

REPORT ON WEEKLY DEATHS IN SOUTH AFRICA

2 JAN – 8 JAN 2022

(WEEK 1)

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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, Week 1 of 2021 is 3 January – 9 January 2021 and Week 1 of 2022 is 2 January – 8 January 2022.

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 deaths to a particular 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 of offices in the metro. 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 1** of 2022, covering the period **2 – 8 Jan 2022**.

The predicted numbers of weekly deaths in 2022 have been estimated using the models prepared for 2021 with population estimates for 2022. A methodological note outlining the approach for monitoring deaths during 2021 can be downloaded from the SAMRC website: [https://www.samrc.ac.za/sites/default/files/files/2021-01-24/Methodological Note on Predicted Weekly Deaths 20 Jan 2021.pdf](https://www.samrc.ac.za/sites/default/files/files/2021-01-24/Methodological%20Note%20on%20Predicted%20Weekly%20Deaths%20Jan%202021.pdf).

Briefly, the predicted values for the provinces and nationally are based on negative binomial models based on death data for the period 2014-2019. After reviewing trends in the data, separate negative binomial models have been fitted to the unnatural deaths for all provinces combined, and separate models for natural deaths for each of KwaZulu-Natal, Western Cape and the Northern Cape, and the 6 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. Predicted values for each metropolitan area continue to be based on the time-series model of data for 2018 and 2019 developed for 2020 as the trends in the sub-provincial data need further investigation to develop a comprehensive district-level model.

Trends

- The weekly number of deaths (all ages) from all causes decreased from **13,213** in **Week 52** in 2021 (26 Dec – 1 Jan 2021) to **12,795** in **Week 1** of 2022 (2 – 8 Jan 2022).
- The number of excess deaths from natural causes (all ages) peaked in **Week 51** of 2021 (19 Dec – 25 Dec 2021) and decreased to **3,156** in **Week 1** of 2022 (2 – 8 Jan 2022) with a p-score of 37% (i.e., the excess was 37% of the predicted number).
- Since 3 May 2020, there has been a cumulative total of more than **290,000** excess deaths from natural causes of persons all ages of which **85,000** occurred in 2020, just over **202,000** occurred in 2021 (since 3 Jan 2021) and just over **3,000** occurred in the first epi week of 2022.

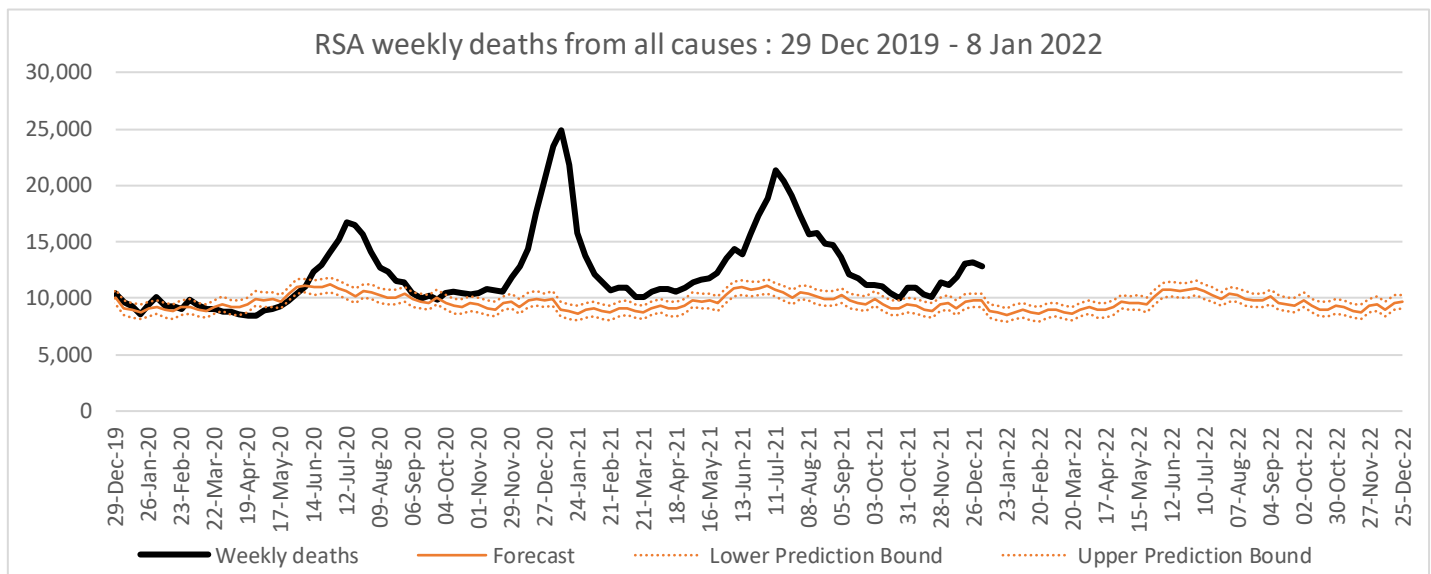
Week	Date	Weekly excess deaths from natural causes (all ages)	Cumulative excess since 3 May 2020 (all ages)	Cumulative excess since 3 January 2021 (all ages)	Cumulative excess since 2 January 2022 (all ages)
43	24-Oct-21 – 30-Oct-21	816	268,892	183,950	
44	31-Oct-21 – 6-Nov-21	1,408	270,300	185,358	
45	7-Nov-21 – 13-Nov-21	1,530	271,830	186,888	
46	14-Nov-21 – 20-Nov-21	1,240	273,070	188,128	
47	21-Nov-21 – 27-Nov-21	1,197	274,267	189,324	
48	28-Nov-21 – 4-Dec-21	1,870	276,137	191,195	
49	5-Dec-21 – 11-Dec-21	1,676	277,813	192,871	
50	12-Dec-21 – 18-Dec-21	2,534	280,347	195,405	
51	19-Dec-21 – 25-Dec-21	3,430	283,777	198,835	
52	26-Dec-21 – 1-Jan-22	3,319	287,096	202,153	
1	2-Jan-22 – 8-Jan-22	3,156	290,252		3,156

- For people under the age of 60, the number of natural deaths tracked within the prediction bounds from **Week 36** (5 – 11 Sep 2021) to **Week 49** (5 -11 Dec 2021). In **Week 43** (24 – 30 Oct 2021), the numbers reached a low, just above the predicted value and then fluctuated between the predicted number and the upper prediction bound. However, since **Week 50** (12 -18 Dec 2021), the number of natural deaths has been higher than the upper prediction bound reaching a peak in **Week 51** (19 – 25 Dec 2021) with a p-score was 25%. The number has decreased below the upper prediction bound to **4,955** in **Week 1** of 2022 (2 – 8 Jan 2022) with a p-score of 14%. The cumulative number of excess natural deaths for people under-60 years since **3 May 2020** was more than **76,000**.
- The number of weekly excess deaths in the 60+ years age group increased to a peak of **7,156** in **Week 28** (11 – 17 Jul 2021) with a p-score of 152% and declined thereafter. After an erratic decline, the numbers remained above the upper prediction bound but reached a low in **Week 43** (24 – 30 Oct 2021) with a p-score of 18%. The weekly number of excess deaths in the age group has increased to **2,504** with a p-score of 61% in **Week 1** of 2022 (2 – 8 Jan 2022). The cumulative total number of excess natural deaths in this age group since **3 May 2020** was **214,000**.

