

REPORT ON WEEKLY DEATHS IN SOUTH AFRICA

8 - 14 AUGUST 2021

(WEEK 32)

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UCT Centre
for Actuarial
Research

Glossary:

Age-standardised excess death rate: Indirectly age-standardised excess death rates have been calculated for each province to adjust the crude death rates per capita for the differences in distribution of the population by age. The adjustment factor for each province is calculated as the crude death rate for South Africa divided by what the crude rate for South Africa would have been had the age distribution of the population been that of the province. Standardisation for age is necessary when comparing populations that differ in their age structure because age has a powerful influence on the risk of dying. The rate is based on the cumulative number of excess deaths since 3 May 2020 to date divided by the population estimate for 2021 and has not been annualised.

Actual number of deaths: The actual number of deaths in South Africa have been estimated from the numbers recorded on the National Population Register using 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 NPR have been re-estimated for the 2021 reports taking into account the 2017 cause-of-death data released by Stats SA in 2020.** A methodological note briefly outlining the changes can be downloaded with this report from the SAMRC website: <https://www.samrc.ac.za/reports/report-weekly-deaths-south-africa>.

Epi-week: The Weekly Death Reports in 2020 used weeks from 1 January and ran from Wednesday to Tuesday. In setting up the monitoring for 2021, we recast the data to 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 and Week 1 of 2021 is 3 January – 9 January 2021.

Excess deaths: There is no universal definition of, or understanding of what is meant by, "excess mortality". It is a term used in epidemiology and public health that refers to the number of deaths that are occurring above what we would normally expect. The WHO uses the term to describe "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."

Excess natural deaths associated with COVID-19: Generally, the number of excess deaths per week is calculated as the number of all-cause deaths in that week less the number that might be assumed to have occurred had there not been the epidemic (i.e. the counterfactual number), provided that the counterfactual is lower. However, this approach has generally only been applied to countries where deaths have been tracking the counterfactual before the onset of significant numbers of COVID-19 related deaths. The method provides a poor estimate of the numbers of COVID-19 and collateral deaths in the early stages of the epidemic when this is not the case. Thus, we estimated the numbers of COVID-19 and collateral deaths, once a clear upward trend is evident, as the number of actual deaths less a baseline number determined as a proportion of the predicted number. By the end of the 1st wave of the pandemic, the predicted values have been used as the counterfactual.

Warning: The Department of Home Affairs has faced sporadic temporary office closures, particularly in areas that are more affected by COVID-19. This may affect our allocation of a death to a metro area. For example, a death that occurred in the City of Cape Town might have been registered at an office outside of the City because of a temporary closure. Closure may also cause a delay in the processing of the death registration which would result in an underestimate of the deaths in the most recent week.

Background

This report provides estimates of the weekly number of deaths of all persons in South Africa for epidemiological **Week 32** of 2021, covering the period **8 – 14 Aug 2021**.

Note: Estimates of the predicted number of weekly deaths for 2020 and 2021 have been revised to include the number of infant deaths (<1 year of age) as well as accounting for a different trend in mortality rates in the Northern Cape. Previously we fitted a negative binomial regression to the 2014-2019 weekly number of natural deaths for 7 provinces excluding Western Cape (which has an earlier winter peak in deaths) and KwaZulu-Natal (which experienced a more rapid decline in mortality rates during the period 2014-2019 than the other provinces). A closer review of provincial trends in mortality rates indicates that the rate of decline in Northern Cape was slower than in the other provinces, indicating the necessity to model the numbers for this province separately. The current predicted numbers of natural deaths for all ages are based on separate negative binomial regression models for natural deaths in Northern Cape, Western Cape, KwaZulu-Natal and a single regression for the remaining 6 provinces including a provincial coefficient to allow for different levels in the provincial rates. The deaths from unnatural causes for all ages have been modelled nationally using a negative binomial regression as done previously but now including infant deaths (<1 year of age).

The revised series of predicted values and excess deaths can be downloaded with this report from the SAMRC website: <https://www.samrc.ac.za/reports/report-weekly-deaths-south-africa>.

While preparing predicted numbers of weekly deaths for 2021, enhancements have been made to the estimation process. The estimates now take into account the release of vital registration data to include registrations up to the close of 2017. They also ensure that the national estimate of excess deaths is consistent with the sum of the estimates for the provinces. Reporting has changed to 'Epi-weeks' that run from Sunday to Saturday, which will align with other weekly reports and enable us to lessen the lag in reporting.

The main methodological change introduced in the 2021 reporting is that predicted values for 2020 and 2021 are based on death data for the period 2014-2019, instead of data for 2018 and 2019 as was done for 2020 estimates. After reviewing trends in the data, separate negative binomial models have been fitted to the unnatural deaths, the natural deaths for each of KwaZulu-Natal and Western Cape, and for natural deaths for the 7 other provinces in a combined model to provide estimates by age, sex and epi-week for each year. A prediction interval has been estimated on the basis of the variability in the observed weekly data for each reported domain. The data for both 2020 and 2021 have been recast and both years will be reported with a cumulative total of excess deaths taken from the week starting 3 May 2020, considered to be the point of rapid increase in excess deaths associated with the COVID-19 pandemic in South Africa. Except for KwaZulu-Natal (and eThekweni in particular), where the additional VR data identified substantial missing late registrations from the 2015 data, the impact of the changes is relatively small. Predicted values for the metropolitan areas are still based on data from 2018 and 2019 as the trends in the sub-provincial data need further investigation to develop a comprehensive district-level model.

A brief methodological note outlining the changes that have been made for monitoring deaths during 2021 can be downloaded with this report from the SAMRC website: <https://www.samrc.ac.za/reports/report-weekly-deaths-south-africa>.

Trends

- This report is based on improved estimates which form a consistent series and can be tracked over time. Firstly, we include **persons of all ages** and not persons 1+ years only. Secondly, the predicted numbers of natural deaths have been revised to allow for the Northern Cape's different historical trend in mortality rates from the other provinces. The actual numbers, therefore, **cannot** be compared directly with the numbers from previous reports, but numbers for previous weeks have re-estimated on the above approach.
- The weekly number of deaths (all ages) from all causes was **15,989** in Week 32 (**8 – 14 Aug 2021**) indicating a decrease in the weekly numbers since a peak of **21,203** in Week 28 (**11 – 18 Jul**). This has decreased from **16,800** in Week 31 (**1 – 7 Aug 2021**).
- The number of excess deaths from natural causes (all ages) decreased to **5,405** in Week 32 (**8 – 14 Aug 2021**) from **6,361** in Week 31 (**1 – 7 Aug 2021**), having peaked at **10,223** in Week 28 (**11 – 18 Jul**). The peak of wave 3 exceeds the highest number experienced during the surge of wave 1 at **6,673** in Week 30 (**19 – 26 Jul 2020**) but is not as high as the **16,105** deaths experienced at the peak of wave 2 in Week 2 (**10 – 16 Jan 2021**).
- Since 3 May 2020, there has been a cumulative total of **238,949** excess deaths from natural causes of persons all ages of which **154,081** occurred in 2021 (since 3 Jan 2021).

Week	Date	Weekly excess deaths from natural causes (all ages)	Cumulative excess since 3 May 2020 (all ages)	Cumulative excess since 3 January 2021 (all ages)
23	6-Jun-21 – 12-Jun-21	3,288	175,699	90,830
24	13-Jun-21 – 19-Jun-21	2,938	178,637	93,769
25	20-Jun-21 – 26-Jun-21	4,849	183,486	98,618
26	27-Jun-21 – 3-Jul-21	6,570	190,056	105,187
27	4-Jul-21 – 10-Jul-21	8,158	198,214	113,345
28	11-Jul-21 – 17-Jul-21	10,223	208,437	123,568
29	18-Jul-21 – 24-Jul-21	10,007	218,443	133,575
30	25-Jul-21 – 31-Jul-21	8,740	227,183	142,315
31	1-Aug-21 – 7-Aug-21	6,361	233,544	148,676
32	8-Aug-21 – 14-Aug-21	5,405	238,949	154,081

