Original Article

Perceptions of healthcare workers on implementing the 2022 WHO verbal autopsy instrument in rural India through the existing public health system

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Abstract

Background: Cause-of-death (CoD) information is crucial for health policy formulation, planning, and program implementation. Verbal Autopsy (VA) is an approach employed for the collection and analysis of CoD estimates at the population level where medical certification of cause of death is low and, secondly, for integrating it with the existing public health system by utilizing the grassroots level workforce. **Objective:** The study aims to understand the field perspectives on implementing the 2022 WHO VA instrument in rural India through the existing public health system. **Methods:** This article is derived from a qualitative arm of study that was conducted in one of the blocks of Kanpur district, Uttar Pradesh. Frontline health workers (FHWs), as well as Medical Officers (MOs) serving in the Community Health Centre (CHC) area, were selected as study participants. A 5-day training and orientation workshop was conducted to train the FHWs to conduct computer-assisted personal interview VA using the 2022 WHO VA instrument. MOs have been trained to assign the CoD via Physician-Certified VA (PCVA). In-depth interviews (IDIs) were conducted with FHWs involved in conducting VA and physicians involved in conducting PCVA within the field practice area. **Results:** A total of 13 IDIs were conducted, consisting of 10 FHWs and 3 MOs, within the selected CHC area of Ghatampur. Based on the responses received, five major themes were identified. Although VA is being used to collect CoD information from the community in India through a Sample Registration Survey (SRS), the key findings suggest that this activity could be scaled up by utilizing the existing public health system. However, additional manpower may be required for constant monitoring and evaluation of the program. Incentivization of FHWs would aid in the timely completion of VAs and coordination with local and higher health authorities. **Conclusion:** The perception of healthcare workers about the feasibility and acceptability of VA in this study highlighted some of the challenges and possible solutions that could aid in developing a comprehensive model to improve CoD information at the population level through the existing public health system.

Keywords: Cause of death, implementation, public health system, rural India, training, verbal autopsy

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Introduction

Cause of Death (CoD) information is crucial for health policy formulation, planning, and program implementation.[1-3]

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Information on births and deaths, including CoD, in high-income countries relies on robust Civil Registration and Vital Statistics (CRVS) systems.[4–7] However, in many Low and Middle Income Countries (LMICs), the death registration, which includes CoD information, is not completely sufficient.[4,5] As per the annual report on vital statistics in India from the civil registration system, released by the Office of Registrar General of India (ORGI), the overall death registration has seen an increase from 76.4 lakhs in 2019 to 81.2 lakhs in 2020.[8] However, only 22.5% of the total registered deaths have received Medical Certification of Cause of Death (MCCD).[8,9] Most of the deaths are home-based, and MCCD majorly covers institutional deaths, leading to a gap in MCCD and death registration in India.[10–11] To bridge this gap in reporting mortality statistics, the ORGI has been conducting Verbal Autopsy (VA) for non-institutional deaths.[12]

VA is an approach employed for the collection and analysis of CoD information at the population level.[13–15] In VA, interviews are carried out with relatives or known persons of the deceased by using a standard questionnaire to elicit information on signs, symptoms, and circumstances leading to death.[13–15] Based on the evidence from the completed questionnaire, the CoD could be assigned by trained physicians or an automated computerized model.[16] WHO has released the harmonized 2022 WHO VA instrument, which is an exhaustive instrument covering questions on major signs and symptoms among all the age groups and specific questions for capturing COVID-19-related deaths.[17]

Several studies have indicated the usefulness of VA as a source for CoD information in case of non-institutional deaths.[14,18,19] There exists a considerable prospect for the VA to supplement MCCD, especially in situations where routine medical certification for all deaths is low.[14,18,19]

There is a lack of CoD information in India, coupled with existing efforts that are largely fragmented and not fully integrated into the existing public health system.[9,20,21] There is a need to gather such information for regular health policy and program evaluation. VA method using the 2022 WHO instrument to collect information on CoD could be integrated with the existing public health system by utilizing FHWs.[13,19] The aim of this article is to describe the field perspectives of the implementation of the 2022 WHO VA instrument in rural India through the existing public health system.

