SMART VERBAL AUTOPSY (SmartVA) IN THE PHILIPPINES

By

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Presented by

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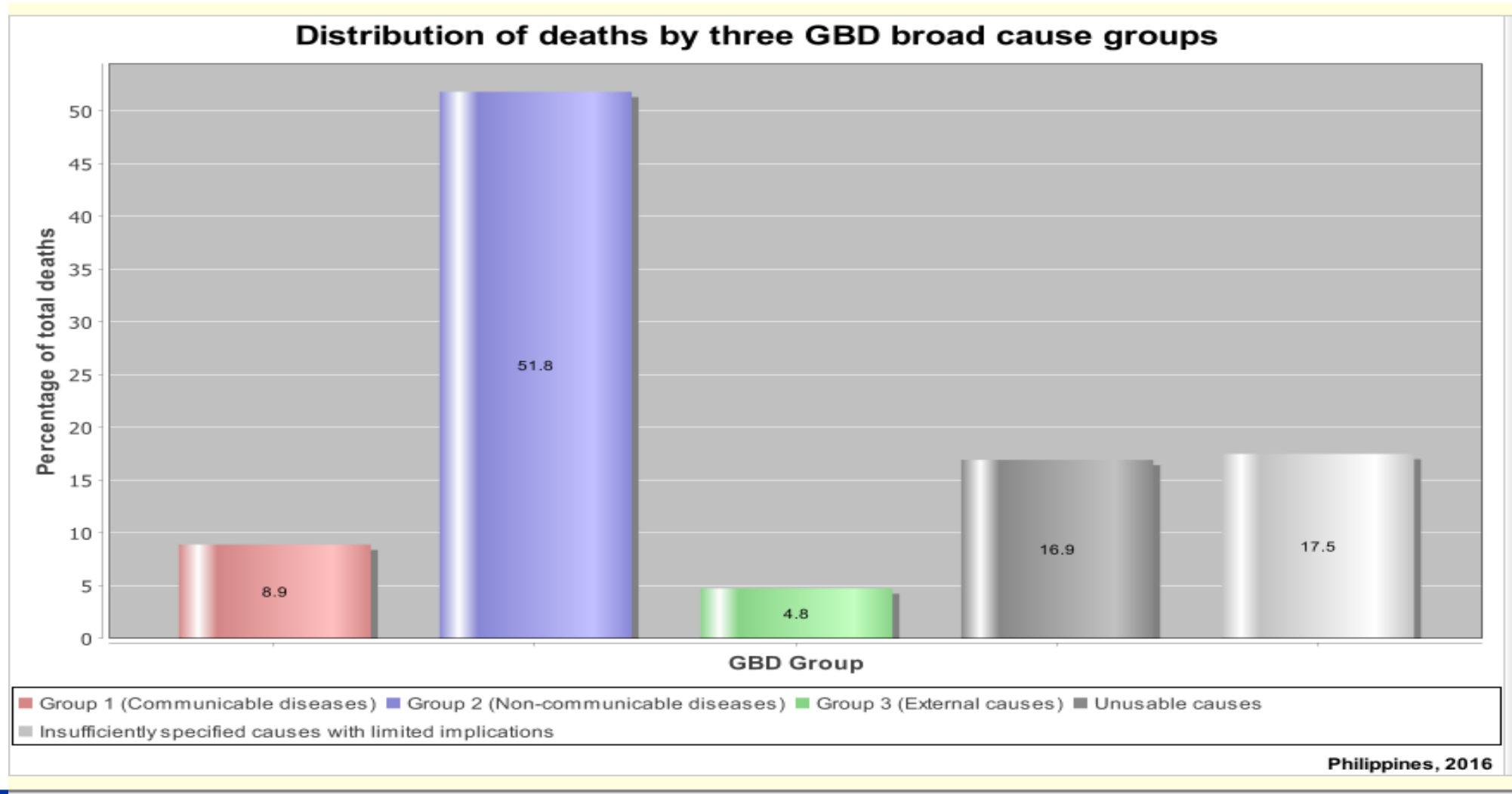Epidemiology Bureau, Department of Health

Facts and Figures
Mortality Statistics, Philippines, 2016
(Source: Philippine Statistics Authority)

- An average of 1,591 death daily (Total reported deaths - 582,183)

- Six out of ten deaths not medically attended.

