

# Evaluation of Errors in Medical Certificate of Cause of Death at a Tertiary Health Care Hospital in North India: An Original Research Study

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## Abstract

**Introduction:** The medical certificate of cause of death (MCCD) also commonly known as death certificate plays an important role in providing mortality pattern of various diseases. Because of this reason, the MCCD scheme is blended closely with the registration of births and deaths act. The details in MCCDs are a very important factor in compiling and understanding the population growth and providing a demographic outlook for health planning and policy formulation. The death certification data are also useful for the community health designers, administrators, medical professionals, and research workers. This study was undertaken to understand and evaluate the common major and minor errors in the MCCDs issued by various medical practitioners so that after identifying the problems proper suggestions and various preventive methods can be advised appropriately and which will positively affect the health-care system of our region.

**Materials and Methods:** It was a Retrograde Study at Forensic Medicine and Toxicology department of our hospital - Shri Guru Ram Rai Institute of Medical and Health Science, Dehradun. Only completely filled 100 MCCD certificates were involved in the study.

**Observations and Results:** The errors while filling the MCCD certificates were divided into Major and Minor Errors. In the current study of 100 cases, 60 cases showed unrelated causal events stated as related and wrong sequence of causal events was found in 56 cases. One or other minor error was found in all death certificates. The most common was the use of abbreviations, which occurred in 89% of cases. Mechanism of death was written as immediate cause of death and followed by legitimate causes of death in 86% of cases. Illegible handwriting was found in 36% of cases.

**Conclusion:** Fallacies can be avoided by proper training of the medical students at various levels like its rigorous involvement in the study curriculum and examination. Hence, this study denotes the various fallacies in MCCD documentations and various proposed methods for its improvement.

**Key words:** Cardio-respiratory arrest, Death, Major and minor errors, Medical certificate of cause of death

## INTRODUCTION

The medical certificate of cause of death (MCCD) also commonly known as death certificate plays an important role in providing mortality pattern of various diseases.

Because of this reason, the MCCD scheme is blended closely with the registration of births and deaths act, 1969,<sup>[1]</sup> and is provided with legal support. MCCD is basically a part of international statistical classification of diseases (ICD) and health-related problems formulated by the World Health Organization (WHO). It provides basic scientific information for medical research and it enables planners to understand the trend and mortality pattern of various diseases.

The registration of Births and Deaths Act, 1969, came into force in the state in 1970. To ensure correct and proper filling up of these forms, the government is currently

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covering this scheme in phased manner to include Medical Practitioners and Coders at primary, secondary and tertiary levels. It is also being included in the MBBS curriculum so that budding medical practitioners will be well versed with this issue.<sup>[2]</sup>

The details in MCCDs are a very important factor in compiling and understanding the population growth and providing a demographic outlook for health planning and policy formulation. The death certification data is also useful for the community health designers, administrators, medical professionals, and research workers. The size and topographical dispersal of deaths in relation to prevalence of diseases, evaluation of risks of deaths from various causes at different ages, the medical implications of combination of the conditions resulting in death, and proportion of deaths occurring in hospitals are a crucial aspect of interest to many professionals. Public health executives, therefore, depend profoundly on analysis of causes of death for vital statistical data, for articulating national and state health care Policies and Programs.<sup>[2]</sup>

The certificate of cause of death is divided into two parts: I and II, Part I is again divided into three parts, lines (a) (b) (c). If a single morbid condition completely explains the deaths, then this will be written on line (a) of Part I, and nothing more is needed to be written in the rest of Part I or Part II, [Figure 1] according the various guidelines, rules, and regulations governing the medical practices in our country it is the accountability of the treating doctor to issue MCCD in the correct manner.<sup>[2]</sup> Almost every medical intern, resident doctor are superficially taught to properly document a MCCD, hence teaching the precise wording and formulation of causes of death is not properly taught either in undergraduate or postgraduate medical education<sup>[3]</sup> The common cause of death certificate format used in India is based on the recommendation of the WHO and the correct method of filling has been extensively mentioned in studies and in national/international guidelines.<sup>[4]</sup> Consequently, inaccuracies in the completion of death certificates may lead to biased estimation of several epidemiological parameters.<sup>[4,5]</sup>

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This study was undertaken to understand and evaluate the common major and minor errors in the MCCDs issued by various medical practitioners so that after identifying the problems proper suggestions and various preventive

methods can be advised appropriately and which will positively affect the health-care system of our region.