Methods

Research team

Our research team consisted of public health scientists, social scientists, and technical officers with additional training in research methodology and qualitative research methods.

Study design

This article is derived from a qualitative arm of our study, which was conducted in one of the blocks of Kanpur district, Uttar Pradesh, to explore the feasibility of using the 2022 WHO VA instrument through the existing public health system for arriving at population-level CoD estimates. The quantitative arm, a cross-sectional study, focuses on assessing the validity of computer-certified VA versus physician-certified VA (PCVA) for assigning CoD in the rural context, which will be covered in a separate article. A 5-day training and orientation workshop was conducted to train the Auxiliary Nurse Midwives (ANMs) and Community Health Officers (CHOs) to Computer Assisted Personal Interview (CAPI) VAs by using the 2022 WHO VA instrument. Medical officers (MOs) were trained to assign the CoD via PCVA. The ANMs/CHOs were then given a task to conduct VAs using handheld Android tablets, which were independently examined by two MOs to assign CoD.

Study setting

Our study was conducted in the area served by a CHC in Ghatampur town, located in the Kanpur Nagar district of Uttar Pradesh, India, which caters to a population of around 1,42,000.

Study participants

In our study, FHWs, namely ANMs and CHOs, involved in conducting VAs in the field catchment area, as well as MOs who were involved in conducting PCVA within the field practice area, were selected as study participants.

Data collection

Interview guides were prepared after reviewing existing literature and discussion within the research team. Mock interviews were conducted, and modifications to the In-depth Interveiw (IDI) guides were made accordingly. The interview guide for FHWs focused on identifying the VA cases and retrieving information from the respondents, challenges, and lessons learned during rapport-building, settings of the interview, challenges faced while administering the VA instrument, handling the tablets, and layout of the instrument. The interview guide for MOs consisted of sections such as the method and process of conducting PCVA, challenges in conducting PCVA, and their perception of the model in terms of manpower requirement, acceptability, and feasibility. Technical officer (JY) and public health scientist (SS) from the research team were involved in conducting IDIs. Written informed consent was obtained along with permission to audio-record the interviews.

Data management and analysis

During IDIs, audio was recorded, in addition to note-taking. The IDIs were transcribed using audio recordings and notes, followed by an English language translation. Quality checks of transcripts and translations were performed by the research team to ensure the details were correct and complete. The deductive approach was used for the development of priori (pre-empirical) codes, whereas the inductive approach was used to create codes based on the qualitative data generated from the IDIs. Data were rigorously re-read, summarized, and labeled as themes and subthemes, reflecting study objectives and illustrated with quotes.

Results

A total of 13 IDIs were conducted (10 IDIs with FHWs and 3 IDIs with MOs). Each interview lasted for about 60–90 minutes. Themes and subthemes are mentioned in Table 1.

Theme 1: Process of conducting VA

Procedures for identifying the deceased's address, tracing the address, seeking consent, and VA interview settings

During the field visit, ASHA workers and community leaders were contacted to identify the deceased's address and for rapport building. The ASHA workers were also provided with the deceased list in advance to improve adherence to field visits. Major sources of information to identify the deceased's address were the Chief Registrar Office/Block Development Officers (BDOs) and death records maintained by health subcenters. To ensure minimum revisits, the deceased's family members were informed prior to the visit to ensure their availability at home.

> *"I have taken the deceased's address from the register maintained by BDO, but sometimes I wasn't able to locate the home. That time, local leaders helped me." – FHW with 11 years of experience.*

As the venue for the interview was primarily the respondent's home, lack of space for one-to-one interaction and privacy was a concern. FHWs had to face a lot of distractions from family members and neighbors. One of the FHWs mentioned that selecting the respondent was sometimes a challenge as there were multiple respondents. The respondents were usually the head of the family, the eldest of the family, or the parent of the deceased.

