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Review Article

Strengthening cause-of-death certification in India: evidence from the 2021-2023 MCCD report

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ABSTRACT

Planning for public health and disease surveillance depends on precise cause-of-death information. The Medical Certification of Cause of Death (MCCD) system in India continues to experience difficulties, such as poor coverage, geographical differences, and problems with data quality. Using information from the 2023 national MCCD report, we sought to evaluate the level of medical certification, demographic trends, and cause-specific mortality. We conducted a descriptive secondary data analysis using the Office of the Registrar General, India's 2023 MCCD report. We examined medically certified deaths by location, age group, sex, and state. We also evaluated cause-of-death patterns and compared the findings with previous years' data and pertinent national statistics. We used descriptive statistics to look at certification coverage, demographic changes, and cause-specific mortality. Of the 8,659,679 deaths recorded in India in 2023, 1,900,956 (22.0%) were medically certified. The certification rates varied greatly between states; in Goa, it was 100%, whereas in Bihar, it was only 5.5%. Circulatory diseases continued to be the leading cause of death (36.4%), followed by respiratory disorders (11.5%) and symptoms and abnormal clinical findings (11.9%). Males accounted for 62.8% of certified fatalities, continuing the trend of male-dominated reporting. Despite an increase in the overall number of certified deaths, the nationwide coverage rate remains relatively constant at about 22%. The system still exhibits significant regional disparities as well as a bias towards institutional and male mortality. To improve, the 2023 RBD Amendment Act must be properly implemented, and medical personnel must get consistent training.

Keywords: Medical certification of cause of death, Mortality data, India, Public health surveillance, ICD-10, Health disparities

INTRODUCTION

For the purpose of tracking population health, developing evidence-based policies, and resolving health disparities, accurate mortality statistics are crucial. The Registration of Births and Deaths Act, 1969 mandates the Medical Certification of Cause of Death (MCCD) scheme, which produces standardised cause-of-death data in India. This approach ensures global comparability and continuity in mortality surveillance since it is in line with the International Classification of Diseases, 10th Revision (ICD-10).[1] However, due to a lack of infrastructure, inadequate certifier training, and significant differences in healthcare delivery, MCCD implementation is still unequal between Indian states.[2-5] The quality of public health data and decision-making are weakened by these gaps, which are especially acute in rural areas where a significant portion of deaths remain uncertified. In addition to tracking illness trends, MCCD statistics are essential for developing national health policies, calculating disease burdens, and matching funding to high-priority medical disorders. Such information is necessary for programs like the NPCDCS, Ayushman Bharat, and the National Health Mission (NHM) to properly design interventions. For instance, mapping

cardiovascular mortality by region aids in the distribution of focused resources and the mitigation of state-to-state disparities in health.[6] High-quality mortality statistics allow India to adhere to international surveillance systems and contribute to global health estimates, which goes beyond domestic planning.

Through decentralised certification processes, integration with digital health platforms, and capacity-building initiatives, nations like Brazil and Thailand have effectively improved their MCCD systems.[7,8] The implementation of MCCD has made uneven progress, notwithstanding the significance of mortality statistics. Nationwide adoption is nevertheless hampered by issues such as manual reporting, a shortage of qualified personnel, disjointed data systems, and a lack of accountability. Deaths that take place at home or in rural areas frequently go unrecorded, even though institutional deaths predominate in MCCD data.[2-5]

A study by the Indian Council of Medical Research has found that India still lacks reliable information on the medical causes behind most deaths, raising serious concerns about health planning, disease surveillance, and policy priorities. The findings, published in the journal Scientific Reports, show that despite improvements in death registration, only a small proportion of deaths in India receive a Medical Certification of Cause of Death (MCCD) the process through which a doctor officially certifies the medical reason leading to death.[13]

A multi-sectoral strategy involving civil registration offices, health agencies, medical colleges, and local community health workers is necessary to address these issues. Rather than being an administrative formality, MCCD should be seen as a public health necessity. Data integrity and coverage can be enhanced by integrating hospital records with registration systems, implementing mobile certification tools, and institutionalising training in medical curricula.[10]

Successful models provide useful avenues for reform on a global scale. Thailand improved MCCD by automating health data flows and giving district-level medical officers more authority. To increase accuracy, Brazil deployed mobile applications with real-time cause-of-death confirmation tools. To guarantee that MCCD fulfils its potential as a tool for health equity and accountability, India must modify such innovations to fit its varied demographic and infrastructure settings.[7,8]

Thus, this study uses the 2023 MCCD annual report to examine the scope and calibre of medically certified death reporting in India. The study aims to identify important implementation gaps in the current system by looking at state-wise variances, demographic disparities, and cause-specific death rates. In the end, it provides evidence-based suggestions to improve mortality surveillance and aid in the creation of a public health infrastructure that is more responsive and equitable.[12]

METHODS

Based on the publicly accessible 2023 Annual Report on Medical Certification of Cause of Death (MCCD), released by the Office of the Registrar General, India, we used a descriptive, secondary data analysis approach in this work. The report compiles cause-of-death information from all States and Union Territories that have been supplied by medically accredited institutions.