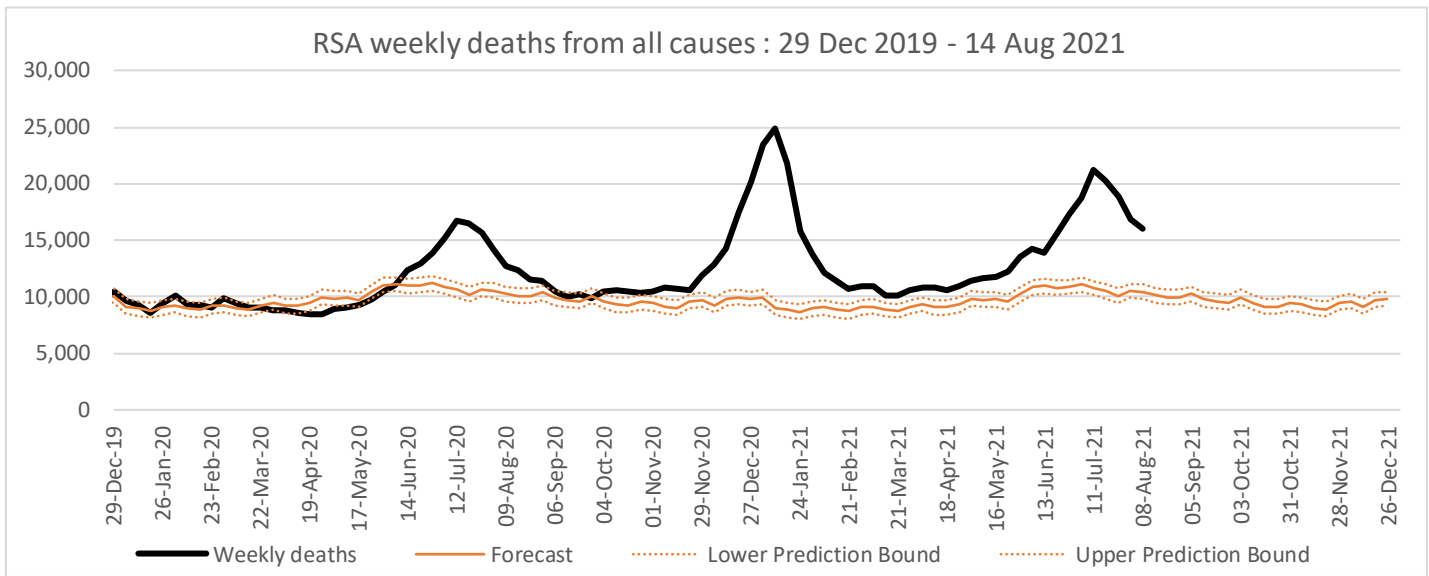
- For people under-60 years, the number of natural deaths tracked within the prediction bounds after wave 1. During Week 25 (**20 – 26 Jun 2021**), the number increased above the upper prediction bound and increased to a peak in Week 28 (**11 – 17 Jul 2021**). By the end of Week 32 (**8 – 14 Aug 2021**), the excess natural deaths for people under-59 years since **3 May 2020** totals nearly **60,300**.
- For people 60 years and older, the number of natural deaths remains well above the upper prediction bound and also reached a peak in Week 28 (**11 – 17 Jul 2021**). The excess natural deaths for people 60 years and older by the end of Week 32 (**8 – 14 Aug 2021**) is over **178,000**.
- Phase 2 of the vaccination programme, targeting persons 60 years and older in addition to health care workers, began on 17 May 2021. In the weeks leading up to the vaccination roll-out, there were about 1,200-1,500 weekly excess deaths from natural causes among persons 60+ years with p-scores ranging from 28%-33%. The table below shows that the number of weekly excess deaths from natural causes in this age group increased to **7,119** in Week 28 (**11 – 17 Jul 2021**) with a p-score of 152%. The numbers have decreased to **3,617** in Week 32 (**8 – 14 Aug 2021**) and the p-score decreased to 80%. However, it is difficult to quantify the impact of vaccines from the decline associated with the decline of Wave 3.

Week	Date	Weekly excess deaths from natural causes for persons 60+ years	p-score
22	30-May-21 – 5-Jun-21	2,251	50.4%
23	6-Jun-21 – 12-Jun-21	2,522	52.9%
24	13-Jun-21 – 19-Jun-21	2,591	53.4%
25	20-Jun-21 – 26-Jun-21	3,684	77.1%
26	27-Jun-21 – 3-Jul-21	4,738	99.8%
27	4-Jul-21 – 10-Jul-21	5,729	119.9%
28	11-Jul-21 – 17-Jul-21	7,119	151.3%
29	18-Jul-21 – 24-Jul-21	7,039	152.9%
30	25-Jul-21 – 31-Jul-21	6,028	137.4%
31	1-Aug-21 – 7-Aug-21	4,323	95.9%
32	8-Aug-21 – 14-Aug-21	3,617	80.0%

- **KwaZulu-Natal** and **eThekweni** experienced a sharp increase in the number of natural deaths in Week 28 (**11-17 Jul 2021**). The increase in the number of excess natural deaths has faltered in the province but has continued to increase in eThekweni in Week 32 (**8 – 14 Aug 2021**).
- The previously observed decrease in excess deaths in the **Eastern Cape** has faltered in Week 32 (**8 – 14 Aug 2021**), associated with an increase in the numbers of deaths in **Nelson Mandela Metro**.
- The numbers of excess natural deaths in **Western Cape** and the **City of Cape Town** turned during Week 31 (**1 – 7 Aug 2021**) and have started to decline in the latest week.
- **Free State** reached a peak in Week 22 (**30 May – 5 Jun 2021**) and had been decreasing since then. However, the decreasing trend stalled in Week 26 (**27 Jun – 3 Jul 2021**) and began to increase again. The numbers of excess deaths peaked in Week 31 (**1 – 7 Aug 2021**) and have started to decline in the latest week. The **Northern Cape**, with smaller numbers of weekly deaths, has shown a similar double-peak in its 3rd wave and has declined in the last week. **Note:** As a result of the revision of the predicted weekly deaths, the cumulative total excess deaths for the **Northern Cape** to Week 32 (**8 – 14 Aug 2021**), has been revised downwards to **5,843**.
- The number of excess deaths from natural causes in **Gauteng** peaked in Week 27 (**4 – 10 Jul 2021**) with **3,781** deaths and has dropped since then to **956** excess natural deaths in Week 32 (**8 – 14 Aug 2021**). This is well above the numbers experienced at the peak of their 1st and 2nd waves of the pandemic (about **2,200** excess deaths). The **City of Johannesburg** also peaked in Week 27 (**4 – 10 Jul 2021**), and **Ekurhuleni** and **Tshwane** metros peaked a week later during Week 28 (**11 – 17 Jul 2021**).
- **Limpopo**, **North West** and **Mpumalanga** continued decreasing in Week 32 (**8 – 14 Aug 2021**).
- Per capita excess death rates have been calculated for the provinces to scale the cumulative deaths for the population size of each province (**Table 1**). By the end of Week 32 (**8 – 14 Aug 2021**), the national excess death rate since 3 May 2020 was **401 per 100,000** population.
- The provinces with the highest cumulative numbers of excess deaths at the end of Week 32 (**8 – 14 Aug 2021**), are, in order, **Gauteng**, **KwaZulu-Natal** and **Eastern Cape**. The ranking changes to **Eastern Cape**, **Northern Cape** and **Free State** for the crude death rates per capita (i.e., taking size of the provincial populations into account) and to **KwaZulu-Natal**, **Eastern Cape** and **Northern Cape** using the age-standardised rates (i.e., taking into account the age distribution of the provincial population).
- Overall, the trend in excess deaths paints different picture of the third wave than portrayed by the numbers of cases or even, to some extent, the much more sensible measure, the percentage testing positive, namely

of having past the peak of the epidemic in all provinces except the Eastern Cape and KwaZulu-Natal, where the trend is somewhat unclear.

- The weekly number of deaths from unnatural causes has continued to track close to the predicted numbers since the end of January 2021, with increases corresponding with month-ends. During Weeks 26 and 27, the unnatural deaths dropped below their lower prediction bound, coinciding with the change of lockdown to adjusted level 4 with re-banning of alcohol sales and extension of curfew. However, coinciding with the unrest in **KwaZulu-Natal** and **Gauteng**, and continued taxi violence in the **Western Cape**, the number of unnatural deaths increased to the level of the upper prediction bound during Week 28 (**11 – 17 Jul 2021**) and dropped to below the lower prediction bound during Week 29 (**18 – 24 Jul 2021**) once the unrest had subsided. Coinciding with the easing of the alcohol ban to limited hours of sale during Week 30 (**25 – 31 Jul 2021**), the number of unnatural increased to close to the predicted number for the past 3 weeks.



