COVID-19

Trends and Insights Report

Updated 27 May 2022

Please note that this report should only be distributed beyond the intended recipients on a need-to-know basis and is not for public consumption.

Purpose of report

This report focuses on a broad national and regional overview with key insights based on the quantitative trends in the New Zealand COVID-19 pandemic, including the trends and scale of infection and diagnosis as well as morbidity and mortality. In interpreting and using these data, readers need to be aware of surveillance data limitations; if unfamiliar with these data, it is strongly advised to review the sources, methods and limitations in the accompanying **Appendix** document.

Key insights from past 7 days

Infection Trends

- **Nationally, the weekly case rate was 10.8 per 1,000** population for the week ending 22 May. This rate is the same as the previous week.
- **For the week ending 15 May**, the estimates suggest that **2.4% (692/29,274) of healthcare workers** and **1.8% (362/20,211) of border workers tested positive.** While these are not representative samples of New Zealanders, **border workers' risk is very similar to the general community risk** (but more reflective of the Auckland population).
- **Border worker comparisons with Auckland** case rates suggest **substantial under ascertainment of cases (1.8% [18 per 1,000] versus 10.8 per 1,000**, respectively).
- Levels of viral RNA in wastewater **have increased in Auckland Metro, Central and Te Manawa Taki.** Contradictory to other evidence, **this could indicate there was no substantial decrease in any region in the underlying level of new infections, which now have started to increase in the past two weeks.**
- In the past week, **eleven out of 19 DHBs experienced an increase in case rates.** These were a 3% increase in Auckland; 5% increase in Waitematā; 10% increase in Bay of Plenty; 1% increase in Capital and Coast; 2% increase in Hutt Valley; 4% increase in Lakes; 4% increase in Waikato; 8% increase in Taranaki; 10% increase in Hawkes Bay; 10% increase in West Coast; and a 19% increase in Whanganui.

Demographic Trends in Case Rates

- The **lowest case rates** are in **Pacific peoples (6.3 per 1,000),** though case rates in this group have increased by **9.9% in the past week. Māori case rates have declined slightly** and are now **7.5 per 1,000.**
- **For 65+ age group, there have been increases across the motu.** Case rates in the Northern region increased by 15.3%, Te Manawa Taki increased by 17.2%, Central increased by 1.2% and Southern increased by 8.4% in the past week.
- Case rates for those at higher risk of complications or severe illness from COVID-19, those aged 45-64 and 65+, were highest in European or Other with their rates for 45-64 at 12.3 per 1,000 and their rates for 65+ at 8.3 per 1,000. **The rate in Māori aged 65+ was increasing in the fortnight leading up to 15 May but has decreased slightly from 8 per 1,000 last week to 7.8 per 1,000.**

Whole Genome Sequencing

- This week marks the **first detection of BA.2.12.1 in the community** (two cases). In addition, **a variant of concern of either BA.4 or BA.5 was detected in the wastewater in Auckland (Rosedale) on 15 May and Gisborne on the 16 May.**
- Among Omicron cases, BA.1 was the dominant subvariant (~60% at the start of February 2022) but has since been outcompeted by BA.2, which made up over 98% of sequenced community cases in the past two weeks.
- Based on WGS data generated over the course of the Omicron wave, **ESR estimate that 83% of all community cases (~1.07 million cases) reported since 20 January 2022 have been the BA.2 variant.**
- As of 22 May, ESR had received samples from 57 of the 145 PCR positive cases who were hospitalised in the week to 20 May 2022. Of these, 47 (82%) had a BA.2 genome, 3 (5%) failed and 7 (12%) had not been sequenced.

Border Surveillance

- In the week ending 15 May, there were 35,410 border arrivals, of which **92.6 % (32,785) uploaded a RAT result upon arrival.** This is slightly higher than the 92.3% from the week prior.
- In the week ending 15 May, the percentage of PCR positive border arrivals with WGS complete was 47.7% (please note that WGS can be incomplete for recent cases). **This percentage was at 66.1% for the week ending 08 May and 63.0% for the week ending 01 May.**

Hospitalisation and Mortality

- For the week ending 22 May, the **national hospital occupancy rate was 8.2 per 100,000 population, an increase of 4.9% in the past week**. Hospital occupancy rates have continued to vary across regions in the past week. The **Northern region (10.0 per 1,000) increased by 7.1%**, **Central (6.5 per 1,000) increased by 7.8% and Southern (8.9 per 1,000) increased by 17%**. In Te Manawa Taki (5.6 per 1,000), the hospital occupancy rate decreased by 18.9% in the past week.
- As of 19 May 2022, **1,102 people have died** with or after COVID-19 infection. Of these, **1,057 have died within 28 days** of being reported as a case.

International Insights and Primary Evidence

- Globally. new weekly COVID-19 cases have increased slightly during the reporting period (16 May to 22 May 2022), with just over 3.7 million cases reported, a 1% increase as compared to the previous week. The number of new weekly deaths continues to decline, with just over 9,000 fatalities reported during the same period, representing a 4% decrease as compared to the previous week.
- Primary evidence section includes studies on outbreak management, economic evaluations, transmission dynamics and modelling studies.

Health System Capacity

- For the week ending 19 May, **20% of the 656 Aged Residential Care (ARC) facilities have at least one active COVID-19 case (134 of 656 facilities).**
- Overall there was a 3% increase in ED presentations for the week ending 19 May out of the 19 DHBs that reported. There were increases in all three Auckland metro DHBs, **but in particular in Counties Manukau, reporting a 15% increase.**

Domestic epidemic outlook

Infection outlook

- Since the March peak, case rates were declining leading up to the week of 17 April, after which a plateau has been observed in national case trends.
- The overall national picture is an increase in cases; driven by increases in Northern, Te Manawa Taki and Central regions. For Northern and Te Manawa Taki, cases have increased for the past four weeks and two weeks respectively.
- The increases across the motu is unlikely to be related to testing behaviours as a similar increase as been occurring in border workers who undergo routine testing. Additionally, there has been an increase in the levels of wastewater RNA in the Auckland Metro, Central and Te Manawa Taki regions.
- Infection levels are likely to be higher than the self-reported cases indicate as wastewater RNA has not decreased since early April (and is now increasing) across the motu despite an overall substantial decrease in cases rates since the March peak.
- Fatigue from following public health orders, misconception about level of infection risk and infection trends from reported cases could be impacting infection prevention and control behaviours and public health measures, which may be increasing risk of infection, especially among vulnerable populations.
    - Relaxation of risk reduction measures may already be playing out: There has been continued increases in cases observed 65+ year olds since 17 April.
- The combined effects of the reduction in mandated public health measures with the move to Orange, e.g. mask wearing in some settings, and the return of schools from term break on 04 May could explain the 31.7% increase in cases rates among 5–14 year-olds in week ending 15 May. There increase in the previous week ending 22 May 22 was 17%.
- This week marks the first detection of BA.2.12.1 in the community (two cases). In addition, a variant of concern of either BA.4 or BA.5 was detected in the wastewater.

Tertiary Care outlook

- There remains a substantial increase in risk for the elderly as infection in the older age groups had been increasing.
- It is likely the highest case hospitalisation and mortality risk will be for at-risk populations such as those residing in age residential care, with co-morbidities and in conditions of high deprivation.

Outbreak Management Outlook

- Given COVID-19 vaccine waning, reduced vaccine uptake for booster dose, and uncertainty around the impact of other respiratory illness, the importance of other public health measures should continue to be emphasized.
- The domestic epidemic outlook is affected by the interactions of both modifiable and non-modifiable risk (and protective) factors. Modifiable factors are ones that can be influenced or more directly changed. Non-modifiable factors cannot be regulated or are very difficult to regulate.
    - **Modifiable factors** – masking, gathering limits, contact tracing, testing, and isolation, welfare and income to enable adherence to PH measures.
    - **Non-modifiable factors** – winter seasons, variants, other respiratory pathogens, behavioural changes in adherence to public health measures and social mixing (e.g. schools back and university back).

Contents

Figures

Infection Trends

Summary of evidence for infection and case ascertainment trends

Currently, **the national border workforce case rates in the past week (17.9 per 1,000) are higher than the general population (10.8 per 1,000) case rates**; these rates were similar when comparing border workforce rates in the Northern region among 25-44 year-olds at 1.6% (where the greatest proportion of the workforce is concentrated). This continues to suggest the **underlying level of infection could be substantially higher than diagnosed rates**. Consistent with the trend in general population diagnoses, **at a national level, rates have again remained similar to the week previous**.

Northern, Te Manawa Taki and Central regions all saw an increase in case rates, border worker rates have also been increasing but have now plateaued, still suggesting that it is **not an artifact of testing behaviours**, but likely an increase in infection incidence. **Increases in Nothern region have been driven by increasing case rates in the Auckland and Waitemata DHBs**, with the **increase in the levels of viral RNA in Auckland Metro wastewater,** in the past two weeks, providing further evidence that **this reflects an increase in the underlying infection rate.**

Levels of viral RNA in wastewater have **increased in Auckland Metro and Central region for the past two weeks.** For **Te Manawa Taki region** they have **increased in the past week.** Contradictory to other evidence, **this could indicate there was no substantial decrease in any region in the underlying level of new infections for the past 2 months and have started to increase.**

Case rates are tracking closely to 'C' the worst-case scenario which assumes an increase in transmission as people return towards pre-COVID levels of social and work mixing after the initial Omicron peak. EpiNow nowcasting reports a median **effective R of 1.0,** meaning cases trends are likely to remain the same over the next week or so.

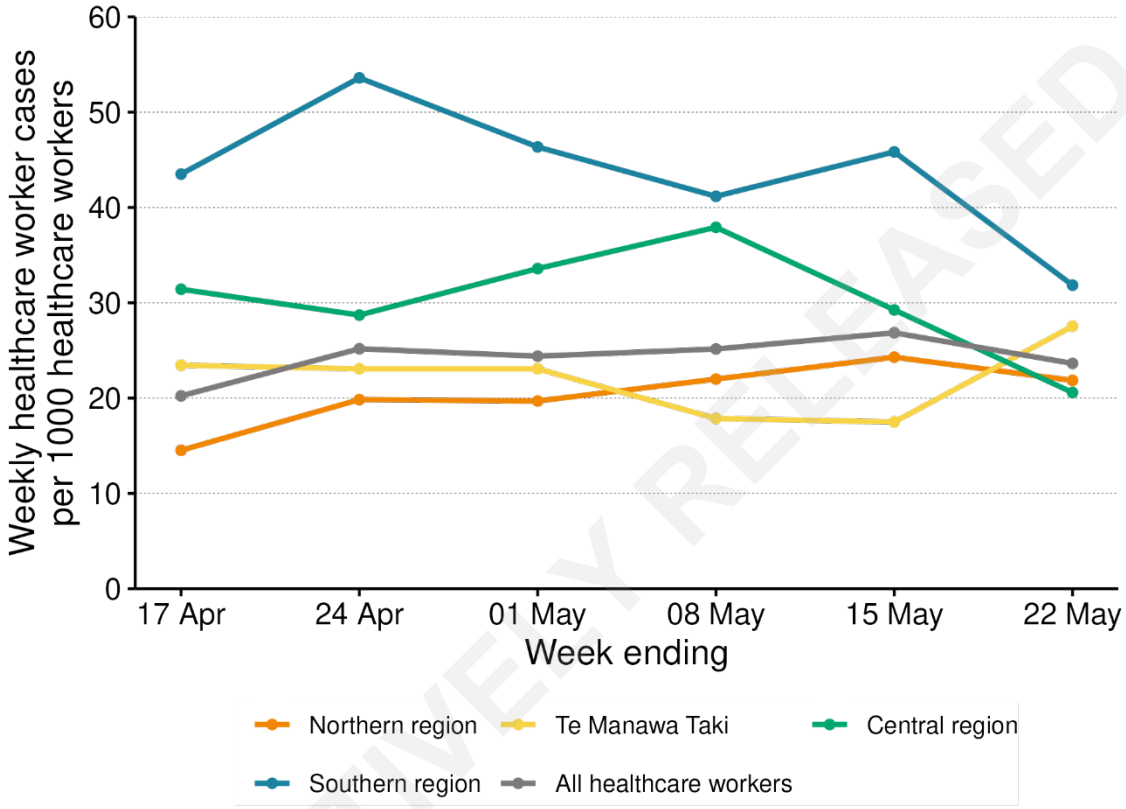
Approximation of underlying infection incidence

Underlying infection incidence has been gauged using case rates for routinely tested healthcare workers and border workers, where there was evidence of regular testing.[1] While these workforces are not a representative sample of New Zealanders, **the border workers are now likely to have a similar risk to the general population (but more indicative of Auckland)** as their risk of infection from the community is likely to be much higher than the risk faced in their workplace.

[1] The population has been identified based on ever having a surveillance code related to the respective workforce and having at least 2 tests (at least one of which was negative) in 2022. A sensitivity check was run using at least 3 tests and while these numbers reduced, the incidence estimates remained very similar.

For the week ending 22 May, estimates suggest that 2.4% (692/29,274) of healthcare workers (**Figure 1**) and 1.8% (362/20,211) of border workers[2] (**Figure 2**) have tested positive (for the first time). The border workforce is concentrated in the Nothern region (56% of the total workforce) in the 25-to-44-year age group; the rate for Northern border workers in this age group was 1.6%.

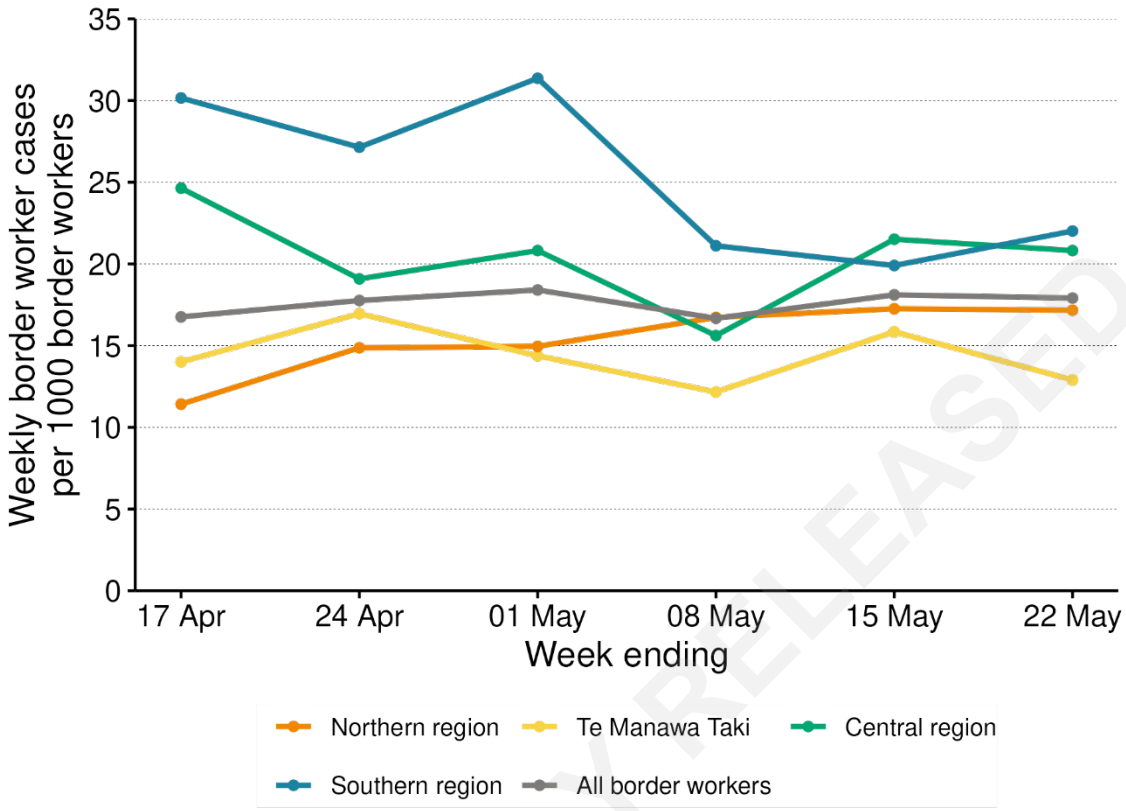
Figure 1: ***Regional weekly case rates of health care workers for weeks 17 April – 22 May 2022***



Source: Éclair/Episurv, 2359hrs 22 May 2022

[2] This rate may be underestimated as not all border workers are rostered on and therefore not required to undertake testing.

Figure 2: ***Regional weekly case rates of border workers for weeks 17 April – 22 May 2022***

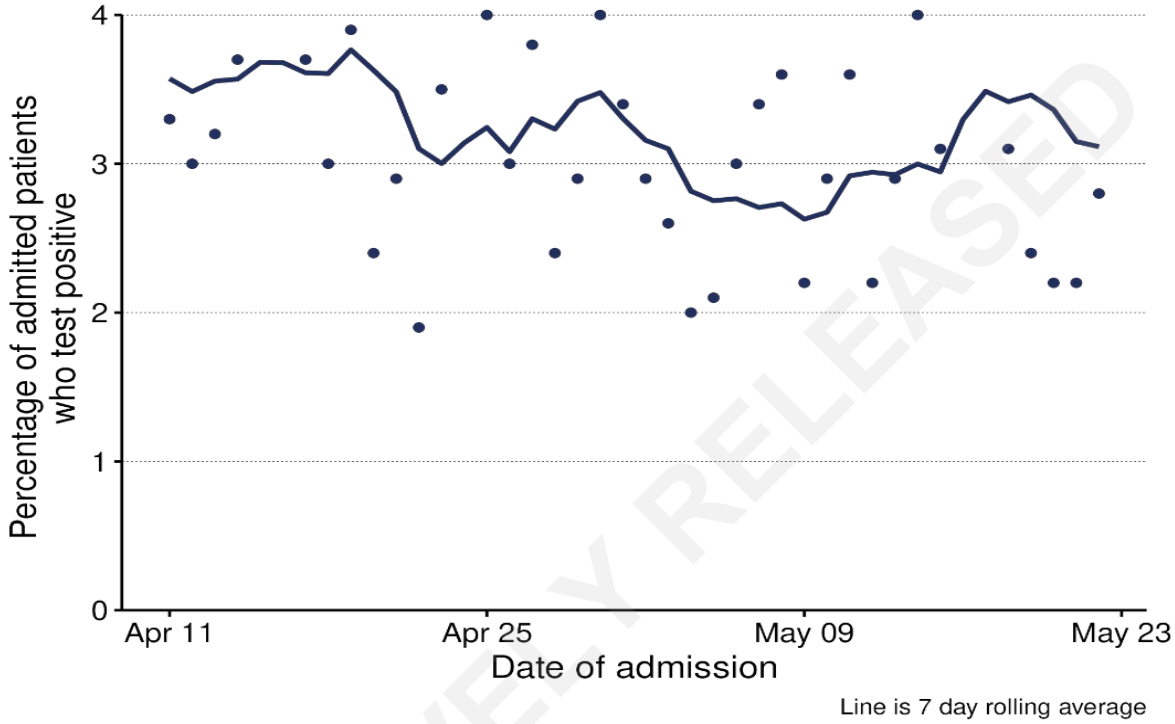


Source: Éclair/Episurv, 2359hrs 22 May 2022

Test positivity trends in Northern region hospital admissions

The Northern region, inpatient positivity rates are shown in **Figure 3**. Since **peaking at ~15% in early March**, the Northern region hospital admissions **positivity have been relatively stable,** being 2.9% (230/7808) in the week ending 15 May and **3.1%** (232/7448) in the week ending 22 May.

Figure 3: ***Percent of tests positive among Northern region hospital admissions***



Source: Northern Region hospitalisation data, NCTS & EpiSurv as at 2359hrs 22 May 2022

Wastewater quantification

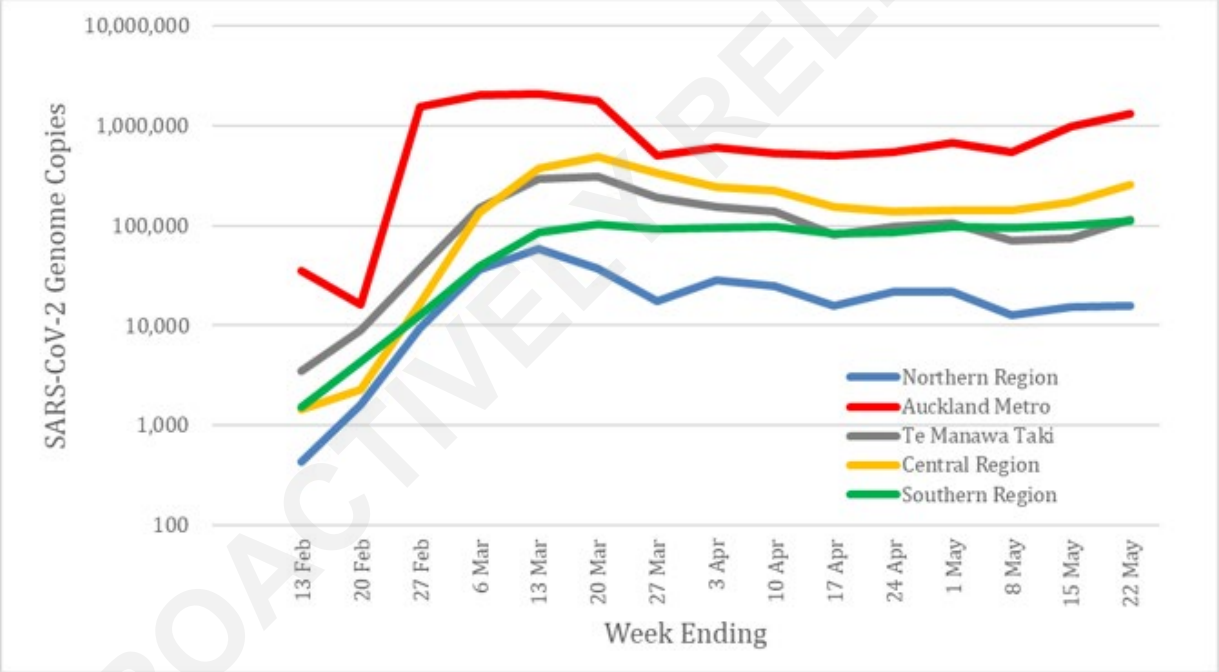
Figure 4 provides an overview of wastewater results by region. Please note that it is not appropriate to compare SARS-CoV-2 absolute levels by region; this figure can only be used to assess the trends *within* each region.

The SARS-CoV-2 RNA levels in wastewater **in Northern region** (excluding Auckland Metro) **have had small variations for the past four weeks but overall are plateaued. Auckland Metro rates** have **substantially increased in the past two weeks ending May 22.**

Te Manawa Taki has increased in the previous week and **Central region trends have increased for the past two weeks**; Southern region wastewater trends have been **stable for the past two months.**

However, the trends in each catchment area are **not necessarily consistent within each region**; within region trends are available in ESR's weekly wastewater report in the **Appendix**.

Figure 4: ***Regional wastewater trends in SARS-CoV-2 genome quantification for weeks 13 February – 22 May 2022***



Source: ESR SARS-CoV-2 in Wastewater update for week ending 22 May 2022

Trends in diagnosed cases

Overall, **the weekly case rate was 10.8 per 1,000** population for the week ending 22 May. This was **the same rate as the previous week,** which was also 10.8 per 1,000.

Figure 5 shows that case rates have varied across regions in the past week. Northern region (10.7 per 1,000) increased by 2%, as did Te Manawa Taki (9.1 per 1,000) by 5% and Central region (10.5 per 1,000) by 2%. While Southern (13.2 per 1,000) decreased by 7%.

In the past week, **eleven DHBs experienced an increase in case rates**. These were a 3% increase in Auckland; 5% increase in Waitematā; 10% increase in Bay of Plenty; 1% increase in Capital and Coast; 2% increase in Hutt Valley; 4% increase in Lakes; 4% increase in Waikato; 8% increase in Taranaki; 10% increase in Hawkes Bay; 10% increase in West Coast; and a **19% increase in Whanganui.**

DHB specific graphs for each region are shown in the **Appendix**.

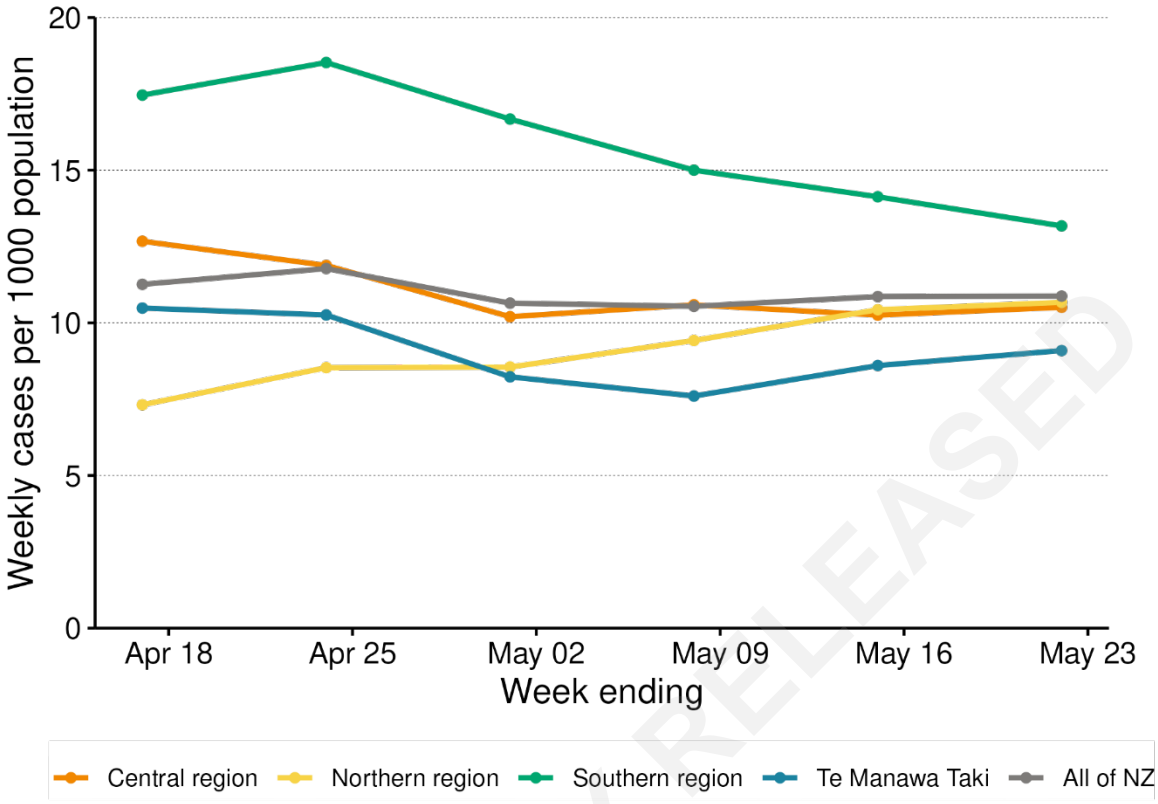
In the Northern region, the weekly case rate was highest for **Waitematā DHB (12.3 per 1,000)** followed closely by Auckland DHB (12.1 per 1,000).

In Te Manawa Taki, weekly case rates were highest in **Taranaki (12.8 per 1,000)**. Other DHBs in Te Manawa Taki had weekly case rates between 8 and 10 per 1,000.

The highest weekly case rates in the Central region were in **Capital and Coast (11.6 per 1,000)**. The lowest weekly case rates in the Central region were in Hutt Valley (9.5 per 1,000).

In the Southern region, the highest case rates were in **West Coast (17.1 per 1,000)** followed by South Canterbury DHB (14.1 per 1,000) and Canterbury DHB (13.9 per 1,000).

Figure 5: ***Regional weekly case rates for weeks 17 April – 22 May 2022***



Source: NCTS/EpiSurv as at 2359hrs 22 May 2022

Modelled and actual cases

COVID-19 Modelling Aotearoa (CMA) have published three "April" scenarios for how case prevalence may develop during the rest of 2022. The three scenarios cover different possibilities for how transmission may develop as the population responds to easing of public health interventions after the March 2022 national peak (**Figure 6**). The scenarios are:

A. Small increase in mixing after the national peak in cases
B. Medium increase in mixing after the national peak in cases
C. Large increase in mixing after the national peak in cases and a shift in the distribution of cases towards older groups at the beginning of July, which has significant flow-on effects on hospitalisation and fatalities.

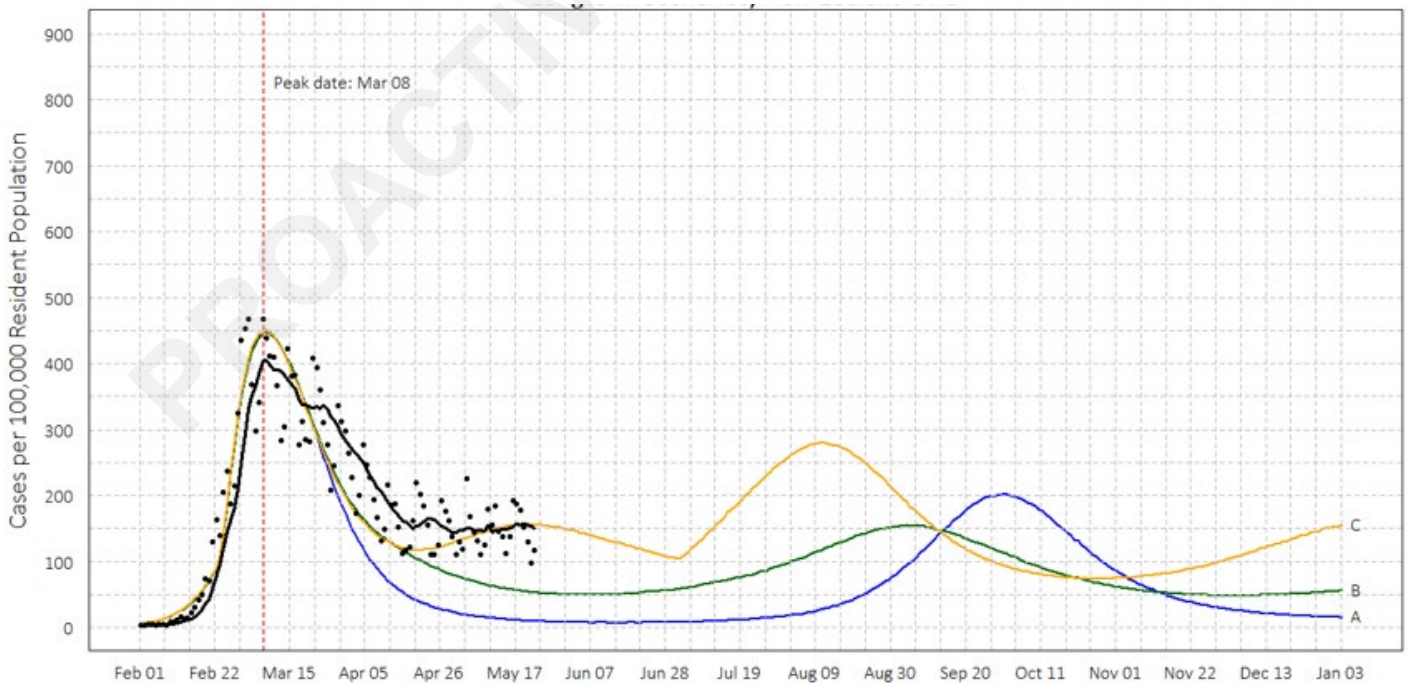
These scenarios allow for waning immunity after vaccination and/or infection. This addition in the modelling scenario leads to a second wave sometime from July. Increase in transmission will occur from waning immunity, which also interacts with changes in population behaviour and adherence to public health measures.

The size and timing of a second wave will be affected by a combination of changes in modifiable exposure risk factors such as gathering size limits, masking, contact tracing, testing and isolation along with pharmaceutical interventions such as boosters and anti-virals. Furthermore, changes in the distribution of infections in older and more at-risk populations will also impact the size and timing of the second wave.

These scenarios are based on the current Omicron BA.2 variant. Any significant changes in the virus could cause significantly different case numbers. Scenarios for BA.4 and possible future Variants of Concern will be reported shortly.

Currently cases are tracking closely to 'C' the worst-case scenario.

Figure 6: *COVID Modelling Aotearoa scenarios compared with reported cases nationally*



Sources: COVID-19 Modelling Aotearoa Branching Process Model April 2022, and Ministry of Health reported case data 22 May 2022

Effective reproduction rate, and forecasts of cases and infections

These estimates used the *EpiNow2* package on 23 May using data to 21 May.[3] Regional estimates for R_{eff} are shown in the accompanying appendix document. The median estimate of **effective R (R_{eff}) nationally is 1.0** (90% Credible Interval [CI]: 0.8-1.1) for cases to 21 May, after adjusting for data lags; this is a decrease from 1.1 the week prior. The wide confidence interval indicate there is high uncertainty for this estimate.

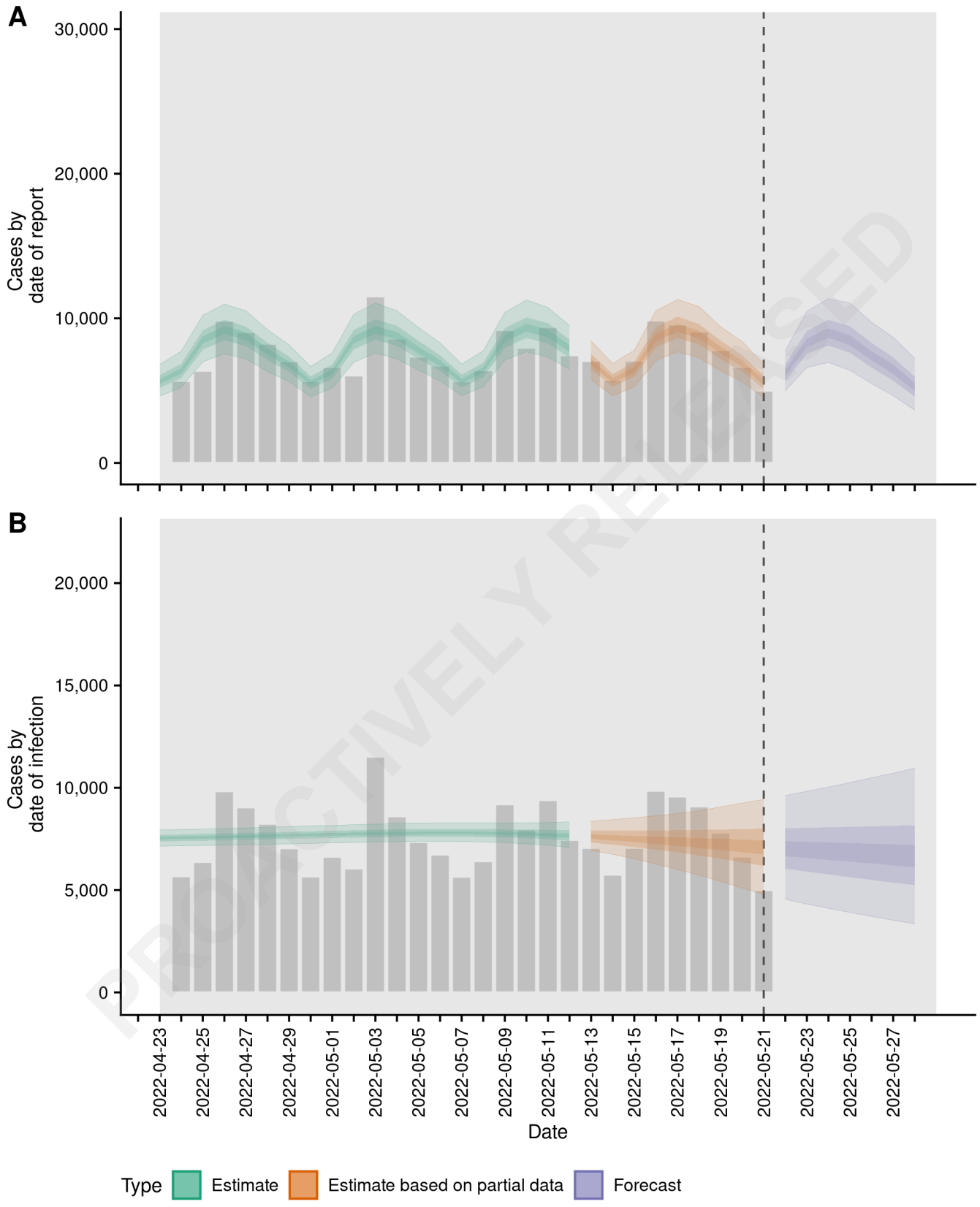
Figure 7 compare the previous week's model median estimate for 21 May 2022 of 6,816 cases per day with a 50% credible interval of 5,848–8,076 to the actual reported cases of 6,635. This was a 3% overestimate over actual but within the 50% upper credible interval.

For all Public Health Units (PHU) except Auckland, Nelson Marlborough, Northland, Southern and Tairawhiti, the model is estimating a **median R_{eff} of 1.0.** The lowest R_{eff} reported is **0.7 in Tairāwhiti PHU.**

The model's median estimate is that national reported cases could be 5,234 cases per day by 28 May (50% credible interval: 4,591–5,960). However, the credible intervals for the projected cases would be even wider if the possibility of continuing trend changes in effective R were included.

[3] The EpiNow package 'now-casts' and forecasts cases to measure current, past and future transmission nationally by calculating and then extrapolating the effective reproduction number, R_{eff}. The model does not consider several factors that may impact transmission, such as rapid changes in public health measures, population behaviour, mobility, or school holidays. This model requires sustained daily cases before it can make predictions. It only counts cases that become confirmed at some stage.

Figure 7: ***Projected national cases by (A) date of report and (B) date of infection***



Source: EpiNow 21 May 2022

Demographic trends in case rates

Ethnicity trends over time and by region

Figure 8 shows national case rates by ethnicity. **Figure 10** shows regional case rates by ethnicity.

In the past two weeks, **rates in Asian and European or Other ethnicities have continued to diverge from those for Māori and Pacific Peoples**. **European or Other** continue to have the **highest weekly case rate at 12.1 per 1,000,** which is a slight increase from last week (11.9 per 1,000). The **lowest case rates continue to be in Pacific Peoples (6.3 per 1,000)** which is a 9.9% decrease from last week (7.0 per 1,000). Māori have had a similar small decrease from 7.9 per 1,000 to 7.5 per 1,000.

Case rates in the Northern region for European or Other were 12.6 per 1,000 and rates for Asian were 11.1 per 1,000. Māori had the second lowest case rate at 7.2 per 1,000. Pacific Peoples (6 per 1,000) continued to have the lowest case rates in this region.

Case rates for Te Manawa Taki were highest for European or Other (10.5 per 1,000), comparable to Asian (9.4 per 1,000) which had increased in the past week. Pacific Peoples (7.1 per 1,000) and Māori (6.4 per 1,000) have similar case rates.

Central region rates for Asian (9.8 per 1,000), European or Other (11.7 per 1,000) have remained stable, while rates for Pacific Peoples (6.1 per 1,000) and Māori (7.5 per 1,000) have now become stable after declining the previous week.

In the Southern region, case rates were highest for Asian (13.6 per 1,000) and European or Other (13.4 per 1,000). Pacific Peoples continue to have the lowest case rate with a 25.7% decrease from 12.8 per 1,000 last week to 9.6 per 1,000. Māori have the next lowest case rate at 11.6 per 1,000.