    - Medically attended deaths are those attended by physician, public health officer, hospital authority or other medical personnel.

In the Philippines almost all deaths get a CoD - but is it reliable enough for policy?

Distribution of deaths by three GBD broad cause groups

Philippines, 2016

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Why does quality of CoD matter?

- Cause of death information at a population level helps to identify health priorities for planning
  - Health planning based on good quality data saves government money by targeting priority issues nationally
  - Poor quality data leads to poor decisions and wrong allocation of resources
- Provides trend data on overall mortality patterns
- Supports ongoing population health surveillance, including emergence of new epidemics, etc.
- Helps identify health research priorities

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Why does quality of CoD matter?

- Philippines has committed to reporting progress for SDG
- SDG indicators that require cause-specific mortality data for monitoring need to be based on reliable data
- Availability of data does NOT guarantee quality and monitoring can only be properly done if data are reliable

Why does quality of CoD matter?

- Philippines has committed to the CRVS Decade Goal 2015-2024:

    - 3.D By 2024, the proportion of deaths coded to ill-defined codes will have been reduced by 50 per cent compared with the baseline year.

    - 3.E. By 2024, at least 85 percent of deaths taking place outside of a health facility and without the attention of a medical practitioner have their underlying cause of death code determined through verbal autopsy in line with international standards.

How do we obtain reliable and useful CoD?

Ideal: a well functioning civil registration system and physician is able to certify the sequence of morbid events leading to death

Reality: a high proportion of deaths occur outside hospitals (community deaths), or in health facilities with limited diagnostic capacity, and therefore do not have a medically certified cause.

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How do we obtain reliable and useful CoD?

Ideal: long-term strategic investment in getting all deaths medically attended and certified.

Reality: Can take many years. Therefore an interim solution is needed

- Verbal autopsy is the only practical alternative for community based (out-of-hospital) deaths
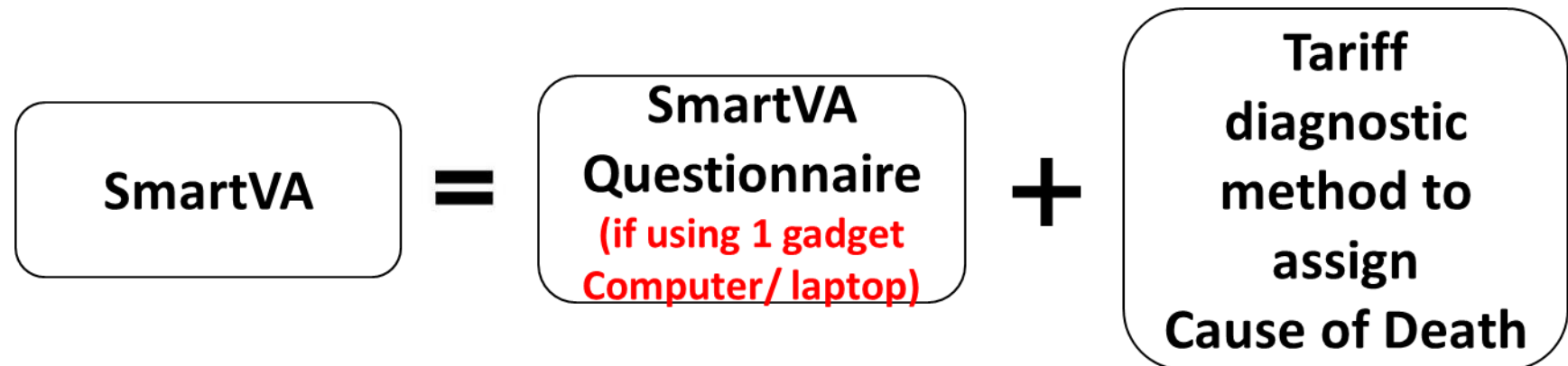
What is Verbal Autopsy (VA)?

