Lessons learned with different criteria used and comparative approaches to evaluate the quality of mortality data: national and subnational experience in South Africa

Jané Joubert, Debbie Bradshaw, Chalapati Rao, Alan Lopez, Chodziwadziwa W. Kabudula, Theo Vos

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## OUTLINE

Background Aim Methods Results Lessons learned



## BACKGROUND

- Good-quality mortality data are key input for a number of health and development indicators and goals.
- Good-quality cause-of-death data, in particular, are essential for the health intelligence needed to effectively respond to the nature and magnitude of a population's health problems.
- However, for South Africa, two WHO comparative assessments (Mathers et al, 2005; Mahapatra et al, 2007) rated the quality of 1996 CRVS mortality data as "low".



## BACKGROUND

- At the time (1996), mortality data suffered the lingering effects of the pre-democracy partial registration system that covered selected segments of the country, and a population treated differentially by the policies & legislation of the apartheid ideologically.
- With the transition to democracy in 1994, however, CRVS underwent major transformation. Key events included:
  - the demise of "separate development" policies;
  - the subsequent geographic consolidation of the country into one geopolitical unit with a single centralised CRVS system;
  - the passing of the Births and Deaths Registration Act of 1992 that mandates <u>all</u> geographic areas and <u>all</u> individuals to register deaths into one centralised CR system, leaving no scope for optional or differential registration as experienced before;



## **BACKGROUND (KEY EVENTS CONTINUED)**

- several strategic improvement efforts by Stats SA, Dept of Health and Dept of Home Affairs, in collaboration with local mortality researchers and academics;
- introduction of a new death notification form (DNF) that complies with WHO standards;
- birth registration forms made available to mothers at the time of delivery;
- health workers trained to assist mothers to complete and submit these forms;
- targeted capacity development at Stats SA to improve the compilation and production of annual vital statistics.

Given these initiatives, it was of interest to ascertain whether or not the quality of more recent civil registration data has improved.





To share the results and lessons learned with using different criteria to evaluate the quality of mortality data from CRVS in South Africa.



## **METHODS**

- a. A desktop review to identify studies that evaluated the quality of country-level CRVS mortality data.
- b. We employed 4 general data attributes and 9 criteria to evaluate SA's CRVS mortality data for 1997 – 2007. Built on earlier evaluations, particularly those for India (Mahapatra & Rao, 2001), China (Rao et al, 2005) & Brazil (França et al, 2008.

c. An update was conducted of the evaluation in b. for 2008 – 2012.



## **DATA SOURCES**

- For four criteria: we drew on a CRVS dataset produced by Stats SA with 11 years' mortality data for 5.4 million deaths that occurred nationally from 1 Jan 1997 to 31 Dec 2007.
- This dataset has been updated annually when cause-of-death statistics have been released by Stats SA, and the update draws on data from deaths that occurred from 1 Jan 2008 to 31 Dec 2010.
- For the remaining five criteria: reviewed relevant legislation, webbased data repositories, statistical releases, and published government and research reports to identify developments which shaped the current status of these criteria in terms of data adequacy.



## **METHODS: PERFORMANCE RATINGS, THRESHOLDS**

A simple and broadly-defined rating system has been used to rate the 9 criteria, distinguishing between:

- 1. satisfactory performance,
- 2. unsatisfactory performance, and
- 3. unknown/undetermined.

To differentiate between 1 and 2, thresholds informed by general premises and principles of demography and epidemiology had been employed.



#### CRITERIA USED IN EVALUATING THE QUALITY OF <u>COUNTRY-LEVEL MORTALITY</u> DATA FROM <u>CIVIL REGISTRATION</u> SYSTEMS

