MONTHLY REPORT ON WEEKLY NUMBERS OF DEATHS IN SOUTH AFRICA

MAY 2024

(TO EPIWEEK 22)

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Glossary:

Actual number of deaths: The actual number of deaths in South Africa have been estimated from the numbers recorded on the National Population Register. We use weighting factors set to produce results consistent with those of the annual Rapid Mortality Surveillance Report to account for deaths of persons who are not on the National Population Register as well as those that have not been registered with the Department of Home Affairs. The adjustments to account for incompleteness of recording of deaths on the National Population Register were re-estimated taking into account the 2017 cause-of-death data released by Stats SA in 2021.

Epi-week: We report by an 'Epi-week' consistent with CDC and many NICD reports which run from Sunday to Saturday, ensuring continuity of weeks from one year to the next. Each week is aligned with the 'Epi-year' that has 4 or more days in that week. Week 53 of 2020 is from 27 December 2020 to 2 January 2021, Week 1 of 2021 is 3 January – 9 January 2021, Week 1 of 2022 is 2 January – 8 January 2022 and Week 1 of 2023 is 1 January – 7 January 2023.

Predicted number of deaths: The predicted number of weekly deaths have been revised after an investigation into the underlying trends in mortality prior to 2020. They are now modelled on data from the period **2015-2019** rather than for the period 2014-2019. A single negative binomial model has been used for unnatural deaths allowing for age and sex. Negative binomial models have been fitted for each province in 10-year age groups from 5 years of age, allowing for different historical trends in each age group. In contrast, for <1 year and 1-4 years, the predicted numbers were set to the average rates for 2015–2019 were continued. The predicted numbers for each component have been summed to give the total.

P-score: The P-Score is frequently used to describe excess mortality. It is the percentage change in the number of deaths from the expected number for that week. Negative values below 0% reflect a deficit in deaths while positive values reflect an increase.

General warning: The Department of Home Affairs faces sporadic temporary office closures for various reasons. Closure may cause a delay in the processing of the death registration which would result in an underestimate of the deaths in the most recent weeks.

Background

The series of reports on weekly deaths in South Africa, based on data from the National Population Register provided to the SAMRC started in March 2020. A time series approach was used to estimate the predicated number of deaths to calculate the excess. For 2022, a negative binomial modelling approach was introduced which took into account estimates of the population. With growing uncertainty about the estimate of the counterfactual (predicted) numbers of deaths and the need to allow for the impact of the epidemic on the size of the population (particularly at the older ages), a careful evaluation of the trends in mortality rates since 2014 was undertaken.

This evaluation indicated that it would be better to exclude the data for 2014 from the models as the numbers of deaths in 2014 were substantially higher than those of 2015–2019. Secondly, it was noted that rates of change in mortality differed by age group. The predicted numbers of weekly deaths for 2020 – 2023 have been estimated using new models together with population estimates for 2020 – 2023 based on data from the pre-COVID period 2015–2019 and have been extended with population estimates to provide predicted values for 2024.

Briefly, the predicted values for the weekly deaths are based on negative binomial models for natural deaths for each province for 10-year age groups (to deal with digit preference in the deaths) from 5-years of age allowing for age-specific trends. For child deaths <1 year and 1-4 years, the average deaths rates for 2015 – 2019 were continued. Deaths in the 10-year age groups have been redistributed to the component five-year age groups in proportion to mortality increases between the 2 five-year age groups from model life table (Coale & Demeny West level 20) up to the age group 35-44. The apportionment for age group 35-44 was applied to all the older age groups.

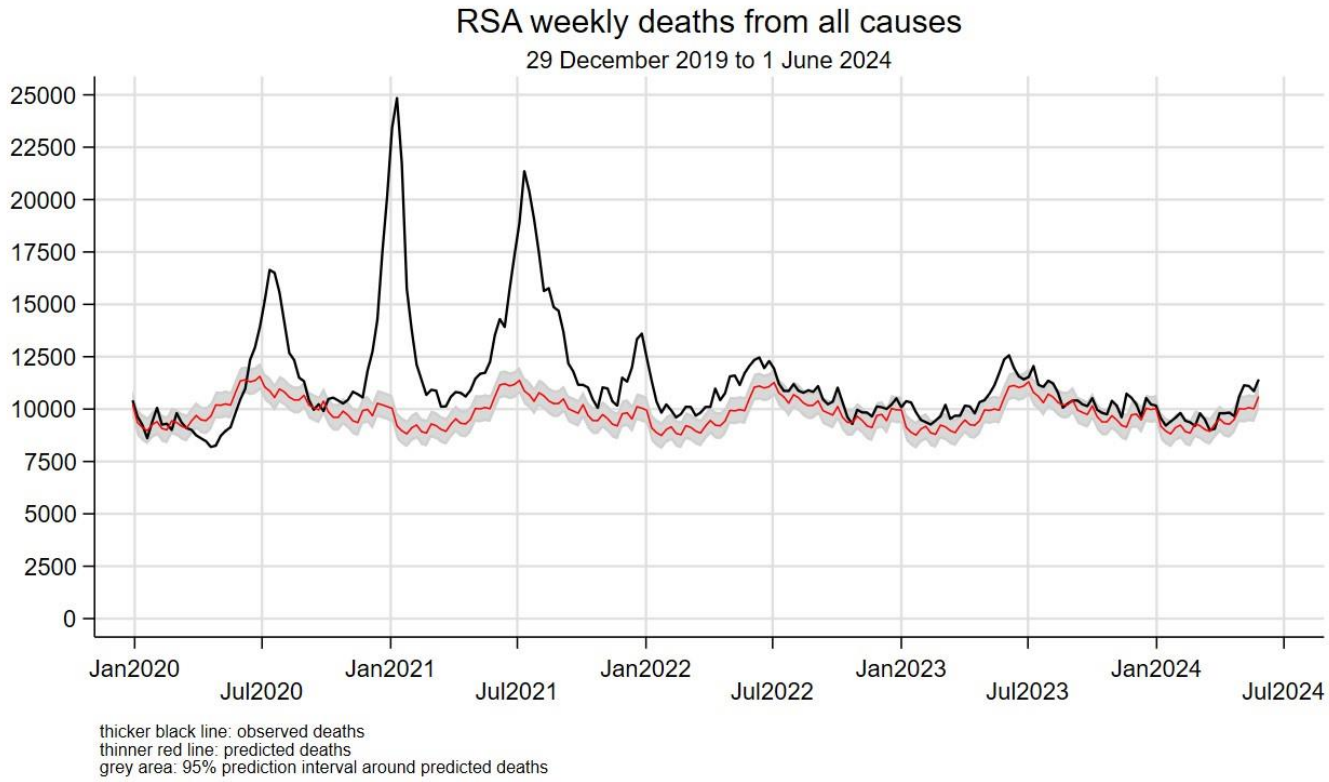
This monthly report provides estimates of the weekly number of deaths of all persons in South Africa up to the end of epidemiological **Week 22** of **2024**, covering the period **January 2020** till **1 June 2024.** It reports national estimates for all causes of death as well as natural and unnatural causes. The report also presents natural deaths by significant age groups and the provincial estimates for all-cause deaths as well as the sex-age group breakdown for natural deaths.