- Process for deriving a cause of death from an interview using a structured set of questions on signs/symptoms experienced by the deceased prior to death

- Principle is to mirror the clinical process in terms of symptom assessment/ medical history

- Traditionally, VA interviews are analyzed by physicians to come up with a likely CoD.
  - Physicians do not always agree on the diagnosis of COD
  - inter-rater-reliability (or diagnostic consistency) among physicians reading the same VA interview could be low, and unstandarised across (and within) countries.

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What is Smart Verbal Autopsy (SmartVA)?

- Smart VA is a package that includes the PHMRC shortened questionnaire, the Open Data Kit (ODK) suite for data collection, and the SmartVA-Analyze for computer certification of VA.

- SmartVA is an internationally recognized and validated tool which electronically determines the most probable CoD.

SmartVA = SmartVA Questionnaire (if using 1 gadget Computer/ laptop) + Tariff diagnostic method to assign Cause of Death

What is Smart Verbal Autopsy (SmartVA)?

- The PHMRC shortened Questionnaire is a VA instrument used as input for the SmartVA application.

- The questionnaire consists of four modules:

  1. A general information module to be applied for all decedents;
  2. Age-specific module for neonate (0-28 days) deaths, including stillbirths;
  3. Age-specific module for child (29 days – 11 years) deaths;
  4. Age-specific module for adolescent and adult (12 years or more) deaths.

- The questionnaire includes questions on symptoms of the deceased, health care seeking/experience, demographic characteristics, possible risk factors (such as tobacco use), and other potentially contributing characteristics

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What is Smart Verbal Autopsy (SmartVA)?

- ***SmartVA*** can be run on any android smartphone or tablet or in a computer or laptop (if using 1 gadget device), and can include both picture and language capabilities

- 20-30 minutes interview

- Assign the CoD using the Tariff method

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What is the Tariff method used in SmartVA?

What is Tariff?

Tariff is based on the "**signal to noise**" concept. Each questionnaire item gets a score, according to the number of times it was *endorsed* by the respondent (i.e., respondents answered "yes" to a question about the presence of a symptom during a VA interview; e.g."did the decedent have cough?").

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What is the Tariff method used in SmartVA?

How does *Tariff* work?

Any symptom reported in the VA that is known to be highly predictive of a *particular cause of death* ("**signal**") will have a significantly higher score ("tariff") assigned to it for that *particular cause of death*, compared with other, less strongly associated symptoms ("**noise**").

The cause with the highest score ("**tariff**") for a particular death is assigned as the cause of death for that individual. *Tariff* scores can be + or - depending on the strength of the signal.
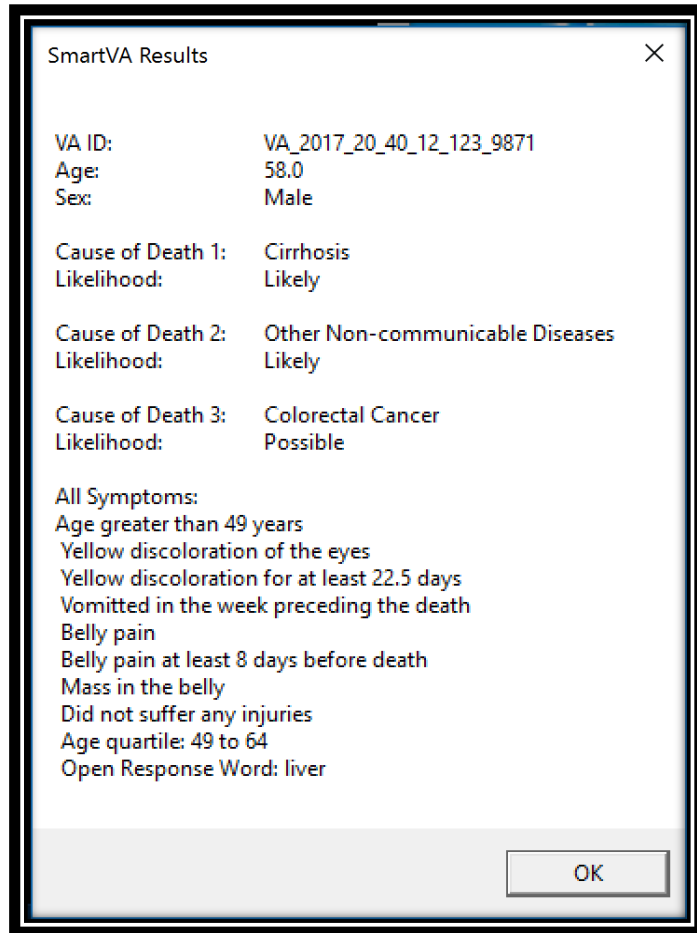
What is the Tariff method used in SmartVA?

