

MONTHLY REPORT ON WEEKLY NUMBERS OF DEATHS IN SOUTH AFRICA

SEPTEMBER 2023

(TO EPIWEEK 39)

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20 October 2023



UCT Centre
for Actuarial
Research

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 does 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 weekly reports on excess natural deaths in South Africa ended in December 2022. The growing uncertainty about the estimate of the counterfactual (predicted) numbers of deaths the further from the start of the pandemic that one projects and the need to allow for the impact of the epidemic on the size of the population (particularly at the older ages), demanded an investigation into the appropriateness of the models that were being used.

A careful evaluation of the trends in mortality rates since 2014 was undertaken. This 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. A detailed report on the revised predicted numbers is still in preparation. Briefly, 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. The overall impact of revised predicted (without changing the benchmark in the early stage of the pandemic) is to reduce the estimate of excess deaths from natural causes for the period 2020 – 2022 by some 32,000 (less than 10%). Much of this was due to the overestimate of excess deaths under age 5.

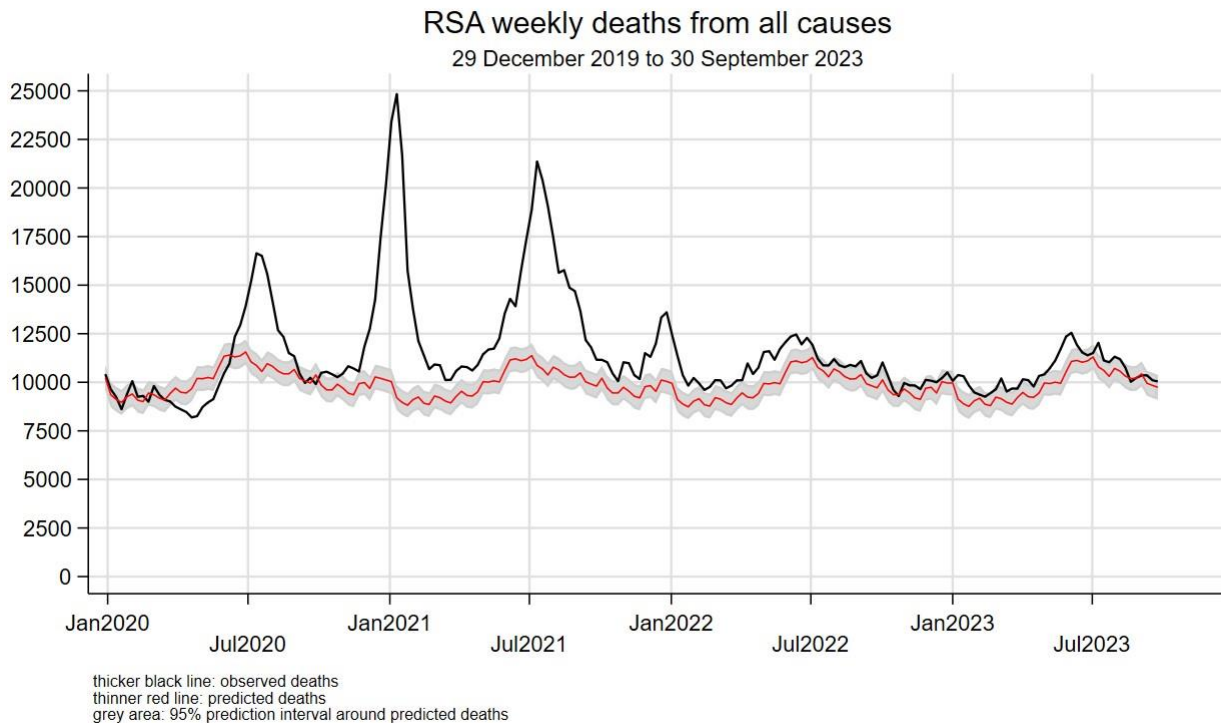
The predicted values for the weekly deaths are based on negative binomial models for natural deaths for each province for 10-year age groups (to deal with digit preference in the deaths) from 5-years of age allowing for age-specific trends. For child deaths <1 year and 1-4 years, the average deaths rates 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 39** of **2023**, covering the period **January 2020** till **30 September 2023**. 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.

