MONTHLY REPORT ON WEEKLY NUMBERS OF DEATHS IN SOUTH AFRICA

MAY 2023

(TO EPIWEEK 22)

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South African Medical Research Council
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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 predicated numbers is in 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 predicteds (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 due 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.

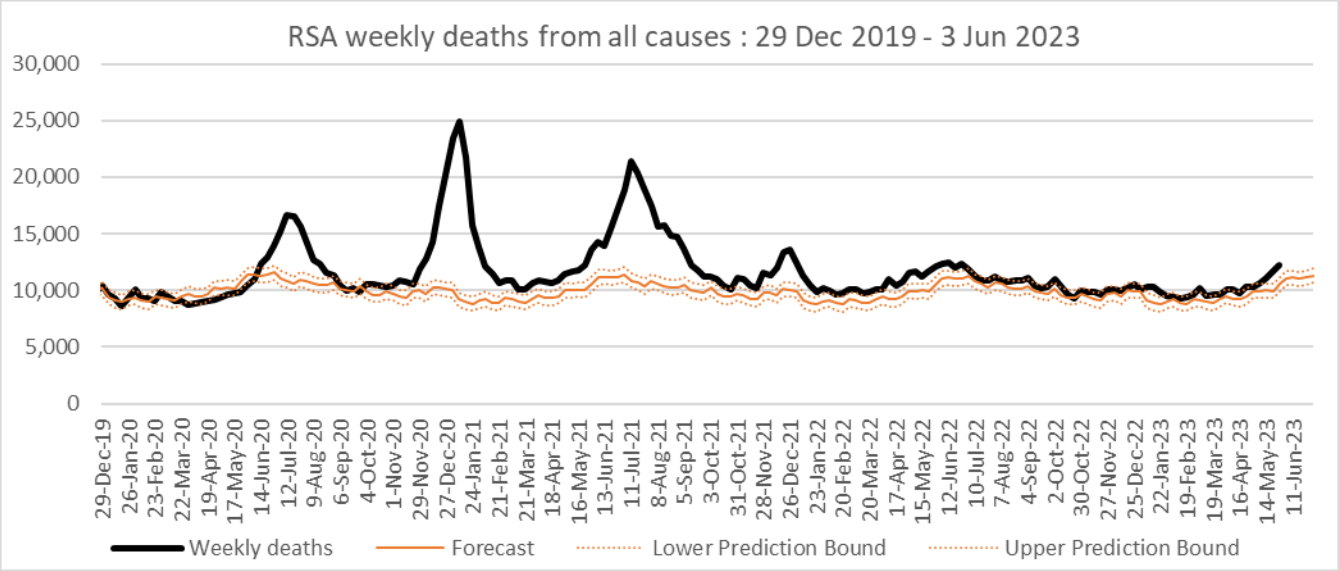
This is the third monthly report and provides estimates of the weekly number of deaths of all persons in South Africa up to the end of epidemiological **Week 22** of **2023**, covering the period **January 2020** till **3 June 2023.** It reports on national estimates and includes estimates for all causes 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

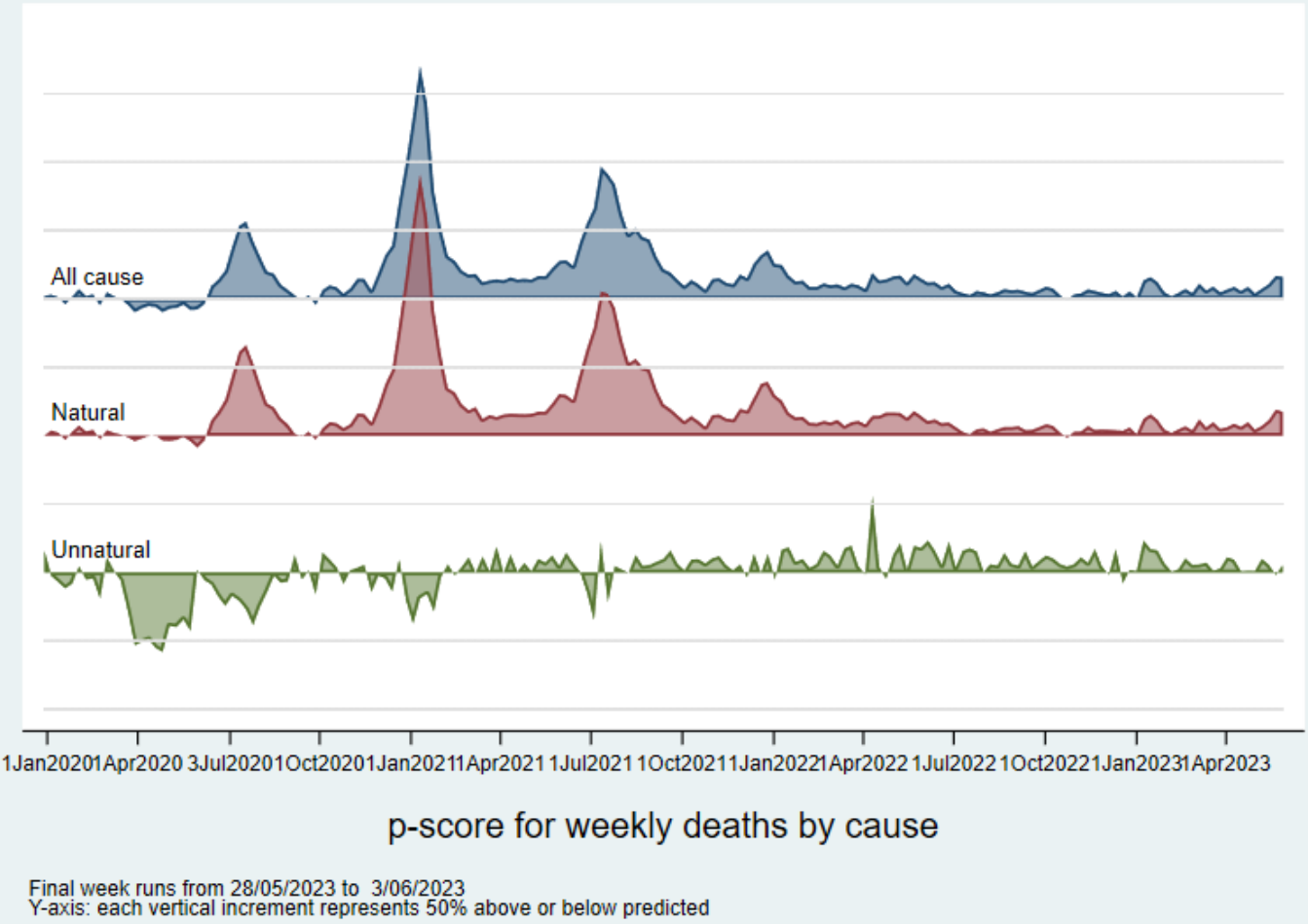
- The all-cause weekly deaths in 2023 reverted to within the prediction bounds (for both natural and unnatural) since February 2023, following a short period of exceeding the upper prediction bound in January. Thereafter the weekly numbers occasionally increased above the upper prediction bound.

