis
Cerebral sclerosis	Atherosclerosis or disseminated sclerosis
Cerebrovascular disease	Nature of disease (e.g. atherosclerosis causing infarction, haemorrhage, occlusion - thrombotic/embolic).
CVA – Cerebrovascular accident	Cause: infarction, haemorrhage, thrombotic/embolic
	Avoid abbreviation
Chorea	Type: Rheumatic
	With heart involvement
	Without heart involvement
	Huntington's
	Gravidarum

Cirrhosis of liver	Cause (e.g. alcoholic)
Corpulmonale	Underlying cause, and whether acute or chronic.
Coryza	Complication leading to death.
Curvature of Spine	Type: Acquired (e.g. tuberculosis).
	Congenital
	With : Heart disease and or hypertension
	Complication leading to death
Cytomegalovirus infection	If due to AIDS or other HIV illness
Debility	Underlying cause
Deep venous thrombosis	If following an operation, condition for which operation performed.
	If due to inactivity, the condition causing the inactivity.
Dementia	Cause (e.g. senile, alcoholic, atherosclerotic, Alzheimer's or multi-infarct).
Dermatitis	Type
	Cause e.g. drug induced (state condition necessitating drug therapy).
Diabetes mellitus	Type: Insulin dependent or non-insulin dependent diabetes.
	With: Complication(s) e.g. nephropathy, peripheral vascular disease.
Diarrhea	Underlying cause (if unknown, whether believed infectious or not).

Dysentery	Type: Amoebic (and, if so, whether acute or chronic).
	Bacterial
	Other protozoan.
Embolism	Site and type (e.g. thromboembolism).
	If following an operation: condition for which surgery performed.
	If due to inactivity: underlying condition causing the inactivity.
Encephalitis	Type: Acute viral
	Late effect of viral
	Post-vaccinal
	Idiopathic
	Meningococcal
	Suppurative
	Tuberculosis
Endocarditis	Acute or chronic
	Site: Mitral valve, aortic valve.
	Cause: Rheumatic, bacterial.
Failure, Renal	Acute or chronic. As well as the cause.
	Cause: Analgesic, diabetes etc. (Renal Failure).
Fatty degeneration	Site e.g. of heart or liver.
	Cause (e.g. alcoholic fatty liver

	disease).
Fractures	Site
	Pathological or traumatic (if due to trauma, state circumstances of trauma).
Gangrene	Site
	Type: Atherosclerotic, diabetic, due to gas bacillus etc.
Gastro-enteritis	Cause: Infectious or non-infectious.
Goiter	Type: Simple.
	Toxic
	Diffuse
	Uni-nodular
	Multi-nodular
Hematemesis	Cause: Gastric ulcer, adverse effects of medication etc.
Hemorrhage	Site
	Cause (if due to trauma, state circumstances of trauma).
Hemiplegia	Cause and duration (e.g. spinal cord injury from road traffic incident - 20 Years previously).
Hepatitis	Type: Acute or chronic.
	Alcoholic
	Of newborn Of pregnancy, Child birth or perpurium

Hydrocephalus	Congenital or if acquired, and if so, the underlying cause.
Hypertension	With: Heart involvement
	Cerebrovascular involvement
	Renal involvement
	Pregnancy
	If secondary, specify underlying cause.
Immaturity	Cause
	Complication leading to death.
Influenza	With: Pneumonia
	Other manifestation leading to death (specify).
Injury	Site and type of injury.
	Circumstances surrounding the injury(s) and if due to accident, suicide, homicide.
Intestinal infection, intestinal obstruction,	Causative organism.
Stenosis or stricture	Cause
Kaposi's sarcoma	If due to HIV/AIDS.
Leukemia	Acute, sub-acute or chronic.
	Type e.g. Lymphatic.
	Myeloid Monocytic
Liver failure; hepatic failure	Cause (e.g. acute infective, post-immunization, post-transfusion,

	toxemiaof pregnancy or of puerperium).
Lung disease (chronic)	Nature of disease (e.g. obstructive).
Infarction – cerebral	If due to occlusion, stenosis, embolism/thrombosis.
Infarction – myocardial	Site
	Acute, healed or old.
	Complication, if present.
Lymphadenitis	Cause (e.g. tuberculosis, septic wound).
Lymphoma	Type (e.g. Hodgkin's disease; Non-Hodgkin's lymphoma, mixed-cell type).
Malignant neoplasm	Anatomical site, morphology and grade of neoplasm,Behaviour of the neoplasm e.g., Benign, maliganant, etc.
Malnutrition	Type:
	If due to deprivation or disease (specify).
	Protein deficient, (specify type and degree of severity).
Melaena	Underlying cause e.g. Primary carcinoma of transverse colon.
Meningitis	Cause: Meningococcal
	Tuberculosis
	Haemophilusinfluenzae

	Other organism (specify).
Mental retardation	Underlying physical condition causing death.
Myocarditis	Acute or chronic.
	Cause (e.g. rheumatic fever, atherosclerosis).
Neoplasm	Type: Benign or malignant.
	Site of primary growth (indicate if unknown).
	Sites of metastases, if present.
Nephritis/Glomerulonephritis	Type: Acute, sub-acute.
	Chronic
	With oedema.
	Infective or toxic (cause).
	If associated with: Hypertension.
	Arteriosclerosis
	Heart disease
	Pregnancy
Obstruction of intestine	Cause
	If paralytic following operation, state condition for which surgery performed.
Obstructive airways disease	Type: Chronic
	Acute lower respiratory infection
	Acute exacerbation of asthma, bronchiectasis, emphysema etc.

Occlusion – cerebral	Site
	With: infarction, due to embolism, thrombosis etc.
Oedema of lungs	Type acute, hypostatic.
	Secondary to heart disease.
	With hypertension.
	If hypostatic or terminal, specify conditions necessitating inactivity.
	If chronic and due to external agents (specify cause).
Paget's disease	Of bone, breast, skin (specify site) or malignant.
Paralysis, paresis	Cause (e.g. due to birth injury, syphilis).
	Precise form (e.g. infantile, agitans).
Paralytic ileus	Underlying cause.
Pelvic abscess, Parametritis, Peritonitis	Cause, particularly whether due to puerperal or post-abortive infection.
Peptic ulcer With: haemorrhage, perforation	Site: Stomach, gastric duodenum.
Peripheral vascular disease	Cause (e.g. atherosclerosis).
Pleural effusion	Cause, particularly whether tuberculosis.
	Whether: Silicosis.
	Anthraco-silicosis

Pneumoconiosis	Asbestosis
	Associated with tuberculosis
	Other (specify)
Pneumocystis pneumonia	If due to HIV/AIDS.
Pneumonia	Type of organism.
	If hypostatic or terminal, specify underlying Illness.
Pneumothorax	Cause
Prematurity	Cause
	Complication leading to death.
Pulmonary embolism	Type (e.g. thrombus, fat, bone marrow, etc.)
	If following an operation, condition for which surgery performed.
	If due to inactivity, the condition causing the inactivity.
Pulmonary oedema	Cause
Renal disease or failure	Acute or chronic.
	Underlying cause e.g. diabetic nephropathy.
	With: hypertension, heart disease, and necrosis.
Respiratory failure	Underlying cause.
Respiratory infection	Nature, location and causative organism if known.
Rheumatic fever	Active or inactive.
	With: Nature of heart disease.