It is planned that the monthly report will be expanded to include subnational estimates once we have improved the adjustment for under-reporting of deaths to these sub-groups.

All-cause deaths

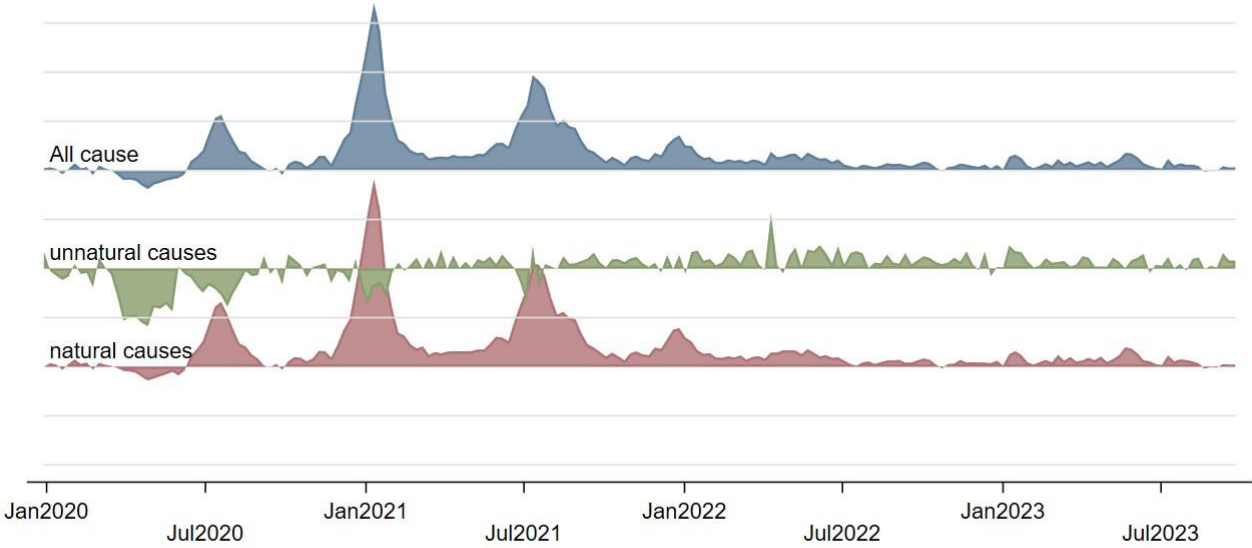
- The all-cause weekly deaths in 2023 reverted to within the prediction bounds (for both natural and unnatural) since February 2023, following a short period of exceeding the upper prediction bound in January. Thereafter the weekly numbers occasionally increased above the upper prediction bound due to increases in deaths from natural causes, particularly among persons older than 60 years. Weekly all cause deaths were raised during May, running higher than the upper prediction bound from Week 20 to Week 23. There was a single spike in the numbers of deaths in July in Week 28. However, in Week 28 – Week 30 (from 9th July), the numbers of deaths from natural causes have exceeded the upper prediction bound, particularly for persons 80 years and older. Natural deaths of persons 20-39 years have tracked consistently above the predicted numbers throughout 2023, although they do not exceed the upper prediction bound.
- During September (Week 36 – Week 39), the weekly number of deaths tracked within the prediction bounds, with the exception of unnatural deaths that increased to the upper prediction bound in Week 37 (10-16 September 2023).