> *"I wanted to calm everyone down and ask the respondent about their relation to the deceased. In order to obtain the correct information, I think it is necessary that the person should be very close to the deceased." - FHW with 6 years of experience.*

Table 1: List of themes and subthemes

Themes	Subthemes
Theme 1: Process of Conducting Verbal Autopsy	Procedures for identifying the deceased's address, tracing the address, seeking consent, and VA interview settings
	Strategies used for conducting VA
	Challenges in conducting VA
Theme 2: Feasibility of Administering Verbal Autopsy Instrument	Administering the VA instrument
	Technical challenges related to the use of CAPI for conducting VA
Theme 3: Feasibility of Verbal Autopsy Instrument	Potential challenges faced by the FHWs
	Strategies for improving data quality
Theme 4: Conducting PCVA	Perception of medical officers (MOs) about the VA instrument and implementation strategy
	Challenges faced in conducting PCVA
Theme 5: Integration of Verbal Autopsy in the existing public health system	Suggestions provided by MOs and FHWs

Strategies used for conducting VA

ASHA workers and community leaders initiated the conversation to help the respondents understand the study's objectives. The community was familiar with FHWs working in the same area; hence, it was comparatively easy for them to communicate and build rapport.

> *"I have visited so many houses before due to immunization, family planning counseling, and surveys; it was not difficult for me to talk to the family members of the deceased." - FHW with one and a half years of experience.*

Challenges in conducting VA

The challenges faced in conducting VAs were primarily linked to the tracing of cases, limited availability of public transportation, and incompleteness of addresses in rural areas. The emotional distress of the family members was one of the challenges faced by the FHWs as the VA interviews led to the recalling of events related to the death of the deceased. Other challenges included lack of time and interest, the educational background of the respondent, the level of medical care received by the deceased, and cases of unnatural deaths.

> *"I had to go up to four times to collect the VA because they were telling the whole thing in bits and pieces… as some people were getting emotional and I had to stop in the middle." - FHW with 6 years of experience*

Theme 2: Feasibility of administering VA instrument

Administering the VA instrument

FHWs who were involved in conducting VA have years of experience in field activities. One of the FHWs mentioned that the instrument was lengthy but convenient because it was bilingual.

> *"I didn't feel any problem in the field visit as I am involved in other field activities. I found it long, but as it was written in both Hindi and English, it was easy for me to understand the questions." - FHW with 11 years of experience*

Technical challenges related to the use of CAPI for conducting VA

Initially, due to unfamiliarity with using CAPI, FHWs faced some technical challenges while switching from one section to another in CAPI, saving and sending completed forms, network issues, the functionality of the tablet such as prolonged charging time, and malfunctioning of chargers.

> *"I have faced difficulty in saving and uploading the form for the first time. Internet issues were there in interior areas, and sometimes software was causing problems for me." - FHW with 6 years of experience*

Theme 3: Feasibility of VA instrument

Potential challenges faced by the FHWs

The FHWs reported an increase in workload in their regular schedule, which included routine immunization, antenatal clinics,

and other ongoing health programs, as they had to dedicate time specifically for this activity. They sometimes had to visit other catchment areas to conduct VAs that did not belong to their assigned area. In addition, limited connectivity made it difficult for the FHWs to reach the deceased's home.

> *"Many times I have visited the area not related to my field catchment area; it was difficult for me to travel that far as it increases my workload" - FHW with 9 years of experience*

Strategies for improving the data quality

To ensure good data quality, FHWs used various strategies, including asking detailed questions and probing responses during interviews. One of the FHWs mentioned the importance of the availability of any medical records of the deceased, which would be helpful in further strengthening the VA information.

> *"I ask the question and try to get as much information as I can from the family member. I try to make further questions from their answers." - FHW with 6 years of experience*

Theme 4: Conduct of PCVA

Perception of medical officers about the VA instrument and implementation strategy

Senior MOs mentioned that it was difficult for them to go through the VA datasheet and narration that was provided online and hence asked for hard copies of the narration along with PCVA forms. However, the newly joined MOs were more comfortable using digital platforms, and they suggested developing a mobile application to synchronize the flow of VA data. They also suggested the development of online ready reckoners and guides for CoD assignments, which may be integrated into the mobile application.