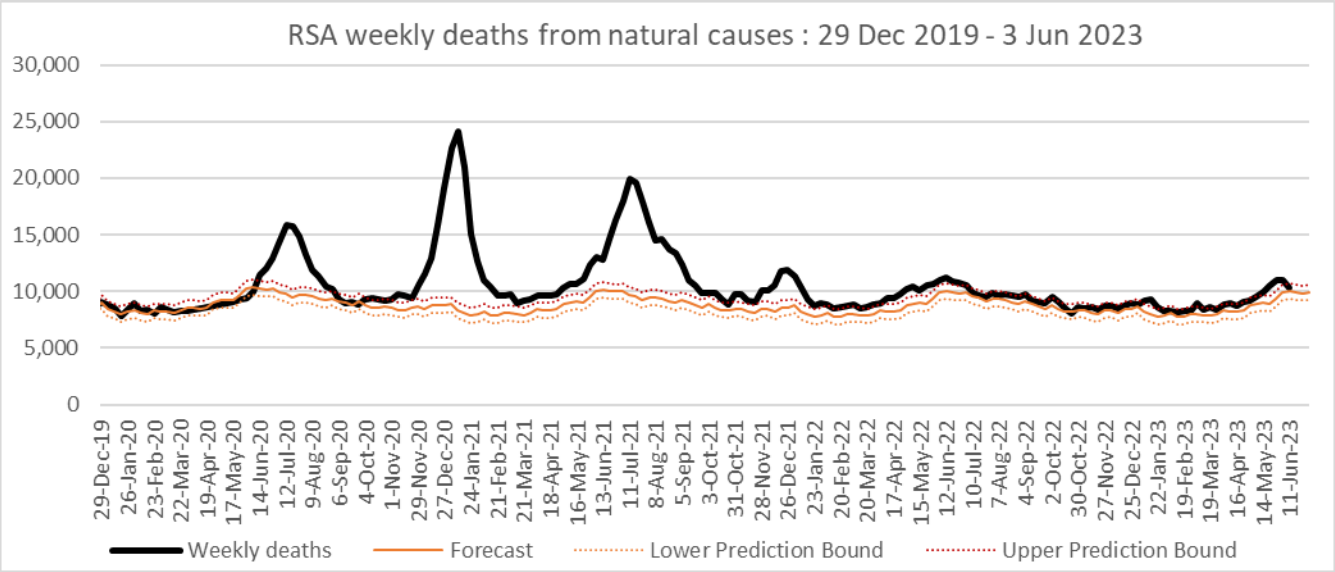
- During the month of May, the weekly number deaths started increasing earlier than the usual increase seen in winter when compared with the predicted numbers based on historical data. This increase is seen in the deaths from natural causes, particularly amongst older persons.