Numbers have been scaled to the estimated actual number of deaths

Natural and unnatural deaths

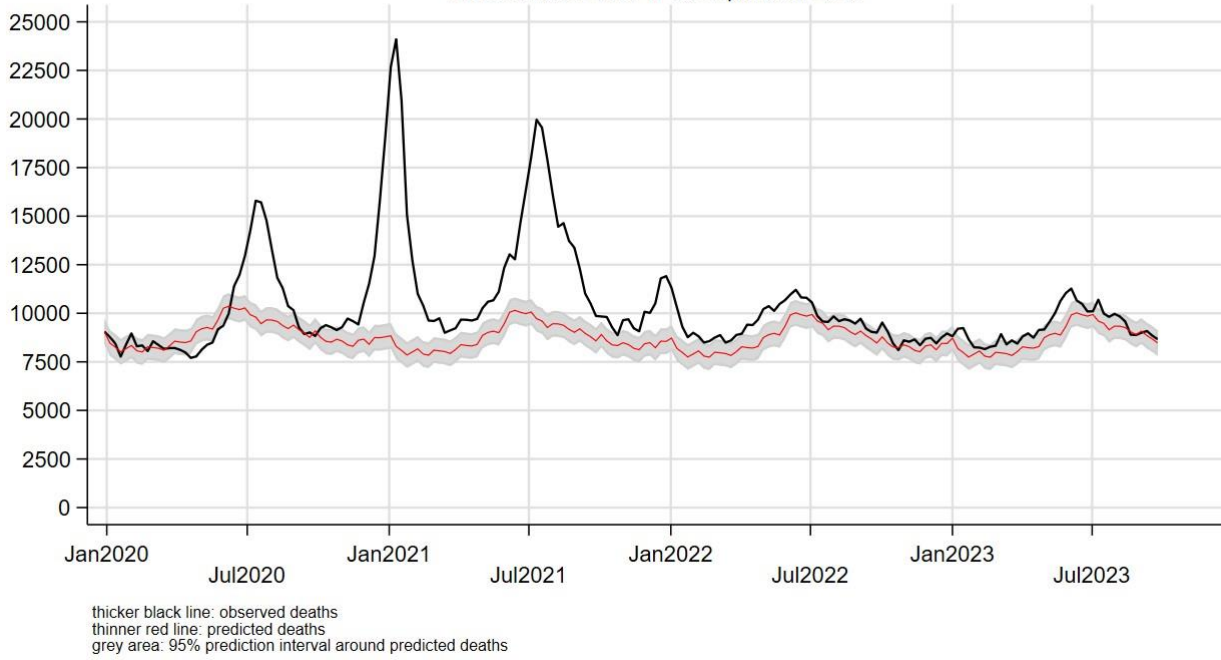
p-score for weekly deaths in South Africa by cause
29 December 2019 to 30 September 2023