| <b>Ruzicka &amp; Lopez,</b><br><b>1990</b><br>Comparative: 6<br>criteria   | M <b>ahapatra &amp;</b><br><b>Rao, 2001</b><br>Country-level:<br>9 criteria                      | Mathers <i>et al,</i><br>2005<br>Comparative:<br>5 criteria         | Rao et al,<br>2005<br>Country-level:<br>9 criteria                         | Franca et al,<br>2008<br>Country-level:<br>9 criteria                      | Mahapatr<br>Comp<br>General vital<br>statistics (12) | ra <i>et al,</i> 2007<br>parative:<br>Cause-of-death<br>statistics (15) | Phillips et al, 2014 <sup>17</sup><br>Comparative:<br>6 dimensions                               |
|--|--|---|--|--|--|---|--|
| Using only rubrics in<br>the ICD relevant to<br>mortality, at the<br>time, ICD-8 or -9                                     |  | Type of cause-of-<br>death coding<br>used, at the time,<br>ICD-9/10 |  |  |  |   | Level of cause-specific<br>detail, measured by<br>nu. of distinct causes<br>of death in data     |
| Extent of incorrect<br>assignment of causes<br>with a clear age and<br>sex dependency                                      | Extent of incor-<br>rect assignment<br>of causes with a<br>clear age- or sex-<br>dependency      |   | Extent of<br>incorrect or<br>improbable<br>age or sex<br>dependency        | Extent of<br>incorrect or<br>improbable<br>age or sex<br>dependency        |  | Extent of<br>improbable age<br>or sex<br>classifications                | Internal consistency:<br>medically impossible<br>cause assignment for<br>any given age or sex    |
| Consistency between<br>proportionate<br>distribution of<br>deaths by cause and<br>estimated mortality<br>level for country | Consistency of<br>cause-specific<br>mortality<br>proportions with<br>general mortality<br>levels |   | Consistency of<br>cause<br>patterns with<br>general levels<br>of mortality | Consistency of<br>cause patterns<br>with general<br>levels of<br>mortality |  | Consistency<br>between cause<br>of death and<br>general mortality       |  |
| Consistency between<br>age-sex distribution<br>of deaths for major<br>causes, & that expec-<br>ted for each cause          | No incidence of<br>improbable age<br>and sex distribu-<br>tion by cause                          |   |  |  |  |   |  |
| Consistency of a<br>current year's data<br>with data from<br>previous years  | Consistency of<br>cause-specific<br>mortality propor-<br>tions over time                         |   | Consistency of<br>cause-specific<br>mortality<br>rates over<br>time        | Consistency of<br>cause-specific<br>mortality rates<br>over time           | Comparable<br>over time                              | Comparable over<br>time   |  |
| Clear indication of<br>number & % of<br>deaths allocated to<br>symptoms, signs &<br>ill-defined conditions                 | Minimal use of<br>residual<br>categories of<br>causes of death                                   | Use of ill-defined<br>and unspecified<br>categories and<br>codes    | Use of ill-<br>defined<br>categories &<br>codes for                        | Use of ill-<br>defined<br>categories and<br>codes for                      |  | Use of ill-defined<br>and unspecified<br>categories                     | Quality of cause-of-<br>death reporting,<br>essentially use of<br>'garbage' codes <sup>153</sup> |

#### CRITERIA USED FOR EVALUATING THE QUALITY OF COUNTRY-LEVEL MORTALITY DATA FROM CIVIL REGISTRATION SYSTEMS (CONTINUED)

