

REPORT ON WEEKLY DEATHS IN SOUTH AFRICA

2 – 8 MAY 2021

(WEEK 18)

Debbie Bradshaw, Ria Laubscher,
Rob Dorrington, Pam Groenewald, Tom Moultrie

Burden of Disease Research Unit
South African Medical Research Council
11 May 2021



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 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. This accounts for the kinks in what should otherwise be a smooth increase in numbers of deaths in Cape Town and Buffalo City, for example.

Background

This report provides estimates of the weekly number of deaths of person 1+ years in South Africa for epidemiological **Week 18** of 2021, covering the period **2 - 8 May 2021**. It is noted that excess deaths have now been monitored for 12 months, since the beginning of May 2020, once the increase in weekly deaths started to reflect the rise due to the pandemic. **A consolidated analysis of the excess deaths reflecting one year of tracking the SARS-CoV-2 epidemic in South Africa, has been included in this report.**

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 as well as a spreadsheet with estimated values:

<https://www.samrc.ac.za/reports/report-weekly-deaths-south-africa>.

Excess deaths after one year of tracking the SARS-CoV-2 epidemic in South Africa

- Excess deaths have been monitored since the beginning of May 2020, once the increase in weekly deaths started to reflect the rise in weekly numbers due to the pandemic.
- Although excess deaths from all causes have been reported, the focus has been on tracking the excess deaths due to natural causes against an adjusted base to assess the direct and indirect effects of the COVID-19 pandemic. The base was adjusted to account for the drop in the numbers of natural deaths below the predicted number associated with the stringent level 5 lockdown which resulted in no influenza and possible reductions in other infectious diseases. For further details see: https://www.samrc.ac.za/sites/default/files/files/2020-08-12/Excess%20deaths_4%20Aug%202020.pdf
- Reflecting on the trend over the past 12 months, the number of excess deaths from natural causes tracked the surge of the 1st wave during July 2020, with Western Cape starting earliest, followed by Eastern Cape before spreading in Gauteng and KwaZulu-Natal. The deaths from the 2nd wave was apparent in the Eastern Cape in October 2020, followed by the Western Cape and KwaZulu-Natal before reaching Gauteng and other provinces.

- Most recently the **Free State** and **Northern Cape** are showing concerning signs of a possible 3rd wave with the continued slow burn of the pandemic in non-metro areas.
- The cumulative excess deaths from natural causes number more than **157,000** over the past 12 months. This is 3 times higher than the number of confirmed COVID-19 deaths (**52,687**) reported by the Department of Health. The confirmed COVID-19 deaths as a proportion of excess natural deaths ranges from a low of 12% in **Mpumalanga** to a high of 69% in the **Western Cape**. Confirmed COVID-19 deaths are likely to be under-reported because deaths that occur outside health facilities are generally not reported.
- The high temporal correlation between the excess deaths and the confirmed COVID-19 deaths nationally and in each province makes it clear that the excess deaths are mostly directly related to the pandemic. While some, particularly during the height of waves, may be collateral deaths associated with overwhelmed health services, it is considered that about 85% of the excess deaths are due to COVID-19. For further details see: <https://www.samrc.ac.za/sites/default/files/files/2021-03-03/CorrelationExcessDeaths.pdf>.

Region	Excess deaths from natural causes vs revised base	DoH confirmed COVID-19 deaths	Confirmed deaths as proportion of excess deaths	Age-standardised excess death rate per 100,000 population
South Africa	157,089	52,687	34%	258
Province				
Eastern Cape	33,673	11,290	34%	420
Free State	7,844	3,795	48%	271
Gauteng	25,873	10,195	39%	166
KwaZulu-Natal	37,950	9,969	26%	382
Limpopo	14,554	2,231	15%	213
Mpumalanga	11,142	1,348	12%	244
Northern Cape	3,714	864	23%	305
North West	5,927	1,670	28%	147
Western Cape	16,411	11,349	69%	184

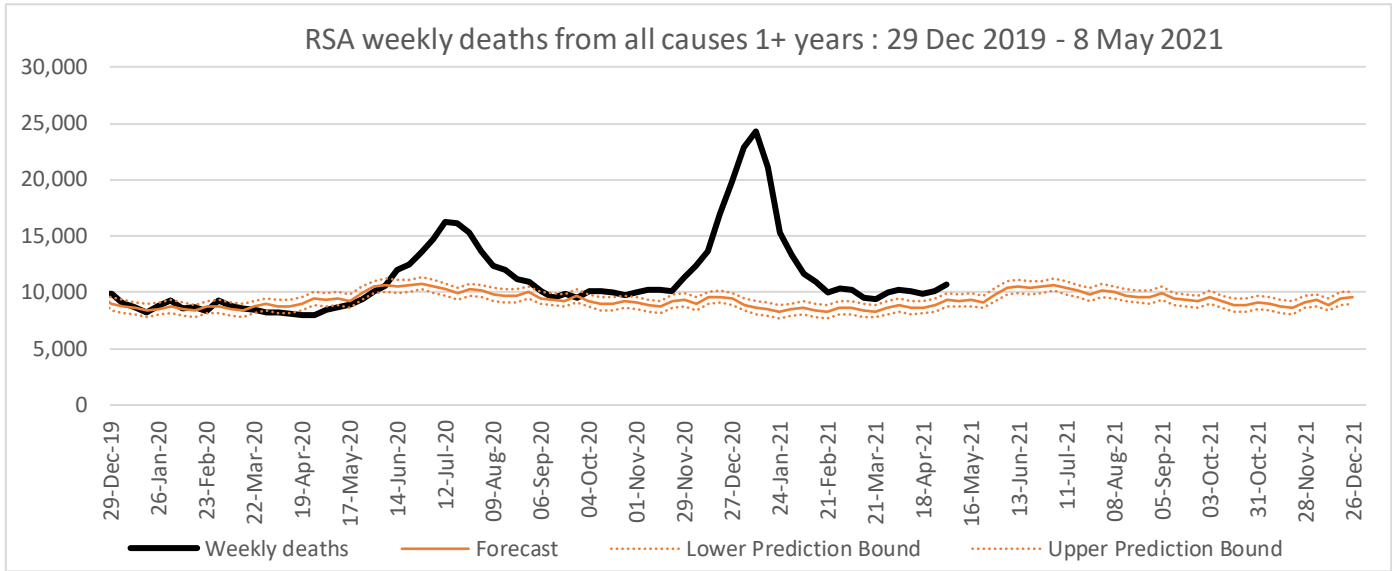
- The excess death rate per 100,000 population for the country was **258** over the 12-month period and places South Africa (on an age-standardised basis) in the top five countries for which excess deaths are measured.
- While KwaZulu-Natal has the highest number of excess deaths followed by Eastern Cape and Gauteng, the age-standardised excess death rate per 100,000 population was highest for the Eastern Cape followed by KwaZulu-Natal.
- North West, Gauteng and Western Cape have age-standardised rates over the 12-month period below 200 per 100,000 population, but still above most European countries (on an age-standardised basis).

Current trends

- The weekly numbers of deaths of persons 1+ years of age from all causes has increased to **10,752** in Week 18 (**2 - 8 May 2021**) tracking higher than the upper prediction bound.
- The number of excess deaths of persons 1+ years from natural causes has continued to increase reaching **1,410** in Week 18 (**2 - 8 May 2021**), following the low in Week 11 (**14-20 Mar 2021**) of **1,024**.
- Since 3 May 2020, there has been a cumulative total of more than **158,000** excess deaths from natural causes of persons 1+ years of age of which more than **75,000** occurred in 2021 (since 3 Jan 2021).