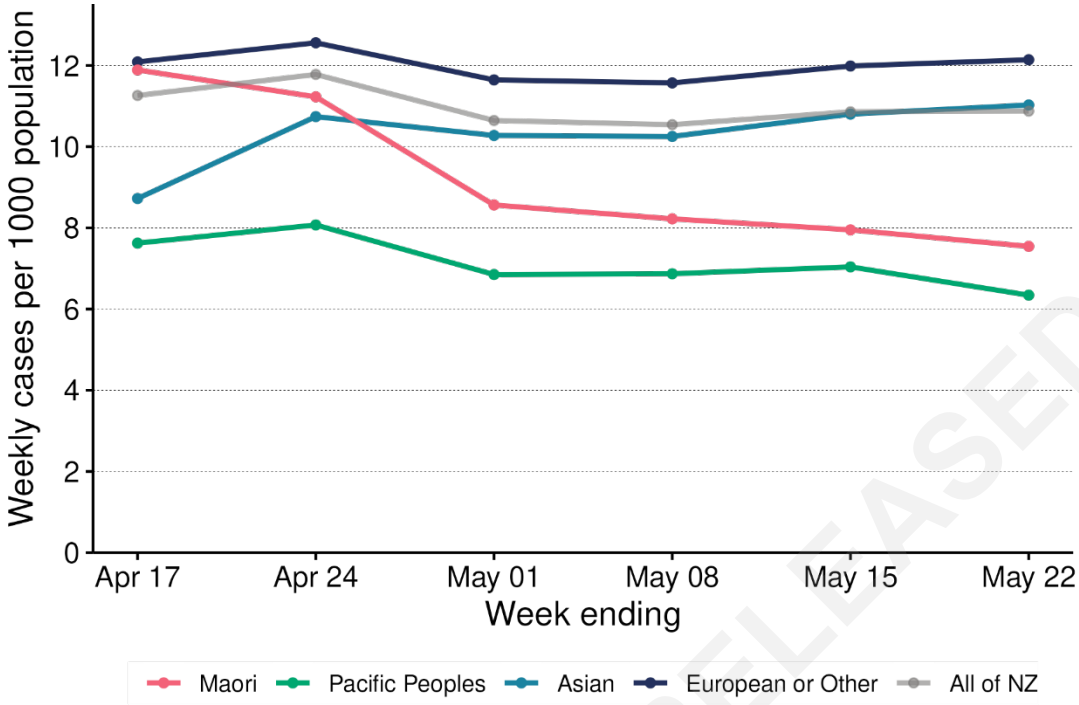
Figure 9 shows national case rates by ethnicity and further breakdown by age group. The **highest case rates** out of any cohort continue to be **within those aged 15-24 of Asian ethnicity (14.9 per 1,000)** whilst the lowest case rates were in those aged 0-4 of Pacific Peoples ethnicity (3.0 per 1,000).

In the week ending 22 May, **case rates continue to increase for Asians aged 65+,** from 5.1 per 1,000 in the week ending 15 May to 6.3 per 1,000. After rising the previous week, **cases in Pacific People aged 65+ have decreased** from 7.1 per 1,000 in the week ending 15 May to 6.6 per 1,000.

Case rates for those at higher risk of complications or severe illness from COVID-19, those aged 45-64 and 65+, were highest in European or Other with their rates for 45-64 at 12.3 per 1,000 and their rates for 65+ at 8.3 per 1,000. **The rate in Māori aged 65+ was increasing in the fortnight leading up to 15 May but has decreased slightly** from 8 per 1,000 last week to 7.8 per 1,000.

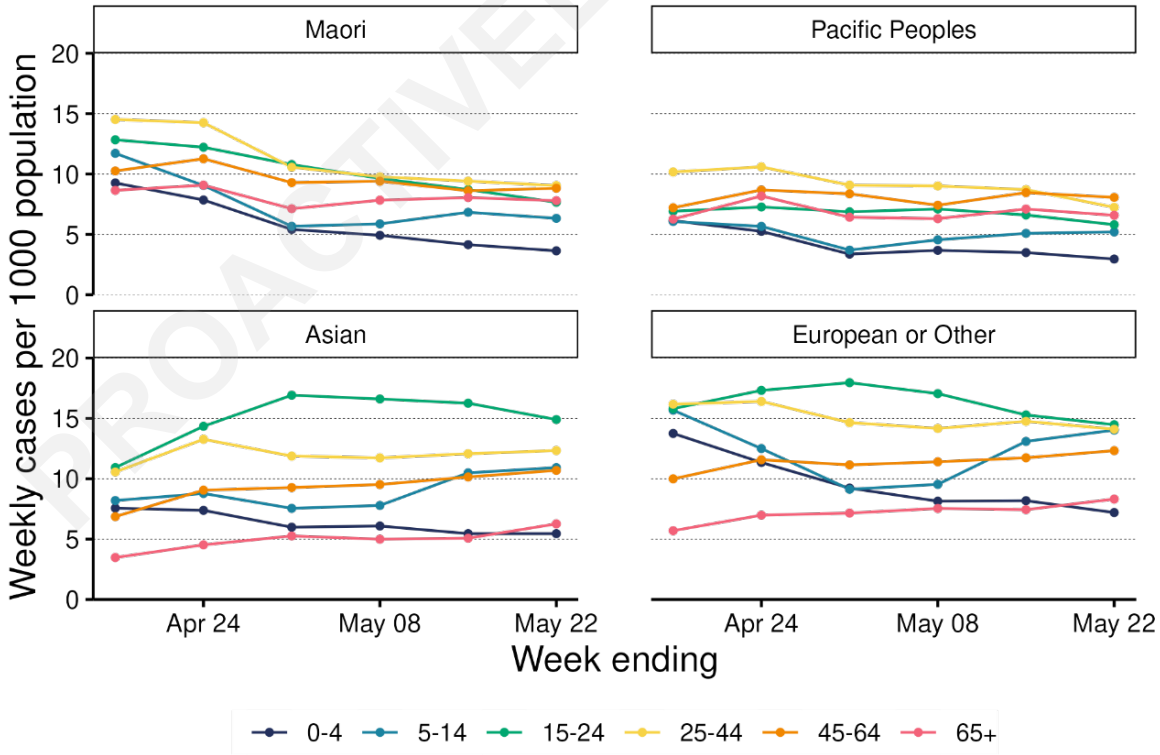
It is important to note that Māori and Pacific Peoples populations have lower life expectancies than other ethnicities in Aoteroa New Zealand. This could mean an increased risk for COVID-19 complications at a lower age than other ethnicities.

Figure 8: ***National weekly case rates by ethnicity for weeks 17 April – 22 May 2022***



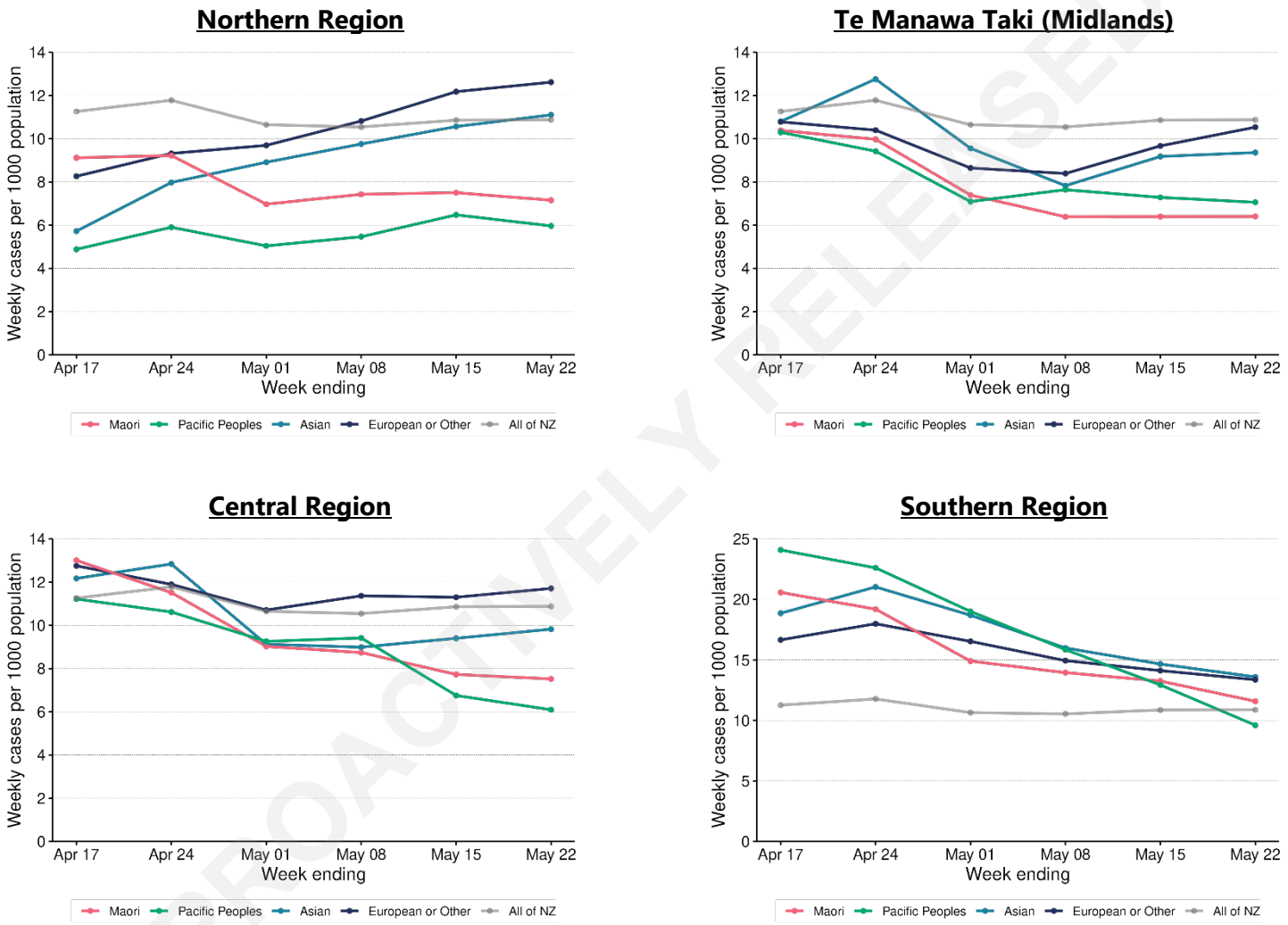
Source: NCTS/EpiSurv as at 2359hrs 22 May 2022

Figure 9: ***National ethnicity-specific weekly case rates by age group for weeks 17 April – 22 May 2022***



Source: NCTS/EpiSurv as at 2359hrs 22 May 2022

Figure 10: ***Regional weekly case rates by ethnicity for weeks 17 April – 22 May 2022***



Source: NCTS/EpiSurv as at 2359hrs 22 May 2022

Age trends over time and by region

Figure 11 shows community cases by age nationally. Case rates in the 0-4 and 15-24 age groups continue to decrease; case rates in the 25-44 age group decreased slightly; while case rates for 5-14 and 45-64 increased slightly. **Case rates for the 65+ age group increased by 10.9% in the past week.**

Nationally, **case rates were relatively similar for 15-24, 25-44 and 45-64 age groups (12.2, 12.5 and 11.0 per 1,000 respectively)** in the past week. Those aged 0-4 continued to have the lowest weekly case rate at 5.6 per 1,000, followed by the 65+ and 5-14 age group (8.1 and 10.8 per 1,000 respectively).

Regional patterns of age group infection were similar to the pattern observed nationally, with case rates for most groups trending between 5 per 1,000 and 15 per 1,000 since late April. Southern region case rates have been trending slightly higher than the rest of the country for all age groups; **see Appendix.**

For the 0-4 age group, case rates in the Northern region increased by 1.7%, Te Manawa Taki decreased by 2.4%, Central decreased by 17% and Southern decreased by 21.3% in the past week.

For the 5-14 age group, case rates in the Northern region increased by 2.9%, Te Manawa Taki increased by 14.4%, Central increased by 8.9% and Southern decreased by 1.3% in the past week.

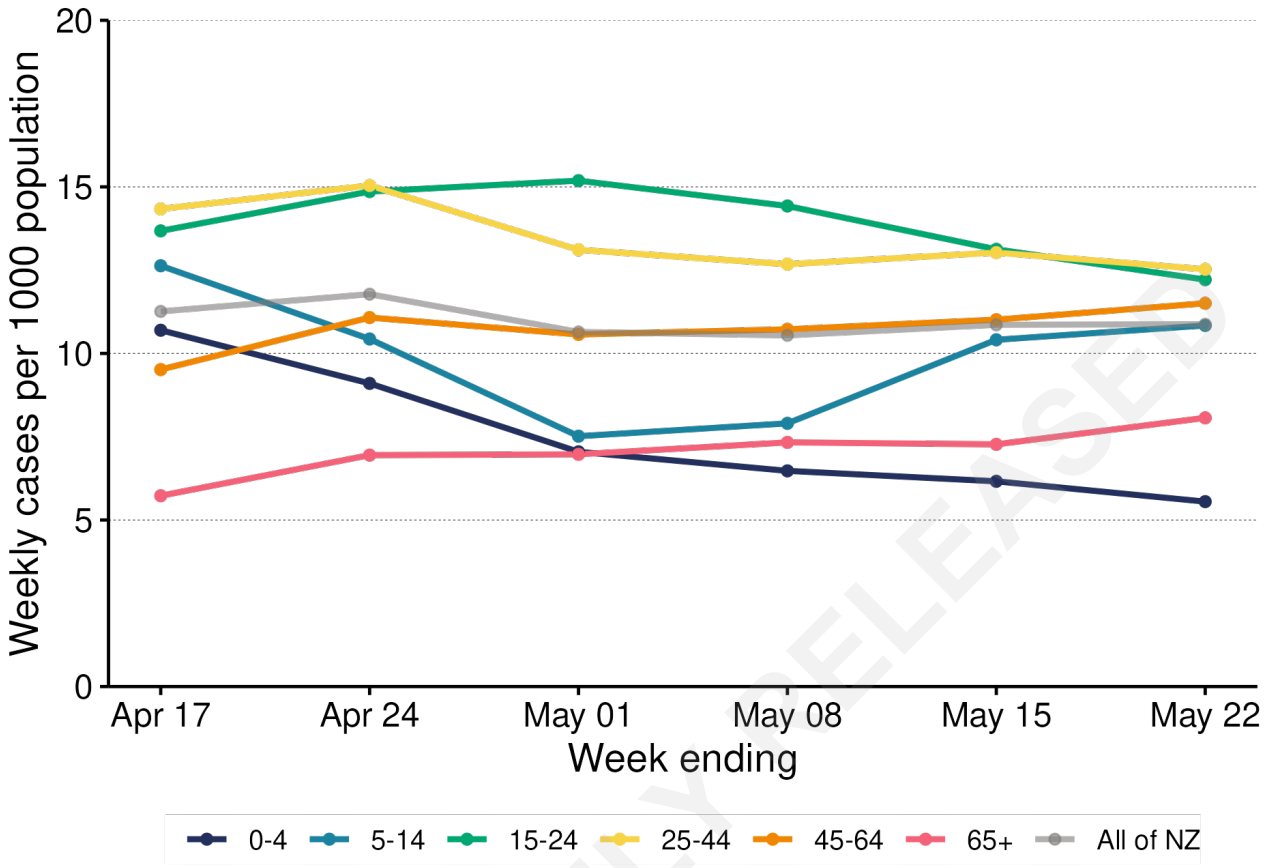
For the 15-24 age group, case rates in the Northern region decreased by 5.4%, Te Manawa Taki decreased by 9.3%, Central decreased by 1% and Southern decreased by 11.8% in the past week.

For the 25-44 age group, case rates in the Northern region decreased by 1.5%, Te Manawa Taki increased by 2.1%, Central remained the same and Southern decreased by 10.6% in the past week.

For the 45-64 age group, case rates in the Northern region increased by 8%, Te Manawa Taki increased by 13.4%, Central increased by 8% and Southern decreased by 6.4% in the past week.

For the 65+ age group, there were increases across the motu. Case rates in the Northern region increased by 15.3%, Te Manawa Taki increased by 17.2%, Central increased by 1.2% and Southern increased by 8.4% in the past week.

Figure 11: ***National weekly case rates by age for weeks 17 April – 22 May 2022***



Source: NCTS/EpiSurv as at 2359hrs 22 May 2022

Deprivation trends over time, by ethnicity and by region

Figure 12 shows case rates based on the NZDep2018.[4] Deprivation is a structural determinant of COVID-19 both in terms of risk and protection. Areas of high deprivation are ones where there is poor access to the internet, low incomes, higher number of welfare recipients, unemployed, single parent families, living in rented accommodation and/or in homes that are overcrowded and damp. These factors impact the ability to sustain self-isolation for cases and their household members.

Overall, in the past week, **case rates continue to be highest in the areas of least deprivation (13.2 per 1,000 population),** followed by areas of mid-range deprivation (11.5 per 1,000) and areas most deprived (8.1 per 1,000).

Access to RATs and to an internet connection to report RAT results is likely associated with lower levels of deprivation. Thus, it is unlikely that as large a difference in case rates exists between those of low and high deprivation and that a higher level of case under-ascertainment exists in areas of higher deprivation.

Comparison of national case rates of deprivation by ethnicity in the past week for areas most deprived shows that case rates were highest in the Asian and European or Other ethnicity (10.1 per 1,000). Cases in Pacific Peoples were the lowest in areas most deprived (4.8 per 1,000) but third highest in areas least deprived (11.2 per 1,000), following European or Other (13.5 per 1,000) and Māori (12.3 per 1,000).

For the most deprived areas, cases in Māori made up 20% of cases. The proportion of cases in the most deprived areas for Pacific Peoples was 10%, for Asian 17% and for European and Other was 53%. Following this, 79% of cases in areas of least deprivation were European and Other compared with 12% being Asian, 6% Māori and 2% Pacific Peoples.

In the Northern region, case rates were highest in the least deprived areas (13.2 per 1,000 population) followed by areas of mid-range deprivation (11.7 per 1,000) and areas most deprived (7.2 per 1,000) (see **Appendix**).

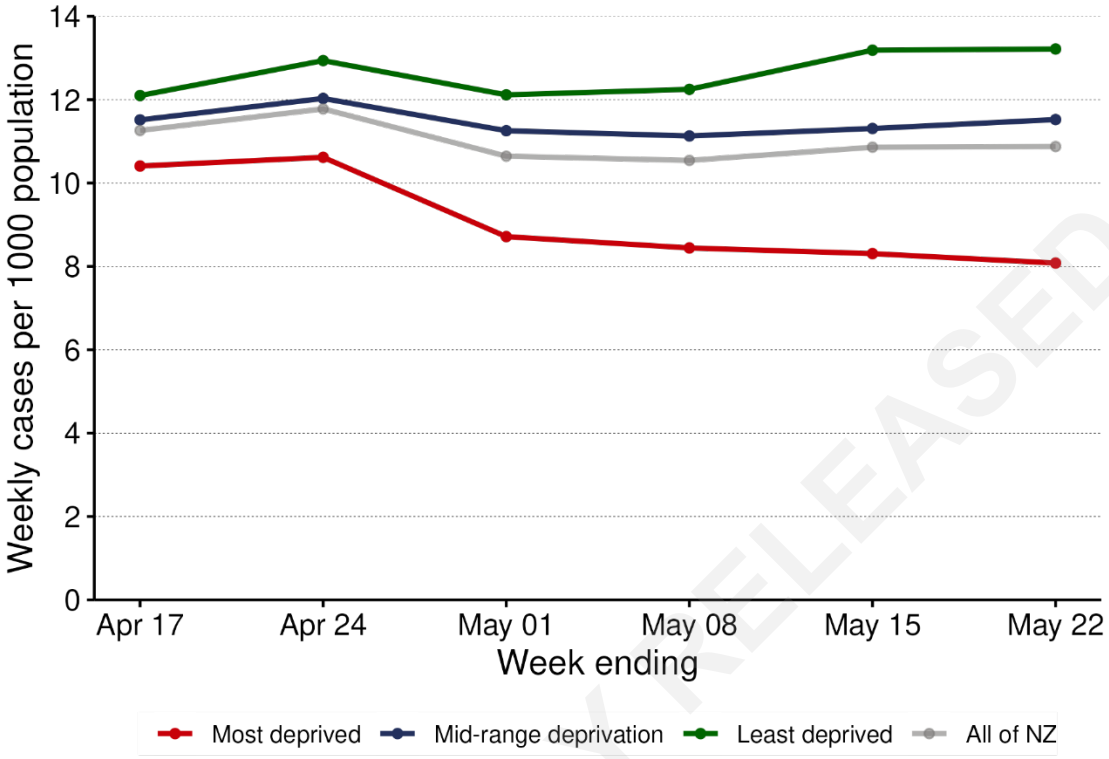
In Te Manawa Taki region, case rates were highest in the least deprived areas (11.5 per 1,000) followed by areas of mid-range deprivation (10.0 per 1,000) and areas most deprived (7.6 per 1,000).

In the Central region, case rates were highest in the least deprived areas (12.7 per 1,000) followed by areas of mid-range deprivation (11.0 per 1,000) and areas most deprived (7.9 per 1,000).

In the Southern region, case rates were highest in the least deprived areas (14.6 per 1,000) followed by areas of mid-range deprivation (13.1 per 1,000) and areas most deprived (11.2 per 1,000).

[4] Contents (otago.ac.nz)

Figure 12: ***National weekly COVID-19 case rates by deprivation status for weeks 17 April – 22 May 2022***



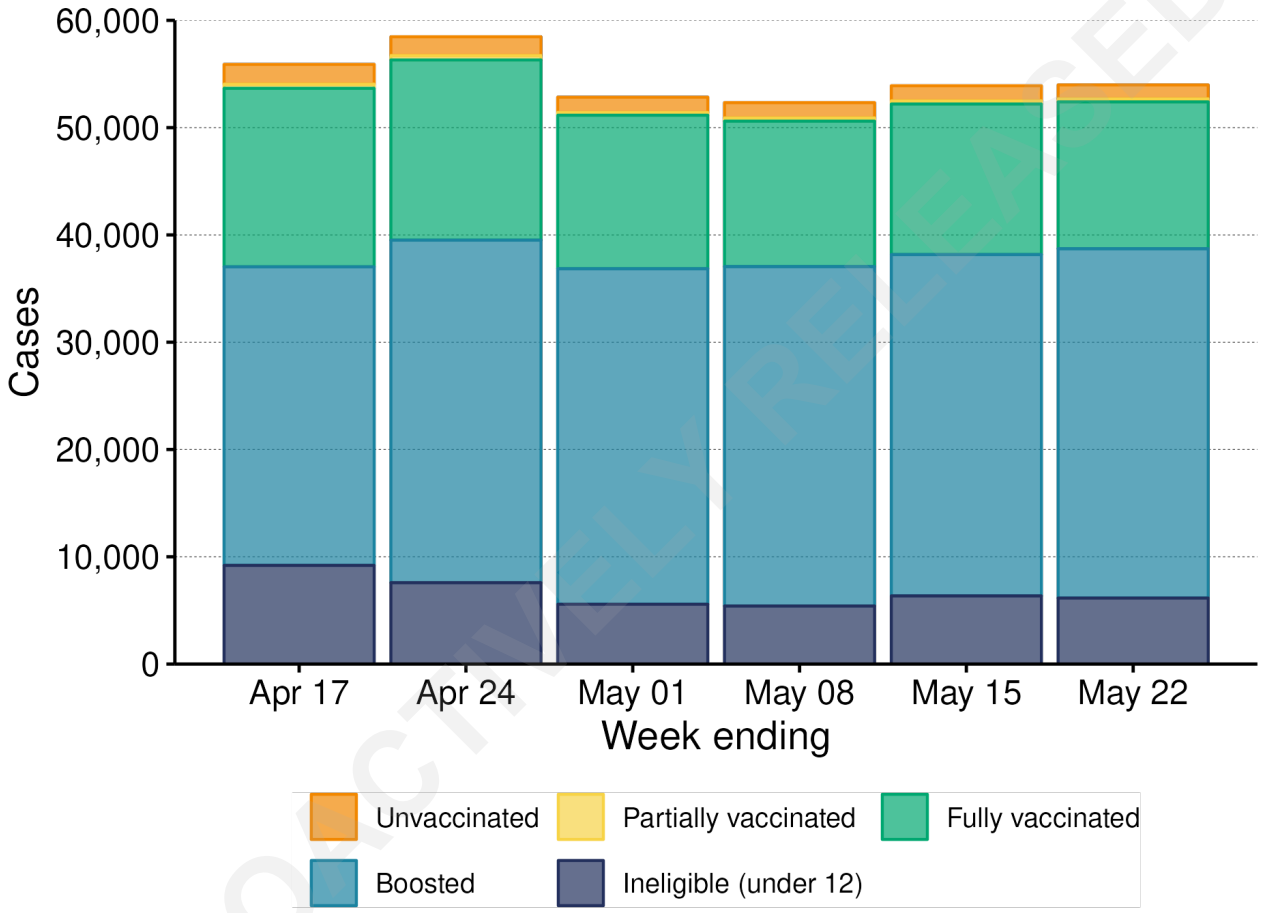
Source: NCTS/EpiSurv as at 2359hrs 22 May 2022

Vaccination trends over time

Figure 13 shows community case numbers by vaccination status nationally. The proportion of boosted cases is very similar to the week prior at 60% of all cases in the week ending 22 May. The proportion reported as fully vaccinated is also similar to the week prior at 25% of all cases in the past week.

The proportion of cases amongst those who are categorised as ineligible due to being under 12 years old[5] is 11.4%. The proportion of cases reported as partially vaccinated remains relatively constant at 0.5%, while cases reported in those unvaccinated remains similar to the week prior at 2.4%.

Figure 13: ***National weekly case numbers by vaccination status for weeks 17 April – 22 May 2022***



Source: NCTS/EpiSurv as at 2359hrs 22 May 2022

[5] Cases deemed Ineligible (under 12) are currently all cases that fall under the age of 12. Modifications to vaccination categories are being developed which will include under 12s.

PCR and RAT testing trends

Since New Zealand entered Phase 3 of the Omicron response, most testing is by rapid antigen tests (RATs) rather than PCR tests. RATs are self-administered and therefore require the individual to self-report their results, which may result in under-reporting. In addition, RATs are more likely than PCR tests to return a false-positive or a false-negative result, especially if used during early periods of infection. On the other hand, increased availability of RATs may mean that more people have tested than would have otherwise had PCR tests continued to be the main surveillance method. Testing rates and test positivity are shown for PCR testing only in the **Appendix.** Test positivity for RATs would require data on the total number of RATs used, especially negative results. As PCR testing is only used to monitor priority populations and confirm positive RATs in specific situations, these rate and positivity data are not representative of the current testing state of New Zealand.

Whole Genomic Sequencing of Community cases

This week marks the first detection of BA.2.12.1 in the community (two cases). In addition, a variant of concern of either BA.4 or BA.5 was detected in the wastewater in Auckland (Rosedale) on 15 May and Gisborne on the 16 May.

Figure 14 shows that Omicron is the dominant variant in New Zealand, having outcompeted Delta which made up ~70% of all sequenced cases in the start of January 2022 but fell to less than 10% of sequenced cases by the end of January 2022.

Among Omicron cases, BA.1 was the dominant subvariant (~60% at the start of February 2022) but has since been outcompeted by BA.2, which made up over 98% of sequenced community cases in the past two weeks. This matches international phylodynamic trends as BA.2 has enhanced transmission advantage compared to the BA.1 subvariant. The proportion of BA.1 cases sequenced continues to decline.

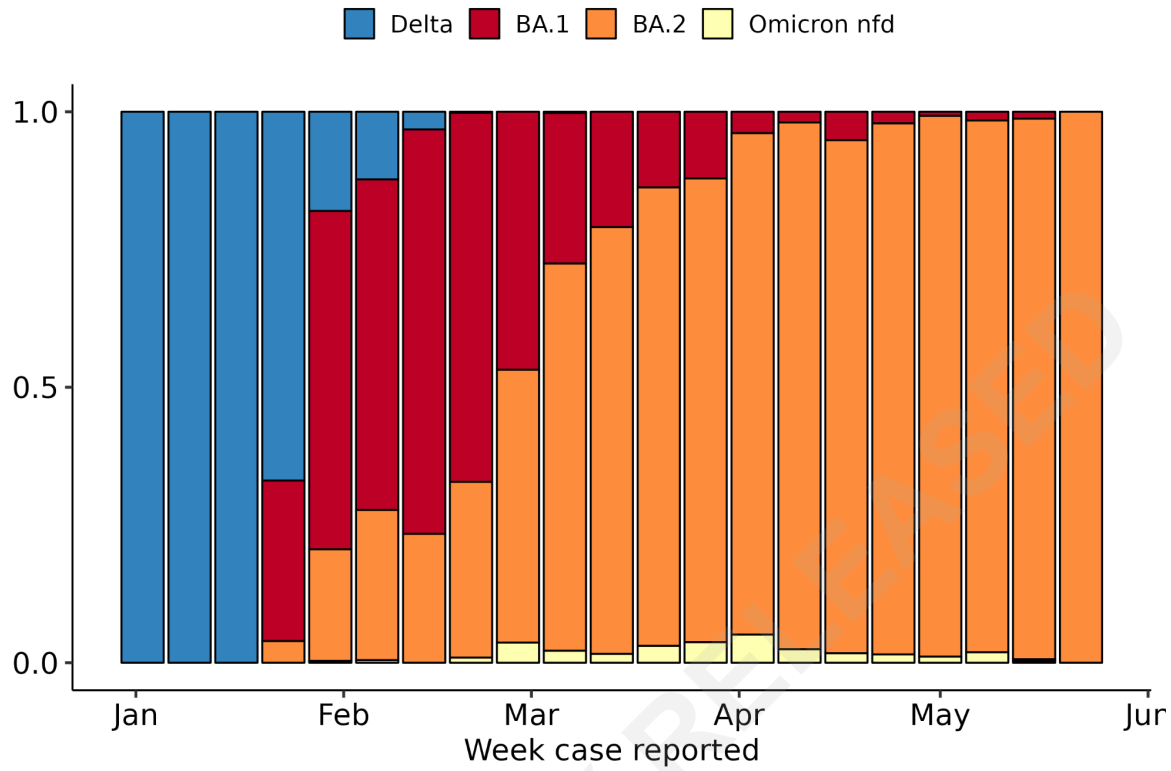
ESR's latest wastewater report indicates that between 08 May and 15 May, BA.2 was the dominant Omicron subvariant across the motu. Delta was not detected, and none of the sentinel sites yielded BA.1 genomes – in this sampling window, 100% of wastewater detections were BA.2.

Based on WGS data generated over the course of the Omicron wave, ESR estimate that 83% of all community cases (~1.07 million cases) reported since 20 January 2022 have been the BA.2 variant (**Figure 15**).

This places New Zealand in a different position to many other countries that are currently experiencing BA.4, BA.5, XE or BA.2.12.1 waves. BA.2 is closer to this most recent group of subvariants than BA.1. Therefore, due to a different variant history, it is not a given that waves seen overseas will necessarily translate to a wave of similar magnitude in New Zealand.

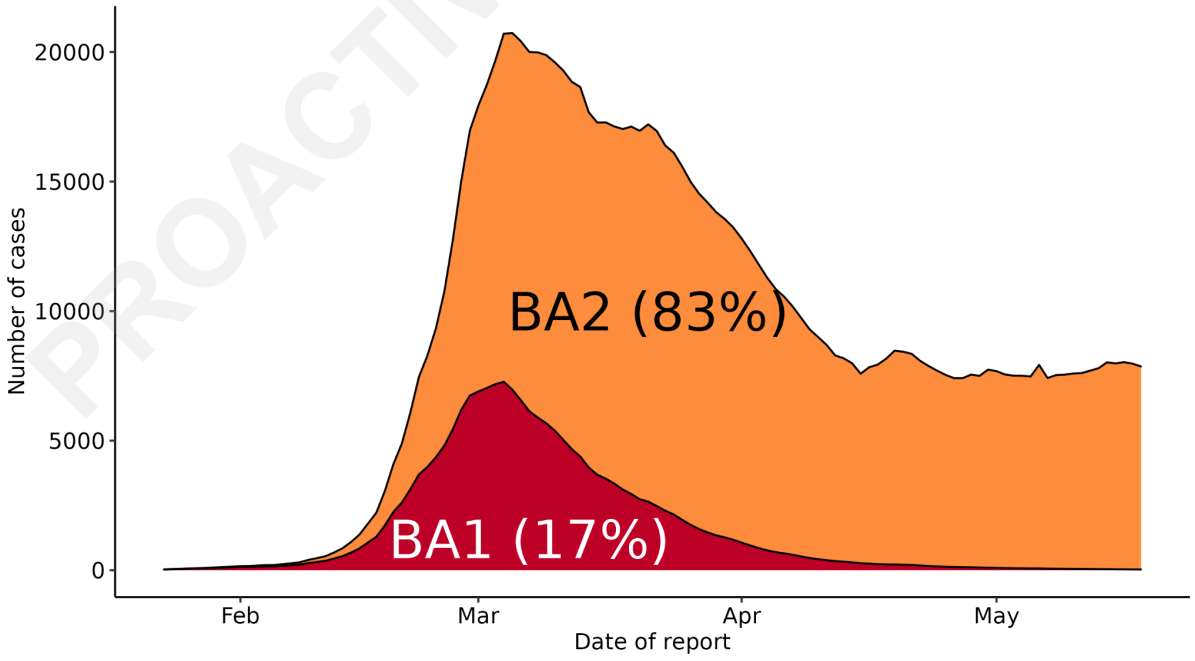
Please see the caveats in the notes section of the **Appendix.**

Figure 14: ***Frequency of Variants of Concern in community cases in New Zealand***



Source: ESR COVID-19 Genomics Insights Report #8, EpiSurv/Microreact 0900hrs 23 May 2022

Figure 15: ***Estimated contribution of BA.1 and BA.2 community cases in New Zealand since 20 January 2022***



Source: ESR COVID-19 Genomics Insights Report #8, 0900hrs 23 May 2022

Border Surveillance

Cases detected at the Air Border

Imported cases initially increased as travel volumes increase, but are reducing since early May.

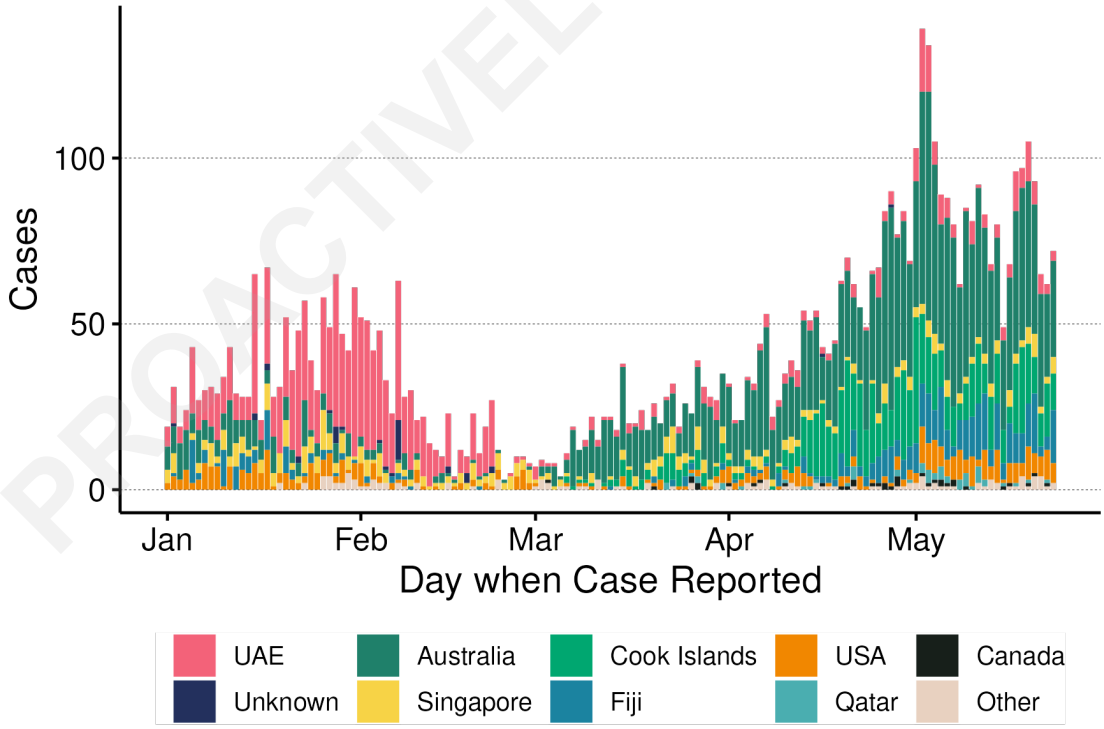
More than 1.5% of recent arrivals were reported as cases. This is above the rates seen in arrivals from Australia during quarantine-free travel in 2021, and above the 1% estimate used for planning Reconnecting New Zealand.

Figure 16 shows the number of RAT-positive cases in arrivals since January 2022. Before Reconnecting New Zealand dropped most of the quarantine requirements, most active cases were on the long-haul flights via the UAE. Since early March, most cases have arrived on flights from Australia, followed by the Cook Islands.

The spike in cases on 2 May was on the first day that citizens of visa-waiver countries could enter without quarantine.

Flights from Australia include both short-haul trans-tasman flights, and long-haul flights that transit an Australian airport. It is no longer possible to accurately track the first country in a multi-stage flight, as arrival cards are no longer scanned and data in the New Zealand Traveller Declaration system is incomplete.

Figure 16: ***Cases reported in post-arrival testing by country of flight departure, 01 January – 24 May 2022***



All cases in recent air arrivals to 11:52 AM, Tuesday 24 May 2022
Cases counted from midnight to midnight

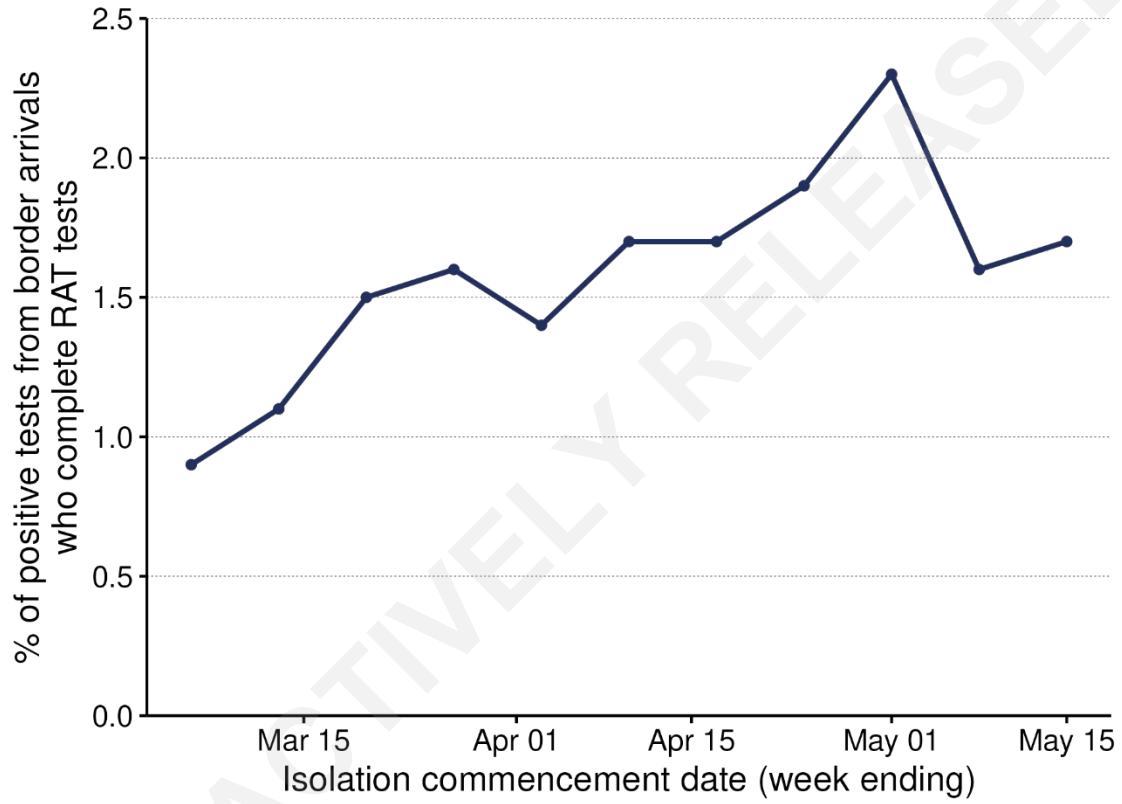
Source: NCTS/EpiSurv as at 2359hrs 23 May 2022

Testing of Border arrivals

Figure 17 shows that the percentage of positive tests among border arrivals (who reported a test) was mostly between 1 and 2% for the period 28 February – 15 May 2022.