	Hypertrophy, carditis, endocarditis.
Sclerosis	Arterial: Coronary;
	Cerebral (specify whether disseminated or atherosclerosis);
	Disseminated, spinal (lateral, posterior), renal.
Scoliosis	Acquired (e.g. tuberculosis, osteoporosis). Congenital
Senility	With: Dementia, Alzheimer's disease etc.
Septicaemia	Underlying illness/site of infection
	Type of organism
Septic infection	If localised, specify site and organism
Shock	Type (e.g. Septic, haemorrhagic, hypovolaemic, etc.)
	Underlying cause
Silicosis	If associated with tuberculosis
Softening of brain	Cause: Embolic, arteriosclerotic etc.
Spondylitis	Whether: Ankylosing
	Deformans
	Gonococcal
	Sacro-iliac
	Tuberculous
Stenosis, stricture	Site
	If congenital or acquired (specify

	cause)
Syphilis	Site affected
	Type: Congenital
	Early or late, primary, tertiary, secondary
Tetanus	If following minor injury (specify)
	If following major injury (specify)
	Puerperal, obstetric
Thrombosis	Arterial (specify artery)
	Intracranial sinus: Pyogenic
	Non-pyogenic
	Late effect
	Post-abortive
	Puerperal
	Venous (specify site)
	Portal
	If post-operative or due to confinement in bed, specify condition which Necessitated operation or immobilization.
Toxaemia	Underlying cause
	Pregnancy (specify): Albuminuria
	Eclampsia
	Hyperemesis

	Hepatitis
	Hypertension
	Pre-eclampsia
Toxoplasmosis	If due to HIV/AIDS
Tuberculosis	Primary site
	Associated pneumoconiosis if present
	If due to HIV/AIDS
Ulcer	Site
	Perforated or with haemorrhage
Ulcer Leg	Nature (e.g. peripheral, varicose)
	Cause (e.g. atherosclerosis)
Uraemia	Cause
	Associated childbirth or pregnancy
Urinary tract infection	Primary: Specify organism and precise location, e.g. ureter or kidney.
	Secondary: Specify underlying disease, e.g. diabetes.
URTI	Complication leading to death
	Organism if identified
	Avoid abbreviation
Valvular disease	Valve(s) affected
	Acute or chronic
	If rheumatic: Active or inactive
	If non-rheumatic: Specify cause
Vascular disease	Nature (e.g. hypertensive, peripheral)

	Cause
Wounds	Site
	Cause
	Circumstances surrounding wounds (place of occurrence, activity etc.)

Confidentiality and legal considerations

The maintenance of confidentiality of patient information is a legal and ethical duty of medical practitioners. However, there are times when it islegally justifiable to breach patient confidentiality and these include:

- When the patient or the decedentnext-of-kin gives consent (*Note: when a person signs a life insurancepolicy, the person gives consent to the insurer to access any medical information required for processing ofthe claim after their death.)*
- When there is a statutory duty to disclose (e.g. Births and Deaths Registration Act1969)
- If there is a moral, legal or social duty to disclose (e.g. to a referring healthcare practitioner or member of atreatment team, or to a relative of the patient if the relative's health is in danger).

For years, HIV/AIDS was a stigmatized condition and life insurance policies had HIV/AIDS exclusion clauses. Under these clauses, insurers did not pay out for AIDS- related deaths. For these reasons doctors were reluctant to report HIV or AIDS on the death certificate.Although there never was a governmental directive that doctors should notwrite HIV or AIDS on the notice of death form, this was often the practice in hospitals.

Since 2005 all HIV/AIDS exclusion clauses have been eliminated, even retrospectively on existing policies. This means that the life insurance claim will be paid even if the death is due to AIDS. However, some policies have a waiting period which applies to all natural causes including AIDS. If the death occurs during this period the payment would be declined. In cases where there was material non-disclosure at application, claims may be declined.However retrospective underwriting is done and the premium and/or insured amount is adapted as if full disclosure had been done.

Legal obligation to provide accurate medical cause of death

The Births and Deaths Registration Act 1969 places a legal obligation on medical practitioners to state the cause of death. The making of a false statement on the cause of death certificate is a criminal offence and, on conviction, a practitioner is liable for a fine or imprisonment, or both. The ethical rules also recognize that statutory duty may require a practitioner to disclose information about the deceased's health status.

It is therefore not unethical to disclose the cause of death as long as the practitioner carries out the instructions to maintain confidentiality.

Reporting cause of death by medical interns and non-Allopathy doctors

Usually when the cause of death certificate is issued to the deceased it is often issued by a general practitioner.InIndiadeath certificates are alsoissued by the physicians of alternate medicines in addition to allopathy.The USCODaims to train all physicians to achieve consistent and high-quality documentation practices to improve the quality of medical certification of cause of death.

Completion of COD for unnatural deaths

The National Health Act stipulates regulations regarding the rendering of ForensicPathology Service. In these regulations "unnatural death, for the purposes of the medico-legal investigation ofdeath" is defined as:

(a) Any death due to physical or chemical influence, direct or indirect, or related complications.

Physical influences would include, for example, motor vehicle accidents and stab wounds, while chemical influences may be drug overdoses. This part of

the definition also includes “natural occurrences”, like lightening related deaths or dog-bites. In addition, if the deceased died due to any complication that can directly be linked to any injury, the case should be referred to forensic opinion (post mortem).

(b) Any death, including those deaths which would normally be considered to be a death due to natural causes, which in the opinion of a medical practitioner, has been the result of an act of commission or omission which may be criminal in nature or

(c) Where the death is sudden and unexpected, or unexplained, or where the cause of death is not apparent.
In these cases, immediately refer the case for a medico-legal post mortem.

Death registration and data analysis process in India:

Registration of an event can only occur after a series of processes which starts with the notification of cause of death, a primary responsibility of physicians. Medical practitioners certify the death using paper forms, form 4 or form 4A, or the online portal, crsorgi.gov.in. It is the responsibility of the health professional to ensure that confidentiality is maintained.

In India deaths are registered broadly via two processes, one that involves the municipal corporation and the other where the death certificate (Form 6) is issued by the hospital death registrar. Please note that variations to these processes may exist and the physician or institute must consult the local or state authorities to understand and abide by the same. The processes below are for the general understanding of doctors.