Week	Date	Weekly excess deaths from natural causes for persons 60+ years	p-score
43	24-Oct-21 – 30-Oct-21	692	17.7%
44	31-Oct-21 – 6-Nov-21	836	20.8%
45	7-Nov-21 – 13-Nov-21	937	23.6%
46	14-Nov-21 – 20-Nov-21	843	21.7%
47	21-Nov-21 – 27-Nov-21	814	21.4%
48	28-Nov-21 – 4-Dec-21	1,112	27.9%
49	5-Dec-21 – 11-Dec-21	1,195	29.5%
50	12-Dec-21 – 18-Dec-21	1,748	45.4%
51	19-Dec-21 – 25-Dec-21	2,392	59.7%
52	26-Dec-21 – 1-Jan-22	2,475	60.9%
1	2-Jan-22 – 8-Jan-22	2,540	60.6%

- Deaths from natural causes in **Week 1** (2 – 8 Jan 2022) were higher than their upper prediction bound for all provinces except for **Gauteng**, which is just below its upper prediction bound.
- There are signs of the 4th wave having peaked in several provinces:
 - **Gauteng** peaked in **Week 50** (12 – 18 Dec 2021) with a p-score of 42% which has dropped to 7%,
 - **Northern Cape** which peaked in **Week 51** (19 – 25 Dec 2021) at a p-score of 55%,
 - **Limpopo** which peaked in **Week 51** (19 – 25 Dec 2021) at a p-score of 43%,
 - **Free State** which peaked in **Week 52** (26 Dec 2021 – 1 Jan 2022) at a p-score of 33%,
 - **KwaZulu Natal** which peaked in **Week 52** (26 Dec 2021 – 1 Jan 2022) at a p-score of 54%, and
 - **North West** which peaked in **Week 52** (26 Dec 2021 – 1 Jan 2022) at a p-score of 38%.
- The number of natural deaths continued to increase in **Week 1** of 2022 (2 – 8 Jan 2022) in
 - **Western Cape** (p-score 49%) but have started to decrease in the **City of Cape Town**, and
 - **Mpumalanga** (p-score of 34%).
- The **Eastern Cape** started increasing early and breached its upper prediction bound in **Week 45** (7 – 14 Nov 2021). The number of excess deaths more or less doubled in **Week 51** (19 – 25 Dec 2022) and has remained at this level for the past 3 weeks with a p-score of 72-73%.

- 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 1** of 2022 (2 – 8 Jan 2022), the national excess death rate since 3 May 2020 was **488** per **100,000** population.
- The provinces with the highest cumulative numbers of excess deaths at the end of **Week 1** of 2022 (2 – 8 Jan 2022), are, in order, **KwaZulu-Natal, Gauteng** 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 **Northern Cape, KwaZulu-Natal** and **Eastern Cape** using the age-standardised rates per capita (i.e., taking into account the age distribution of the provincial population). The **Western Cape** followed by **Gauteng** continue to have the lowest cumulative age standardised per capita rates.
- Following some declines below the predicted, coinciding with the change of lockdown to adjusted level 4 with re-banning of alcohol sales and extension of curfew, the number of unnatural deaths has tracked the predicted number since **Week 30** (25 – 31 Jul 2021). **Week 52** (26 Dec 2021 – 1 Jan 2022), followed the predicted trend closely and saw the highest number of unnatural deaths in 2021, at **1,574**. In **Week 1** of 2022 (2 – 8 Jan 2022), there were **1,109** unnatural deaths, slightly lower than the predicted number.



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

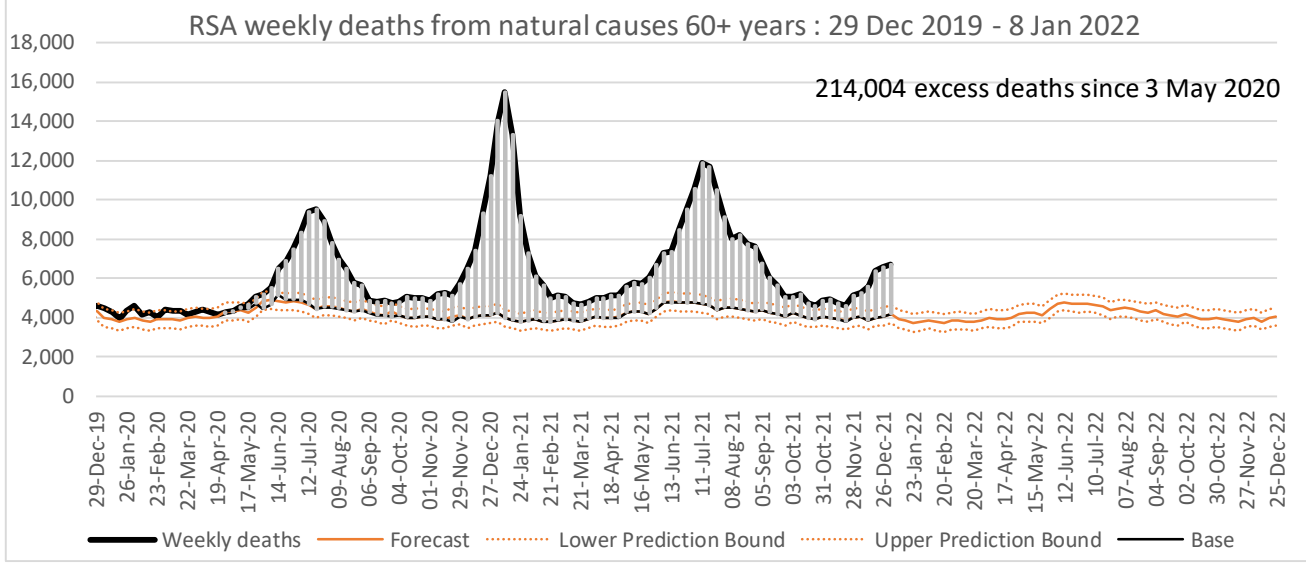
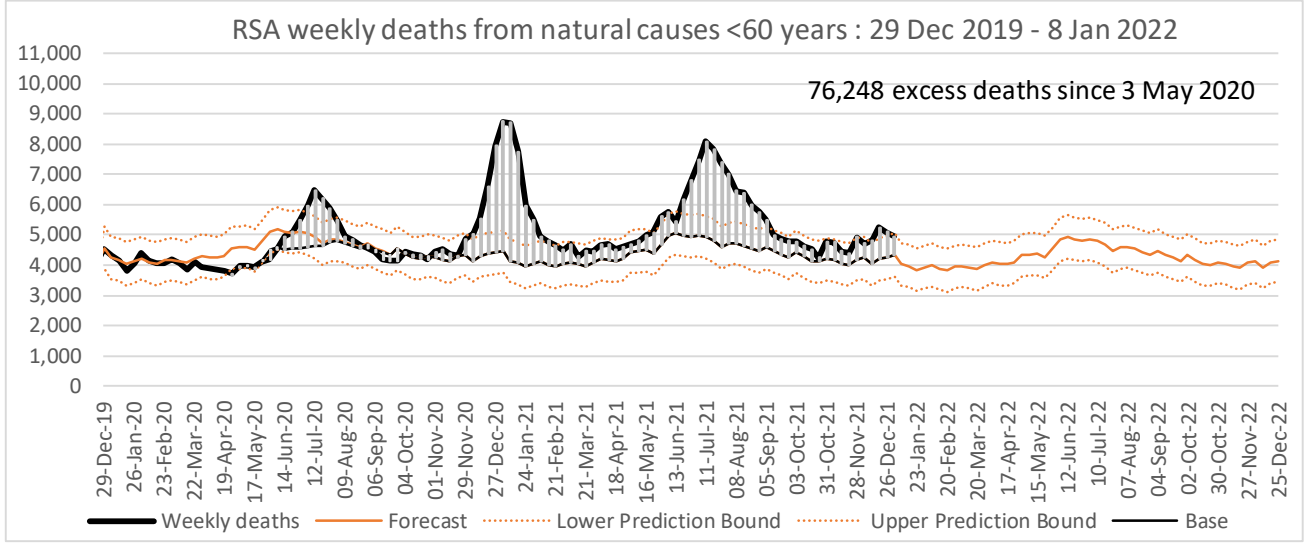
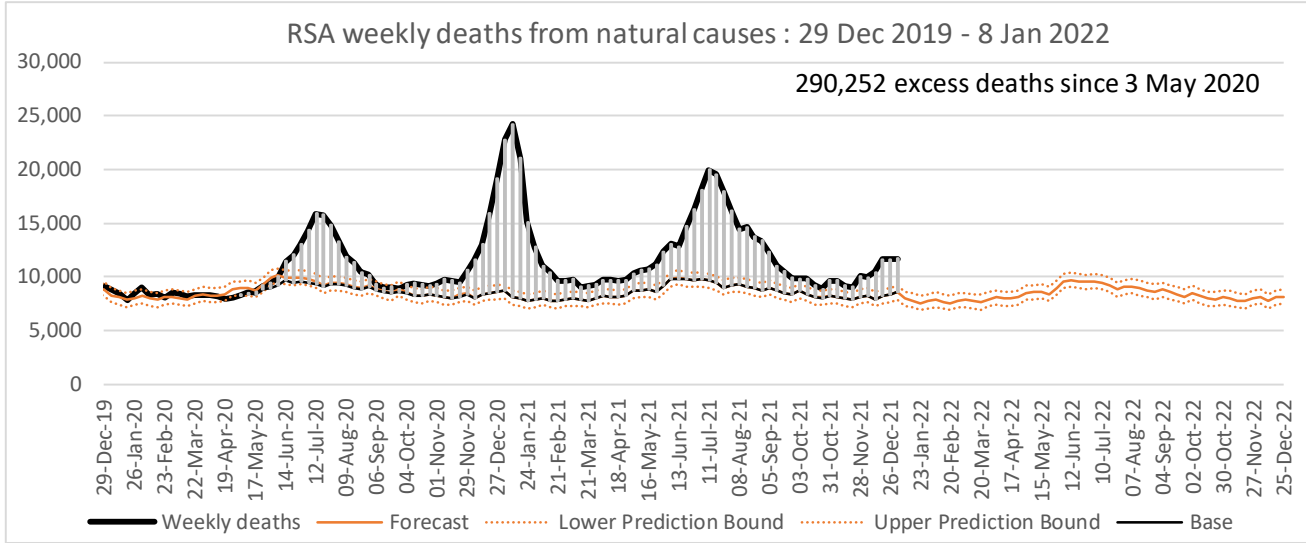
Table 1: Number of excess natural deaths of persons by province and metro relative to revised predicted number based on the observed drop during lockdown, South Africa 2020/21