Numbers have been scaled to the estimated actual number of death and for the last week has been adjusted for delayed registrations

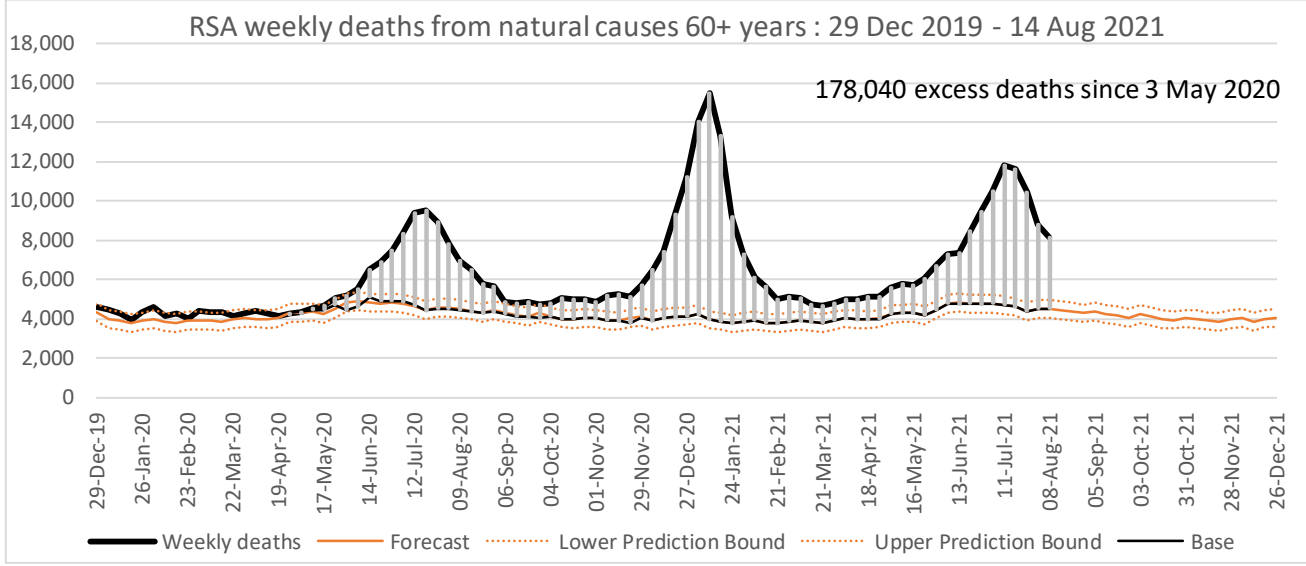
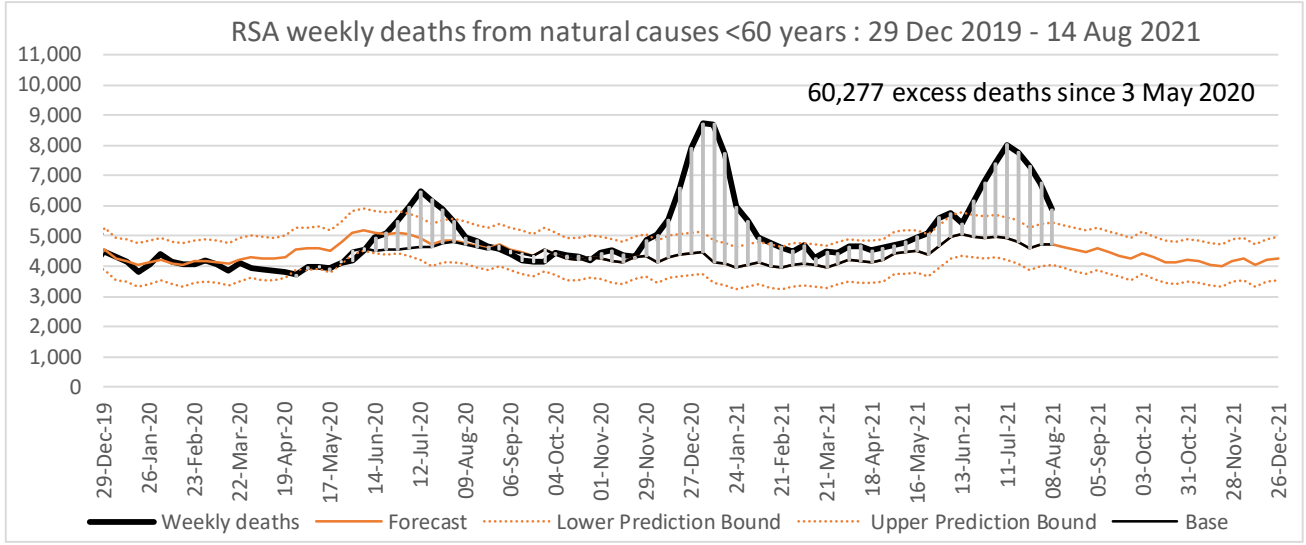
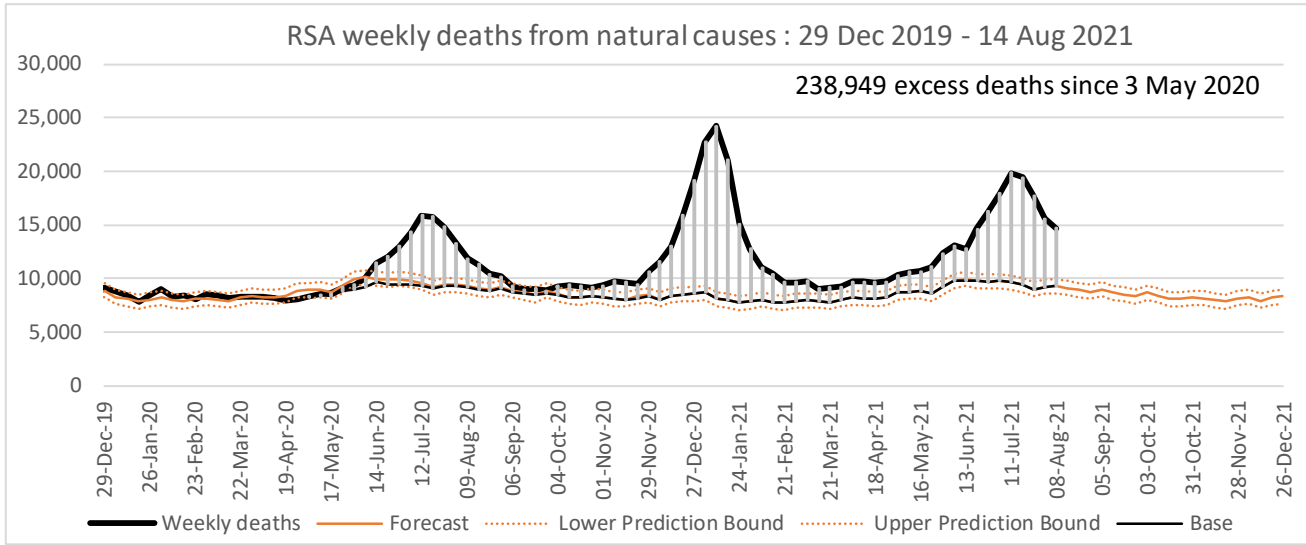
Table 1: Number of excess natural deaths of persons by province and metro relative to revised predicted number based on the observed drop during lockdown, South Africa 2020/21

Region	Period	Excess deaths vs revised base	Excess deaths per 100,000 population	Age standardised excess death rate per 100,000
South Africa	3 May 20 – 14 Aug 21	238,949	401	401
Province				
Eastern Cape	31 May 20 – 14 Aug 21	38,140	580	467
Free State	21 Jun 20 – 14 Aug 21	13,237	455	455
Gauteng	7 Jun 20 – 14 Aug 21	53,193	341	375
KwaZulu-Natal	7 Jun 20 – 14 Aug 21	47,630	416	479
Limpopo	21 Jun 20 – 14 Aug 21	25,378	430	376
Mpumalanga	21 Jun 20 – 14 Aug 21	18,484	384	414
Northern Cape	28 Jun 20 – 14 Aug 21	5,843	499	467
North West	28 Jun 20 – 14 Aug 21	13,852	344	353
Western Cape	3 May 20 – 14 Aug 21	23,191	329	289
Metropolitan Municipality				
Buffalo City	31 May 20 – 14 Aug 21	3,959		
City of Cape Town	3 May 20 – 14 Aug 21	16,698		
Ekurhuleni	7 Jun 20 – 14 Aug 21	13,484		
eThekweni	14 Jun 20 – 14 Aug 21	10,473		
Johannesburg	7 Jun 20 – 14 Aug 21	17,391		
Mangaung	21 Jun 20 – 14 Aug 21	3,680		
Nelson Mandela Bay	31 May 20 – 14 Aug 21	5,933		
City of Tshwane	7 Jun 20 – 14 Aug 21	10,122		