Week	Date	Weekly excess deaths from natural causes	Cumulative excess since 3 May 2020	Cumulative excess since 3 January 2021
11	14-Mar-21 – 20-Mar-21	1,024	149,690	66,796
12	21-Mar-21 – 27- Mar-21	1,132	150,822	67,928
13	28-Mar-21 – 3-Apr-21	1,134	151,956	69,062
14	4-Apr-21 – 10-Apr-21	1,358	153,314	70,420
15	11-Apr-21 – 17-Apr-21	1,298	154,612	71,718
16	18-Apr-21 – 24-Apr-21	1,285	155,898	73,003
17	25-Apr-21 – 1-May-21	1,191	157,089	74,195
18	2-May-21 – 8-May-21	1,410	158,499	75,605

- For people 1-59 years, the number of natural deaths has tracked the predicted number since February 2021. By the end of Week 18 (**2 – 8 May 2021**), the excess natural deaths since **3 May 2020** totals **37,228**.
- For people 60 years and older, the number of natural deaths remains well above the upper prediction bound. The excess natural deaths for people 60 years and older by the end of Week 18 (**2 – 8 May 2021**) is **121,271**.
- In Week 18 (**2 – 8 May 2021**), the numbers of deaths from natural causes in **Free State** and **Northern Cape** are concerningly high. **Gauteng** is showing indications of an uptick in the past week.
- As most of the metropolitan areas are tracking to the predicted numbers of natural deaths, the excess deaths appear to be a result of slow burn in non-metro areas in the country.
- 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 18 (**2 – 8 May 2021**), the national excess death rate was **266 per 100,000** population.
- The provinces with the highest numbers of excess deaths at the end of Week 18 (**8 May 2021**), are, in order, **KwaZulu-Natal**, **Eastern Cape** and **Gauteng**. The ranking changes to **Eastern Cape**, **Northern Cape** and **KwaZulu-Natal** for the crude death rates per capita (i.e., taking size of the provincial populations into account) and to **Eastern Cape**, **KwaZulu-Natal** and **Northern Cape** using the age-standardised rates (i.e., taking into account the age distribution of the provincial population).
- The weekly number of deaths from unnatural causes have continued to track close to the predicted numbers, with the month-end peaks being higher and in February and March reaching the upper prediction bound.



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

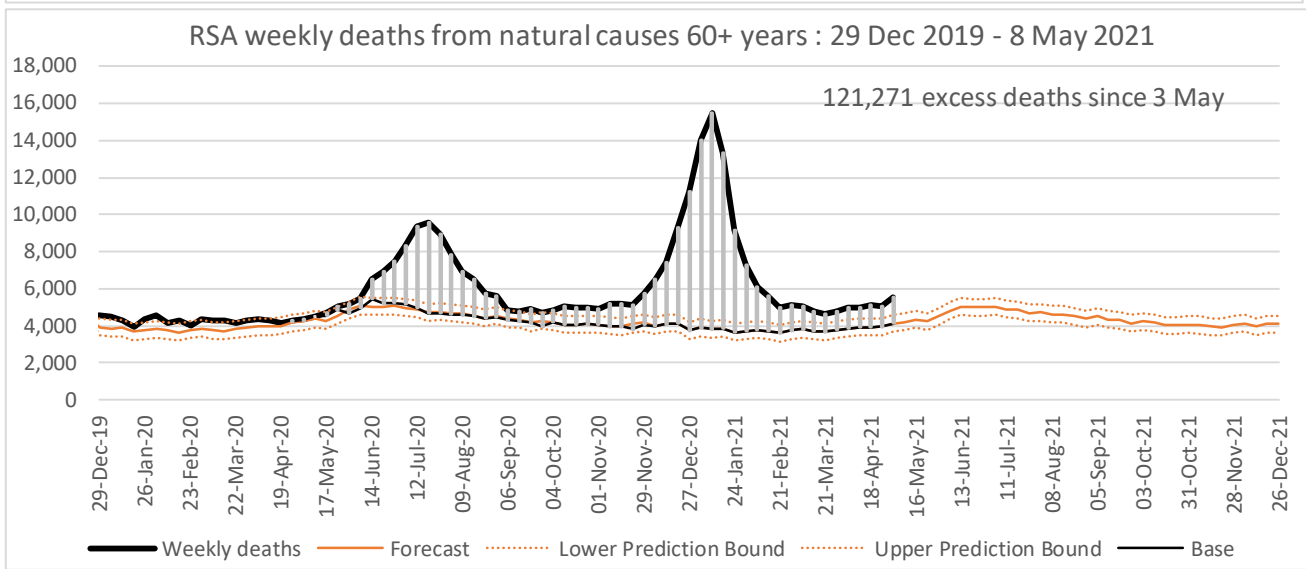
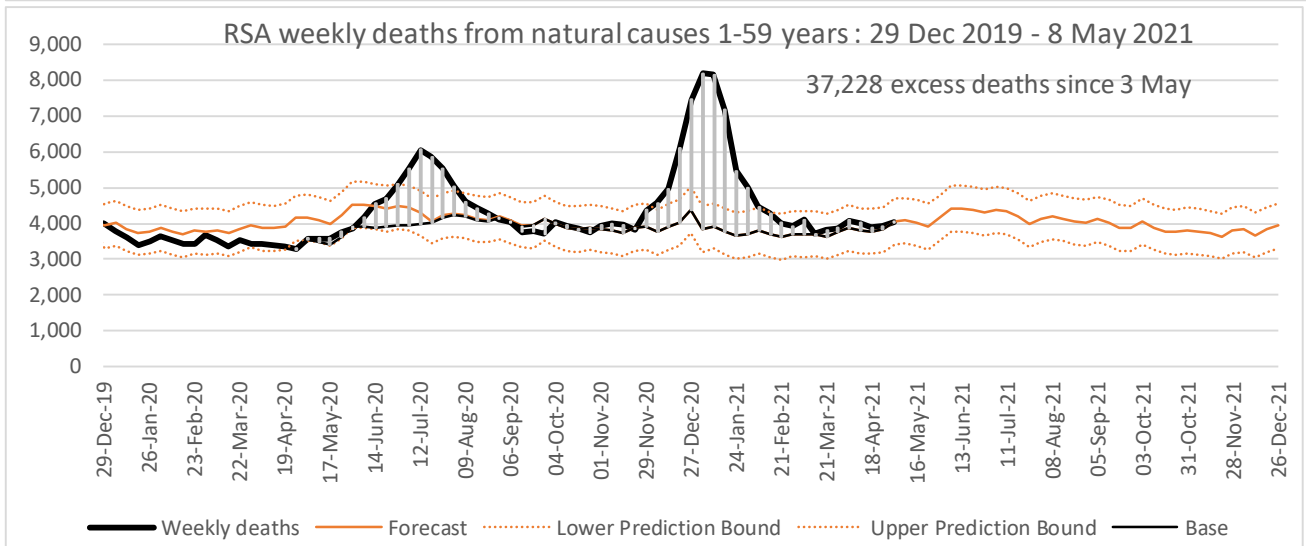
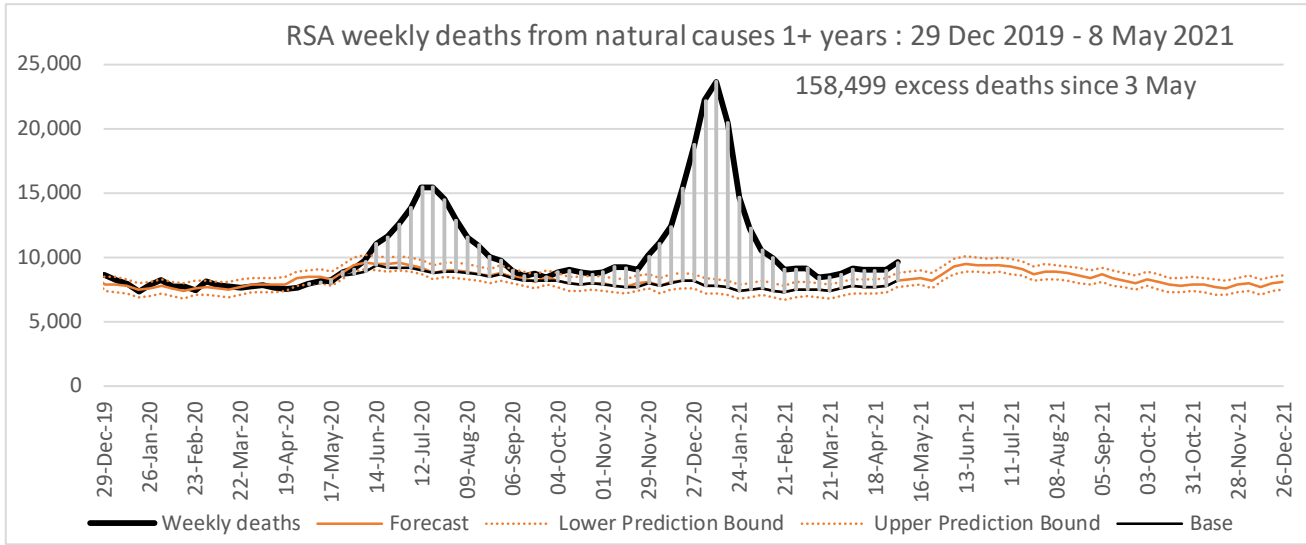
Table 1: Number of excess natural deaths of persons 1+ years by province and metro relative to revised predicted number based on the observed drop during lockdown, South Africa 2020/21