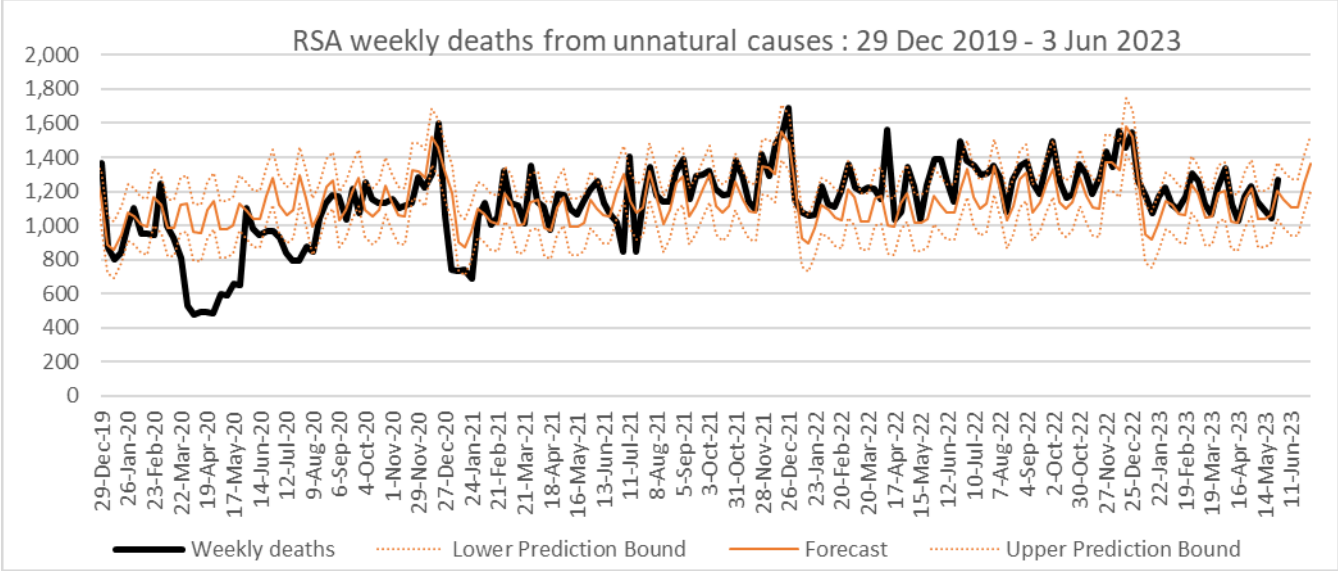


Numbers have been scaled to the estimated actual number of deaths

Natural and unnatural deaths

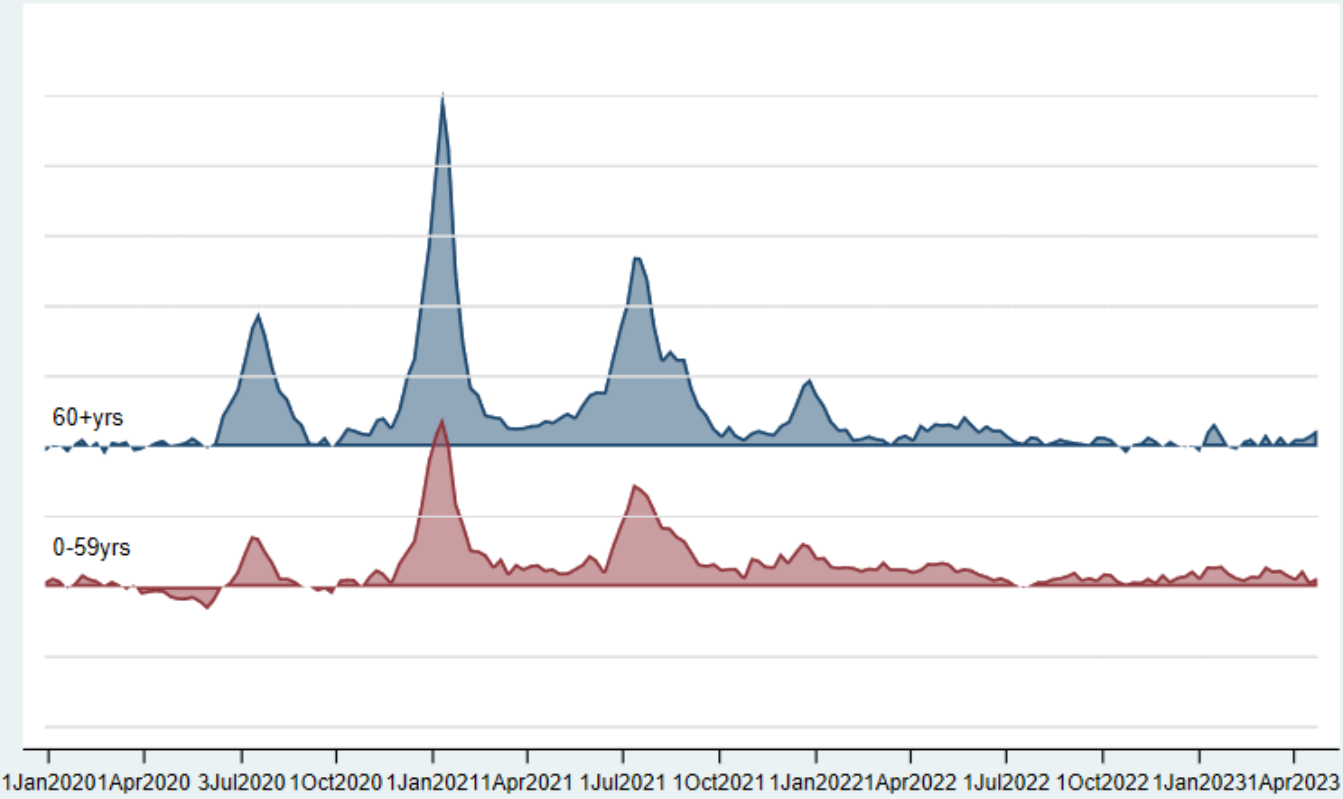






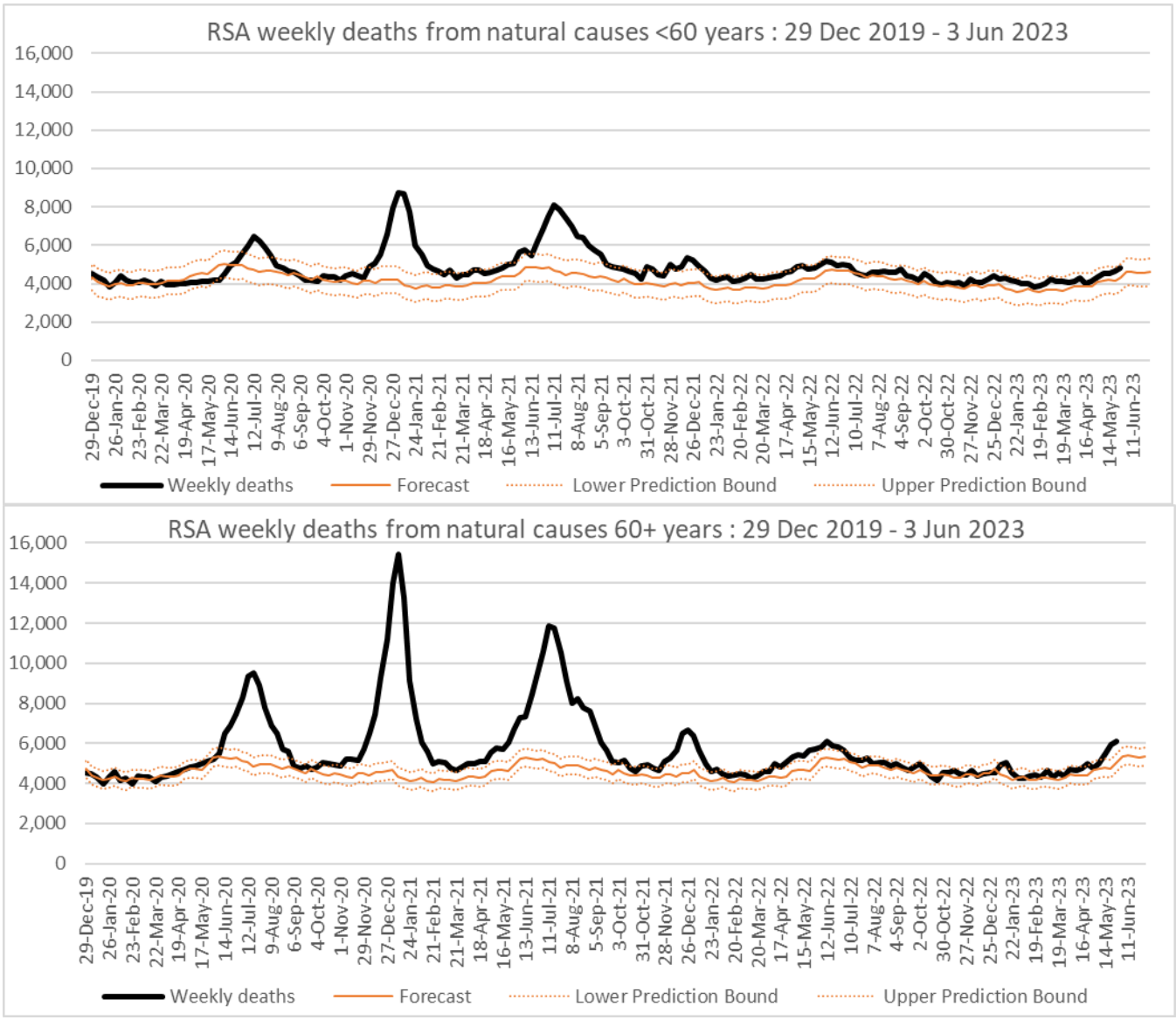
Numbers have been scaled to the estimated actual number of deaths