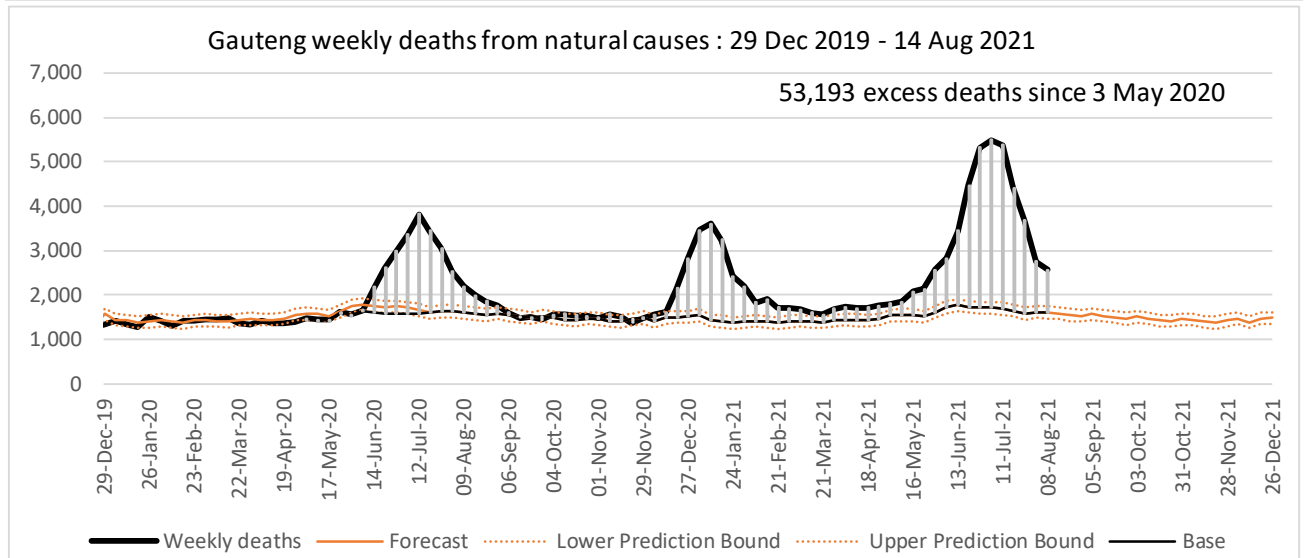
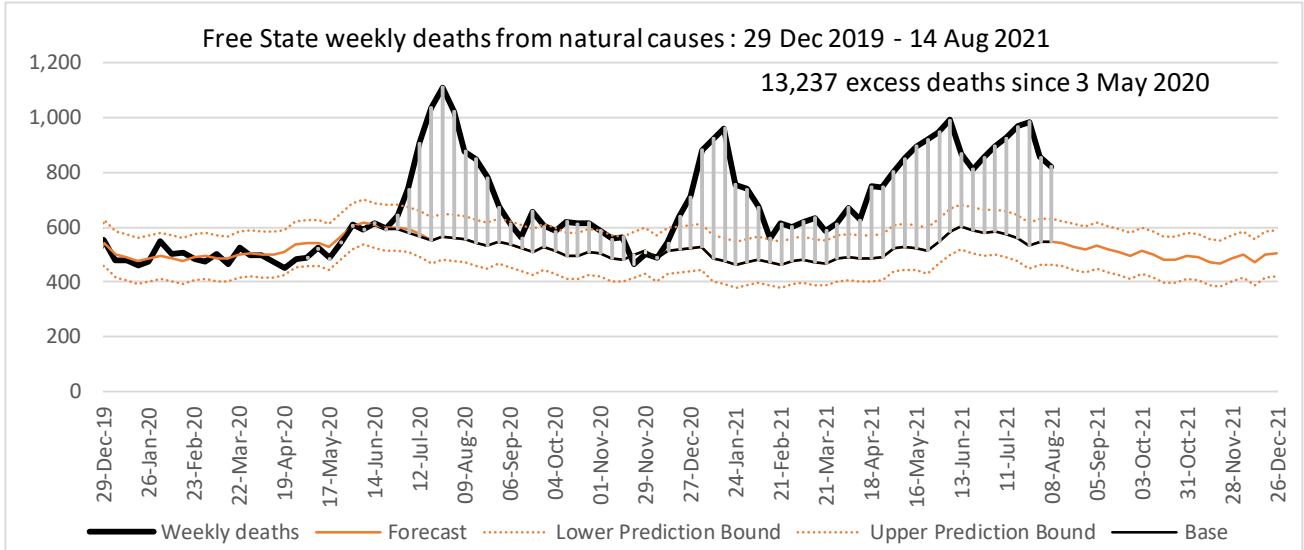
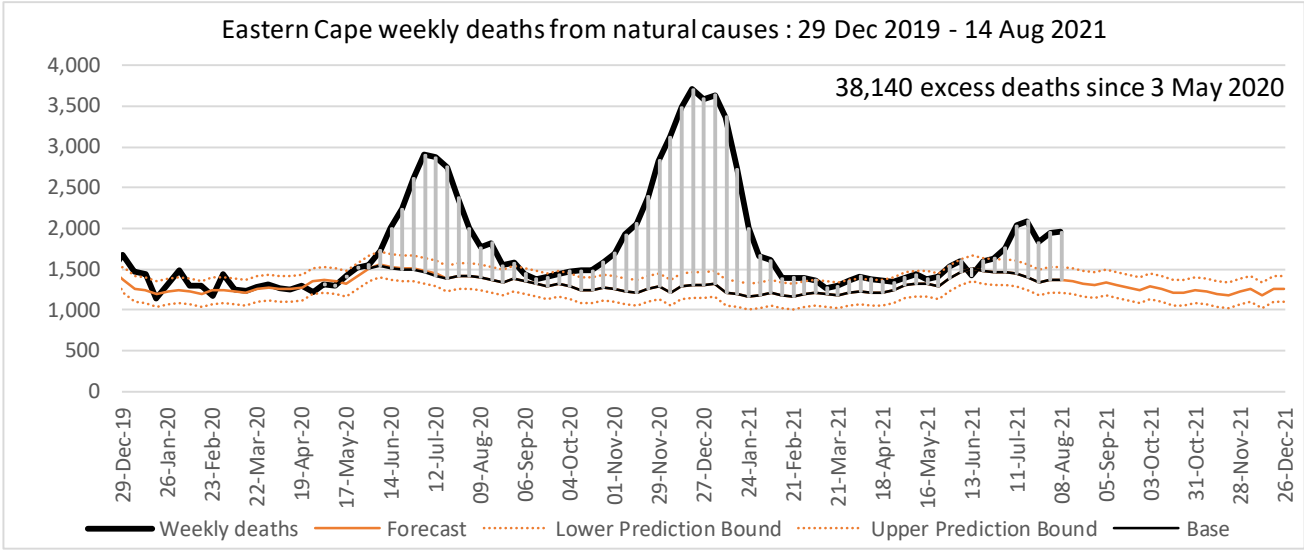
Note: Period has been determined based on when an upturn in the number of natural deaths became apparent. Parts do not sum to the whole because office closures due to Covid-19 may have led to registration of deaths at other offices which may not be in the same area, and random fluctuation at the point at which the baseline is determined.

Table 2: Number of excess deaths from all causes of persons by province and metro relative to predicted number based on historical trend, South Africa 2020/21