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 – 8 May 21	158,499	266	266
Province				
Eastern Cape	38 May 20 – 8 May 21	33,769	513	414
Free State	21 Jun 20 – 8 May 21	8,103	278	278
Gauteng	7 Jun 20 – 8 May 21	26,134	168	184
KwaZulu-Natal	7 Jun 20 – 8 May 21	38,113	333	383
Limpopo	21 Jun 20 – 8 May 21	14,633	248	217
Mpumalanga	21 Jun 20 – 8 May 21	11,248	234	252
Northern Cape	28 Jun 20 – 8 May 21	3,912	334	313
North West	28 Jun 20 – 8 May 21	6,072	151	155
Western Cape	3 May 20 – 8 May 21	16,515	234	206
Metropolitan Municipality				
Buffalo City	38 May 20 – 8 May 21	3,530		
City of Cape Town	3 May 20 – 8 May 21	12,106		
Ekurhuleni	7 Jun 20 – 8 May 21	6,876		
eThekweni	14 Jun 20 – 8 May 21	9,139		
Johannesburg	7 Jun 20 – 8 May 21	9,138		
Mangaung	21 Jun 20 – 8 May 21	2,505		
Nelson Mandela Bay	38 May 20 – 8 May 21	5,052		
City of Tshwane	7 Jun 20 – 8 May 21	6,281		

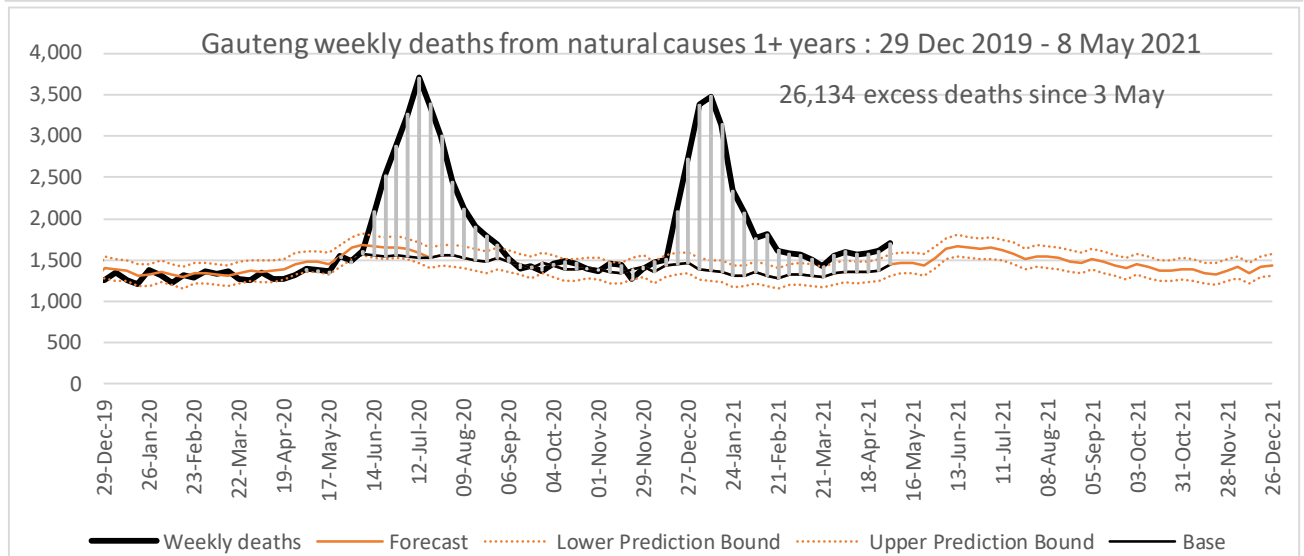
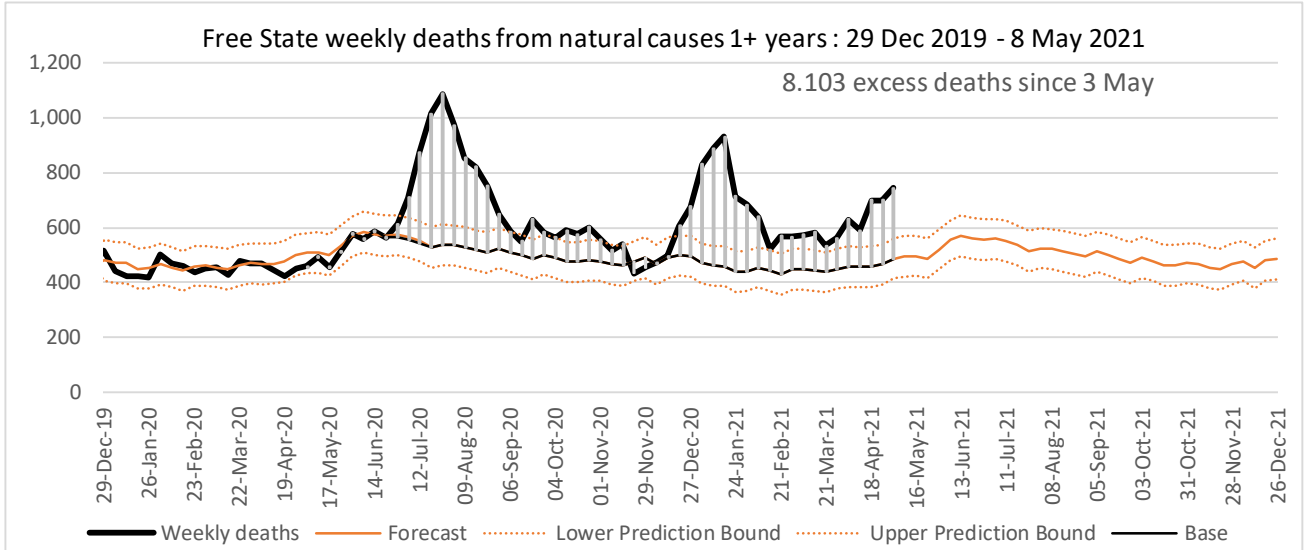
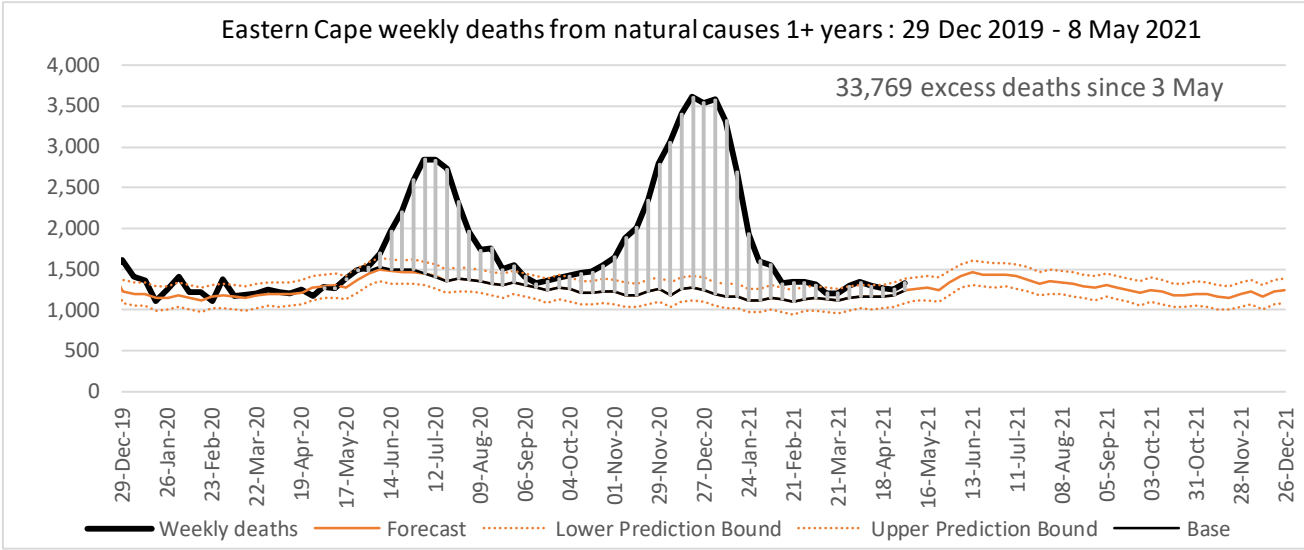
Note: Period has been determined based on when an upturn in the number of natural deaths became apparent. Parts do not sum to the whole because office closures due to Covid-19 may have led to registration of deaths at other offices which may not be in the same area, and random fluctuation at the point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

