



# CRVS Fellowship report

## Summary: Developing a CRVS-VA management dashboard in Ghana

This *CRVS summary* is edited from 'CRVS Fellowship Report: CRVS-VA management dashboard tool' submitted by Patrick Larbi-Debrah, Policy, Planning, Monitoring and Evaluation, Ghana Health Service.

### Implementing verbal autopsy in Ghana

While there have been many initiatives implemented to improve the quality of mortality statistics in Ghana, they have not achieved their full potential because most deaths that occur in the community remain unregistered and without a probable **underlying cause of death** assigned.

The failure to register these **community deaths** or record the underlying cause of death is producing inaccurate and biased statistics for the Government, which are of limited use for health and development.

Given that as many as 70 percent of deaths occur in the community, verbal autopsy has become necessary in Ghana to ensure that accurate and complete mortality statistics are available for health policy, planning, monitoring and evaluation, setting research priorities, and resource allocation.

### What is verbal autopsy?

Verbal autopsy (VA) is a method for collecting information about the signs and symptoms experienced by a deceased individual prior to their death from their family or next of kin, and interpreting these to diagnose the likely or most probable cause of death.<sup>1</sup> The primary purpose of a VA is to describe the cause composition of mortality through the estimation of cause-specific mortality fractions. Verbal autopsy also serves as a cost-effective tool for completing the gaps in mortality data at the national level.

The VA process consists of three basic steps:

1. Setting up an interview by a trained VA staff member at the household (or another appropriate place).
2. Conducting a structured interview to collect information on signs and symptoms of illnesses, and events that the deceased suffered before death.
3. Interpreting the interview data to diagnose the most probable underlying cause of death (historically, this was done by physicians, however automated methods are now widely applied).

<sup>1</sup> de Savigny D, et al. Integrating community-based verbal autopsy into civil registration and vital statistics (CRVS): system-level considerations. *Global Health Action* 2017; 10:1272882.

### Bongo District pre-test

As part of the Data for Health (D4H) Initiative, Ghana is implementing a system of community-based **automated VA**, which is progressing in three phases: 1) Bongo District pre-test; 2) Volta Region **pilot**; and 3) National scale-up. Using the 2016 WHO VA Instrument,<sup>2</sup> the pre-test in Ghana began in April 2017, and aimed to establish the required evidence-base to inform the pilot and national scale-up. During this time, a total of 99 VA interviews were conducted.

Initial results from the pre-test highlighted several challenges with implementation, including the lack of real-time monitoring for managers; the absence of a feedback mechanism for VA interviewers; and the lack of opportunities for physicians to review the VA interview data, especially for those that resulted in an 'undetermined' cause of death, or when discordant causes were produced when different VA algorithms were applied.

### Developing a CRVS-VA management dashboard

The pre-test demonstrated that real-time monitoring of summary statistics of the submitted VA interview data was required to ensure quality control and provide feedback to VA interviewers. Having a 'dashboard' that also includes a platform for physicians to review VA interview data and reassign a probable cause of death was also important, particularly for those with undetermined causes of death. Other key design features of a dashboard were that it should:

- Be a user-friendly tool for managers at the district, regional, and national levels to view and monitor VA interview data as they are submitted.
- Provide a management portal to the Open Data Kit (ODK) Aggregate server.<sup>3</sup>
- Provide feedback to VA interviewers.
- Facilitate **physician-coding of VA (PCVA)** Interviews using conventional methods.

<sup>2</sup> Available at: <http://www.who.int/healthinfo/statistics/verbalautopsystandards/en/>  
<sup>3</sup> Available at: <https://opendatakit.org/>



## CRVS Fellowship program

The dashboard was developed by Patrick Larbi-Debrah of the Policy, Planning, Monitoring and Evaluation department, Ghana Health Service between January and March 2018 as part of the D4H Fellowship program. It was developed with technical support from the Swiss Tropical and Public Health Institute, University of Basel, and Melbourne School of Global and Population Health, University of Melbourne. Objectives of the Fellowship included:

- To develop and pilot a modified version of the existing CRVS-VA Management Dashboard Tool as used in Tanzania.
- To explore potential additional functions of the dashboard to meet the needs of VA interviewers and managers in Ghana.
- To assess how the dashboard will interoperate with the ODK platform for VA data, the District Health Information Management System (DHIMS-2) of the Ghana Health Service, and other digital platforms.
- To assess whether the Ghana CRVS-VA management dashboard tool can ultimately enhance the quality of VA data.