While the current estimates of weekly deaths and comparison of the actual number with the predicted number has served the country well in providing a near to real-time mortality surveillance system, we continue to investigate improvements to establishing the baseline expected deaths to enhance the estimate of excess deaths. We recognise that with each year of extrapolation, our uncertainty (even though not quantifiable) as to those mortality rates increases; likewise the population numbers are derived from standard demographic projection techniques that were complicated by the impact of Covid-19.

Trends

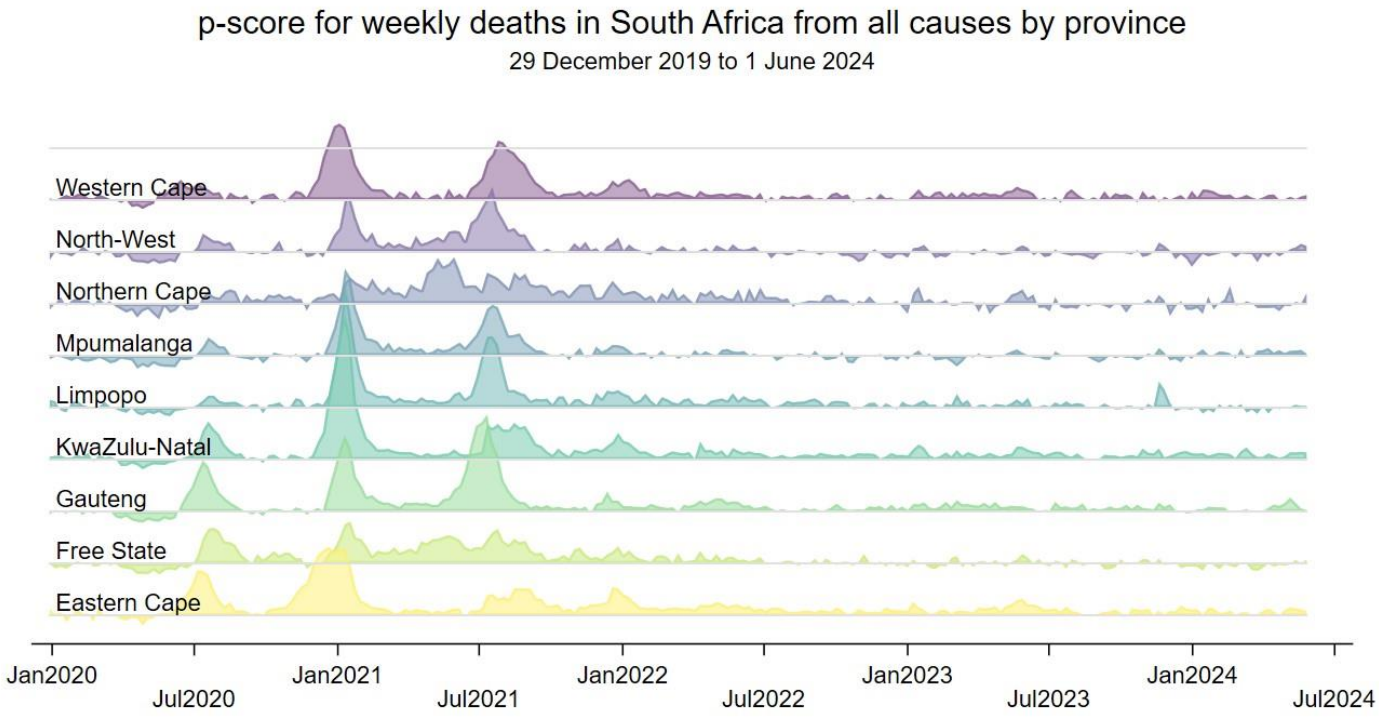
- Throughout May 2024 (Week 19-22), the numbers of all cause deaths exceeded the upper prediction bound. This was largely seen in deaths from natural causes and deaths over the age of 60 years.

- **Gauteng** experienced a noticeable increase in natural deaths during **Weeks 19&20.** However, numbers of natural deaths also exceeded their upper bound in the following provinces:
    - **Week 19-22** in **KwaZulu Natal**,
    - **Weeks 19&20** in **Eastern Cape,**
    - **Weeks 20&21** in **Mpumalanga,** and
    - **Week 22** in **Northern Cape**.