Natural deaths by broad age groups



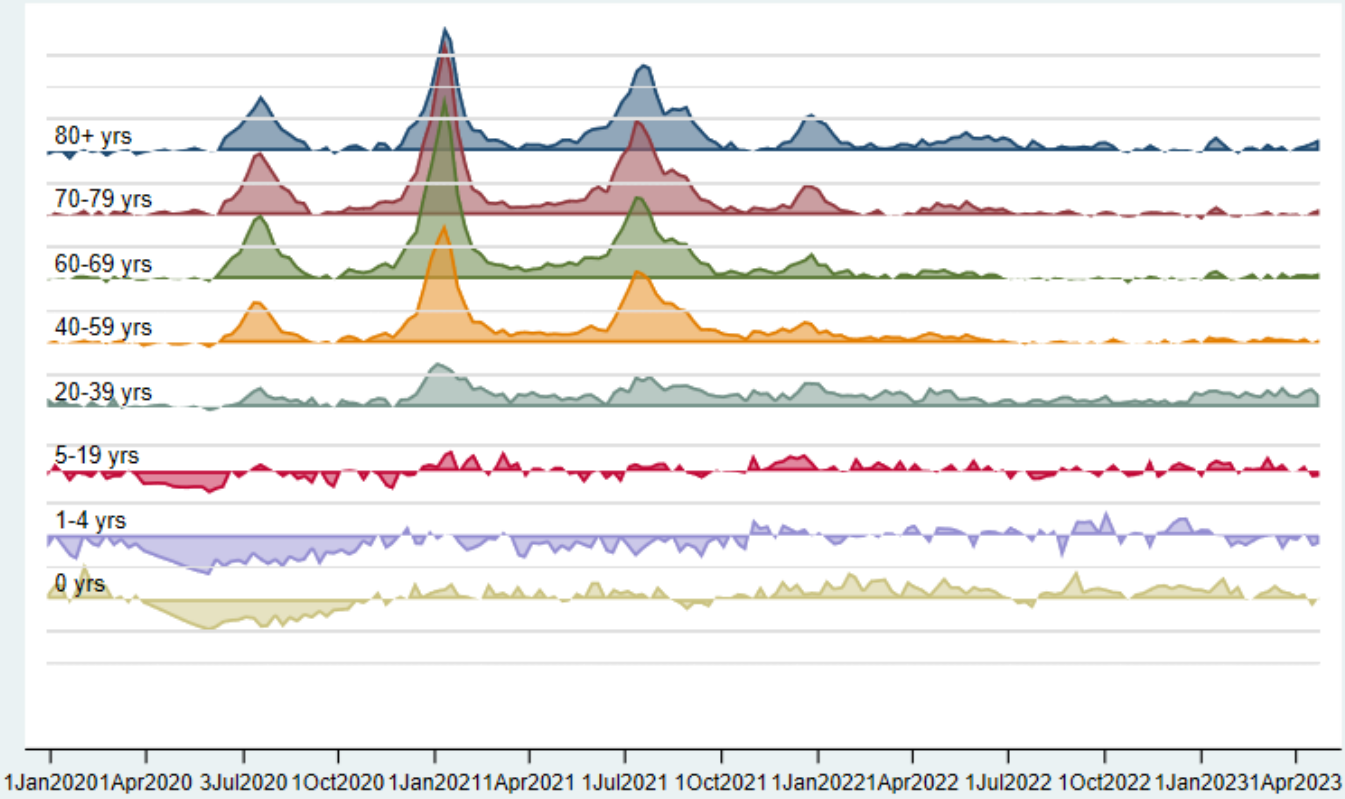
p-score for weekly deaths from natural causes by broad age group

Final week runs from 23/04/2023 to 29/04/2023
Y-axis: each vertical increment represents 50% above or below predicted