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

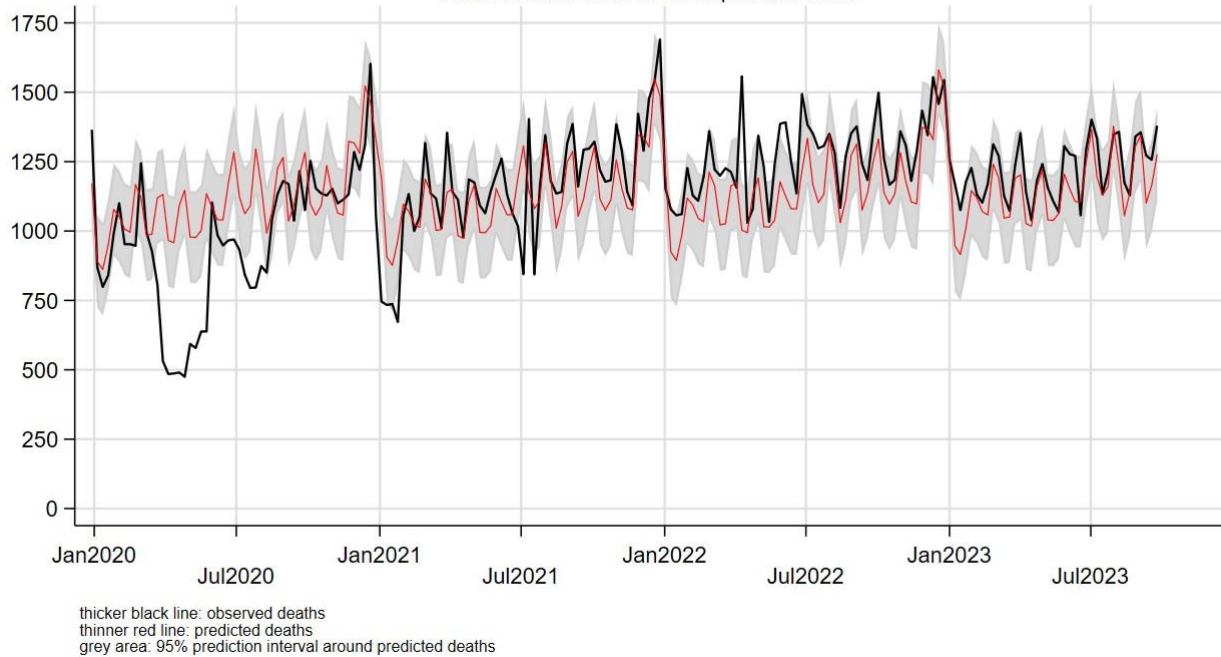
RSA weekly deaths from natural causes

29 December 2019 to 30 September 2023



RSA weekly deaths from unnatural causes

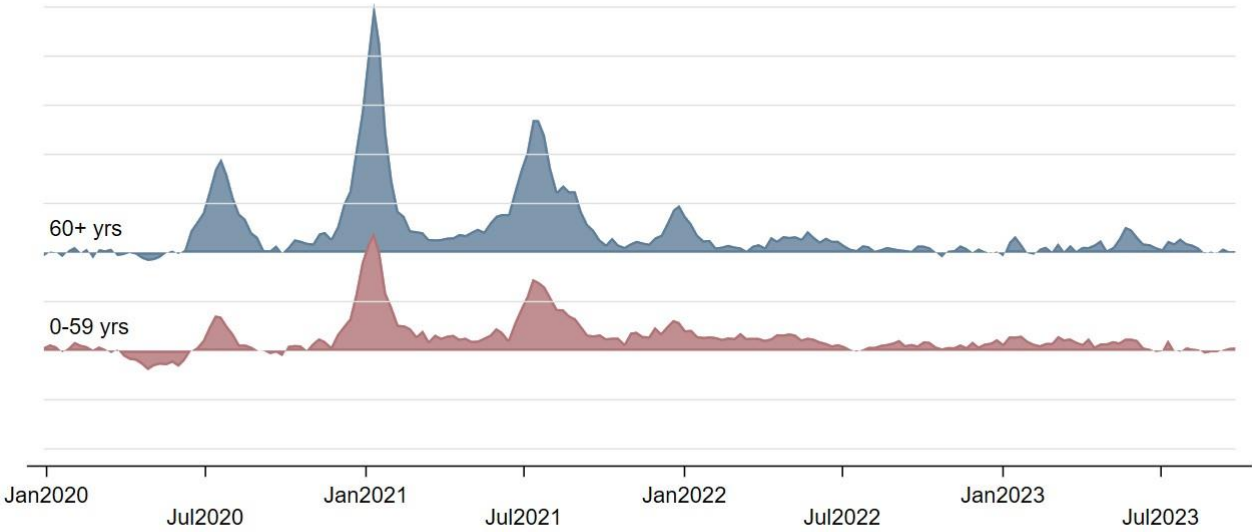
