Verbal Autopsy for Mortality Statistics in Resource Constrained Settings:

Toward an adaptive solution

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BILL & MELINDA GATES *foundation*

What's the problem?

- **Lancet series "WHO Counts?" (2007)**
  - Vital Statistics Systems – particularly mortality and CoD in a pitiful state
  - Little change for going on half a century, but there are some possible next steps
  - VA is part of that picture

- **Low-income countries:**
  - Bear greatest disease burdens
  - Premature death accounts for 80% of total DALYs lost
  - lack any cost-effective means to reliably and directly measure leading causes of death at the population or community level

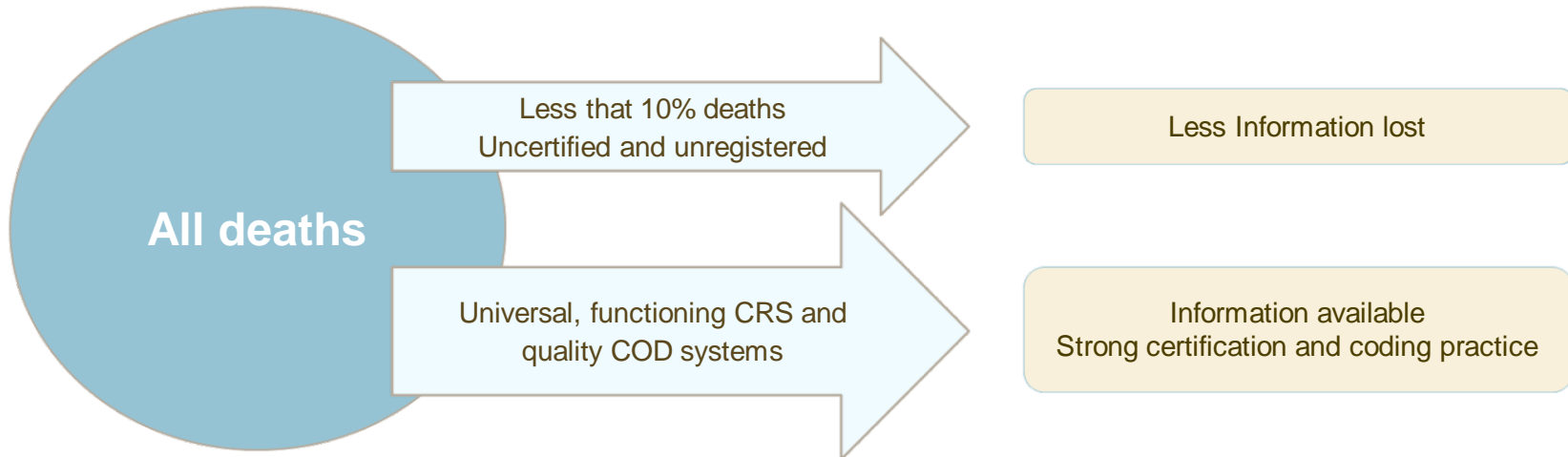- **Central question: are there any *practical* alternatives to VA?**

But what *kind* of problem is it?

- **Is it a purely technical problem?**
  - Solvable by structured research and scientific inquiry?

- **Is it a "wicked" or adaptive problem?**
  - Complex, intractable, raising new problems even as we try to solve it, and requiring more strategic, adaptive, and pragmatic interim solutions?

- **After several decades in search of technical solution, it is time to shift to a more adaptive approach?**