Process of Registration of Institutional Death via Institution

Filling up of form 2 by Hospital Staff

Filling up MCCD (form 4/4A) by Medical Officer

Process of Registration of Institutional Death via Municipal Corporation

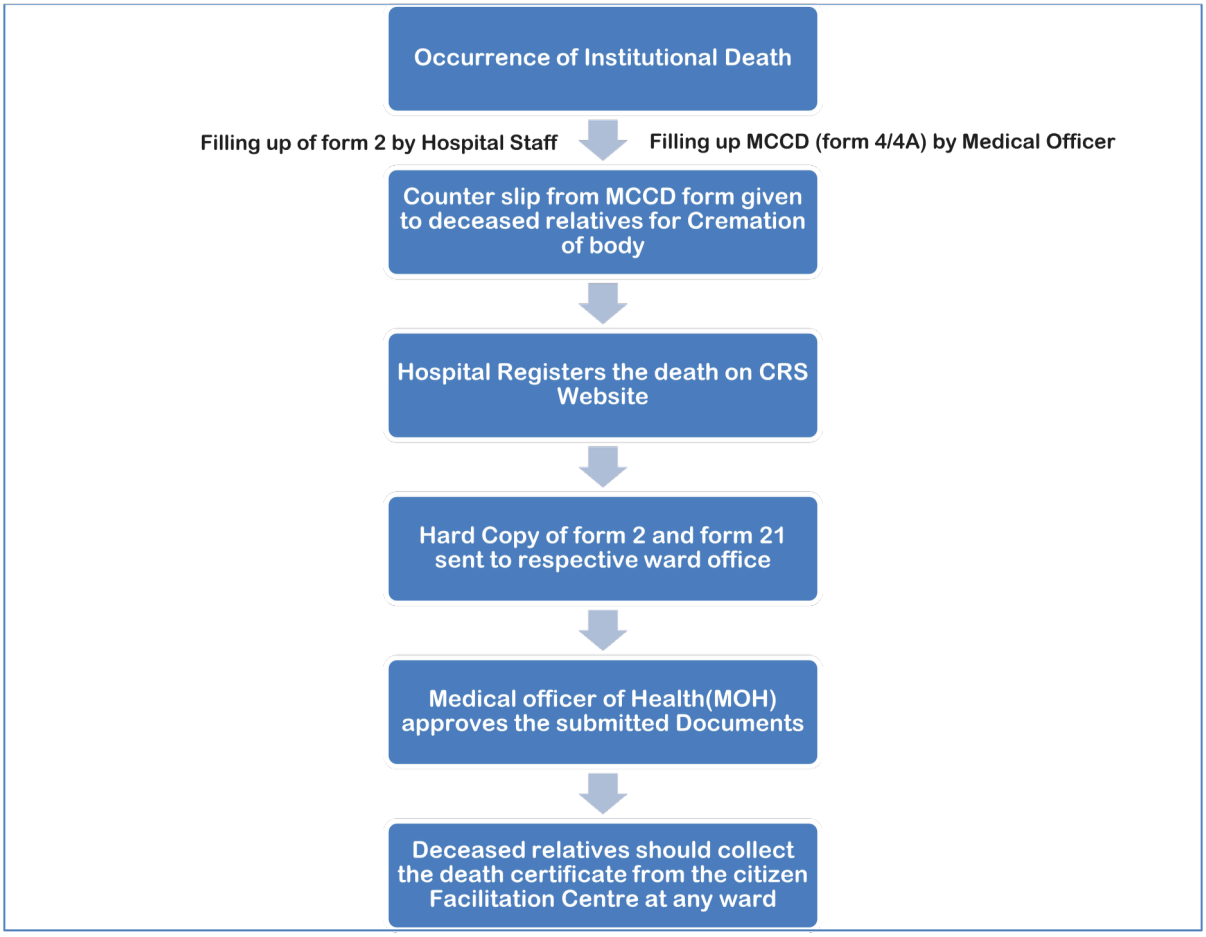


Figure 6. Image of Death Certificate from CRS system from Jan 2016

प्रमाणपत्र क्रमांक/ Certificate No. _____ नमुना - ६ / Form - 6

महाराष्ट्र शासन
GOVERNMENT OF MAHARASHTRA
आरोग्य विभाग
HEALTH DEPARTMENT
प्रमाणपत्र निर्गमित करणाऱ्या स्थानिक क्षेत्राचे नाव
Name of local body issuing certificates

सत्यमेव जयते

मृत्यु प्रमाणपत्र
DEATH CERTIFICATE

(जन्म व मृत्यु नोंदणी अधिनियम, १९६९ च्या कलम १२/१७ आणि महाराष्ट्र जन्म आणि मृत्यु नोंदणी नियम, २००० चे नियम ८/१३ अन्वये देण्यात आले आहे.)

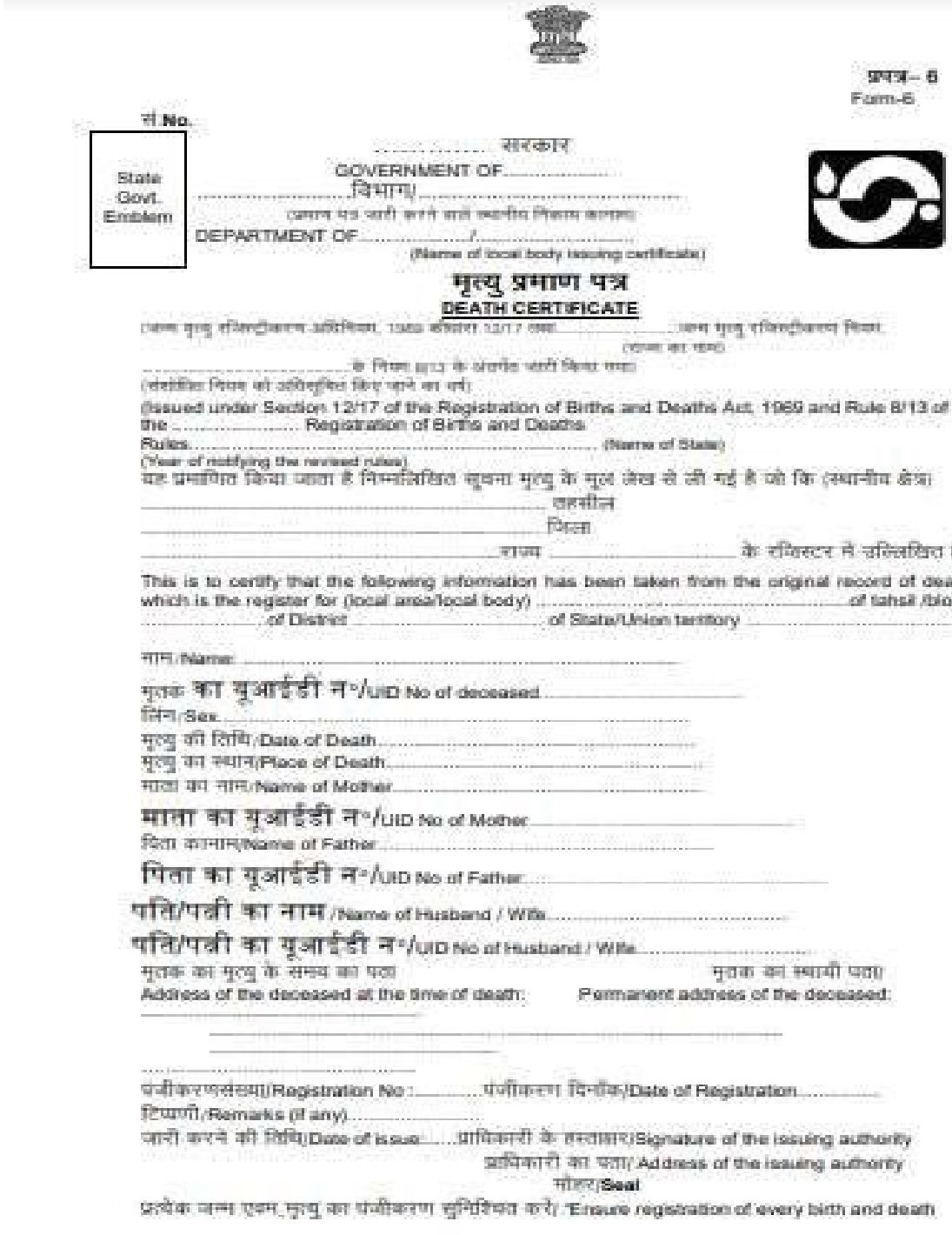
(Issued under section 12/17 of the Registration of Births & Deaths Act, 1969 and Rule 8/13 of the Maharashtra Registration of Births and Deaths Rules, 2000.)

प्रमाणित करण्यात येत आहे की, खालील माहिती मृत्युच्या मूळ अभिलेखाच्या नोंदवहीतुन घेण्यात आली आहे, जी की (स्थानिक क्षेत्र) _____ ,तालुका _____ , जिल्हा _____ , महाराष्ट्र राज्य च्या नोंदवहीत उल्लेख आहे.

This is to certify that the following information has been taken from the original record of death which is the register for (local area/local body) _____ of tahsil /block _____ of District _____ of Maharashtra **State.**

मृताचे पूर्ण नाव :
Full Name of Deceased: _____
लिंग :
Sex: _____
मृत्यु दिनांक :
Date of Death: _____
मृत्युचे ठिकाण :
Place of death: _____
आईचे पूर्ण नाव :
Full Name of Mother: _____
वडिलांचे पूर्ण नाव :
Full Name of Father: _____
आईचे आधारकार्ड क्र. (असल्यास)
वडिलांचे आधारकार्ड क्र. (असल्यास)
पतीचे/पत्नीचे पूर्ण नाव:
पतीचे /पत्नीचे आधारकार्ड क्र. (असल्यास)
मयत व्यक्तीचा मृत्यूसमयीचा पत्ता :
Address of the deceased at the time of death:
मयत व्यक्तीचा कायमचा पत्ता :
Permanent address of the deceased:
नोंदणी क्रमांक :
Registration No. : _____
नोंदणी दिनांक :
Date of Registration: _____
शेरा :
Remarks (If any) : _____
निर्गमित करणाऱ्या प्राधिकाऱ्याची सही
Signature of the issuing authority
प्रमाणपत्र दिल्याचा दिनांक :
Date of issue : _____
शिक्का / Seal
प्राधिकाऱ्याचा पत्ता :
Address of the issuing authority : _____

"प्रत्येक जन्म आणि मृत्यूची घटना नोंदल्याची खात्री करा" "Ensure Registration of every birth & death"



प्रपत्र– 6
Form-6

सं.No.