It is important to note that testing and reporting of RATs at the border relies heavily on a 'high-trust' model and as such, it is not expected that there will be 100% compliance with testing amongst travellers.

Figure 17: ***Percentage of positive tests from border arrivals who complete RAT tests, 28 February – 15 May 2022***



Whole Genomic Sequencing of Imported cases

Figure 18 shows the completion metrics for border returnee testing and WGS. For the period 28 February – 15 May 2022, the percentage of arrivals uploading a RAT test has been constant with an average of 92.1%.

Figure 19 Error! Reference source not found.shows the border returnee testing and WGS metrics for arrivals. In the week ending 15 May, there were 35,410 border arrivals, of which 92.6 % (32,785) uploaded a RAT result upon arrival. This is slightly higher than the 92.3% from the week prior.

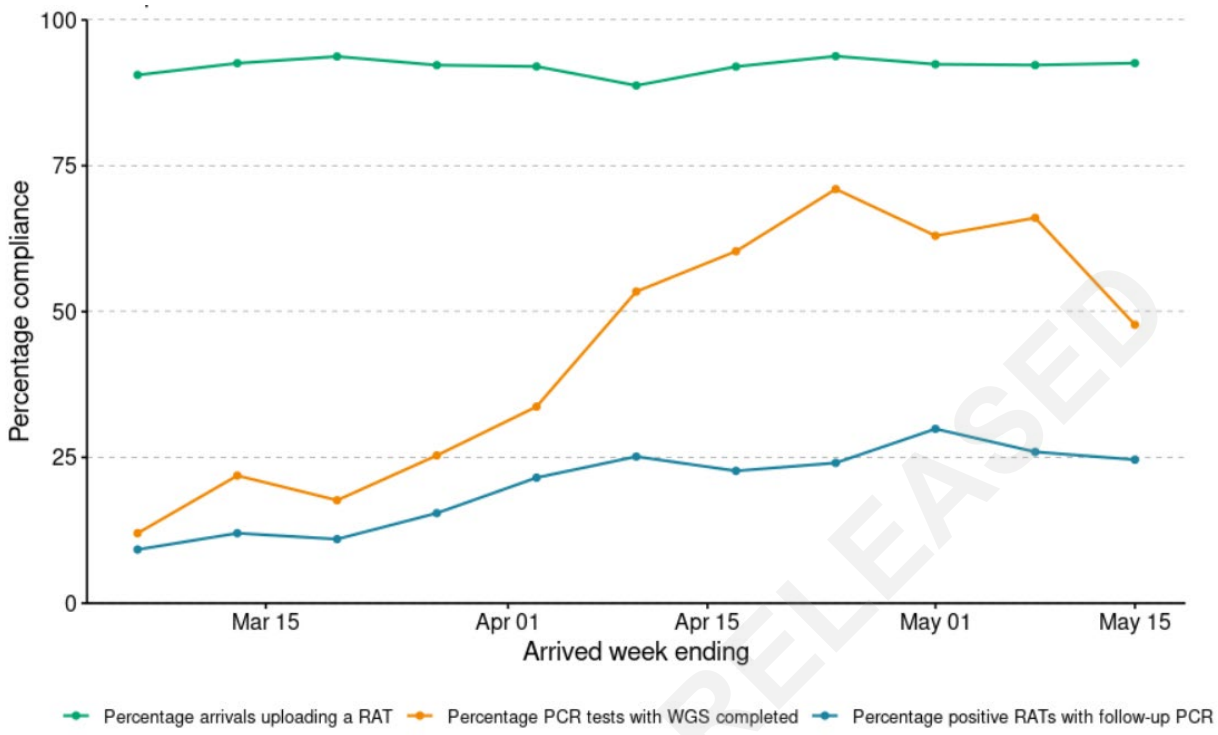
From early March to early May, there was a steady increase in the number of border arrivals returning positive RATs. This trend peaked at 1,285 in the week ending 01 May, and dropped to 902 and 943 in the weeks ending 08 and 15 May respectively. In the week ending 15 May, 24.6% of border arrivals who returned a positive RAT had a follow-up PCR test. This is slightly less than the 25.9% from the week prior.

In the week ending 15 May, the percentage of PCR positive border arrivals with WGS complete was 47.7%. **However, please note that WGS can be incomplete for recent cases.** This percentage was at 66.1% for the week ending 08 May and 63.0% for the week ending 01 May.

A case can only be referred to ESR for whole genomic sequencing (WGS) if the traveller is referred to PCR testing, and the lab then sends the PCR sample on.

Labs are notified of all positive RAT results that are known to be from recent arrivals. However, up to 10% of arrivals have not completed a New Zealand Traveller Declaration that enables data linkage, and others may not be reporting RAT results.

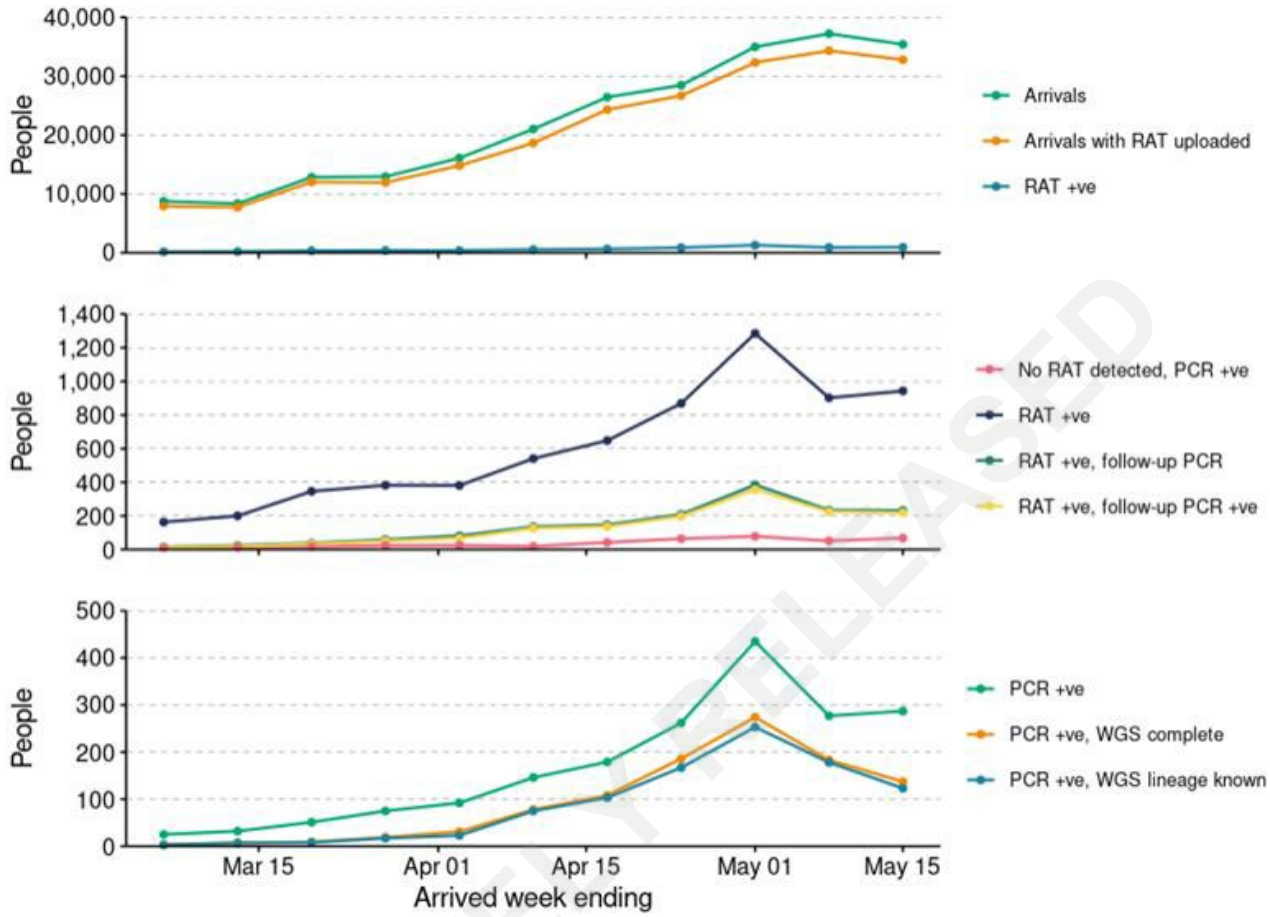
Figure 18: ***Completion metrics for border returnee testing and WGS for arrivals, 28 February – 15 May 2022***



Sources: NCTS/EpiSurv/Éclair as at 2359hrs 26 May 2022, ESR WGS 26 May 2022[6]

[6] Please note that WGS may not be completed/uploaded yet for more recent cases

Figure 19: ***Border returnee testing and WGS metrics for arrivals, 28 February – 15 May 2022***



Sources: NCTS/EpiSurv/Éclair as at 2359hrs 26 May 2022, ESR WGS 26 May 2022[7]

[7] Please note that WGS may not be completed/uploaded yet for more recent cases

Hospitalisation and Mortality

Hospitalisation Rates

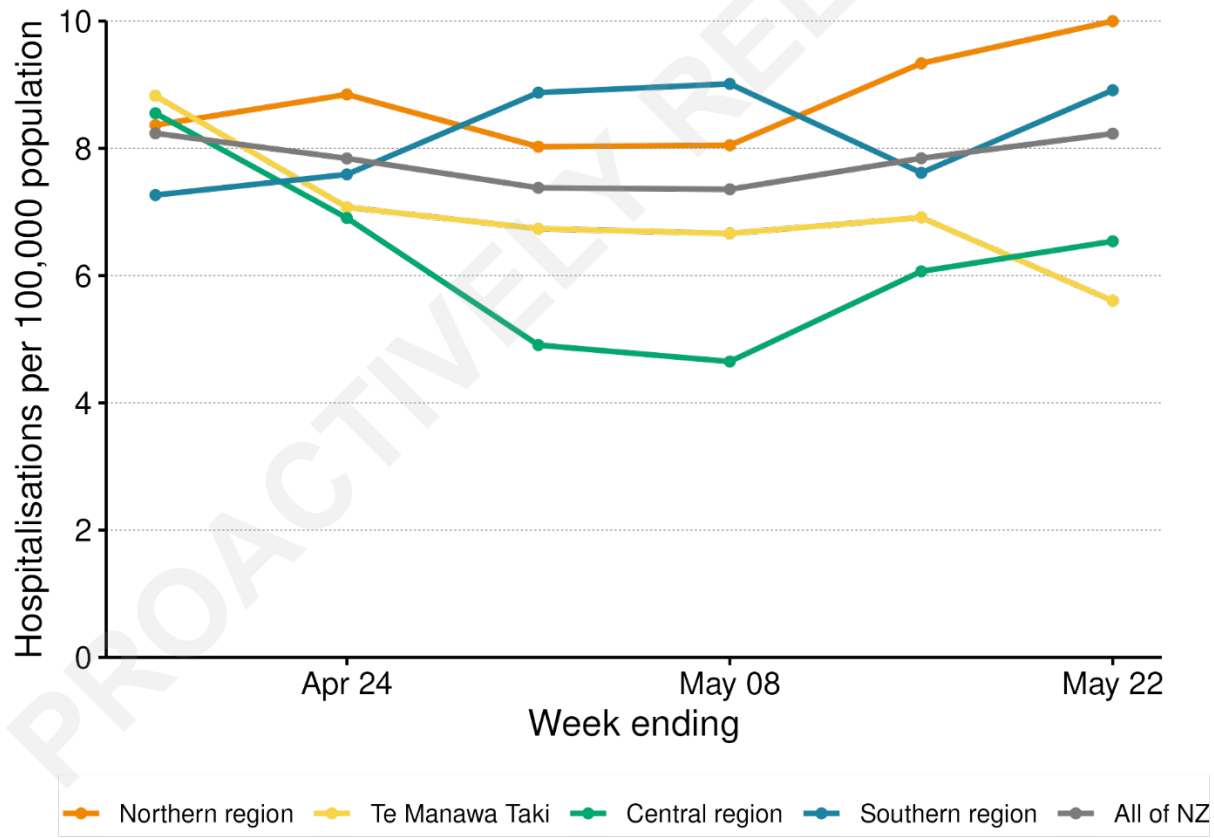
Due to varying definitions of an active case, there may be regional differences in the coding of COVID-19 infection status for hospitalisations.

Hospital Occupancy

For the week ending 22 May, the **national hospital occupancy rate was 8.2 per 100,000 population, an increase of 4.9% in the past week** (**Figure 20**).

Hospital occupancy rates have continued to vary across regions in the past week. The **Northern region (10.0 per 1,000) increased by 7.1%**, **Central (6.5 per 1,000) increased by 7.8% and Southern (8.9 per 1,000) increased by 17%**. In Te Manawa Taki (5.6 per 1,000), the hospital occupancy rate decreased by 18.9% in the past week.

Figure 20: ***Regional weekly hospital occupancy rate per 100,000 population, 11 April – 22 May 2022***



Source: Daily hospital questionnaire as of 22 May 2022

Hospitalisation rates by age and ethnicity in the Auckland Metro DHBs

Due to ongoing data issues with the demographic breakdown of hospitalisations we have removed the following section from this week's edition of the Trends and Insights report.

Whole Genomic Sequencing of hospitalised cases

As of 22 May, ESR had received samples from 57 of the 145 PCR positive cases who were hospitalised in the week to 20 May 2022. Of these, 47 (82%) had a BA.2 genome, 3 (5%) failed and 7 (12%) had not been sequenced.

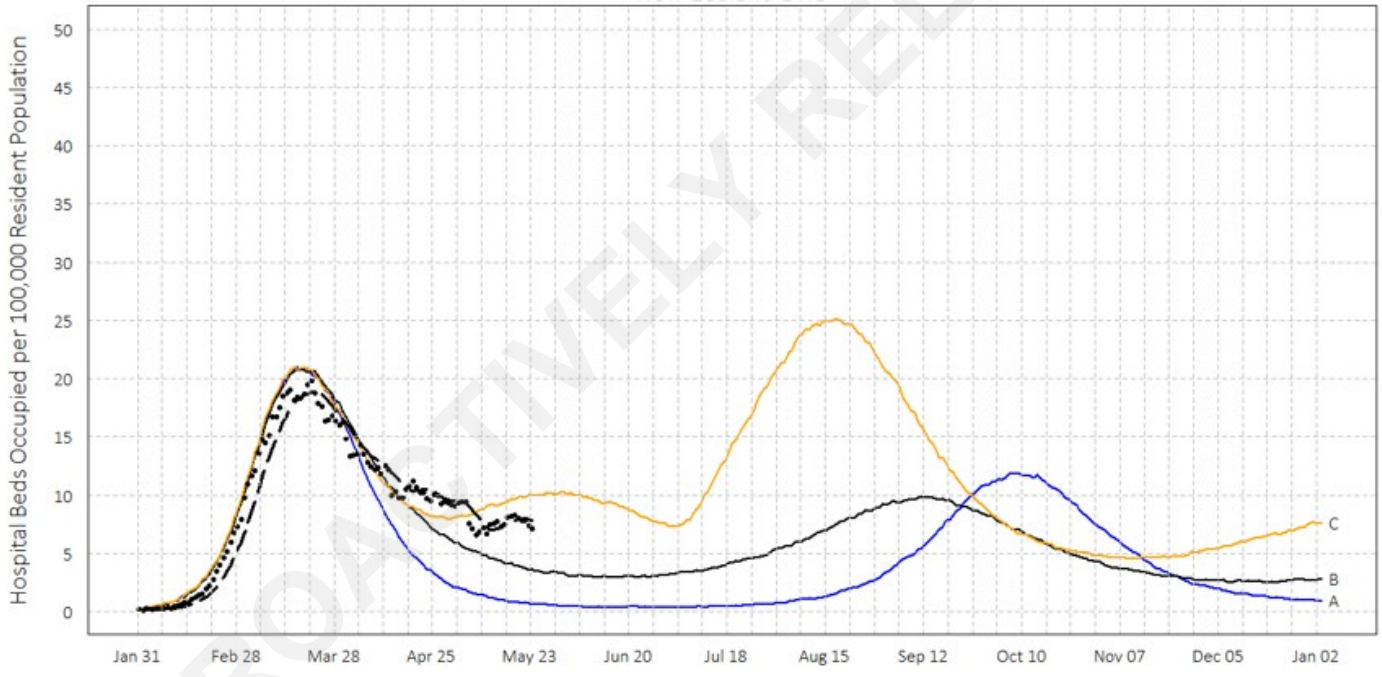
ESR now receives a daily list of active COVID-19 cases who tested positive in the past 14 days and were hospitalised in the past 7 days. ESR is working with the Ministry of Health to receive information on which cases have been admitted to ICU/HDU.

Modelled and actual hospital occupancy rate

COVID-19 Modelling Aotearoa's modelling scenarios include hospitalisations of people with COVID-19 infections (**Figure 21**).

The number of hospital beds occupied by people with confirmed COVID-19 infections is approximately 7 per 100,000 population. This count includes people hospitalised for any reason, and is tracking between the modelled scenarios B and C.

Figure 21: CMA Hospital occupancy scenarios compared to actual hospital occupancy rates



Sources: COVID-19 Modelling Aotearoa (CMA) Branching Process Model April 2022, and DHB reports to Ministry of Health of daily hospital occupancy (all COVID-19 positive people admitted as inpatients) as of 22 May 2022.

Mortality

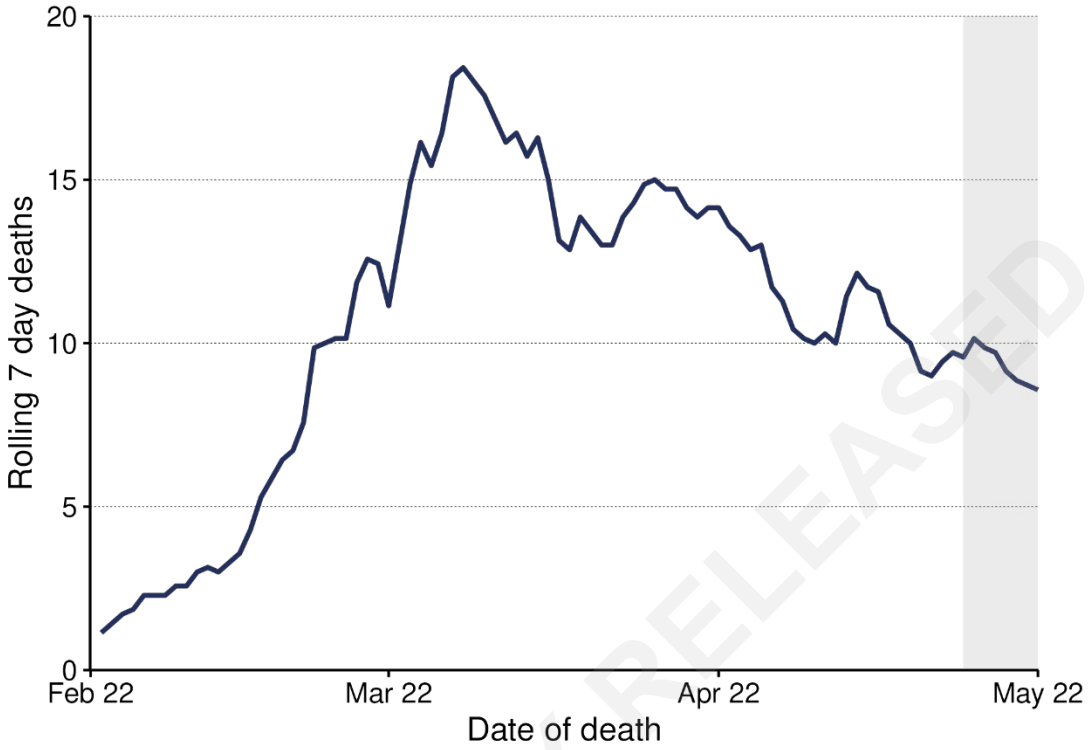
As of 26 May 2022, 1,102 people have died with or after COVID-19 infection. Of these, 1,057 have died within 28 days of being reported as a case. **Figure 22** shows the 7-day rolling average of deaths by date of death which is 9 as of 22 May 2022.

Currently deaths are tracking closely to 'C', the worst-case scenario.

All deaths where someone has died within 28 days of being reported as having a positive test result for COVID-19 are now reported. This approach is in line with that taken by other countries such as the United Kingdom; it ensures that all cases of COVID-19 who die are formally recorded to help provide an accurate assessment of the impact of COVID-19.

All of the deaths within 28 days of a postive test report are fast-tracked for clinical coding, to determine whether the infection caused the death, contributed to the death, or was unrelated to the death. An example of an unrelated death is a car accident; an example of a COVID-19 contributing is a person who dies with an existing health condition combined with COVID-19.

Figure 22: ***7-day rolling average of COVID-19 deaths by date of death, 22 February – 22 May 2022***



Source: NCTS/EpiSurv as of 22 May 2022[8]

[8] Note, this is a 7-day rolling average of deaths by date of death. In the shaded grey area, additional deaths may still be pending report.

All cause death rates

The following figures provide a measure of the overall rate of deaths in New Zealand during the pandemic compared to pre-pandemic years. It is not a measure of people known to have died from COVID-19; it reflects all causes of deaths during this time. This is an experimental analysis on excess mortality (Please note: These have not been formally peer-reviewed and are not Official Statistics).

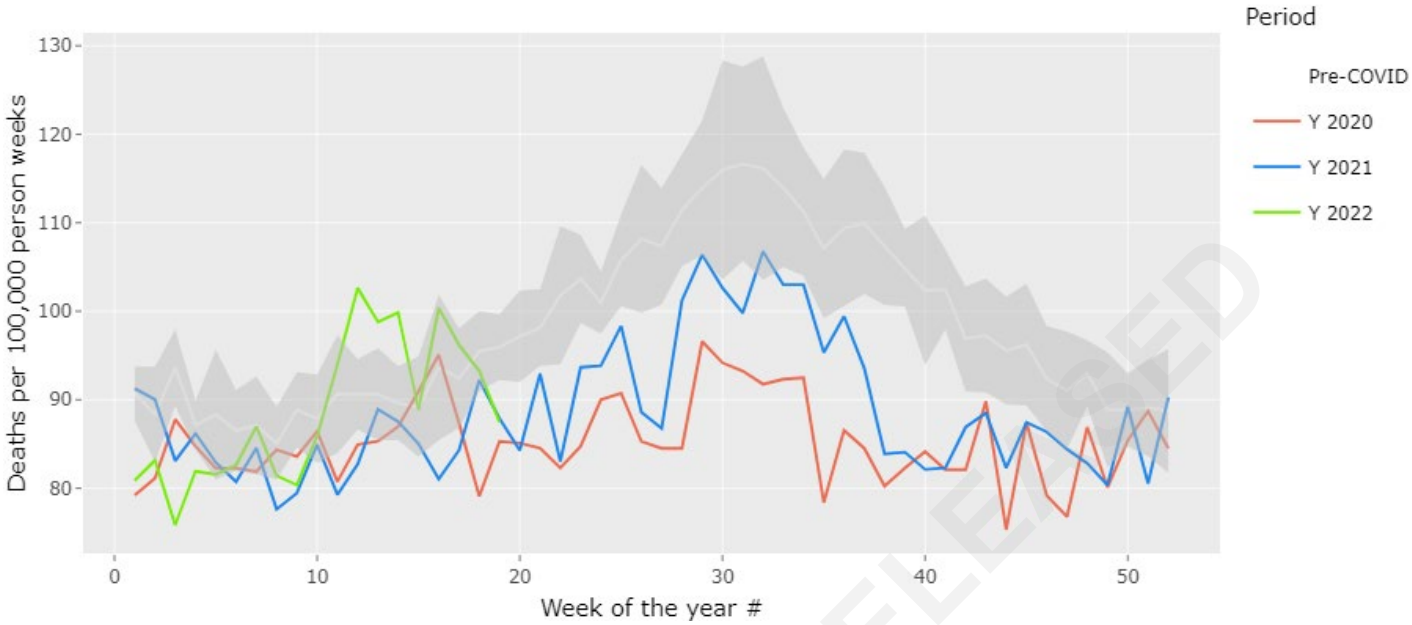
These data compare observed death rates in New Zealand throughout the epidemic (2020 – present) to pre-epidemic averages in death rates taken between 2012 – 2019, averaged across each week in the period (e.g., the mean of all week 10s across 2012 – 2019 is taken, and the range is specified as 1 standard deviation from this mean).

Mortality data comes from the Department of Internal Affairs (DIA) after a two-week reporting lag. Information shown here indicates deaths up to 08 May 2022. The date of death is used by DIA to assign deaths to a given week.

All cause death rates have dropped below the pre-pandemic range for those 70 years and older for the three weeks ending 08 May. (We define this as 1 standard deviation from the mean rates). In the week ending 08 May, weekly all cause death rates were 87 per 100,000. However, the latest death numbers are likely to revise upward as more death registrations come in through the DIA system.

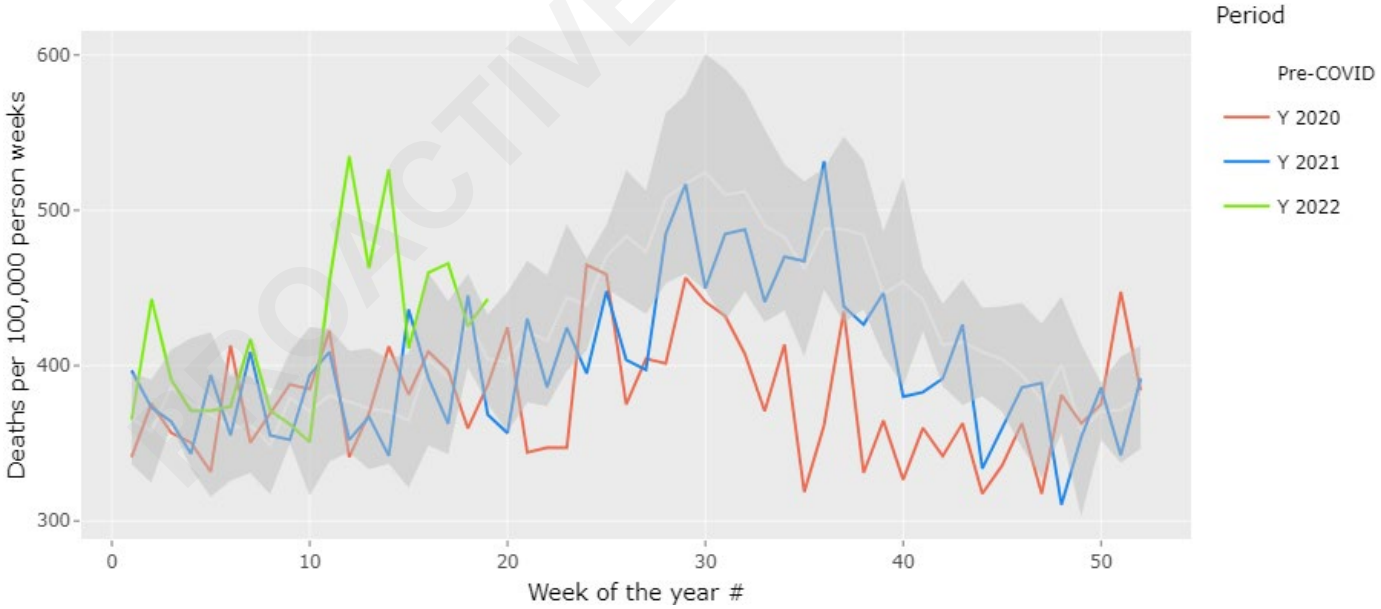
When looking at weekly all cause death rates for those 90 years and older in **Figure 23** we see that deaths in the 90+ age group contribute significantly to the overall death rates of those 70 years and older. As seen in **Figure 24**, weekly all cause death rates for those >90 years of age have risen above the observed pre-pandemic range in the week ending 08 May. In the week ending 08 May, weekly all cause death rates were 443 per 100,000 for >90 years old. Note, as above, the latest death numbers are likely to revise upward as more death registrations come in through the DIA system.

Figure 23: ***Weekly all-cause death rates for 70+ year-olds during 2020, 2021 and 2022, compared to pre-COVID-19 average (2012-2019)***



Source: StatsNZ, 22 May 2022

Figure 24: ***Weekly all-cause death rates for 90 year-olds and over compared to pre-COVID-19 average (2012-2019)***



Source: StatsNZ, 22 May 2022

International and Scientific Insights

Please note, global trends in cases and deaths should be interpreted with caution as several countries have been progressively changing COVID-19 testing strategies, resulting in lower overall numbers of tests performed and consequently lower numbers of cases detected.

Overseas waves and the likely impacts of new variants, policy changes and waning immunity

Globally, new weekly COVID-19 cases have increased slightly during the reporting period (16 May to 22 May 2022), with just over 3.7 million cases reported, a 1% increase as compared to the previous week. The number of new weekly deaths continues to decline, with just over 9,000 fatalities reported during the same period, representing a 4% decrease as compared to the previous week.

At the regional level, the number of new weekly cases increased in the Region of the Americas (+13%) and in the Western Pacific Region (+6%), while decreasing trends were observed in the remaining four regions. The number of new weekly deaths increased in the Eastern Mediterranean Region (+30%), remained stable in the Western Pacific and the Region of the Americas (both <1%), and decreased in the other three regions.

The WHO has stated that available data suggests that globally, BA.4, BA.5 and BA.2.12.1 appear to be spreading faster in countries with substantial prior waves of cases due to BA.1; while countries that experienced more substantial BA.2 waves appear to have fewer cases due to BA.4, BA.5 and BA.2.12.1 at this stage. The extent of vaccination, public health measures, seasonal and behavioural effects in each country also likely influences the impact of these emerging Omicron lineages.

USA

The US is currently reporting a 7-day average of more than 100,000 reported cases for the first time since February 2022. Cases are rising in nearly every state, with the true count likely higher than official figures due to underreporting in some areas. Cases appear to be stabilizing in some North-eastern states that were among the first to see a spring surge in cases.

The Center for Disease Control and Prevention (CDC) warned that one third of Americans now live in areas with "medium to high" levels of virus transmission.

Hospitalisations are increasing in all but five states and territories. Though the number of COVID-19 patients hospitalised nationwide remains far below peak levels, it has increased by 29% in recent weeks to an average of more than 23,000 per day.

Using Nowcast modelling, the US estimates that between 15 to 21 May approximately 58% of sequenced cases are BA.2.12.1, 39% are BA.2 and 3% are BA.1.

Australia

Case growth is slowing in Australia as the Western Australia outbreak peaks. 96% of sequences have been identified as BA.2, though BA.4, BA.5 and BA.2.12.1 have all been detected at low levels.

Portugal

Following a large outbreak in January/February 2022, driven by BA.1 and BA.2, Portugal is now experiencing a surge in cases, with prevalence of BA.5 increasing. PCR S-gene target failure (SGTF) data indicates that BA.5 may now make up over 60% of sequences in Portugal, however the delay in genomic sequencing and reporting prevents confirmation of this at this stage.

Vaccinations

Medical professionals in Australia are calling for the flu vaccine to be made free nationwide, as hospitalisations rise, driven by increasing flu rates alongside high levels of COVID-19 infection across Australia. Just 24% of adult Australians have received a flu vaccine, while over 10,500 flu cases and 153 hospital admissions due to influenza have been reported in Australia to 8 May, almost all cases subtyped have been influenza A.

As of 13 May 2022, 36 jurisdictions have rolled out fourth doses. Of those 36, only Chile, El Salvador, Hungary, Israel, Laos and Mongolia have rolled out fourth doses to all adults. In Germany, fourth doses are recommended for specified priority groups such as people over 70, priority populations and health care workers.

In other jurisdictions, including Australia, Canada, France, Hong Kong, Singapore, South Korea, Spain, United Kingdom and United States, fourth doses are recommended for priority populations only, such as older age groups or immunocompromised people. Australia also recommends a fourth dose for Aboriginal and Torres Strait Islanders aged 50 years and older.

Primary evidence on effectiveness of infection prevention and control measures

This section outlines some of the available literature about the effectiveness of infection prevention and control (IPC) and public health measures. It is not intended to be a systematic review of all available evidence, but to provide an overview of available evidence.

- An observational study on the impact of contact tracing and testing on controlling COVID-19 without lockdown in Hong Kong found i) that restoring social distancing measures without maintaining tracing and testing efficiency was not enough to prevent growth of the outbreak; ii) a rise in number of daily cases increased the probability of confirmation delay among contact-traced cases; iii) testing at-risk groups reduced the probability and the duration of confirmation delay among contact-traced cases.
- A cross-sectional study comparing OECD countries in evaluating economic outcomes found that non-pharmaceutical interventions effectively contained the outbreaks and had positive impacts in lowering unemployment rates.
- A modelling study points to the role of super-spreader events in the contribution of novel variant predominancerom a public health perspective, the results give weight to the need to focus NPIs on preventing large super-spreader events (10 or 20 secondary infections from single infected individual).
- A preprint study on social gatherings and transmission found that small gatherings, due to their frequency, can be important contributors to transmission dynamics and that because gathering size distributions are "heavy-tailed", a meaningful reduction in new cases only occurs once restrictions are set quite low (to achieve reduction in cases of 50% or more, restrictions must be set below 30 in most settings)
- An Australian study found that in the early phase of an outbreak, containing a wild type-dominant epidemic to a low level (≤10 cases/day) would require effective combinations of social distancing and face mask use interventions to be commenced before the number of daily reported cases reaches 6. Containing an Alpha-dominant epidemic would require more stringent interventions that commence earlier. For the Delta variant, public health interventions alone would not contain the epidemic unless the vaccination coverage was ≥70%.
- A systematic review of economic evaluations of COVID-19 interventions found that treatment, public information campaigns, quarantining identified contacts/cases, cancelling public events, and social distancing were deemed highly cost-effective. The authors also concluded that accounting for broad non-health impacts and distributional effects is essential for a comprehensive assessment of interventions' value.

Health System Capacity

Omicron Dashboard

The Omicron dashboard (**Figure 25**) provides oversight of how the health system is being impacted by the Omicron outbreak. It uses data gathered from various clinical and health sector indicators. On the following page is the summary of indicators for the week ending 19 May 2022.

Figure 25: *Omicron Health Sector Clinical Indicators Dashboard summary, week ending 19 May 2022*

Sector	Summary of data
General Practice & Urgent Care	Sector leaders have not raised any new items of concern over the past week. GP Qualifying Encounter Date rates for under 4 year olds have been adversely affected by national lockdowns and COVID-19 restrictions. There is little sign of recovery over time in these age ranges which will continueto be monitored.
Aged Residential Care	20% of the 656 Aged Residential Care (ARC) facilities have at least one active COVID-19 case (134of 656 facilities). This is a reduction in the number of facilities from last weeks total of 145 facilities. A significant increase in case numbers in ARC facilities has been seen this week in the Hutt Valley, Nelson Marlborough, Northland, Waitemata and South Canterbury.
Māori Health Providers	Māori health providers continue to work with the community to increase vaccination rates across all ages. The ratios for Māori vaccinations compared to Non-Māori remain unchanged since March 2022 for both 5-11 year vaccinations and booster vaccinations.
Pacific Health	Pacific providers continue to use innovative ways to promote vaccination across the Pacific population. Vaccination rates continue to be lower than Non-Pacific Non-Māori
Emergency Ambulance Service	The number of 111 calls received and the number of incidents attended by ambulances increased slightly above forecast levels last week. Nationally, ramping times are reducing (<4mins) however remain higher in Auckland
Mental Health	Nothing to escalate from the Mental Health & Addictions Inpatient Units this week. Calls to the Mental Health and Addiction telehealth support service remain around 3,000 calls per week.
Disability providers	The Ministry continues to work with key stakeholders and communities within the disability system, across the wider Health sector and through interagency work, to ensure the Omicron response meets the needs of disabled people and continues to protect those at greater risk.
Hospital	There continues to be ongoing capacity constraints across the motu. The number of facilities that report 15 or more censuses to be over 90% occupancy has gone up to 11 hospitals, compared to only 5 hospitals a month ago. There was an increase in COVID-19 hospitalisations this week.
ED	The overall % for all patients seen and treated within 6 hours is the lowest it has been this year, at 74% and the lowest it hasbeen this year for non-admitted patients at 80% seen and treated within 6 hours. Overall there was a 3% increase in ED presentations this week out of the 19 DHBs that reported. There were increases in all three Auckland metro DHBs, but in particular in Counties Manukau, reporting a 15% increase
Planned Care (Hospital)	Waikato DHB is the only hospital that has resumed planned care fully, all other regions have resumed planned care to some extent however are being impacted by capacity and staffing constraints. Elective surgery waiting list numbers continue to grow, particularly through January to March 2022.The waiting list grew by 3887 patients from January to March 2022; 21% of the increase were Māori patients.
Pharmacy	Steady increase in prescriptions of oral therapeutics for COVID-19 –2,538 courses supplied to date (17/05/22). Pharmacies are still experiencing reduced staffing due to sickness as well as long term pharmacy workforce shortages.
Home and Community Support	Reduction in total numbers of employees compared with Oct-Dec last year continues along with a reduction in total services delivered.
COVID care in the community	Over 98% of positive COVID-19 cases have been consistently contacted daily over the past week. Increases in completion of the assessment form online by Māori and Pacific continues to be seen this week.
Rural Health	Pressure across the rural hospitals appears to have eased this week. Staffing shortages are still being reported.

Sources: Omicron Health Sector Clinical Indicators Dashboard, 19 May 2022

COVID-19

Trends and Insights Report

Updated 27 May 2022

Appendix Document

Contents

Data & Notes

Data Sources

Community Cases

Data on community cases is sourced from a combination of the National Contact Tracing Service (NCTS) and EpiSurv (New Zealand's public health surveillance platform).

Whole genome sequencing (WGS)

All information on WGS is sourced from the ESR COVID-19 Genomics Insights (CGI) Report which provides a weekly overview of SARS-CoV-2 genomic surveillance across the country.