## MATERIALS AND METHODS

- Study design: Retrograde study
- Study area: Forensic Medicine and Toxicology department of our hospital - Shri Guru Ram Rai Institute of Medical and Health Science, Dehradun
- Approval of research project was granted by the institutional ethics and research committee
- Our study included the correct procedure of filling of medical certificate of death and the common mistakes committed during issuing of a medical certificate of death
- Only completely filled MCCD certificates were involved in the study
- The incomplete filled MCCDS were not included in the current study which included various criterion [Table 2]
- The cases where cause of death or manner of death was kept reserved were excluded from the study
- Prefilled Performa of major and minor errors which was peer validated and according to rules and regulation.<sup>[7]</sup>
- Data were gathered from 100 certificates dated from December 10, 2022, to June 10, 2023.

## OBSERAVTIONS AND RESULTS

The errors while filling the MCCD certificates were divided into major and minor errors. The major errors were unrelated causal events stated as related and wrong sequence of causal events. The minor errors were duration of illness not mentioned, mechanism of death without underlying cause, use of abbreviations, and signature of the doctor illegible handwriting [Table 1].

In our study, out of 100 cases, 60 cases showed unrelated causal events stated as related. Wrong sequence of causal events was found in 56 cases and unaccepted cause of death was noted in 20 cases [Table 3].

One or other minor error was found in all death certificates. By far, the most common was the use of abbreviations, which occurred in 89% of cases [Table 4]. Mechanism of death such as cardiorespiratory arrest, respiratory failure, and heart failure was written as immediate cause of death and followed by legitimate causes of death in 86% of cases. Illegible handwriting was found in 36% of cases. Doctor's signature was not found in as many as 9% of cases. Column of duration of illness was completely blank in 8% of the cases.

**ANNEXURE- V**

**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 person 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 onset & death approx. ..... .....
I Immediate cause (a) ..... State the disease, injury or complication which caused death, not the mode of dying such as heart failure, asthenia, etc. Due to (or as a consequences of) Antecedent cause (b) ..... Morbid conditions, if any, giving rise to the above Cause, stating underlying conditions last Due to (or as a consequences of) (c) ..... II Other significant conditions contributing to the death but not related to the disease or conditions causing it .....				
<b>Manner of Death</b>		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 certification .....				
<b>SEE REVERSE FOR INSTRUCTIONS</b> (To be detached and handed over to the relative of the deceased)				
Certified that Shri/Smt./Kum. .... SW/D of Shri ..... R/O ..... Was admitted to this hospital on ..... and expired on .....				
Doctor ..... (Medical Supdt. & Name of Hospital)				

Figure 1: The World Health Organization recommended medical certificate of cause of death format

**Table 1: The classification of errors into major and minor groups**

Major errors	Minor errors
Unrelated causal events stated as related	<ul style="list-style-type: none"> <li>• Duration of illness not mentioned</li> <li>• Mechanism of death without underlying cause</li> </ul>
Wrong sequence of causal events	<ul style="list-style-type: none"> <li>• Use of internationally unacceptable abbreviations</li> <li>• Signature of the doctor</li> <li>• Illegible handwriting</li> </ul>

**Table 2: List of criteria of incompletely filled MCCDS not included in the current study<sup>[4]</sup>**

S.No.	List of criteria
1.	Hospital and ward name
2.	The details of the deceased
3.	Pregnancy status of the females (in case of married and reproductive age group)
4.	Date and time of death

MCCDS: Medical certificate of cause of deaths

**Table 3: Frequency of major error in death certificates (n=100)**

S. No.	Major errors	Percentage	Frequency (n)
1.	Unrelated causal events stated as related	60	60
2.	Wrong sequence of causal events	56	56
3.	Unaccepted cause of death	20	20

**Table 4: Frequency of minor errors in death certificates (n=100)**

S.no.	Minor errors	Percentage	Frequency (n=100)
1.	Duration of illness not mentioned	8	8
2.	Mechanism of death without underlying cause	86	86
3.	Use of abbreviations	89	89
4.	Sign of the doctor	9	9
5.	Illegible handwriting	36	36

## DISCUSSION

In our study, underlying cause of death could be ascertained and coded according to ICD-10 from the information provided in the cause of death section in most cases.