Numbers have been scaled to the estimated actual number of deaths

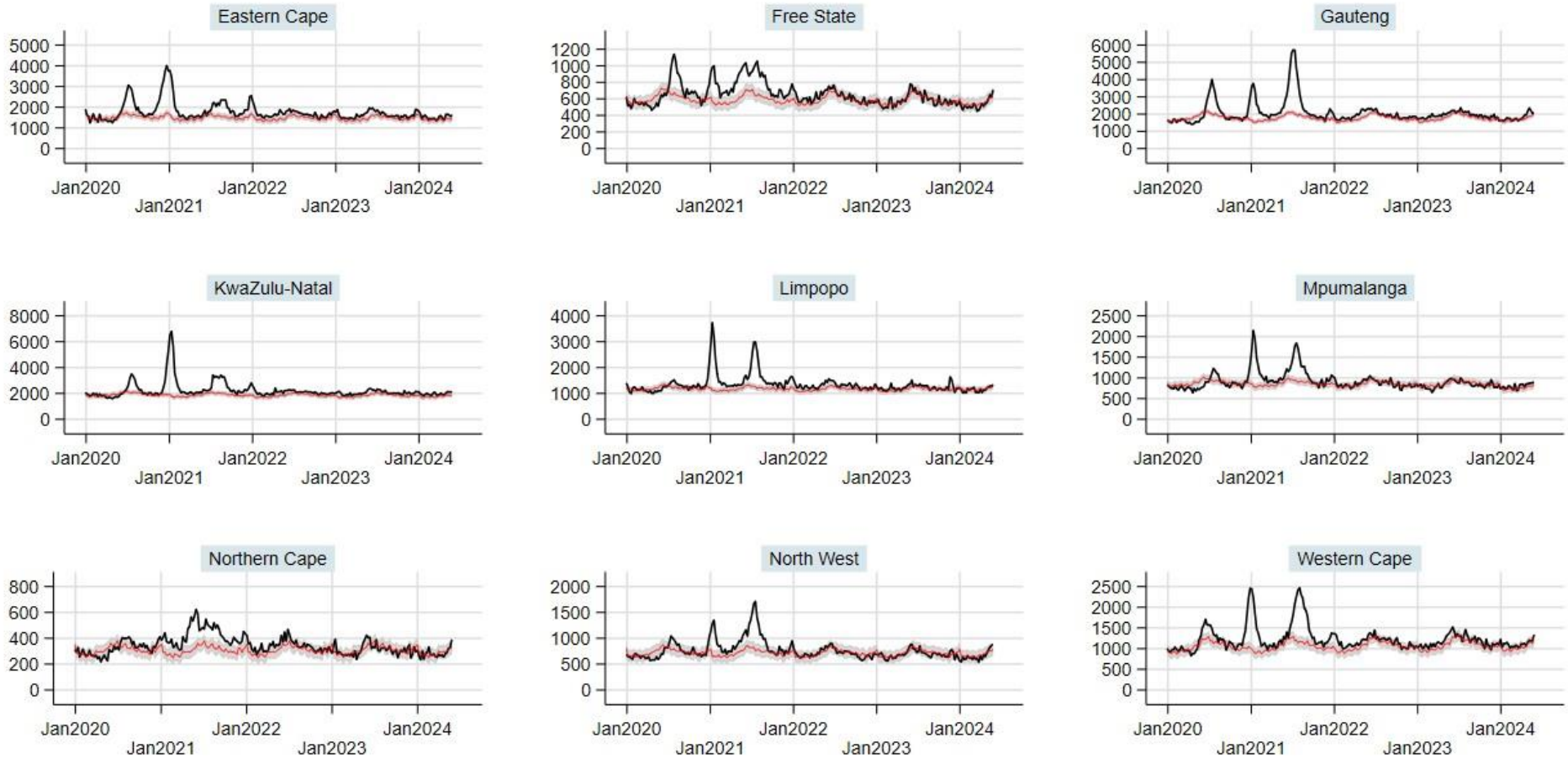
All-cause deaths by province



Y-axis: each vertical increment represents 100% above or below predicted

Deaths from all causes, by province

29 December 2019 to 1 June 2024



thicker black line: observed deaths