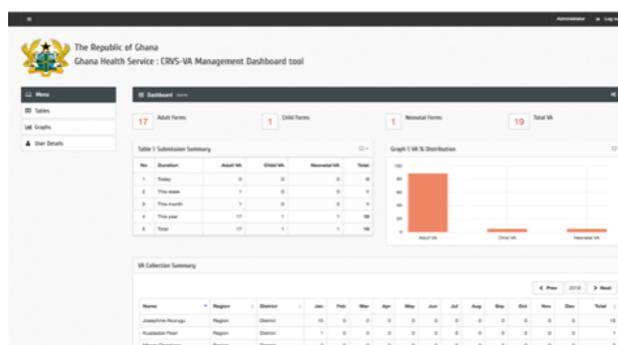
## Outcomes

The CRVS-VA Management Dashboard was customised for Ghana and built within the ODK Aggregate server. The dashboard is an interactive tool that generates real-time summaries on VA interview data submitted to the server. It allows managers and supervisors (with access permission) to view the summaries without needing to download or extract the data.

The visualisations offered by the tool include (Figures 1 & 2):

- Total number of VA interviews conducted at different periods (today, this week, this month, this quarter).
- Total number of VA interviews conducted according to age group of the deceased (adults, children, and neonates).
- Total number of VA interviews conducted by VA interviewer, region, and district.

**Figure 1 CRVS-VA management dashboard visualisations**



**Figure 2 Individual-level data**

Region	District	Ward/Village	Deceased	Interviewer	VA Type	ICD	Options
REGION	DISTRICT	VILLAGE	Noomah Awotogo	Mwona Christiana	ADULT	-	🔍 🔄 🗑️
REGION	DISTRICT	VILLAGE	Hana Akantump	Mwona Christiana	ADULT	-	🔍 🔄 🗑️
REGION	DISTRICT	VILLAGE	Akwashie Apayanga	Josephine Alungo	ADULT	-	🔍 🔄 🗑️
REGION	DISTRICT	VILLAGE	Bertha Nyabie	Josephine Alungo	CHILD	-	🔍 🔄 🗑️
REGION	DISTRICT	VILLAGE	A-senaga Alogba	Josephine Alungo	ADULT	-	🔍 🔄 🗑️
REGION	DISTRICT	VILLAGE	A-sengli Awaka	Josephine Alungo	ADULT	-	🔍 🔄 🗑️
REGION	DISTRICT	VILLAGE	A-mungwa Aamabonga	Josephine Alungo	ADULT	-	🔍 🔄 🗑️
REGION	DISTRICT	VILLAGE	A-dongyom Ayibanga	Josephine Alungo	ADULT	-	🔍 🔄 🗑️
REGION	DISTRICT	VILLAGE	baby has no name yet Aluka	Josephine Alungo	NEONATAL	-	🔍 🔄 🗑️
REGION	DISTRICT	VILLAGE	Ayashine Aburys	Josephine Alungo	ADULT	-	🔍 🔄 🗑️

### Key terms

**Automated verbal autopsy:** Refers to the process where the complete sequence of VA activities, from data collection to analysis and determination of probable underlying cause of death, is automated through the use of handheld devices and software applications.

**Community deaths:** Refer to those deaths that take place outside of a formal health facility (such as at home, at the workplace, while in transit) and as such, are not attended by a medical physician.

**ICD-10:** The International Classification of Diseases and Related Health Problems, 10<sup>th</sup> Revision (ICD-10) is maintained by the World Health Organization (WHO) and permits the systematic recording, analysis, interpretation and comparison of mortality data. The ICD-10 is used to translate diagnoses of diseases and other health problems from words into an alphanumeric code.

**Physician-coded verbal autopsy (PCVA):** Refers to the process of having medical physicians review VA interview data and determine the probable underlying cause of death.

**Pilot:** Carried out to test VA process issues such as training, supervision, communication, technology, costing and standard operating procedures.