Prevalence Estimates

National estimates of underlying infection incidence are based on the weekly test positivity in routinely asymptomatically tested populations, assuming therefore that their positivity rates are indicative of their underlying infection rates. The populations identified for these estimates using surveillance codes provided for testing data are border, emergency, and healthcare work forces, as well as hospital inpatients. Inpatient estimates are also produced based on a direct data feed from the Northern Region, rather than identifying inpatients in the national testing database; they are therefore more accurate than the national figures. However, this data is currently only available for the Northern Region.

Wastewater quantification

The wastewater analysis has been undertaken at the ESR Kenepuru and Christchurch Laboratories.

Data limitations

Prevalence estimates based on routinely tested populations

- The groups of routine testers that have been identified (Health care, border and emergency workers, and hospital inpatients) are not a representative sample of New Zealanders, overall, they are higher risk than the general population.
- The identification of these groups at a national level is based on surveillance codes, which may not be completed accurately, particularly since the introduction of RAT testing.
- The national estimate is for people who have uploaded at least one test result in the week, so will be an over-estimate if negative test results are not being recorded for these groups.
- National level estimates will be masking differing trends be region.
- Northern region hospital inpatient data, while likely to be more accurate than the national level data, still reflect a higher-risk group, and neither the estimates nor the trend are generalisable outside of the Northern Region
- The identification of these groups is based on surveillance codes, which may not be completed accurately, particularly since the introduction of RAT testing.
- The population has been identified based on ever having a surveillance code related to the respective workforce and having at least 2 tests (at least one of which was negative) in 2022. A sensitivity check was run using at least 3 tests, while this numbers reduced, the incidence estimates remained very similar.

Wastewater quantification

- Approximately 1 million people in New Zealand are not connected to reticulated wastewater systems.
- Samples may be either grab or 24 hr composite samples. Greater variability is expected with grab samples.
- While a standard method is being used, virus recovery can vary from sample to sample.
- SARS-CoV-2 RNA concentrations should not be compared between wastewater catchments.
- Day to day variability in SARS-CoV-2 RNA concentrations especially in smaller catchment is to be expected.
- Recent changes to the way case data is collected and processed may have resulted in some uncertainties in the cases counts, and the catchments to which they are mapped. While this is being resolved, the case data presented in this report should be used as a guide only and is subject to change. ESR are continuing work to improve the algorithms for how cases are assigned to wastewater catchments, including integrating a new meshblock data feed recently made available from NCTS.

Acknowledgements

ESR – routine testing estimates and wastewater quantification. Thomas Lumley for advice on proxy indicators.

Case Demographic Tables

DHB	Community cases reported since 16 May to 22 May 2022	Rate per 1,000
Northland	1525	8.0
Waitemata	7699	11.6
Auckland	5917	11.7
Counties Manukau	5099	8.8
Bay of Plenty	1784	6.2
Waikato	4111	9.1
Tairawhiti	423	9.1
Lakes	944	8.0
Taranaki	1560	11.7
Hawke's Bay	1824	9.4
Whanganui	669	8.0
MidCentral	1743	9.8
Hutt Valley	1459	9.2
Capital and Coast	3636	11.4
Wairarapa	493	12.2
Nelson Marlborough	1763	11.2
West Coast	548	15.2
Canterbury	7826	14.2
South Canterbury	857	14.9
Southern	4072	14.8
Unknown	31	
Total	**53983**	**10.8**

Regions	Community cases reported since 16 May to 22 May 2022	Rate per 1,000
Northern	20240	10.6
Te Manawa Taki	8822	9.0
Central	9824	10.4
Southern	15066	13.1
Unknown	31	-
Total	**53983**	**10.8**

Ethnicity	Community cases reported since 16 May to 22 May 2022	Rate per 1,000
Māori	5742	7.5
Pacific Peoples	2321	6.3
Asian	8077	11.0
European or Other	37418	12.0
Unknown	425	-
Total	**53983**	**10.8**

Sex	Community cases reported since 16 May to 22 May 2022	Rate per 1,000
Female	29190	11.4
Male	24747	10.1
Unknown	46	-
Total	**53983**	**10.8**

Age	Community cases reported since 16 May to 22 May 2022	Rate per 1,000
0-9	4618	7.1
10-19	8115	12.7
20-29	7939	11.8
30-39	8593	12.5
40-49	8551	13.6
50-59	7306	11.4
60-69	4659	8.7
70+	4202	7.8
Total	**53983**	**10.8**

Rate per 1,000

National	Māori	Pacific Peoples	Asian	European or Other	Total
Total	7.5	6.3	11.0	12.0	10.8

Northern	Māori	Pacific Peoples	Asian	European or Other	Total
Northland	6.2	7.5	7.9	8.9	7.9
Waitemata	9.2	8.6	12.0	13.2	12.2
Auckland	9.2	6.2	1.2	13.8	12.0
Counties Manukau	5.7	4.9	9.7	11.8	8.6
Total	**7.1**	**5.9**	**11.1**	**12.5**	**10.6**

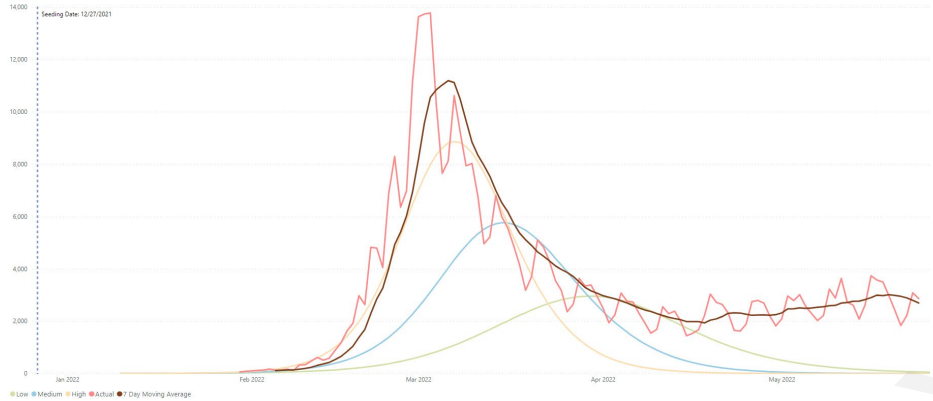
Te Manawa Taki	Māori	Pacific Peoples	Asian	European or Other	Total
Bay of Plenty	4.4	2.9	5.8	8.0	6.9
Waikato	6.7	7.4	10.0	10.6	9.6
Tairawhiti	7.7	5.9	5.7	9.2	8.2
Lakes	5.7	8.2	7.1	9.9	8.2
Taranaki	9.0	16.0	13.6	13.4	12.7
Total	**6.2**	**7.1**	**8.9**	**10.2**	**9.0**

Central	Māori	Pacific Peoples	Asian	European or Other	Total
Hawkes Bay	7.0	6.4	13.0	11.8	10.5
Whanganui	7.5	2.7	8.3	11.0	9.8
MidCentral	7.8	6.2	7.3	10.4	9.6
Hutt Valley	6.1	5.4	9.0	10.8	9.4
Capital and Coast	8.9	6.5	10.3	12.7	11.5
Wairarapa	6.3	6.6	11.1	11.1	10.1
Total	**7.4**	**6.1**	**9.8**	**11.6**	**10.4**

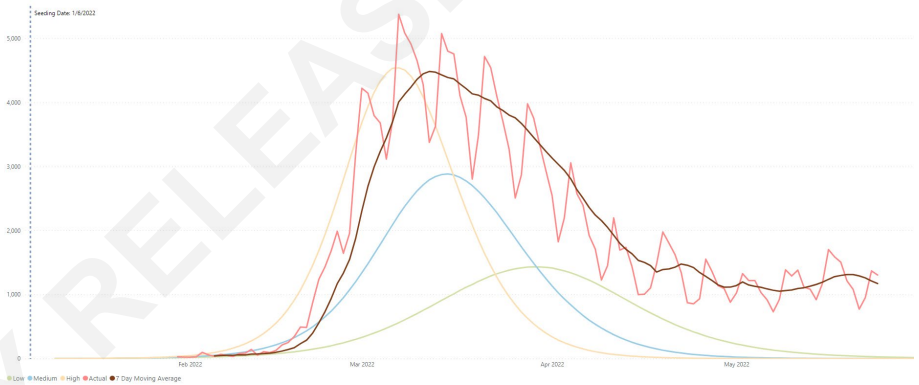
Southern	Māori	Pacific Peoples	Asian	European or Other	Total
Nelson Marlborough	9.0	9.5	11.1	11.4	11.2
West Coast	18.5	16.3	23.6	16.5	16.9
Canterbury	12.3	9.6	13.9	14.1	13.8
South Canterbury	12.1	4.2	11.5	14.6	14.0
Southern	10.6	9.8	13.1	12.3	12.1
Total	**11.5**	**9.5**	**13.5**	**13.3**	**13.1**

COVID Modelling Aotearoa

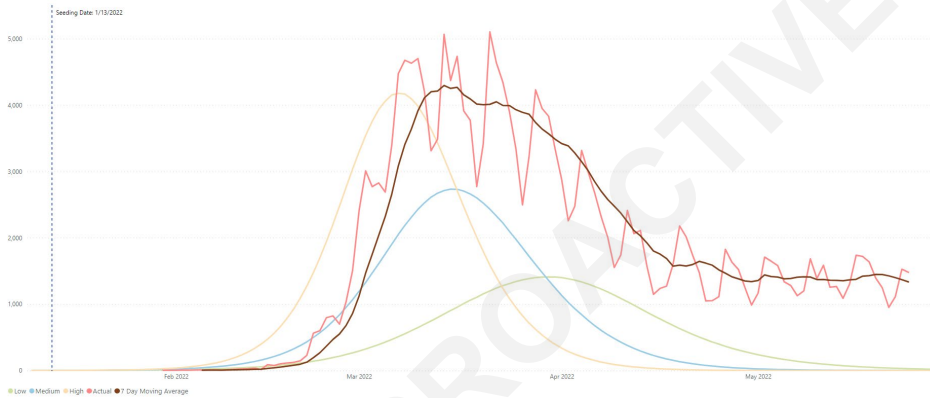
Northern Region



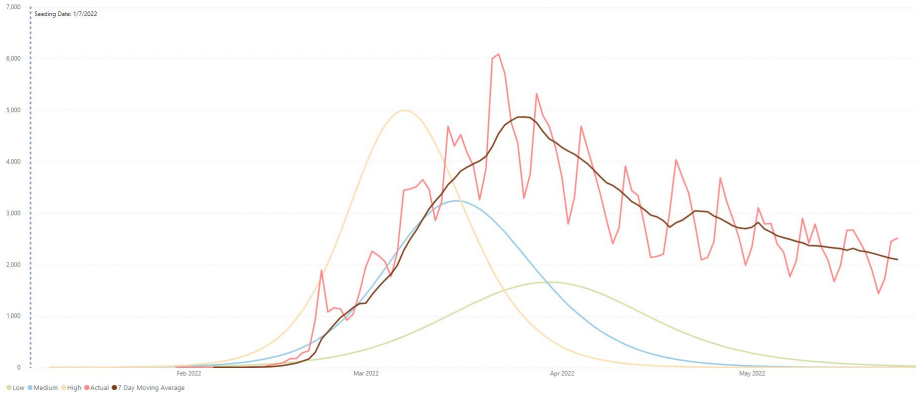
Te Manawa Taki (Midlands)



Central Region



Southern Region



Sources: TAS, based on COVID-19 Modelling Aotearoa Branching Process Model 14 April 2022, and Ministry of Health reported case data to 25 May 2022

EpiNow

Table 1: ***Estimated median effective R (R_{eff}) by Public Health Unit region, for cases to 21 May*** **2022**

Public Health Unit region	**R_{eff} (90% Credible Interval [CI])**
Northland	0.9 (0.6-1.1)
Auckland	0.9 (0.7-1.1)
Taranaki	1.0 (0.7-1.2)
Waikato	1.0 (0.7-1.1)
Toi Te Ora	1.0 (0.8-1.2)
Tairawhiti	0.7 (0.3-1.3)
Regional Public Health (Wellington Region)	1.0 (0.8-1.1)
Mid Central	1.0 (0.8-1.2)
Hawkes Bay	1.0 (0.6-1.3)
Canterbury/ South Canterbury	1.0 (0.8-1.2)
Southern	0.9 (0.7-1.0)
Nelson Marlborough	0.9 (0.6-1.3)
West Coast	1.0 (0.9-1.2)
National	**1.0 (0.8-1.1)**

ESR Wastewater

Interpreting site graphs

Sample collection method. Results based on autosampler may be more representative than grab sample-based results.

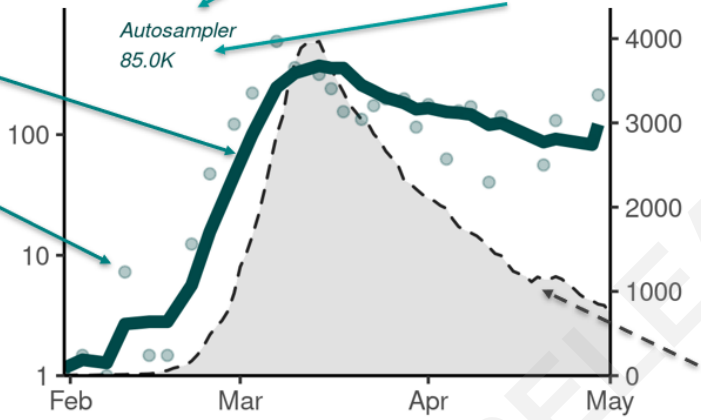
Wastewater Results

Rolling 14-day average of genome copies/day/person **shown as solid line**

Individual wastewater sample results are shown as **circles**

Log_{10} scale

Population of wastewater catchment



Rolling seven-day average **new cases** in the catchment based on onset date of illness, or if not available the laboratory sample date

Dotted line (shaded)

Linear scale

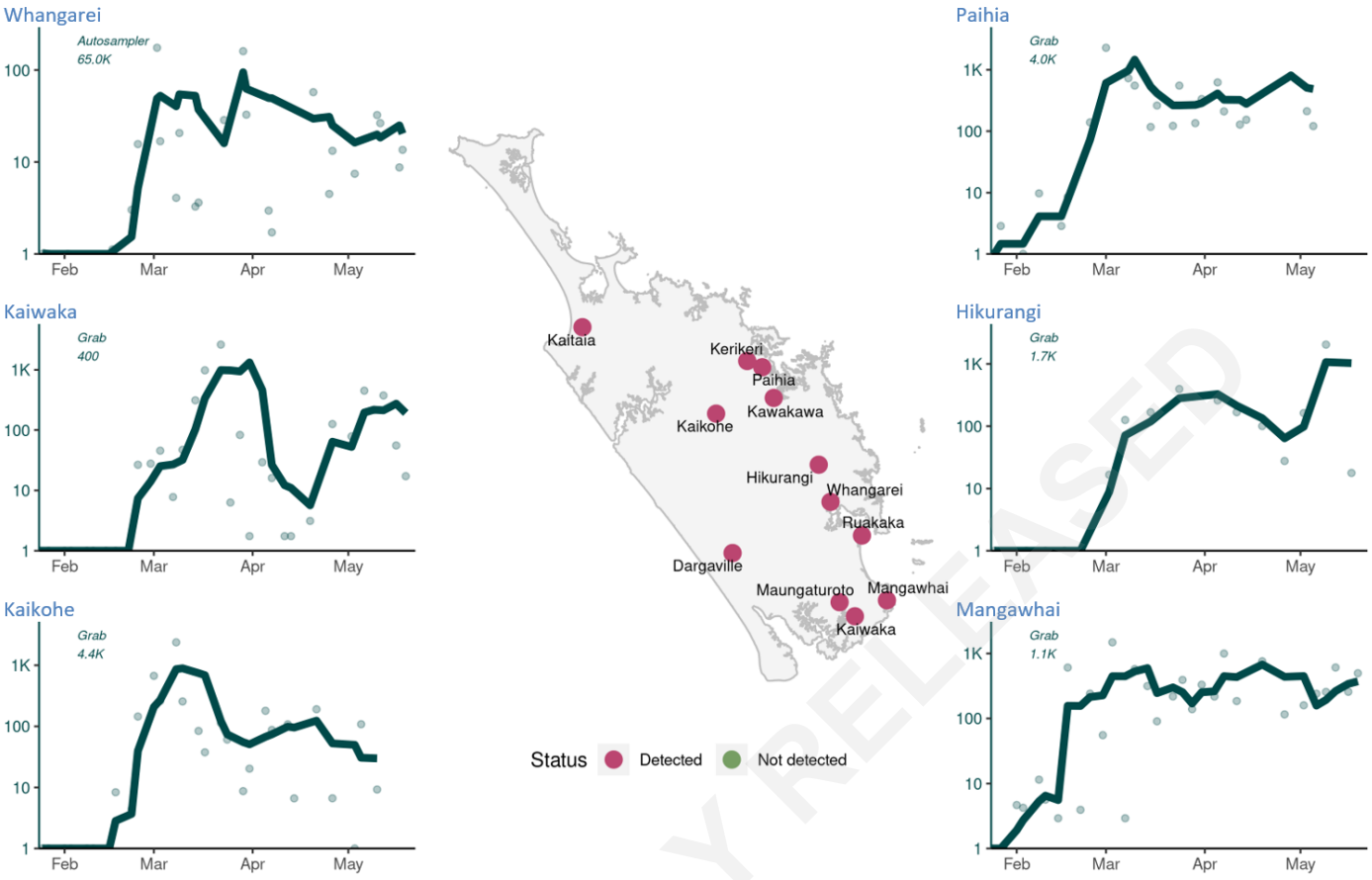
Genome copies/mL x Daily wastewater influent (m^3) = genome copies x 10^4/day

Genome copies/day ÷ population = genome copies x 10^4/day/person

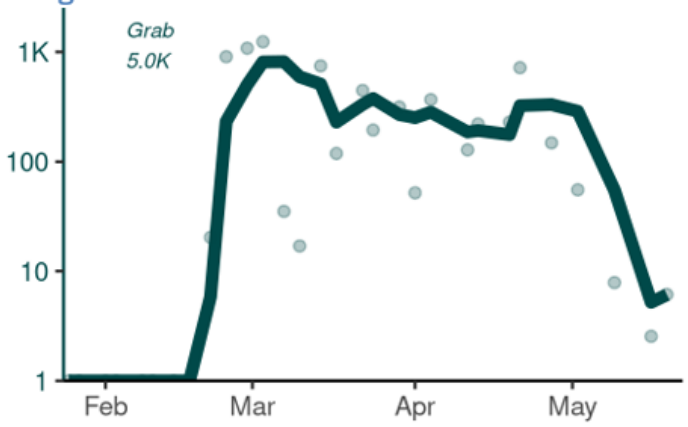
Note the scales may differ for each graph

Wastewater results are on log_{10} scale, while case data is on a linear scale.

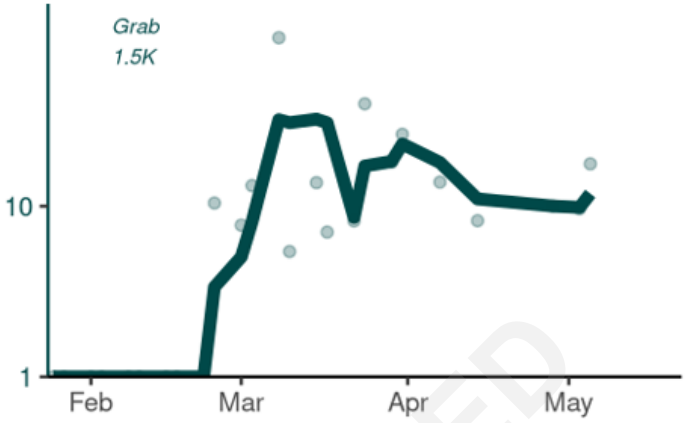
Northland



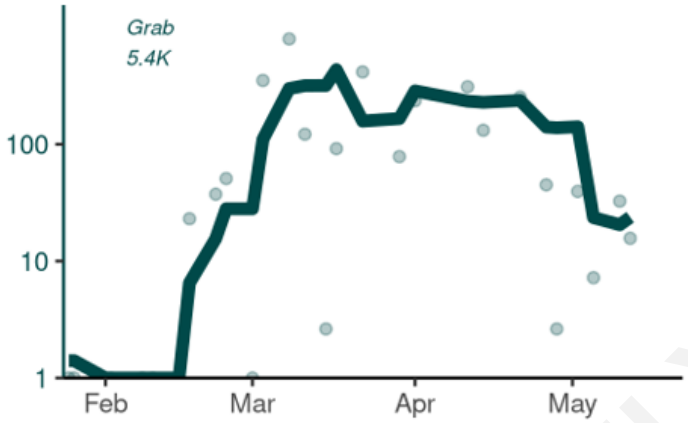
Dargaville



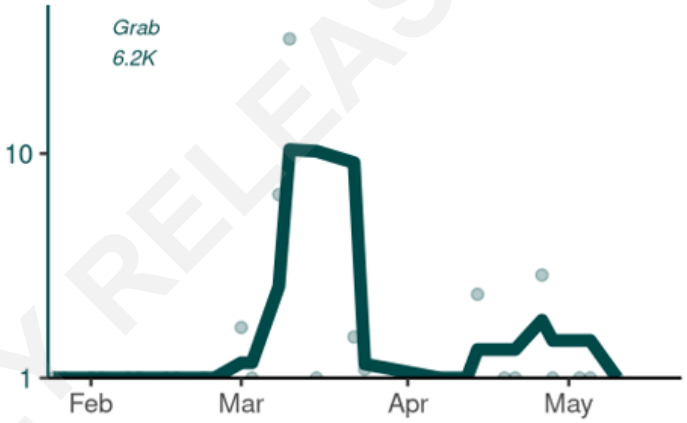
Kawakawa



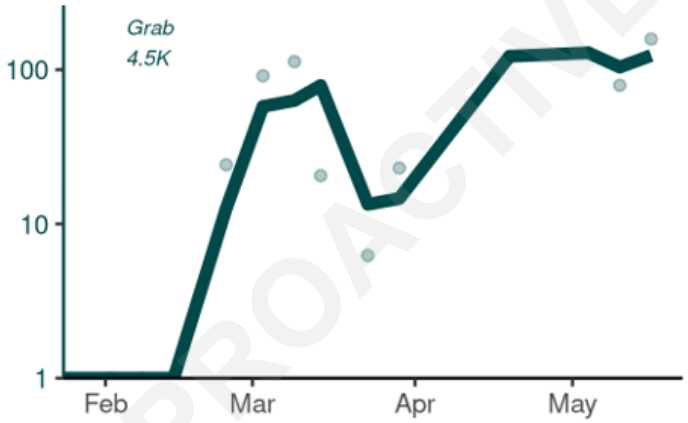
Kaitaia



Kerikeri

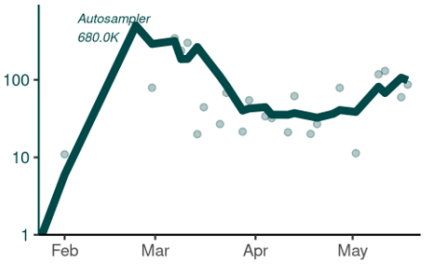


Ruakaka

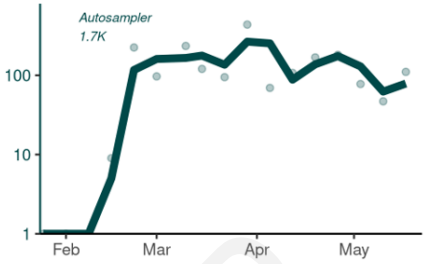


Auckland

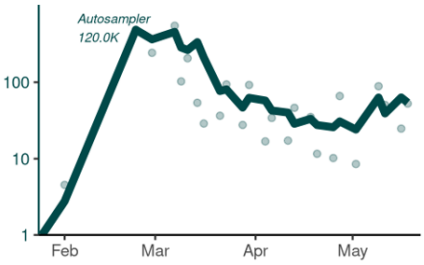
Auckland East

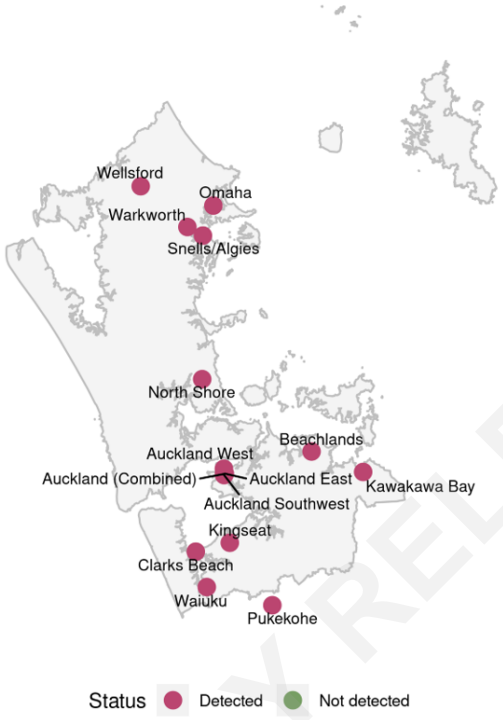


Wellsford

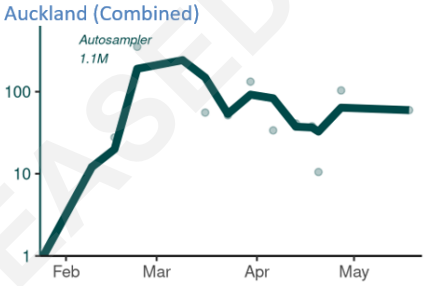


Auckland Southwest

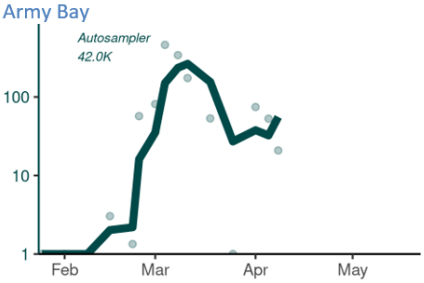




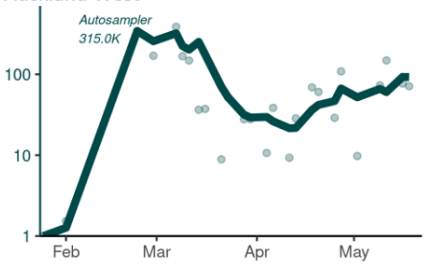
Auckland (Combined)



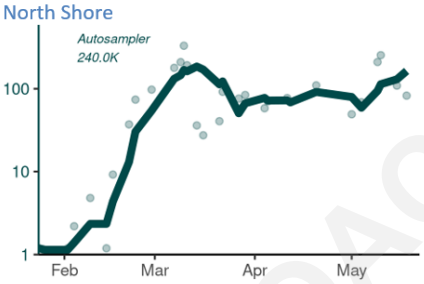
Army Bay



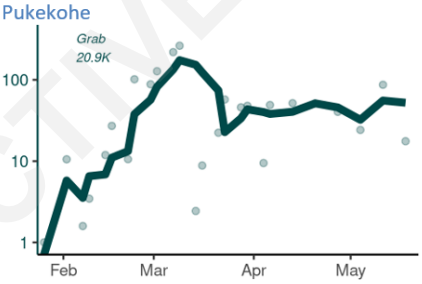
Auckland West



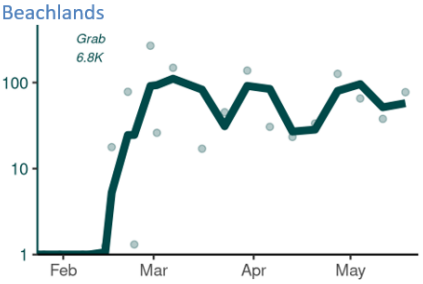
North Shore



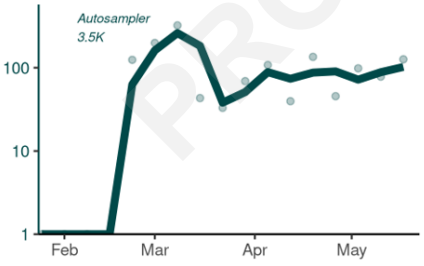
Pukekohe



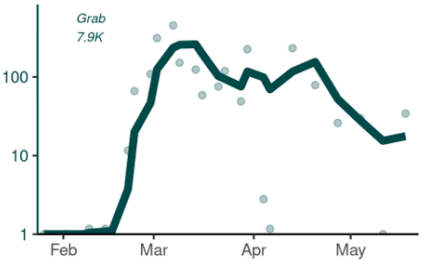
Beachlands



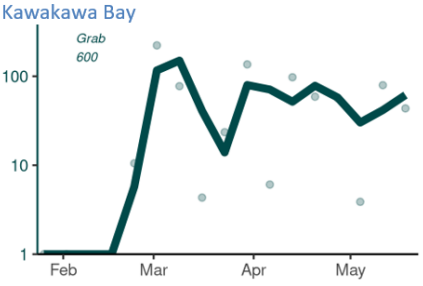
Warkworth



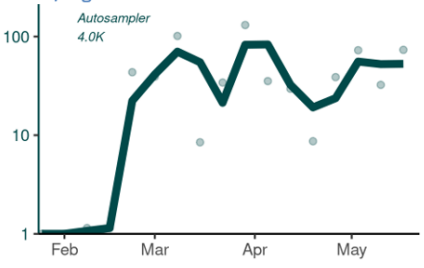
Waiuku



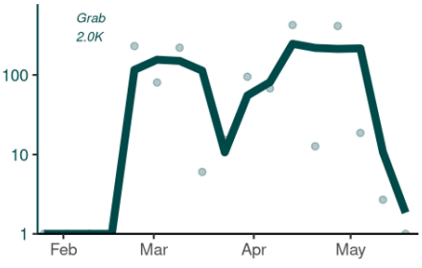
Kawakawa Bay



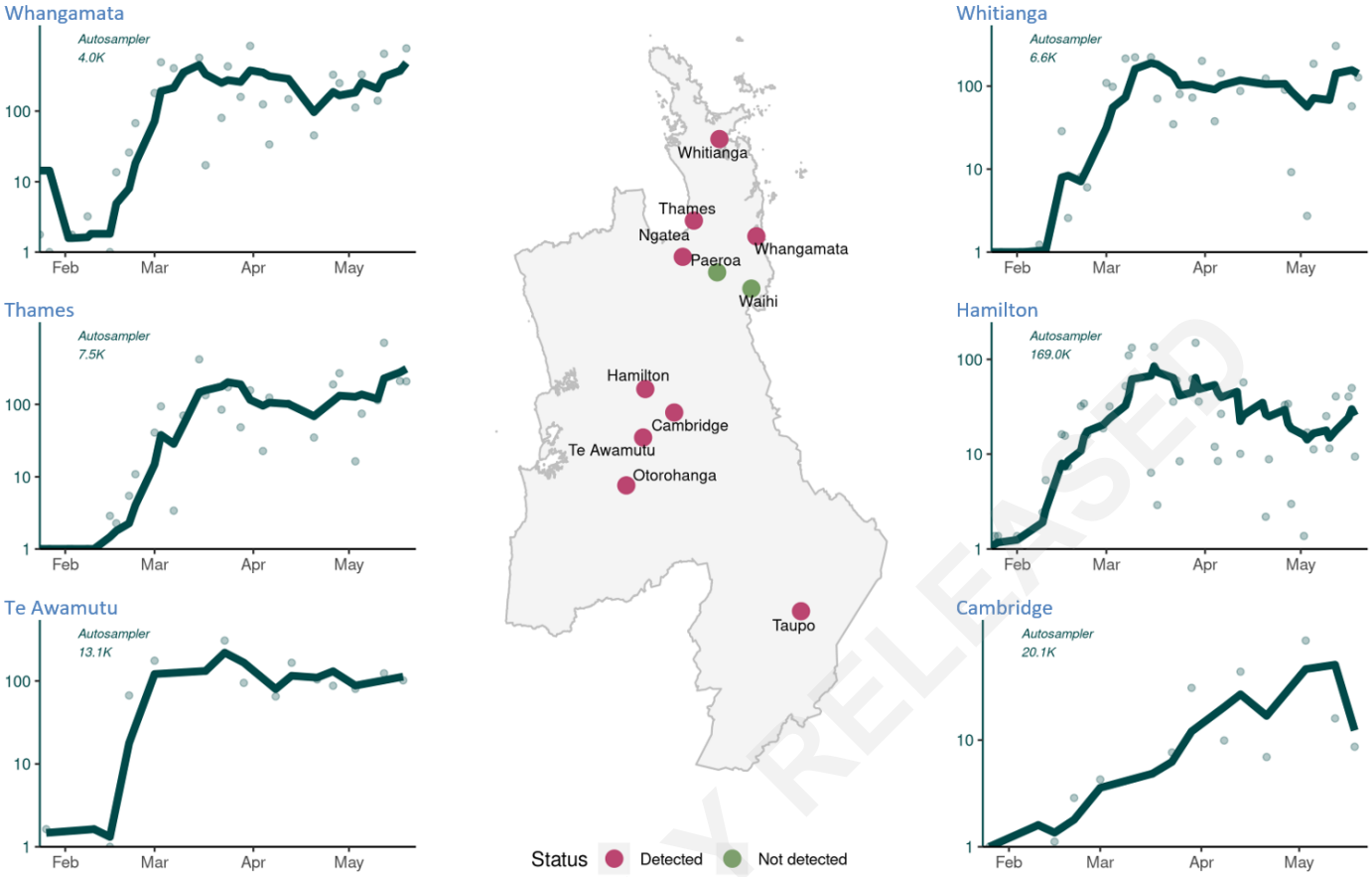
Snells/Algies

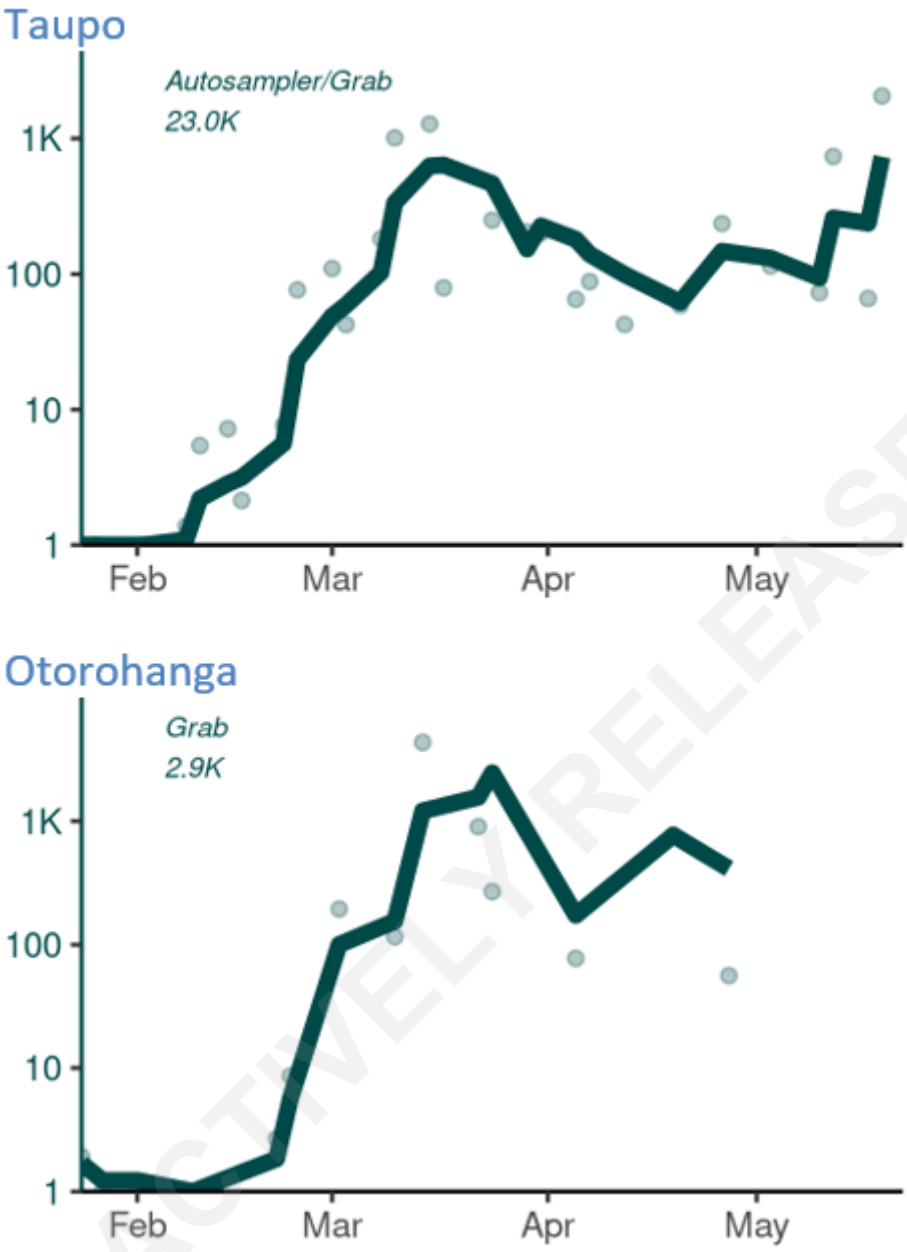


Clarks Beach

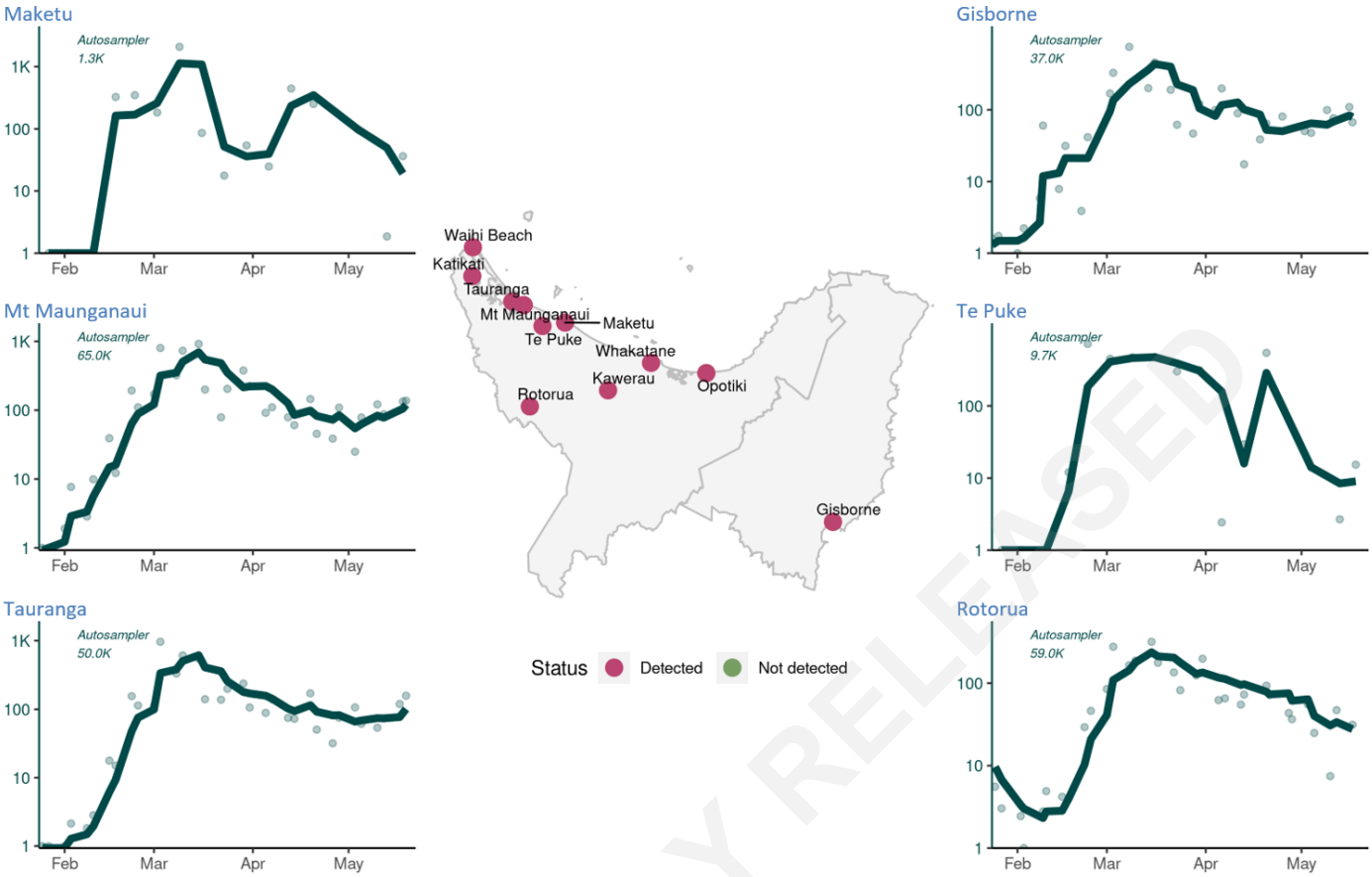


Waikato

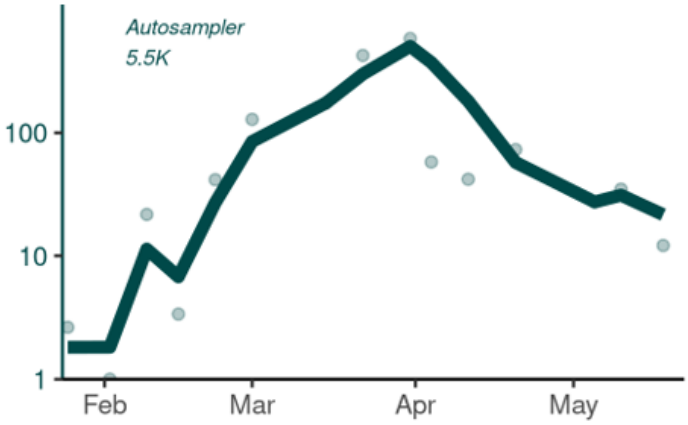




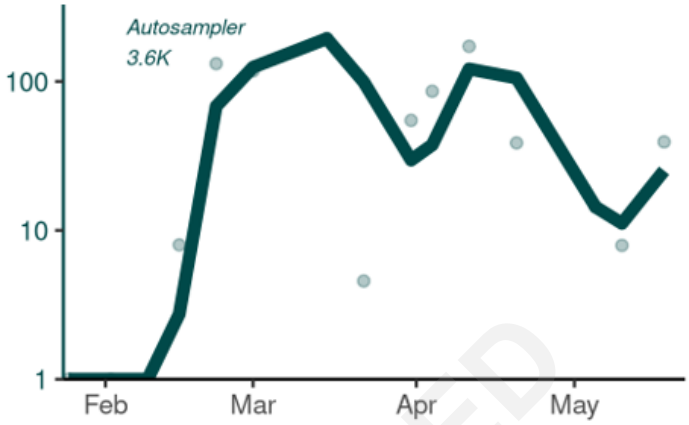
Bay of Plenty and Gisborne



Katikati



Waihi Beach



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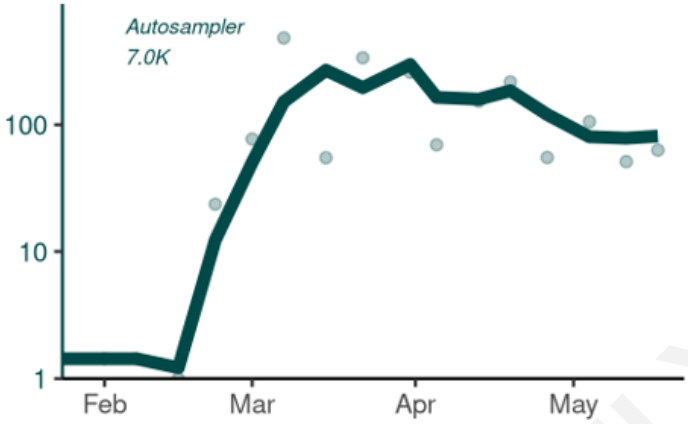
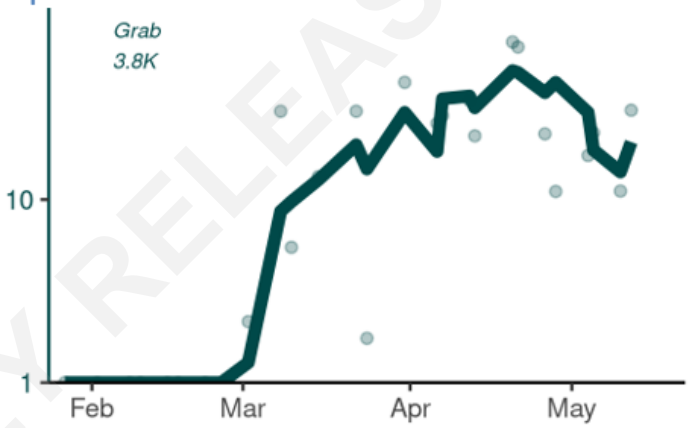