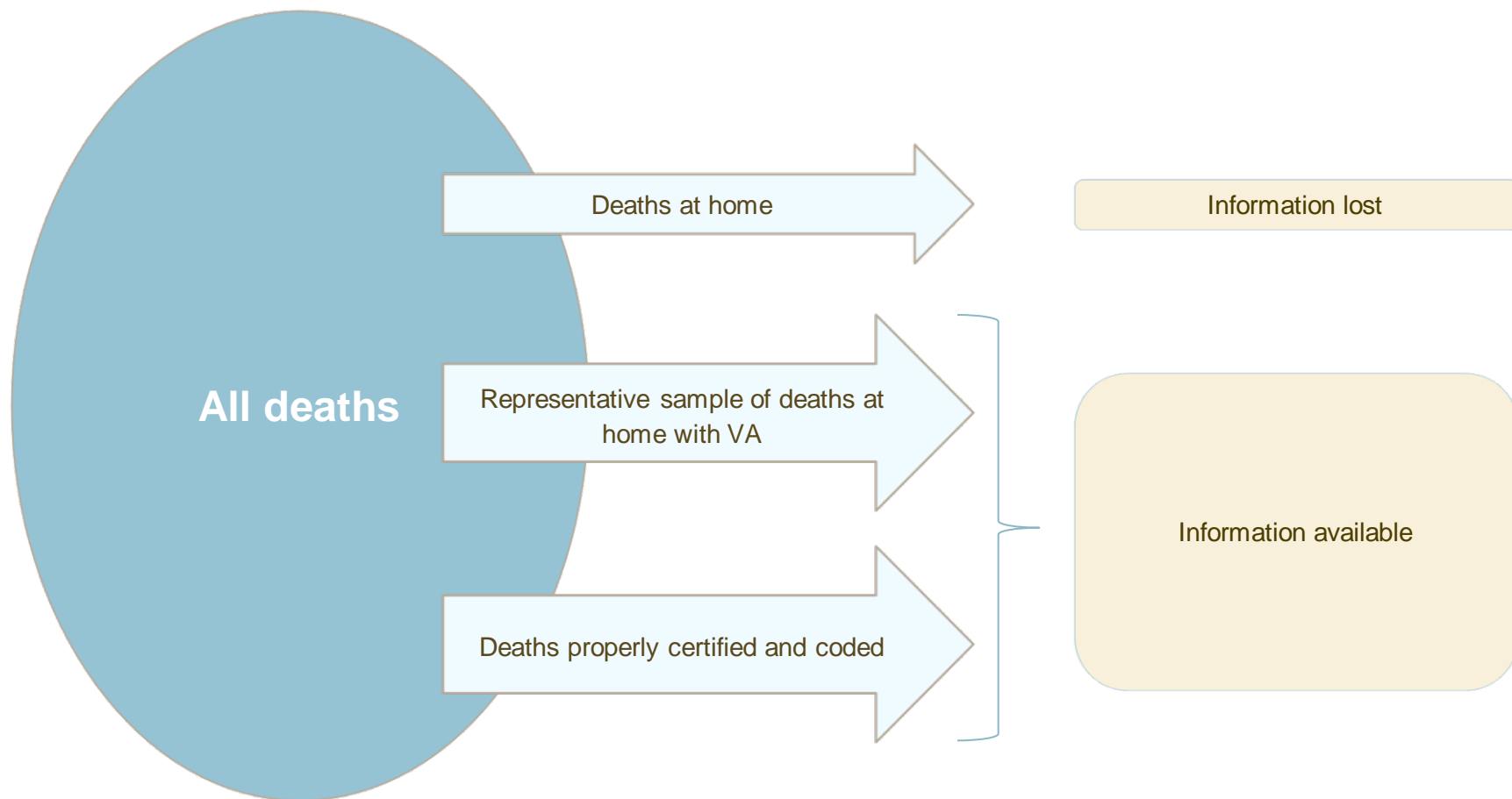- **Countries and funders will ultimately decide …**

Current Situation—2012

All deaths

Up to 90% at home
Uncertified and unregistered

Information lost

10%-40% certified and registered
(at health facilities)

Information available
Weak certification and coding practice

Desired Future State—2112?

All deaths

Less that 10% deaths
Uncertified and unregistered

Less Information lost

Universal, functioning CRS and
quality COD systems

Information available
Strong certification and coding practice

An Adaptive Solution Might Look Something Like This

All deaths

Deaths at home → Information lost

Representative sample of deaths at home with VA →

Deaths properly certified and coded → Information available

Verbal Autopsy:

One Piece of this Wicked Proplem

What is "Verbal Autopsy" and what is its purpose?