> *"I think hard copies will be a better option for me; it will be easy for me to understand as I am not good with technology." - Senior MO with 20 years of experience*
>
> *"If an app is created on mobile, it will be easy. It's handy, too. MCCD-ready reckoners and guides may also be part of the application." - Junior MO with 6 years of experience*

Challenges faced in conducting PCVA

The narration provided to the MOs to assign the CoD was sometimes difficult to understand due to the use of local language and illegible handwriting. One of the MOs mentioned the insufficient information collected by FHWs regarding terminal illness, which led to difficulty in ascertaining the sequence of events.

> *"The FHWs have tried to collect the information related to death from the family member. Sometimes it is difficult to understand as they are using their local language and not sufficient to understand it fully." - Junior MO with 6 years of experience*

Theme 5: Integration of the VA in the existing public health system

Suggestions provided by MOs and FHWs

The MOs suggested that multipurpose health workers can be utilized to conduct VA instruments as a routine activity. They also emphasized that CHOs are a better choice as compared to ANMs as they have higher qualifications, better training, and an understanding of common non-communicable diseases, which in turn will improve the quality of VA data.

> *"As the staff on the field already have so many tasks to complete, my suggestion is to include other healthcare professionals like CHOs as they have a better understanding of common illnesses; it will improve the quality of data and also reduce the burden on ANMs..but need proper monitoring and evaluation plan so that it will be implemented properly." - Junior MO with 6 years of experience.*

The MOs suggested refresher training for both the FHWs conducting VAs as well as MOs on MCCD and PCVA to improve the quality of CoD assignments. They also highlighted the role of supportive supervision and interdepartmental collaboration along with the resolution of technical queries by a dedicated health professional for improving the VA quality.

> *"The training provided was helpful to me in conducting the VA. I will say more training like this should be provided in the future with the coordination of higher and local authorities." - Junior MO with 5 years of experience*

FHWs emphasized the incentivization of this activity and the provision of travel allowances for improved compliance. They also suggested that the grassroots level workers may also be paid some remuneration for case tracking and assistance in VA interviews.

> *"Incentives for each case should be given to the frontline workers. Ideally, even the ASHA worker should be paid identifying the case." - FHW with 11 years of experience*

Discussion

VA method is being used in India through SRS; however, it is not sufficient to provide CoD information at subnational and district levels.[22] This created a need to develop a model to improve the CoD estimates at the population level through the existing public health system.

The major findings of our study were based on statements made by FHWs and MOs [Figure 1]. Our study highlighted the role of ASHA workers and community leaders who were included during the field visits to identify the deceased's address and for rapport building. However, our study also reported that those FHWs who regularly provided services in the area were easily able to build rapport with family members. The study conducted by Ndambo *et al.*[23] in Malawi reported the significant