29 December 2019 to 30 September 2023



Numbers have been scaled to the estimated actual number of deaths

Natural deaths by broad age groups

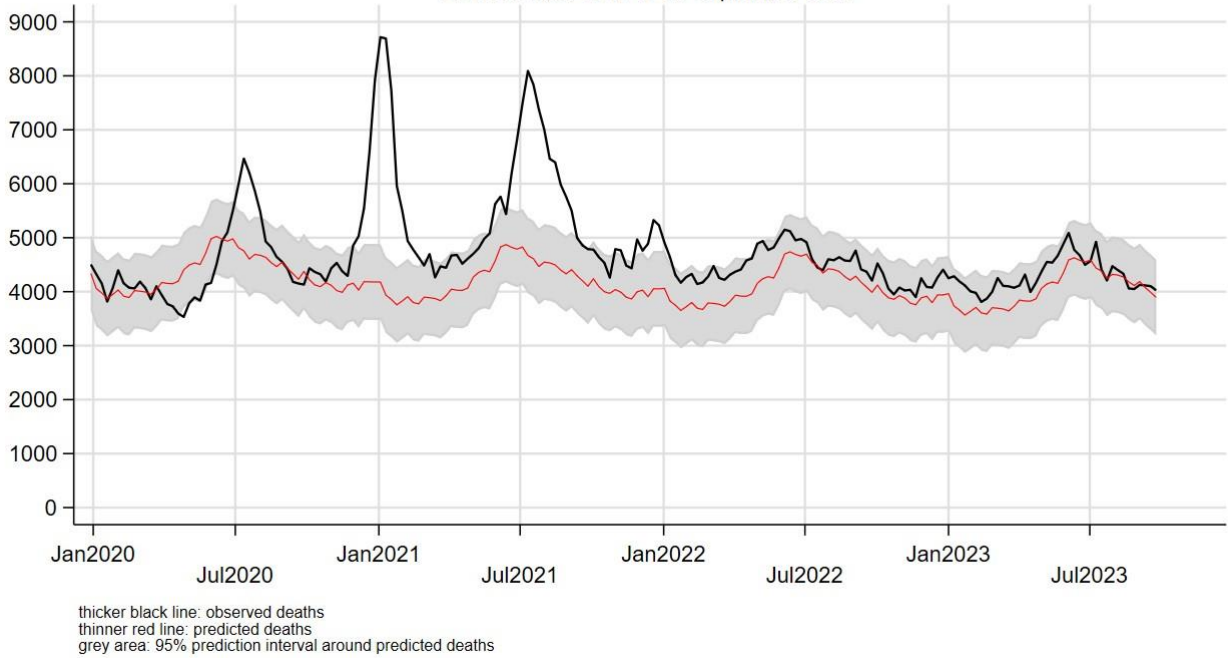