Suppose the family member said that their deceased had fever, and was coughing blood (i.e. these symptoms were endorsed and get a score of 1).

Tariff Matrix	Cause of Death (CoD)				Response
	TB	Malaria	Fall	...	
Suffered a fall	0	0	32	...	No (0)
Coughing blood	5	0	0	...	Yes (1)
Fever	1	1.4	-1	...	Yes (1)
Diagnosed with Dementia	0	-1	0	...	No (0)
Cause specific Tariff Score	6	1.4	-1	...	

We multiply the endorsement score for each symptom by the tariff value and sum them to get a set of tariff scores for various causes. **In this example, TB has the highest *Tariff* score (6), and is therefore the CoD assigned for this case.**

What is the Tariff method used in SmartVA?

- Tariff gives 1-3 CoDs
- The Physician can choose one from the CoDs given for MCCOD

SmartVA Results ✕

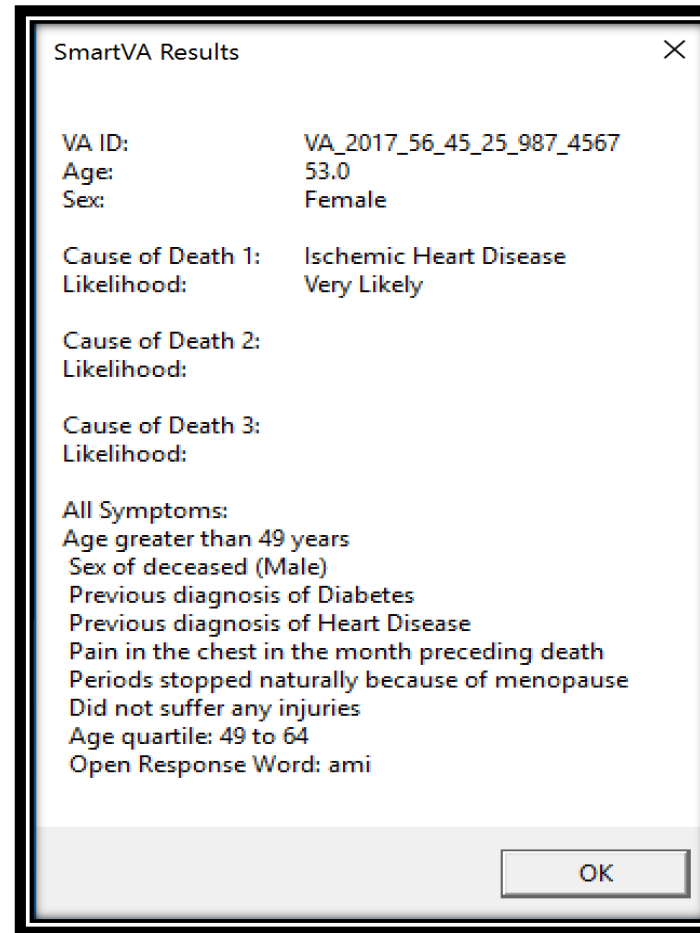| VA ID: | VA_2017_20_40_12_123_9871 |
| Age: | 58.0 |
| Sex: | Male |