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 – 8 Jan 22	290,252	488	488
Province				
Eastern Cape	31 May 20 – 8 Jan 22	48,786	741	597
Free State	21 Jun 20 – 8 Jan 22	16,229	557	557
Gauteng	7 Jun 20 – 8 Jan 22	58,026	372	409
KwaZulu-Natal	7 Jun 20 – 8 Jan 22	59,549	520	599
Limpopo	21 Jun 20 – 8 Jan 22	30,900	523	458
Mpumalanga	21 Jun 20 – 8 Jan 22	22,445	466	503
Northern Cape	28 Jun 20 – 8 Jan 22	8,220	702	657
North West	28 Jun 20 – 8 Jan 22	16,395	407	418
Western Cape	3 May 20 – 8 Jan 22	29,701	421	371
Metropolitan Municipality				
Buffalo City	31 May 20 – 8 Jan 22	5,436		
City of Cape Town	3 May 20 – 8 Jan 22	21,199		
Ekurhuleni	7 Jun 20 – 8 Jan 22	14,369		
eThekweni	14 Jun 20 – 8 Jan 22	13,228		
Johannesburg	7 Jun 20 – 8 Jan 22	19,715		
Mangaung	21 Jun 20 – 8 Jan 22	4,704		
Nelson Mandela Bay	31 May 20 – 8 Jan 22	7,532		
City of Tshwane	7 Jun 20 – 8 Jan 22	11,022		

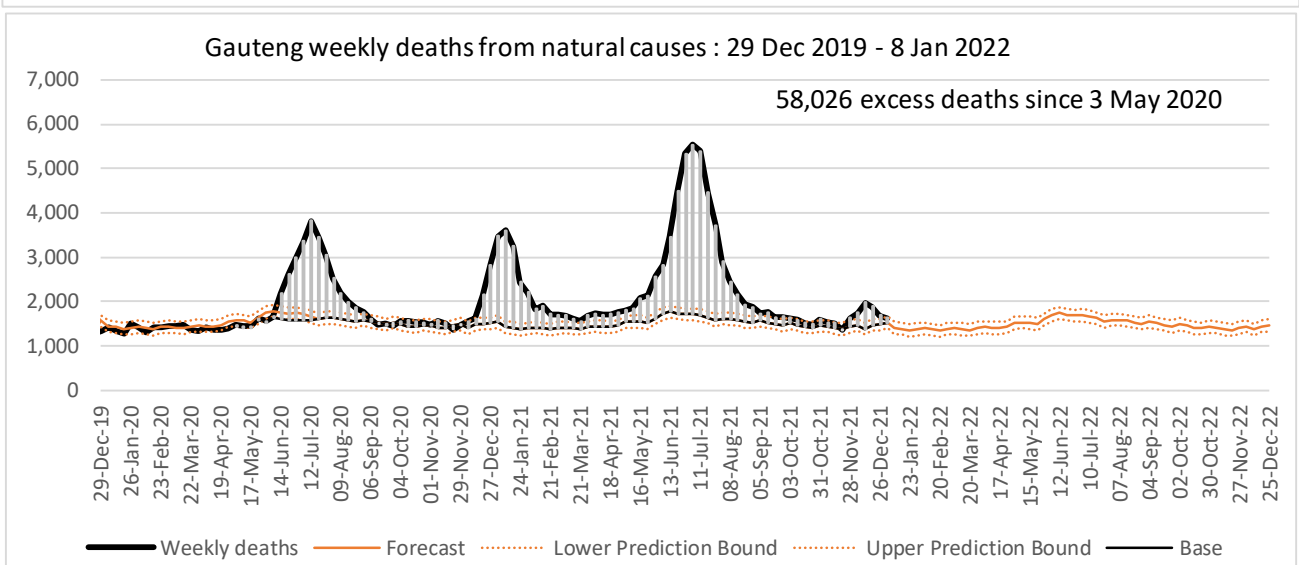
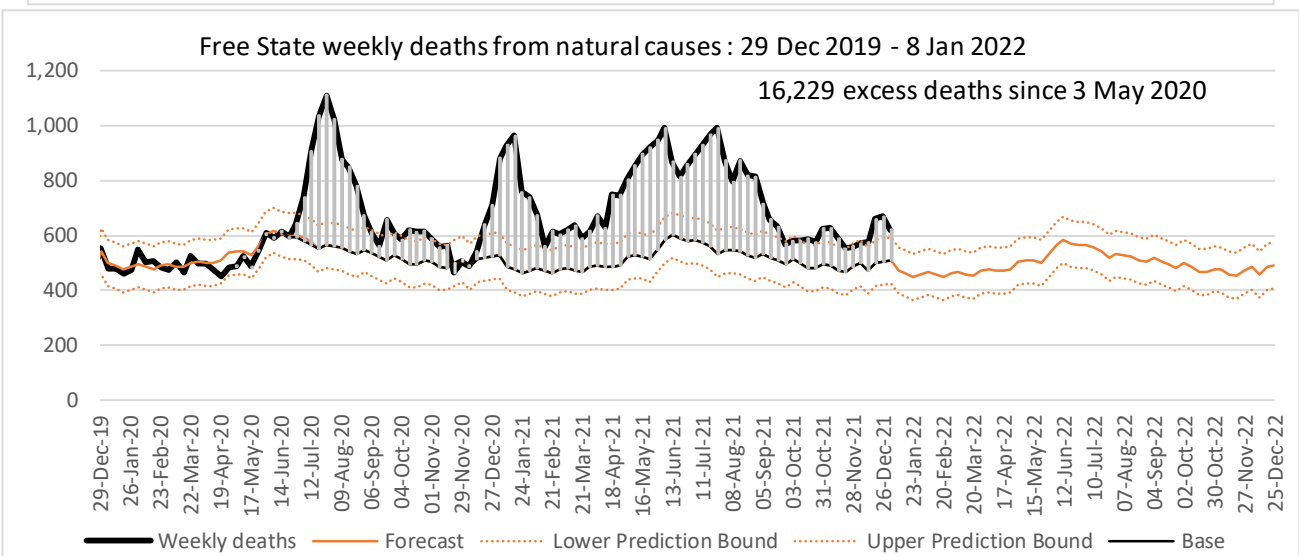
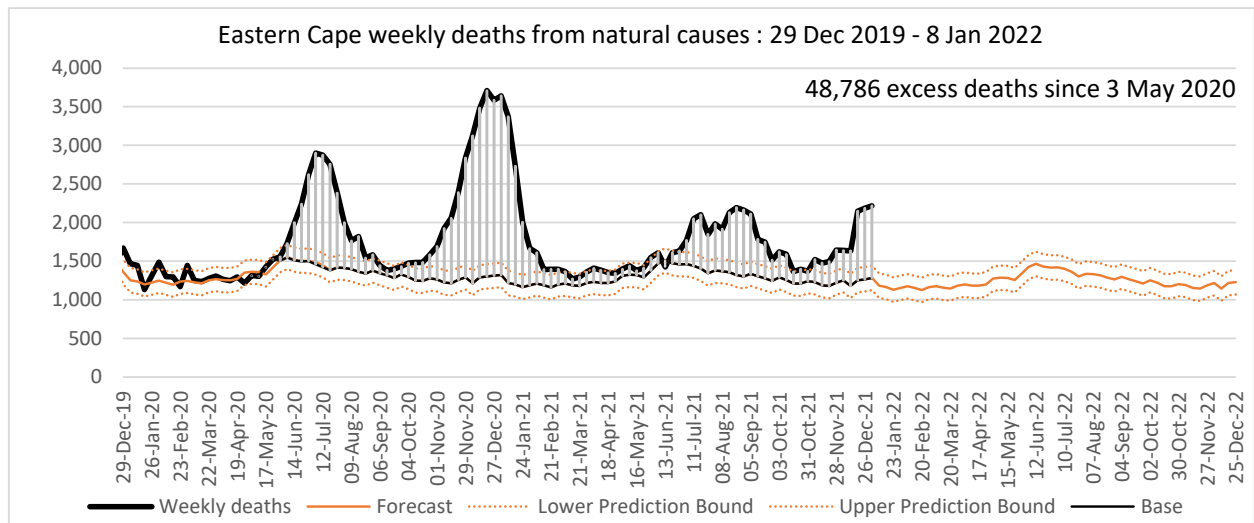
Note: Period has been determined based on when an upturn in the number of natural deaths became apparent. Parts do not sum to the whole because office closures due to Covid-19 may have led to registration of deaths at other offices which may not be in the same area, and random fluctuation at the point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