Our study reported more major errors 73% when compared to other studies<sup>[9-12,14]</sup> where it ranged from 38% to 57.5% which is on quite a higher side.

In our study, 90% cause of death was ascertained and could be coded with difficulty whereas a study conducted by Patel *et al.*<sup>[9]</sup> reported that only 7.5% of cases, the cause of death could be coded with difficulty requiring the attending physician's assistance and in the rest of 92.5% of cases, it was easily coded according to ICD-10.

Wrong sequence of causal events was contributed to 56% of major errors and it was in accordance to the study done by Patel *et al.*<sup>[9]</sup> and more than double of other studies (24–28%).<sup>[12,14]</sup>

At least one minor error was found in 89% of death certificates in this study which was in accordance with the study conducted by Patel *et al.*<sup>[9]</sup> whereas other studies<sup>[10,14,15]</sup> reported minor error rates from 78% to 100%. Use of abbreviations is the most prevalent minor error in our study (89%), higher than in other studies<sup>[8-11]</sup> as they reported and was in contrast with the study done by Akakpo *et al.*<sup>[13]</sup> Done in Ghana which showed the failure of clinicians to omit “apparent or stated” relating to the age of the patient.

Next in majority (86%) of cases, mechanisms of death (i.e., cardiorespiratory arrest, respiratory failure, and heart failure) were entered as the immediate cause of death. Similar prevalence was found in other studies also<sup>[8,12]</sup> It was quite surprising to see this error in such abundance. Because in the death certificate itself, instruction is written under the heading of immediate cause in Part I that state the disease, injury or complication which caused death, not the mode of dying such as heart failure, asthenia, etc. further the difference between cause of death and mode of dying is covered in MBBS curriculum and explicitly mentioned in textbooks and literature, still doctors get confused.

The handwriting of the doctor filling death certificate was also found illegible (36%) in many of the cases which was in contrast with the study done by Burger *et al.* reported which reported only 2.5% of cases.<sup>[11]</sup>

Duration of illness was not mentioned in as many as 8% of cases. A time estimate for each cause of death is crucial in providing complete picture of the cause of death and determining underlying cause of death. Since these entries give the chronology of events and ensure the correctness of the sequence which can prevent major error of improper sequencing, attending doctor should pay attention to this element carefully.

Many doctors qualify with little or no formal training in death certification, whereas others may be inexperienced or have had insufficient practice. This might be the reason for occurrence of errors in death certificates. Other reason may be that doctors had lack of understanding regarding importance of MCCD in mortality statistics for epidemiology, public health policy, and research; or carelessness and reluctance on their part to fill in such forms.

The present study is a single hospital-based study and therefore, results cannot be applied to the whole city. Nonetheless, findings could be applicable to hospitals with similar settings and can initiate such studies on a large scale.

## CONCLUSION

The current study exposed many avoidable errors in all death certificates. Such errors in documentation of the MCCD certificates can lead to false interpretation of results by the governing health authorities and health-care policymakers which, in turn, will affect the various prevention and management of various diseases in our region and by far the whole country. The poor documentation of MCCD can also lead to may medico-legal complications for the treating doctors which is a significant issue to address by our medical professional community as there already many litigations and legal complications for the medical

professionals. Also, MCCD poor documentation may also lead to the relatives of the deceased as it may cause various issues in their insurance settlements, job replacement of the dependent, and various pension schemes provided by the private employment provider or the local or national government.

Such fallacies can be avoided by proper training of the medical students at various levels like its rigorous involvement in the study curriculum and examination. Also, training of interns and residents should be mandatory. For the treating consultants, various workshops and CMEs can be organized at various local and regional levels. Hence, this study denotes the various fallacies in MCCD documentations and various proposed methods for its improvement which in turn will positively affect the doctors, medical students, various medic-legal institutions, and national health policy makers.

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