

## Medical Certification of Cause of Death (MCCD) with special reference to deaths due to Coronavirus Disease 2019 (COVID-19)

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### Abstract

In communicable diseases pandemic, death certificates are vital for public health surveillance and deaths. A uniform protocol is expected for the same as inconsistent death certification protocol may lead to misleading death-related statistics. Deaths due to COVID-19 may occur in varying circumstances and even in patients without prodromal symptoms. Similarly, deaths in suspected COVID-19 patients may be misdiagnosed or certified. An accurate certification of deaths due to COVID-19 infections is vital as it is critical for ongoing public health surveillance and response. Similarly, e-Mortality (e-Mor) software, hosted by The National Centre for Disease Informatics and Research (NCDIR) should be used as it records details of the death of all institution and non-institution-based deaths with a guide to prevent errors in the cause of death. The article is intended to guide health professionals on proper cause-of-death certification for cases where confirmed or suspected COVID-19 infection resulted in death.

### Keywords

COVID-19; The underlying cause of death (UCOD); Pandemic; MCCD.

### Introduction

Registration of Births and Deaths Act, Sec. 2 (b) defines death as the permanent disappearance of all evidence of life at any time after live birth has taken place.<sup>1,2</sup> Mortality statistics form an integral part of the vital statistics system. They are one of the essential components of population growth. Further, the cause-specific mortality rates are key indicators of the health trends in the population. They are provided on a scientific basis by the Medical Certification of Cause of Death (MCCD).

The data on the cause of death contained in the certificate serve many purposes; they help assess the effectiveness of public health programs and provide feedback for future policy and implementation. They are essential for better health planning, management and deciding priorities of health and medical research programs. A notable example of the utility of death certificates for public health surveillance is the ongoing monitoring of deaths due to COVID-19. This article is intended to guide Health professionals on proper cause-of-death certification for cases where confirmed or suspected COVID-19 infection resulted in death.

Medical Certification of Cause of Death under the Civil Registration System has statutory backing under sections 10(2) and 10(3) of the Registration of Births & Deaths Act, 1969. As

per Section 17 (1) (b) of the Registration of Birth and Death act, any person can obtain an extract from the register relating to any death.<sup>2</sup> However, the information on the cause of death will not be disclosed unless it is in the interest of the public.<sup>2</sup> MCCD is also essential for claiming family allowance, hospital reimbursement, life insurance claims, obtaining a succession certificate, settling inheritance/property claims, releasing gratuity and provident fund claims, deleting the deceased name for the Ration Card, etc. Apart from these, MCCD have various administrative and statistical importance while implementing safety norms, public health program, research purposes, etc.<sup>3</sup>

### General guidelines for issuing of MCCD

The medical practitioner has to diagnose the occurrence of death, decide the cause of death, and record the same in MCCD.<sup>4</sup> It is common to refer to form 4 / 4A (Medical Certificate of the cause of death) issued by doctors as a Death Certificate. However, as per the act, the term Certificate of Death or death certificate refers to Form 6 issued by the Office of Registrar and not by Doctor.<sup>5</sup> A medical practitioner should issue MCCD immediately after the person's death, provided that the Doctor is certain about the cause of death.<sup>5</sup>

- The death report (Form 2) and MCCD (Form 4/4A) should reach the Registrar within a prescribed time limit.<sup>6</sup>
- He should not withhold issuance of a medical certificate of cause of death even if the relatives have not cleared his dues.<sup>5</sup>
- In case it is an Unnatural death, the body should be handed over to the police.<sup>5</sup> However, the Doctor is responsible for informing the Registrar about the occurrence of death.<sup>6</sup>

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### How to fill MCCD

The Medical Certificate of Cause of Death (MCCD) is of two types;

1. Form No. 4 - For deaths occurring in the hospitals.
2. Form No. 4A - For non-institutional deaths.

The certificate should be filled in 2 parts. Part I mentions the events which led to death, and Part II mentions the conditions which contributed to the death.

**Part I:** Cause of death in part-I can be written in sequential lines (a, b, and c or more).

#### Line (a): Immediate cause

The direct or immediate cause of death is reported in line (a). This is the disease, injury, or complication that directly preceded death. It can be the sole entry in the statement if only one condition was present at death. There must always be an entry in line (a). The mode of dying (e.g., heart failure, respiratory failure) should not be stated at all since it is no more than a symptom of the fact that death occurred and provides no useful information.

#### Line (b): Antecedent cause

If the condition on line (a) was the consequence of another condition, record that in line (b).

This condition must be antecedent to the immediate cause of death. An antecedent condition might have just prepared the way for the immediate cause of death, by damage to tissues or impairment of function, even after a long interval.

**Line (c):** The condition, if any, which gave rise to the antecedent condition on line (b) is to be reported here. Usually, the condition or circumstance on the lowest line used in part I will be taken as the basis for underlying cause statistics, though the classification of it may be modified to take account of complications or other conditions entered by special provisions of the ICD.<sup>6</sup>

However, if the sequence of events comprises more than three stages, an extra line (and entries) may be made in part I as (d).

#### Part II: Other significant Conditions contributing to the death but not related to the disease or condition causing Part-I

All diseases or conditions, which were not directly related to the disease-causing the death, though, might have unfavorably influenced the morbid process, should be entered here.<sup>6</sup> This includes conditions like obesity, diabetes, occupational hazards, exposure history, surgical history, etc.

- **The interval between Onset and Death:** The exact period from the onset of the morbid condition and the date of

death is to be mentioned.

- **Accident, Suicide, Homicide:** Explain the circumstances or cause of the accident briefly. If the Doctor suspects that death is due to unnatural cause and when the manner of unnatural death is not ascertained, it must be mentioned as **Pending Investigations**.
- **Female death:** If women are of the childbearing age group (15-49 yrs.), information on pregnancy and delivery is to be given
- **Name of the Practitioner:** The name with the registration number of the medical practitioner should be mentioned.