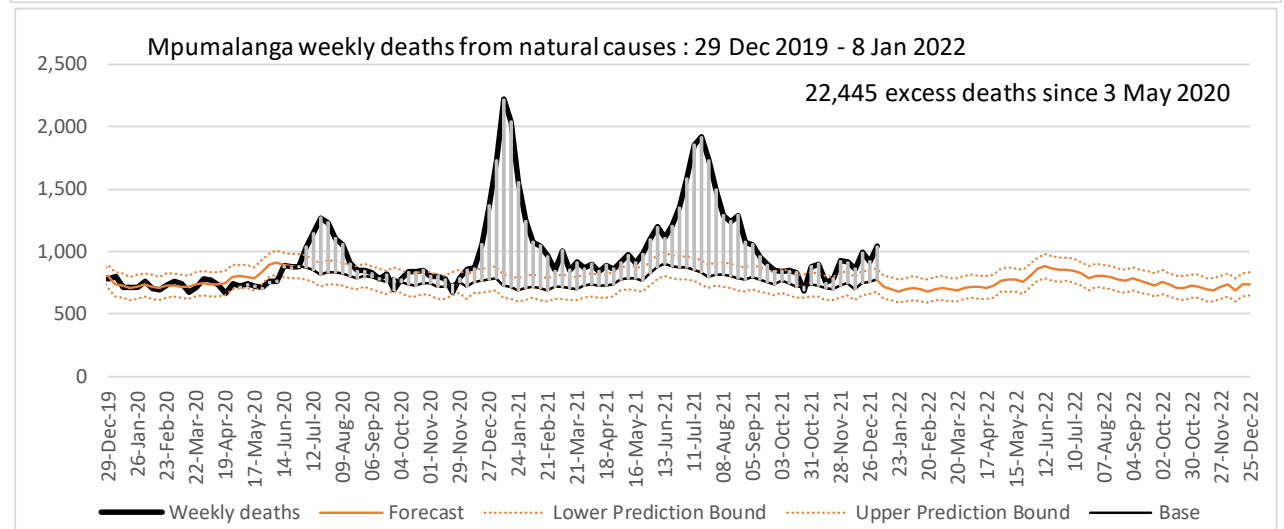
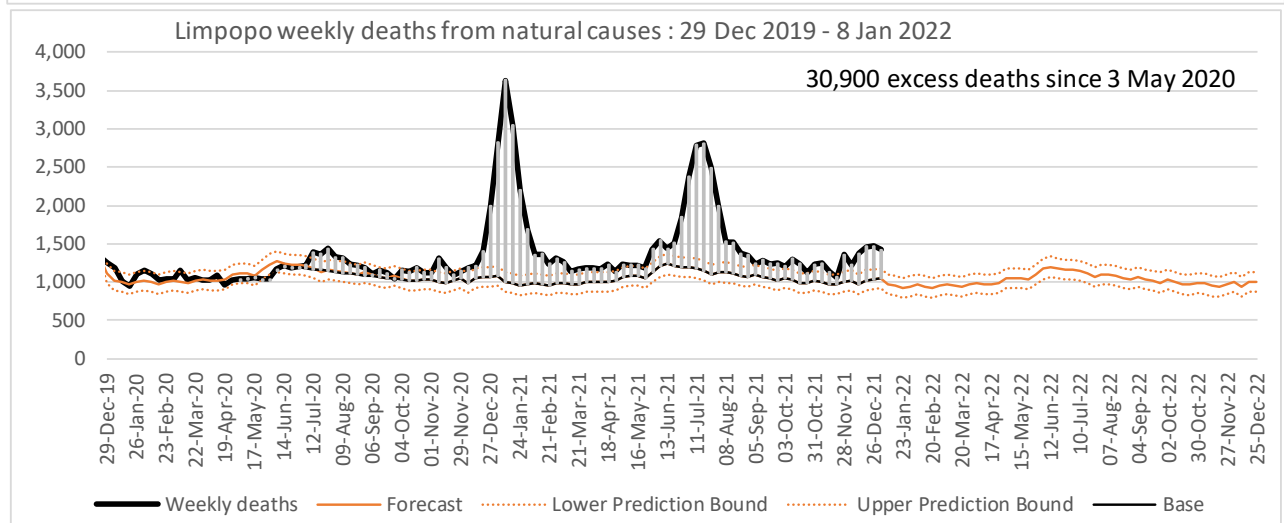
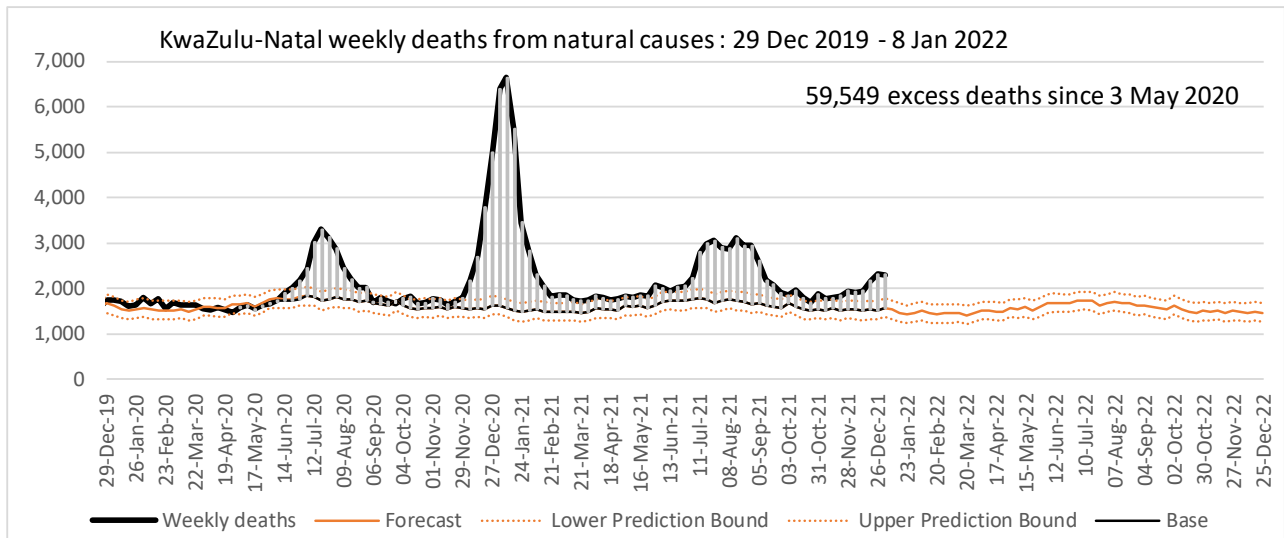
Region	Excess deaths vs forecast	Excess deaths per 100,000 population
South Africa	283,906	477
Province		
Eastern Cape	49,046	745
Free State	15,864	545
Gauteng	54,775	351
KwaZulu-Natal	60,134	525
Limpopo	30,721	520
Mpumalanga	21,909	455
Northern Cape	8,036	687
North West	15,769	392
Western Cape	27,651	392
Metropolitan Municipality		
Buffalo City	5,435	
City of Cape Town	19,373	
Ekurhuleni	13,042	
eThekweni	12,026	
Johannesburg	19,388	
Mangaung	5,065	
Nelson Mandela Bay	7,450	
City of Tshwane	11,216	