Opotiki



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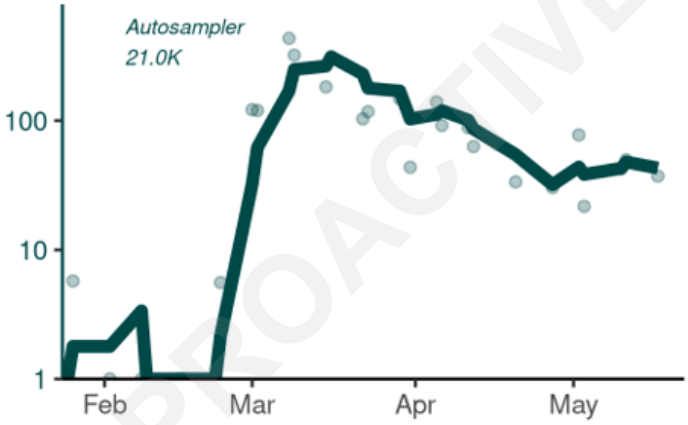

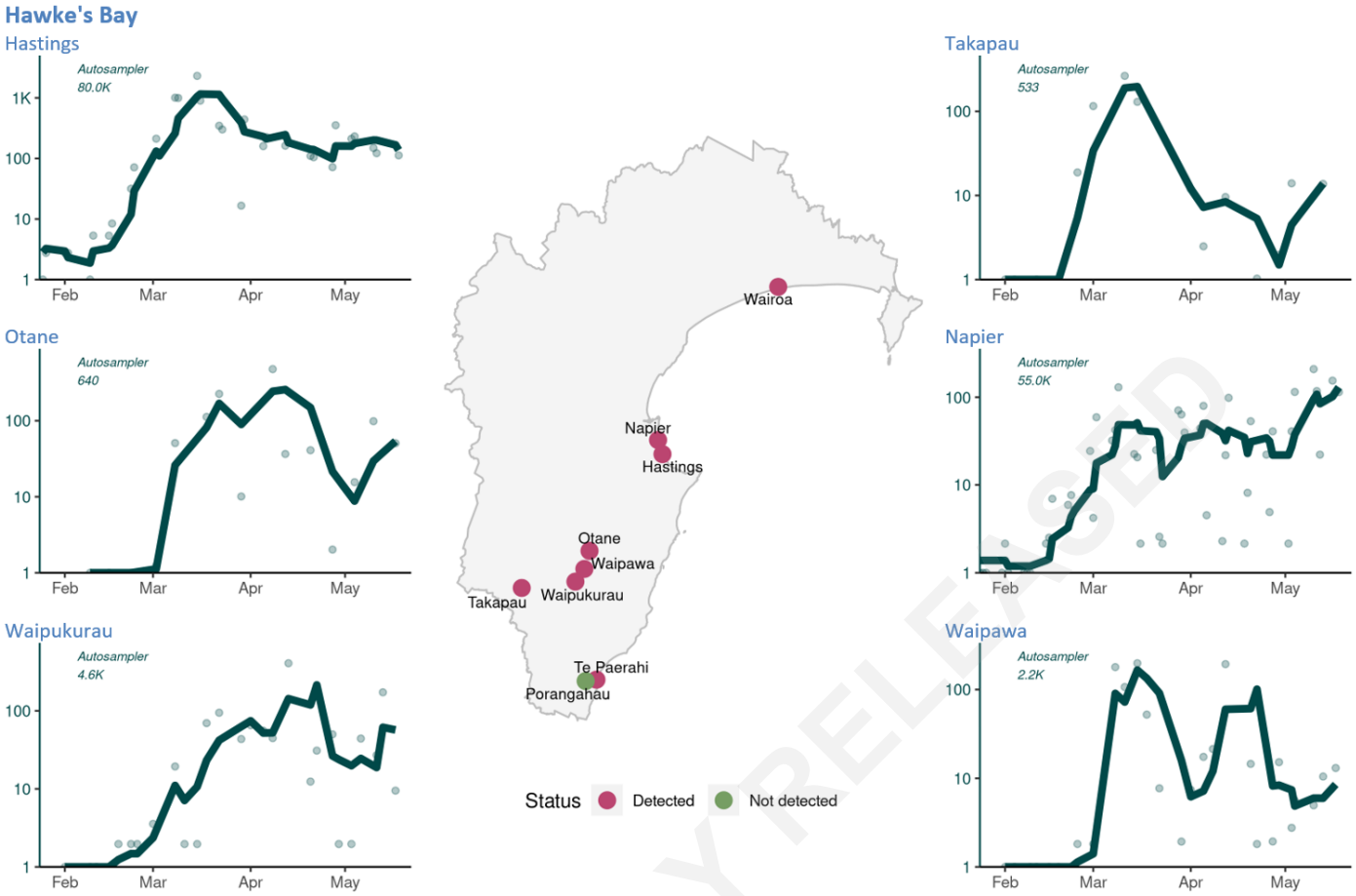

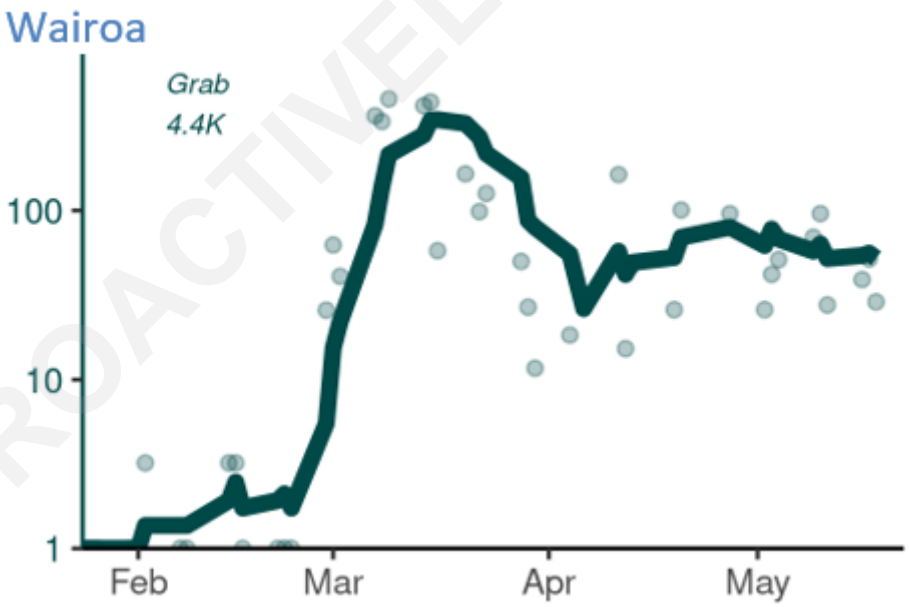

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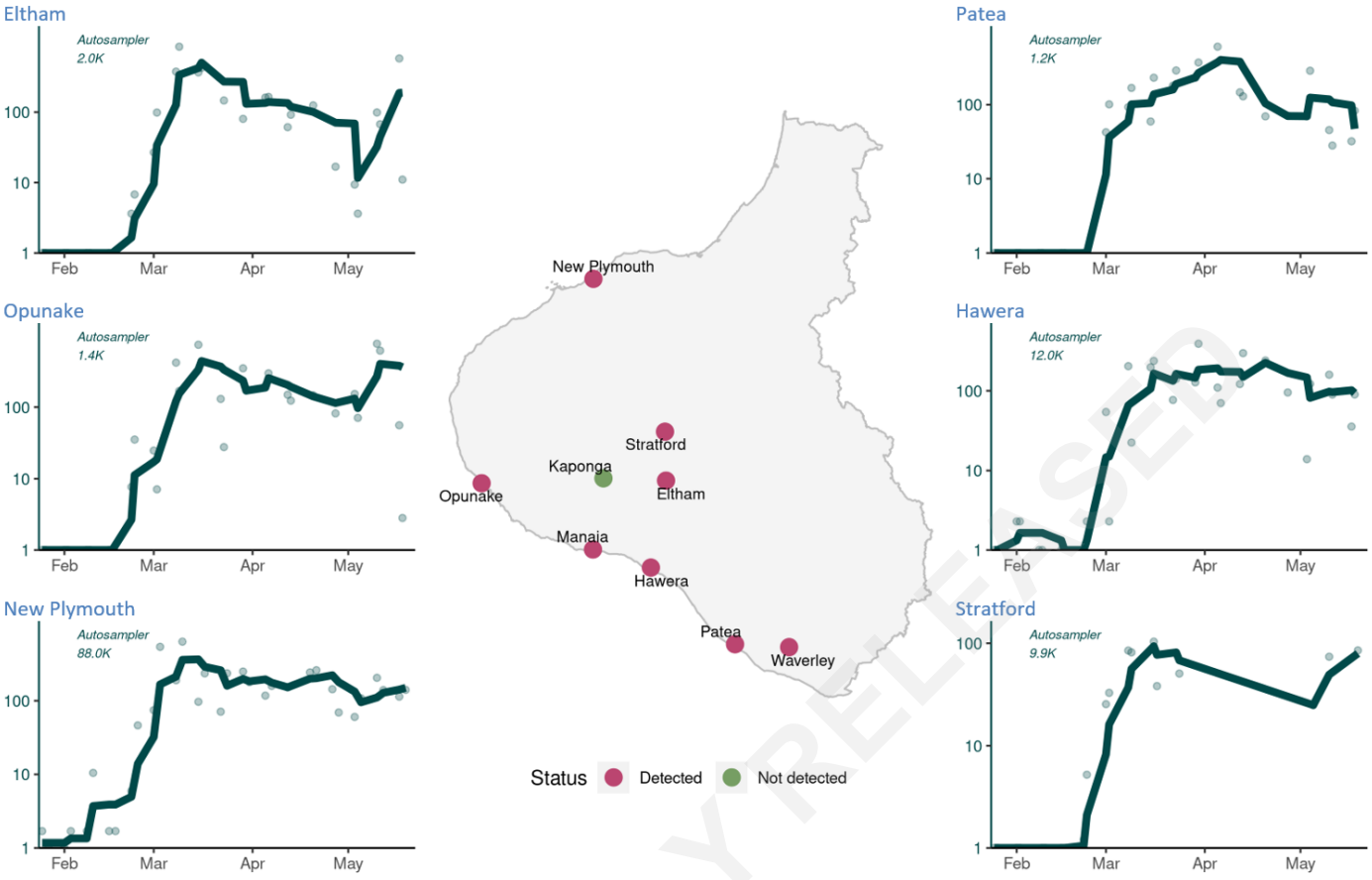
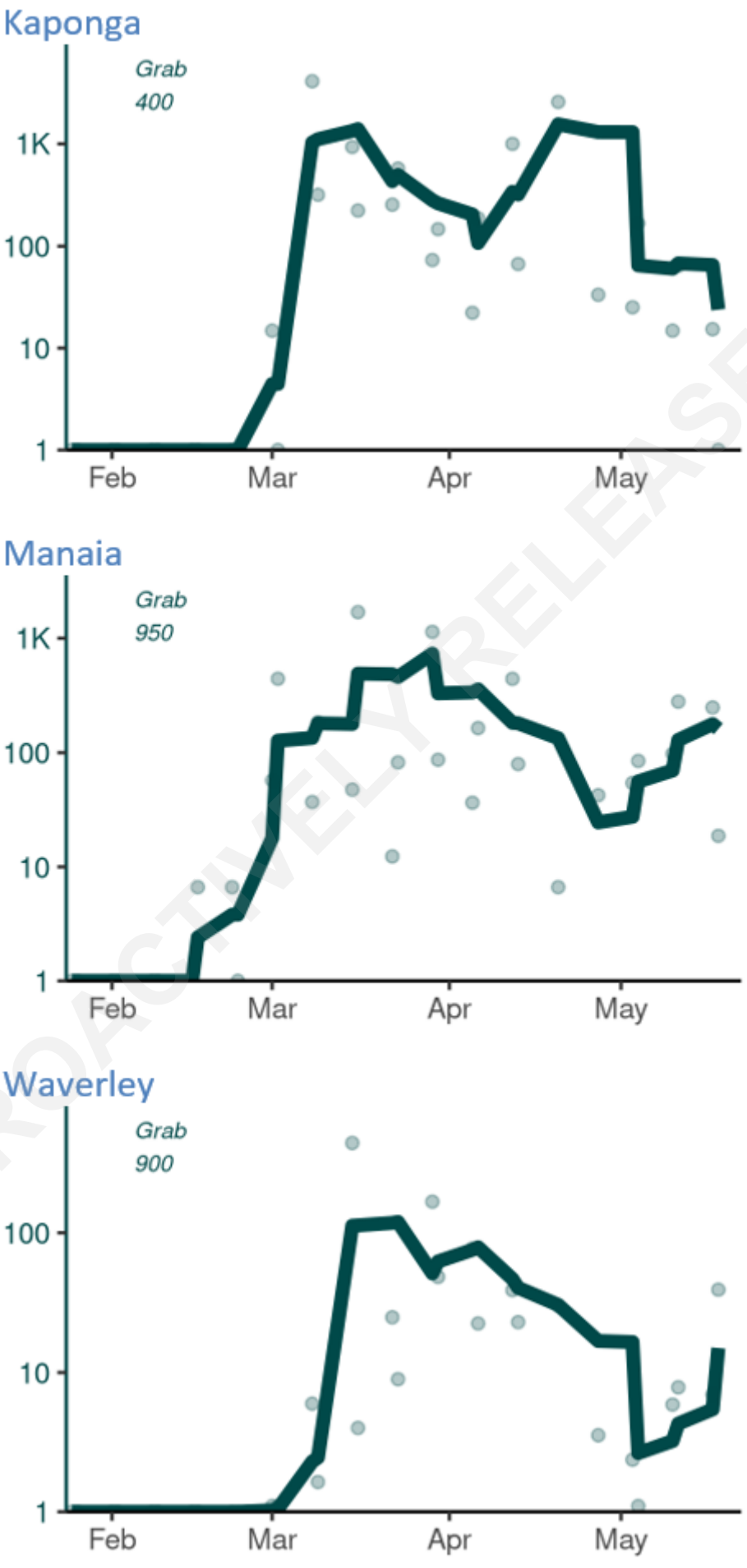
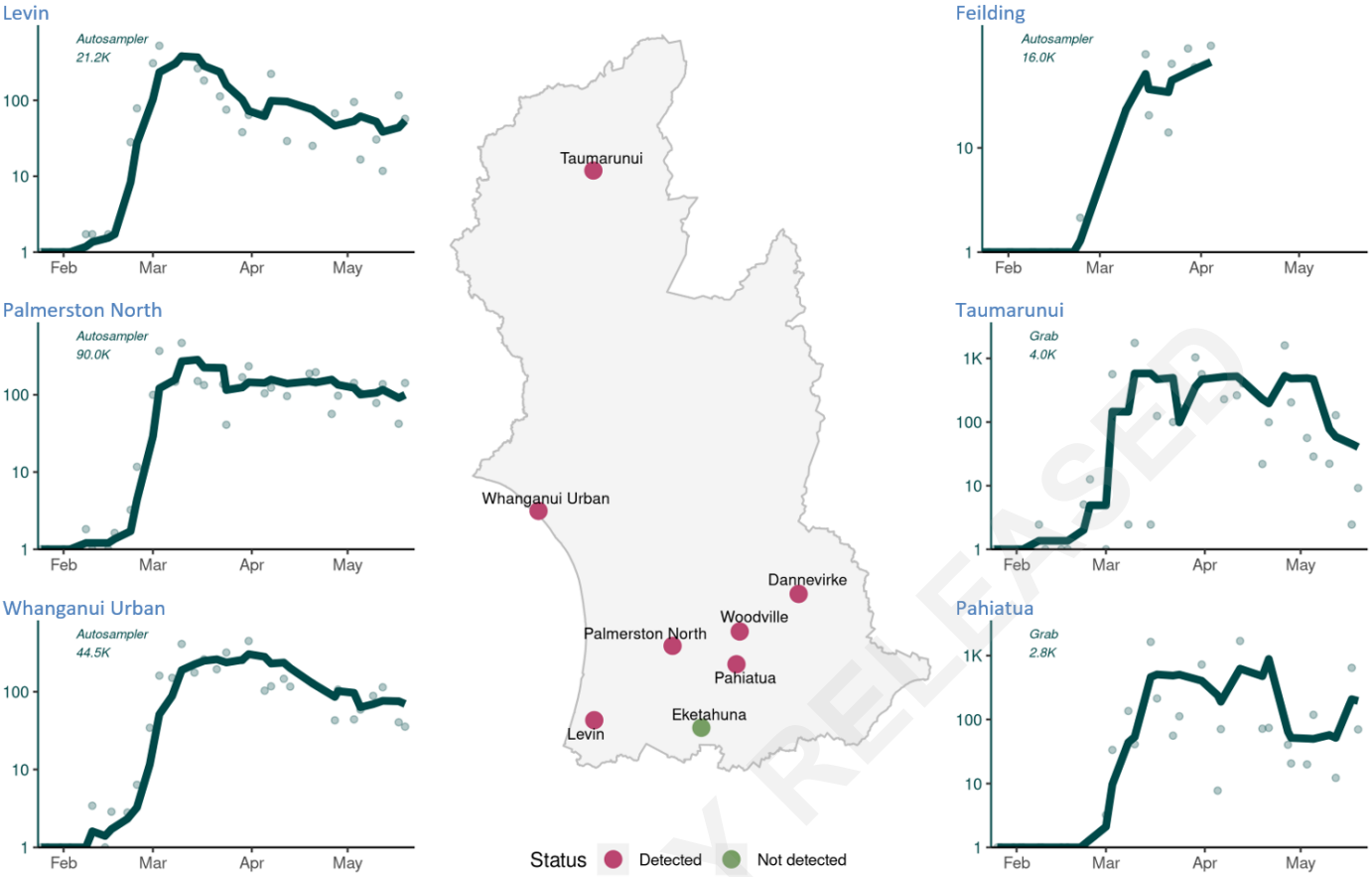
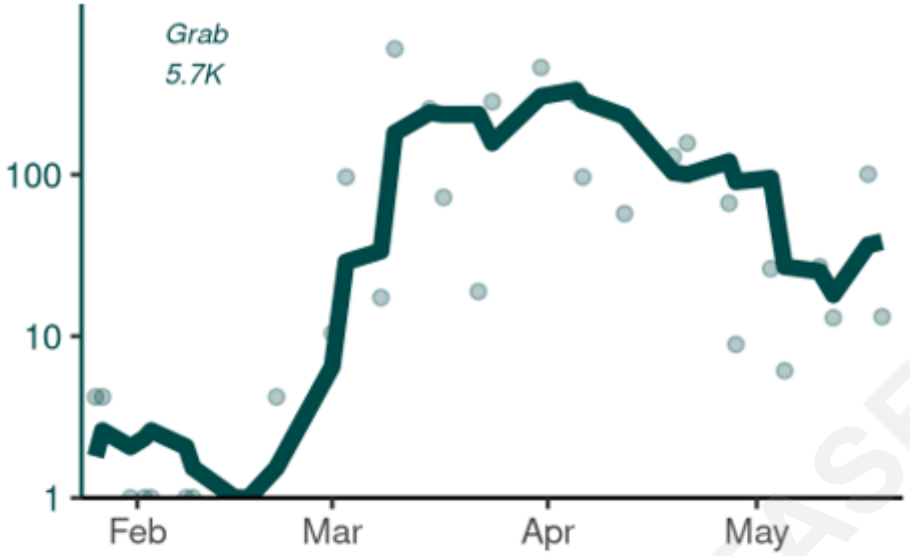




Manawatu-Wanganui



Dannevirke



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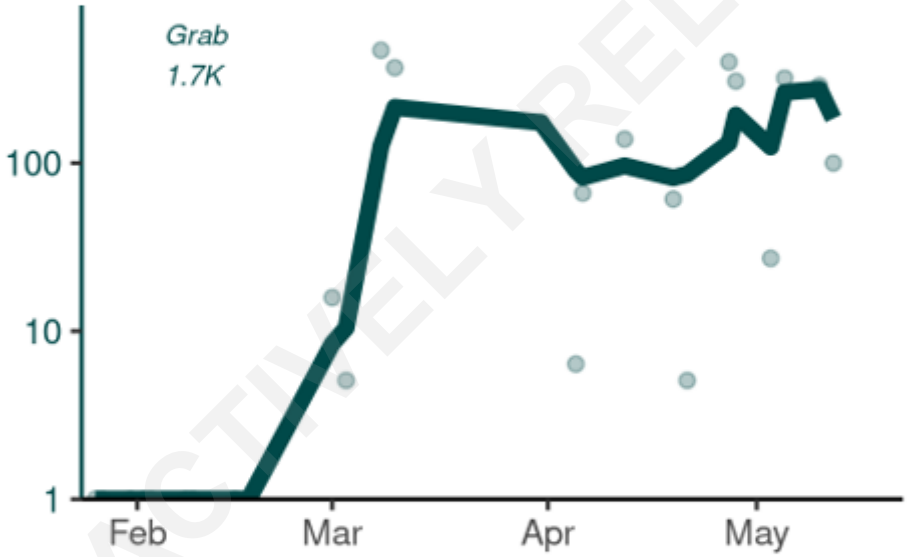
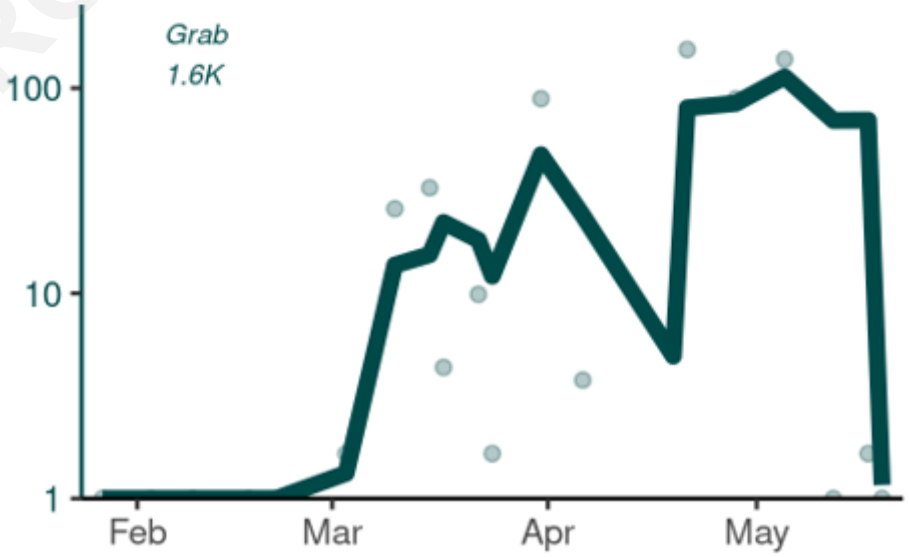
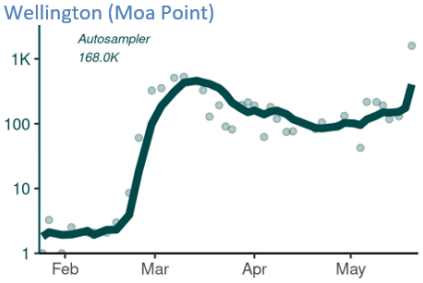


Eketahuna

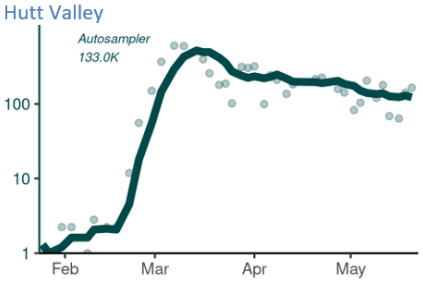


Wellington

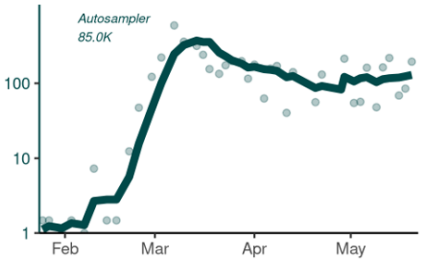
Wellington (Moa Point)



Hutt Valley

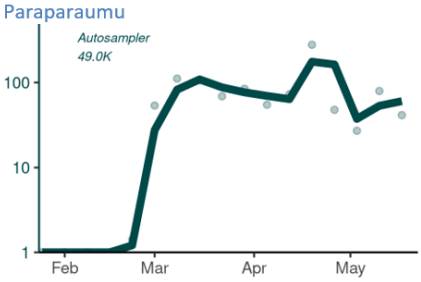


Porirua

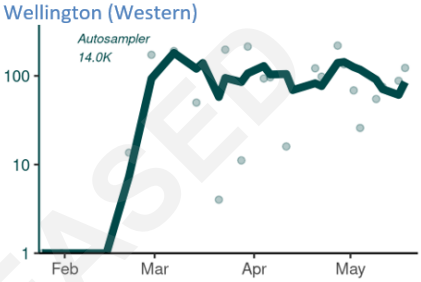


Status Detected Not detected

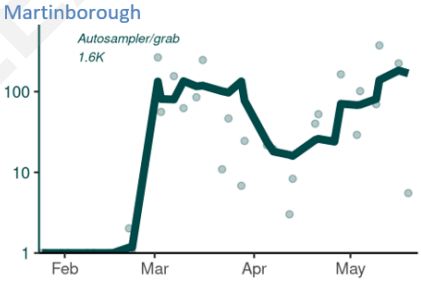
Paraparaumu



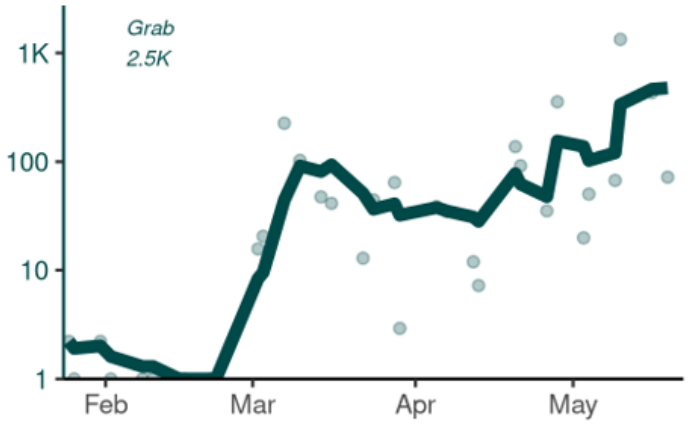
Wellington (Western)



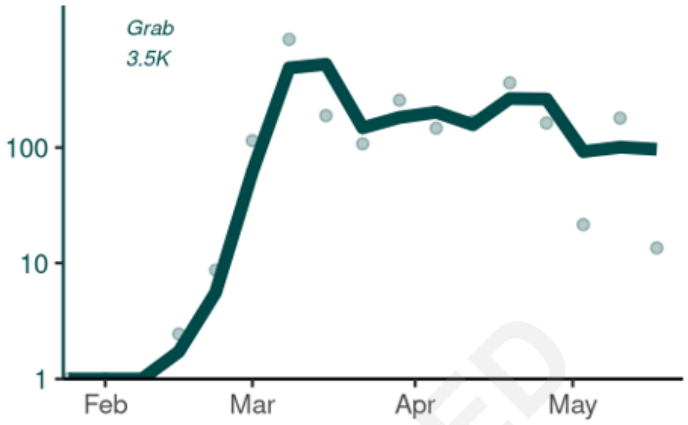
Martinborough



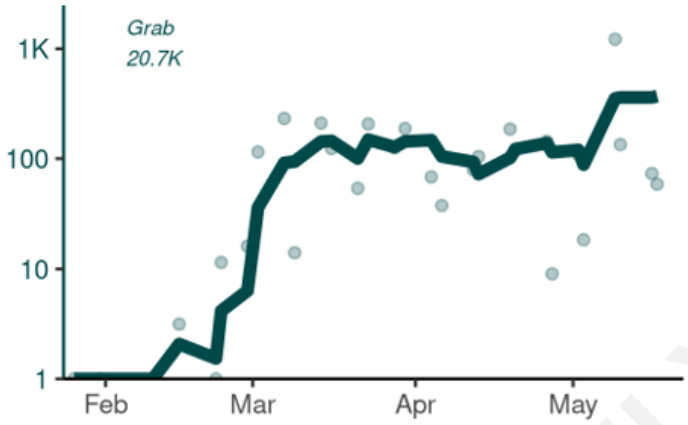
Featherston



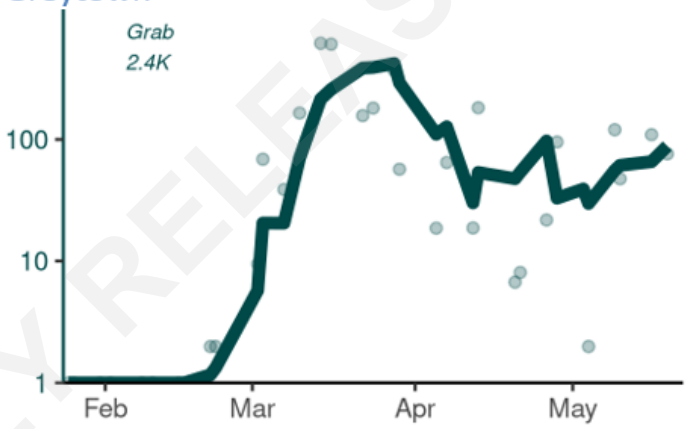
Otaki



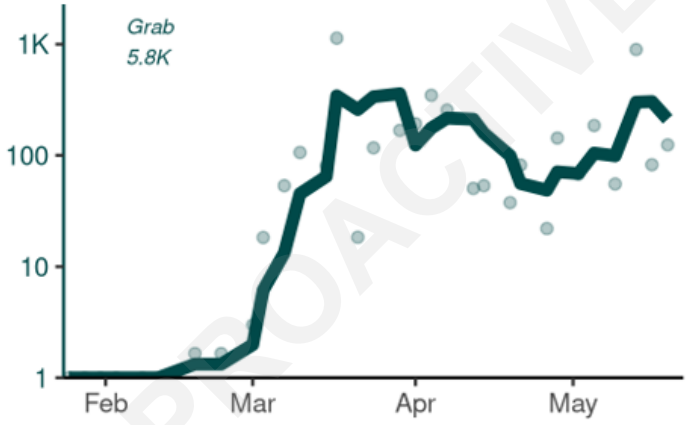
Masterton



Greytown

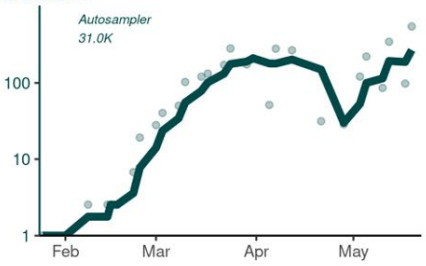


Carterton

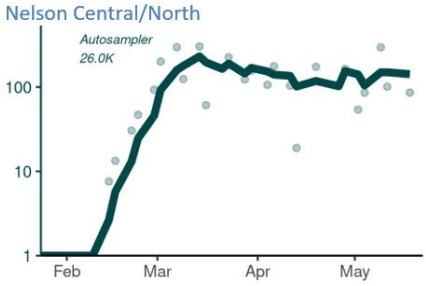


Tasman, Nelson, and Marlborough

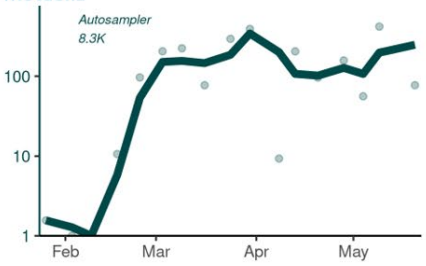
Blenheim



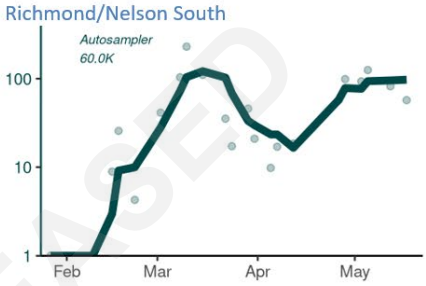
Nelson Central/North



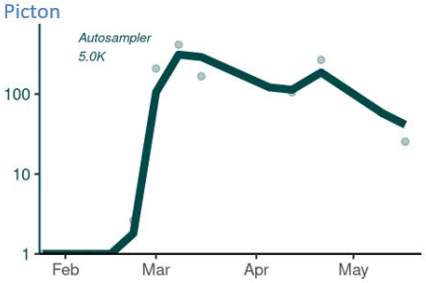
Motueka



Richmond/Nelson South

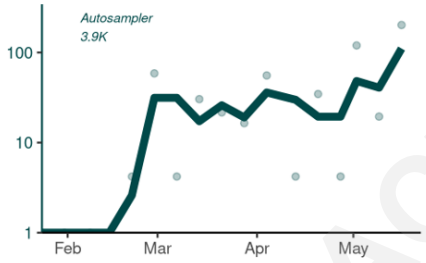


Picton

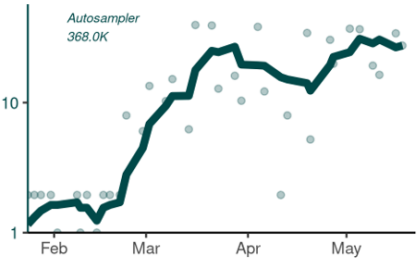


West Coast and Canterbury

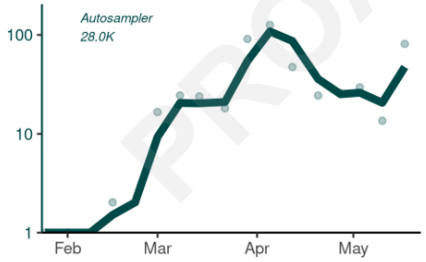
Leeston



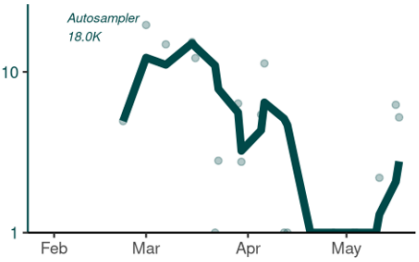
Christchurch

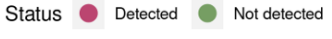


Timaru

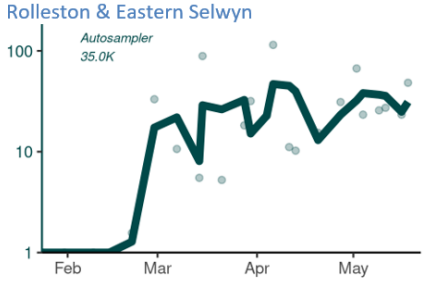


Ashburton





Rolleston & Eastern Selwyn



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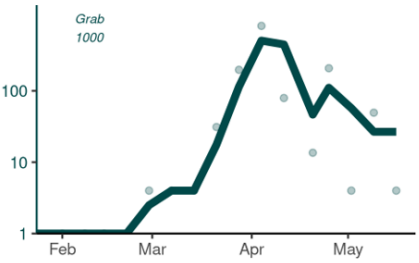
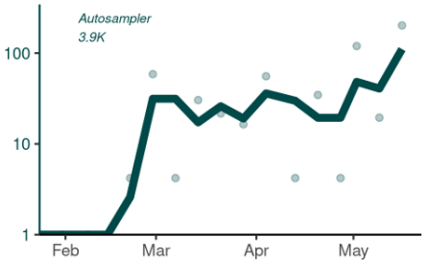
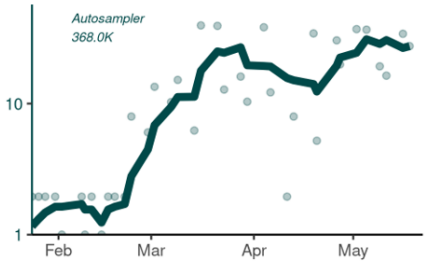