thinner red line: predicted deaths
grey area: 95% prediction interval around predicted deaths

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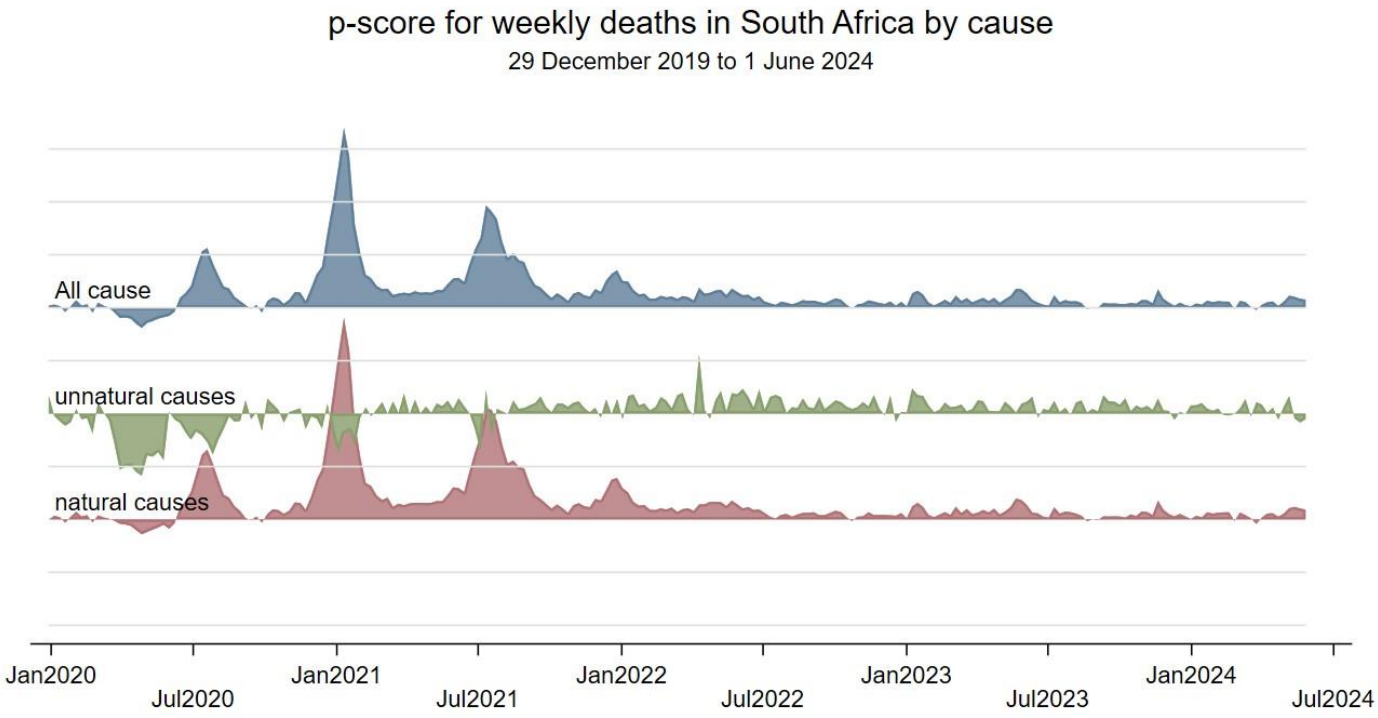
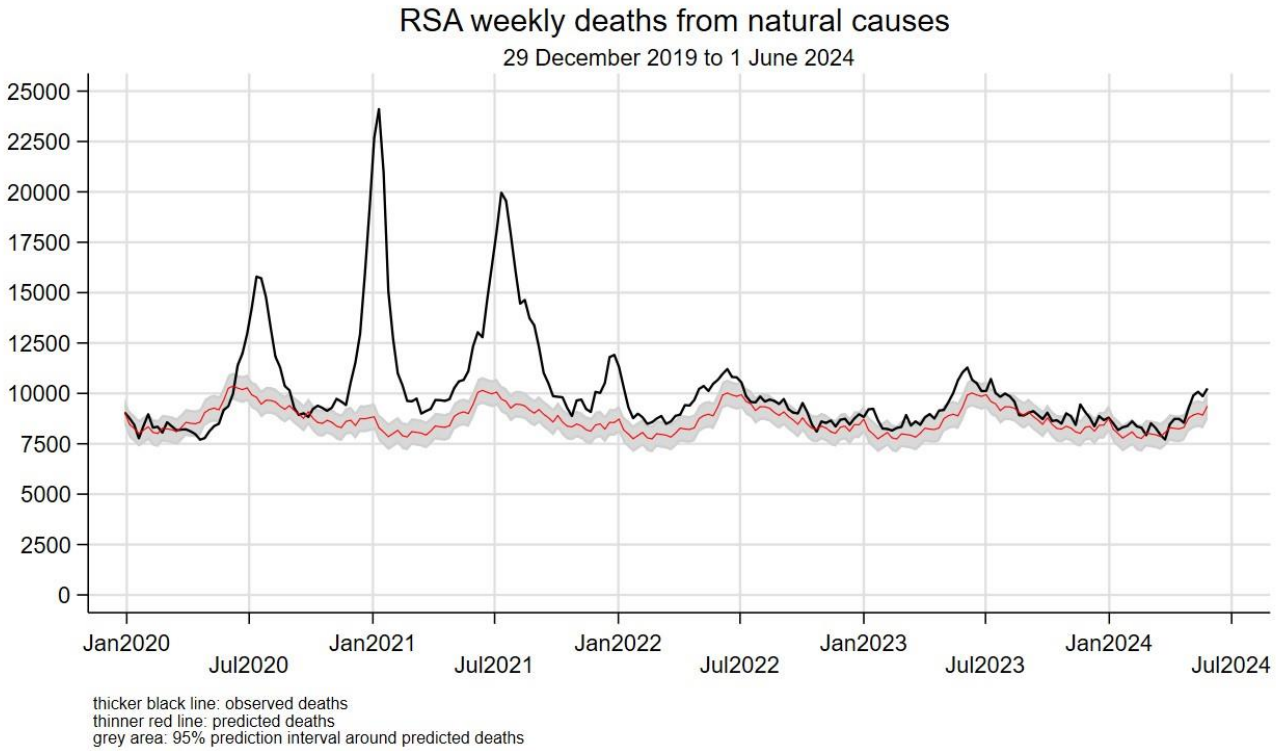
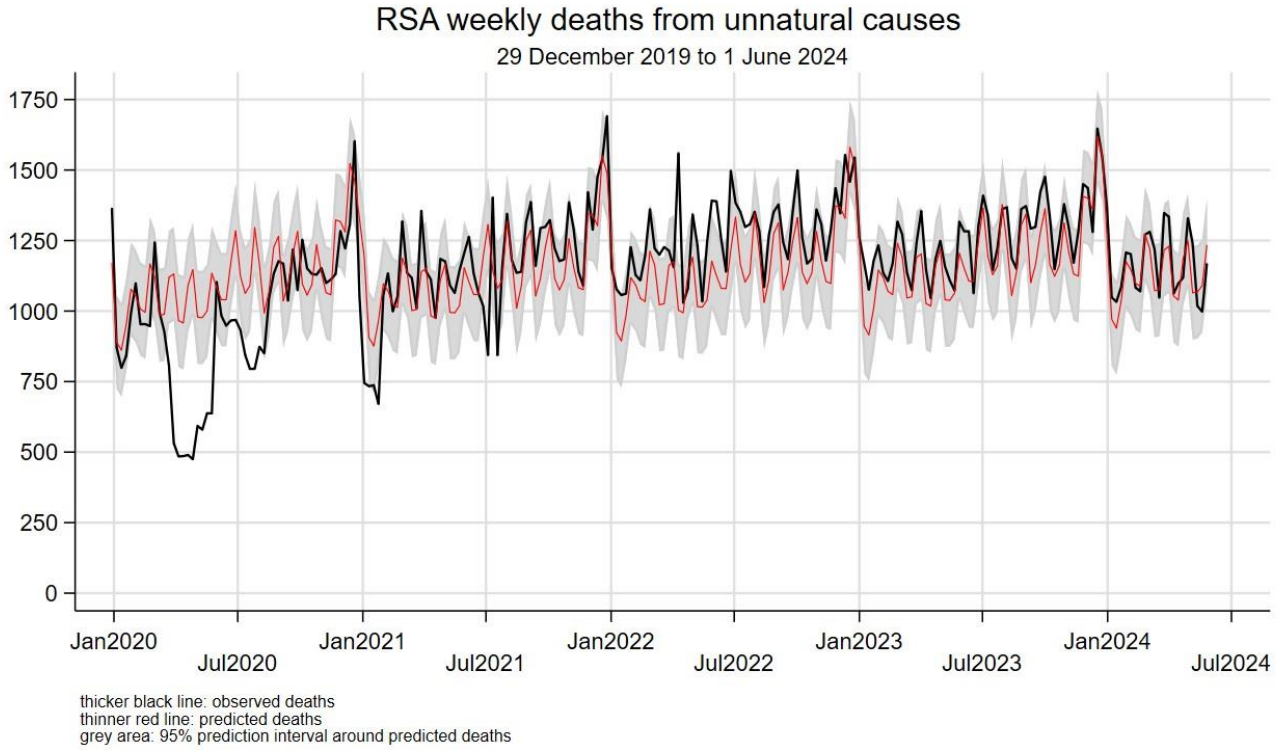
Natural and unnatural deaths



