MONITORING MORTALITY AND EXCESS DEATHS IN SOUTH AFRICA

PRESENTATION TO WEBINAR ON
THE DEMOGRAPHIC IMPACT OF COVID-19
21 OCTOBER 2020

DEBBIE BRADSHAW
BACKGROUND

• South Africa has a well established civil registration and vital statistics system

• In the past 25 years, completeness of death registration has improved but there are challenges with the quality of cause of death information

  ~ 14.2 % are ill-defined natural causes
  ~ 16.3 % are not-sufficiently specified as underlying cause
  – extensive mis-attribution of HIV/AIDS deaths
  – incomplete information about manner of death for injuries

• Annual cause of death report takes about 3 years to be released
RAPID MORTALITY SURVEILLANCE

- SAMRC obtains data for the deaths registered on the National Population Register from the Department of Home Affairs on a monthly basis since 2001

- Completeness of registration is estimated, after additional data are obtained from NDOH and Stats SA - ongoing analyses of completeness based on death distribution methods, comparison with direct and indirect estimates from censuses and surveys

- Annual Rapid Mortality Report gives empirical estimates of mortality indicators for the country such as life expectancy, infant and under-5 mortality rate etc.
• With COVID-19 in mind, we investigated the pattern of weekly data up till end Feb 2020 => high proportions registered within 2 weeks of death

• Requested DHA to provide data on a weekly basis during March

• The number of deaths changes during the year => estimated the predicted weekly numbers of deaths using time series analysis from previous two years after adjusting for completeness of registration

• Estimate the deaths in the last week that are still to be registered
The number of weekly deaths peaked in the week 15-22 July 2020

- Black line shows the weekly number of deaths in 2020
- Orange line shows the number predicted from historical data with bounds of uncertainty – a lower bound and upper bound
EXCESS MORTALITY

Used in epidemiology and public health to measure the mortality impact of a crisis when not all causes of death are known.

The World Health Organization defines ‘EXCESS MORTALITY’ as:

“Mortality above what would be expected based on the non-crisis mortality rate in the population of interest. Excess mortality is thus mortality that is attributable to the crisis conditions. It can be expressed as a rate (the difference between observed and non-crisis mortality rates), or as a total number of excess deaths.”
Number of deaths per week from all causes, 2020 vs recent years:

Shading indicates total excess deaths during outbreak

FT Visual & Data Journalism team AUGUST 20 2020
RSA weekly deaths from natural causes 1+ years: 1 Jan - 12 May 2020

RSA weekly deaths from unnatural causes 1+ years: 1 Jan - 12 May 2020
Excess natural deaths using adjusted baseline to account for lower deaths during lockdown:

- Base set to continue parallel to the predicted, at the level before confirmed COVID-19 deaths were identified
- Transitioned to meet the predicted level after the winter peak
- This measure of excess deaths aims to identify natural deaths that might have resulted from the direct and indirect effects of COVID-19
WEEK 40: 30 SEP – 6 OCT 2020

<table>
<thead>
<tr>
<th>Source</th>
<th>Cumulative Number</th>
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<tbody>
<tr>
<td>Confirmed COVID-19 deaths</td>
<td>16,664</td>
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<tr>
<td>Excess natural deaths vs revised base</td>
<td>45,701</td>
</tr>
<tr>
<td>Excess natural deaths vs forecast</td>
<td>40,373</td>
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Weekly excess natural deaths by province 6 May - 6 Oct 2020

- Gauteng
- Eastern Cape
- KwaZulu Natal
- Western Cape
- Free State
- Mpumalanga
- North West
- Limpopo
- Northern Cape

BURDEN OF DISEASE RESEARCH UNIT
CONCLUSIONS

• There are world-wide challenges with COVID-19 data related to the availability of laboratory infrastructure and testing kits, the testing strategy as well as reporting protocols - sub-Saharan Africa is particularly disadvantaged with limited laboratory infrastructure and limited mortality data systems

• Weekly tracking of deaths in near real-time has provided South Africa with an important “bird’s eye view” of the pandemic to supplement other data - and indicates that the confirmed COVID-19 deaths understate the true impact of the pandemic

• Additional information is required to establish whether the excess deaths are due to COVID-19, an overburdened health service, fear of using the health service or the a consequence of stringent lockdown – but the temporal correspondence across provinces and age pattern of excess deaths suggest a large proportion are likely related to COVID-19
Acknowledgments

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- Prof Rob Dorrington and Prof Tom Moultrie for demographic analysis
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https://www.samrc.ac.za/reports/report-weekly-deaths-south-africa