| Ruzicka & Lopez, | Mahapatra & Rao,   | Mathers <i>et al,</i>   | Rao <i>et al,</i> 2005 <u>10</u>                                   | Franca et al,  | Mahapatra <i>et al,</i> 2007 <sup>9</sup>                   |  | Phillips <i>et al</i> ,             |
|------------------|--|---|--|--|---|--|-------------------------------------|
|                  | 2001   | 2005º   | 9 criteria   |  | General vital   | Cause-of-death   | 2014 <del>1/</del>                  |
| o criteria       | Content validity of  | 5 criteria  | Content validity of  | Content validity of  |   |  | 6 dimensions                        |
|                  | lay reporting<br>systems   |   | cause-of-death<br>data   | cause-of-death<br>data   |   |  |                                     |
|                  | Adequate coverage<br>and compliance  | Coverage of the resident population by death registration       | Coverage of the<br>resident<br>population by<br>death registration | Coverage of the<br>resident<br>population by<br>death registration | Coverage of resident<br>population by death<br>registration | Coverage of deaths<br>by medical<br>certification                    |                                     |
|                  | Validity of statistics<br>at sub-national<br>levels of<br>disaggregation   |   | Geographical<br>disaggregation of<br>data                          | Geographical<br>disaggregation of<br>data                          | Availability of<br>statistics for small<br>areas            | Availability of<br>statistics for small<br>areas                     |                                     |
|                  | Timeliness of<br>compilation and<br>publication of<br>mortality statistics | Timeliness of<br>supplying death<br>registration data to<br>WHO | Timeliness of the<br>release of<br>mortality statistics            | Timeliness of the<br>release of<br>mortality statistics            | Timeliness in terms of production time                      | Timeliness in terms of production time                               | Timeliness and availability of data |
|                  |  | Completeness of death registration                              | Completeness of death registration                                 | Completeness of death registration                                 | Completeness of death registration                          | Completeness of<br>deaths with<br>medically-certified<br>cause       | Completeness of death reporting     |
|                  |  |   |  |  | Missing data: % key<br>variables with no<br>response        | Missing data: %<br>cause-of-death<br>reports with no<br>age/sex data | Quality of age and<br>sex reporting |
|                  |  |   |  |  | Routine tabulations<br>by 5-yr age groups<br>and sex        | Routine tabulat-<br>ions by 8 age<br>groups and sex                  |                                     |
|                  |  |   |  |  | Comparable across space                                     | Comparable across space  |                                     |
|                  |  |   |  |  | Regularity of dissemination                                 | Regularity of dissemination  |                                     |
|                  |  |   |  |  | Accessibility of data in various formats                    | Accessibility of<br>data in various<br>formats                       |                                     |
|                  |  |   |  |  | Accessibility of metadata                                   | Accessibility of metadata  |                                     |
|                  |  |   |  |  | Accessibility of user service                               | Accessibility of user service  |                                     |

| Data<br>attributes    | Criteria: country<br>level CRVS<br>mortality data      | CRVS data<br>quality:<br>1997 - 2007 | CRVS data<br>quality:<br>2008 - 2012 | Assessment<br>question   | Suggested threshold /<br>desired response   |
|-----------------------|--|--------------------------------------|--------------------------------------|--|---|
| Generaliza-<br>bility | 1. Coverage  |                                      |                                      | What % of the population and the geography of the country is covered by the CRVS system?   | 100% of national population   |
|                       | 2. Completeness  |                                      |                                      | Within the covered population, what % of deaths is registered into the CR system?  | ≥ 90% of deaths   |
| Reliability           | 3. Epi consistency                                     |                                      |                                      | To what extent are cause-of-death patterns consistent with the total level of mortality?   | < 2 standard deviations from<br>mean model-predicted levels   |
|                       | 4. Temporal<br>consistency                             |                                      |                                      | To what extent is cause-specific mortality consistent over time?   | < 2% annual death rate<br>fluctuation in leading causes,<br>unless explained by particular<br>local epi phenomena                                       |
| Validity              | 5. Content validity                                    |                                      |                                      | Against reference diagnoses, to what extent<br>are the attributed underlying cause<br>accurate?                                  | If no concordance, sensitivity,<br>specificity, or kappa scores from<br>validation studies, consider<br>criteria 6 & 7, plus extent of<br>errors on DNF |
|                       | 6. Extent of ill-<br>defined & non-<br>specified codes |                                      |                                      | What proportion of registered deaths is assigned an ill-defined/non-specific cause?  | < 10% of deaths   |
|                       | 7. Use of age- &<br>sex-improbable<br>classifications  |                                      |                                      | What proportion of deaths is assigned an improbable age- or sex-cause?   | < 1% of deaths  |
| Policy<br>relevance   | 8. Timeliness  |                                      |                                      | What is the time gap between the end of<br>the reference period (year of death) and<br>time of publication of final tabulations? | ≤ 2 years   |
|                       | 9. Availability of sub-national data                   |                                      |                                      | Are death and cause-of-death data available at sub-national jurisdictions for analysis?  | Yes, at least at provincial/state<br>level, but preferably at health<br>district level  |