Y-axis: each vertical increment represents 50% above or below predicted





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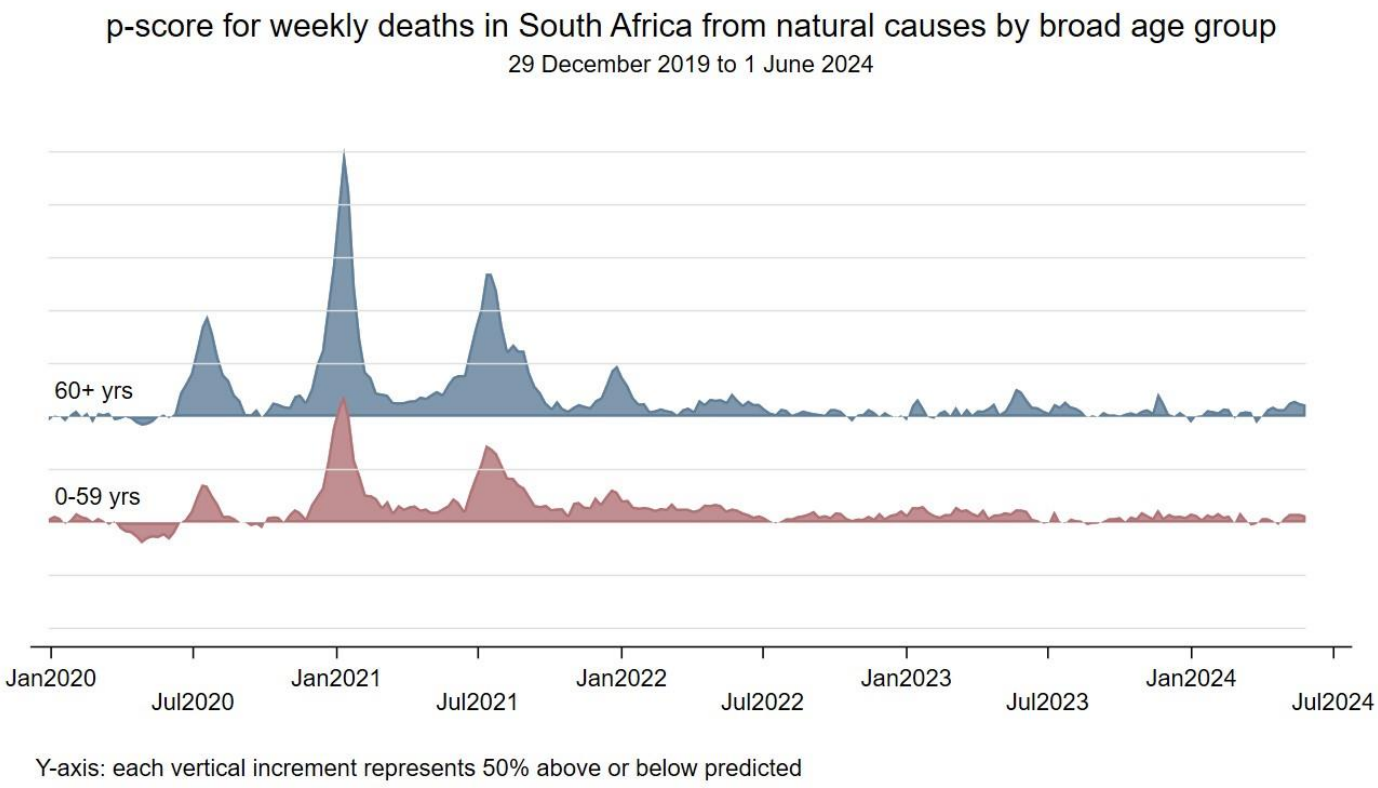
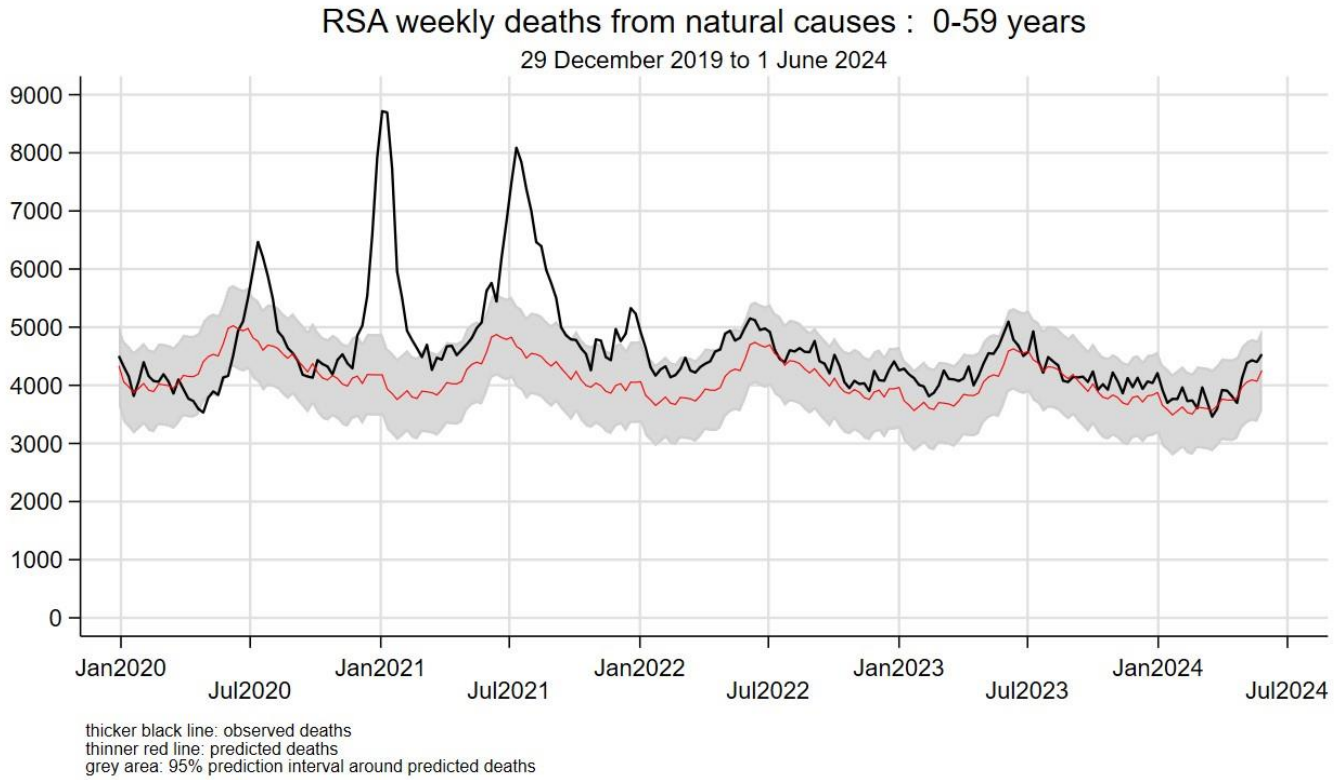
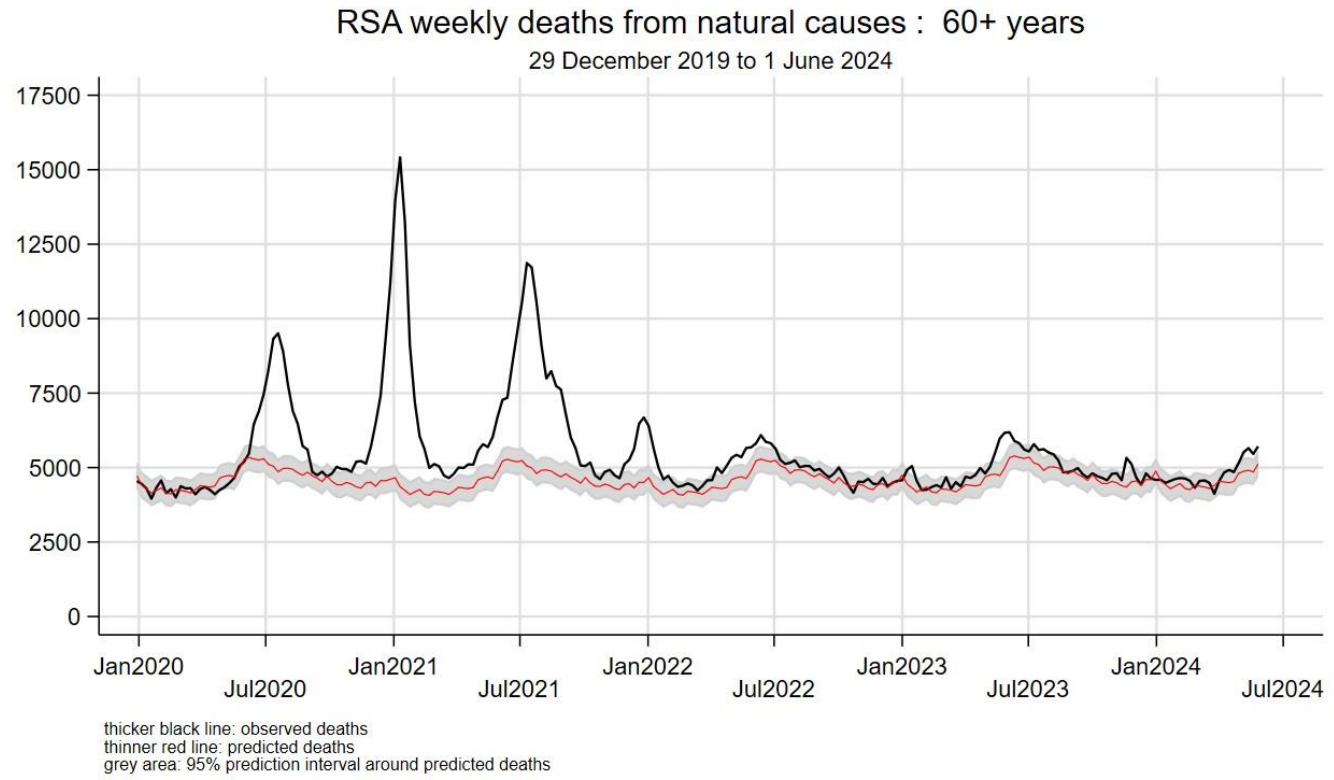
Natural deaths by broad age groups