Numbers have been scaled to the estimated actual number of deaths

Natural deaths by age group



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

Final week runs from 23/04/2023 to 29/04/2023
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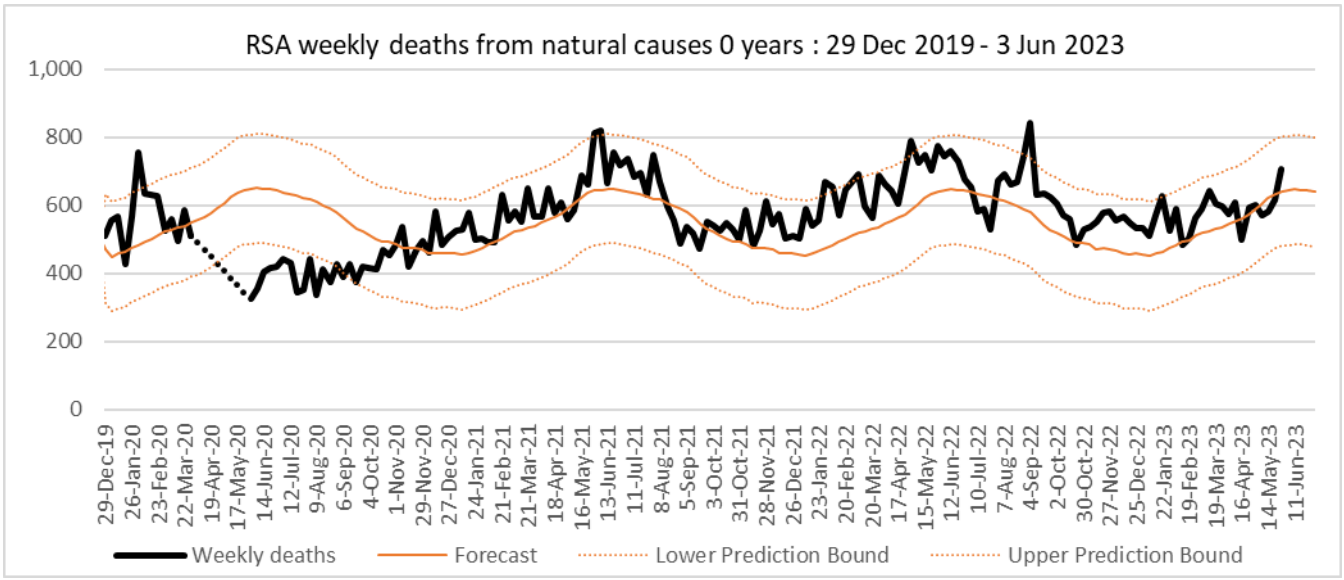
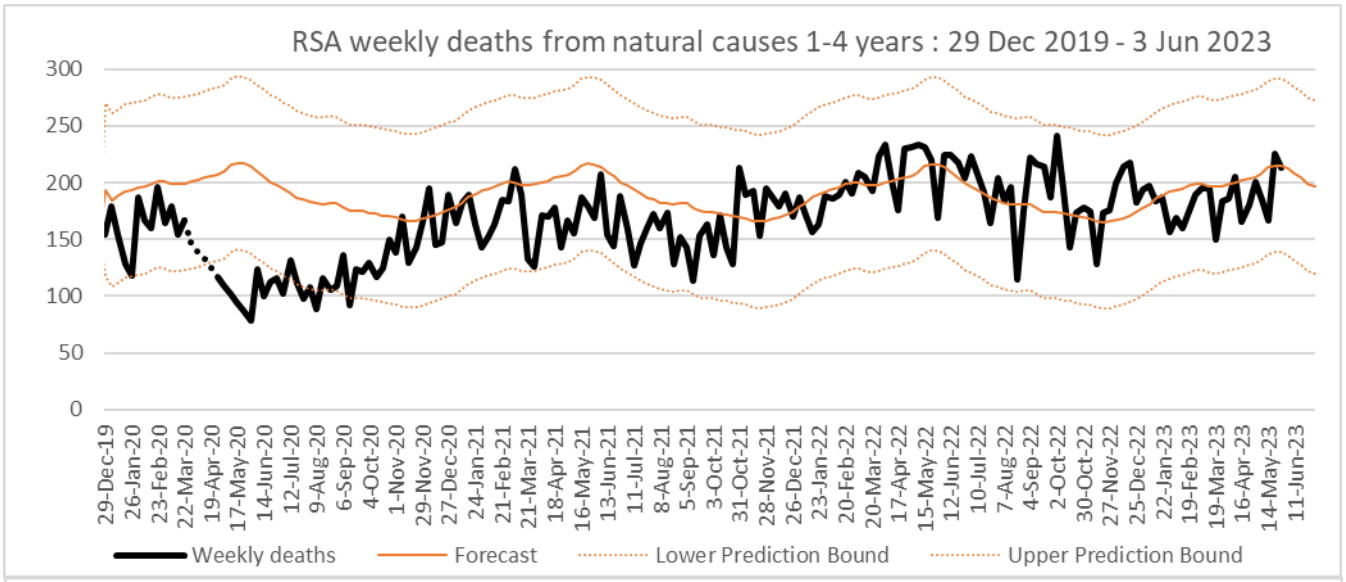
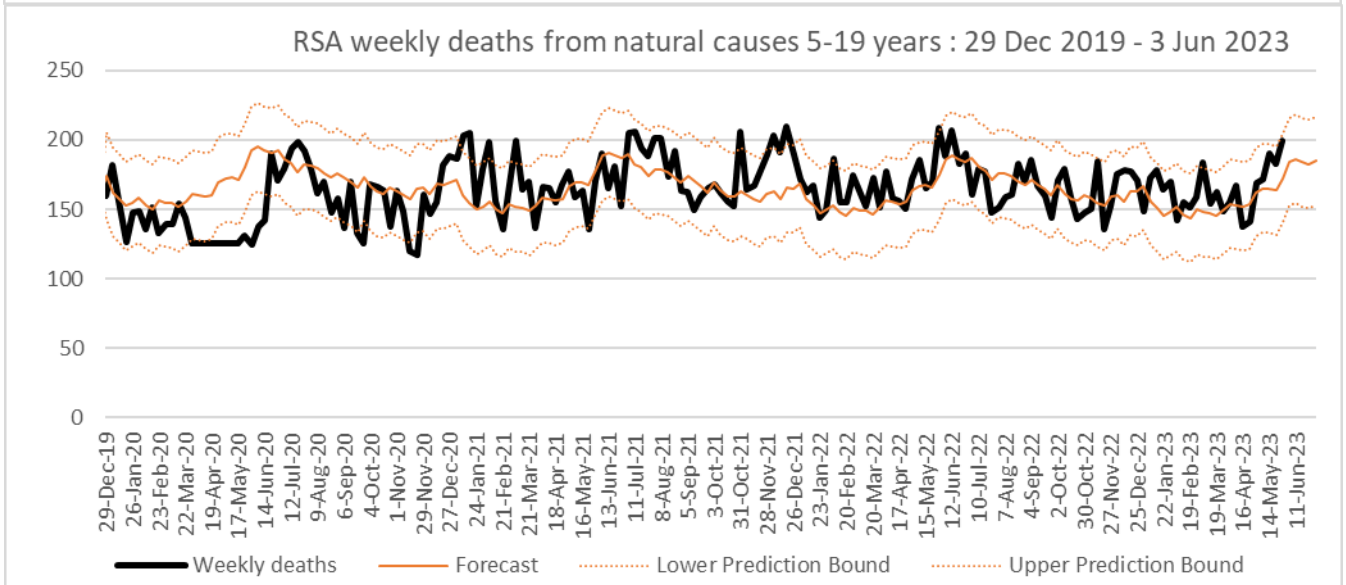
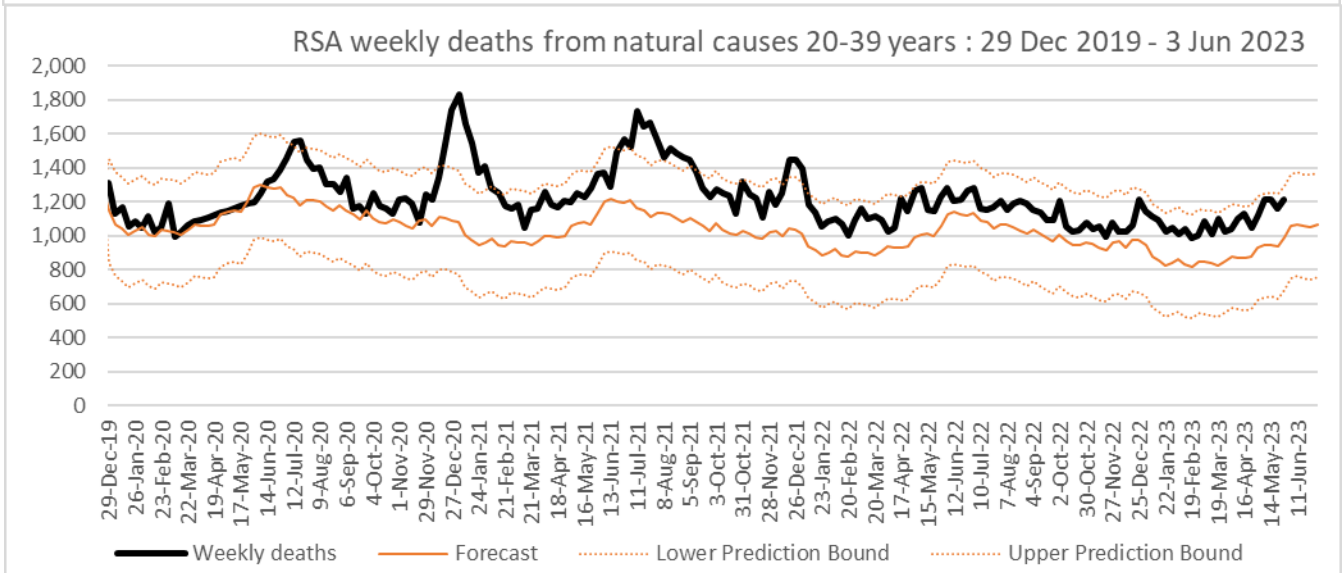