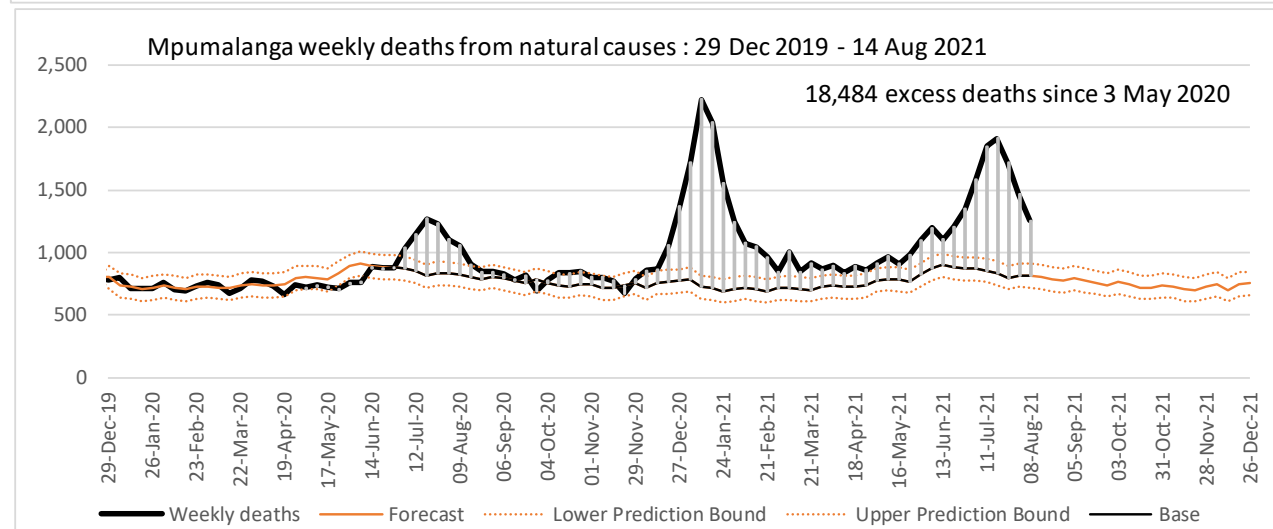
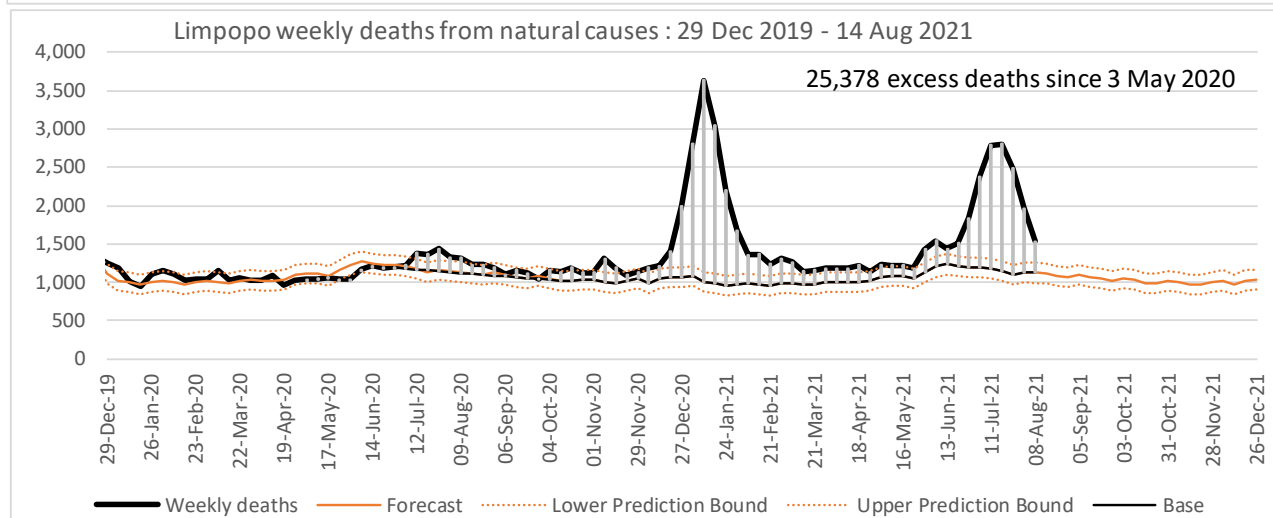
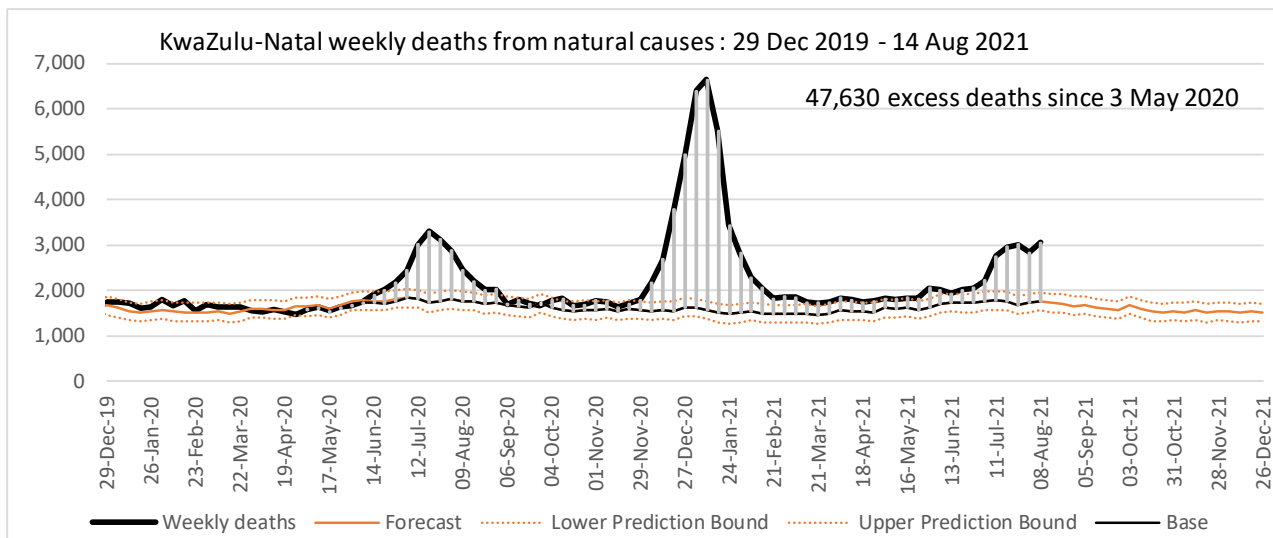
Region	Excess deaths vs forecast	Excess deaths per 100,000 population
South Africa	258,204	434
Province		
Eastern Cape	41,671	633
Free State	14,653	503
Gauteng	54,666	350
KwaZulu-Natal	51,400	449
Limpopo	28,564	483
Mpumalanga	20,460	425
Northern Cape	8,119	694
North West	15,257	379
Western Cape	23,412	332