Table 2: Number of excess deaths from all causes of persons 1+ years by province and metro relative to predicted number based on historical trend, South Africa 2020/21

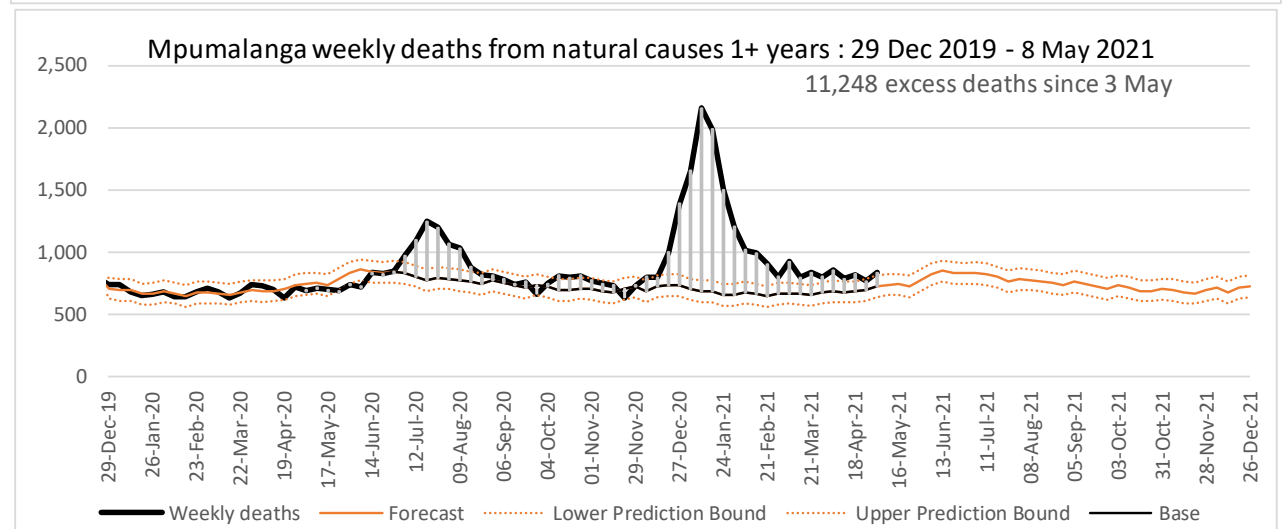
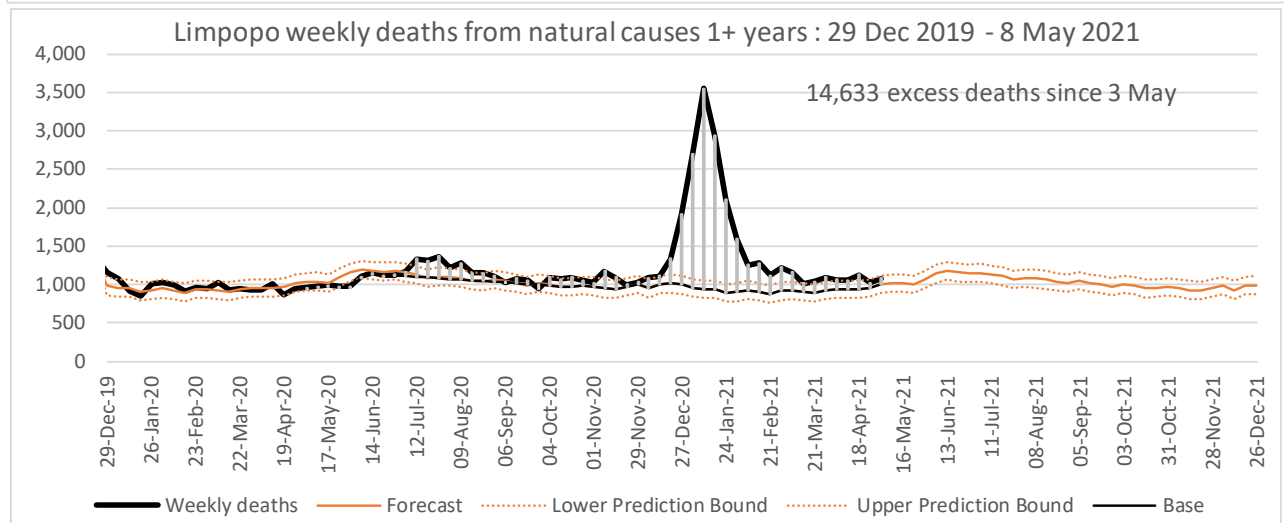
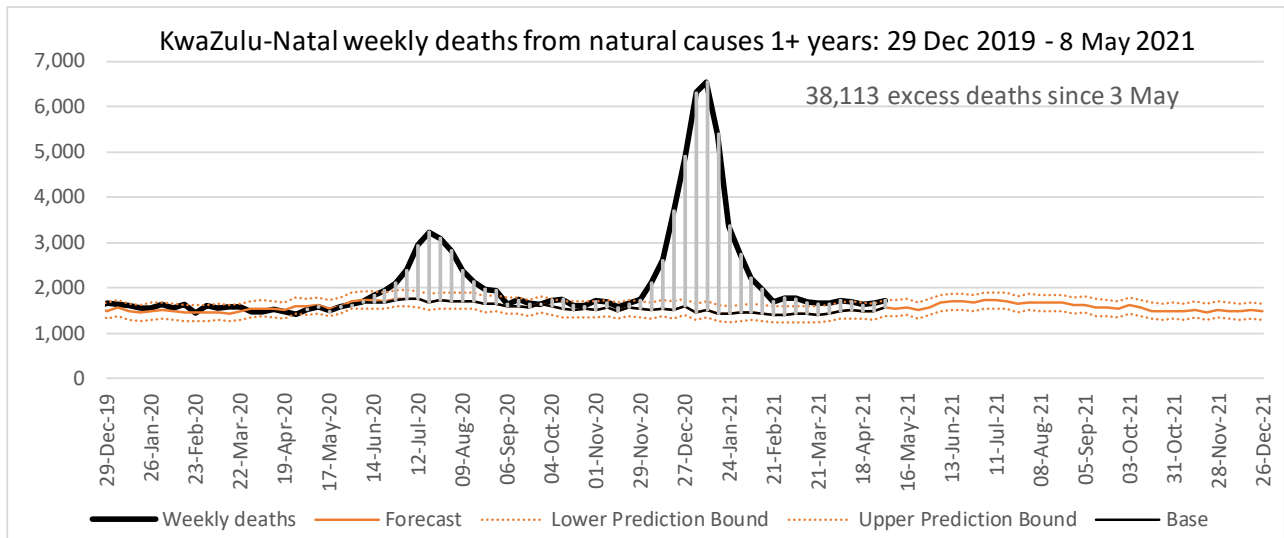
Region	Excess deaths vs forecast	Excess deaths per 100,000 population
South Africa	153,351	258
Province		
Eastern Cape	34,312	521
Free State	7,899	271
Gauteng	23,607	151
KwaZulu-Natal	37,971	332
Limpopo	14,372	243
Mpumalanga	10,883	226
Northern Cape	3,822	327
North West	5,773	143
Western Cape	14,711	208
Metropolitan Municipality		
Buffalo City	2,810	
City of Cape Town	9,729	
Ekurhuleni	6,784	
eThekweni	9,323	
Johannesburg	7,288	
Mangaung	2,741	
Nelson Mandela Bay	5,031	
City of Tshwane	5,881	