| Ruzicka & Lopez,  | Mahapatra &<br>Rao, 2001  | Mathers <i>et al</i> , 2005   | Rao et al, 2005  | Mahapatra <i>et al</i> , 2007    |  | Franca <i>et al.</i> ,   | Joubert et al.,   | Phillips <i>et al</i> , 2014  | Mikkelsen <i>et al.</i> ,   |
|---|---|---|--|----------------------------------|--|--|---|---|---|
| 6 criteria  | 9 criteria  | 5 criteria  | 9 cinena   | General vital<br>statistics (12) | Cause-of-<br>death statistics<br>(15)                                      | 9 criteria   | 9 criteria  | o cincila   | 6 criteria  |
| Using only rubrics<br>in the ICD relevant<br>to mortality—at the<br>time, ICD-8 or -9   |   | Type of cause-<br>of-death coding<br>used—at the<br>time, ICD-9 or<br>-10 |  |                                  |  |  |   | Level of cause-<br>specific detail,<br>measured by<br>number of distinct<br>causes of death in<br>data                                  | Level of cause-<br>specific detail,<br>measured by<br>number of distinc<br>causes of death ir<br>data                               |
| No incorrect<br>assignment of<br>causes of death<br>with a clear age-sex<br>dependency  | Absence of<br>incorrect<br>assignment of<br>causes with a<br>clear age and sex<br>dependency                        |   | Incorrect or<br>improbable age<br>or sex<br>dependency                     |                                  | Incorrect or<br>improbable age<br>or sex<br>dependency                     | Incorrect or<br>improbable age or<br>sex dependency                        | Incorrect or<br>improbable age or<br>sex dependency   | Internal consis-<br>tency: extent to<br>which reported<br>causes are biolo-<br>gically plausible<br>with regard to age<br>or sex        | Internal consis-<br>tency: extent to<br>which reported<br>causes are biolo-<br>gically plausible<br>with regard to age<br>or sex    |
| Consistency<br>between propor-<br>tionate distribution<br>of deaths by cause<br>and estimated<br>mortality level for<br>the country | Consistency of<br>cause-specific<br>mortality<br>proportions with<br>general mortality<br>levels for the<br>country |   | Consistency of<br>cause patterns<br>with general<br>levels of<br>mortality |                                  | Consistency of<br>cause patterns<br>with general<br>levels of<br>mortality | Consistency of<br>cause patterns<br>with general<br>levels of<br>mortality | Consistency of<br>cause patterns with<br>general levels of<br>mortality<br>(Epidemiological<br>consistency) |   |   |
| Consistency<br>between age-sex<br>distribution of<br>deaths for major<br>causes and that<br>expected per cause                      | No incidence of<br>improbable age<br>and sex<br>distribution by<br>cause  |   |  |                                  |  |  |   |   |   |
| Consistency of a<br>current year's data<br>with data from<br>previous years   | Consistency of<br>cause-specific<br>mortality<br>proportions over<br>time   |   | Consistency of<br>cause-specific<br>mortality rates<br>over time           | Comparable<br>over time          | Consistency of<br>cause-specific<br>mortality rates<br>over time           | Consistency of<br>cause-specific<br>mortality rates<br>over time           | Consistency of<br>cause-specific<br>mortality rates over<br>time (Temporal<br>consistency)                  |   |   |
| A clear indication<br>of number &<br>proportion of<br>deaths allocated to<br>symptoms, signs &<br>ill-de-fined<br>conditions        | Minimal use of<br>residual<br>categories of<br>causes of death  | Use of ill-<br>defined and<br>unspecified<br>categories and<br>codes      | Use of ill-<br>defined<br>categories and<br>codes for causes<br>of death   |                                  | Use of ill-<br>defined<br>categories and<br>codes for<br>causes of death   | Use of ill-defined<br>categories and<br>codes for causes<br>of death       | Use of ill-defined<br>categories and<br>codes for causes of<br>death  | Quality of cause-of-<br>death reporting,<br>essentially the use<br>of 'garbage' <sup>52</sup> (ill-<br>defined or<br>unspecified) codes | Quality of cause-<br>of-death reporting<br>essentially the use<br>of 'garbage' <sup>52</sup> (il<br>defined or<br>unspecified) code |

## **RESULTS: 1. COVERAGE**

- During most of the 1900s, coverage was constrained by differential registration practices, based on geographical segmentation and population segregation acts and policies.
- During the 1990s, the 'homeland' ideology was abolished, and the country was geo-politically unified under one government.
- A new *Births and Deaths Registration Act* was passed in 1992, whereby death notification became a national, inclusive legal requirement for *all* people in *al* geographic areas.
- Hence, coverage was rated satisfactory for 1997-2007.