State Govt. Emblem

..... सरकार
GOVERNMENT OF.....
.....विभाग/.....
(जारी कर जारी करने वाले स्थानीय निकाय का नाम)
DEPARTMENT OF...../.....
(Name of local body issuing certificate)

मृत्यु प्रमाण पत्र
DEATH CERTIFICATE

(जन्म मृत्यु रजिस्ट्रीकरण अधिनियम, 1969 की धारा 12/17 तथा.....जन्म मृत्यु रजिस्ट्रीकरण नियम
(राज्य का नाम)
.....के नियम 8(13) के अंतर्गत जारी किया गया)
(संशोधित नियम को अधिसूचित किए जाने का वर्ष)
(Issued under Section 12/17 of the Registration of Births and Deaths Act, 1969 and Rule 8/13 of the ..... Registration of Births and Deaths
Rules..... (Name of State)
(Year of notifying the revised rules)

यह प्रमाणित किया जाता है निम्नलिखित सूचना मृत्यु के मूल लेख से ली गई है जो कि (स्थानीय क्षेत्र)
..... तहसील
..... जिला
..... राज्य ..... के रजिस्टर में उल्लिखित है

This is to certify that the following information has been taken from the original record of death which is the register for (local area/local body) .....of tahsil /block .....of District .....of State/Union territory .....

नाम/Name: .....

मृतक का यूआईडी नं°/UID No of deceased .....

लिंग/Sex .....

मृत्यु की तिथि/Date of Death .....

मृत्यु का स्थान/Place of Death .....

माता का नाम/Name of Mother .....

माता का यूआईडी नं°/UID No of Mother .....

पिता का नाम/Name of Father .....

पिता का यूआईडी नं°/UID No of Father .....

पति/पत्नी का नाम /Name of Husband / Wife .....

पति/पत्नी का यूआईडी नं°/UID No of Husband / Wife .....

मृतक का मृत्यु के समय का पता
Address of the deceased at the time of death: .....

मृतक का स्थायी पता
Permanent address of the deceased: .....

पंजीकरण संख्या/Registration No: .....पंजीकरण दिनांक/Date of Registration .....

टिप्पणी/Remarks (if any) .....

जारी करने की तिथि/Date of issue .....प्राधिकारी के हस्ताक्षर/Signature of the issuing authority

प्राधिकारी का पता/ Address of the issuing authority

मोहर/Seal

प्रत्येक जन्म एवम् मृत्यु का पंजीकरण सुनिश्चित करें/ Ensure registration of every birth and death

Updated Death Certificate Form 6 as per CRS 2020- Common form for all states of India

FINAL REVIEW:Key considerationsfor reporting cause of death

1. **Examine and analyse patient case notes to** formulate and report causes of death. State the pathological and chronological sequence and time intervals of the reported diagnostic events and complete an Indian/International death certificate. Review all identifying information about the deceased (such as age, sex, and place of death), the narrative history on specific symptoms, with their durations, details of past medical illness, and summary of medical evidence.
2. Several causes can be attributed to the death but **only one underlying cause** needs to be identified and reported on the **lowest** line. **IMMEDIATE** cause is listed on line a.
3. The WHO International Form of Medical Certificate of Cause of Death consists of two parts. **Part I** of the form has 4 lines which represent the causal chain of death **Part II** is used to record other contributing causes of death but not related to those in **Part I**.
4. **Write legibly and don't use abbreviations.** e.g. ARI, MI, etc.
5. Provide sufficient **detail on the circumstances of death**, e.g. place of injury, manner of death, etc. See **Table 1** for guidance.

Examples of cause-of-death certification:

IN ALL THE EXAMPLES DESCRIBED BELOW;

1. **FILL THE CAUSES OF DEATH IN THE CERTIFICATE**
2. **DETERMINE AND IDENTIFY THE UCOD AND FINALLY**
3. **EXPLAIN WHY YOU HAVE CHOSEN THE REPORTED UCOD**

Case history no. 1

Shortly after dinner on the day prior to admission to the hospital, this 48-year-old male developed a cramping, epigastric pain, which radiatedto his back, followed by nausea and vomiting. The pain was not relieved by positional changes or antacids. The pain persisted, and 24 hours after its onset, the patient sought medical attention. He had a 10-year history of excessive alcohol consumption and a 2-year history of frequent episodes of similar epigastric pain. The patient denied diarrhea, constipation, hematemesis, or melena. The patient was admitted to the hospital with a diagnosis of an acute exacerbation of chronic pancreatitis. Radiological findings included a duodenal ileus and pancreatic calcification. Serum amylase was 4,032 units per liter. The day after admission, the patient seemed to improve. However, that evening he became disoriented, restless, and hypotensive. Despite intravenous fluids and vasopressors, the patient remained hypotensive and died. Autopsy findings revealed many areas of fibrosis in the pancreas with the remaining areas showing multiple foci of acute inflammation and necrosis.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Acute Exacerbation of Chronic Pancreatitis	3 Days
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Chronic Pancreatitis	2 Years
		Due to (or as a consequence of)	

	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c) Chronic Alcoholism	10 Years
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1		

Notes on death certification:

Duodenal ileus and pancreatic calcification are nonspecific processes and neither could be listed as an underlying cause of death

Case history no. 2

A 68-year-old male was admitted to the hospital with progressive right lower quadrant pain of several weeks' duration. The patient had lost approximately 40 pounds, with progressive weakness and malaise. On physical examination, the patient had an enlarged liver span that was four finger breadths below the right costal margin. Rectal examination was normal and stool was negative for occult blood. Routine laboratory studies were within normal limits.A chestx ray and barium enema was negative. His EKG showed a right bundle branch block. CT scan showed numerous masses within both lobes of the liver. A needle biopsy of the liver was diagnostic of moderately differentiated hepatocellular carcinoma, and the patient was started on chemotherapy. Three months after the diagnosis, the patient developed sharp diminution of liver function as well as a deep venous thrombosis of his left thigh, and he was admitted to the hospital. On his third day, the patient developed a pulmonary embolism and died 30 minutes later.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Pulmonary Embolism	30 Minutes
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Deep Vein Thrombosis In Left Thigh	3 Days
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c) Acute Hepatic Failure	3 Days
		Due to (or as a consequence of)	
		d) Moderately Differentiated Hepatocellular Carcinoma	Over 3 Months
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1		

Case history no. 3

This 75-year-old male was admitted to the hospital complaining of severe chest pain. He had a 10-year history of arteriosclerotic heart disease with EKG findings of myocardial ischemia and several episodes of congestive heart failure controlled by digitalis preparations and diuretics. Five months before this admission, the patient was found to be anemic, with a hematocritof17,andtohave occult bloodinthe stool.A barium enemarevealed a large polypoid mass in the cecum diagnosed as carcinoma by biopsy.

Because of the patient's cardiac status, he was not considered to be a surgical candidate. Instead, he was treated with a 5-week course of radiation therapy and periodic packed red cell transfusions. He completed this course 3 months before this hospital admission. On this admission the EKG was diagnostic of an acute anterior wall myocardial infarction. He expired 2 days later.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Acute Anterior Myocardial Infarction	2 Days
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Congestive cardiac failure	5 months
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c) Atherosclerotic Heart Disease	10 Years
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Carcinoma Cecum	5 Months

Notes on death certification: Acute myocardial infarction, listed in Part I line (a) as the immediate cause of death, is a direct consequence of congestive cardiac

failure which was caused by arteriosclerotic heart disease, the underlying cause listed in Part I line (b).
Carcinoma of cecum is listed in Part II because it caused anemia and weakened the patient, but it did not cause arteriosclerotic heart disease.

Case history no. 4

A 68-year-old female was admitted to the ICU with dyspnea and moderate retrosternal pain of 5-hours duration, which did not respond to nitroglycerin. There was a past history of obesity, noninsulin-dependent diabetes mellitus, hypertension, and episodes of non-exertional chest pain, diagnosed as angina pectoris, for 8 years. Over the first 72 hours, she developedasignificantelevationof theMB isoenzymeof creatine phosphokinase, confirming an acute myocardial infarction. A Type II second-degree AV block developed, and a temporary pacemaker was put in place. She subsequently developed dyspnea with fluid retention and cardiomegaly on chest radiograph. She improved with diuretics. On the seventh hospital day, during ambulation, she suddenly developed chest pain and increased dyspnea. An acute pulmonary embolism was suspected and intravenous heparin was started. The diagnosis of pulmonary embolism was confirmed by a ventilation/perfusion scan as well as arterial blood gas measurements.Onehourlater,she becameunresponsiveandresuscitation efforts were unsuccessful.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Pulmonary Embolism	1 Hour
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Acute Myocardial Infarction	7 Days
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c) Chronic Ischemic Heart Disease	8 Years
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Non-Insulin Dependent Diabetes Mellitus , Obesity , Hypertension , Congestive Heart Failure	

Notes on death certification:

In this case, noninsulin-dependent diabetes mellitus, obesity, hypertension, and congestive heart failure would all be considered factors that contributed to the death. However, they would not be in the direct causal sequence of Part I, so they would be placed in Part II.