| Cause of Death 1: | Cirrhosis |
| Likelihood: | Likely |

| Cause of Death 2: | Other Non-communicable Diseases |
| Likelihood: | Likely |

| Cause of Death 3: | Colorectal Cancer |
| Likelihood: | Possible |

All Symptoms:
Age greater than 49 years
Yellow discoloration of the eyes
Yellow discoloration for at least 22.5 days
Vomitted in the week preceding the death
Belly pain
Belly pain at least 8 days before death
Mass in the belly
Did not suffer any injuries
Age quartile: 49 to 64
Open Response Word: liver

OK

SmartVA Results ✕

VA ID:	VA_2017_56_45_25_987_4567
Age:	53.0
Sex:	Female

| Cause of Death 1: | Ischemic Heart Disease |
| Likelihood: | Very Likely |

| Cause of Death 2: | |
| Likelihood: | |

| Cause of Death 3: | |
| Likelihood: | |

All Symptoms:
Age greater than 49 years
Sex of deceased (Male)
Previous diagnosis of Diabetes
Previous diagnosis of Heart Disease
Pain in the chest in the month preceding death
Periods stopped naturally because of menopause
Did not suffer any injuries
Age quartile: 49 to 64
Open Response Word: ami

OK

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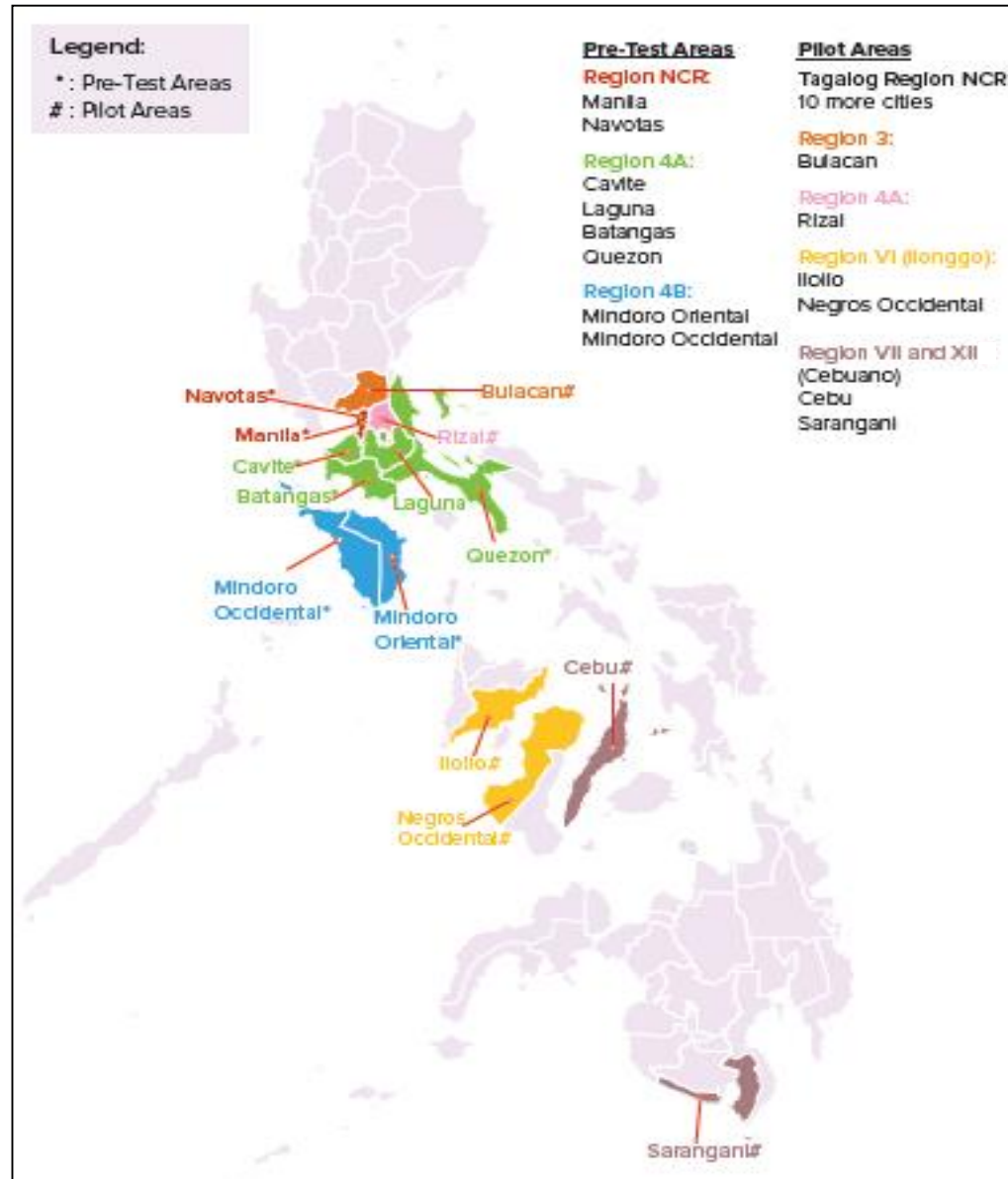# Objectives of SmartVA in the Philippines