RSA weekly deaths from natural causes 1-4 years : 29 Dec 2019 - 3 Jun 2023
300
250
200
150
100
50
0
29-Dec-19
26-Jan-20
23-Feb-20
22-Mar-20
19-Apr-20
17-May-20
14-Jun-20
12-Jul-20
9-Aug-20
6-Sep-20
4-Oct-20
1-Nov-20
29-Nov-20
27-Dec-20
24-Jan-21
21-Feb-21
21-Mar-21
18-Apr-21
16-May-21
13-Jun-21
11-Jul-21
8-Aug-21
5-Sep-21
3-Oct-21
31-Oct-21
28-Nov-21
26-Dec-21
23-Jan-22
20-Feb-22
20-Mar-22
17-Apr-22
15-May-22
12-Jun-22
10-Jul-22
7-Aug-22
4-Sep-22
2-Oct-22
30-Oct-22
27-Nov-22
25-Dec-22
22-Jan-23
19-Feb-23
19-Mar-23
16-Apr-23
14-May-23
11-Jun-23
Weekly deaths
Forecast
Lower Prediction Bound
Upper Prediction Bound


RSA weekly deaths from natural causes 5-19 years : 29 Dec 2019 - 3 Jun 2023
250
200
150
100
50
0
29-Dec-19
26-Jan-20
23-Feb-20
22-Mar-20
19-Apr-20
17-May-20
14-Jun-20
12-Jul-20
9-Aug-20
6-Sep-20
4-Oct-20
1-Nov-20
29-Nov-20
27-Dec-20
24-Jan-21
21-Feb-21
21-Mar-21
18-Apr-21
16-May-21
13-Jun-21
11-Jul-21
8-Aug-21
5-Sep-21
3-Oct-21
31-Oct-21
28-Nov-21
26-Dec-21
23-Jan-22
20-Feb-22
20-Mar-22
17-Apr-22
15-May-22
12-Jun-22
10-Jul-22
7-Aug-22
4-Sep-22
2-Oct-22
30-Oct-22
27-Nov-22
25-Dec-22
22-Jan-23
19-Feb-23
19-Mar-23
16-Apr-23
14-May-23
11-Jun-23
Weekly deaths
Forecast
Lower Prediction Bound
Upper Prediction Bound