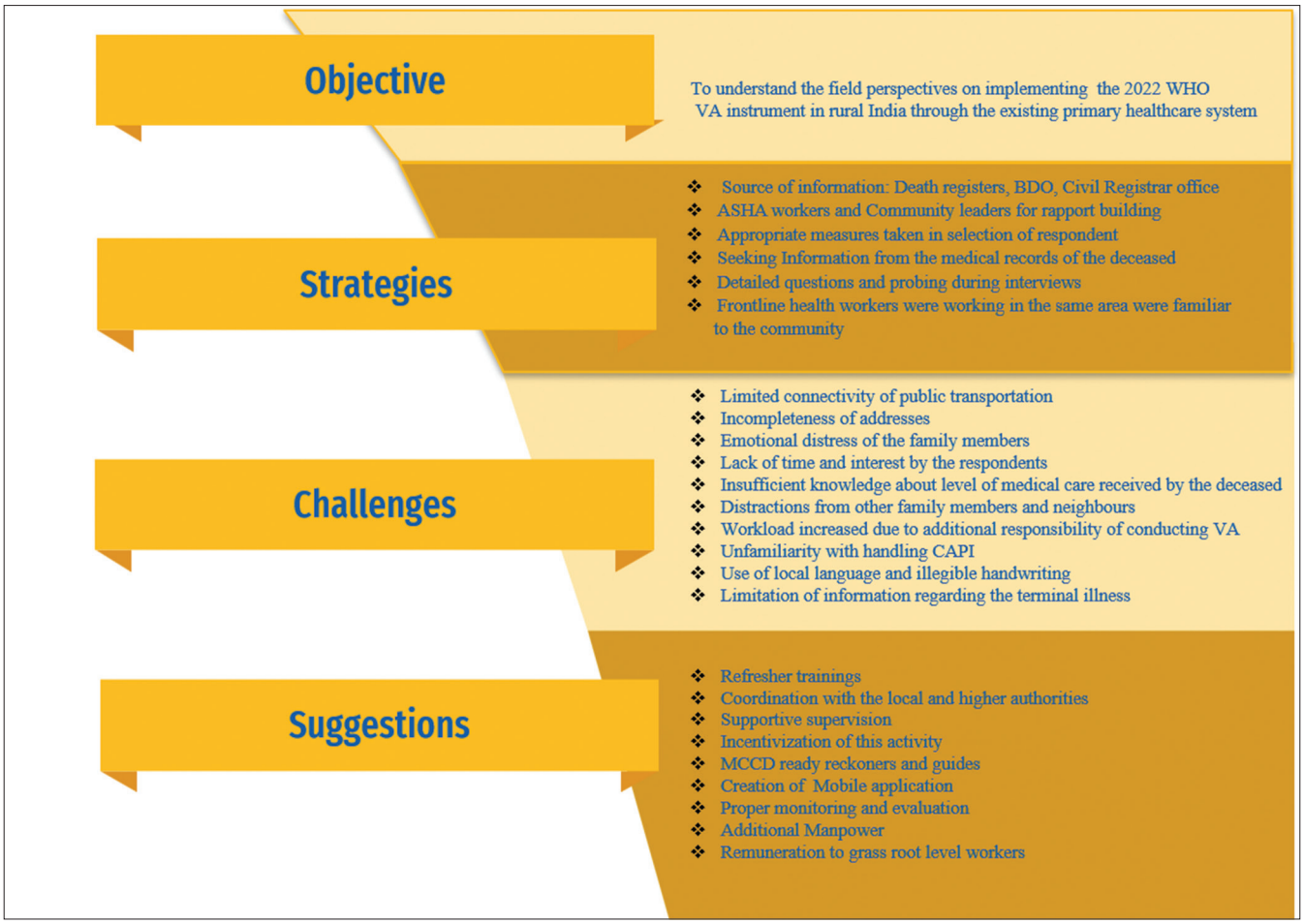

Figure 1: Conceptual framework to assess the feasibility of VA through existing public health system

role FHWS has played in building positive relationships with households.

Our study has reported several challenges faced by the FHWs, including incomplete addresses, limited connectivity of public transportation, lack of space for one-to-one interaction, distractions from neighborhoods, family reluctance to participate, and emotional distress during VA interviews. A similar study was conducted by Hinga *et al.*[24] in Kenya, which highlighted that emotional distress by the respondent was one of the challenges in interacting in the emotional environment. A study by Biswas *et al.*[25] conducted in Bangladesh reported that recalling an event and hard-to-reach areas were some of the challenges. Another study conducted by Gouda *et al.*[26] reported that the local customs, beliefs, and sensitivities could influence the acceptability of VA. To address the challenges, our study also highlighted the strategies followed by FHWs, such as asking for medical records and selecting appropriate respondents to improve the quality of data collected.