- Assist physicians to certify reliably the cause of death for out-of-hospital deaths
- Improve the accuracy of cause of death data for out-of-hospital (community) deaths

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Pre-Test and Pilot Implementation

The collaboration

- Department of Health
- Philippine Statistics Authority
- Municipal/City Health Officers
- Vital Strategies
- University of Melbourne
- Funding
  - Bloomberg Philantropies
  - Australian Government

Legend:
* : Pre-Test Areas
# : Pilot Areas

Pre-Test Areas

Region NCR:
Manila
Navotas

Region 4A:
Cavite
Laguna
Batangas
Quezon

Region 4B:
Mindoro Oriental
Mindoro Occidental

Pilot Areas

Tagalog Region NCR:
10 more cities

Region 3:
Bulacan

Region 4A:
Rizal

Region VI (Ilonggo):
Iloilo
Negros Occidental

Region VII and XII (Cebuano)
Cebu
Sarangani

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Pilot Implementation

- July 2017 to June 2018
- MHOs to use SmartVA for all community (out-of-hospital) deaths
- Mid-term evaluation in Jan 2018
- Evaluation in July, 2018

Changes introduced to SmartVA

- New SOP
- Introduction of SmartVA for physicians
- MCCoD training

Pilot Implementation

Methods

a. Training of physicians in SmartVA and in medical certification of cause of death
b. Training of IT personnel in the SmartVA technology
c. Provision of tablets with the SmartVA application and installation of Tariff auto-analyse software for cause of death analysis on the MHO laptop.
d. Translation of questionnaire into three languages (Tagalog, Cebuano and Ilonggo).
e. Pre-testing of the questionnaire and process used
f. Implementation of pilot

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Pilot Implementation

Results

Number of regions covered: 6 regions – 69 cities/municipalities
Number of physicians trained = 126
Number of IT personnel trained = 95

