

Mortality Statistics in India: Current Status and Future Prospects

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Abstract

When plague epidemics swept India in the second half of the 19th century, there was an epidemiological need for mortality statistics; as a result, vital event registration systems were established. However, despite the existence of multiple sources of mortality statistics in many ministries/departments of the government, neither the number of deaths nor the causes of deaths reported annually are complete yet. Multilateral international organisations have supported modelling for the generation of mortality statistics in developing countries rather than supporting and funding the development of real-time mortality data. With specific initiatives for decentralising the registration process to primary health centres and sub-health centres, the civil registration system despite its flaws, can be improved for gathering accurate data on mortality, including the causes of deaths.

Keywords: Cause of death, civil registration, mortality, surveillance, vital events

In the nineteenth century, civil registration system (CRS) was set up in several provinces of India. However, each province had established it under a different Act. Therefore, after the independence, the Registration of Births and Deaths (RBD) Act, 1969, was passed by the Parliament to mandate a uniform legal framework for registration and reporting of births and deaths in all Indian states and union territories (UTs).^[1] The Office of Registrar General of India (ORGI), Ministry of Home Affairs, Government of India (GoI) was assigned the responsibility of (a) issuing directions to chief registrars, (b) coordination of activities, and (c) release of vital statistics (VS) report annually. Chief registrars are the implementing authorities of RBD Act in the states/UTs, and they are also required to publish annual VS report of the area under their jurisdiction. States/UTs appoint officials from the department of health/economics/statistics/planning/local bodies, etc., as chief registrar, district registrar, and registrar at the state, district, and local levels, respectively. Thus, CRS requires a high level of coordination between multiple departments to develop and support its operations. In the absence of political and administrative will and financial allocations, even after 50 years, CRS is still not considered to be a reliable source of mortality statistics in India.

At the national level, neither the number of deaths nor the causes of deaths reported annually is complete. In 2019, 93%

of estimated deaths were registered, and only 19% of estimated deaths had a medically certified cause of death (MCCD).^[2,3] For rest of the deaths, although the cause of death reported by the relatives of the deceased is recorded, this information is not included in the annual reports. Mortality statistics have large state-wise variation. The level of death registration varies from 28% to 100% and MCCD varies from 3% to 100%. Although completeness of death registration has increased at about 4% per year from 2010 to 2019, rise in MCCD in this time period has been slower (2.3%).^[4] There is a lag of more than 1-year period in the release of the VS and MCCD reports.

Ideally, mortality statistics should be made available at shorter intervals (weekly) for small areas (wards) for epidemiological purposes to find any unusual rise in deaths for investigation of the causes so as to take public health action at an early stage. This epidemiological need for mortality data was felt in the second half of the nineteenth century when plague epidemics ravaged India. COVID-19 Pandemic has once again highlighted the importance of mortality surveillance.

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Considering the need for having accurate VS for planning and monitoring of social welfare programs, instead of strengthening CRS, ORGI started a model vital events (VE) registration scheme in few states in 1964–1965 on pilot bases, which was expanded as sample registration system (SRS) to all states and UTs by 1971. Over the years, SRS has become the main source of fertility and mortality statistics in India, although it covers only 0.6% of Indian population. Verbal autopsy (VA)-based cause of death was also implemented in SRS by the turn of this century, but the sample size of only about 50,000 deaths in SRS are not sufficient for providing valid statistical estimates of mortality in small areas (ward, block, and district) and causes of deaths even at state and national level. Hence, a 3-year rolling average of causes of death and maternal mortality reports is released after a lag of about 3–5 years. Latest report on causes of deaths statistics is available for year 2016–18, bulletin of maternal mortality is reported for year 2017–19, and SRS bulletin has released data on births, infant mortality, and deaths for year 2020.^[5–7] Thus, SRS also suffers from a long lag period between collection and release of mortality data, especially that for causes of deaths.