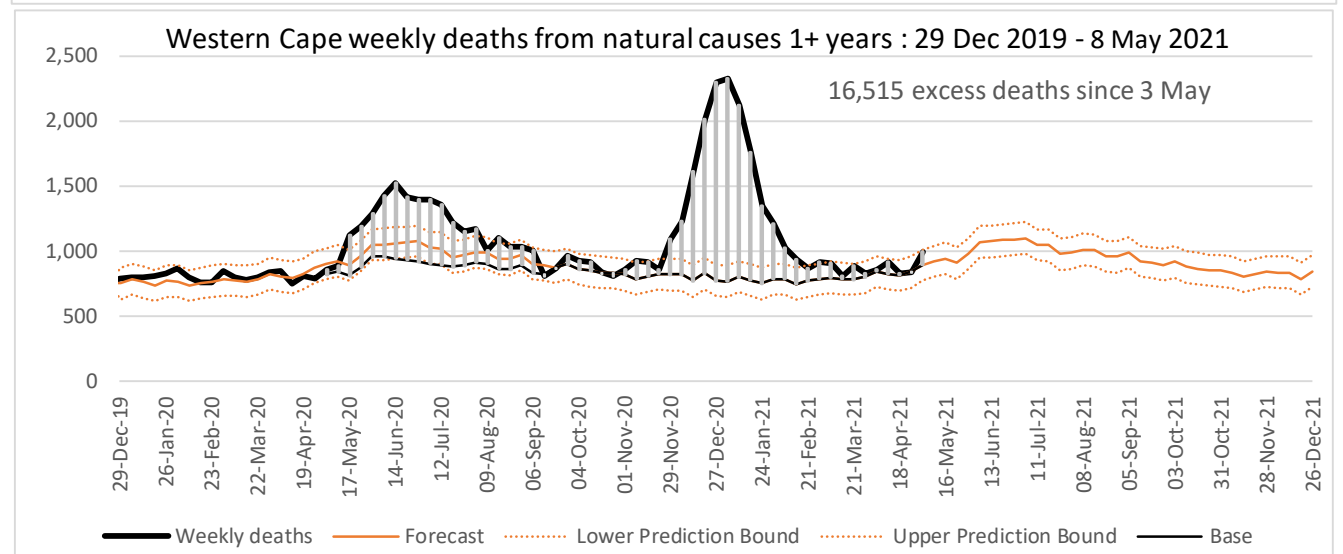
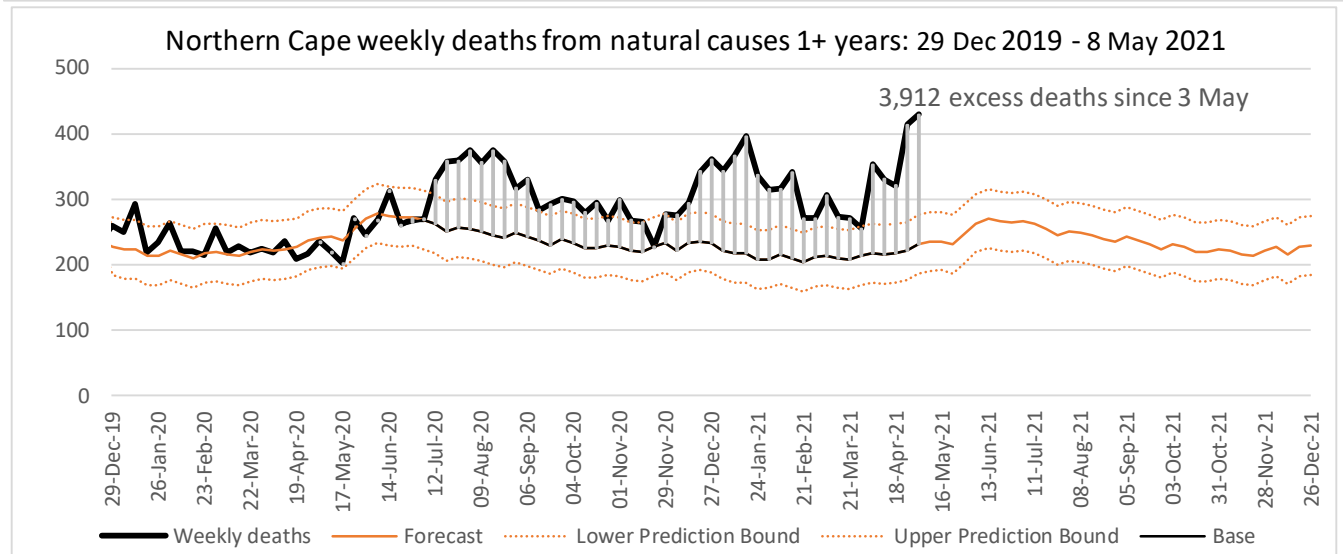
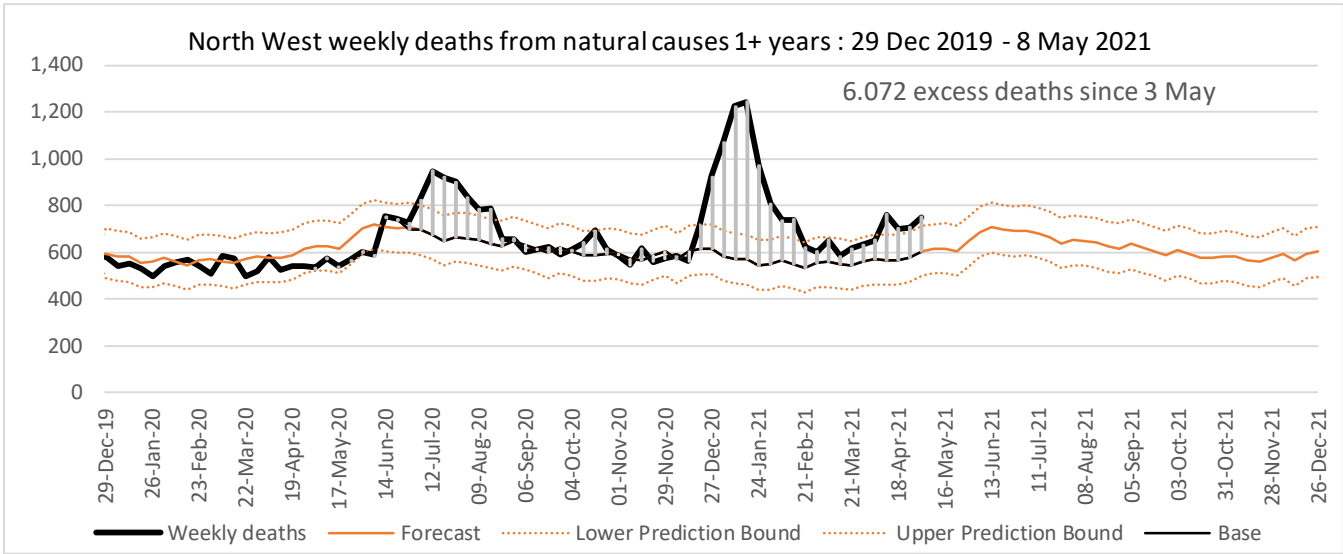
Numbers have been scaled to the estimated actual number of death and for the last week has been adjusted for delayed registrations