Total No. of Deaths: 5,649
    Male deaths: 3,065 (54.3%)
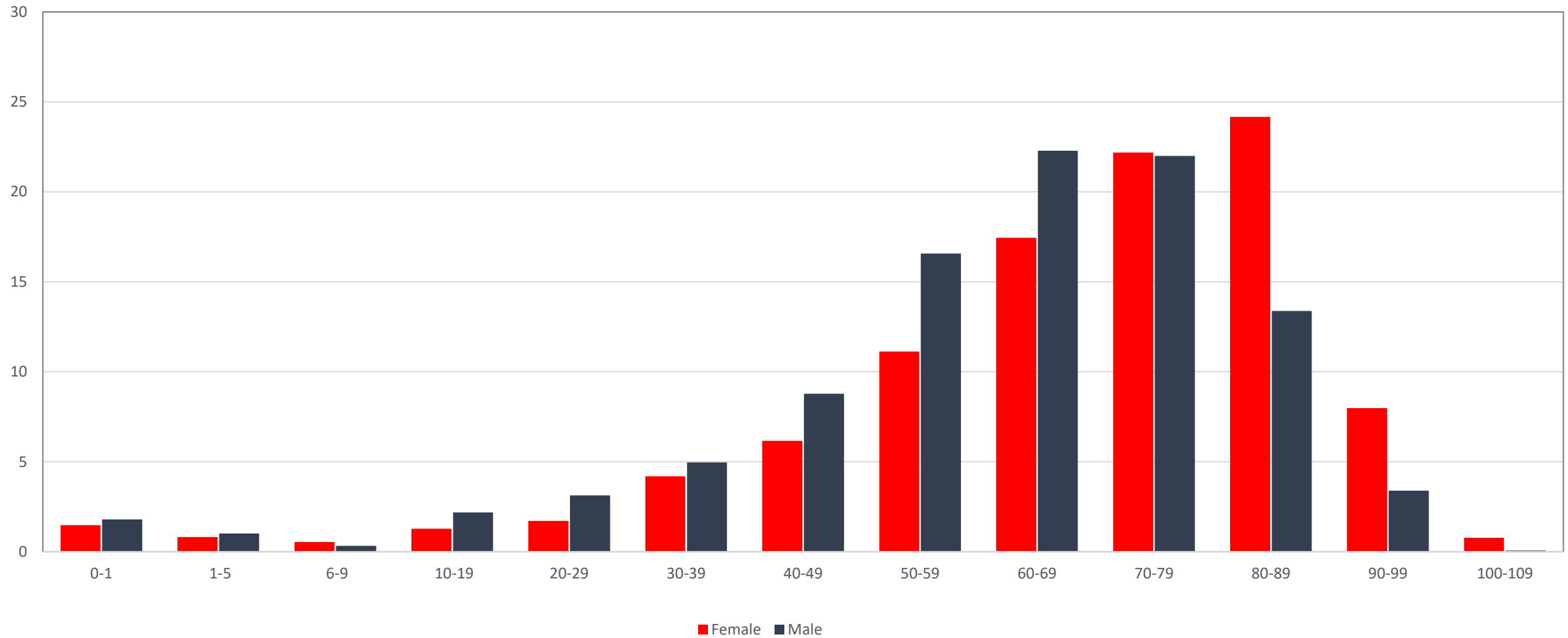   Female deaths: 2,579 (45.7%)
    Not indicated: 5 (0.01%)

Total No. of Deaths where SmartVA was used: 4,586 (81.2%)