Keeping in view the urgent need for bottom-up planning annually, starting from urban ward/village level, National Health Mission has started recording of deaths and causes of deaths from sub-health centers and other government health facilities through its health management and information system, and maternal and child death reviews are also conducted.^[8] Similarly, other national health programs, such as for TB, HIV, malaria, etc., also record and report deaths because of these diseases. In addition, Central Bureau of Health Intelligence, Ministry of Health and Family Welfare, GoI compiles and reports every year the morbidity and mortality statistics reported by states and UTs from their clinics and hospitals.^[9] National Family Health Survey also estimates maternal and child mortality statistics.^[10] Thus, there are multiple sources of mortality statistics in multiple ministries/departments of GoI but none of these sources offer valid mortality statistics in a timely manner for planning and monitoring of programs at local level.

Therefore, globally, instead of advocating and investing in development of CRS for real-time mortality data, multilateral global agencies have promoted modeling for creation of mortality statistics even when no mortality data or poor-quality mortality data exist in many low- and middle-income countries including India. Institute for Health Matrix and Evaluation (IHME) is leading this field. Indian Council of Medical Research has also collaborated with IHME to produce India Disease Burden Estimates based on modeling that are often quoted by GoI.^[11]

Publications of modeling data on mortality are readily available from IHME website and in reputed journals such as *The Lancet*, whereas CRS data are rarely published in peer reviewed journals because the data are considered “legal” and even the de-identified data at unit level are not available in the

public domain for analysis and publication by researchers. Readily available mortality estimates based on small sample size surveys and modeling have indirectly hampered the development CRS for real data collection, analysis, and use.

Despite its weaknesses, CRS, the only source of VE data at local level, can be improved. In the last decade, registration of deaths has increased in most of the states and UTs, including the empowered action group states.^[12] Lessons can be learnt from states where rapid improvements have been made by changes in the policies.^[13,14] Decentralization can ensure better implementation of RBD Act. Medical officer (MO) in-charge of primary health centers (PHCs) can be designated as the local registrar and auxiliary nurse midwife (ANM) of sub-health centre can be assigned the role of the sub-registrar. Community-based volunteers such as Accredited Social Health Activist or Anganwadi Worker (ASHA or AWW) can be incentivized to perform the role of the notifiers of vital events. Involvement of health human resources can lead to further improvement in VE registration even in states/UTs where higher level of death registration has been achieved but still registration of stillbirths, infant, child, and maternal deaths continues to be low.^[15]

Substantial improvements are also required in certification of causes of deaths. According to SRS report of year 2019, medical attention was received before death at government or private hospitals in 48.7% of the deaths, but according to MCCD report, only 19% of estimated deaths had a MCCD.^[2,3] It shows that many hospitals are not yet recording and reporting cause of death to local registrar. Therefore, a notification by chief registrars to all medical practitioners in their jurisdictions, whether in government or private sector, must be issued for compulsory medical certification and reporting of cause of death to local registrar as per RBD Act. For home deaths, VA can be integrated in CRS. ANMs can conduct VA interview and MOs of PHC can assign probable cause of death on the same lines as was used to be done in a sample Survey of Causes of Death (Rural).^[16] ANMs and MOs are familiar with VA procedures as they are already using these methods for maternal and child death reviews.^[8]

In most of the states/UTs, information technology (IT) has been deployed for registration of births and deaths, but data analysis and use are still an issue. Therefore, capacity of human resources needs to be built by using e-resources not only for improving registration process but also for utilization of the data for mortality surveillance at local level. Weekly reports on at least age and sex distribution and top 10 causes of deaths at district and block level should be disseminated online to provide feedback for public health action, and de-identified data of CRS should be placed in the public domain so that researchers can use it for publishing high-quality research papers periodically. Data use will provide further impetus for improvement of CRS.

Initially, few districts in each state can pilot the above proposed scheme in the CRS with the support from professional

organizations such as Indian Association of Preventive and Social Medicine and Indian Association of Public Health with the funding support from National Health Mission. Lessons learnt can, then, be discussed in state-level coordination committee for scale up at national level.

The availability of reliable CRS data on death rates and cause-of-death patterns at local, district, state, and national levels will be useful for early detection and control of outbreaks, identifying diseases of public health importance for allocating resources, evaluating the effectiveness of national health programmes, and for analysing socioeconomic, demographic, and environmental factors related to deaths. It will also help in monitoring the progress of sustainable development goal for achieving the health and wellbeing of the population by 2030.

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Conflicts of interest

There are no conflicts of interest.

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