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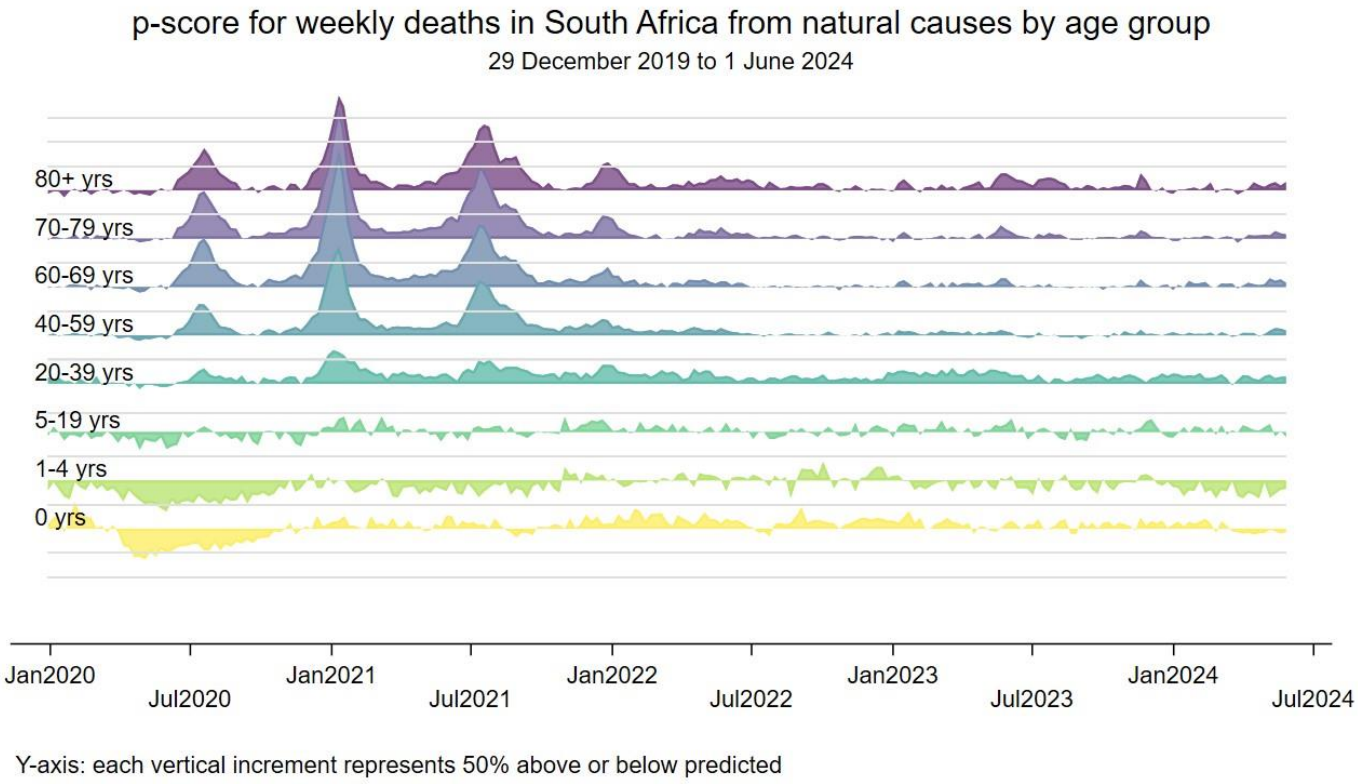
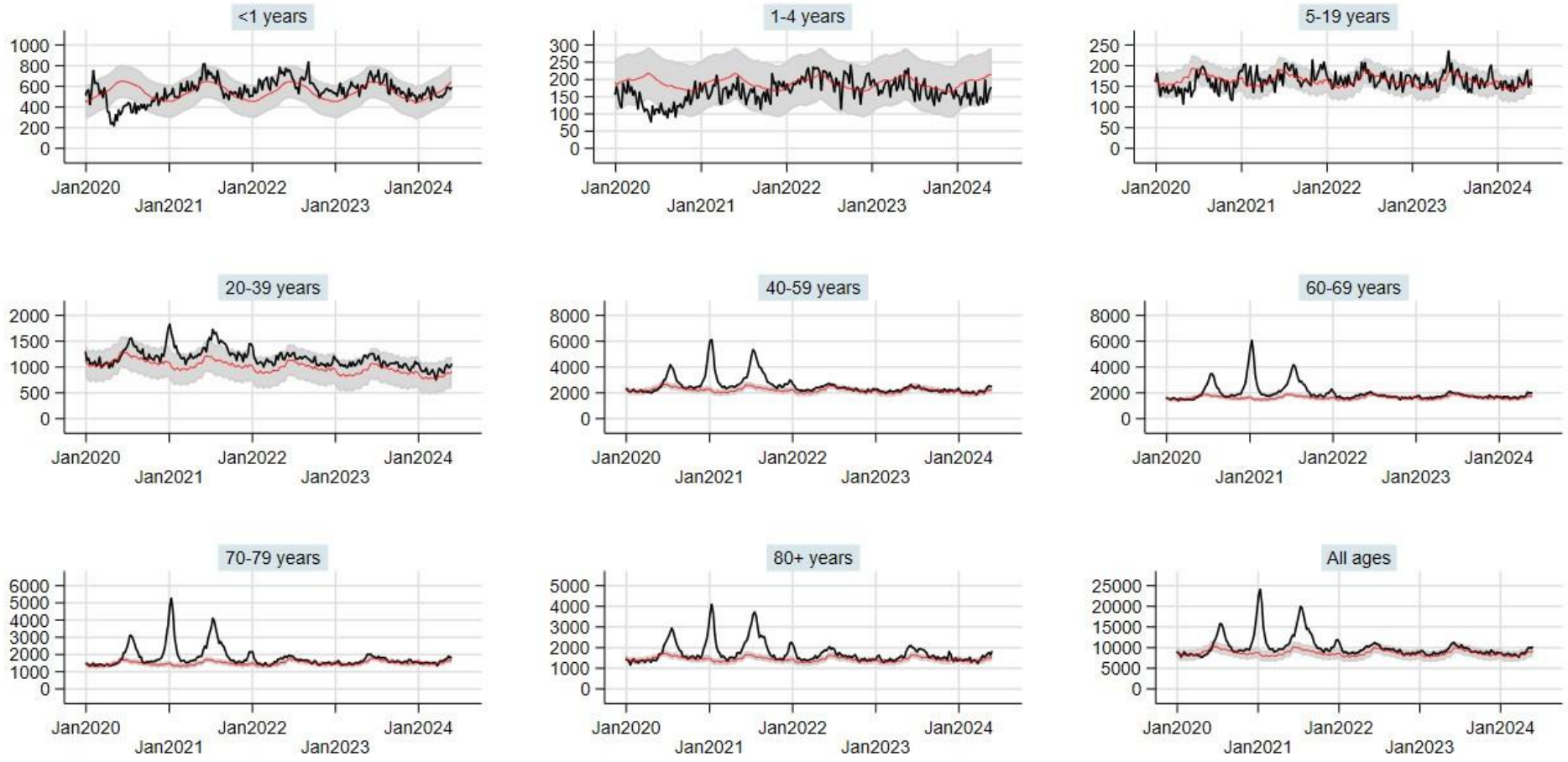
Natural deaths by age group