p-score for weekly deaths in South Africa from natural causes by broad age group
29 December 2019 to 30 September 2023



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

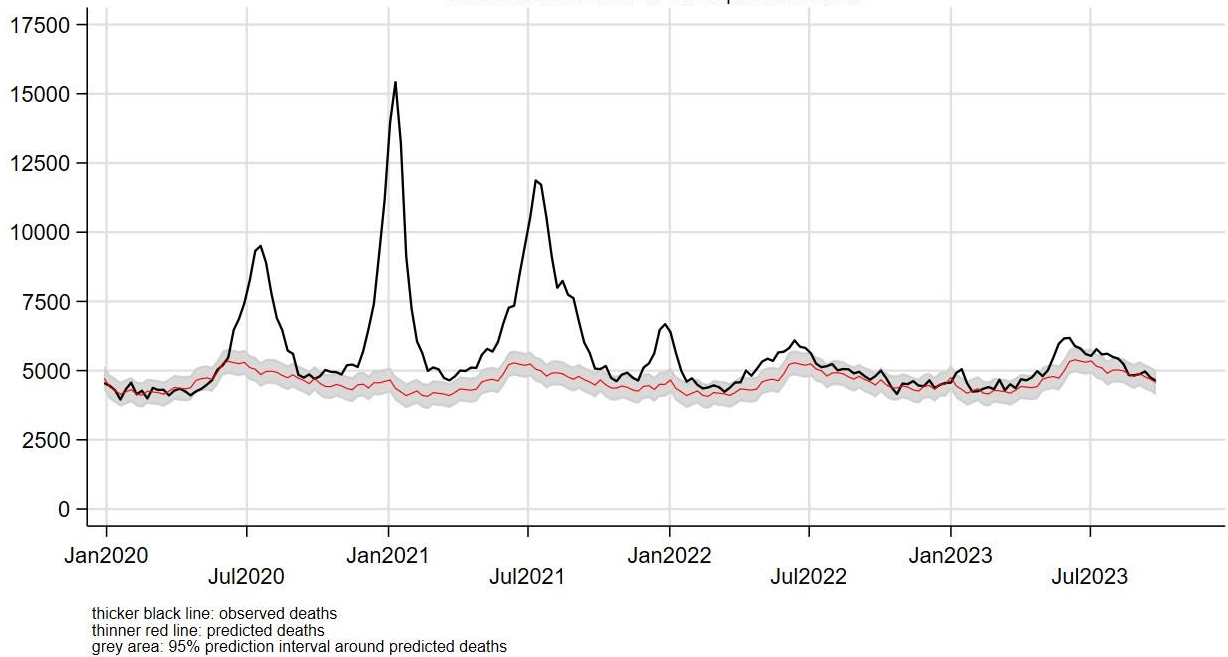
RSA weekly deaths from natural causes : 0-59 years