Metropolitan Municipality		
Buffalo City	3,201	
City of Cape Town	15,004	
Ekurhuleni	15,205	
eThekweni	11,580	
Johannesburg	17,747	
Mangaung	4,724	
Nelson Mandela Bay	6,418	
City of Tshwane	11,710	



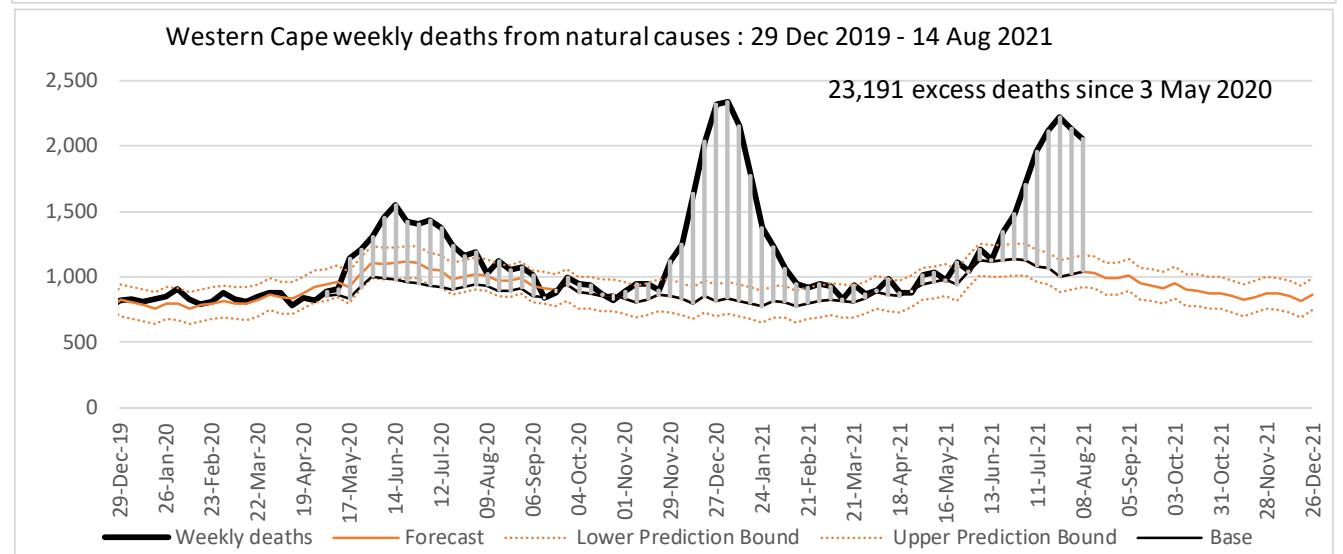
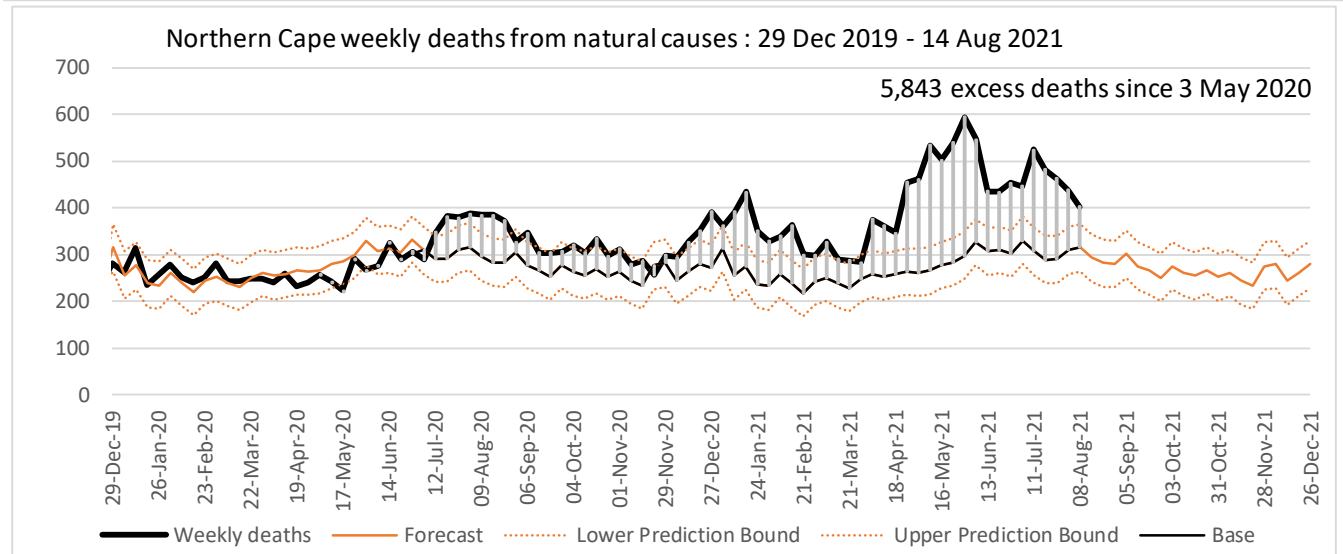
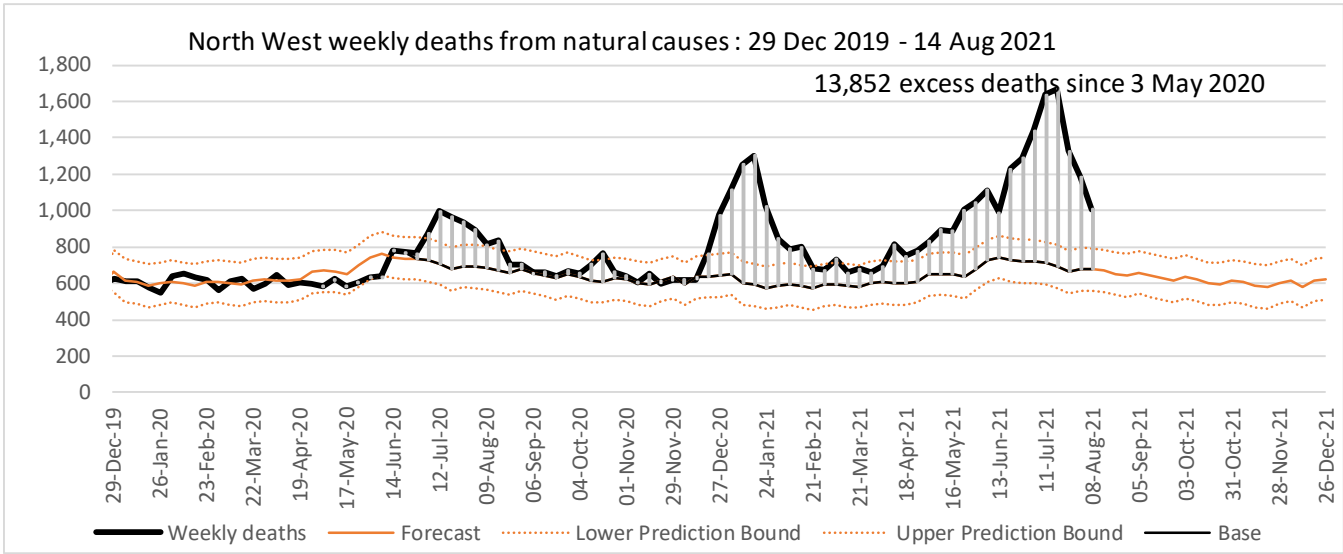
Numbers have been scaled to the estimated actual number of death and for the last week has been adjusted for delayed registrations