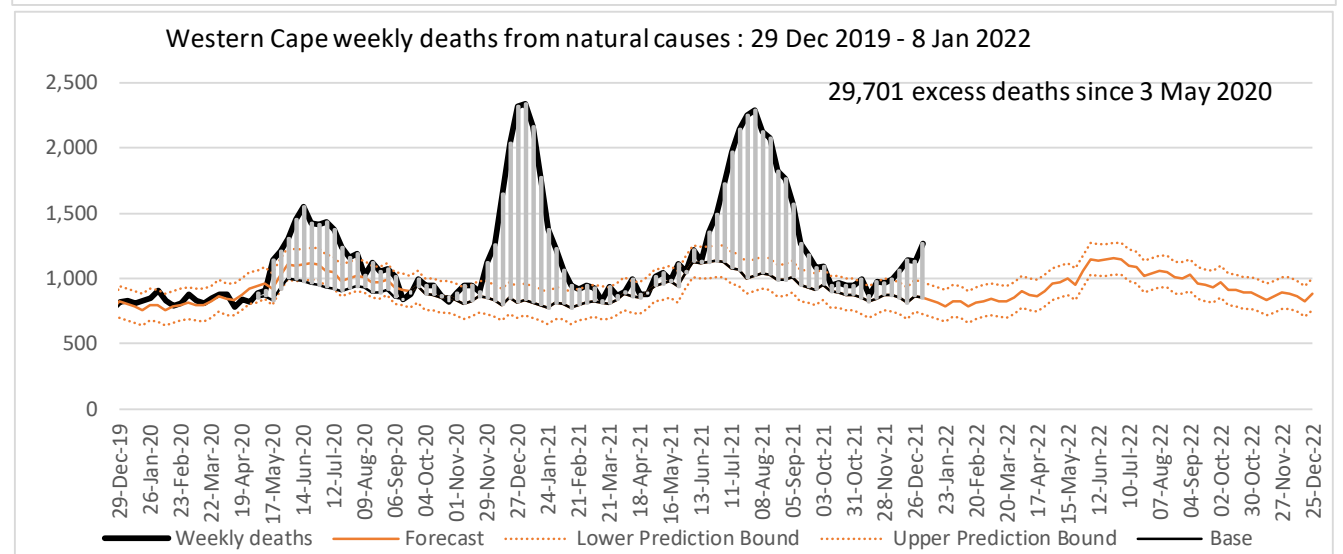
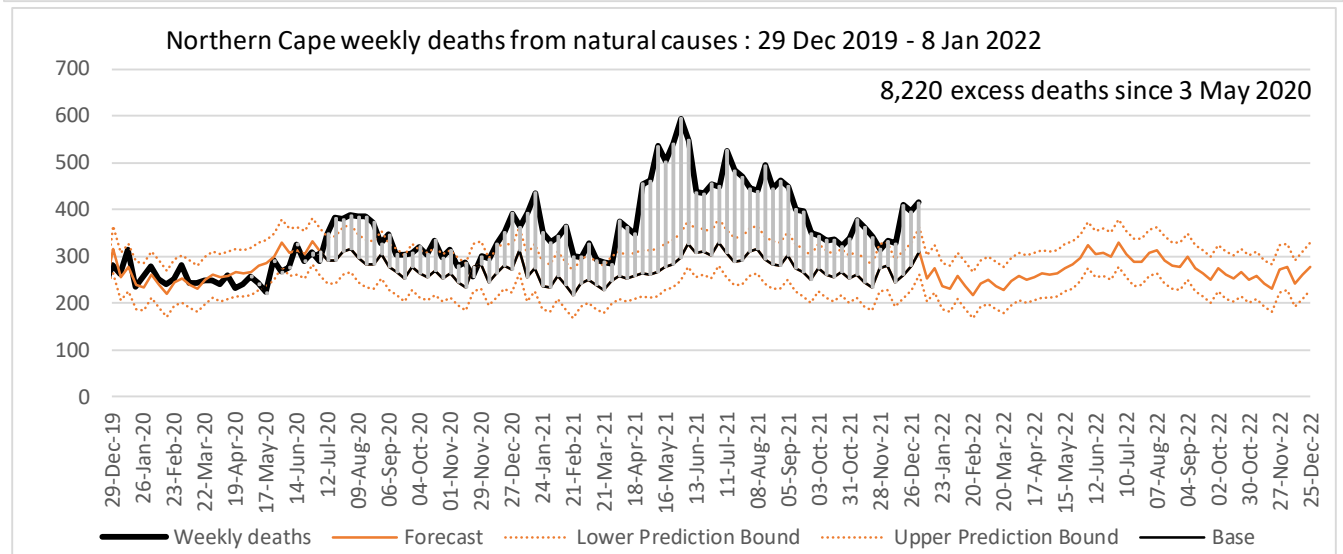
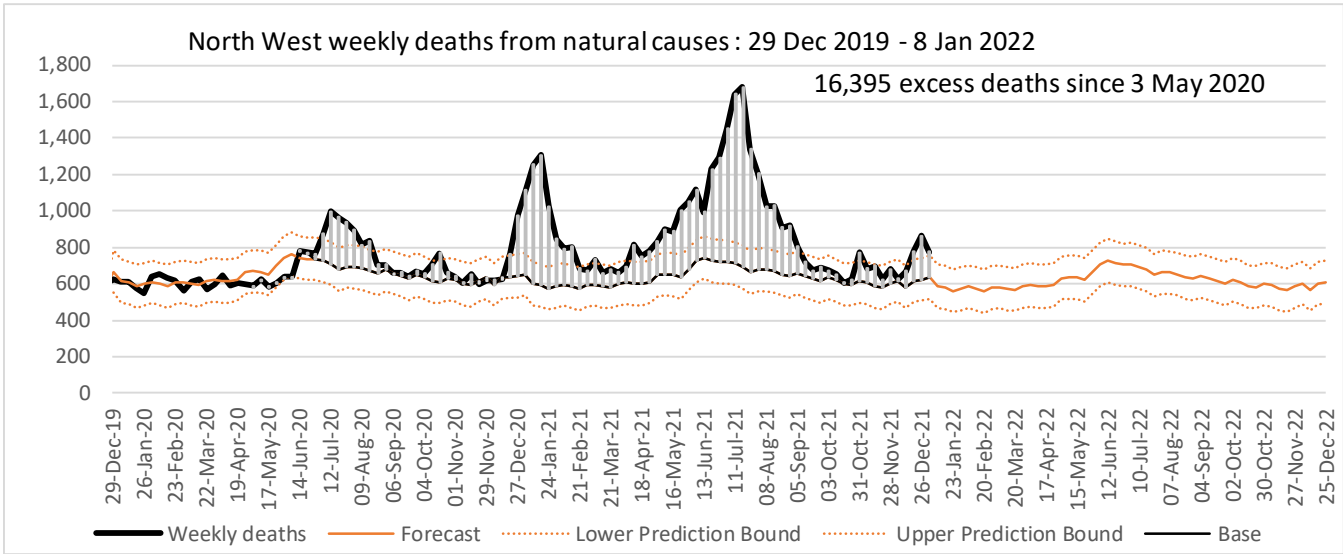
Numbers have been scaled to the estimated actual number of death and for the last week has been adjusted for delayed registrations