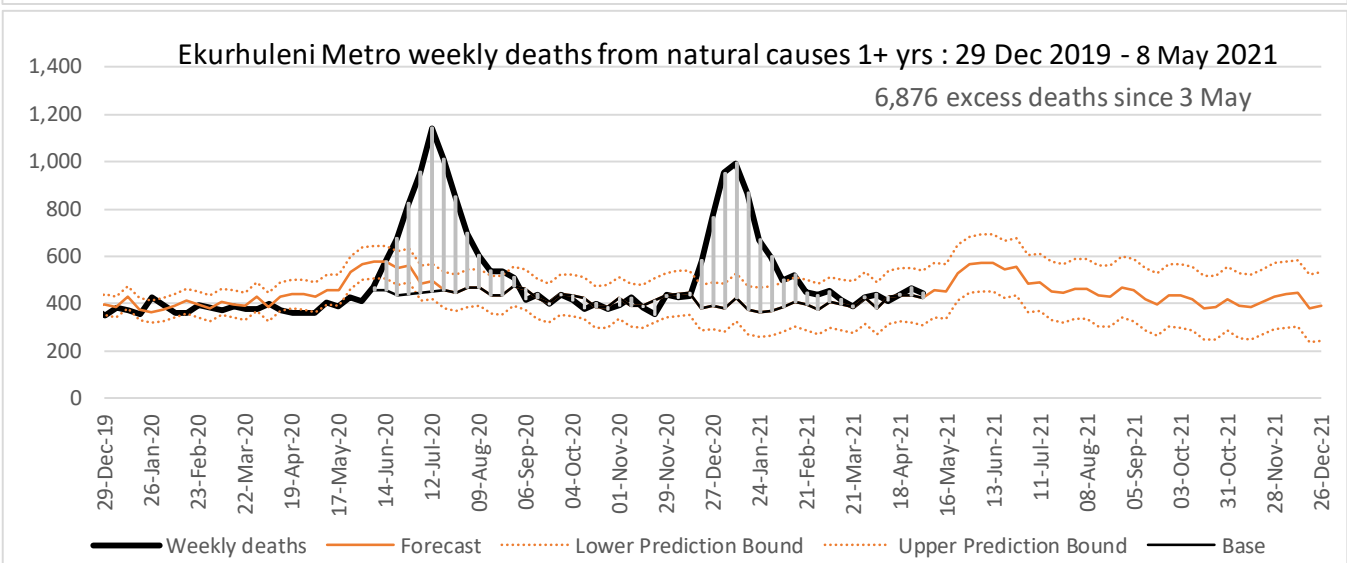
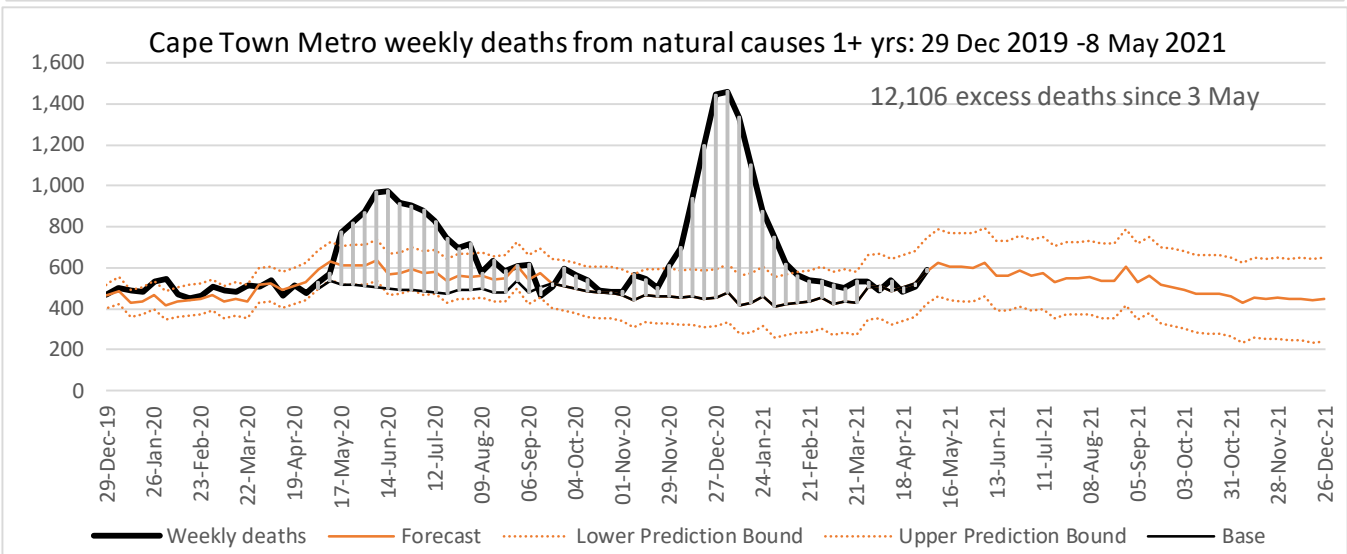
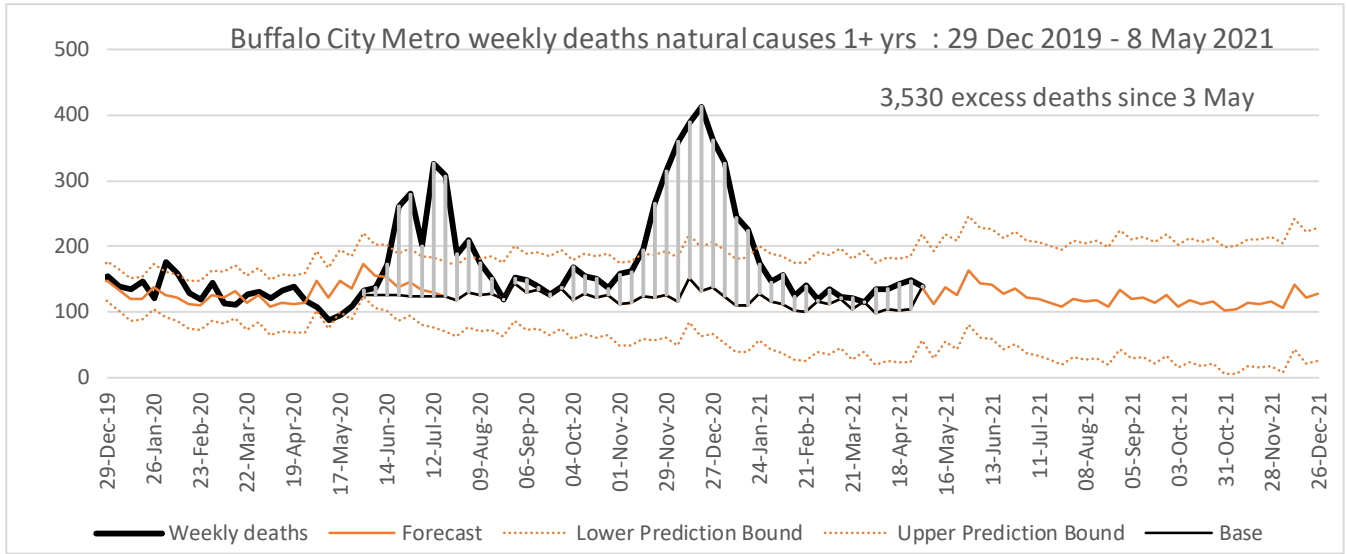
Numbers have been scaled to the estimated actual number of death and for the last week has been adjusted for delayed registrations



