Commentary: Verbal autopsy procedure for adult deaths

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Estimation of cause of death is more difficult in developing countries because neither health-facility-based information systems nor vital registration provides adequate data on the cause of mortality. In many of the developing countries verbal autopsy (VA) may be a surrogate for death certificates in ascertaining causes of death. VA is a systematic retrospective inquiry of the family members about the circumstances, events, symptoms, and signs of illness prior to death to help determine the underlying cause of death and to classify the broad patterns of mortality. There are two main approaches to conducting a VA.

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One is using a questionnaire approach; and, the other is using a list of symptoms and signs to probe the respondent so as to get more details that would help write narrative text. The questionnaire method is more commonly used for childhood deaths and both questionnaire and narrative approaches have been used for adult deaths in different population settings. The VA tool used for childhood deaths and maternal deaths has been validated by several studies, whereas the VA tool for adult deaths for all causes has been validated by only a few studies.

A paper in this issue of the International Journal of Epidemiology describes the method adopted to validate the VA procedure for adult deaths in urban China. In this study, 3290 deaths attributed to specific underlying cause of death that occurred between June and November 2002 in six cities in China were included; and, 2102 families were interviewed using a structured symptomatic questionnaire for VA. VA diagnosis was validated against the diagnosis derived from reviewing medical records. Authors felt sensitivity of the VA tool used in this study for adult deaths was less satisfactory in detecting deaths attributed to causes of major public health concern in China, for example, tuberculosis, chronic obstructive pulmonary disease (COPD), ischaemic heart disease (IHD), and diabetes. A few deaths due to cerebrovascular disease, IHD, COPD, and diabetes were misclassified as ill-defined causes by VA. In this study the VA diagnosis was largely based on responses to the structured questions on symptoms and duration, which in turn depends on intensity of training given to the interviewers and interviewing skills.

VA diagnosis for adult deaths in India has been based on the narrative part of the VA tool that gives the chronology of events, progression of the disease, symptoms, duration, treatment details, history of similar episodes in the past, and history of hospital admission, if any. Since causes of death are numerous among adults compared with the limited number of causes for childhood deaths or maternal deaths, our experience has shown that the VA questionnaire has not been successful in capturing all relevant information required to arrive at the diagnosis of specific underlying cause of death among adults.

The VA tool in use for adult deaths in India has been developed and tested among 48,000 adult deaths in an urban area (Chennai, Tamil Nadu) and 32,000 adult deaths in a rural area (Villupuram district of Tamil Nadu). The novel VA methodology for adult deaths developed in Tamil Nadu consists of using non-medical graduates to interview the spouse/close associates/neighbours to collect information on circumstances, events, signs, and symptoms of illness experienced by the deceased before death. Symptoms/signs list was used to prompt or probe to get more details. To enhance accuracy, the VA report was written in the local language and described the chronological order of the appearance of signs and symptoms and their progress with details of treatment received, if any, and name of the hospital(s) admitted, and the history of similar episodes. About 5% of VA reports at random were checked by re-interview and the final judgement on the diagnosis was made based on the VA report by two physicians independently. The validity of the VA diagnosis arrived by physicians depends to a great extent on the training given to them to arrive at probable underlying cause of death by reviewing the VA reports and on how well the VA reports were written by the field workers/interviewers.

The Tamil Nadu studies showed that VA can ascertain the leading causes of death, reduce the misclassification of causes, reduce the proportion of adult (age 25 or older) deaths attributed to unspecified or unknown causes (from 54 to 23% in urban areas and from 41 to 26% in rural areas), derive the probable underlying cause of death when it has not been reported, and yield a broad classification of the underlying causes in ~90% of deaths before age 70. In old age (70+), however, the proportion of classifiable deaths was lower. Unlike the China validation study, physicians gave only one cause to the best of their judgement as underlying cause of death in Tamil Nadu studies.

The methodology of writing the VA report (narrative text) developed in Tamil Nadu based on large-scale studies for adult deaths is the basis for the VA study on adult deaths in the Sample Registration System (SRS) in India, which is a large demographic survey of vital events occurring in a random national sample of urban and rural areas, covering ~6.0 million population, by the Registrar General of India to provide annual estimates of age-specific birth and death rates at the national and state levels.

The VA tool for adult deaths has been validated in two studies in India. The first study validated the VA tool used for 48,000 adult deaths that occurred during 1995–97 in Chennai city in South India. The study compared deaths attributed to cancer based on reviewing the narrative part of the VA tool to the cancer cases registered in the Chennai population-based cancer registry, which is in the network of population-based cancer registries in India. The results showed that the sensitivity of the VA tool used for adult deaths to identify cancer was 95% in the age group 25–69 years, and VA identified 288 deaths that were not registered in the Chennai population-based cancer registry. The high sensitivity of the VA tool to detect cancer deaths among adults was also observed in the China validation study.

The second validation study done in North India compared all-cause mortality determined by VA against the diagnosis arrived by reviewing hospital medical records for 262 adult deaths that occurred in urban and rural areas. Authors used both open format/narrative text of deceased illness and structured questions on symptoms and signs to get the information on adult deaths. VA correctly identified cause of death in 65% of deaths when both narrative and close-ended questions were used, 56% of deaths when narrative only was used, and 49% of deaths when the close-ended questions only were used to assign the underlying cause of death. The authors felt that the narrative part of the questionnaire provided much more information than the questionnaire alone and the narrative part had information on the chronology of events, which was lacking in the close-ended part of the questionnaire.

For specific diseases, the sensitivity was 75% for coronary artery disease, 75% for stroke, 57% for tuberculosis, 30% for diabetes, and 25% for COPD. In the China validation study (which included only urban deaths), the sensitivity was 62% for IHD, 81% for stroke, 62% for tuberculosis, 57% for diabetes, and 60% for COPD. In both these studies, random checking of VA reports was not done. Our experience shows in-built random checking of at least 5% of VA reports ensures reliably motivated fieldwork at the initial survey and also helps to assess whether there are any systematic defects in the technique used by any of the field workers in collecting data.

Few studies have evaluated the VA method in African settings. The multicentre validation study of VA for adult
deaths conducted in Africa found a sensitivity and specificity of 82 and 78%, respectively, for all communicable diseases, and a sensitivity and specificity of 71 and 87%, respectively, for all non-communicable diseases. 

VA is useful for understanding broad cause group mortality and planning of public health programmes in countries where death certification data is grossly incomplete. The use of the VA method with a narrative section for adult deaths to estimate specific underlying cause of death has certain advantages over the questionnaire approach because it has information on chronology of events, progression of disease, treatment details, and history of similar episodes in the past. However we need more experience with both these approaches of VA to understand more about their limitations and advantages.

References