RSA weekly deaths from natural causes, by age group

29 December 2019 to 1 June 2024



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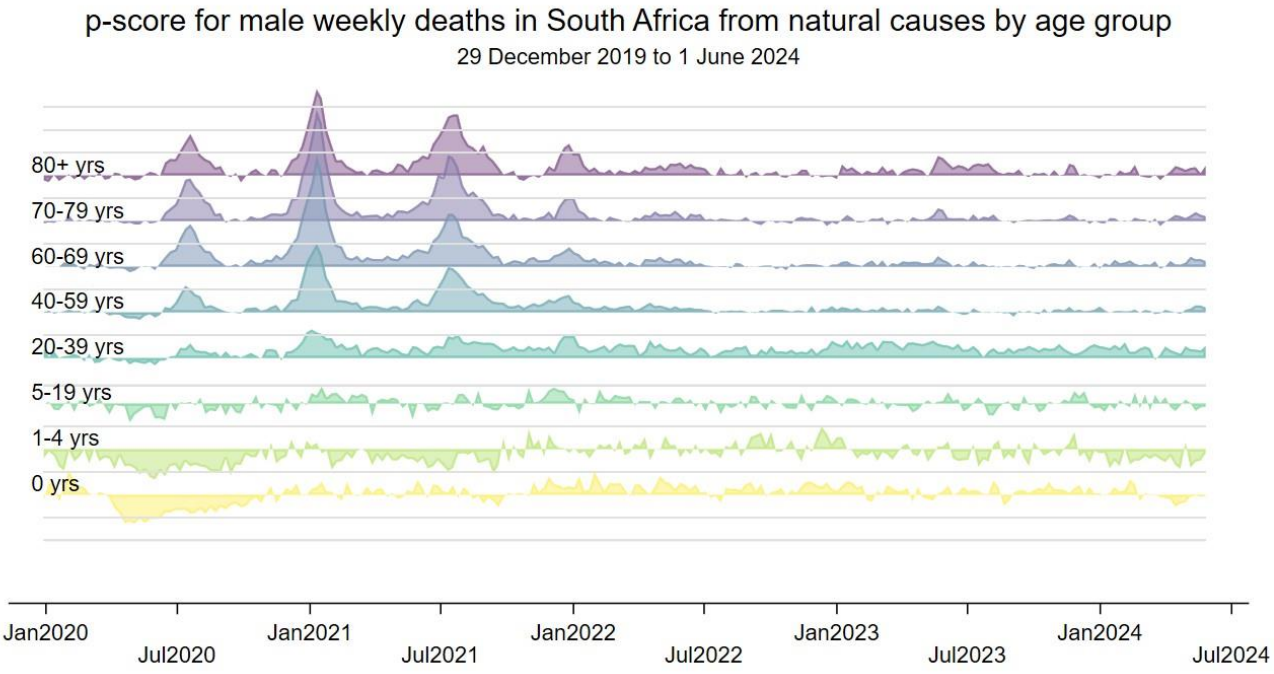
Natural deaths by sex and age group



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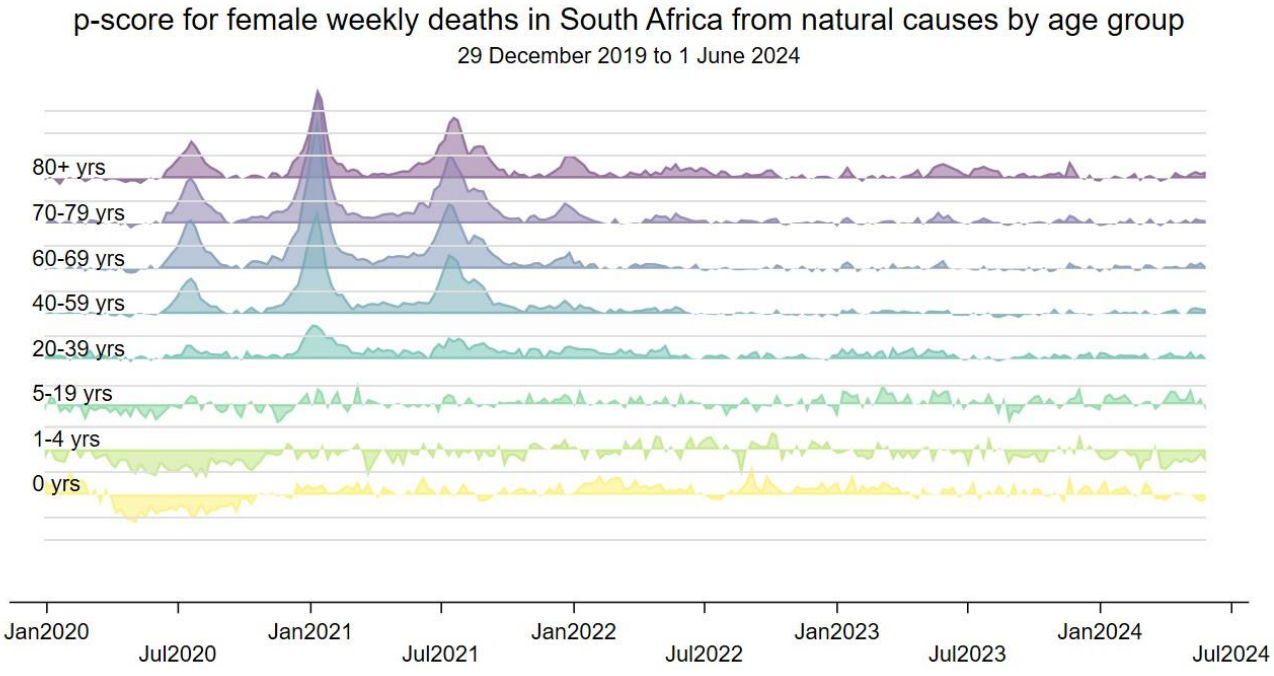
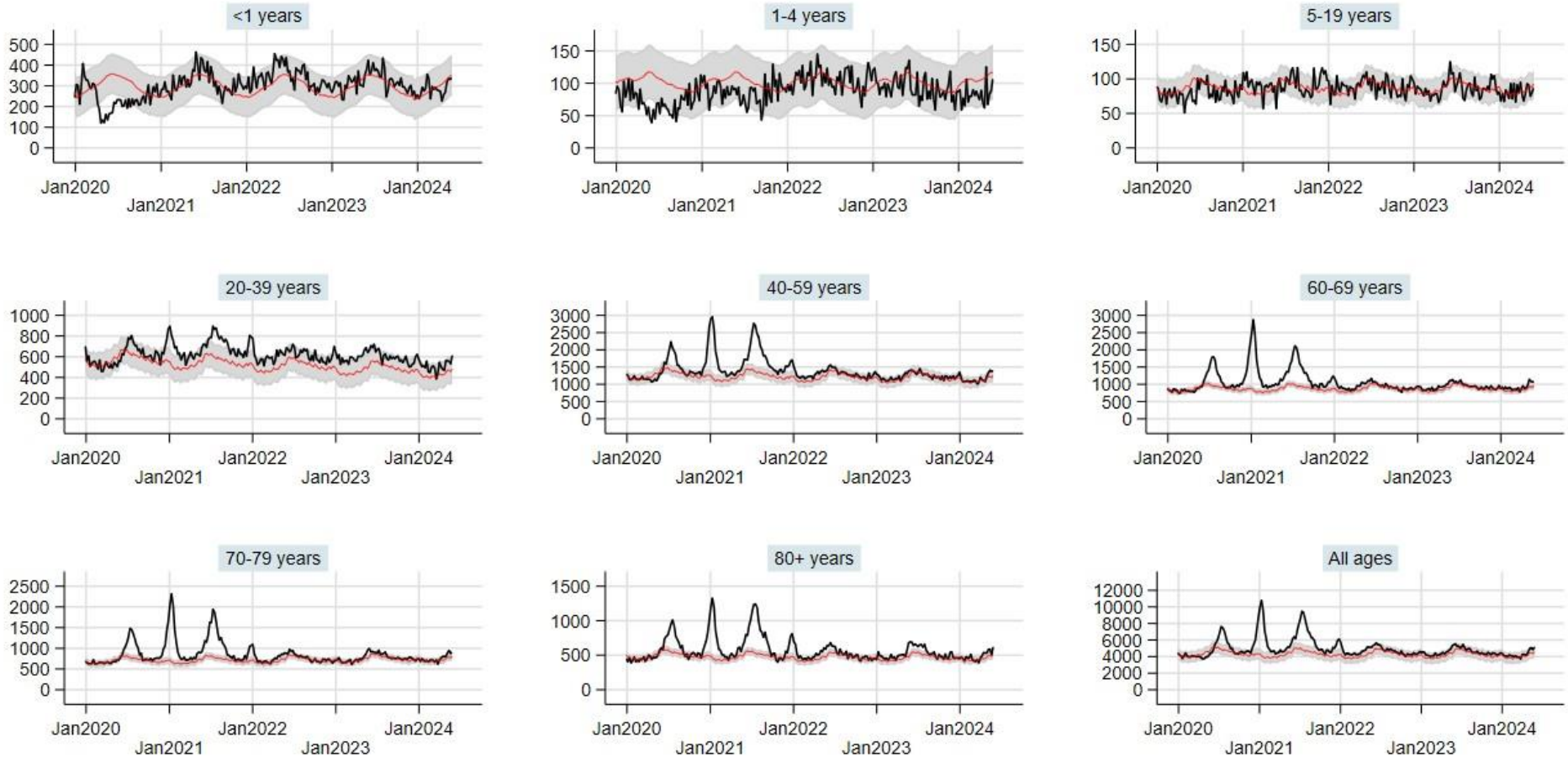