## 1. COVERAGE: 2<sup>ND</sup> PERIOD

- During the 2<sup>nd</sup> period, the same inclusive principles applied in legislation and CR practise, and death registration continued as a centralised government service.
  - For these purposes, *coverage* could be rated *satisfactory* for this period too.
- However, it became apparent that for a proportion of natural deaths, possibly up to 10%, the event of death were certified by traditional leaders or village headmen.
  - Suggests that the country has two coverage systems, with differing resources and dissimilar performance prospects:
    - a) mandatory certification of the fact and cause of death by a medical officer in the official civil registration system; and
    - b) certification of the fact and circumstances of death by traditional leaders/ village headmen, mainly in rural areas where clinicians are not available.

For <u>2008 - 2012</u>: *coverage* was rated unsatisfactory



## 2. COMPLETENESS



#### Fig. 1a: <u>1997 - 2007</u>: satisfactory Fig. 1b: <u>2008 - 2010</u>: satisfactory, & improved since previous period;

**But:** to be alert for lower levels at ages 1-4 & 5-14 yrs; Rob reported deterioration in young adult levels

## 3. EPIDEMIOLOGICAL CONSISTENCY

Based on the premise that the composition of mortality by cause changes systematically as all-cause mortality decline,

- *observed* broad patterns of causes of death for SA were compared with *expected* broadcause values in a model (Salomon & Murray, 2002) that considers the relationship between the overall level of mortality and the relative contribution of causes to the overall level.
- a difference of more than two standard deviations (>2 SD) between observed and modelpredicted proportions suggests unsatisfactory epi consistency of the observed data.

On the basis of the large differences between the SA epi profile and that produced in the model predictions, this criterion could not be assessed conclusively as the model does not have the discriminatory power to enable an assessment for South Africa's particular high-HIV/AIDS mortality profile.

Epidemiology consistency: <u>1997 - 2007</u>: undetermined <u>2008 - 2012</u>: undetermined



## **4. TEMPORAL CONSISTENCY**



Fig. 2a: Proportion of total deaths due to leading categories & single causes of death, 1997–2007

Fig. 2c: Proportion of total deaths due to *Other perinatal conditions*, and 3 other causes likely to havebeen affected by the marked decrease in *Other perinatal conditions*, 1997–2013.

<u>1997 - 2007</u>: satisfactory <u>2008 - 2012</u>: unsatisfactory



hs

**Fig. 2b:** Proportion of total deaths due to selected causes of death, 1997–2013



## **5. CONTENT VALIDITY**

The extent to which attribution and coding of causes of death are accurate, is not routinely assessed in SA.

 However, a number of studies have highlighted considerable problems around cause attribution, mostly focussing on the misclassification of HIV/AIDS deaths, but also of ischemic heart disease and diabetes.

#### Injuries in SA represent another substantial quality problem:



1997 - 2007: unsatisfactory; 2008 - 2012: unsatisfactory



## 5. CONTENT VALIDITY: LINKAGE STUDY

- Moreover, in a linkage study, data from CRVS death notification forms, and information from verbal autopsy questionnaires from the INDEPTH Agincourt HDSS, were matched to examine the quality of rural CRVS mortality data.
- Deterministic and probabilistic techniques were used to link death data for 2006 - 2009. Causes of death were aggregated into the WHO Mortality Tabulation List and a locally-relevant short list of 15 causes. Using the VA diagnoses as reference, misclassification patterns and cause-specific mortality fractions (CSMFs) were calculated for the short list.
  - A matching rate of 61% was attained. For the 2,264 matched cases, cause agreement was 15% (kappa 0.1083) for the WHO list, and 23% (kappa 0.1631) for the short list.
  - CSMFs were significantly different for all but four of the 15 causes on the short list: tuberculosis, cerebrovascular disease, other heart disease, and ill-defined natural)