Case history no. 5

A 78-year-old female witha temperatureof 102.6°F was admittedtothe hospital from a nursing home. She first became a resident of the nursing home 2 years earlier following a cerebrovascular accident, which left her with a residual left hemiparesis. Over the next year, she became increasingly dependent on others to help with her activities of daily living, eventuallyrequiring an in-dwelling bladder catheter6 months before the current admission. For the 3 days prior to admission, she was noted to have lost her appetite and to have become increasingly withdrawn. On admission to the hospital her leukocyte count was 19,700, she had pyuria, and gram-negative rods were seen on a gram stain of urine. Ampicillin and gentamicin were administered intravenously. On the third hospital day, admission blood cultures turned positive for *Pseudomonas aeruginosa*, which was resistant to ampicillin and gentamicin. Antibiotic therapy was changed to ticarcillin clavulanate, to which the organism was sensitive. Despite the antibiotics and intravenous fluid support, the patient's fever persisted. On the fourth hospital day, she became hypotensive and died.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Pseudomonas Aerugenosa Sepsis	Days
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Pseudomonas Aerugenosa Urinary Tract Infection	Days
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c) In-dwelling Bladder Catheter	6 Months
		Due to (or as a consequence of)	
		d) Left hemiparesis	2 Years
		Due to (or as a consequence of) e) Old Cerebrovascular Accident	2 Years
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1		

This case illustrates that additional lines may be added to Part I

Case history no. 6

A 34-year-old male was admitted to the hospital with severe shortness ofbreath. He had a 9-month history of unintentional weight loss, night sweats, and diarrhea. The patient had no history of any medical condition that would cause immunodeficiency. An Elisa test and confirmatoryWestern Blot test for human immunodeficiency virus (HIV) were positive. T-lymphocyte tests indicated a low T helper -suppressor ratio. A lung biopsy was positive for pneumocystis carinii pneumonia (PCP), indicating a diagnosis of acquired immunodeficiency syndrome (AIDS).

The patient's pneumonia responded to pentamidine therapy, and the patient was discharged. The patient had two additional admissions for PCP. Seventeen months after the patient was first discovered to be HIV positive, he again developed PCP but did not respond to therapy. He died 2 weeks later.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Pneumocystis Carinii Pneumonia	2 Weeks
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Acquired Immunodeficiency Syndrome	17 Months
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c)	
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	HIV	17+ months

Notes on death certification:

By definition, AIDS is due to HIV infection. HIV contributes to the development of AIDS, so it is listed in part 2. AIDs initiated the causal sequence and is listed as the underlying cause of death in Part 1.

Case history no. 7

A 75-year-old male hada 10-year historyof chronicbronchitis associated with smoking two packs of cigarettes a day for more than 40 years. When seenby his physician approximately2 years prior to his terminal episode, he had moderately reduced FEV_1 and FVC with no response to bronchodilators. During his last year,herequired corticosteroidstoprevent wheezing and coughing at night; however,he was unable toreduce his smoking to less than one pack of cigarettes per day. When seen 3 months prior to his terminal episode, he had significantly reduced FEV_1 and FVC with no response to bronchodilators. He awoke one evening complaining to his wife about coughing and worsening shortness of breath. He was taken to the emergencyroomwherehewasfoundtohavean acute exacerbationof obstructive airway disease. He was admitted to the hospital. At the patient's request, no mechanical ventilation was employed, and he died 12 hours later in respiratory arrest.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Acute Exacerbation of Obstructive Airway Disease	12 Hours
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Chronic Bronchitis	10 Years
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c)	
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Cigarette Smoking	40 Years

Notes on death certification:

In this case, respiratory arrest is considered a mechanism of death, and it would not be listed as the Immediate Cause of Death.

Case history no. 8

A 75-year-old female had a 15-year history of noninsulin-dependent diabetes mellitus, a 13-year history of mild hypertension treated with thiazide diuretics, and uncomplicated myocardial infarction6 years prior to the present illness. She was found disoriented in her apartment and brought to the hospital. On admission she was noted to be unresponsive, without focal neurologic signs, and severely dehydrated with a blood pressure of 90/60. Initial laboratory tests disclosed severe hyperglycemia, hyperosmolarity, azotemia, and mild ketosis without acidosis.A diagnosis of hyperosmolar nonketotic coma was made.

The patient was vigorously treated with fluids, electrolytes, insulin, and broad-spectrum antibiotics, although no source for infection was documented.Within 72 hours, the patient's hyperosmolar, hyperglycemic state was resolved. However, she remained anuric with progressive azotemia. Attempts at renal dialysis were unsuccessful, and the patient died on the 8th hospital day in severe renal failure.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Acute Renal Failure	5 Days
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Hyperosmolar Non-Ketotic Coma	8 Days
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c) Diabetes Mellitus (Non-Insulin Dependent)	15 Years
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Hypertension , Previous Myocardial Infarction	

Notes on death certification:

In this case, hypertension and a previous myocardial infarction would both be considered factors that contributed to the death. However, they would not be in the direct causal sequence of Part I, so they would be placed in Part II.

Case history no. 9

This 53-year-old male was admitted to the hospital following2 days of intermittent midepigastric and left-sided chest pain. The pain radiated to his left arm and was accompanied by nausea and vomiting. He gave a history that included2 yearsof occasional chest discomfort,a near syncopal episode 6 months prior, hypertension, a 30-year history of one pack per day cigarette smoking, congenital blindness, and insulin dependent diabetes mellitus. He was noted to be markedly obese and to have severe hypercholesterolemia.

At the time of admission, his enzyme studies were normal, but the EKG suggested myocardial ischemia. Two days later,he experienced an episode of severe chest pain that did not respond to nitroglycerin and was accompanied by ST-segment elevation. A cardiac catheterization demonstrated severe multivessel coronary artery stenosis. He underwent quadruple coronary artery bypass surgery. Shortly, after being taken off the cardiopulmonary bypass machine, he went into cardiac arrest. As resuscitation was being attempted by open cardiac massage, a rupture developed in his left ventricular wall that resulted in rapid exsanguination and death.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Rupture of Left Ventricle	Minutes
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Myocardial Infarction	2 Days
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c) Coronary Atherosclerosis	2 Years
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Insulin-dependant Diabetes Mellitus , Cigarette smoking , Hypertension , Hypercholesterolemia , Coronary	

		Bypass Surgery.	

Notes on death certification:

In this case, insulin-dependent diabetes mellitus, cigarette smoking, hypertension, and hypercholesterolemia would all be considered factors that contributed to the death. However, they would not be in the direct causal sequence of Part I, so they would be placed in Part II. The surgery probably played a role in death but did not cause the coronary artery disease, so it is also listed in Part II.

Case history no. 10

A 480 grammale infantwasbornat 32-weeks' gestationtoa 20-year-old primiparous woman. Newborn screening found elevated levels of immune reactive trypsinogen in the blood. The infant developed respiratory distress syndrome and required mechanical ventilation for 7 days. Despite receiving adequate calories for growth, the infant gained weight poorly and had persistent diarrhea. Steatorrhea was confirmed upon microscopic examination. Results from a sweat chloride test given on the 21st day after birth were negative, but the patient had an elevated sweat chloride concentration of 85 mill moles per liter when the test was repeated at 35 days of age. On the 37th day after birth, the infant became lethargic and was noted to be edematous. Escherichia coli was cultured from the infant's cerebral spinal fluid, total serum proteins were reported to be low, and clotting studies wereprolonged. The infant died at 45 days of age despite appropriate life-saving efforts. Gross autopsy confirmed the clinical impression of cystic fibrosis.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Escherichia Coli Meningitis	7 Days
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Cystic Fibrosis	45 Days
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c)	
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Prematurity, Malabsorption , Respiratory Distress Syndrome, Failure to thrive.	