The coverage, demographic distribution, and cause-specific mortality trends of certified fatalities were evaluated by analysing the data. State, sex, and age group stratified analyses were performed. To investigate longitudinal patterns, comparisons with prior yearly reports were conducted. Cause-specific mortality and certification coverage were examined using descriptive statistics.

RESULTS

There were 8,659,679 recorded deaths in India in 2023. Under the Medical Certification of Cause of Death (MCCD) program, 1,900,956 deaths (22.0%) were medically certified. This indicates a slight decline in the national percentage compared to 2021, where 23.4% of total registered deaths were medically certified.[4] In 2022, the coverage was 22.3%, following a total of 8,649,930 registered deaths.[3] At the national level, the certification coverage reached 48.5% in 2023 when the analysis was restricted to deaths that received medical assistance during the terminal illness. This is comparable to 2021, where the rate was 49.5%, and 2022, which saw a rate of 46.5% for those receiving medical attention.[3,4] This disparity implies that a significant percentage of deaths especially those that take place outside of medical facilities or without official medical attendance remain uncertified.

States differed greatly in their certification rates. Goa attained 100.0% certification coverage, followed by Puducherry (91.4%) and Lakshadweep (99.2%). Goa has consistently maintained a 100% certification rate from 2021 through 2022.[3,4] Bihar (5.5%), Assam (5.6%), and Uttar Pradesh (5.8%) had the lowest certification rates, although a number of large states continued to perform poorly. Historically, Bihar reported rates of 4.5% in 2021 and 5.4% in 2022, while Uttar Pradesh showed 10.1% in 2021 and 10.4% in 2022.[3,4] A consistent absolute rise of certified fatalities was one of the noteworthy patterns, while the national percentage of coverage was essentially unchanged from prior years.

In terms of demographics, 37.2% (706,674) of certified fatalities were female, while 62.8% (1,194,258) were male. This gender gap is consistent with 2021 data (62.4% male, 37.6% female) and 2022 data (64.0% male, 36.0% female.[3,4] In terms of age, people 70 years of age and above made up the largest number (26.7%), followed by those in the 55-64 age range (18.0%). The 70+ age

group has remained the highest contributor, accounting for 27.0% in 2021 and 26.9% in 2022. 6.1% of certified deaths were infant deaths (those under one year old). Conditions that started during the prenatal era accounted for 66.3% of these baby fatalities, making them the main cause. This is consistent with 2021 (68.7%) and 2022 (64.5%) infant mortality findings.

According to cause-specific mortality data, circulatory system disorders accounted for 36.4% of medically certified fatalities, making them the top cause of death. This group has seen a sharp increase in its share, rising from 29.8% in 2021 and 40.8% in 2022. Ischaemic heart disorders made up 23.9% of this category, while "diseases of pulmonary circulation and other heart diseases" made up 51.5%. Respiratory disorders accounted for 11.5% of deaths, making them an important cause. This compares to 12.7% in 2021 and 9.7% in 2022. In contrast to the data from 2020, COVID-19 did not rank among the top three causes in 2023.[2,9] COVID-19 was the second leading cause in 2021, accounting for 17.3% of certified deaths, but dropped significantly by 2022.[9]

Neoplasms (4.8%), genitourinary system disorders (4.9%), and some viral and parasitic diseases (8.7%) were additional noteworthy reasons. Neoplasms accounted for 3.4% in 2021 and 4.3% in 2022. Septicaemia accounted for 63.1% of the infectious illnesses. "Symptoms, signs and abnormal clinical findings, not elsewhere classified" continued to account for a significant portion of certified deaths (11.9%), demonstrating ongoing shortcomings in reporting quality and diagnostic specificity. This figure was 9.7% in 2021 and 11.9% in 2022.

The MCCD system is changing as a result of the Registration of Births and Deaths (Amendment) Act, 2023, according to longitudinal trend analysis. Major states with greater compliance rates are Maharashtra (42.4%) and Tamil Nadu (39.1%), however the national average of 22.0% reveals a large difference in thorough mortality surveillance. Tamil Nadu reported 50.9% in 2021 and 43.0% in 2022, while Maharashtra reported 39.1% and 39.3% in those years respectively.

The number of certified deaths has increased in absolute terms, but systemic and quality-related issues are still prevalent. Ill-defined symptoms and indications accounted for 11.9% of all medically certified fatalities in 2023, underscoring persistent diagnostic shortcomings.[2] Furthermore, the gender disparity still exists, with males accounting for 62.8% of certified deaths, suggesting that female mortality is still under-represented in the certification records. These differences indicate structural deficiencies in equal mortality surveillance along gender and geographic dimensions.