**Content validity** is therefore rated unsatisfactory for both periods.



#### 6. % ILL-DEFINED AND NON SPECIFIC CAUSE-OF-DEATH CODES

Percentage of total deaths assigned selected ill-defined and non-specific codes by province of death occurrence, South Africa, 1997-2007

|                     | Western<br>Cape | Eastern<br>Cape | Northern<br>Cape | Free<br>State | KwaZulu-<br>Natal | North<br>West | Gau-<br>teng | Mpuma-<br>langa | Lim-<br>popo | South<br>Africa |
|---------------------|-----------------|-----------------|------------------|---------------|-------------------|---------------|--------------|-----------------|--------------|-----------------|
| Chapter R codes     | 6.0             | 17.5            | 7.5              | 9.6           | 15.0              | 9.9           | 12.4         | 8.5             | 17.9         | 12.8            |
| Non-spec. cancer    | 1.5             | 0.6             | 0.7              | 0.5           | 0.5               | 0.4           | 0.8          | 0.4             | 0.4          | 0.6             |
| III-def. CVD        | 3.0             | 3.0             | 4.0              | 4.5           | 3.5               | 5.1           | 3.8          | 3.4             | 3.8          | 3.7             |
| III-def. injury     | 12.3            | 6.6             | 6.3              | 5.4           | 6.9               | 5.7           | 10.4         | 7.0             | 4.4          | 7.6             |
| All four categories | 22.8            | 27.7            | 18.5             | 20.0          | 25.9              | 21.1          | 27.4         | 19.3            | 26.5         | 24.7            |

Proportion of total deaths due to ill-defined natural causes (R00-R99), 1997–2012. Source: Vital statistics from civil registration data, provided by Stats SA.

Criteria 6: III-defined/non-specific codes: 1997 - 2007: unsatisfactory 2008 - 2012: unsatisfactory



## 7. USE OF AGE- AND SEX-IMPROBABLE CLASSIFICATIONS





Unadjusted age- and sex-specific rates for cerebrovascular deaths, SA, 1997–2007.

Unadjusted age-specific death rates by year of death for three major cause groups, SA, '97-'07.

#### 1997 – 2007: satisfactory

2008 – 2012: similar, satisfactory to

## 8. TIMELINESS

9. SUB-NATIONAL AVAILABILITY OF MORTALITY DATA

## 8. Timeliness

 1997 - 2007: poor at the outset of the period, but over time, became satisfactory

For 1997 – 2001:10% sampleBy 2002:full data set for 1997 up to 2002 became available

- 2008 2012: timeliness satisfactory and improved
- Currently: lag of 11 months
- 9. Sub-national availability of mortality data
  - 1997 2006: satisfactory—available at provincial level
  - 2007 2012: satisfactory and improved—further disaggregated to the health district level



| Data<br>attributes    | Criteria:<br>country-level<br>CRVS mortality           | CRVS data<br>quality:<br>1997 - 2007 | CRVS data<br>quality:<br>2008 - 2012 | Assessment<br>question   | Suggested threshold /<br>desired response   |
|-----------------------|--|--------------------------------------|--------------------------------------|--|---|
| Generaliza-<br>bility | 1. Coverage  | Satisfactory                         | Unsatisfactory                       | What % of the population is covered by the (CR) system?  | 100% of national or sample population   |
|                       | 2. Completeness  | Satisfactory                         | Satisfactory                         | Within the covered population, what % of deaths is registered into the CR system?  | ≥ 90% of deaths   |
| Reliability           | 3. Epi consistency                                     | Undetermined                         | Undetermined                         | To what extent are cause-of-death patterns consistent with the total level of mortality?                                 | < 2 standard deviations from the<br>mean of model-predicted levels  |
|                       | 4. Temporal consistency                                | Satisfactory                         | Deteriorated                         | To what extent is cause-specific mortality consistent over time?   | < 2% annual death rate fluctuation in<br>leading causes, unless explained by<br>local epi phenomena   |
| Validity              | 5. Content validity                                    | Unsatisfactory                       | Unsatisfactory                       | Against reference diagnosis, to what extent<br>are attribution and coding of the underlying<br>cause accurate?           | If no concordance, sensitivity,<br>specificity, or kappa scores from<br>validation studies, consider<br>criteria 6 & 7, plus extent of errors<br>on DNF |
|                       | 6. Extent of ill-<br>defined & non-<br>specified codes | Unsatisfactory                       | Unsatisfactory                       | What proportion of registered deaths is assigned an ill-defined/non-specific cause?                                      | < 10% of deaths   |
|                       | 7. Use of age- &<br>sex-improbable<br>classifications  | Satisfactory                         | Satisfactory                         | What proportion of deaths is assigned an improbable age- or sex-cause?   | < 1% of deaths  |
| Policy<br>relevance   | 8. Timeliness  | Satisfactory                         | Satisfactory                         | What is the time gap between end of the reference period (yr of death) and the time of publication of final tabulations? | ≤ 2 years   |
|                       | 9. Availability of sub-national data                   | Satisfactory                         | Satisfactory                         | Are death and cause-of-death data<br>available at sub-national jurisdictions for<br>analysis?                            | Yes, at least at provincial/state level,<br>but preferably at health district level   |
|                       |  |                                      |                                      |  | advancinglife   |