Notes on death certification:

In this case, prematurity, malabsorption, respiratory distress syndrome, and failure to thrive would all be considered factors that contributed to the death. However, they would not be in the direct causal sequence of Part I, so they would be placed in Part II.

Case history no. 11

A 37 year old multipara with gestational diabetes mellitus was admitted to hospital with dribbling at 32 weeks of gestation. Diagnosis of premature rupture of the membranes was made and she was put on antibiotics. Two days later, she delivered a baby boy weighing 1.4 kg. On examination, the baby was found to be premature and was short of breath. The diagnosis of respiratory distress syndrome of neonates was made. The baby was sent to the premature baby unit for further care.

Despite all treatment, the baby died 14 hours following birth

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) neonatal respiratory distress syndrome	2 days
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Prematurity/premature baby	2 days
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c) pre-term labour	2 days
		Due to (or as a consequence of)	
		premature rupture of membranes	More than 2 days
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	grand multi para (32 Weeks), gestational diabetesmellitus(when not known).	

Case history no. 12

A 30-year-old, gravida six, para five, (G6, P5) with a history of gestational hyper-tension, reported to the emergency room at 36 weeks gestation with complaints of abdominal cramping and light vaginal bleeding during the past 12 hours. At time of first assessment, fetal heart tones were detected. The uterus was tense, irritable, and tender. The mother was hypotensive with tachycardia.Apresumptive diagnosis of abruptio placenta was made, and an emergency cesarean section was performed under general anesthesia. The baby was stillborn. The mother continued to bleed from her uterus and phlebotomy sites and went into profound shock secondary to disseminated intravascular coagulation. Despite administration of blood and clotting factors, intravascular pressure could not be maintained, and the mother died on the operating table. Maternal autopsy confirmed the clinical diagnosis.

A death certificate would be completed for the mother and a fetal death report for the fetus. The cause of fetal death is reported using a different format.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Hemorrhagic Shock	Minutes
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Disseminated Vascular Coagulopathy	Hours
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c) Abruptio Placenta	Over 13 Hours
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Gestational Hypertension , 36 Weeks Pregnancy	

Maternal death certificate: *Notes on death certification:*

*In this case, gestational hypertension would be considered a factor that contributed to the death. However, it would not be in the direct causal sequence of Part I, so it would be placed in Part II.*Fetal death report.

Case history no. 13

A 92-year-old male was found dead in bed. He had no significant medical history. Autopsy disclosed minimal coronary disease and generalized atrophic changes commonly associated with aging. No specific cause of death was identified. Toxicology was negative.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Undetermined Natural Causes	Unknown
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b)	
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c)	
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1		

Note: In some cases, no overwhelming cause presents itself. It is acceptable to indicate that a thorough investigation was performed; however, no cause could be determined.

Case history no. 14

A 102-year-old female was brought to the hospital because her word combinations were not comprehensible. However, at admission, her sentences were lucid. She was placed on blood anticoagulants. She had a history of arthritis, hypertension, blocked arteries, coronary thrombosis (25 years before), stroke (10 years before), periodic TIAs (8-year period), and congestive heart failure (hospitalized 6 years before). On the fourth day in the hospital, a colonoscopy indicated internal bleeding, so the anticoagulant was discontinued. She was released from the hospital after 7 days. After discharge, language and motor skills were impaired although functioning was better earlier in the day; moreover, her leg coloration started changing. After a week at home, the woman was re-admitted to the hospital following a spell of vomiting. Vascular imaging indicated that circulation was blocked at the groin, there was no improvement in language, ability to eat and keep food down deteriorated, and heart rate periodically was arrhythmic with periods of third-degree heart block. After a week of hospitalization, she was sent home under hospice care and died2 days later. Her attending physician completed the death certificate.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Congestive Heart Failure	7 Years
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Coronary Heart Disease	25 Years
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c)	
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1		

COVID Cases

COVID history no. 1

A 67-year-old man presents to the hospital with 6-day history of shortness of breath and dry cough. He was unable to take his temperature at home but feels "hot" and has night sweats. He has a past medical history of hypertension (10 years) and chronic renal insufficiency (6 years). The patient recently traveled from Pune to Mumbai two weeks ago during the lockdown period when Mumbai was experiencing increases in COVID cases and deaths. The travel was necessary to see a specialist for Acute Myelogenous Leukemia (AML) diagnosed only 1 month ago.The patient was admitted to the hospital with a fever of 103 degrees and transported to the medical unit. Chest x-ray indicated a bilateral pneumonia. He underwent a nasopharyngeal swab for COVID-19. The patient became worse overnight and required intubation. He spent 20 hours on the ventilator prior to death.The COVID-19 NP swab returned positive.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Acute Respiratory Distress Syndrome	1 Day
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Pneumonia	1 Day
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c)COVID-19, CONFIRMED	7 Days
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Acute Myelogenous Leukemia (1 Month), Hypertension (10 Years)	

Note: that the decedent suffered from shortness of breath and dry cough etc. Remember, these are signs and symptoms and you do not write them on the MCCD form. Report only detailed medical conditions in a causal sequence with time intervals on MCCD forms.

COVID history no. 2

A 57-year-old man returned 3 weeks ago from visiting family in Delhi during the lockdown period when Delhi was experiencing a spike of COVID cases and deaths. He followed lockdown restrictions, but used taxis to visit family and did not consistently wear a mask. During his visit in Delhi, he was notified that a family member he visited multiple times was diagnosed with COVID19 and hospitalized.He has a past medical history of hypertension, obesity and obstructive sleep apnea. He has been complaining of being tired with fatigue and malaise for the last week. He also complained of feeling warm and sleeping poorly at night due to chills and what he called a fever. For the last 3 days the patient has had a dry nonproductive cough. He was preparing to go to see his doctor when he suddenly collapsed and died at home.His family called his doctor to the home to declare and certify his death. The family told his doctor about his symptoms upon return from his trip and visit with a family member diagnosed with COVID19.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	c) Probable COVID-19	1 Week
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	d)	
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c)	
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Hypertension, Obesity, Obstructuve Sleep Apnea	

Note: It is acceptable to write PROBABLE or SUSPECTED in MCCD certificate if you are not sure of the diagnosis or the condition which lead to death. In this case, a COVID test was not performed, but the decedent showed signs of COVID as per the standard case definition of the disease, so it is acceptable to write probable or suspected COVID-19.The decedent also suffered from fever with chills and a dry non-productive cough. Remember, these are signs and symptoms and you do not write them on the MCCD

form. Report only detailed medical conditions in a causal sequence with time intervals on MCCD forms.

COVID history no. 3

A 75-year-old bedridden woman who is a resident of a nursing home has been suffering from fever and chills for the last week. The nursing home had a recent COVID19 outbreak with multiple cases and deaths despite quarantine efforts. The woman began to complain of shortness of breath and swelling of her right leg and was admitted to the hospital. Upon arrival she was in acute respiratory distress and was placed on oxygen via nasal canula. The patient has a past medical history of diabetes mellitus (20 years), obesity and asthma (40 years). The patient was swabbed for COVID-19 and tested positive. Her chest x-ray is positive for pneumonia. She becomes acutely short of breath the following day and is found to have bilateral pulmonary emboli just hours prior to her death.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Pulmonary embolus	Hours
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Pneumonia	1 Day
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c)Deep Vein Thrombosis	1 Day
		Due to (or as a consequence of)	
		d)COVID-19, Confirmed	1 Week
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Diabetes Mellitus, Obesity, Asthma	

Note: The decedent also suffered from fever with chills, shortness of breath and swelling of her right leg. Remember, these are signs and symptoms and you do not write them on the MCCD form. Report only detailed medical conditions in a causal sequence with time intervals on MCCD forms.