Our study highlighted that Android tablets were used to administer VA. The study conducted by Flaxman *et al.*[27] showed that the use of electronic tablets could be a quick and cost-effective method for collecting data. However, technological glitches, such as saving and uploading data due to network connectivity issues, were faced by the FHWs in our study. Our study reported that the instrument used for data collection was lengthy but convenient as it was bilingual, there was ease in moving from one section to another in the VA instrument, and training helped them understand the terminology well. Another study conducted by Biswas *et al.*[25] discussed the views of FHWs about VA and reported that this method of collecting death information at the community level was interesting and informative.

Our study highlighted challenges reported by the MOs in conducting PCVA, which included incomplete information, diagnostic ambiguity, and language barriers. Junior MOs were more technology-friendly and suggested digitization of the whole PCVA process. The MOs emphasized that CHOs were better qualified and trained for conducting VAs. Our study also highlighted the suggestions of FHWs related to integrating VA into the existing primary healthcare system, including interdepartmental collaboration, refresher training, recruitment of more staff, provision of traveling allowance, and incentivization. Similar recommendations were provided in the study conducted by Gouda *et al.*[26]

Our study has some strengths: (i) Training was provided to the MOs and FHWs before initiating of VA method in the study site; (ii) IDIs were conducted for both MOs and FHWs to

understand the challenges and possible solutions at field and administrative levels.

Our study explored the perceptions of FHWs and MOs regarding the feasibility of implementing VA at the community level. It provides valuable insights into the challenges and possible solutions for integrating VA into public health system, which in turn will help in estimating population-level CoD estimates. This evidence in turn will aid in carrying out community-level studies aimed at improving primary care practices and addressing public health challenges.

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Authors' contributions

Conceived and designed the analysis:

SS, SN, GM, BKG, SDS, JY, CR

Collected the data:

ST, SS, SN, GM, BKG, SS, JY, MSC

Contributed to data analysis:

ST, SG, SS, SN, GM, BKG, SDS, JY, MSC, CR

Performed the analysis:

ST, SG, SS, SN

Wrote the manuscript:

ST, SG, SS

Ethics and consent

The study has been approved by the Institutional Ethics Committee of the research Institute. We confirm that all methods were performed in accordance with the relevant guidelines and regulations (Declaration of Helsinki). The study team explained the study to the participants, and written informed consent was obtained before conducting IDIs.

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Conflicts of interest

There are no conflicts of interest.

References

1. Who. int. World Health Organisation. Strengthening cause of death information system in India. Available from: https://www.who.int/india/news/detail/21-09-2022-strengthening-cause-of-death-information-system-in-india. [Last accessed on 2024 Mar 30].
2. Chauhan H, U. S. S, Singh SK. Health Information and Its Crucial Role in Policy Formulation and Implementation. J Health Manag 2021;23:54–62.
3. Reeve M, Chowdhury H, Mahesh PKB, Jilini G, Jagilly R, Kamoriki B, *et al.* Generating cause of death information to inform health policy: Implementation of an automated verbal autopsy system in the Solomon Islands. BMC Public Health 2021;21. doi: 10.1186/s12889-021-12180-y.
4. Mikkelsen L, Phillips DE, Abouzahr C, Setel PW, De Savigny D, Lozano R, *et al.* A global assessment of civil registration and vital statistics systems: Monitoring data quality and progress. Lancet 2015;386:1395–406.
5. Worldbank.org. Global Civil Registration and Vital Statistics. Available from: https://www.worldbank.org/en/topic/health/brief/global-civil-registration-and-vital-statistics. [Last accessed on 2024 Mar 30].
6. Who. int. Civil registration and vital statistics. Available from: https://www.who.int/news-room/fact-sheets/detail/civil-registration-and-vital-statistics. [Last accessed on 2024 Mar 30].
7. AbouZahr C, De Savigny D, Mikkelsen L, Setel PW, Lozano R, Nichols E, *et al.* Civil registration and vital statistics: Progress in the data revolution for counting and accountability. Lancet 2015;386:1373–85.
8. Office of the Registrar General, India, Vital Statistics of India based on the civil registration system. Office of the Registrar General, Ministry of Home Affairs Vital Statistics Division, 2020.
9. Ministry of Home Affairs, Government of India. Office of Registrar General of India. Report on Medical Certification of Cause of Death. 2020. 1-226p.
10. Saikia N, Kumar K, Das B. Death registration coverage 2019–2021, India. Bull World Health Organ 2023;101:102.
11. Jha P, Gajalakshmi V, Gupta PC, Kumar R, Mony P, Dhingra N, *et al.* Prospective study of one million deaths in India: Rationale, design, and validation results. PLoS Med 2006;3:e18.
12. Krishnan A, Gupta V, Nongkynrih B, Kumar R, Kaur R, Malhotra S, *et al.* Mortality in India established through verbal autopsies (MINErVA): Strengthening national mortality surveillance system in India. J Glob Health 2020;10:020431.
13. de Savigny D, Riley I, Chandramohan D, Odhiambo F, Nichols E, Notzon S, *et al.* Integrating community-based verbal autopsy into civil registration and vital statistics (CRVS): System-level considerations. Glob Health Action 2017;10:1272882.
14. Chandramohan D, Fottrell E, Leitao J, Nichols E, Clark SJ, Alsokhn C, *et al.* Estimating causes of death where there is no medical certification: Evolution and state of the art of verbal autopsy. Glob Health Action 2021;14:1982486.
15. Fottrell E, Byass P. Verbal autopsy: Methods in transition. Epidemiology Rev 2010;32:38–55.
16. World Health Organisation India, Validation study on assigning causes of death, World Health Organization, Country Office for India, 2023, **ISBN:** 978-92-9021-026-9.