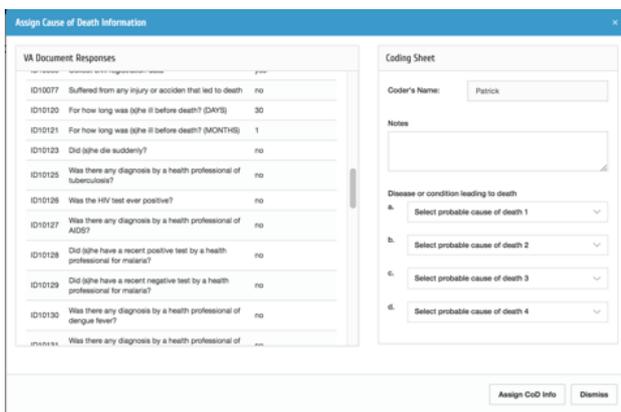
**Pre-test:** Carried-out to test technical issues with the VA questionnaire itself, such as technologies, translation, and instruments.

**Underlying cause of death:** Is 'the disease or injury which initiated the train of morbid events leading directly to death, or the circumstances of the accident or violence which produced the fatal injury'.

- Individual data on the deceased, including location, name, VA interviewer name, VA type (age category), and underlying cause of death.

Additionally, the dashboard has the functionality to allow online physician-coding of VA interview data (**Figure 3**). Once registered with the system, physicians can log-in to review questions and responses to VA interviews, and electronically assign a cause of death in line with ICD-10 standards.<sup>4</sup>

**Figure 3 Online physician-coding (ePCVA) functionality within the dashboard**



## Moving forward: next steps

### Improving the dashboard

The CRVS-VA Management Dashboard tool is expected to greatly help managers to monitor the quality of VA interview data. The development team is working to further improve the tool, with added functionality to include automated Short Message Service (SMS) messages to provide feedback on VA activities, and improved visualisations. User manuals and standard operating procedures are also being developed as the tool is finalised.

Other activities to strengthen the CRVS-VA Management Dashboard include:

- Improve the visualisations, such as by showing the actual age of the deceased, and include other relevant charts and tables such as (but not limited to):
  - Number of interviews by types of respondents: parent, child, other family members, friend, health worker, public officer, another relationship, refused to answer.
  - Time taken to complete an interview.
  - Monthly, quarterly and annual analysis of the top 20 causes of death.
  - VA analysis by sex and age on undetermined causes of death.

- Build the capacity of national, regional and district supervisors on effective monitoring of VA activities.
- Organise a regular debriefing session on VA data quality.
- Identify and train physicians on how to access VA interview data and review them to assign a probable underlying cause of death. Physician-coders with previous knowledge on coding VA will be identified from the health and demographic surveillance system (HDSS) sites.
- Develop an executable mailing system among physician-coders to improve communication. This is especially important when the cause of death assigned by one physician does not match with another.
- Explore the feasibility of visualising analysis from any method of VA algorithms.

### Strengthening VA implementation

Many activities are also planned to strengthen VA implementation in Ghana:

- Orient and reorient national, regional and district supervisors along with VA interviewers on integrating VA within Community-based Health Planning and Services (CHPS) Zones.
- Customize the 2016 WHO VA Instrument to include elements to enhance the analysis. This may include having cascading features within location attributes, and having an audio feature to record the narrative section.
- Support the Continuing Professional Development (CPD) course on improving medical certification of cause of death, as granted by Ghana Medical and Dental Council.
- Develop a concept note for use in advocacy to development partners, to ensure the sustainability of VA.
- Develop a VA dataset (reporting form) in DHIMS-2 for use in facilities within the CHPS Zones in the pilot.
- Liaise with the health promotion unit to develop regular mortality reports and disseminate them to the community, to ensure they remain engaged and aware of the importance of VA and mortality statistics.
- Develop a proposal for the development of curriculum for pre- and in-service training on VA for community health training programmes.

<sup>4</sup> Available at: <http://apps.who.int/classifications/icd10/browse/2016/en#IV>

The program partners on this initiative include: The University of Melbourne, Australia; CDC Foundation, USA; Vital Strategies, USA; Johns Hopkins Bloomberg School of Public Health, USA; World Health Organization, Switzerland.

Civil Registration and Vital Statistics partners:



**The University of Melbourne recognises the Swiss Tropical and Public Health Institute for their partnership and contribution**



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