Understanding the mortality impact of COVID-19 from a longitudinal surveillance study in Kilifi County

Policy Brief

Key Messages
- We conducted a survey among residents of Kilifi Health and Demographic Surveillance System to compare mortality in 2020 with historical data.
- Annual incidence of mortality among Kilifi Health and Demographic Surveillance System (KHDSS) residents was no higher in 2020 compared with previous years.
- Acute Respiratory Infection (ARI) increased between 2012 and 2016 (for reasons unknown) but no further increase was noted after 2016 and in particular no increase in 2020.
- The results do not exclude the possibility that COVID-19 caused more deaths in 2020 but if it did, a similar number of non-COVID-19 deaths must have been prevented, perhaps by COVID-19 response measures.

Introduction
- The primary means of monitoring the toll of the COVID-19 pandemic has been through counts of PCR positive cases and deaths among infected persons.
- Although Kenya has data on COVID-19 cases and deaths, limited testing capacity has led to an underestimate of case numbers and may also underestimate deaths.
- Unreliable Civil Registration data and the negative impact of pandemic control measures on utilisation of health services further limit the accuracy of routine data for monitoring deaths.
- Population-based surveillance provides and alternative source of data for determining mortality during the COVID-19 pandemic which is more likely to be accurate but is applicable only to the areas in which the surveys were conducted.
- Since 2000, KEMRI-Wellcome Trust Research Programme has supported a Health and Demographic and Surveillance System (KHDSS) with regular surveys to capture vital events among 300,000 residents of Kilifi County, linked to morbidity and mortality surveillance at Kilifi County Hospital.
- The KHDSS surveys are conducted in a predominantly rural area with only one town (Kilifi).
- We re-enumerated the residents of the KHDSS between January and April 2021.
- We have analyzed the trends in mortality and causes of death using verbal autopsy from community-based surveys in the KHDSS from 2003 to 2020 to understand the impact of the pandemic on mortality in the KHDSS community.

Findings
- The annual incidence of mortality among KHDSS residents did not increase discernably in 2020 compared with previous years (Figures 1 and 3).
- Acute Respiratory Infection (ARI) increased between 2012 and 2016 (for reasons unknown) but no further increase was noted after 2016 and in particular no increase in 2020.
- There was a reduction in the proportion of deaths attributable to acute respiratory illness in the 5-14 year age group in 2020, but the significance of this one variation among the many trends examined is unclear.
- There was no obvious change in pattern of the causes of death in any other age groups.
**Figure 1.** Annual mortality rates in KHDSS from 2003 – 2020 (all ages).

**Figure 2.** Stacked bar graphs of mortality fractions for leading causes of death (all ages).

ARI – acute respiratory illness

Absolute numbers of deaths are given in figures over each bar.
Figure 3. Annual mortality rates in KHDSS for seven age groups from 2003 – 2020.
Figure 4. Stacked bar graphs showing mortality fractions for leading causes of death by age group.

ARI – acute respiratory illnesses

Absolute numbers of deaths are given in figures over each bar.
Assumptions and Implications

- We have assumed that all 2020 deaths have been recorded. Based on previous observations, we anticipate a small percentage of all the deaths that occurred in 2020 will be captured in forthcoming survey rounds. However, this is not expected to alter the results that we have reported.
- Verbal Autopsies are typically obtained in approximately 80% of all deaths. However, in 2020 verbal autopsies were obtained in only 60% of deaths due to difficulties conducting fieldwork under COVID-19 restrictions. Because the deaths investigated were assigned by random selection, we do not think this affects the representativeness of the findings.
- The KHDSS community is predominantly rural. These results should therefore not be generalized to urban settings where the virus may have spread more extensively.
- Population-based surveys and results from other HDSSs will extend and modulate our understanding of the mortality impact of COVID-19 in Kenya.

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