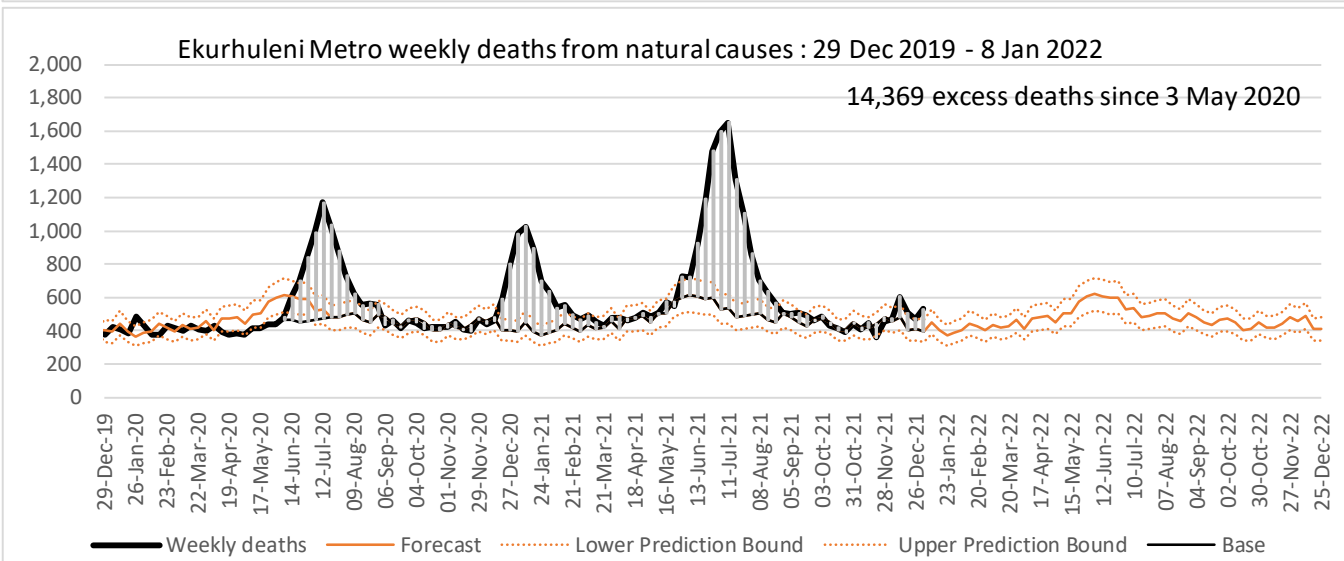
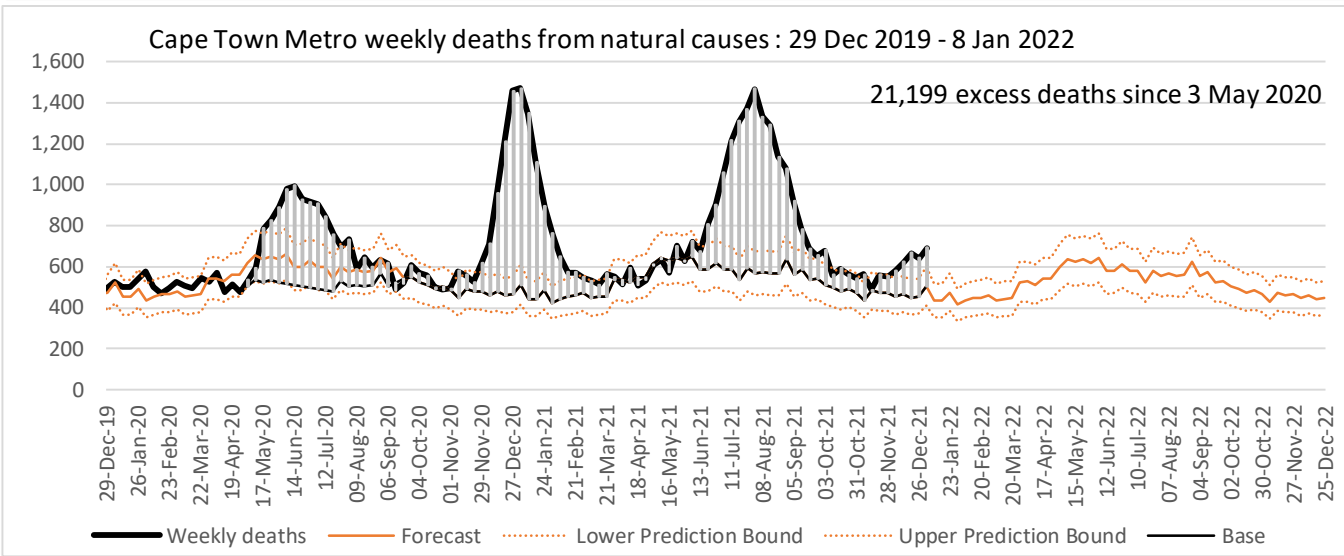
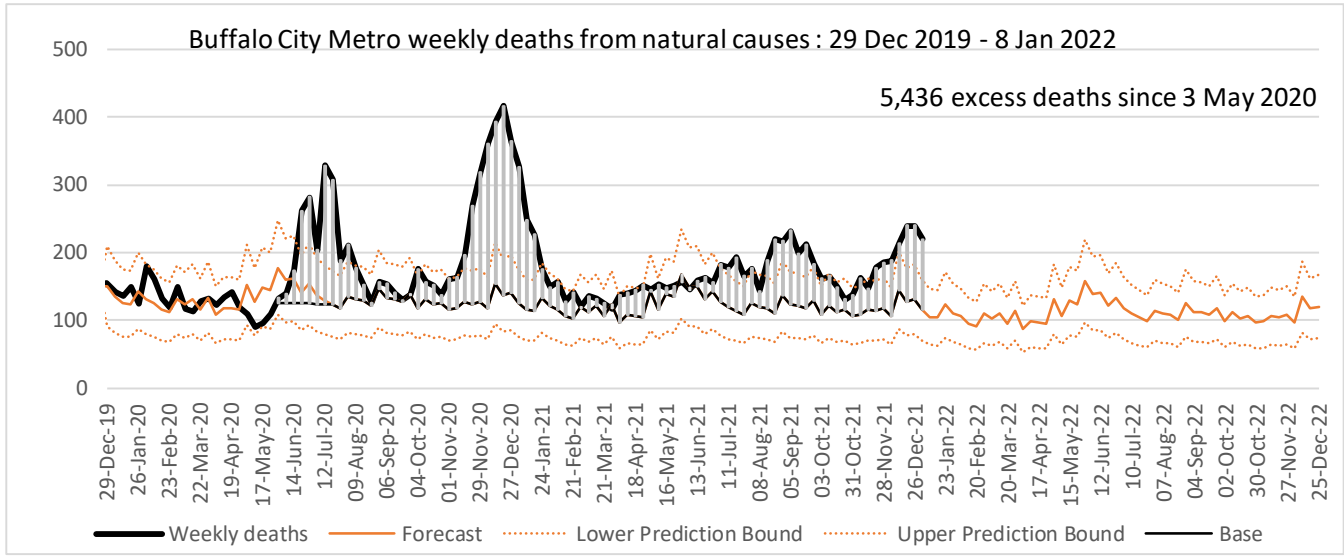
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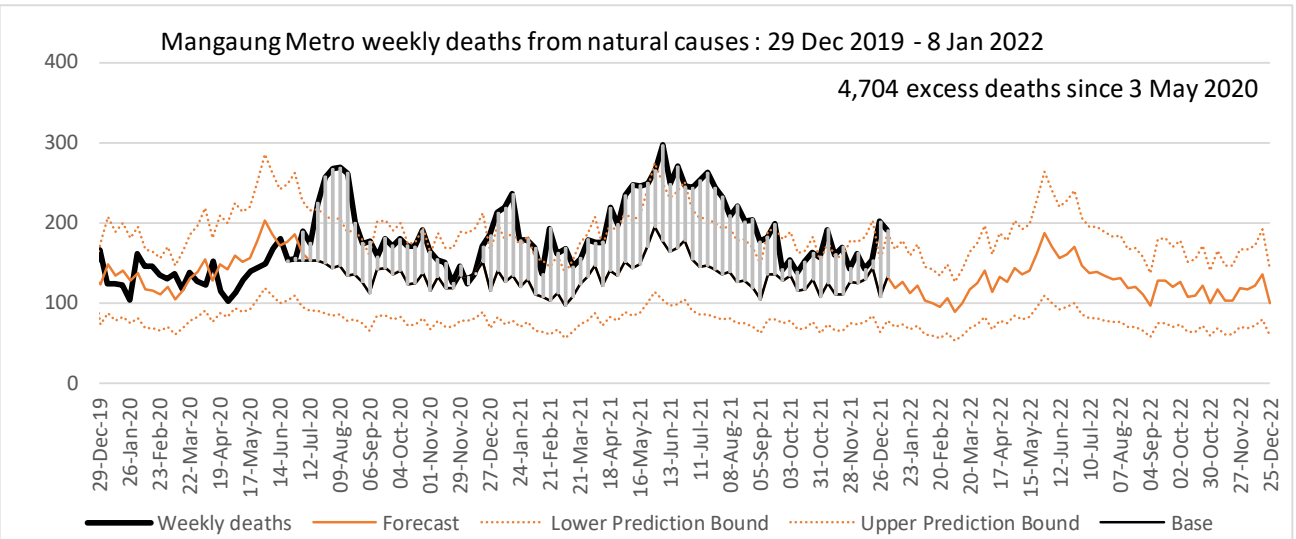
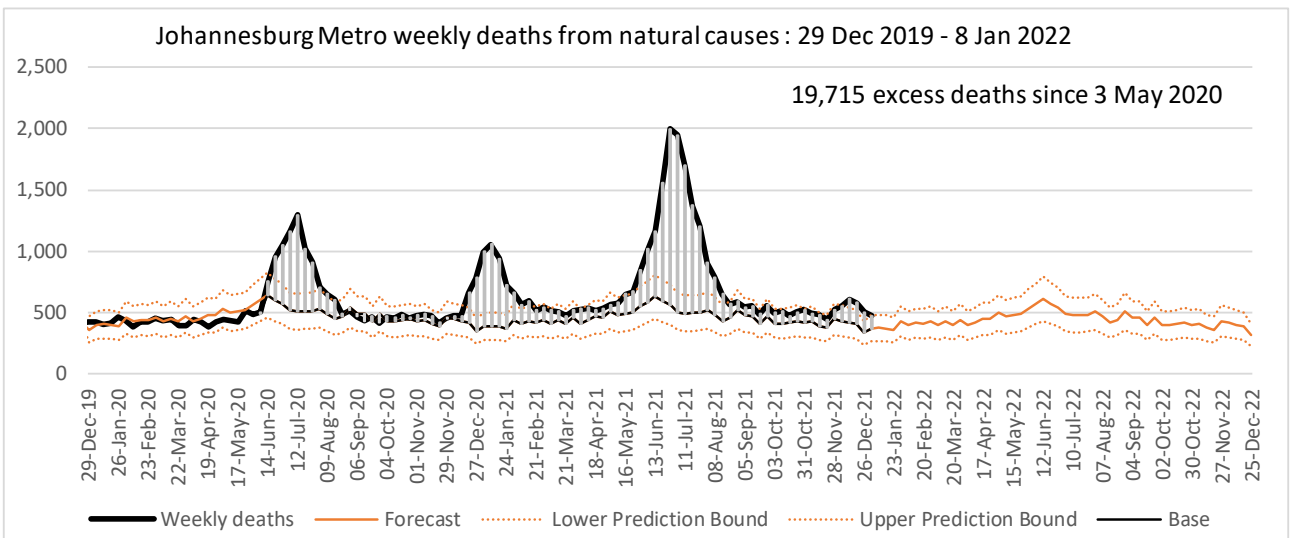
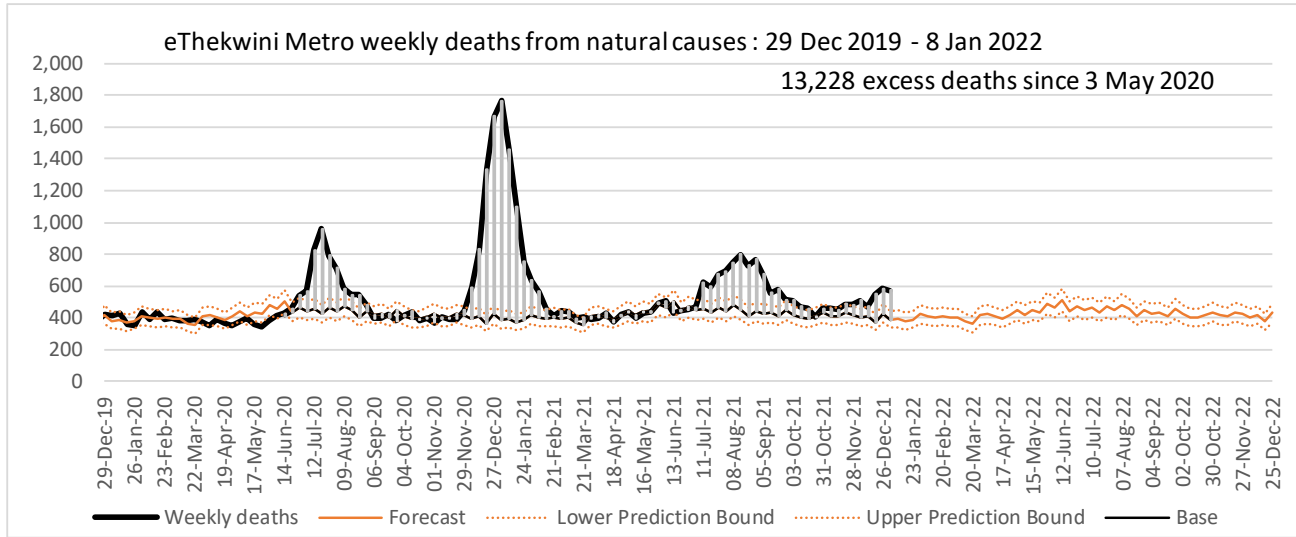
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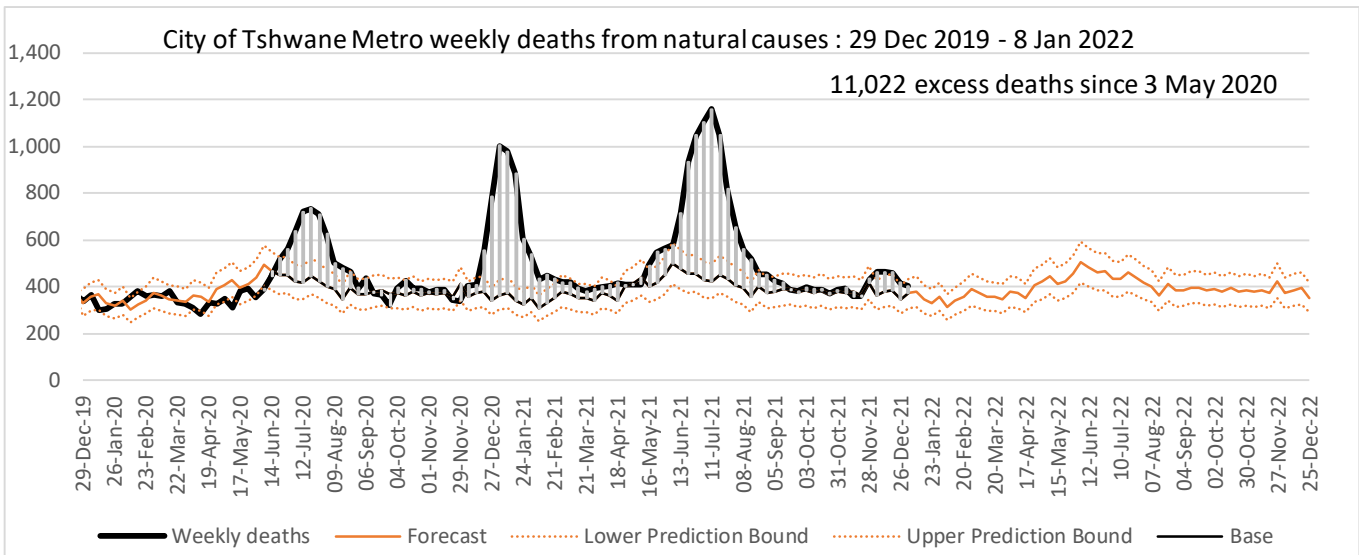
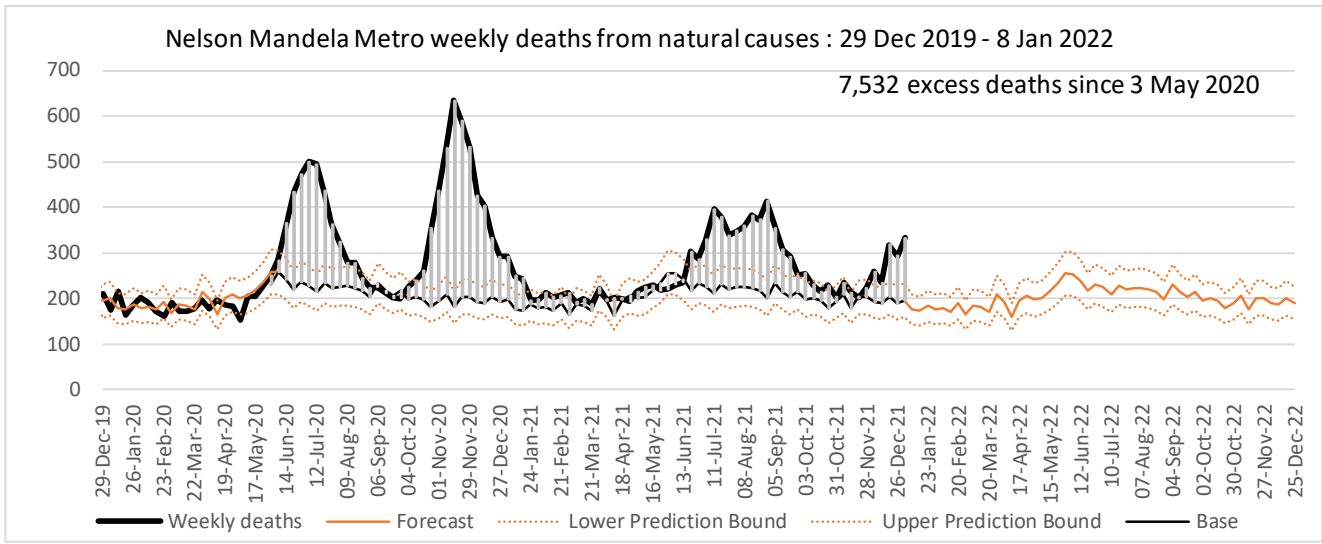