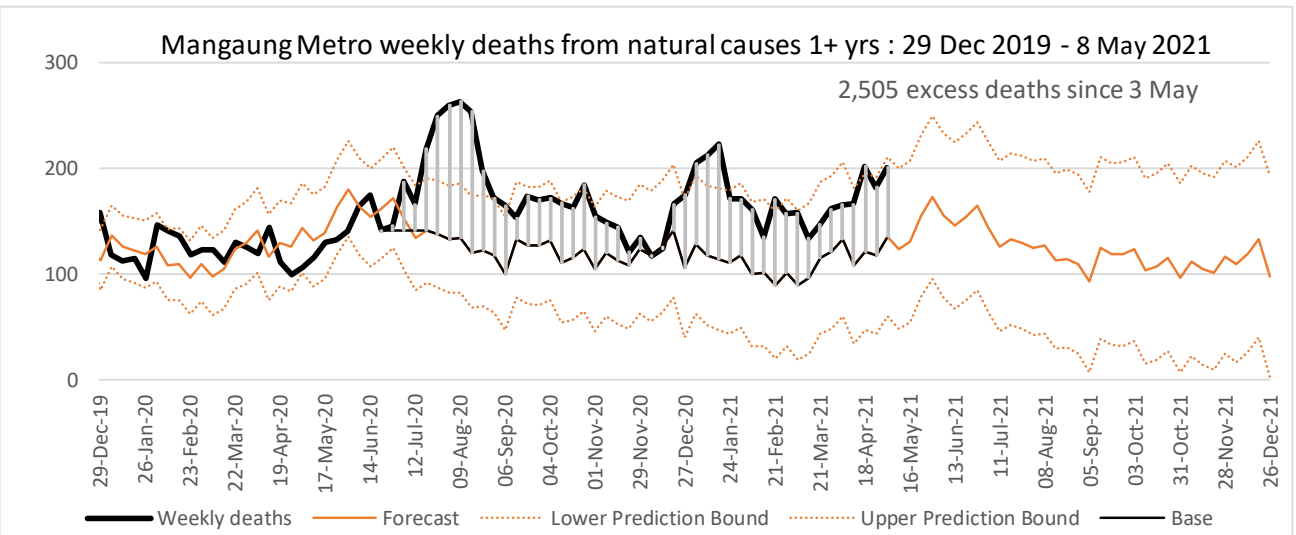
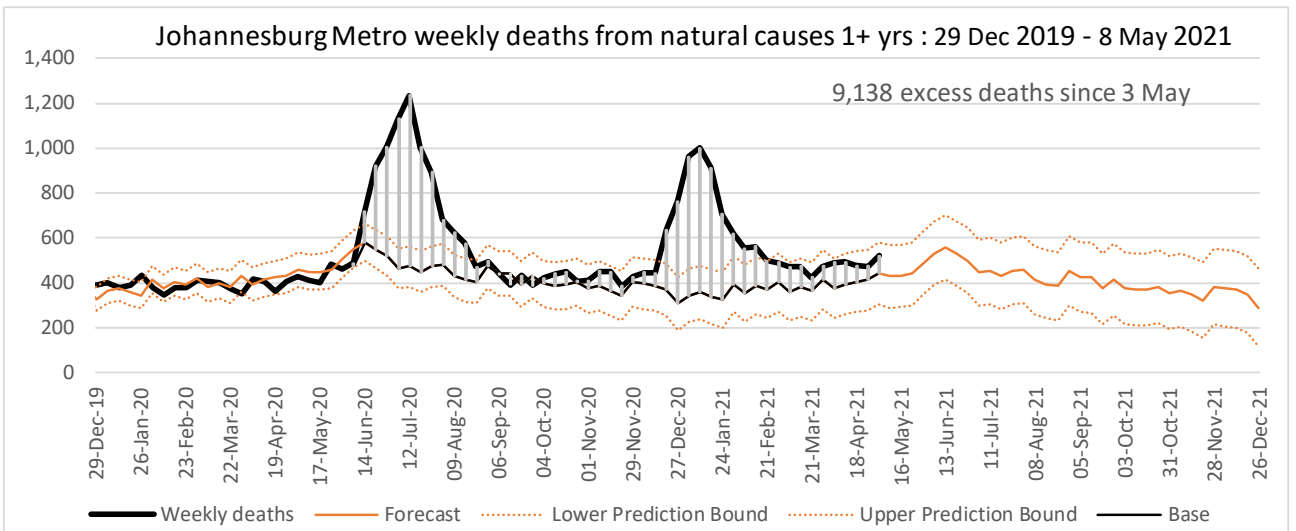
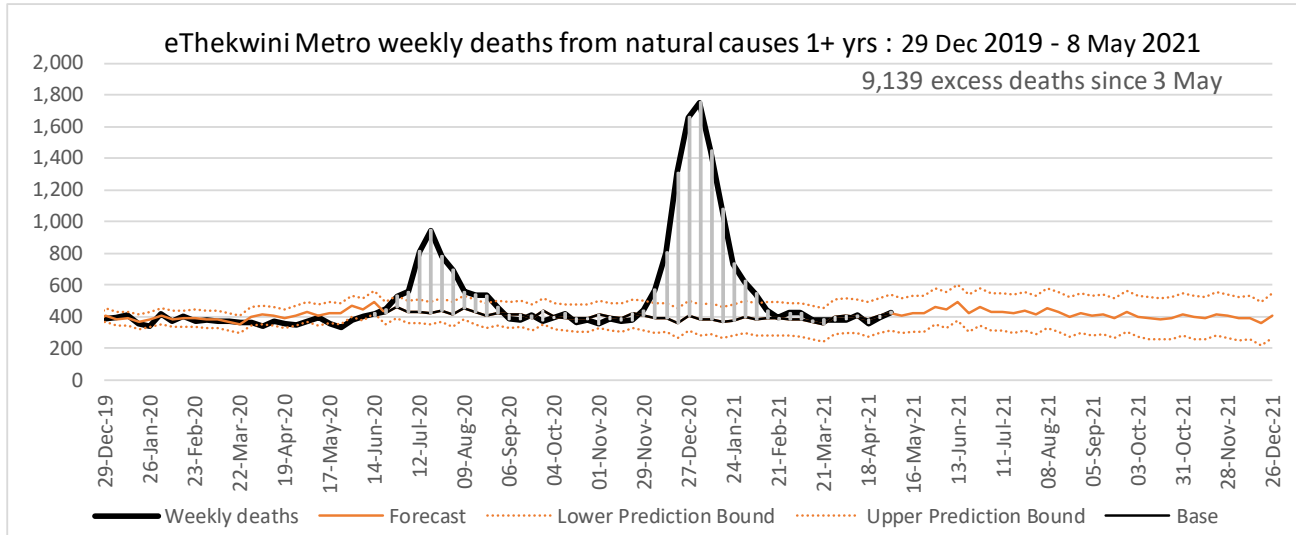
Numbers have been scaled to the estimated actual number of death and for the last week has been adjusted for delayed registrations