West Coast and Canterbury

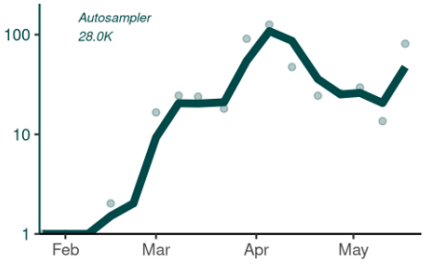
Leeston



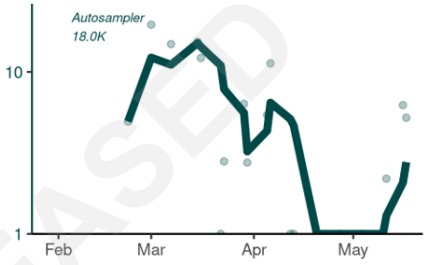
Christchurch



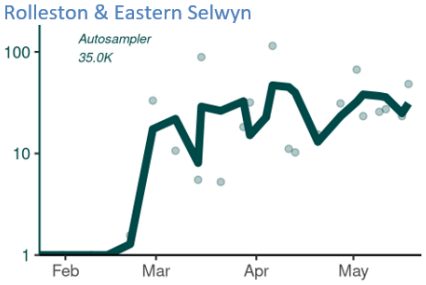
Timaru



Ashburton



Rolleston & Eastern Selwyn



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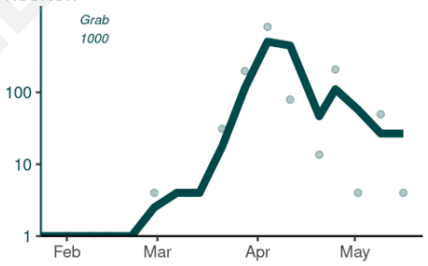
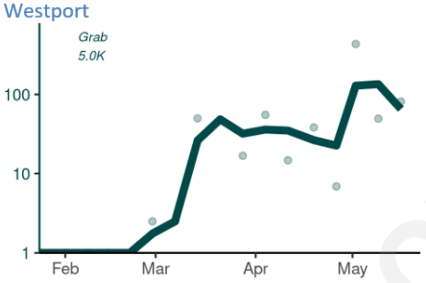
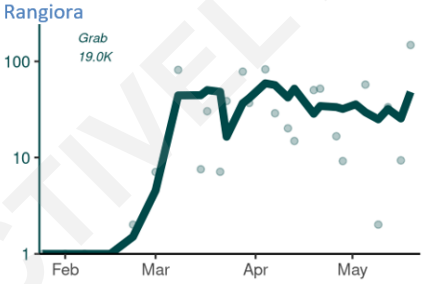


