CRVS best-practice and advocacy
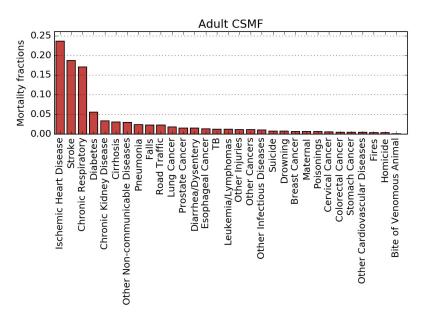## Introduction to SmartVA for Physicians

This document provides an overview of the automated verbal autopsy tool, SmartVA for Physicians (also known as SmartVA Auto-Analyse), and describes a pilot implementation of the tool in the Philippines. For information on how to download and set up the tool, see *SmartVA Auto-Analyse: User Guide*, available at: https://crvsgateway.info/file/14682/3844

Introduction

Verbal autopsy (VA) is a method for collecting information about an individual's signs and symptoms prior to their death, where that death occurred outside of a health facility without a medically certified cause of death (COD).[1] It involves interviewing a decedent's family or carer, using a standardised set of questions and interpreting their replies to diagnose the likely or most probable COD. The principal purpose of a VA is to describe the cause composition of mortality in a non-hospital population through the estimation of cause-specific mortality fractions (CSMFs). VA, particularly when using automated methods, serves as a cost-effective tool for filling the gaps in mortality data. Studies suggest that VA can provide population-level COD data similar in quality and reliability to medical certification of death by physicians in hospitals.[2]

SmartVA is an automated VA tool developed by the Institute for Health Metrics and Evaluation (IHME), University of Washington.[3] It consists of a validated questionnaire to conduct a structured interview which can be undertaken by a trained health worker (not necessarily a physician) who enters the data on an Android smartphone or tablet. The results are then sent to a central server and assigned a probable underlying COD through the use of a computer algorithm ('Tariff'). The results obtained may look like the those in **Figure 1**.

Figure 1. Example of CSMF output from SmartVA

1   De Savigny D, Riley I, Chandramohan D et al. Integrating community-based verbal autopsy into civil registration and vital statistics (CRVS): system-level considerations. Global Health Action 2017; 10:1272882.
2   Hernández B, Ramírez-Villalobos D, Romero M et al. Assessing quality of medical death certification: concordance between gold standard diagnosis and underlying cause of death in selected Mexican hospitals. Population Health Metrics 2011; 9:38
3   University of Melbourne. SmartVA: Technical user guide (V2.0). CRVS resources and tools. Melbourne, Australia, Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, University of Melbourne; 2017.

Smart-VA for Physicians

In countries where deaths must be medically certified by law, community physicians often find that they are asked to write a death certificate for a person who was not their patient and without access to the body. In cases where the family do not have any medical records on the decedent, SmartVA for Physicians (also known as SmartVA Auto-Analyse) is a tool that physicians can use to get insight into the signs and symptoms experienced by the decedent prior to death.

Smart VA Auto-Analyse ('Auto-Analyse') is a diagnostic program for physicians that runs on Tariff 2.0 to analyse the VA data to produce a computer certification of COD. Auto-Analyse produces real-time COD estimates from the Tariff score and offers the physician up to three potential causes of death (including the likelihood of dying from each cause, rated as: possible, somewhat likely, likely, very likely). Auto-Analyse also produces a summary of all endorsed symptoms, providing greater insight for the certifying physician to make an informed, final decision on the COD for each decedent. The likelihood of each COD listed for the top three causes is based on the relative ranking of the Tariff scores that met the necessary cause-specific and absolute thresholds.

SmartVA Auto-Analyse differs from SmartVA performed by non-physicians. Firstly, the sequence in which the different VA sections are presented have been changed to be more applicable to certifying physicians, commencing with the open-ended narrative and decedent's past history, followed by the system-based structured questions. Indeed, the certifying doctor may find that the open-ended interview and past history provide sufficient information to write the death certificate without conducting the rest of the interview. If not, the physician continues with the full structured interview and applies the Auto-Analyse application to obtain the tariff outputs and select the COD.

Country example: SmartVA for Physicians in the Philippines

SmartVA for Physicians was first piloted in the Philippines 2017 in 50 municipalities across seven different regions. The majority of deaths in the Philippines occur out-of-hospital (community deaths), requiring a medical certificate of cause of death to be written by a physician who is likely unfamiliar with the patient and the circumstances surrounding death. Approximately 90 physicians from these regions were trained in use of the tool for community deaths, for application where no or insufficient information was available to assign a COD.

An evaluation of the pilot reviewed 4,333 community deaths and found that 65% of these physicians had used one of the three diagnosis provided by Tariff. In the remaining 35% of cases, physicians had either given a more specific cause of death than Tariff could deliver, or had disagreed with the Tariff diagnosis to select another cause.[4] The 20 leading causes of death as obtained from the pilot are shown in **Figure 2**.
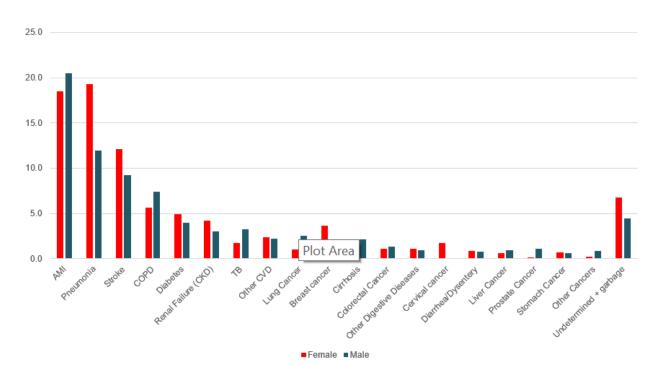
Figure 2. 20 leading causes of death (Philippines) according to SmartVA Auto-Analyse

As at 2020, SmartVA for Physicians is being rolled out in the Philippines in three dialects - plus English - by the Department of Health. Trainers have been trained in all 16 of the country's 17 regions, with the aim of having four out of five community deaths certified with the assistance of SmartVA for Physicians by 2024.

Other countries who similarly have applied the tool include Brazil and Colombia.[5]

For information on how to download and set up Auto-Analyse, see *SmartVA Auto-Analyse: User Guide*, available on the CRVS Knowledge Gateway at: https://crvsgateway.info/file/14682/3844

5   Colombia Implementation Working Group. Colombia: A strategy to improve the registration and certification of vital events in rural and ethnic communities. CRVS country perspectives. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, the University of Melbourne; 2018 https://crvsgateway.info/file/14212/2020

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.

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