RSA weekly deaths from natural causes 20-39 years : 29 Dec 2019 - 3 Jun 2023
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
29-Dec-19
26-Jan-20
23-Feb-20
22-Mar-20
19-Apr-20
17-May-20
14-Jun-20
12-Jul-20
9-Aug-20
6-Sep-20
4-Oct-20
1-Nov-20
29-Nov-20
27-Dec-20
24-Jan-21
21-Feb-21
21-Mar-21
18-Apr-21
16-May-21
13-Jun-21
11-Jul-21
8-Aug-21
5-Sep-21
3-Oct-21
31-Oct-21
28-Nov-21
26-Dec-21
23-Jan-22
20-Feb-22
20-Mar-22
17-Apr-22
15-May-22
12-Jun-22
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7-Aug-22
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19-Mar-23
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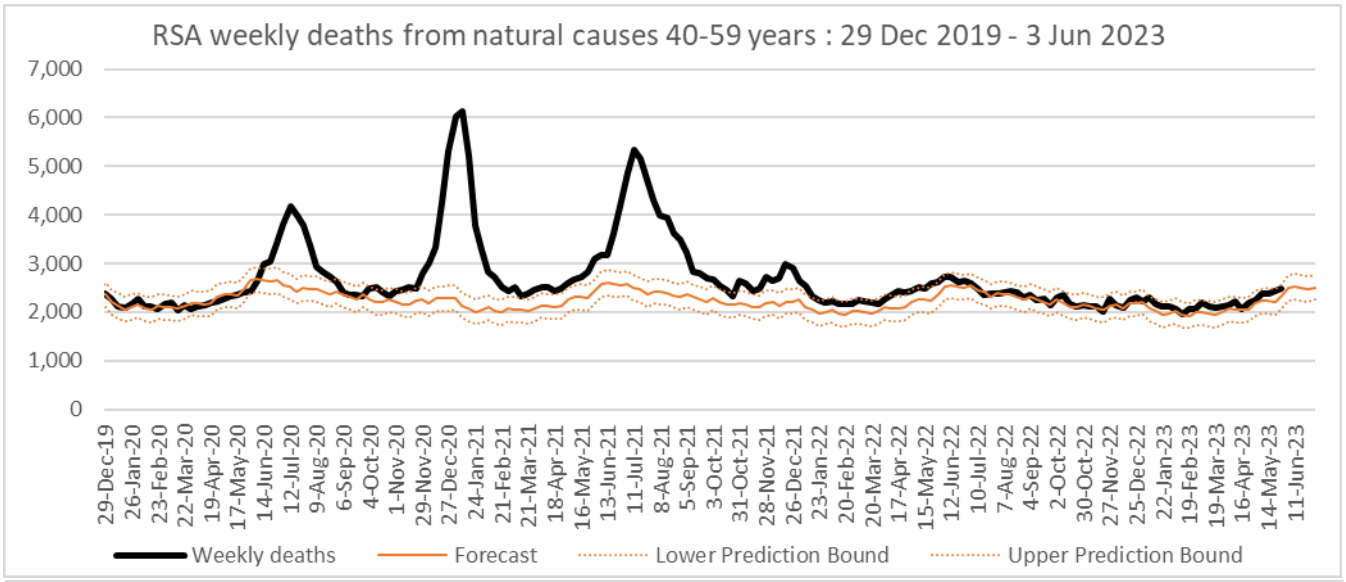
Upper Prediction Bound


RSA weekly deaths from natural causes 40-59 years : 29 Dec 2019 - 3 Jun 2023
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
29-Dec-19
26-Jan-20
23-Feb-20
22-Mar-20
19-Apr-20
17-May-20
14-Jun-20
12-Jul-20
9-Aug-20
6-Sep-20
4-Oct-20
1-Nov-20
29-Nov-20
27-Dec-20
24-Jan-21
21-Feb-21
21-Mar-21
18-Apr-21
16-May-21
13-Jun-21
11-Jul-21
8-Aug-21
5-Sep-21
3-Oct-21
31-Oct-21
28-Nov-21
26-Dec-21
23-Jan-22
20-Feb-22
20-Mar-22
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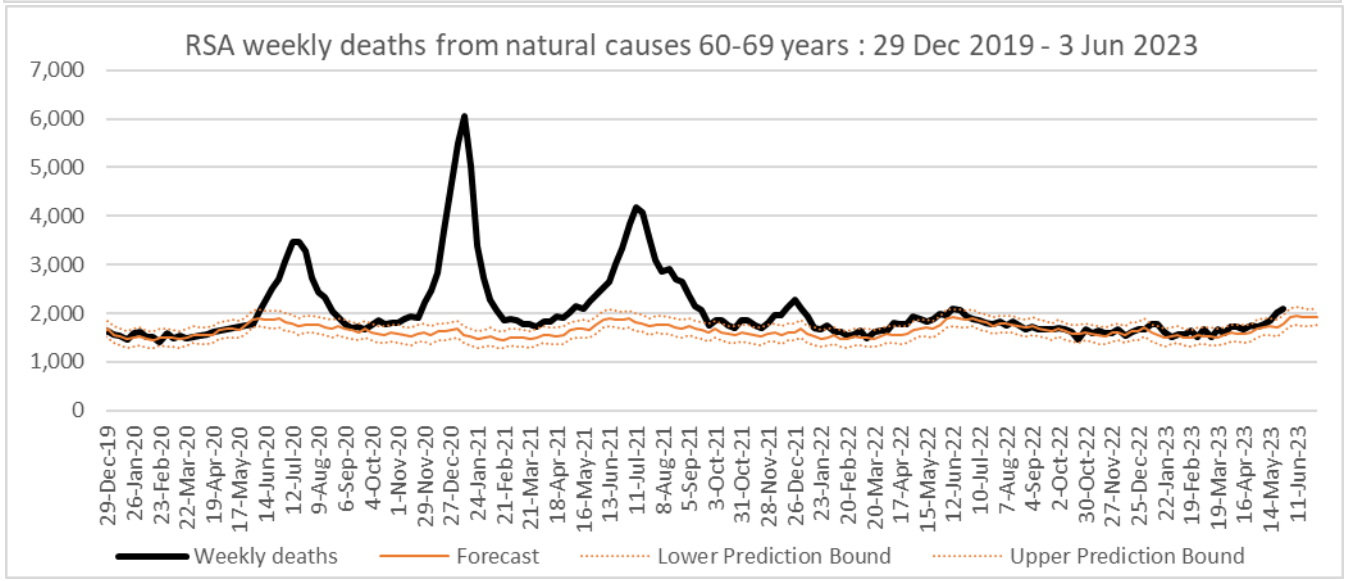
RSA weekly deaths from natural causes 60-69 years : 29 Dec 2019 - 3 Jun 2023
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0
29-Dec-19
26-Jan-20
23-Feb-20
22-Mar-20
19-Apr-20
17-May-20
14-Jun-20
12-Jul-20
9-Aug-20
6-Sep-20
4-Oct-20
1-Nov-20
29-Nov-20
27-Dec-20
24-Jan-21
21-Feb-21
21-Mar-21
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5-Sep-21
3-Oct-21
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7-Aug-22
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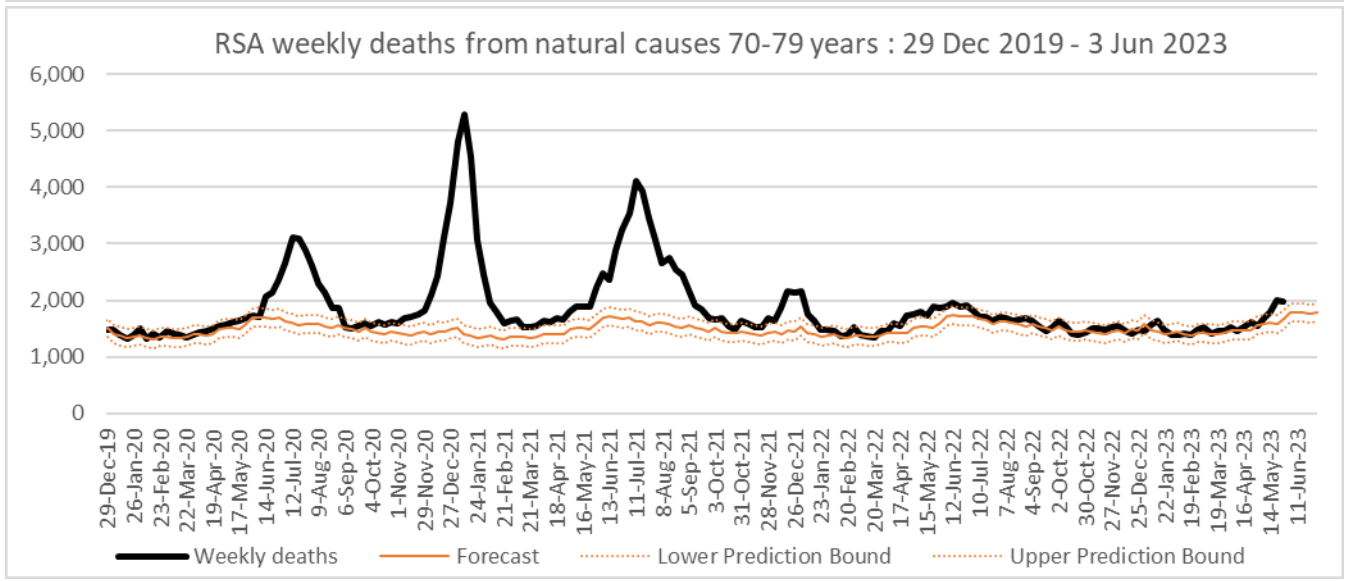
Upper Prediction Bound