DISCUSSION

The national death certification coverage, which has stayed almost unchanged at 22.0%, continues to perform poorly, according to the 2023 MCCD data.[2] Significant differences across states still reflect different administrative priorities and health infrastructure.[6]

The significant proportion of deaths categorised under "Symptoms, Signs and Abnormal Clinical Findings" (11.9%) highlights the critical need for better clinician training in ICD-10 coding and diagnostic strengthening.[1,10]

The representativeness of mortality statistics is still compromised by gender bias and rural under-representation, with verified deaths substantially biassed towards males (62.8%).[2-5]

Stronger digital infrastructure and complete execution of the Registration of Births and Deaths (Amendment) Act, 2023 are necessary to address these problems. Decentralised reporting and mobile tools can enhance cause-of-death documentation in underserved areas, as demonstrated by successful international models like those in Brazil and Thailand.[7,8]

There is still a persistent gap between deaths that occur in institutions and those who do not even though the 2023 Amendment act now requires all medical facilities, whether public or private, to provide a certificate of cause of death, there are still insufficient medical professionals in rural areas to treat terminal illnesses at home.[6] To close this gap, community involvement and mobile certification teams are crucial.

Reporting accuracy and timeliness can be improved by integrating MCCD with real-time dashboards and electronic health records (EHRs). To guarantee completeness, these systems need to be connected to civil registration databases. Additionally, the persistence of "ill-defined" categories indicates that medical professionals still need systematic training in MCCD and ICD-10 coding.

The 2023 Amendment Act offers a more robust legislative foundation for required certification from a policy perspective. Important actions include enforcement, setting performance benchmarks for states, and guaranteeing private sector compliance. Civil society activities that highlight the importance of cause-of-death data for national health planning can increase public trust. Tracking Sustainable Development Goal 3 (SDG 3) on health and well-being requires improving MCCD quality.[7]

Summary of key findings

The systemic issues with India's MCCD framework are highlighted by this analysis. The system still suffers from poor diagnostic specificity (11.9% ill-defined) and insufficient coverage (22.0%) in spite of the increased regulatory requirements implemented in 2023.[2] Home-based fatalities are under-represented in certification,

which is still primarily male-dominated and probably institution-focused.[2]

Comparison with existing literature

The results of earlier evaluations, such the 2020 report, which likewise observed low certification rates and high percentages of ill-defined causes, are consistent with the 2023 performance.[2] The nationwide percentage has not changed much since 2020 (22.5%), even though the total number of certified fatalities has increased to approximately 1.9 million. In 2021, the absolute number of certified deaths was 2,395,128, which was the highest reported in the series, before dipping to 1,932,540 in 2022 alongside a decrease in total registered deaths. Global comparisons continue to suggest that decentralised, technology-enabled approaches are the best path towards reform.[2-5]

Strengths and limitations

The use of the most recent nationally representative data from the 2023 MCCD report released by the Office of the Registrar General, India, is a significant strength of this analysis.[2] The lack of cross-verification with verbal autopsy data for non-institutional fatalities and the dependence on secondary data, which may contain reporting biases, are among the limitations.

Implications for policy, practice, and future research

The 2023 RBD Amendment Act must be strictly enforced in order to reform the MCCD system. All doctors must be required to complete standardised ICD-10 training, which should be incorporated into medical curriculum.[1] Timeliness and data integrity can be greatly enhanced by integrating MCCD into electronic health records, as demonstrated in Kerala, with the use of real-time dashboards and automatic quality checks.[10]

Mobile certification units and task-sharing strategies could aid in expanding coverage in remote areas.[8] Scaling rural coverage may need task-sharing strategies, such as allowing qualified non-physician staff to certify at basic health centres. According to effective models in low- and middle-income nations, mobile certifying units and community health professionals can help improve reporting in non-institutional fatalities.[11]

In order to investigate operational obstacles to certification, especially in jurisdictions with the lowest reporting rates, future research should employ mixed-method approaches. In the end, achieving SDG 3 and creating an open health surveillance network require a strong MCCD system.[6]

CONCLUSION

Although the Medical Certification of Cause of Death (MCCD) system is essential to India's efforts in public health planning and mortality tracking, it is nevertheless limited by low coverage, poor data quality, and notable gender and rural-urban inequities. These gaps impair the accuracy of national health statistics and make it more difficult to allocate resources and monitor diseases effectively.

Digital integration, increased training in ICD-10 documentation, and institutional changes in both the public and commercial sectors are all necessary to strengthen MCCD. Improving coverage and equity requires interministerial cooperation, community involvement, and mobile certification tactics. To support evidence-based health governance and achieve Sustainable Development Goal 3, it is imperative to invest in a strong MCCD system.

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