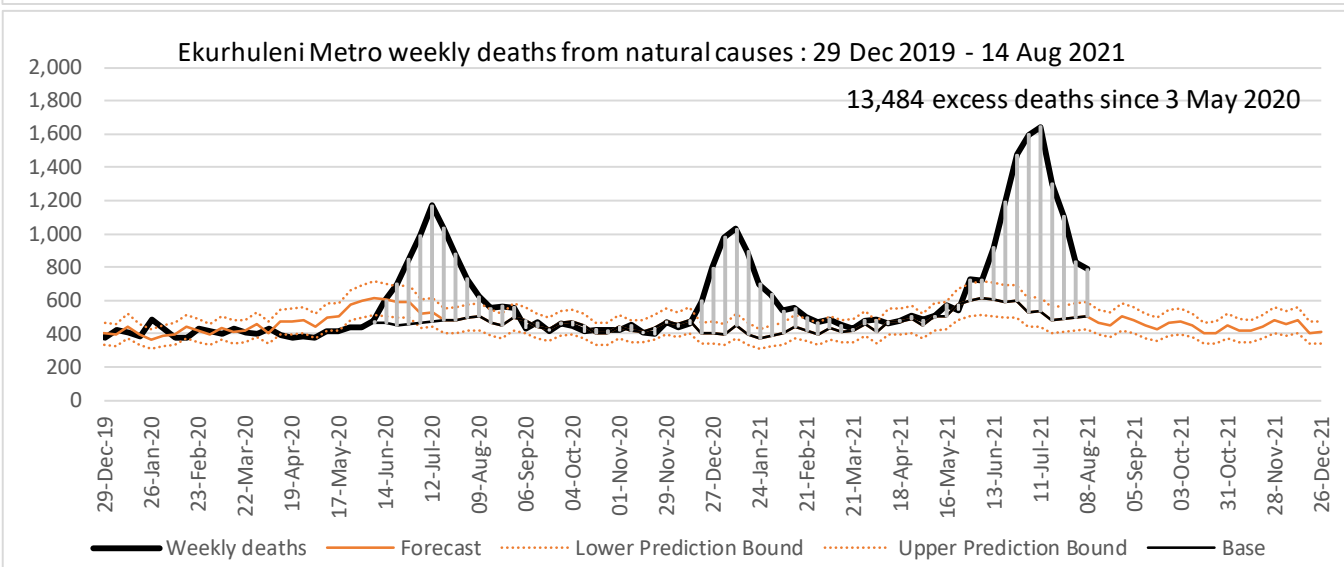
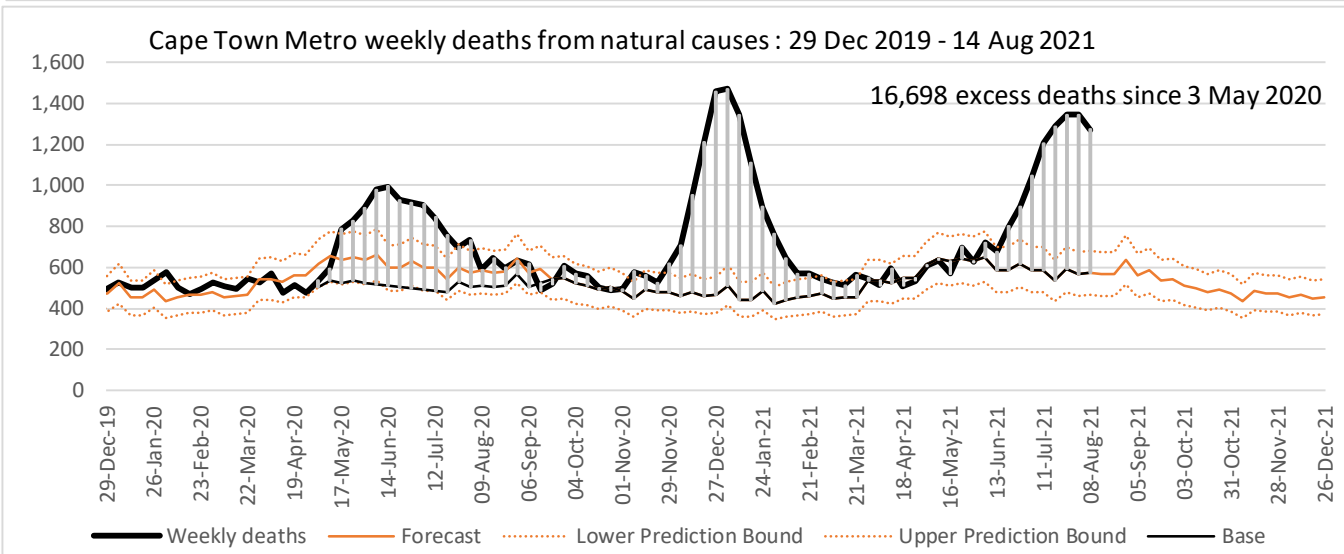
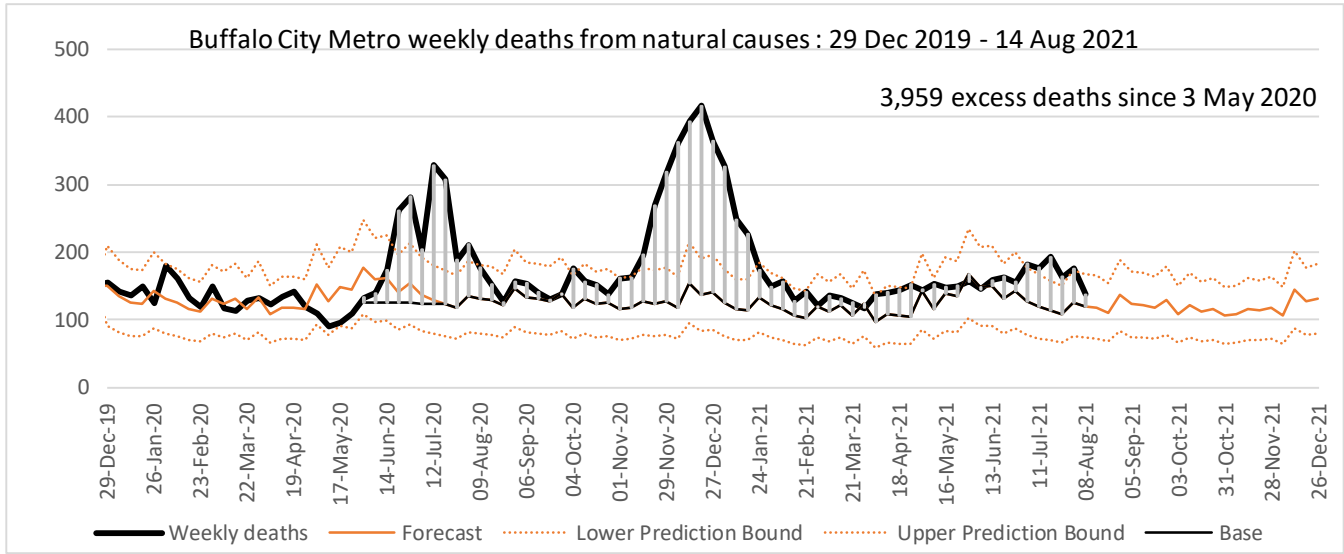
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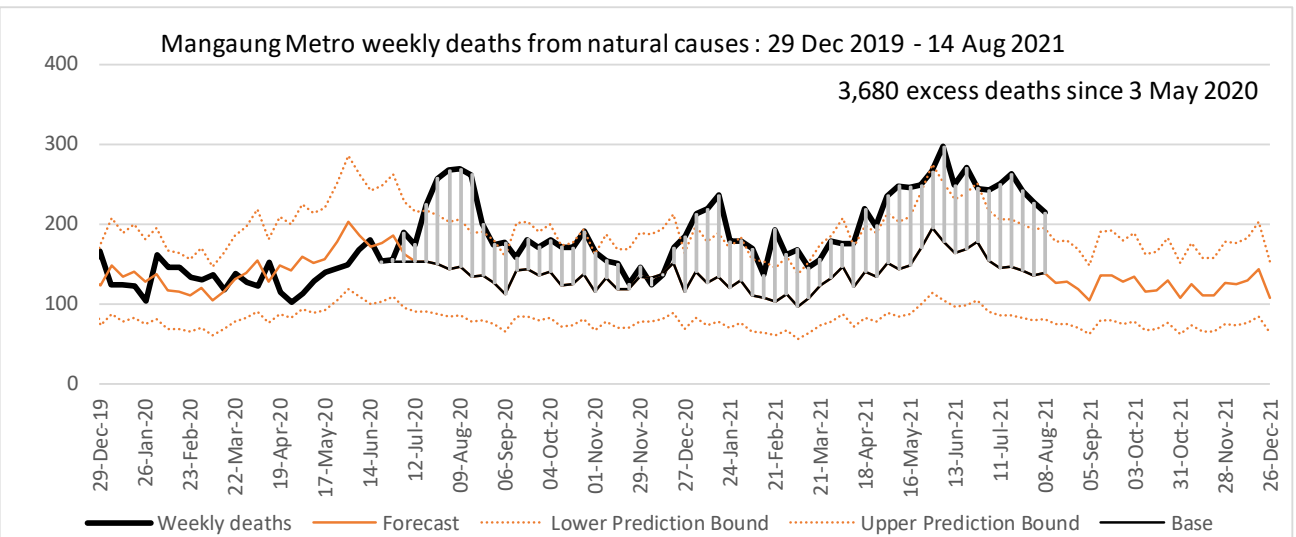
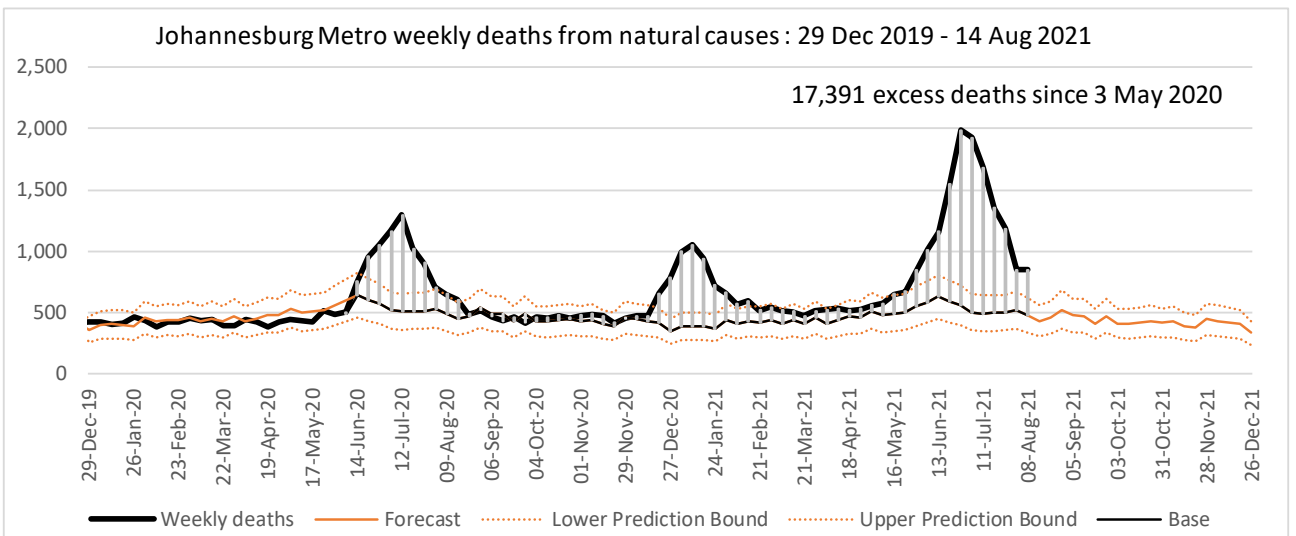
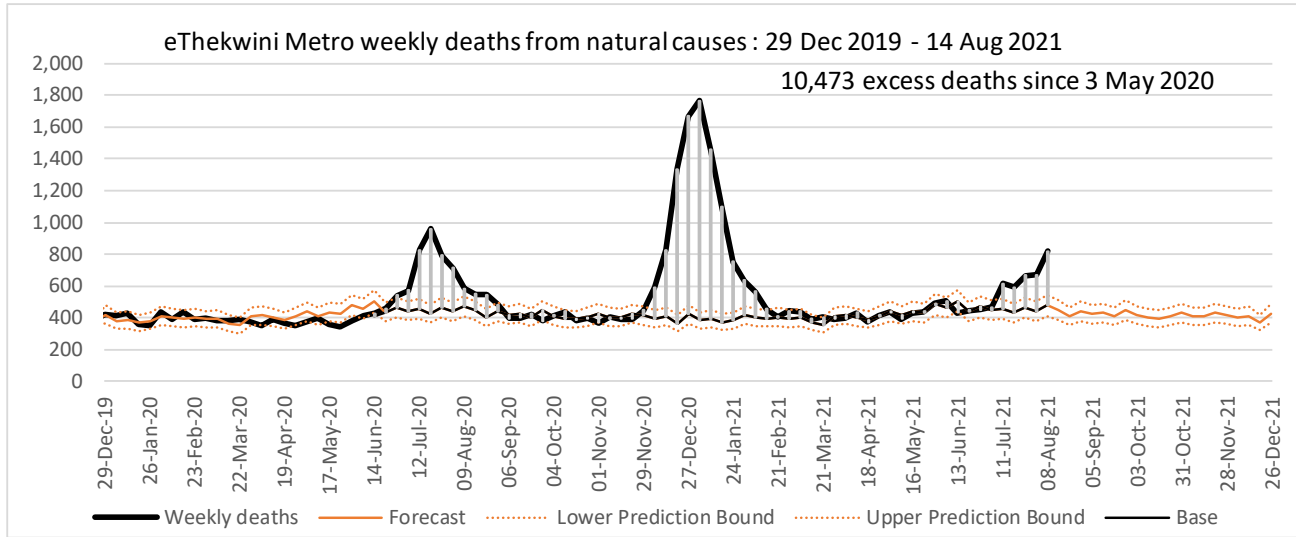
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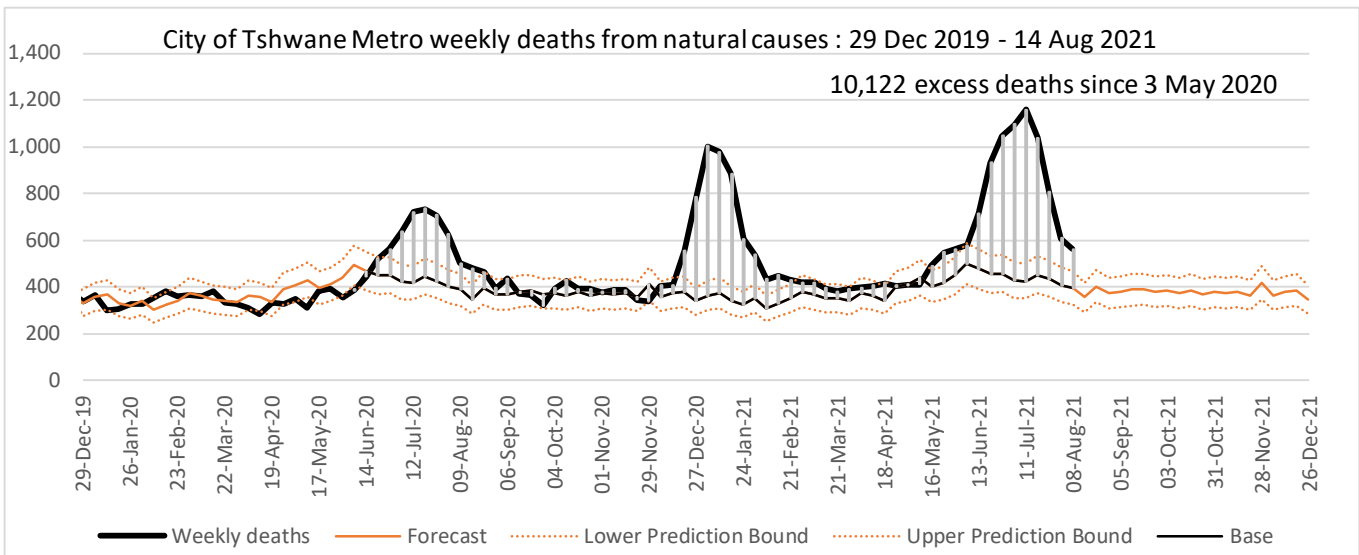
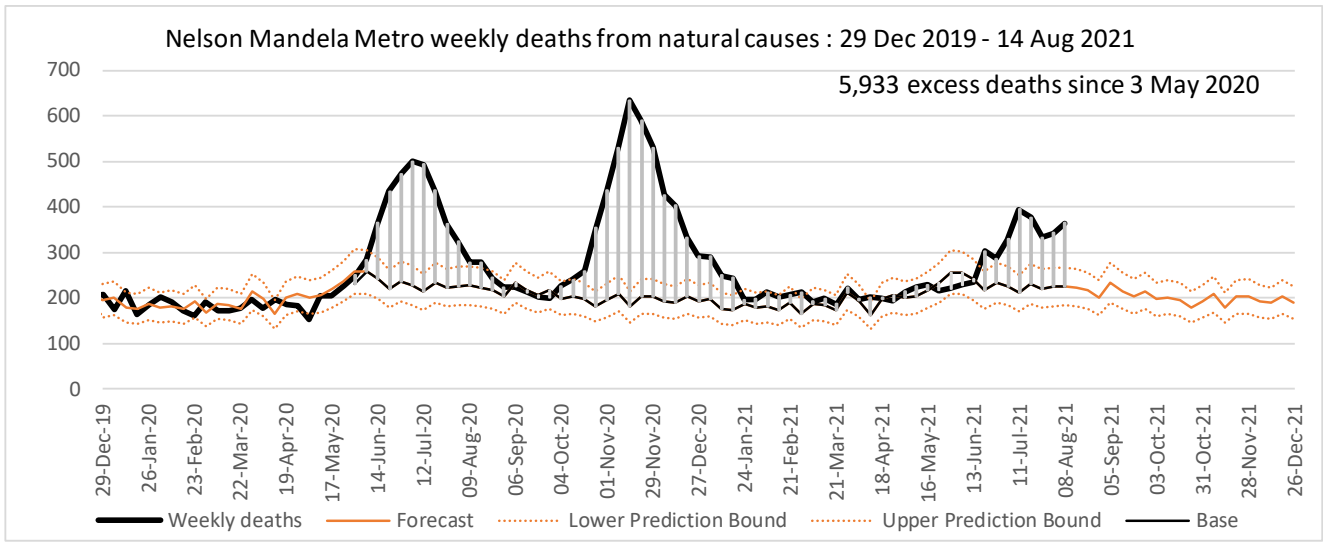
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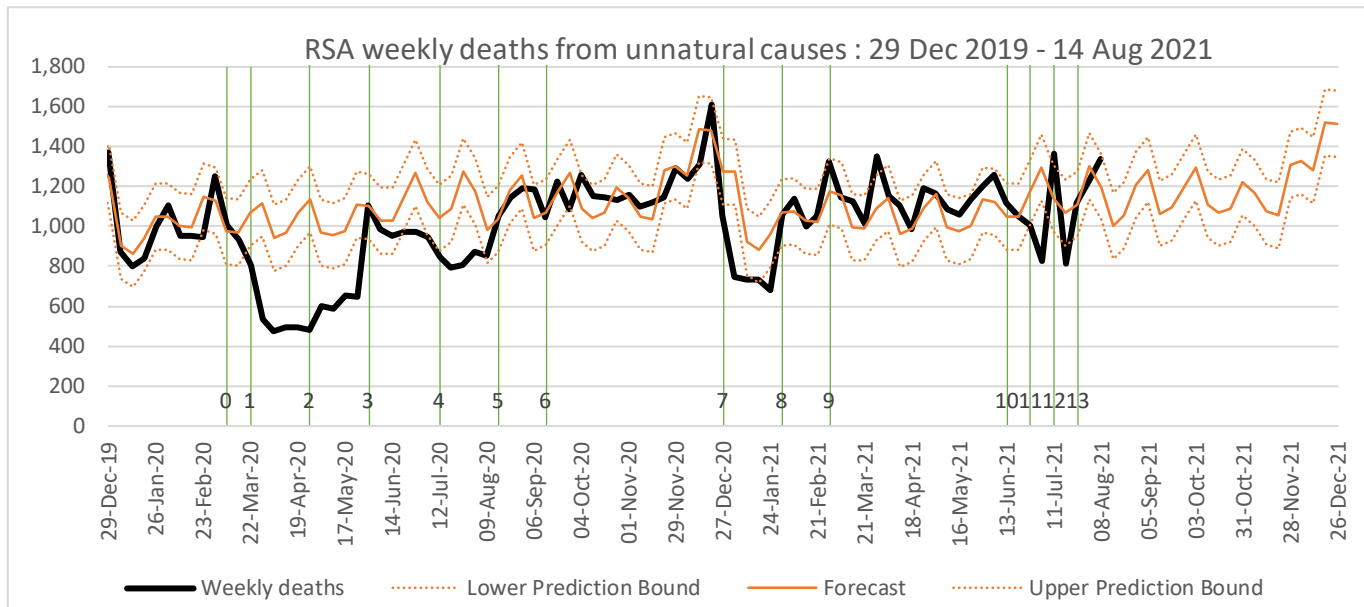
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Numbers have been scaled to the estimated actual number of death and for the last week has been adjusted for delayed registrations. As only a quarter to a third of unnatural deaths in the most recent week are processed at the time of the survey, the estimate for the most recent week is quite uncertain.

Vertical lines in order

- 0 Week Disaster Management Act implemented
- 1 Week lockdown level 5 introduced
- 2 Week lockdown changed to level 4, with curfew
- 3 Week lockdown changed to level 3 including unbanning of alcohol
- 4 Week alcohol re-banned and a curfew re-introduced
- 5 Week lockdown changed to level 2, including unbanning of alcohol
- 6 Week lockdown changed to level 1
- 7 Week lockdown changed to level 3 advanced (re-banning alcohol and a extension of curfew)
- 8 Week lockdown relaxed to allow sale of alcohol 4 days/week and reduce curfew
- 9 Week lockdown relaxed to allow sale of alcohol except during curfew and reduce curfew to midnight to 4am
- 10 Week lockdown changed to level 3 advanced (limiting alcohol and a extending of curfew)
- 11 Week lockdown changed to level 4, with re-banning of alcohol and longer curfew
- 12 Week of unrest in KZN and GT
- 13 Week lockdown changed to level 3 advanced (limiting alcohol and reducing curfew)