COVID history no. 4

A 65-year-old man complained of fever and shortness of breath. The patient had a 20 year history of asthma and 10 year history of diabetes mellitus. He went to a local hospital and was given a nebulizer treatment and oxygen via nasal canula. The hospital has just run out of COVID tests so the doctor wanted to admit him to monitor him and test him when tests arrived the following day. The patient declined overnight hospitalization since he improved with the nebulizer treatment.The patient was given instructions to follow-up with his family doctor the following day and to get a COVID19 test. His family doctor visited him the following day when he was complaining of worsening shortness of breath. He was too tired to go to the health clinic for a COVID19 test and decided to go the following day.The patient was found deceased in his home the following day by his doctor who checked on him.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	e) Probable COVID-19	2 Days
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	f)	
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c)	
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Asthma (20 years), Diabetes Mellitus (10 years)	

Note:It is acceptable to write PROBABLE or SUSPECTED in MCCD certificate if you are not sure of the diagnosis or the condition which led to death. In this case, a COVID test was not performed, but the decedent showed signs of COVID as per the standard case definition of the disease, so it is acceptable to write probable or suspected COVID-19. The decedent also suffered from fever and shortness of breath. Remember, these are signs and symptoms and you do not write them on the MCCD form. Report only detailed medical conditions in a causal sequence with time intervals on MCCD forms.

Covid history no. 5

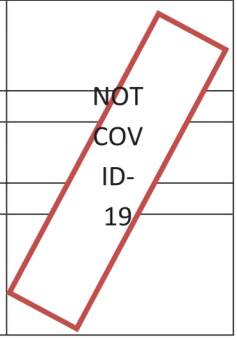
A 60-year old male was admitted to a hospital with a five-day history of fever, sore throat and body aches. History included two years of occasional chest discomfort, hypertension, a 30-year history of one-pack per-day cigarette smoking, and a 10-year history of type 2 diabetes. He was noted to be markedly obese and to have severe hypercholesterolemia.

His nasopharyngeal swab for polymerase chain reaction (PCR) was positive upon admission. Three days after hospitalization, his fever and sore throat subsided. On the tenth day of hospitalization, the second PCR was negative. One day later, the patient complained of sudden tightening retrosternal chest pain associated with sweating, nausea and vomiting. ECG showed evidence of non-ST elevation anterior myocardial infarction.

A coronary angiography done on the next day demonstrated severe multi-vessel coronary artery stenosis.

Two hours after angiography, he again developed severe chest pain and went into cardiac arrest. Despite all attempts of resuscitation, the patient expired thirty minutes after the arrest.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	a) Non ST elevation anterior myocardial infraction	2 days
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	b) Coronary atherosclerosis	2 years
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c)	
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Covid-19 virus identified (17 days), Hypertension (10 Years), Diabetes mellitus type 2 (15 Years); smoking (30 Years)	



Covid history no. 6

A 76-year old person was coming to the hospital after he has been tested positive for COVID – 19 in a community screening program

He was knocked down by a motor car, while he was crossing the road in front of the hospital. The patient was then rushed to the surgical emergency ward.

Emergency X – ray left thigh revealed a displaced fracture in the shaft of the left femur. Patient was pale. Blood pressure on admission was very low.

Despite the transfusion of blood and plasma expanders, the patient developed hypovolemic shock.He died on the same day.

CAUSES OF DEATH			
Part 1	Enter the disease, injuries or complications that caused the death. Do not enter the mode of dying, such as cardiac or respiratory arrest, shock or heart failure, List only one cause on each line		Approximate interval between onset and death (Day, Month, Years)
	IMMEDIATE CAUSE (Final disease or condition resulting in death)	c) hypovolemic shock	1 day
		Due to (or as a consequence of)	
	Sequentially list conditions, if any, leading to immediate cause.	d) fracture left femur	1 day
		Due to (or as a consequence of)	
	Enter UNDERLYING CAUSE last (disease or injury that initiated events leading to death)	c)Pedestrian knocked down by a car	1 day
		Due to (or as a consequence of)	
		d)	
		Due to (or as a consequence of)	
Part 2	Other significant conditions contributing to death but not resulting in the cause given in Part 1	Covid-19 virus identified (17 days)	

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APPENDIX A: Form 4

For Hospital Events **Appendix - II**

FORM NO. 4

(see rule 7)

MEDICAL CERTIFICATION OF CAUSE OF DEATH

(Hospital in-patients. Not to be used for still births)

To be sent to Registrar along with Form No. 2 (Death Report)

Name of the Hospital _____ I hereby certify that the persons whose particulars are given below died in the hospital in Ward No_____ on _____at _____ A.M./ P.M.

NAME OF DECEASED					For use of Statistical Office
SEX	Age at Death				
	If 1 year or more, age in Years	If less than 1 year, age in Months	If less than one month, age in Days	If less than one day, age in Hours	
1. Male 2. Female					
CAUSE OF DEATH				Interval between on set & death approx.....	
I immediate cause State the diseases, injury or complication which caused death, not the mode of dying such as heart failure, asthenia, etc.	(a) _____ Due to (or as a consequences of)				
Antecedent cause Morbid Conditions, if any, giving rise to the above Cause, stating undertying conditions last	(b)..... ..... Due to (or as a consequences of)				
II Other significant conditions contributing to the death but not related to the disease or conditions causing it	(c).....				

Manner of Death How did the injury occur ?

1. Natural 2. Accident 3. Suicide 4. Homicide
5. Pending investigation

If deceased was a female, was the death associated with pregnancy ? 1. Yes 2. No
If Yes, was there a delivery ? 1. Yes
2. No.

Name and signature of the Medical Attendant certifying the cause of death
Date of verification_____

(To be detached and handed over to the relative of the deceased)

Certified that Shri/Smt./Kum. _____ S/W/D of Shri _____ R/O _____ was admitted to this hospital on _____ and expired on _____

Doctor _____
(Medical Supdt. & Name of Hospital)

APPENDIX B: Form 4A

For Non-Hospital Events **Appendix-III**

FORM NO. 4A
(see rule 7)
MEDICAL CERTIFICATION OF CAUSE OF DEATH
(For non-institutional deaths, Not to be used for still births)
To be sent to Registrar along with Form No. 2 (Death Report)

I hereby certify that the deceased Shri/Smt./Km. _____ son of /wife of/ daughter of _____ resident of _____ was under my treatment from _____ to _____ and he/she died on _____ at _____ A.M./ P.M.

NAME OF DECEASED					For use of Statistical Office
SEX	Age at Death				
	If 1 year or more, age in Years	If less than 1 year, age in Months	If less than one month, age in Days	If less than one day, age in Hours	
1. Male 2. Female					
CAUSE OF DEATH				Interval between on set & death approx.....	
I Immediate cause State the diseases, injury or complication which caused death, not the mode of dying such as heart failure, asthenia, etc.	(a) _____ Due to (or as a consequences of)				
Antecedent cause Morbid Conditions, if any, giving rise to the above Cause, stating underlying conditions last	(b)..... Due to (or as a consequences of)				
II Other significant conditions contributing to the death but not related to the disease or conditions causing it	(c).....				

If deceased was a female, was the death associated with pregnancy? 1. Yes 2. No
If Yes, was there a delivery? 1. Yes 2. No.

Name and signature of the Medical Attendant certifying the cause of death
Date of verification_____

(To be detached and handed over to the relative of the deceased)

Certified that Shri/Smt./Kum. _____ S/W/D of Shri _____ R/O _____ was admitted to this hospital on _____ and expired on _____ at _____ A.M. / P.M.

Doctor _____
Signature and address of Medical Practitioner /
Medical Attendent with Registration No.