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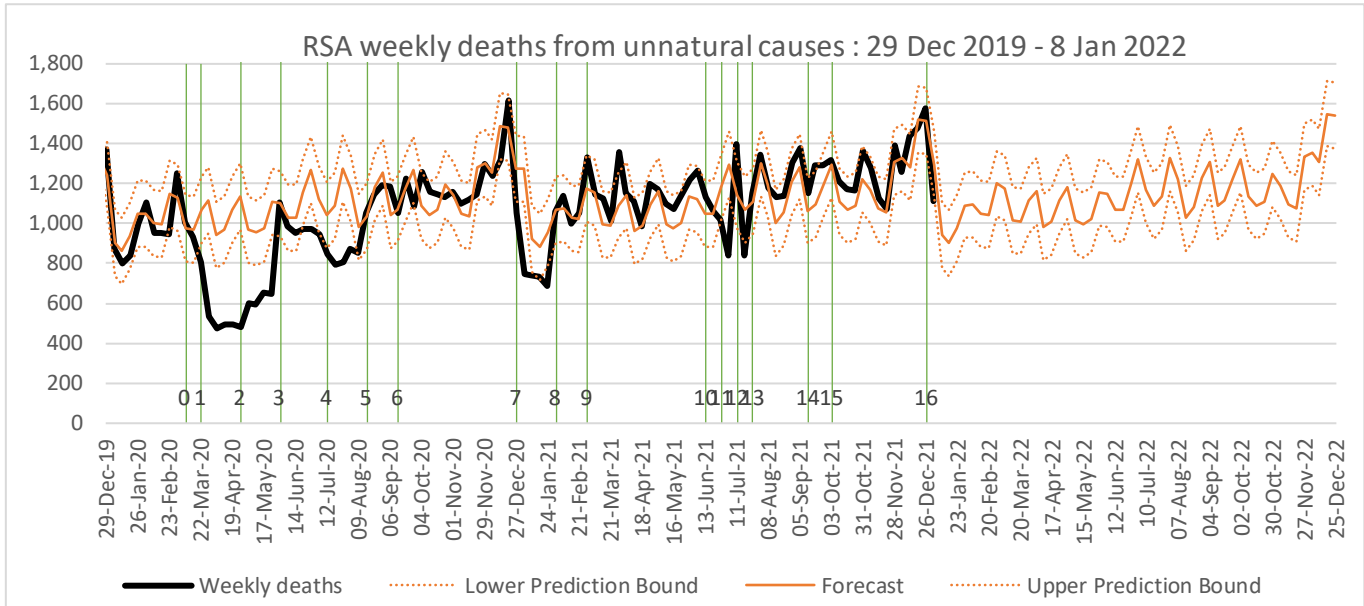
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Numbers have been scaled to the estimated actual number of death and for the last week has been adjusted for delayed registrations. As only a quarter to a third of unnatural deaths in the most recent week are processed at the time of the survey, the 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, curfew 9pm-4am
- 12 Week of unrest in KZN and GT
- 13 Week lockdown changed to level 3 advanced (alcohol 4 days/w, curfew 10pm-4am)
- 14 Week lockdown changed to level 2 advanced (alcohol 5 days/w, curfew 11pm-4am)
- 15 Week lockdown changed to level 1 advanced (no alcohol post 11pm, curfew 12pm-4am, large gatherings)
- 16 Week lockdown level 1 advanced (removed limits on alcohol & curfew, allowed larger gatherings)