# LESSONS LEARNT/CONCLUDING REMARKS

First period: 6 / 8 criteria rated satisfactory

Second period: 4 / 8 satisfactory

Lesson 1: First period: 6/8 criteria were rated satisfactory. Second period, 4/8 performed satisfactory.

**However**, this does not reflect a deterioration in data quality, but rather better data availability, more analysis, slightly more hands to analyse, slightly more minds to interpret and scratch deeper, and, hence, more insight into data

Lesson 2: Updating made us realize there is a subjectiveness in thresholds (e.g. headman's tasks increases the count and contribute to higher completeness (good!), but decreases reliability of cause-of-death

**Lesson 3**: Some training efforts to assist physicians in accurately attributing the underlying cause has been conducted. However, the need for training remains massive.



## **LESSONS LEARNT/CONCLUDING REMARKS (1)**

Mikkelsen et al (2015) reported the status of CRVS in 148 countries, based on methodological work by Phillips et al (2014) who proposed a single composite metric, the *Vital Statistics Performance Index (VSPI)*. The metric is based on results from 6 data dimensions from public domain CR data, as implied by the 2010 and 2013 Global Burden of Disease Studies.

- For South Africa, VSPI shows 'rapid and extensive improvement in the performance of the CRVS system, improving from "very low" (VSPI = 7.8) for 1990-94 to "high" quality (70.5 for 2005-2009).
- Our evaluation of the CRVS mortality data, using nine criteria, confirms the overall observation by Mikkelsen et al, but ours also highlights the problem areas.
- Lesson 4: a single composite metric, that is good for international comparison, may 'over-estimate' performance of a country's CRVS system as it may be unable to pick up or show quality problems with individual criteria.



## **LESSONS LEARNT/CONCLUDING REMARKS (2)**

Lesson 5 : Our desktop review illustrated that much work has been done to develop frameworks and identify criteria to assess the performance of *health* information systems, as well as assessing the guality of the data that are captured into these systems. In contrast, less work has been done in developing frameworks and criteria for assessing the quality of data from *civil registration and vital statistics*, in particular.

Why? What is this a symptom of?



## **LESSONS LEARNT/CONCLUDING REMARKS (3)**

Lesson 6: Political will and drive, technical expertise, and collaboration among stakeholders are essential when a country desires improved CRVS data quality.

- Lesson 7: Academics and researchers have a critical independent role to play.
- Lesson 8: Compared to the assessments of Mathers et al (2005) and Mahapatra et al (2007), SA's mortality data have improved considerably since their analyses of 1996 data.

Lesson 9: However, there is still much to be done to improve the quality of mort data—in particular with regard to cause-of-death data.



Jané Joubert SA MRC Burden of Disease Research Unit PO Box 19070 Tygerberg 7505 South Africa

Jane.Joubert@mrc.ac.za





Criteria related to <u>input</u> components of a CRVS system (e.g. legal framework, registration resources and infrastructure), and criteria related to <u>process</u> components (e.g. death registration practices, data capture, training of mortality coders) are certainly important factors of a country's mortality-data machinery to study in terms of quality, however this presentation is about the quality of an <u>output</u> element—mortality data—of the South African CRVS.