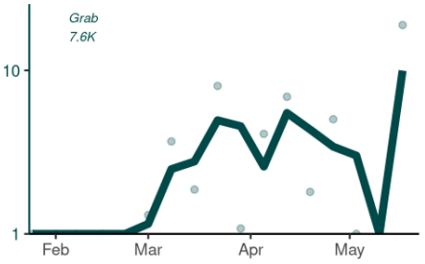
Westport



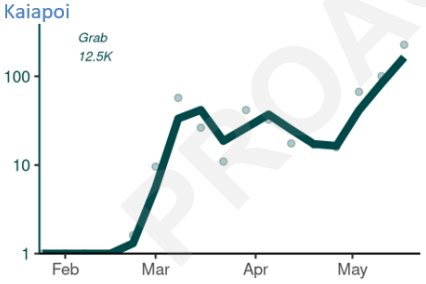
Rangiora



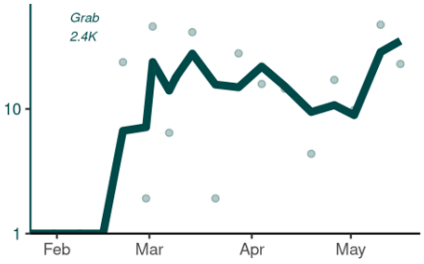
Woodend



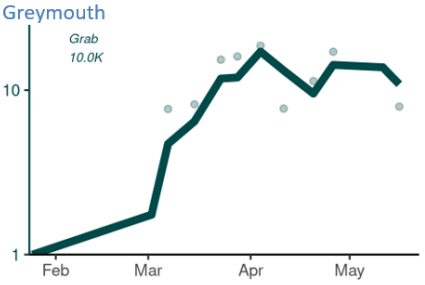
Kaiapoi



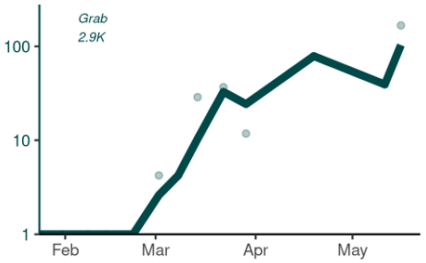
Kaikoura



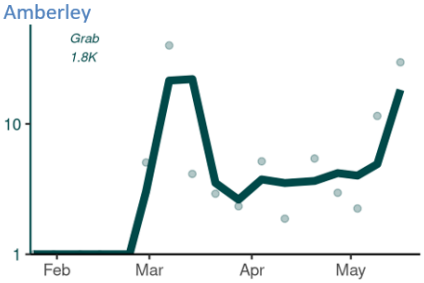
Greymouth



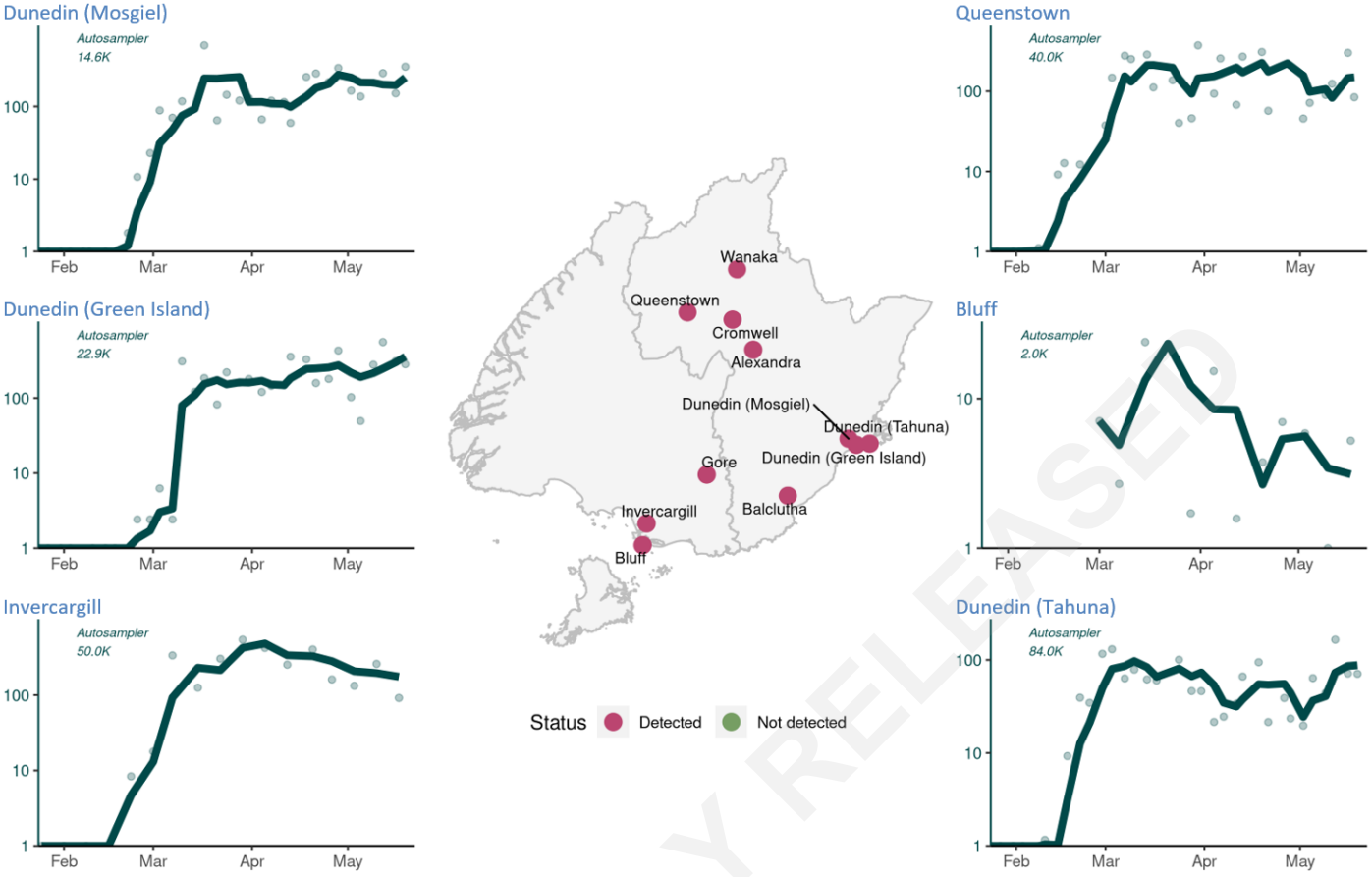
Hokitika



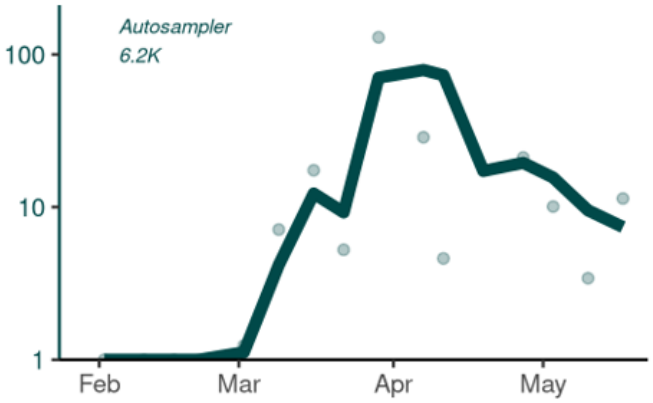
Amberley



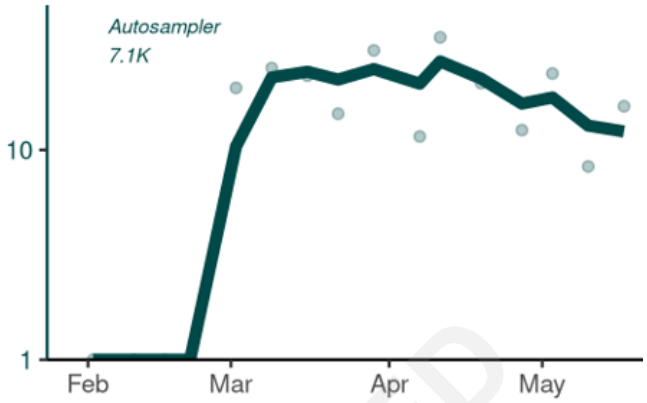
Otago and Southland



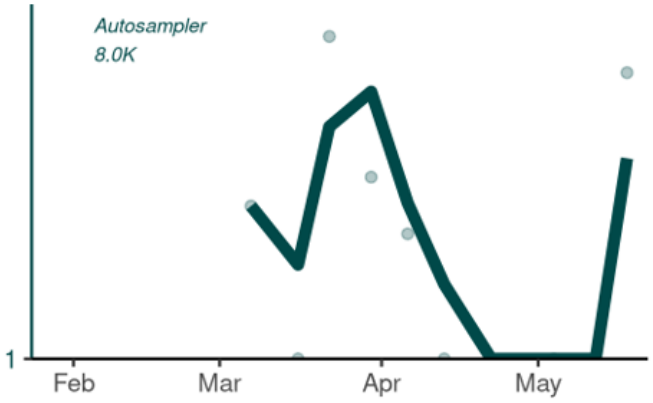
Alexandra



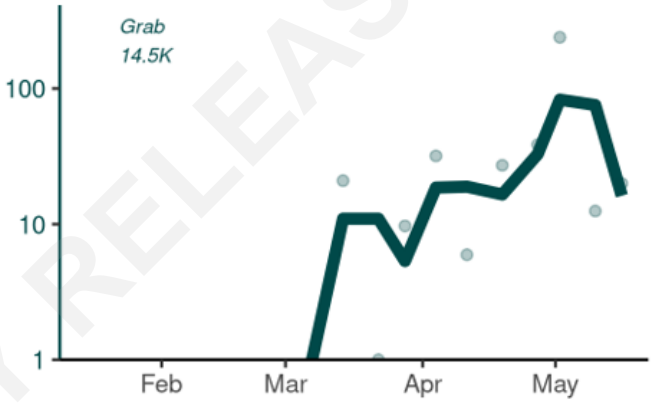
Cromwell



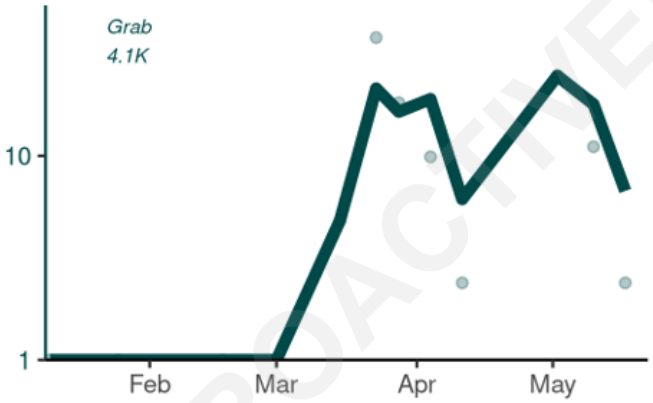
Gore



Wanaka

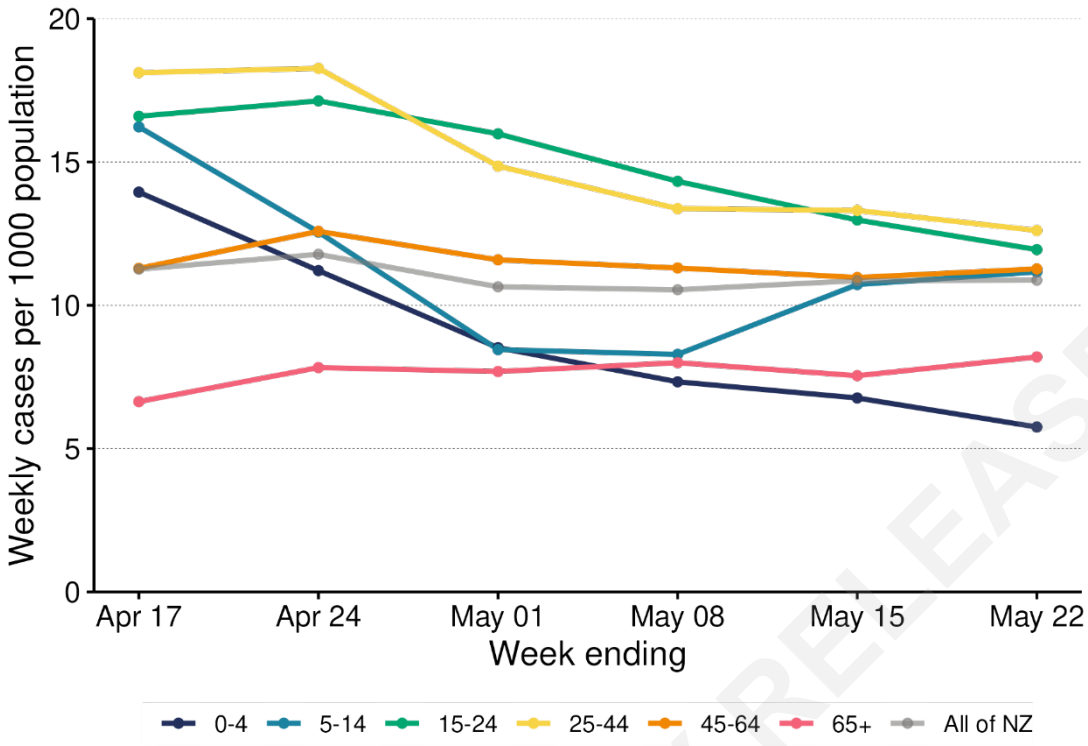


Balclutha

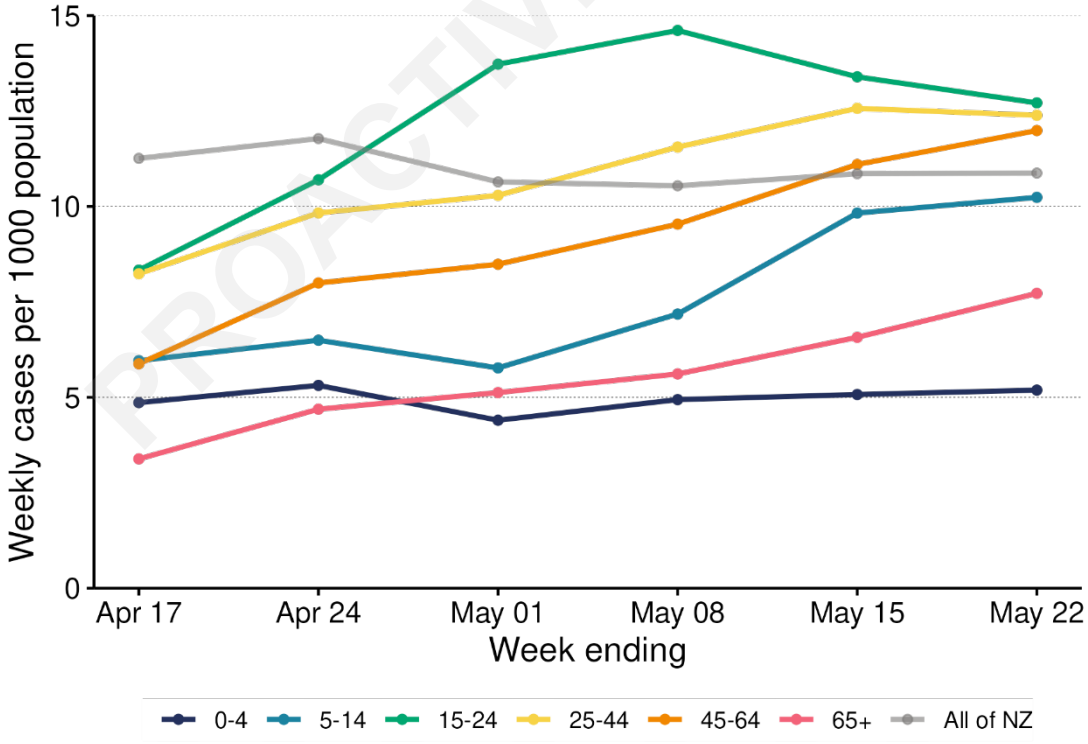


Age Graphs

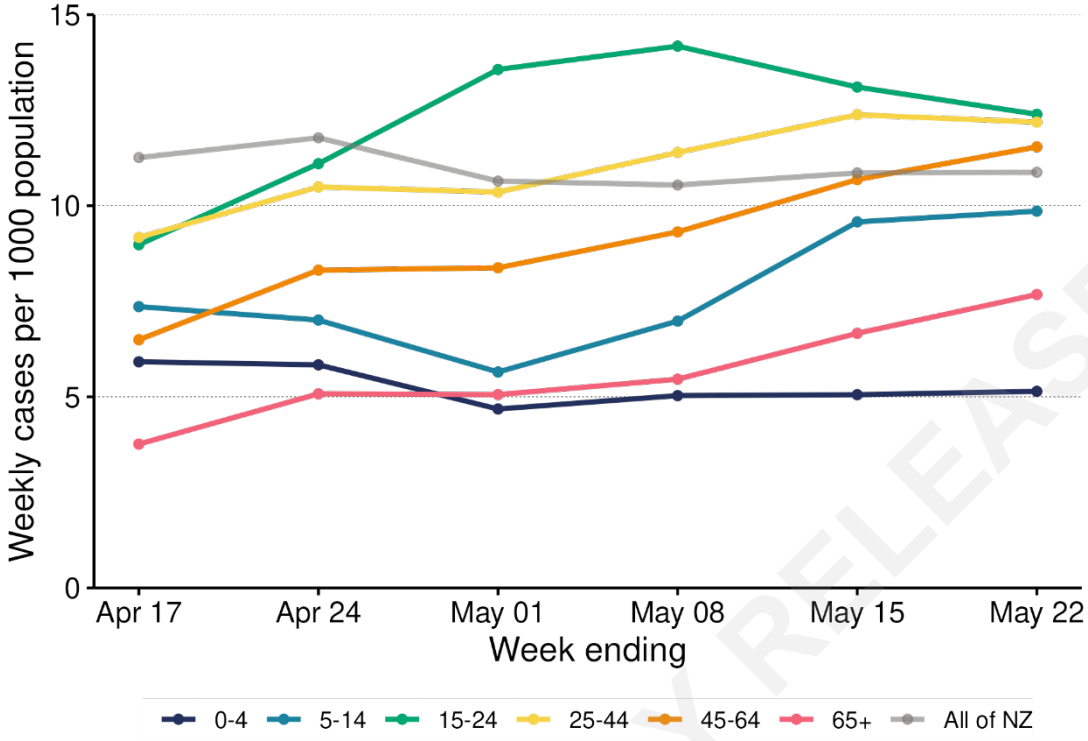
NZ Excluding Auckland Region



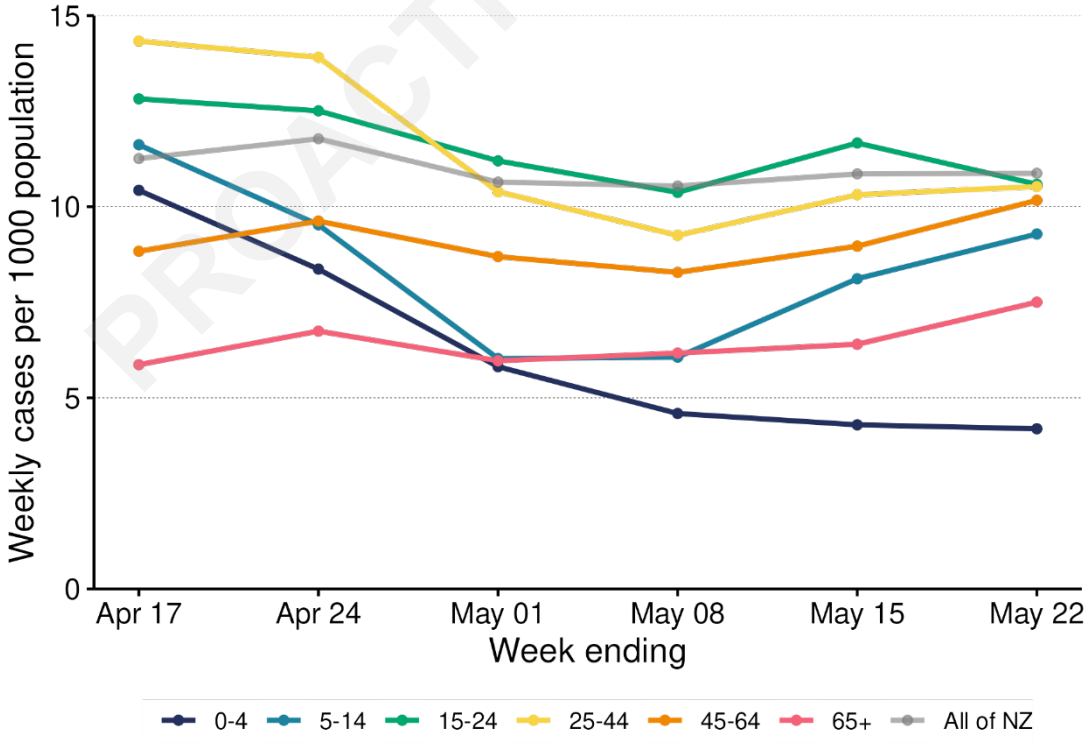
Auckland Region



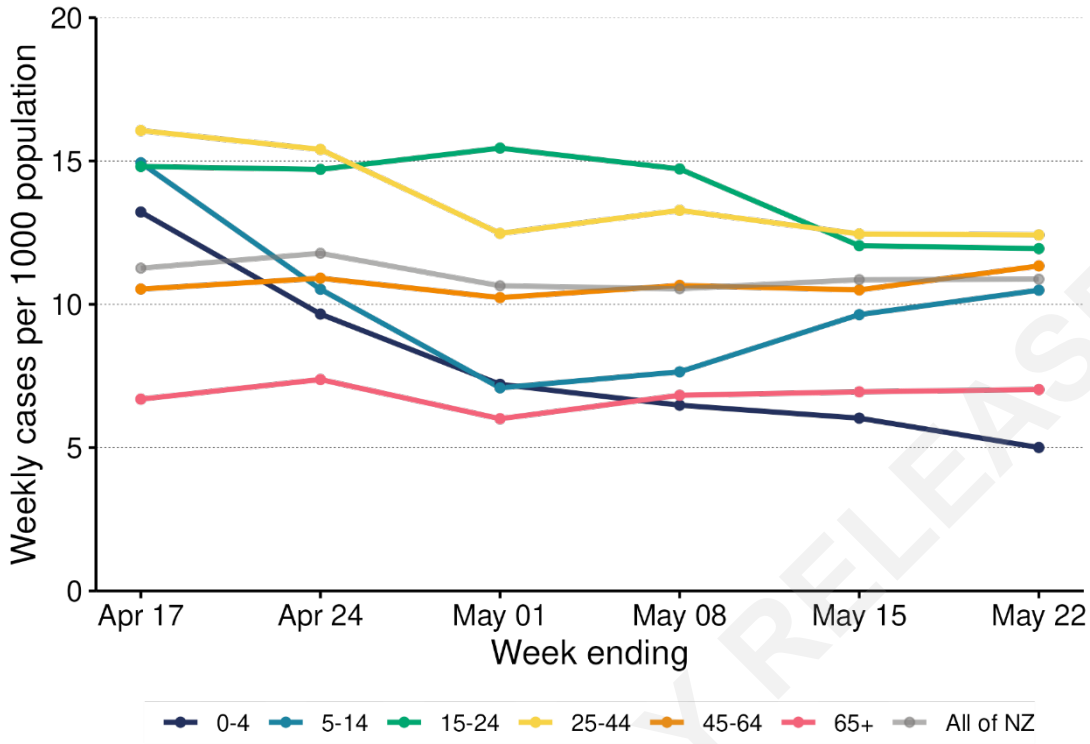
Northern Region



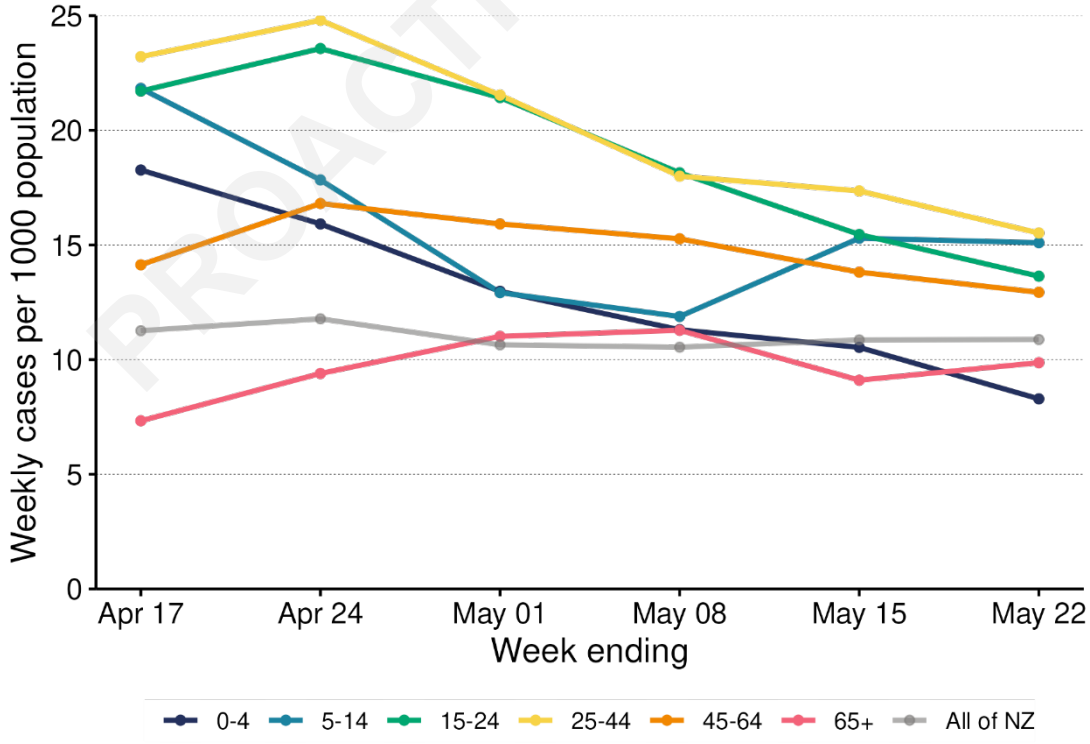
Te Manawa Taki



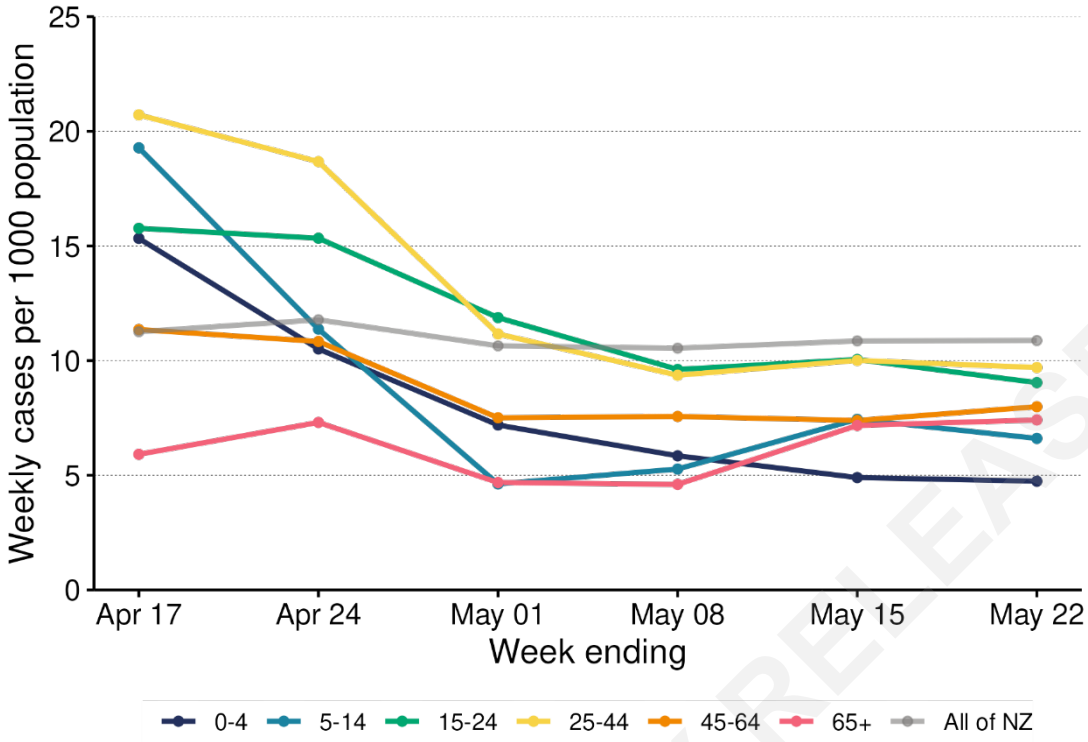
Central Region



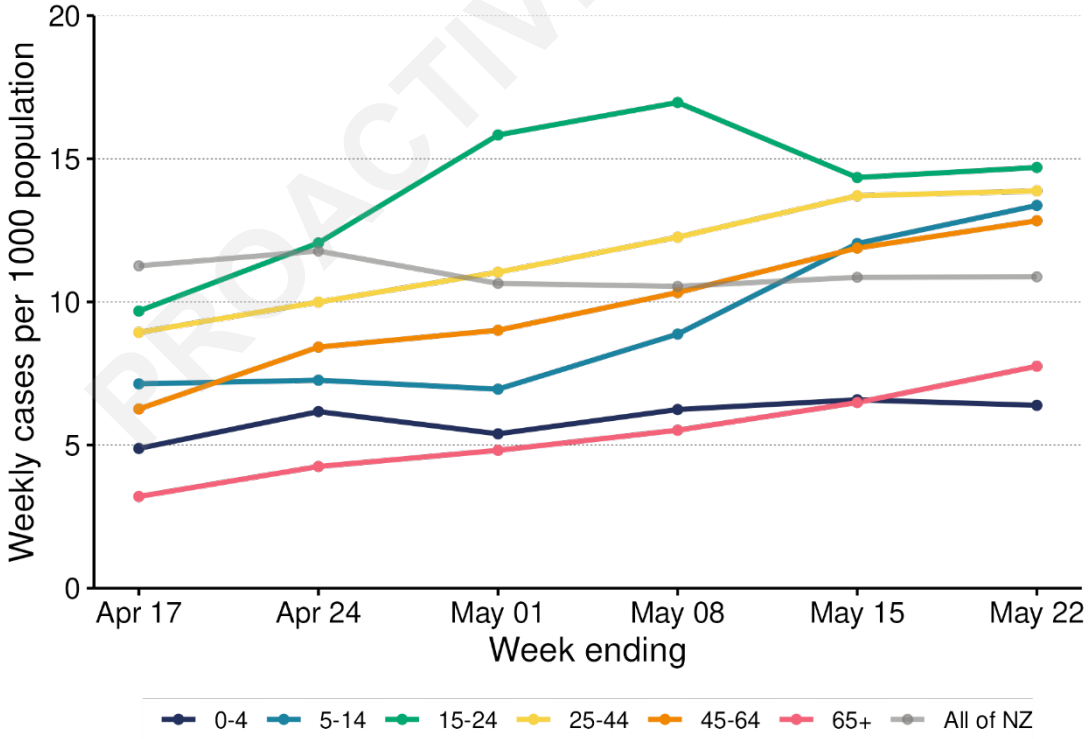
Southern Region



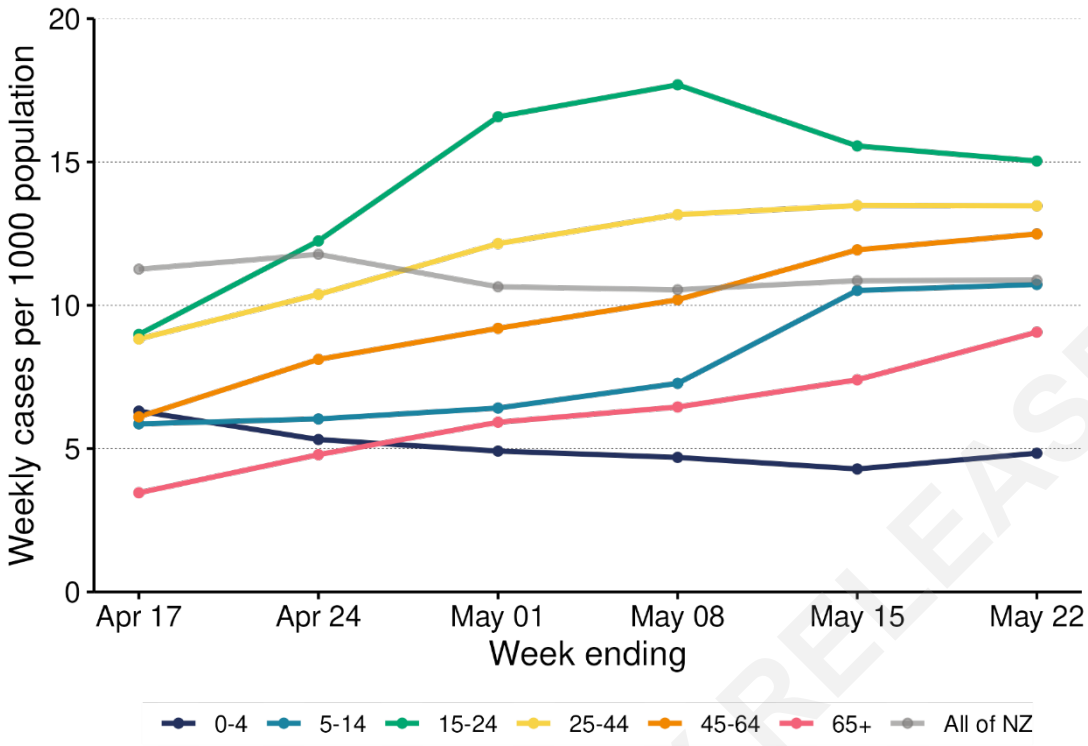
Northland DHB



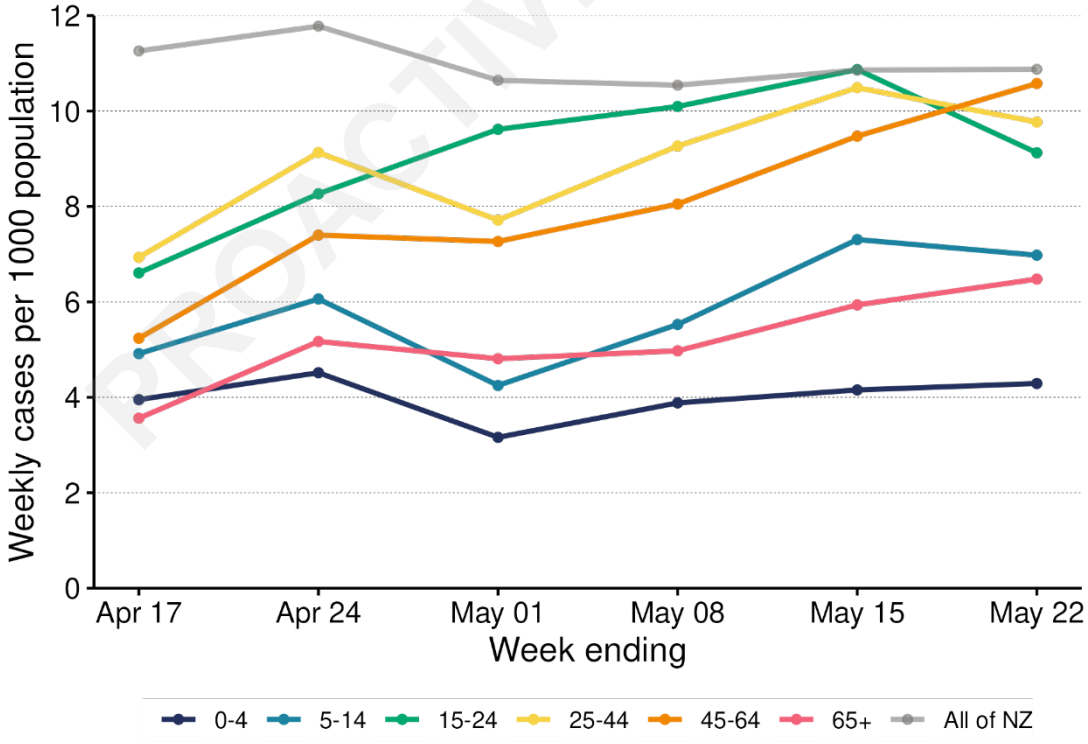
Waitemata DHB



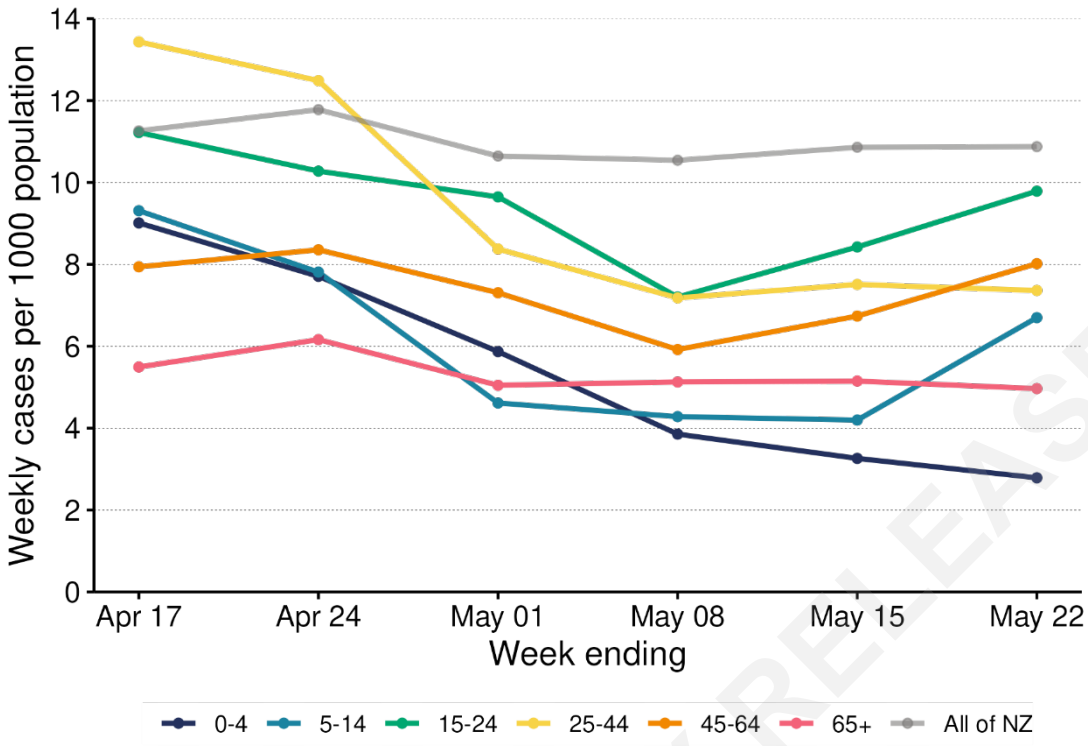
Auckland DHB



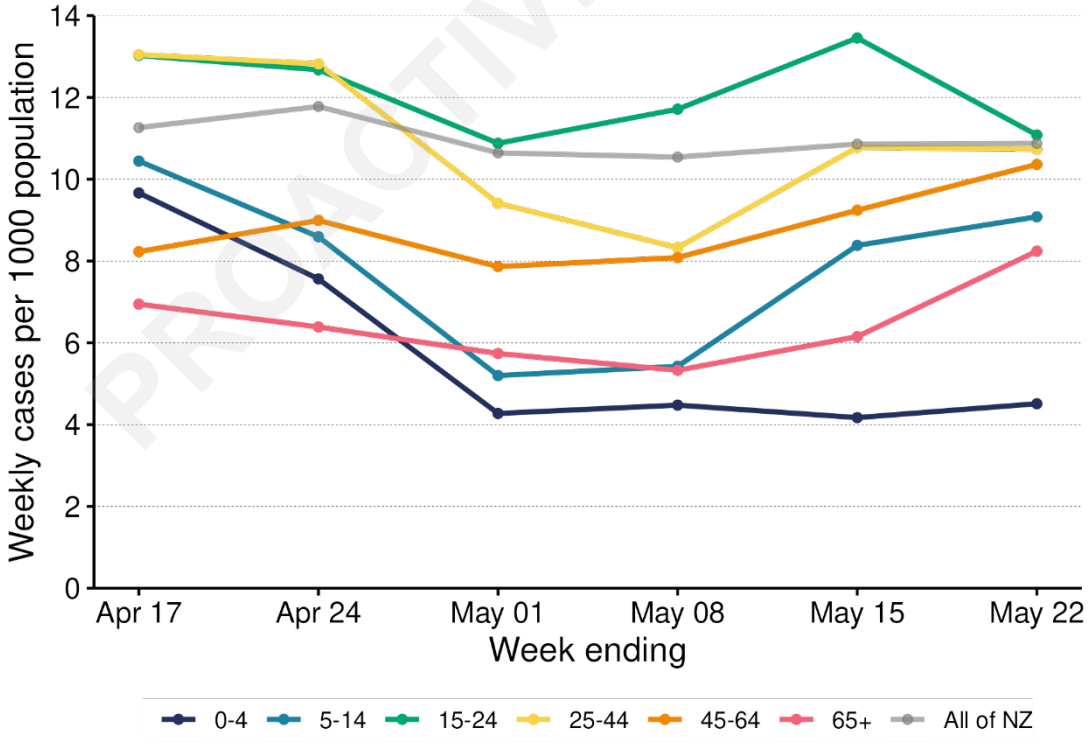
Counties Manukau DHB



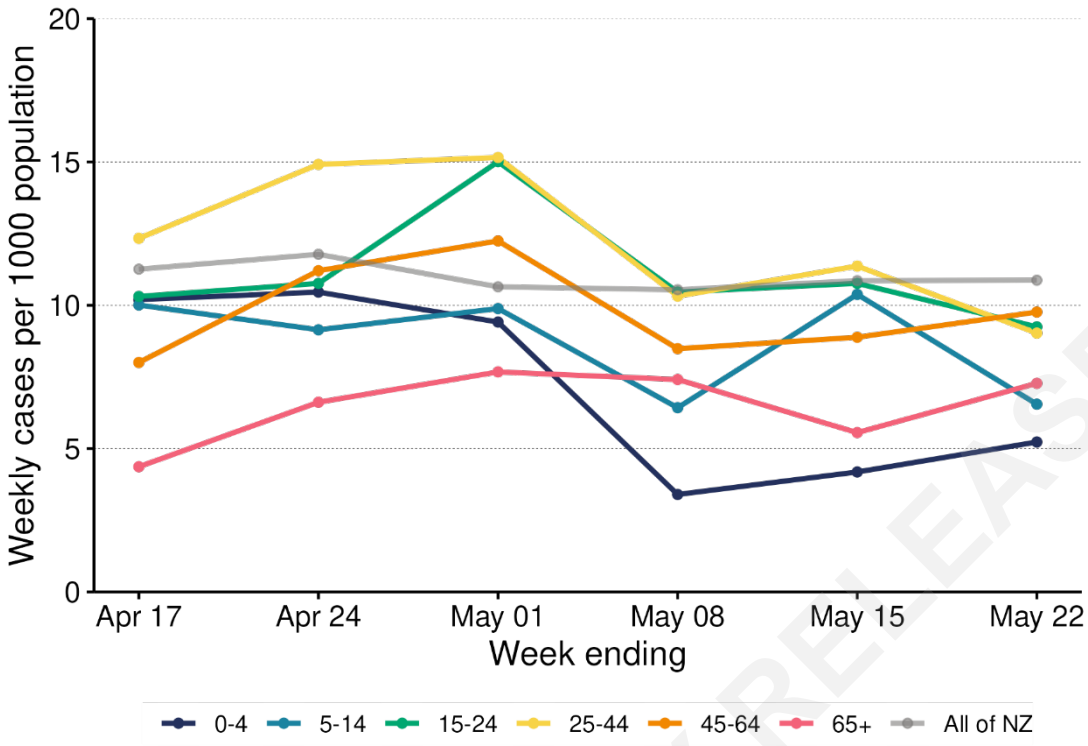
Bay of Plenty DHB



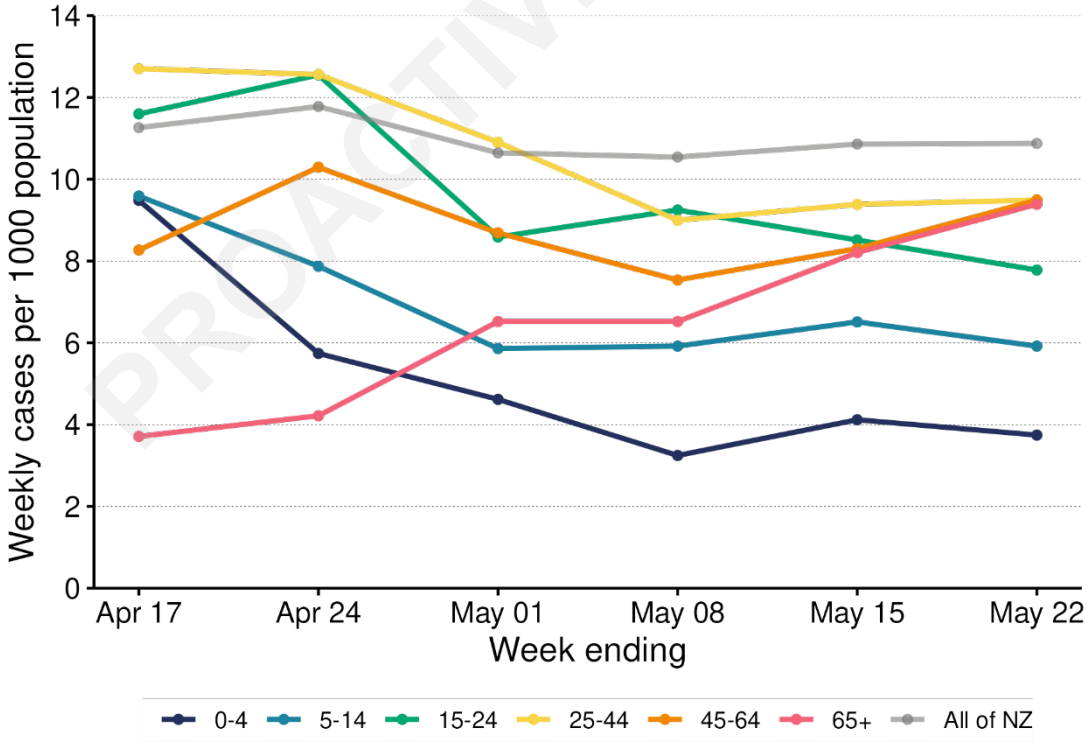
Waikato DHB



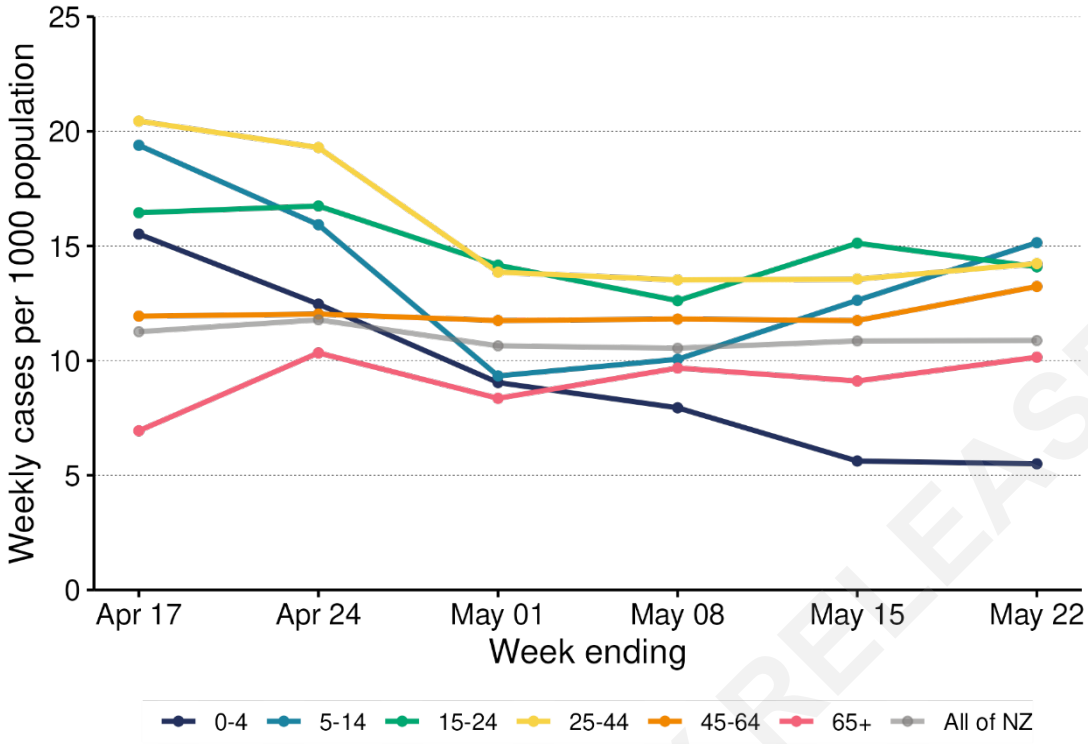
Tairawhiti DHB