- **What it is:**
  - Post-mortem care-giver interview & data collection with lay-informants
  - Replicable way to measure proportions and trends of more common causes of death
  - The best *practical* alternative to guessing

- **What it isn't:**
  - Permanent alternative to proper death certification & registration
  - Means to reliably determine CoD at the *Individual Level*
  - Universally accepted as 'reliable' or even 'good enough' for some policy purposes (especially for rarer causes)

How is it applied in the field?

- **VA is platform *independent***
  - **Need system to identify or ascertain incident deaths**

- **Longitudinal Surveillance**
  - **Non-representative Demographic Surveillance Systems (DSS)**
  - **Nationally representative SRS in India**

- **Cross-Sectional Applications**
  - **Nationally representative 'rider' surveys on national census activities (INCAM in Mozambique; Malaria Indicator Surveys)**
  - **MIS (sample size issues)**

What is scientific validity of VA?

- **Success criteria are *not* straightforward**
  - CSMFs? Sensitivity/Specificity/PPV?
  - Validation methodologies problematic

- **How good is good enough? How bad is useless?**
  - Standard of credible evidence required to make a decision?
  - Acceptable measurement error in general trends of leading causes of death?

- **VA has many component parts:**
  - Questionnaires (age-group, sex-specific)
  - Means of eliciting responses
  - Quality of respondents
  - Means of assigning CoD & handling uncertainty

Implications of VA … so what?

"Unintended" aspects of VA

Positive

- **Face-to-face accountability of the health system**

- **Behavior change – socialize/normalize reporting, registration, and certification of deaths**

- **Strong sense of ownership from locally generated data – both by communities & health systems**

- **Validation studies shine light on poor 'gold standard'**

Negative

- **Potential for over-confidence in accuracy of data from a crude tool because it's the only source of direct measurement**
  - **Especially for less-common causes**
- **May present complications for roll-out of ICD**

Implications for real-time decision-making or policy debates?

- **Tanzania:**
  - <u>Finding</u>: acute febrile illness/malaria leading CoD of children; many children die at home even after being treated at clinic
  - <u>Policy Change</u>: Re-prioritizing malaria prevention at district level & support for national policy change in first-line drug

- **IHME Reports on Global Maternal Mortality:**
  - <u>Finding</u>: Maternal Mortality falling more rapidly than previously thought
  - <u>Policy Change</u>: Evidence of progress bolstered renewed advocacy for global commitments to MNCH & Family Planning

Mozambique: 'INCAM'

- **National VA study contributed evidence to policy changes**
  - Finding: Higher than expected HIV mortality in northern provinces led
  - Policy change: accelerated roll-out of ARV country-wide

  - Finding: High mortality in young children from road traffic accidents
  - Policy change: education campaigns targeting children and their parents to increase pedestrian safety

  - Finding: High malaria mortality in <5s
  - Policy change: MOH accelerated scale-up bed-net distribution to pregnant women and children accompanied by an educational campaign

But controversy continues …

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Global malaria mortality between 1980 and 2010: a systematic analysis

Prof Christopher JL Murray MD [a] 📝✉, Lisa C Rosenfeld AB [a], Stephen S Lim PhD [a], Kathryn G Andrews AB [a], Kyle J Foreman MPH [a], Diana Haring BSc [a], Nancy Fullman MPH [a], Mohsen Naghavi MD [a], Prof Rafael Lozano MD [a], Prof Alan D Lopez PhD [b]

Next steps

- **Keep improving the science and application …**
  - Stronger validation methods & evidence for reliable algorithm coding of VA; more sustainable systems applications

- **While lowering barriers to use …**
  - Tablets to capture data & immediately generate probable CoD (coming)

- **Supporting progress (not perfection) …**
  - Fund the growing country-level demand for these tools and systems

- **And learning.**
  - Seek continuous improvement via global community of practice

Further reading

Population Health Metrics, 2011. "Theme issue: Verbal autopsy: innovations; applications; opportunities." (v 9)

Acknowledgement

The views expressed are those of the author and do not necessarily reflect the position of the Bill & Melinda Gates Foundation.

Thank You