% of cases where Physician used the Smart VA CoD in MCCOD: 65%

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Pilot Implementation

Figure 1: Age and sex pattern of community deaths in the pilot areas, N=5,649

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Pilot Implementation

Figure 2: Proportion of Top 20 causes of community deaths when Physicians used SmartVA , N =4586
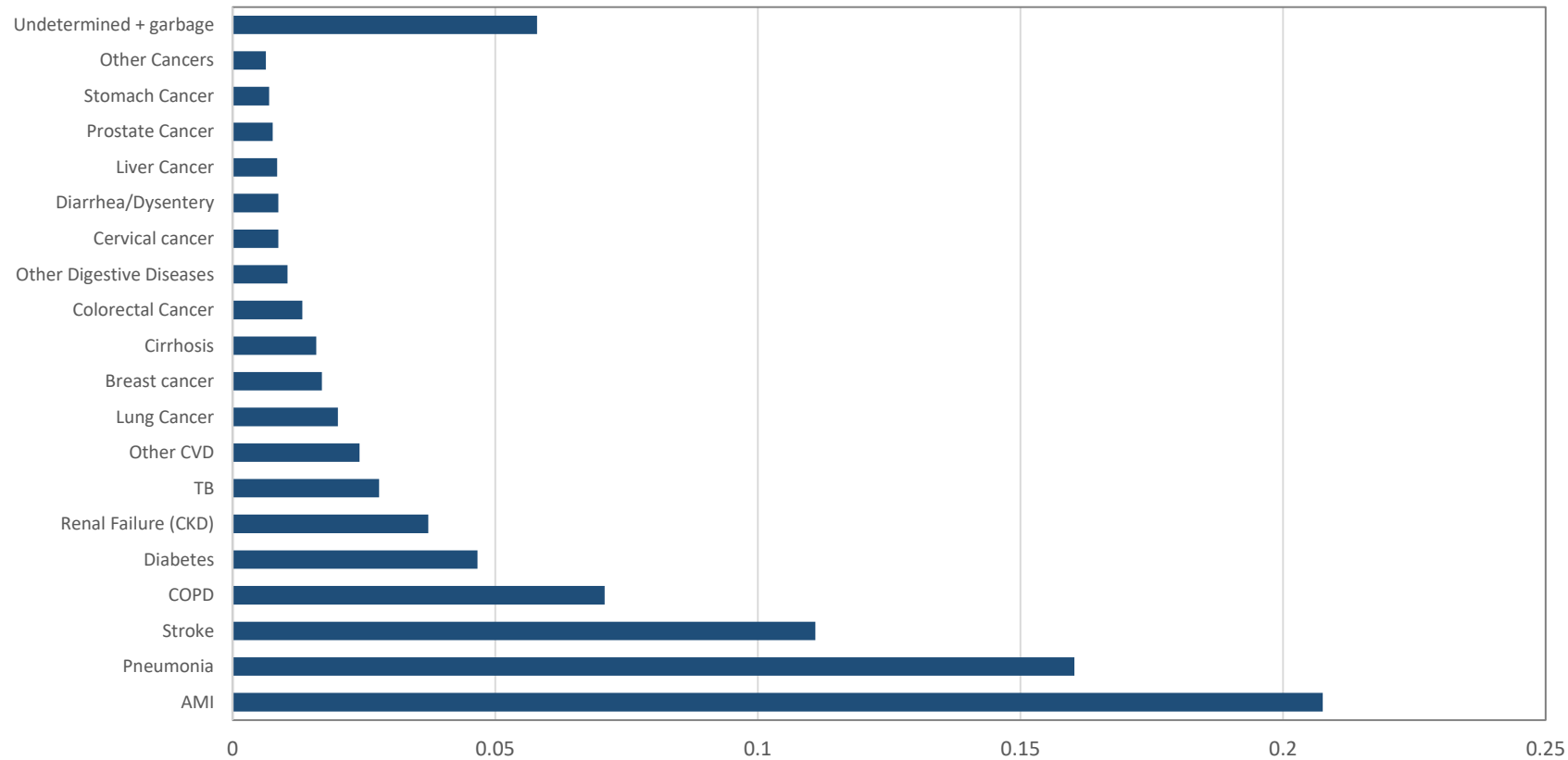
Conclusion

Generally, SmartVA is acceptable to the MHOs who have used it and can be implemented in the country to improve the quality of death certification of community deaths.

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Conclusion

More specific assessments on SmartVA are as follows:

a.   SmartVA is a useful tool for doctors to have to certify the cause of death of people that do not present with medical records;

b.   SmartVA is culturally acceptable in the Philippines and both doctors and families cooperated willingly;

c.   SmartVA can be introduced without changing the existing CRVS system;

d.   Rolling out SmartVA as a fully integrated part of the CRVS system can be done without major extra costs;

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Conclusion

e.   SmartVA for physicians assisted MHOs with certifying many community deaths for whom no medical records were available;
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f.   SmartVA eliminates inter-physician variability by always using the same standard questions and methods for all deaths; and

g.   Comparisons to other sources of COD data (PSA) confirmed that the cause specific mortality fractions (CSMF) produced by SmartVA for the VA areas were comparable and produced fully reliable data for policy.

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