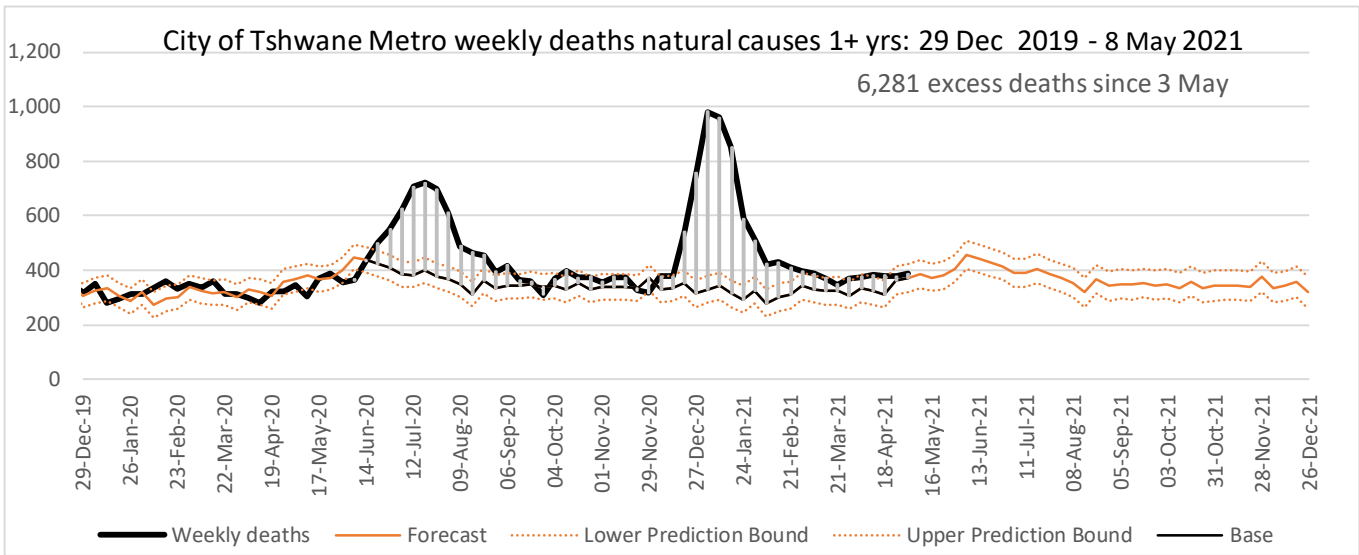
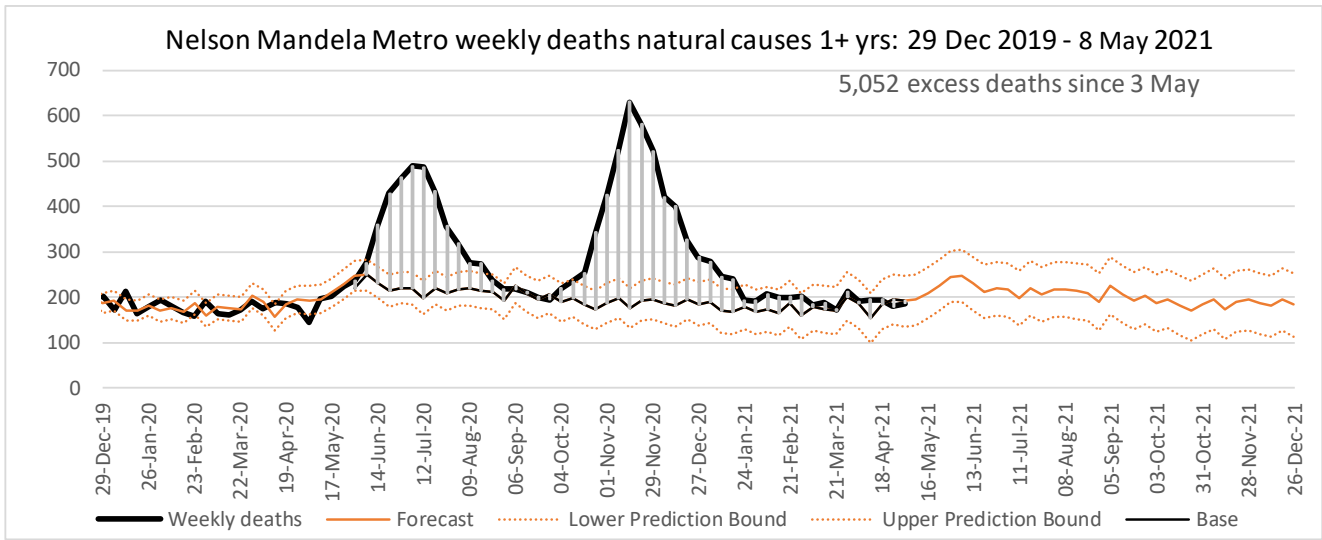
Numbers have been scaled to the estimated actual number of death and for the last week has been adjusted for delayed registrations



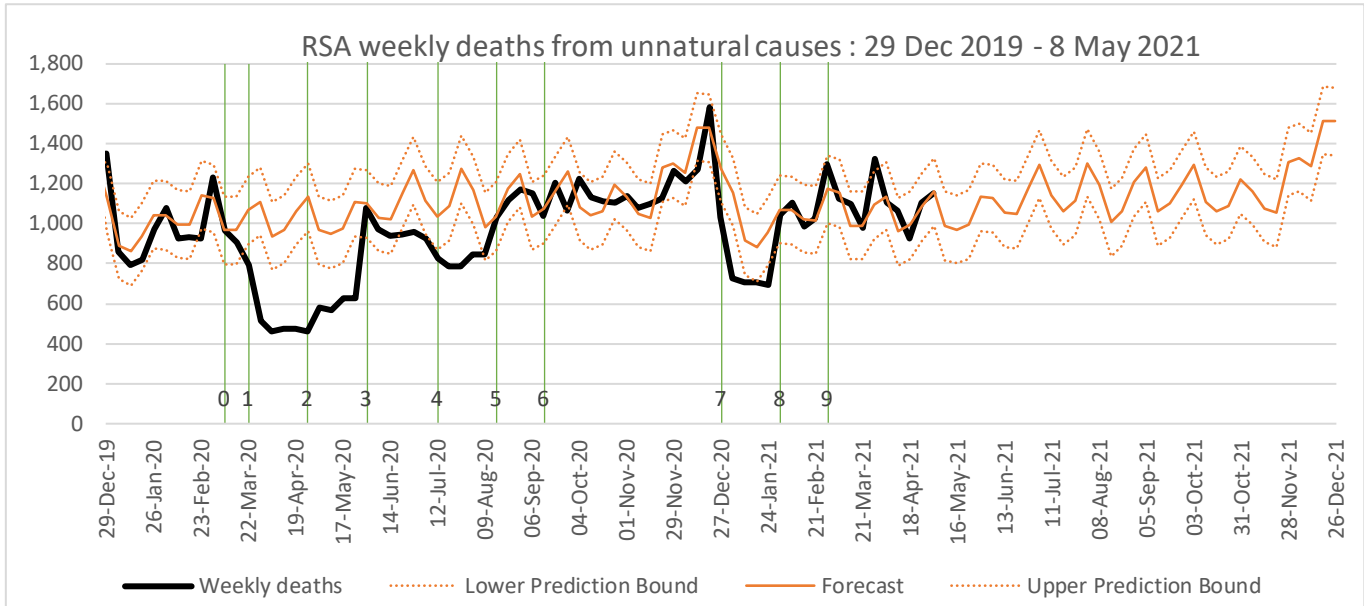
Numbers have been scaled to the estimated actual number of death and for the last week has been adjusted for delayed registrations



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



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



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 (rebanning 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