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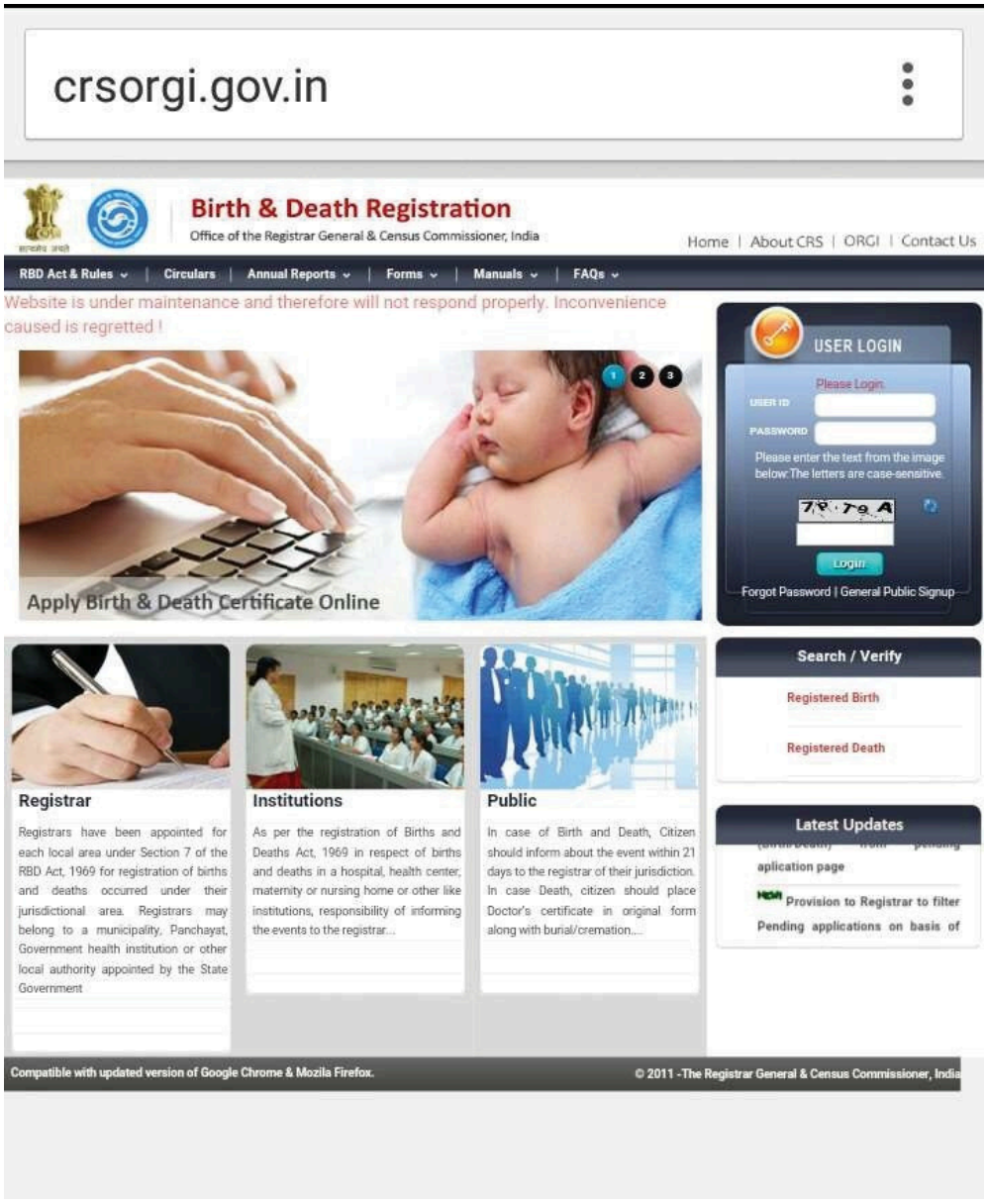
Both form 4 & 4A are as per CRS 2020

APPENDIX C: Online birth and death registration portal



Pocket Reference for

Filling Out Death Certificates

Accurate Cause of Death Reporting

Mortality statistics are essential health information used in India to influence and formulate health policy. Documenting the causes of death on the death certificate requires following basic principles and steps.

Patients may have single or multiple conditions contributing to death. In principle, all conditions should be stated and entered in the Medical Certificate of Cause of Death (MCCD) according to international standards. Below is an outline of steps required in completing the MCCD accurately.

- The causes of death listed on form 4 or 4A should reflect the physician's medical opinion as based on the comprehensive evaluation of the patient and medical record.
- In **Part I**, document the complete chain of events and time intervals according to the pathological and chronological sequence. The condition recorded in the lowest used line that initiated the chain of events is the tentative **underlying cause of death**.
- In **Part II**, document **other significant conditions** that contributed to death. These conditions are not causally related to conditions in Part 1 that led directly to the death. For example, if a patient died of carcinoma of the breast (entered in Part 1) and in addition had Diabetes Mellitus, then Diabetes Mellitus should be entered in Part II.

Part I: Line A, Immediate cause of death

- **Indicate the immediate cause of death-** ***the condition that occurred right before the patient death*** – Examples: Pulmonary embolism; Congestive heart failure; Liver failure; Upper gastrointestinal haemorrhage; Left lower lobe pneumonia.

Part I: Lines B-D, Intermediate and Underlying Causes of Death

- **Outline the sequence of conditions that led to the immediate cause of death listed in line A.**
- A physician may report more than one cause which should be entered in the remaining lines B, C and D where applicable. ***Only one cause is listed per line.***
- **Line B:** Indicate the condition that led to the immediate cause of death mentioned in line A. For example: If pulmonary embolism is on line A, indicate its cause on line B (e.g. pathological fracture).
- **Line C:** Continue backwards in time and pathological sequence. Specify, to the best of your knowledge, what led to the preceding line (e.g., Line A: pulmonary embolism; Line B: pathological fracture; Line C: secondary carcinoma of the right femur)
- **The LAST LINE** (*in this case line D*) **should be the UNDERLYING CAUSE, the condition that initiated the chain of events.** (e.g., Line A: pulmonary embolism; Line B: pathological fracture; Line C: secondary carcinoma of the right femur; Line D: primary carcinoma of the left upper outer quadrant of breast)
- **Note:** Paraplegia, Hypotension, and Renal failure would not be the underlying causes because you can specify further the conditions that caused them.

Part II: Other significant conditions

- The deceased might have had medical condition(s) which was/were not part of the sequence in Part I. Use Part II to list this/these **Other Significant Condition(s)** (e.g. Diabetes mellitus type 2).

Filling Out Death Certificates

Cause of death data is used to allocate public funds and clinical resources.
THANK YOU for providing accurate information!

Examples

- A 60 year old female with a history of poorly controlled hypertension for 12 years and a positive stress test six years ago dies after having an acute myocardial infarction three days ago.

  Part I: Line A: Acute myocardial infarction (3 days), Line B: Atherosclerotic coronary artery disease (6 years), Line C: Essential hypertension ***Tentative Underlying Cause*** *(12 years)*

- A 55 year old male with liver cirrhosis for 1 year from chronic alcohol abuse for the past 15 years dies of an upper gastrointestinal bleed of 2 days.

  Part I: Line A: Upper gastrointestinal bleed (2 days), Line B: Ruptured oesophageal varices (2 days), Line C: Liver cirrhosis (1 year), Line D: Chronic alcohol abuse ***Tentative Underlying Cause*** *(15 years)*

- A 30 year old male with a history of emphysema 4 years is hospitalized for community acquired Klebsiella pneumonia 5 days and dies.

  Part I: Line A: Acquired Klebsiella Pneumonia (5 days), Line B: Emphysema ***Tentative Underlying Cause*** *(5 years)*

Do's and Don'ts of writing COD Reporting

- Do not use abbreviations (e.g., MI, DM, CHF, PM, MR, IHD, CCF, AGE). *Only AIDS is acceptable.*
- Each field to be written in legible CAPITAL LETTERS.
- No field should be left blank between immediate cause and underlying cause of death.
- Verify with the informant the spelling of names.
- Obtain all signatures and rubber stamps.
- Avoid using non-specific causes of deaths (e.g. terms like hypoxia, cardio-respiratory arrest and respiratory failure).
- Lines A, B, C, and D in Part I should be filled in the correct pathological and chronological sequence.
- Always fill the time interval column if known and state "Unknown" or "Not Known" if time interval unknown.
- Write only **one** causes of death per line in Part I.
- Be specific! Specify location if applicable, e.g. Fracture of left femur; Hit by truck while riding bicycle.

For More Information visit: www.crsorgi.gov.in

For the World Health Organization online self-learning course on MCCD visit: http://apps.who.int/classifications/apps/icd/icd10training/

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टी एम सी
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ATOMS IN THE SERVICE OF THE NATION
टाटा स्मारक केंद्र
Tata Memorial Centre

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