17. World Health Organization. Verbal autopsy standards. The 2022 WHO verbal autopsy instrument. 2022. 1-40p.
18. Danso SO, Manu A, Fenty J, Amanga-Etego S, Avan BI, Newton S, *et al.* Population cause of death estimation using verbal autopsy methods in large-scale field trials of maternal and child health: Lessons learned from a 20-year research collaboration in Central Ghana. Emerg Themes Epidemiol 2023;20:1–10.
19. Firth SM, Hart JD, Reeve M, Li H, Mikkelsen L, Sarmiento DC, *et al.* Integrating community-based verbal autopsy into civil registration and vital statistics: Lessons learnt from five countries. BMJ Glob Heal 2021;6:1–11.
20. Rao C, Gupta M. The civil registration system is a potentially viable data source for reliable subnational mortality measurement in India. BMJ Glob Health 2020;5:e002586.
21. Pandey A, Roy N, Bhawsar R, Mishra RM. Health information system in India: Issues of data availability and quality. Demography India 2010;39:111–28.
22. Kumar R. Mortality statistics in India: Current status and future prospects. Indian J Community Med Off Public Indian Assoc Prev Soc Med 2022;47:476.
23. Ndambo MK, Munyaneza F, Aron M, Makungwa H, Nhlema B, Connolly E. The role of community health workers in influencing social connectedness using the household model: A qualitative case study from Malawi. Glob Health Action 2022;15:2090123.
24. Hinga A, Marsh V, Nyaguara A, Wamukoya M, Molyneux S. The ethical implications of verbal autopsy: Responding to emotional and moral distress. BMC Med Ethics 2021;22:1–16.
25. Biswas A, Rahman F, Halim A, Eriksson C, Dalal K. Experiences of community verbal autopsy in maternal and newborn health of Bangladesh. HealthMED 2015;9:329–38.
26. Gouda HN, Flaxman AD, Brolan CE, Joshi R, Riley ID, AbouZahr C, *et al.* New challenges for verbal autopsy: Considering the ethical and social implications of verbal autopsy methods in routine health information systems. Soc Sci Med 2017;184:65–74.
27. Flaxman AD, Stewart A, Joseph JC, Alam N, Alam SS, Chowdhury H, *et al.* Collecting verbal autopsies: Improving and streamlining data collection processes using electronic tablets. Popul Health Metr 2018;16:3.