RSA weekly deaths from natural causes 70-79 years : 29 Dec 2019 - 3 Jun 2023
6,000
5,000
4,000
3,000
2,000
1,000
0
29-Dec-19
26-Jan-20
23-Feb-20
22-Mar-20
19-Apr-20
17-May-20
14-Jun-20
12-Jul-20
9-Aug-20
6-Sep-20
4-Oct-20
1-Nov-20
29-Nov-20
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8-Aug-21
5-Sep-21
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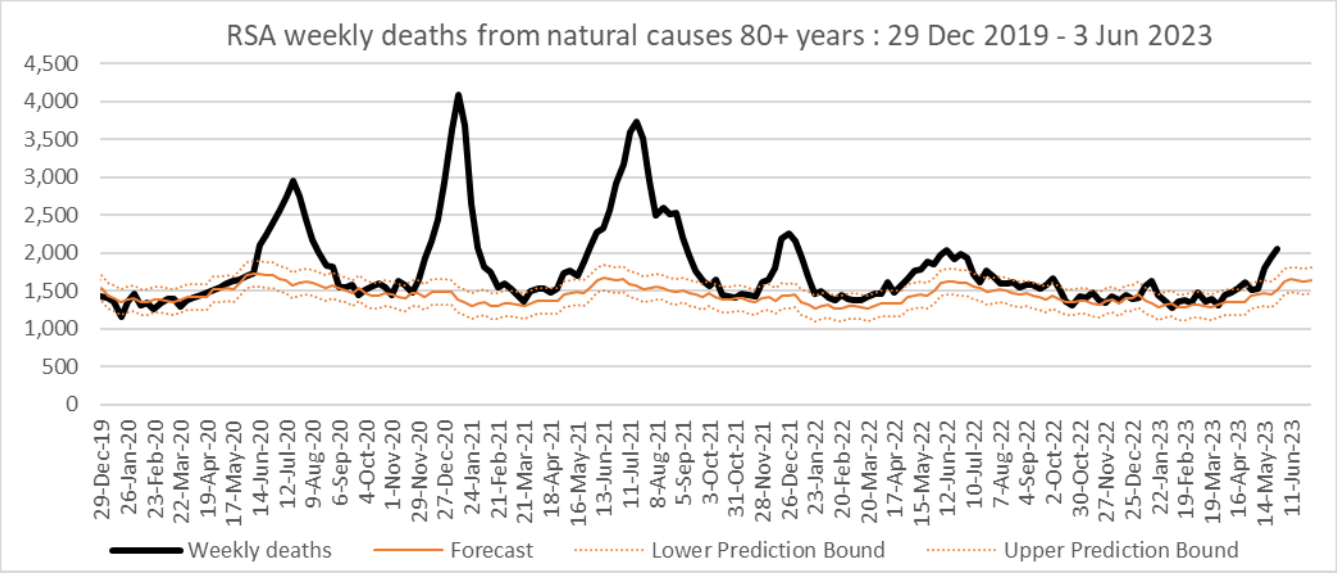
RSA weekly deaths from natural causes 80+ years : 29 Dec 2019 - 3 Jun 2023
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
29-Dec-19
26-Jan-20
23-Feb-20
22-Mar-20
19-Apr-20
17-May-20
14-Jun-20
12-Jul-20
9-Aug-20
6-Sep-20
4-Oct-20
1-Nov-20
29-Nov-20
27-Dec-20
24-Jan-21
21-Feb-21
21-Mar-21
18-Apr-21
16-May-21
13-Jun-21
11-Jul-21
8-Aug-21
5-Sep-21
3-Oct-21
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