29 December 2019 to 30 September 2023



RSA weekly deaths from natural causes : 60+ years

29 December 2019 to 30 September 2023

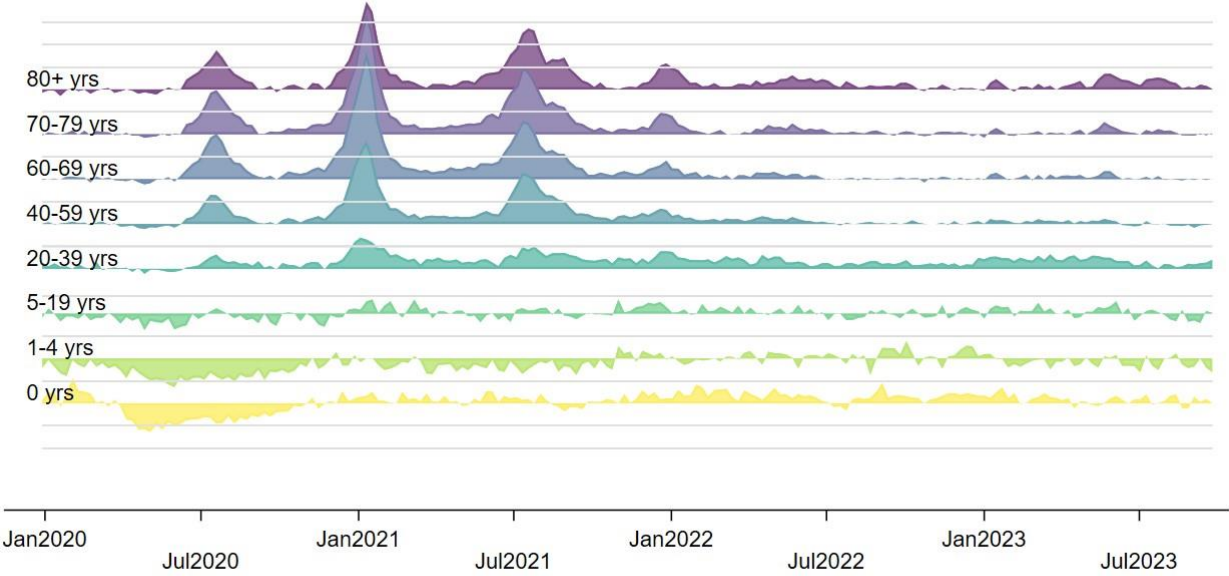


Numbers have been scaled to the estimated actual number of deaths

Natural deaths by age group

p-score for weekly deaths in South Africa from natural causes by age group

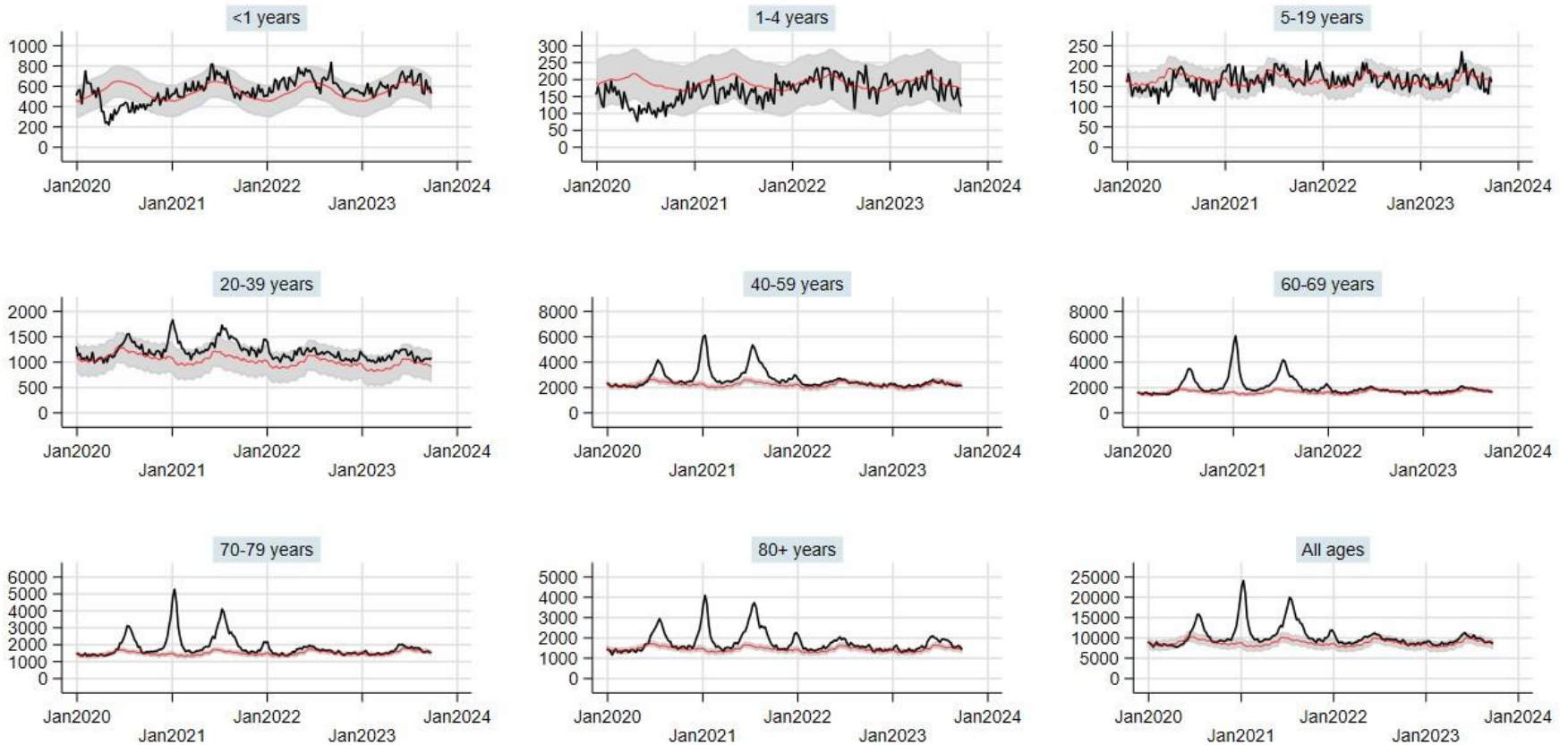
29 December 2019 to 30 September 2023



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

RSA weekly deaths from natural causes, by age group

29 December 2019 to 30 September 2023



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

Numbers have been scaled to the estimated actual number of deaths