### MCCD in Deaths Due to Coronavirus Disease 2019 (COVID-19)

COVID-19 is the infectious disease caused by the most recently discovered coronavirus (SARS-CoV-2) from Wuhan, China, in December 2019. The COVID-19 disease outbreak was declared a Public Health Emergency of International Concern (PHEIC) on 30 January 2020 by the World Health Organization, and later on 11 March 2020 as a Global Pandemic.<sup>7,8</sup> During such situations, mortality surveillance becomes a vital public health tool to assess the impact of viral infection.

#### The underlying cause of death in the case of COVID-19 disease

COVID-19 is reported to cause pneumonia/acute respiratory distress syndrome (ARDS) / cardiac injury/disseminated intravascular coagulation, and so on. These may lead to death and maybe recorded inline 'a' or 'b' of Part-I. COVID-19 is likely the underlying cause of death (UCOD) that leads to ARDS or Pneumonia in most deaths due to COVID-19 (test positive and symptoms positive). In these cases, COVID-19 must be captured in the last line / lowest line of Part I of MCCD form 4/4 A. Acute respiratory failure is a mode of dying, and it is prudent not to record it in line a/b/c.

Patients may present with other pre-existing comorbid conditions such as chronic obstructive pulmonary disease (COPD) or asthma, chronic bronchitis, ischemic heart disease, cancer, and diabetes mellitus. These conditions increase the risk of developing respiratory infections and lead to complications and severe disease in a COVID-19 positive individual. These conditions are not considered as UCOD as they have directly not caused death due to COVID-19.

#### Points to be avoided in writing cause of death (COD):

- Avoid mode of dying as the cause of death – Mode of dying merely tells you that death has occurred and is not specifically related to the disease process.

Examples of the mode of dying are - Respiratory Arrest, Asphyxia, Asthenia, Brain failure, Exhaustion, Heart Failure, Hepatic/Liver failure, Hepato-renal failure, Kidney failure, /Renal failure, Cardiac Arrest/Heart Attack, etc.

- Avoid abbreviations and short forms like ARDS, COPD, SARI. The correct way to write is a complete form like acute respiratory distress syndrome for ARDS, Chronic obstructive pulmonary disease for COPD and Severe Acute Respiratory illness for SARI.
- Though COVID-19 (Coronavirus disease -19) is an abbreviation, it has been specified by the WHO and is an acceptable term to be used as UCOD.

ICD-10 Codes for COVID-19 provided by World Health Organization

Test	Symptoms of COVID-19	Diagnosis	Code
Positive	None	Confirmed COVID-19	U07.1
Positive	Present	Confirmed COVID-19 documented as UCOD	U07.1
Positive	Present with comorbid conditions like heart disease, asthma, COPD, Type 2 diabetes	Confirmed COVID-19 documented as UCOD	U07.1
Negative	Present	Clinically - Epidemiologically diagnosed COVID-19	U07.2
Test awaited	Present	Suspected COVID-19	
Test inconclusive	Present	Probable COVID-19	

Manner of death due to COVID-19 infection will mostly be 'natural,' as it is the disease that leads to death. In the case of suicide by an individual who tested positive for COVID-19, the manner of death may be captured as suicide / pending investigation if the medical autopsy is awaited. Most of the deaths due to COVID-19 occur in a hospital, and in such cases, the place of death should be captured as 'Hospital.' In case an individual is discharged from the hospital, and the death occurs in his/her residence, the place of death must be captured as 'House.'

#### Indian Council of Medical Research (ICMR)- The National Centre for Disease Informatics and Research (NCDIR) e-Mortality (e-Mor) software for recording cause of death<sup>9</sup>

The ICMR-NCDIR e-Mortality (e-Mor) software application aids in recording and reporting the cause of deaths as per national standards of death reporting laid down by the Office of Registrar General of India (ORGI) under its Civil Registration System (CRS). This software can be implemented by hospitals and district local registrar offices in a district (to record deaths occurring in residence). Institutions should register with ICMR-NCDIR or State authority for the provision of authorized login

credentials. This will allow access to the software with its technical training on MCCD), ICD-10 coding for cause of death, and the use of software for recording and reporting deaths. The application data entry form is designed to record all details of Form 2 (Death Report) and Form 4 / 4A (MCCD Forms).

#### Features of NCDIR e-Mor software

- Record details of the death of all institution and non-institution-based deaths with a guide to prevent errors in the cause of death.
- Guide in recording the sequence of death events and underlying cause of death
- Guide in ICD-10 coding as per the National list of the ORGI and codes for COVID-19 announced by the World Health Organization.
- Quality check modules to reduce errors in a recording like a date check, missing field check and search and export features.
- Exporting data to maintain the mortality register of the institutional deaths and generate statistical tables for data analytics to establish mortality audit systems in hospitals.
- District Registrar and Chief Registrar Office at the state level can monitor data coverage, MCCD coverage and generate statistical tables on leading causes of death district and state wise.
- This software is available free of cost for use by any hospital/health facility/private practitioner/ administrative unit concerned with recording the cause of death. It is available on <http://ncdirindia.org/e-mor>

#### Conclusion

While dealing with death, the physician has to fill MCCD (Form4/4A) and the Death Report (Form 2). If he is not able to conclude regarding the cause of death, then the concerned authority should be informed for further investigation. When death is due to COVID-19, it is likely the UCOD, and thus, it should be reported on the lowest line used in Part I of the death certificate. An accurate certification of deaths due to COVID-19 infections is vital as it is critical for ongoing public health surveillance and response.

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