Y-axis: each vertical increment represents 50% above or below predicted

Males: Natural deaths, by age group

29 December 2019 to 1 June 2024



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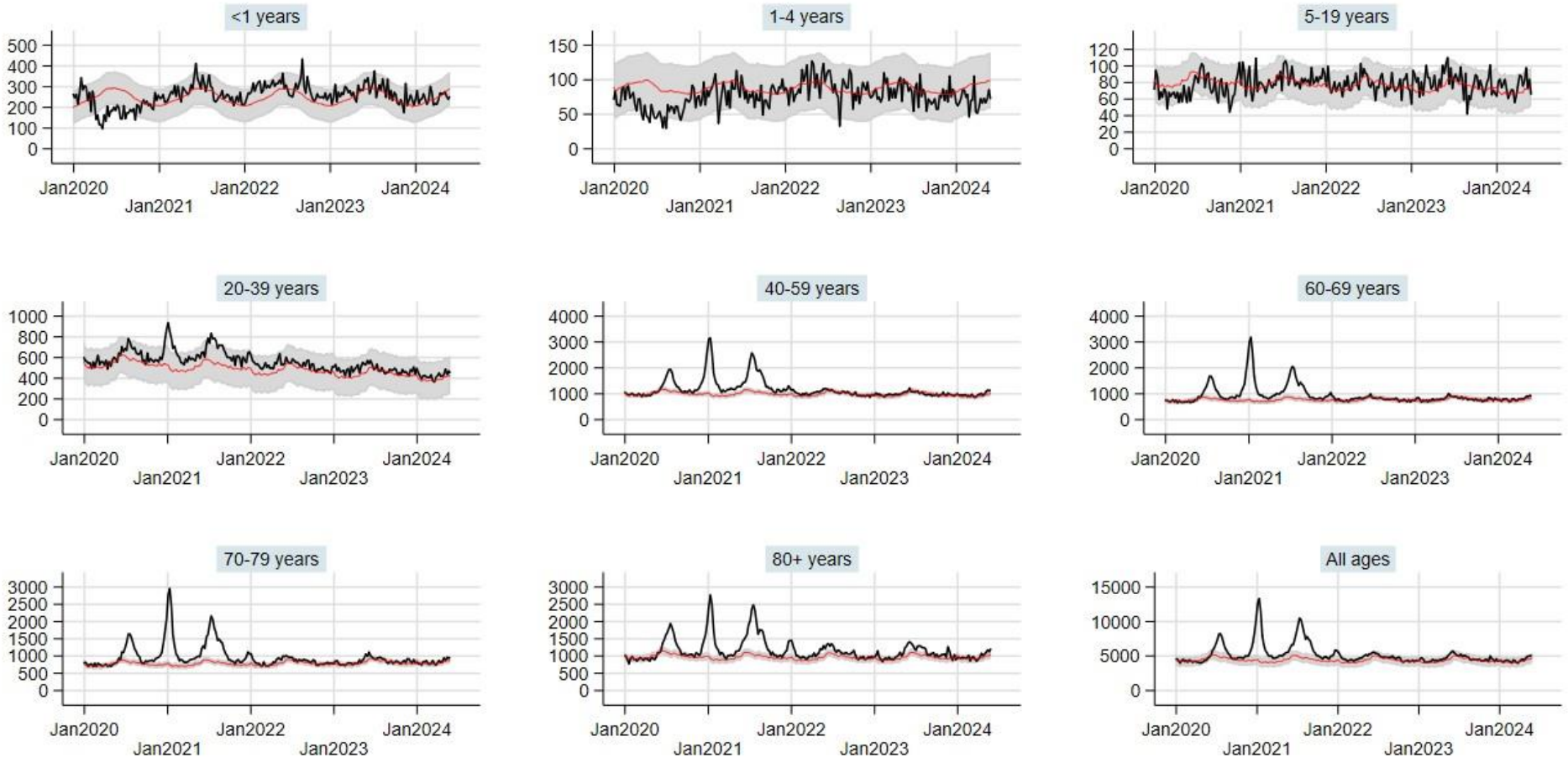
Females: Natural deaths, by age group

29 December 2019 to 1 June 2024



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