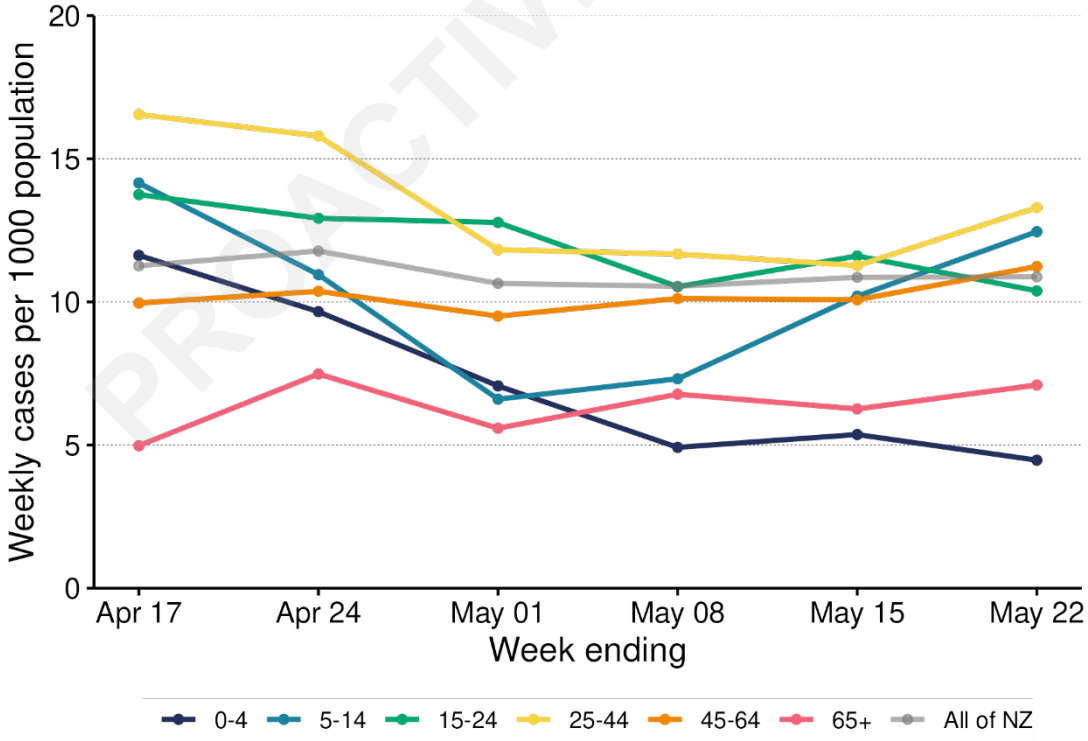
Lakes DHB



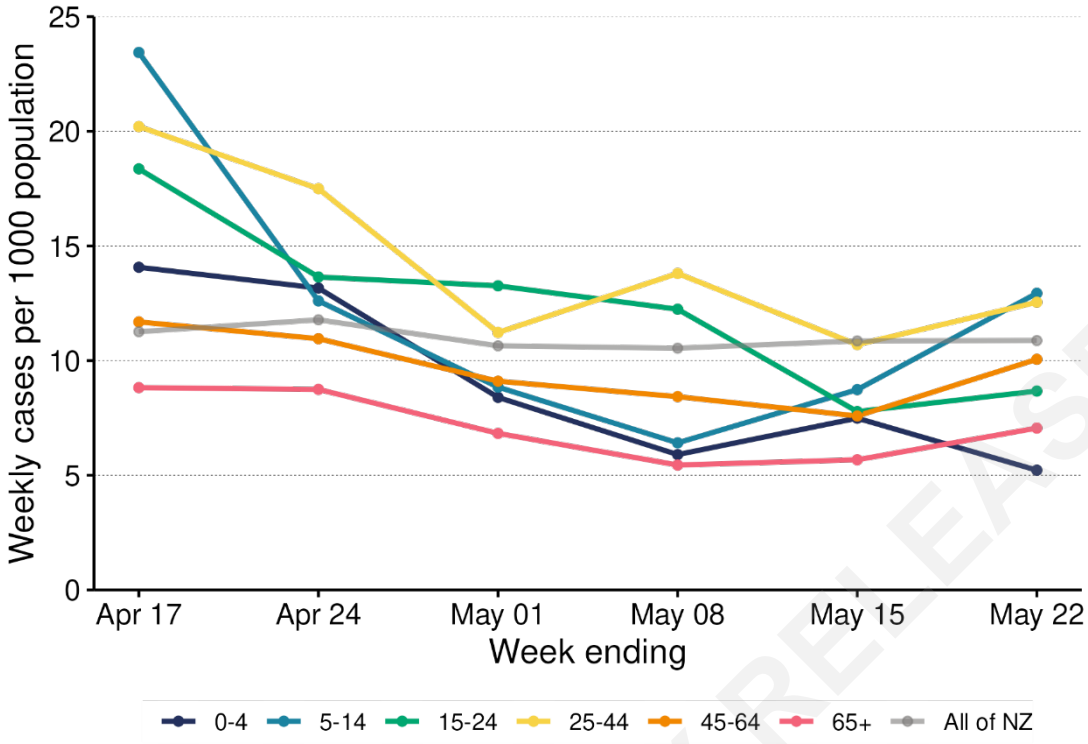
Taranaki DHB



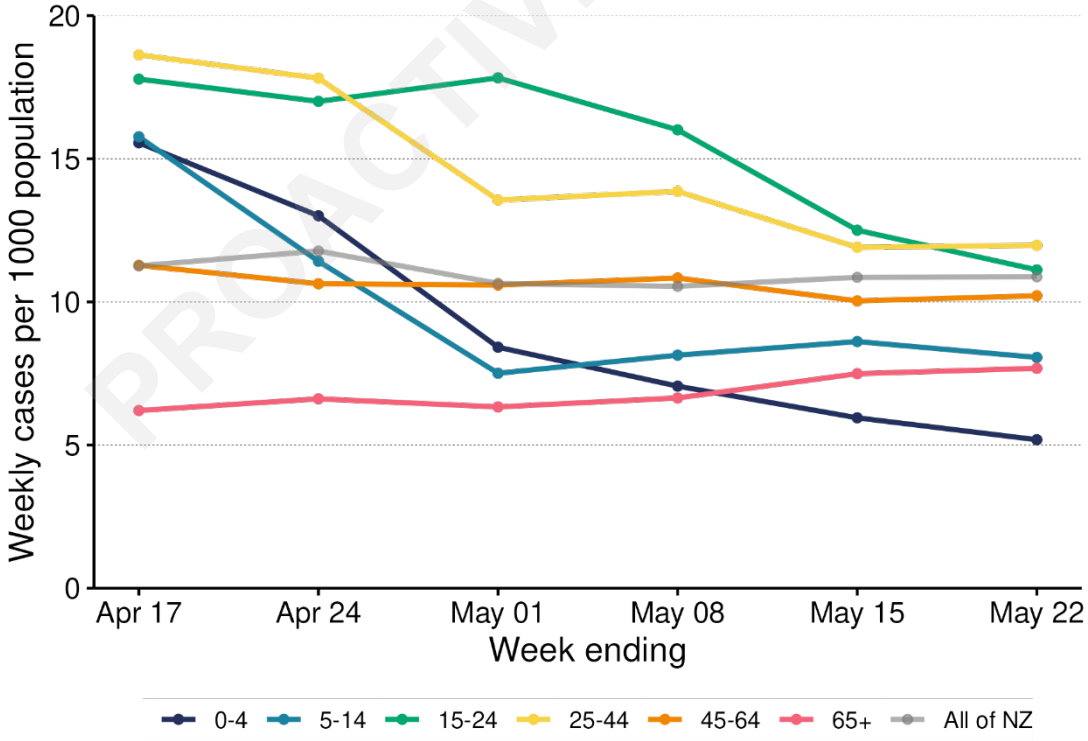
Hawke's Bay DHB



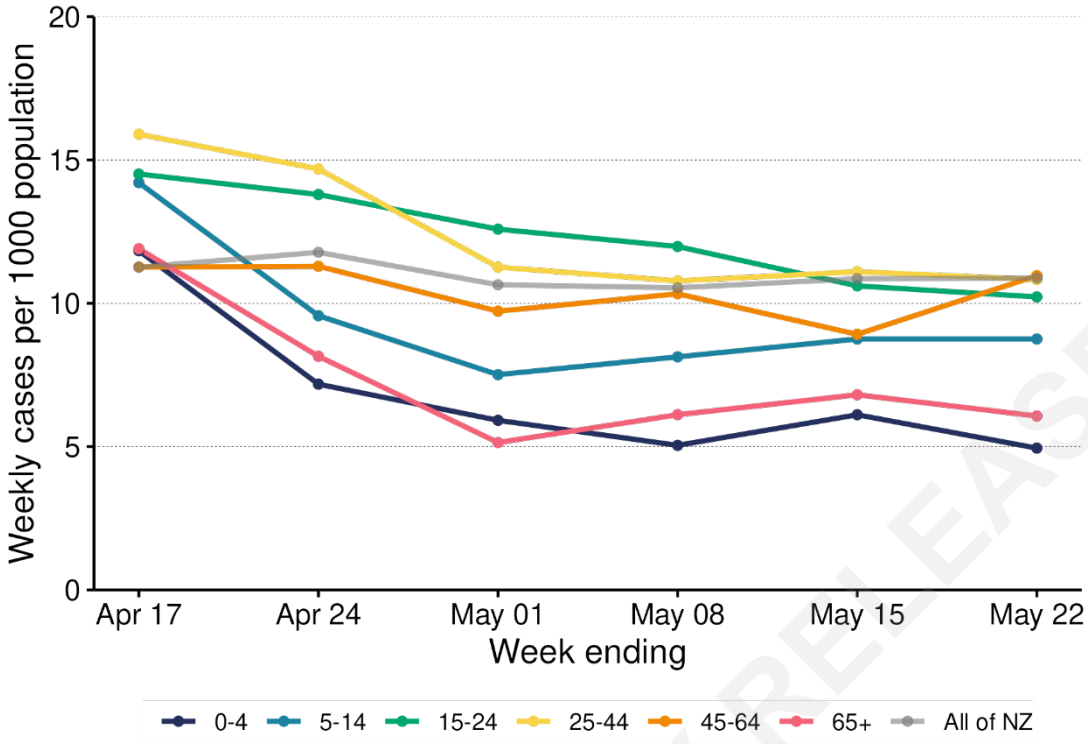
Whanganui DHB



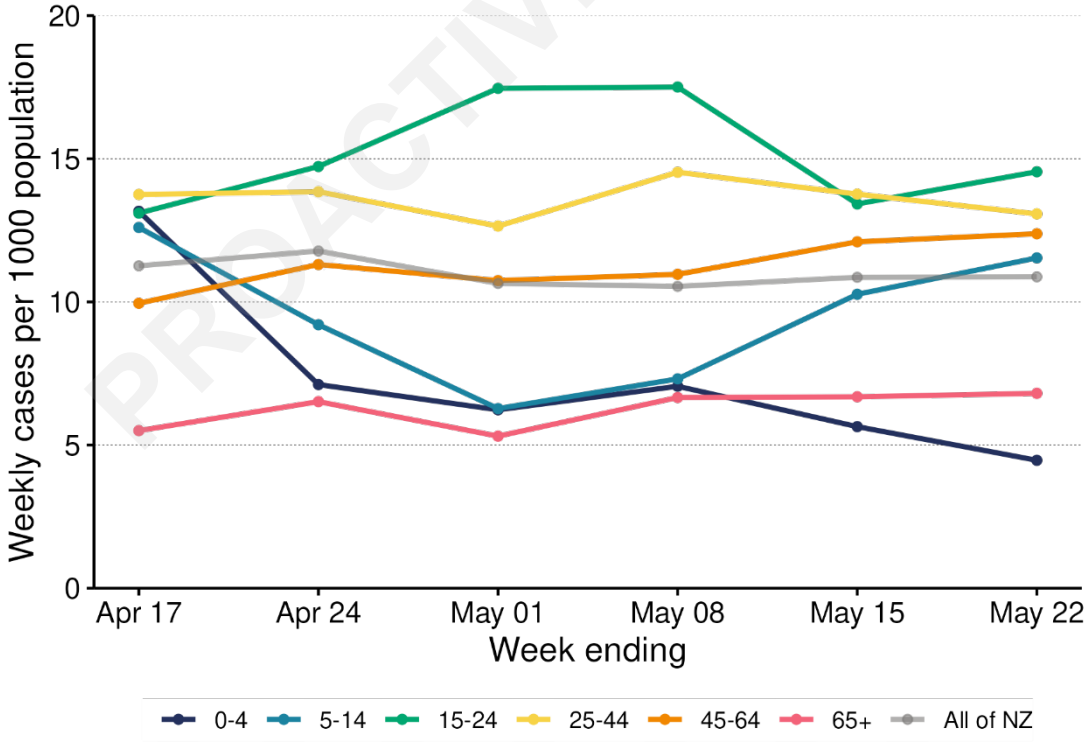
MidCentral DHB



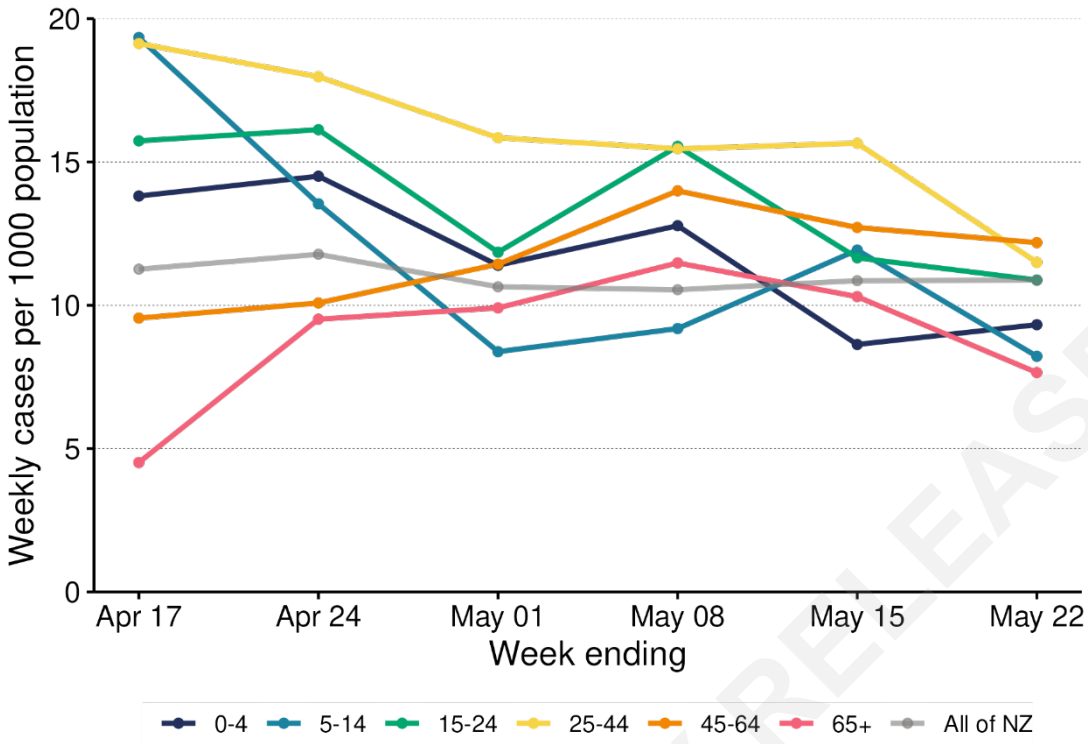
Hutt Valley DHB



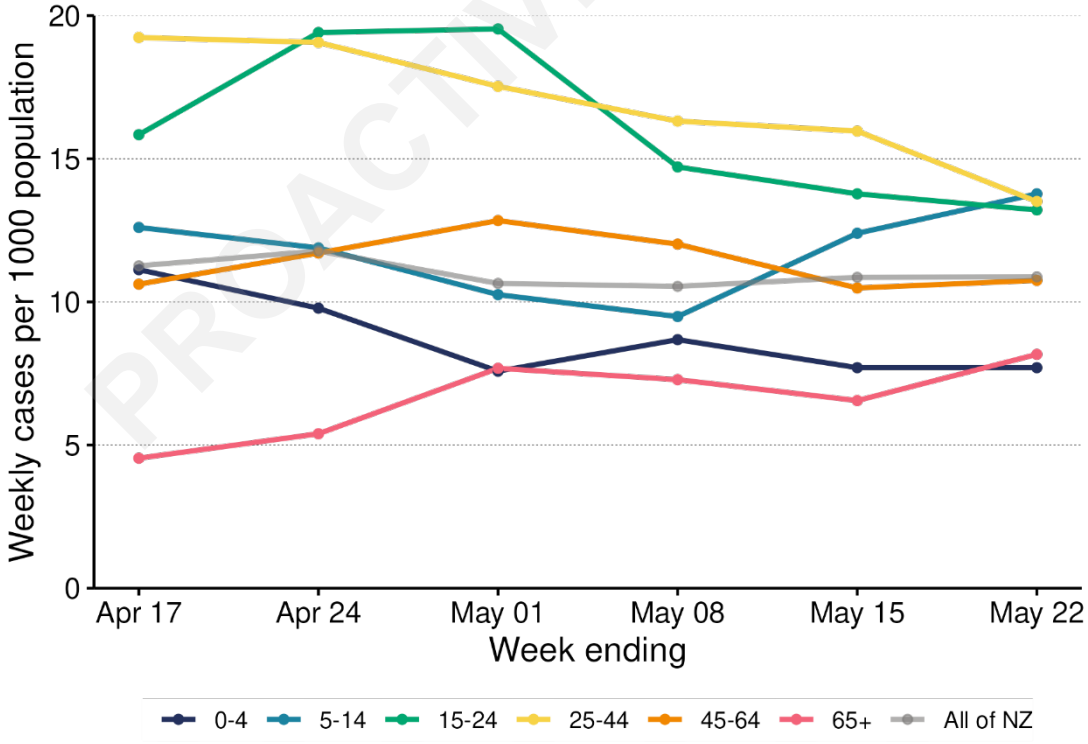
Capital and Coast DHB



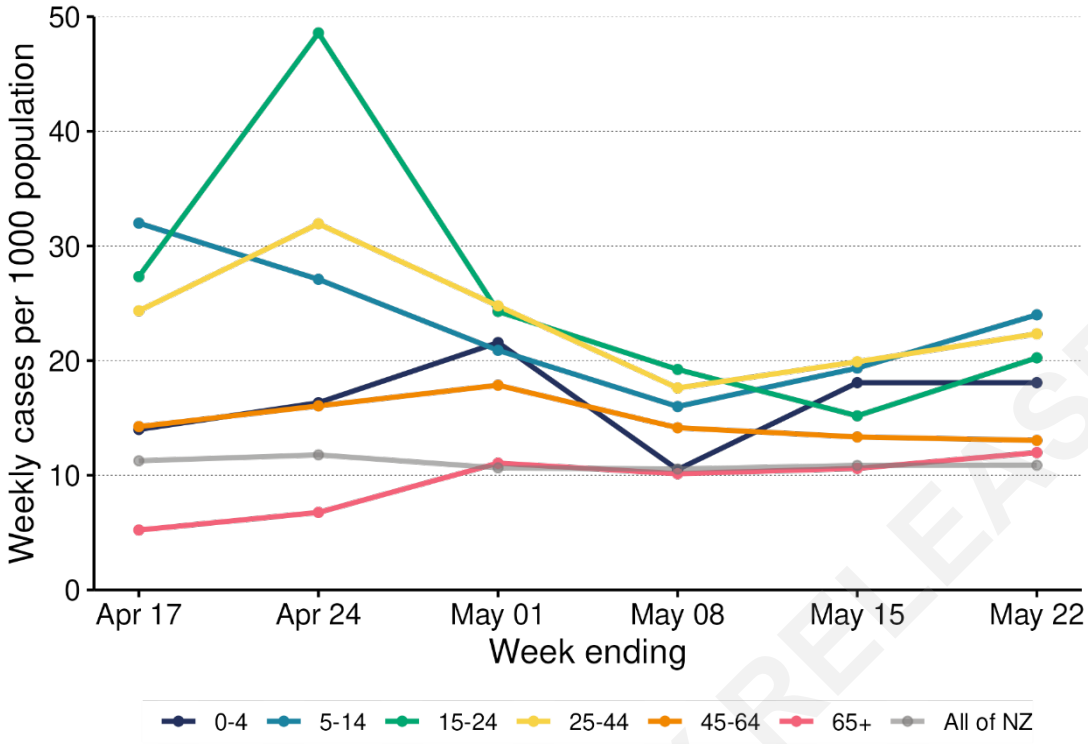
Wairarapa DHB



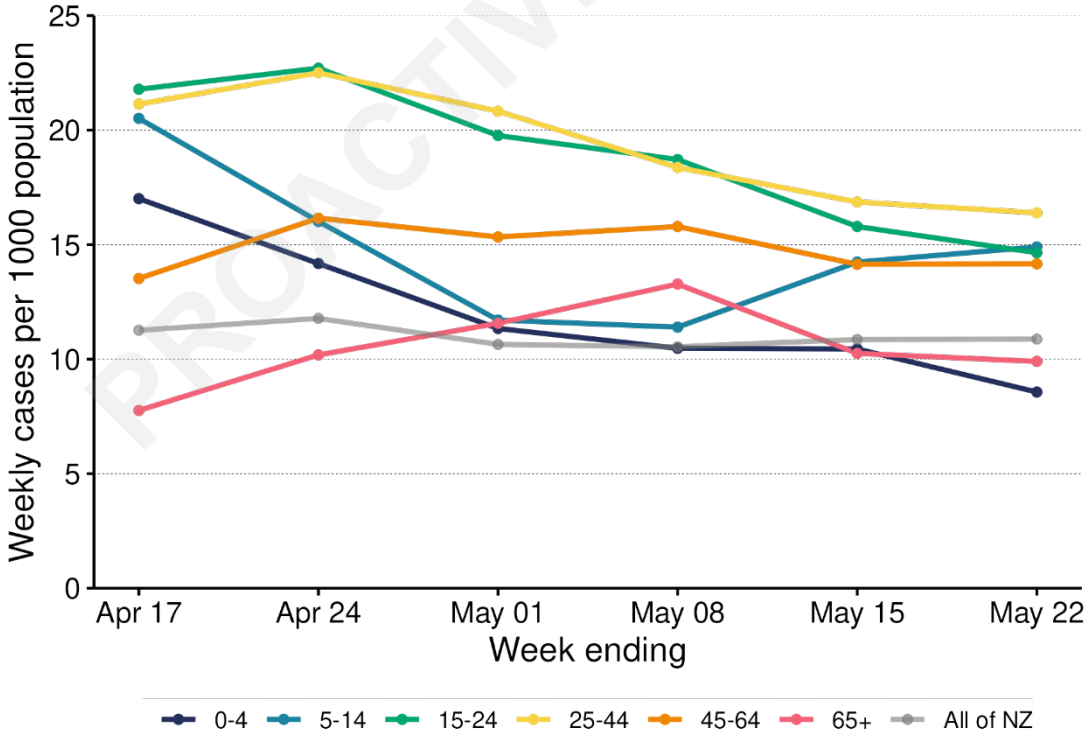
Nelson Marlborough DHB



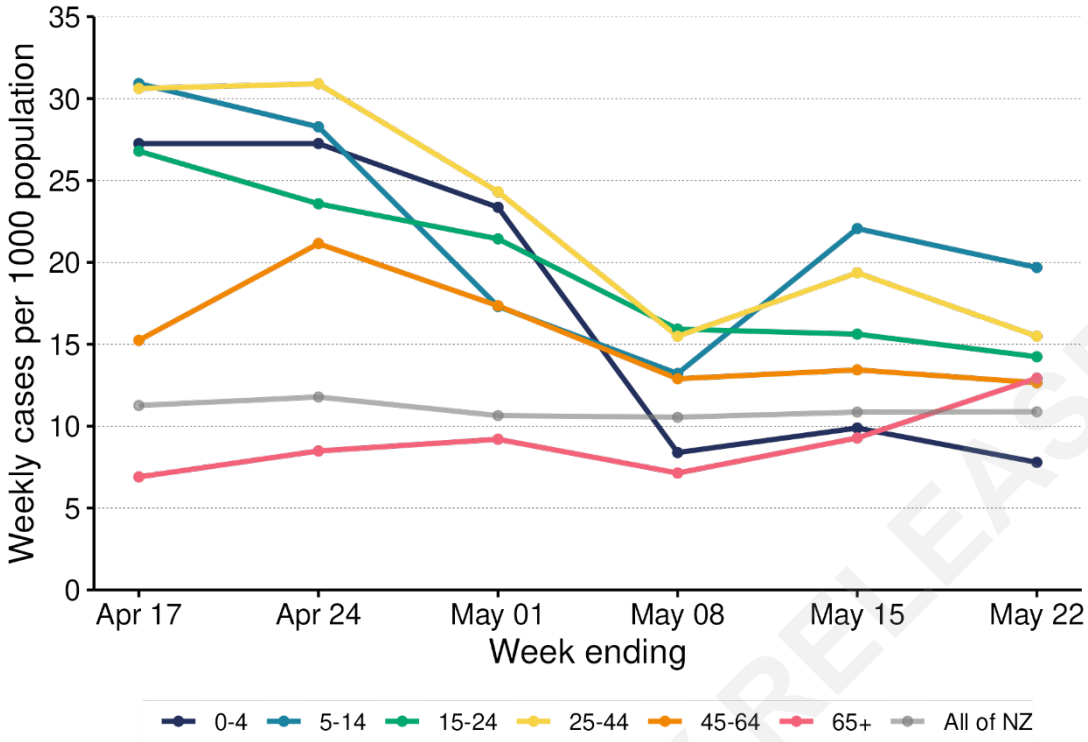
West Coast DHB



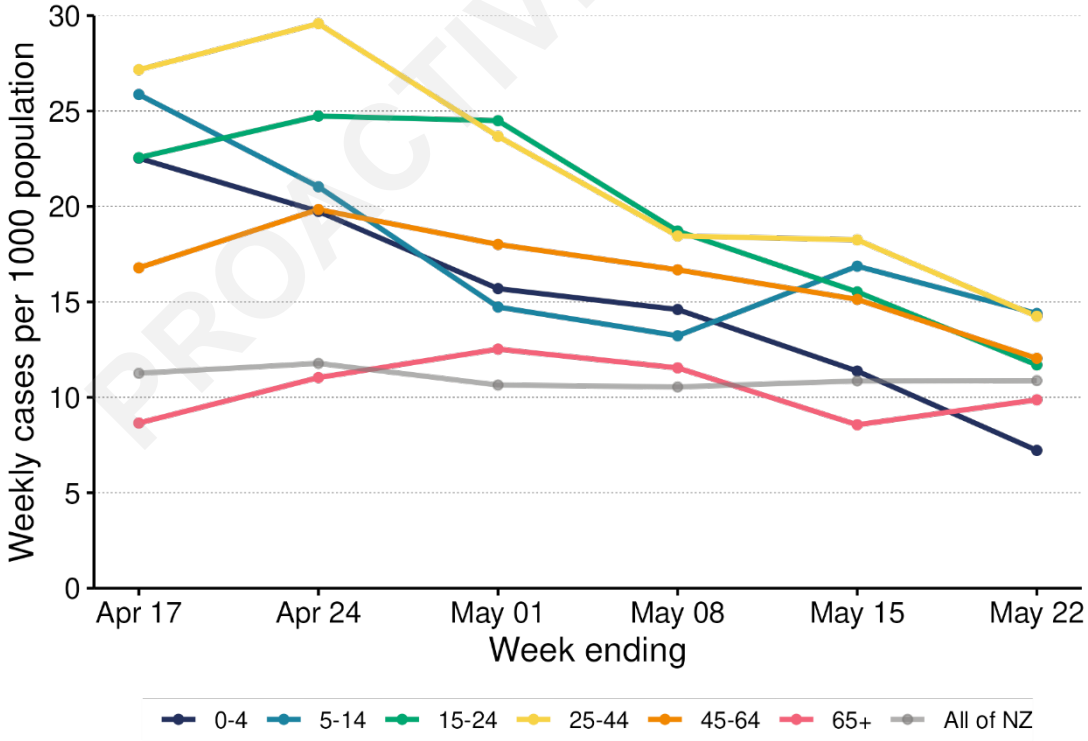
Canterbury DHB



South Canterbury DHB



Southern DHB



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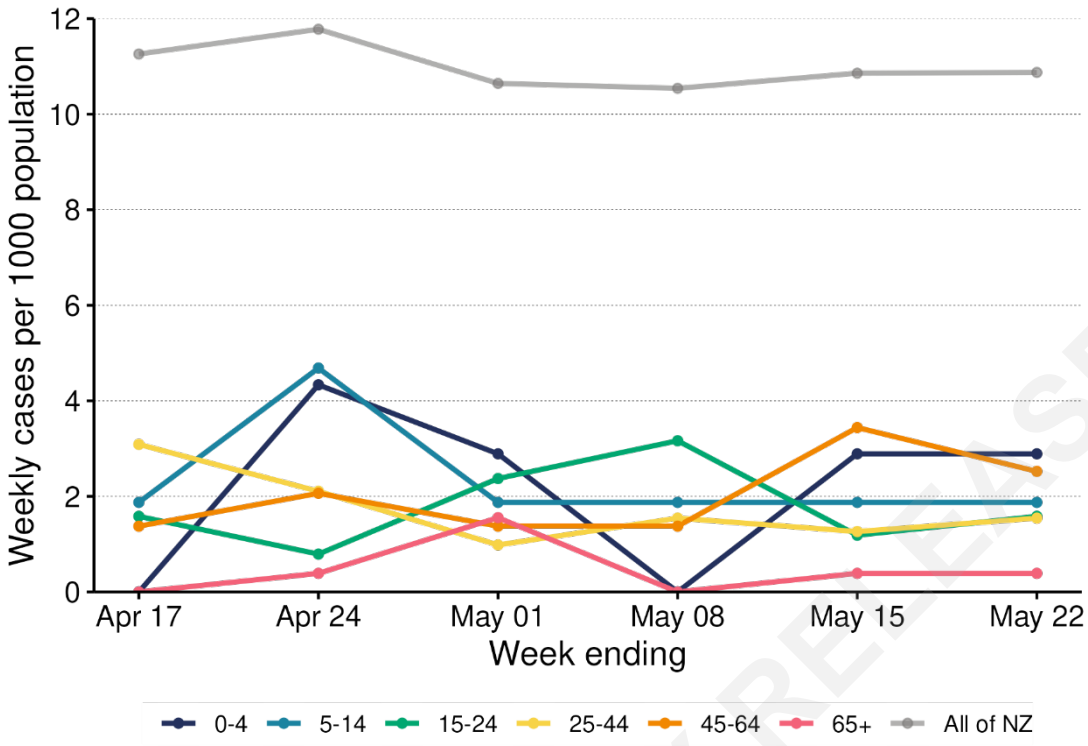
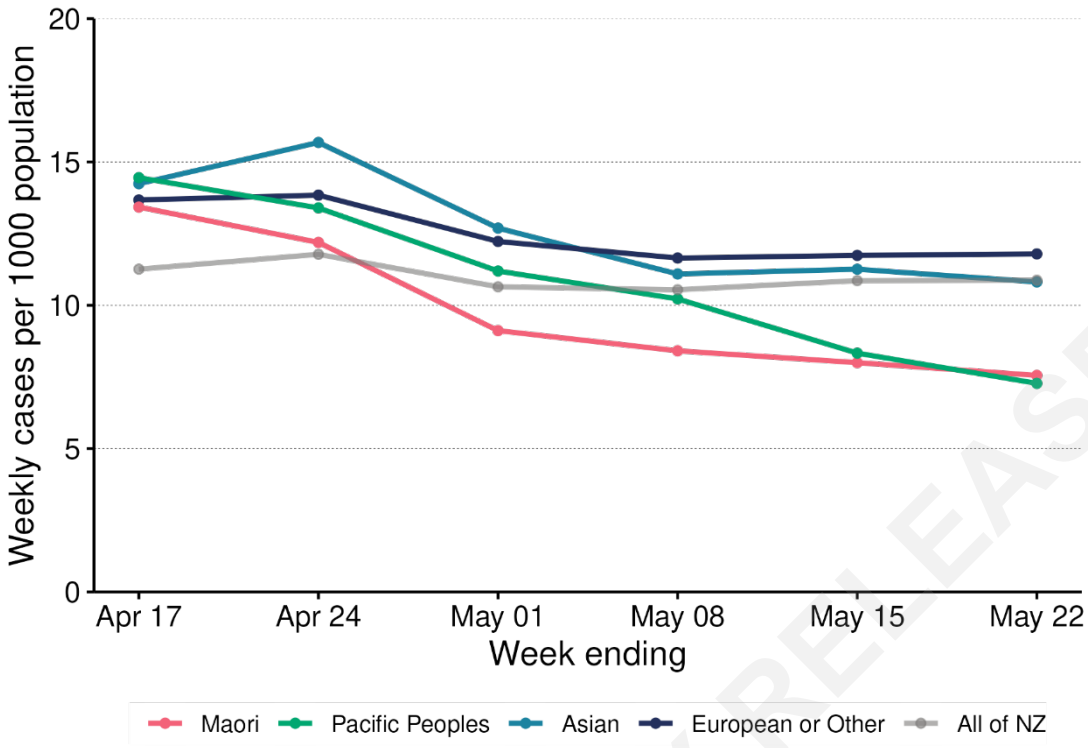
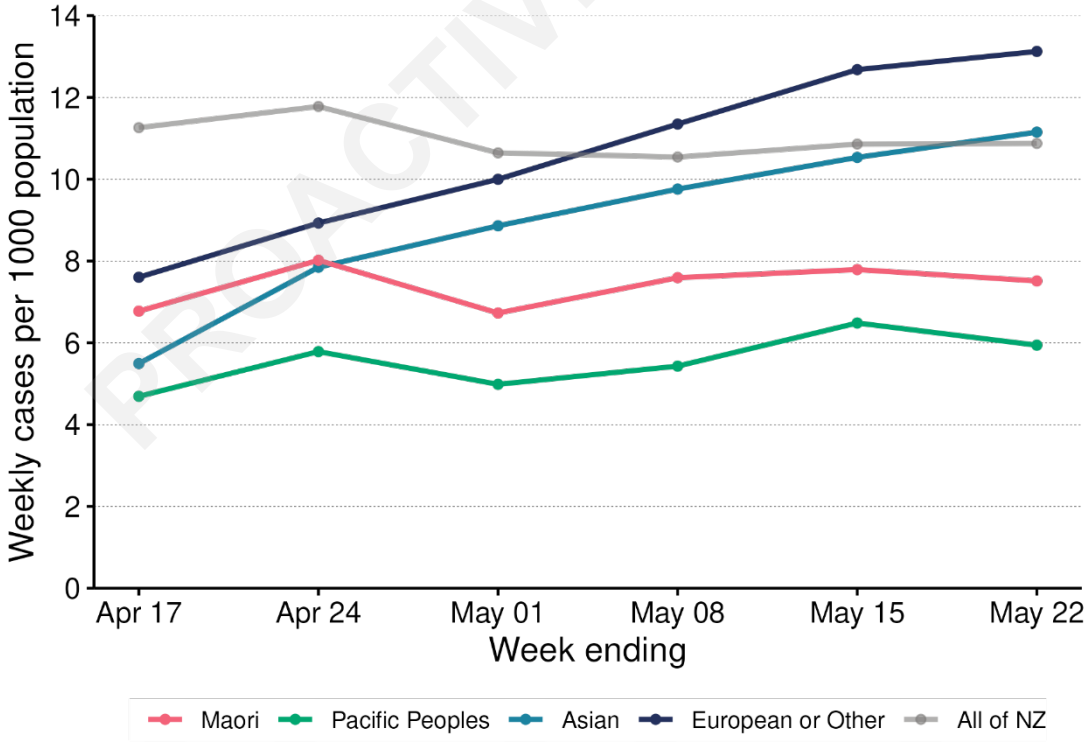


Ethnicity Graphs

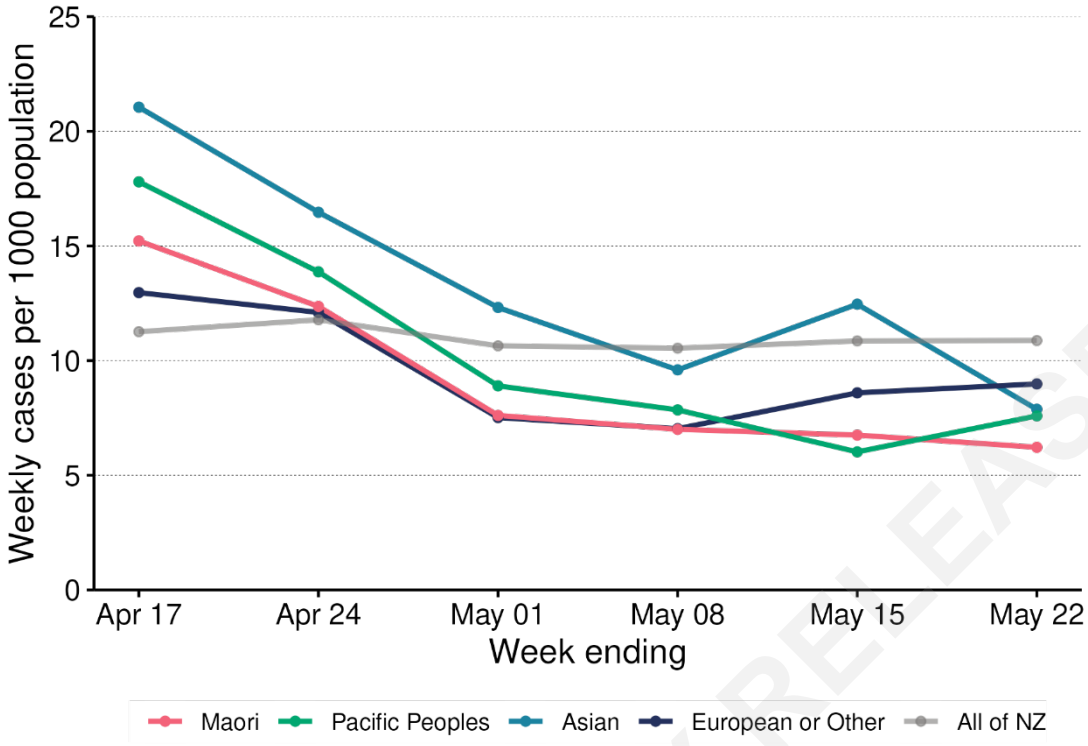
NZ Excluding Auckland Region



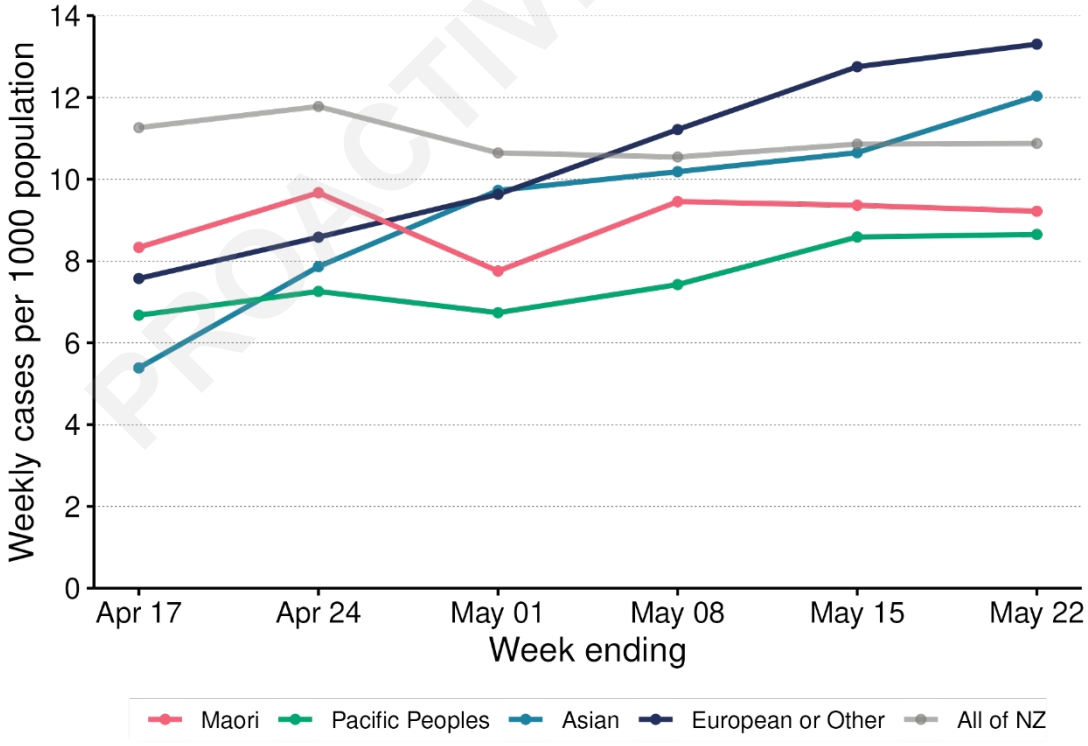
Auckland Region



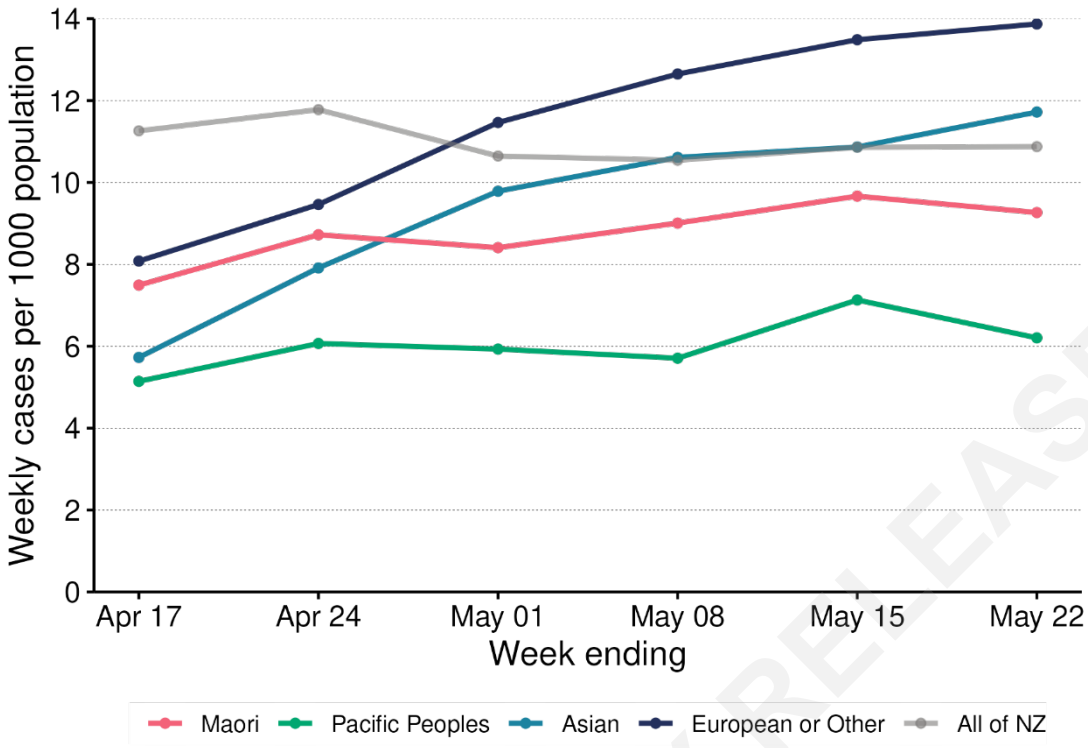
Northland DHB



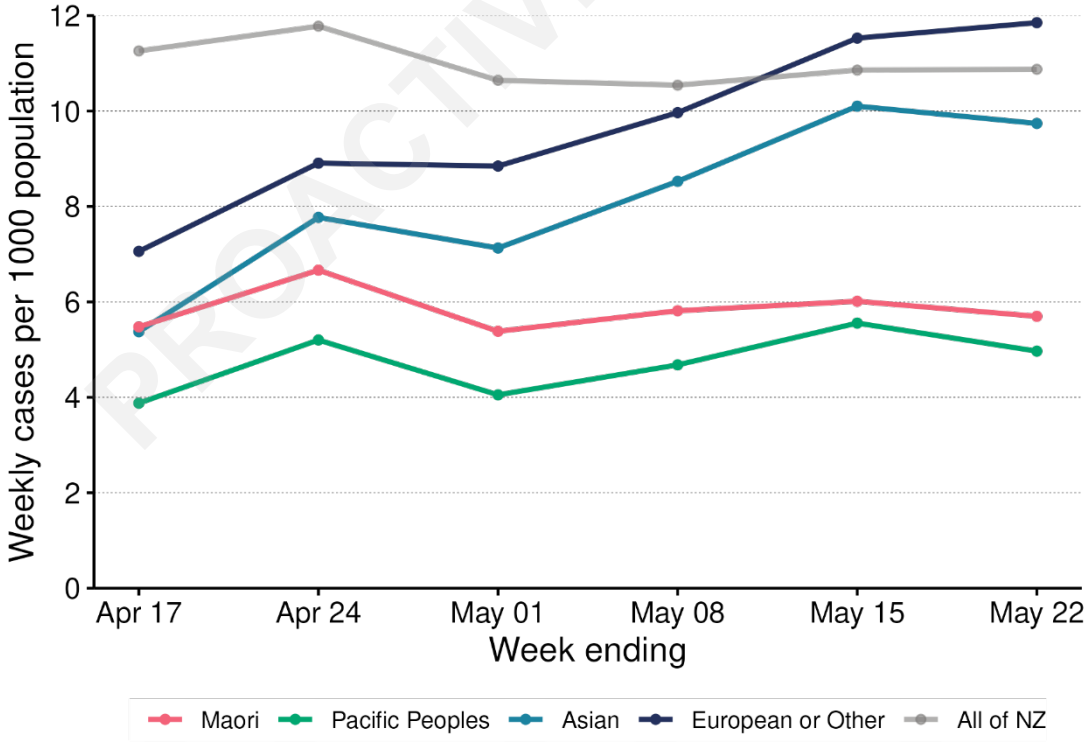
Waitemata DHB



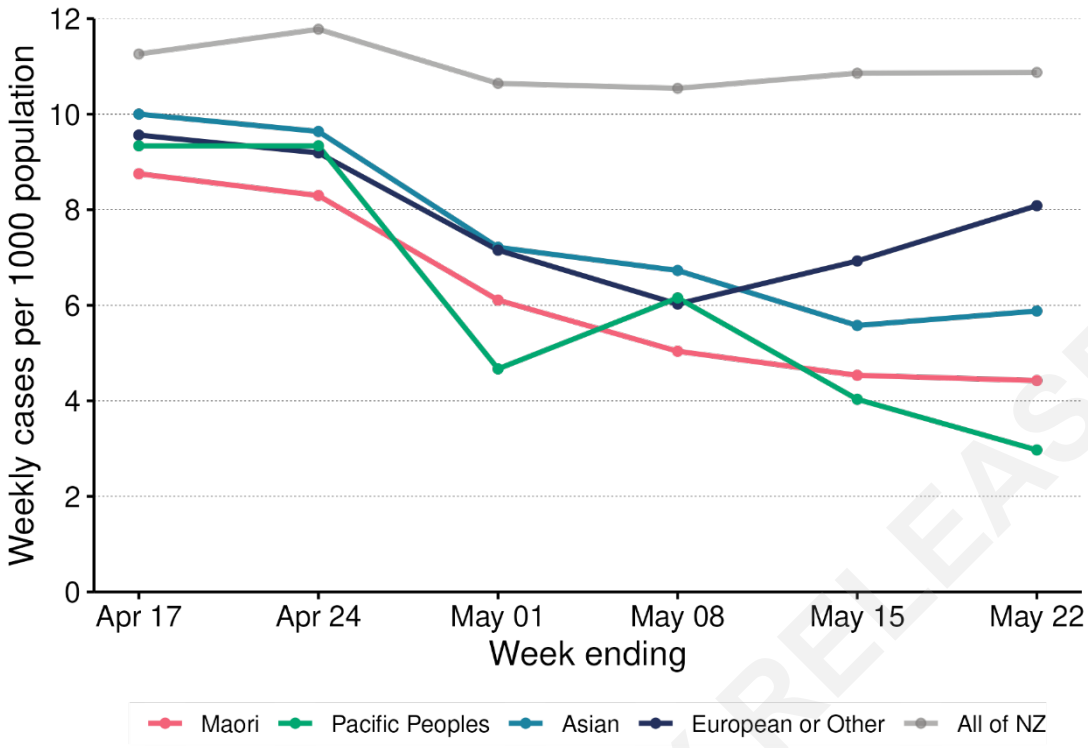
Auckland DHB



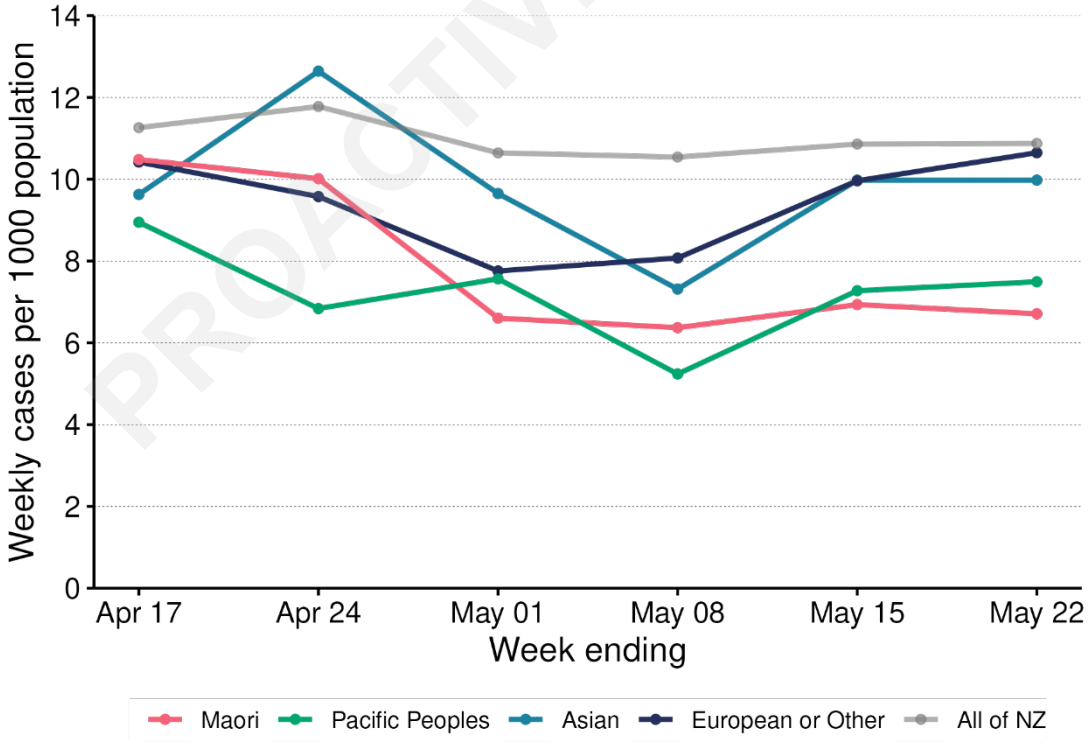
Counties Manukau DHB



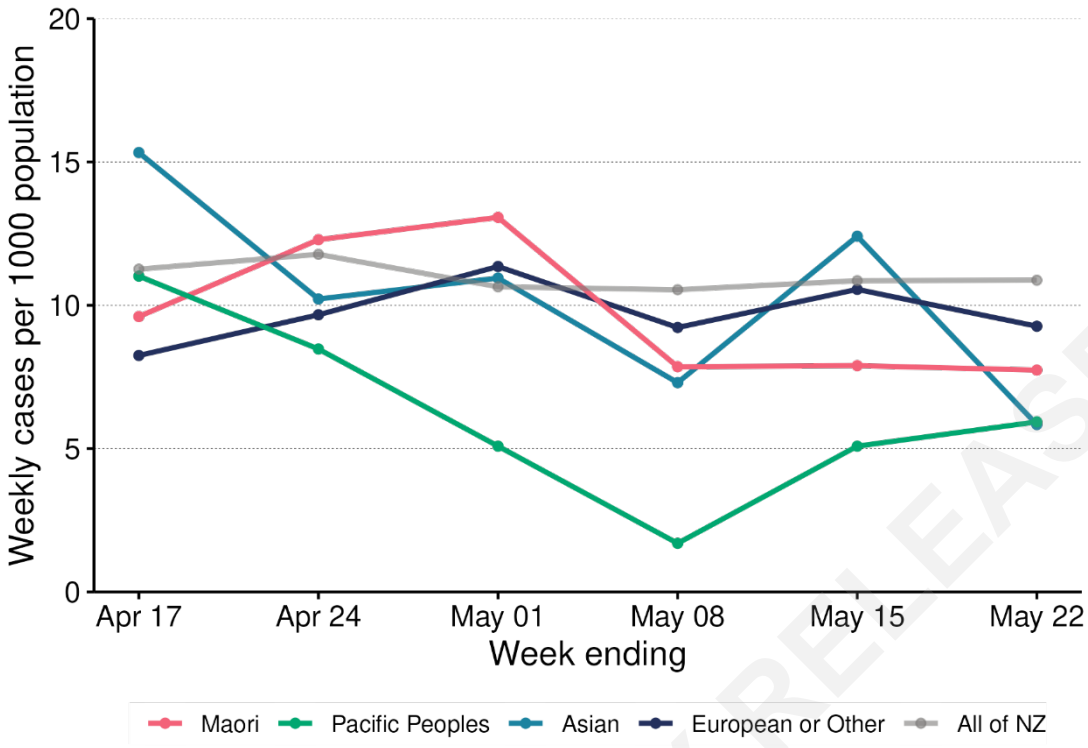
Bay of Plenty DHB



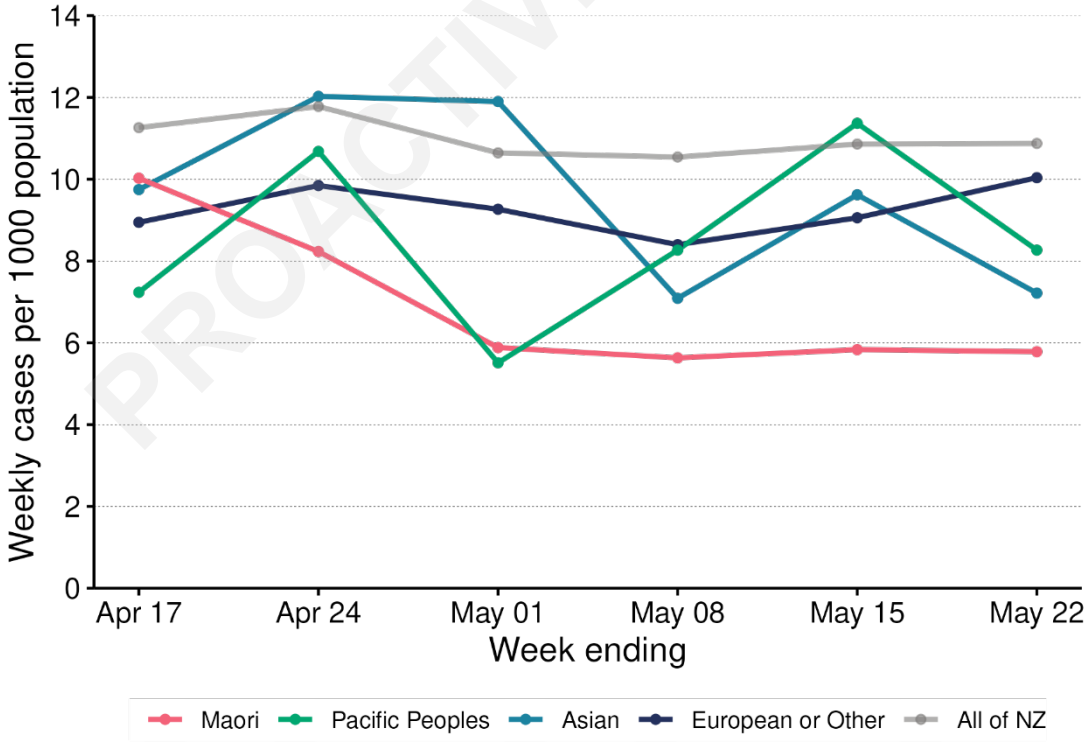
Waikato DHB



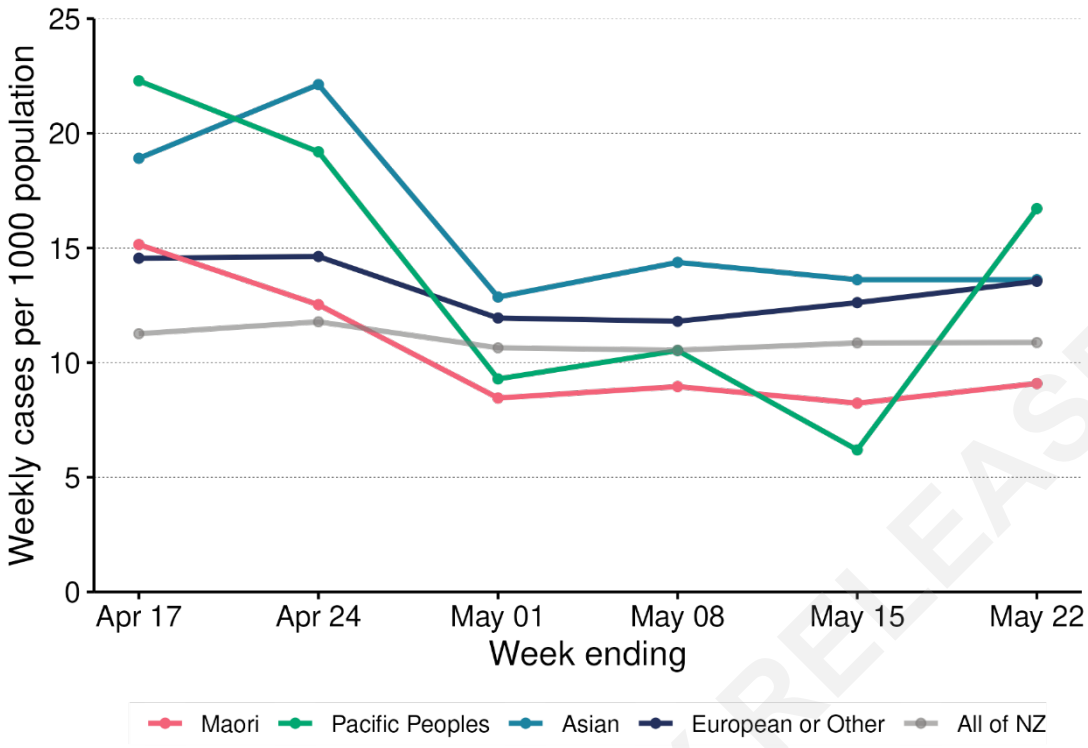
Tairawhiti DHB



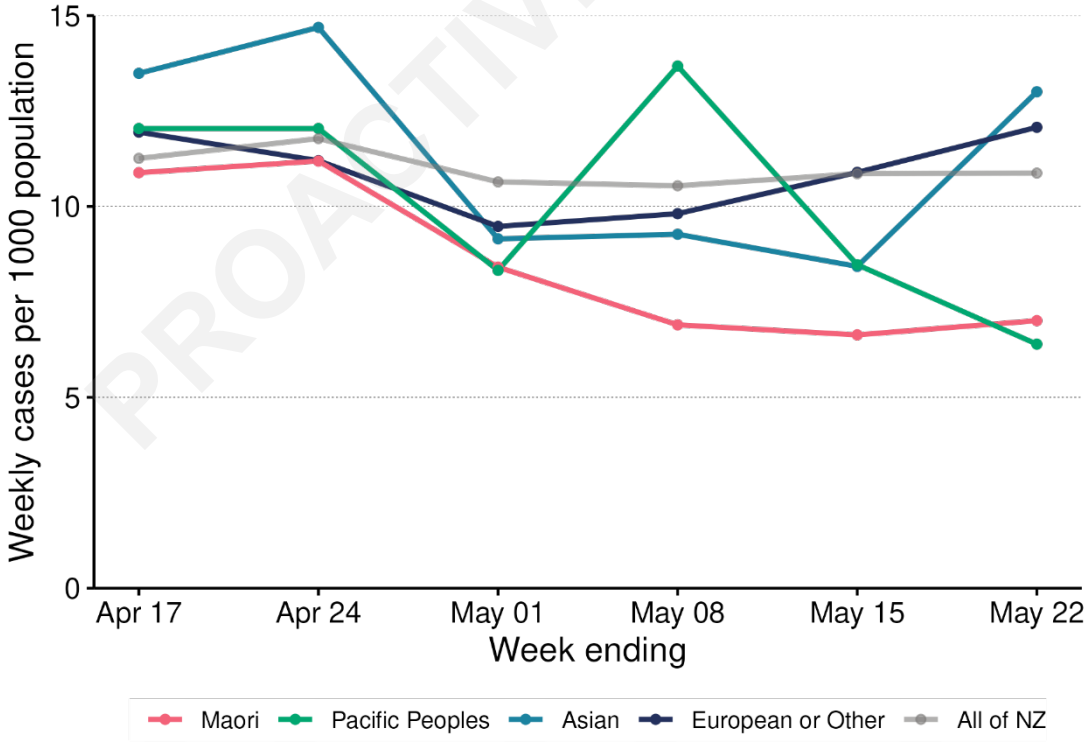
Lakes DHB



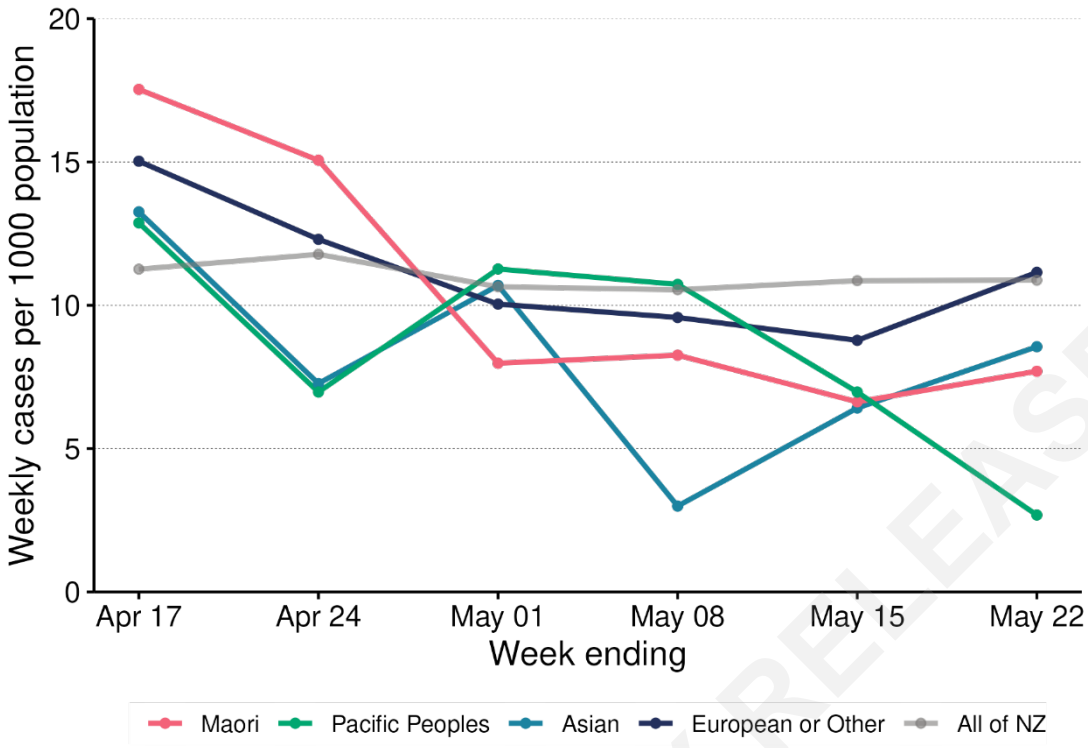
Taranaki DHB



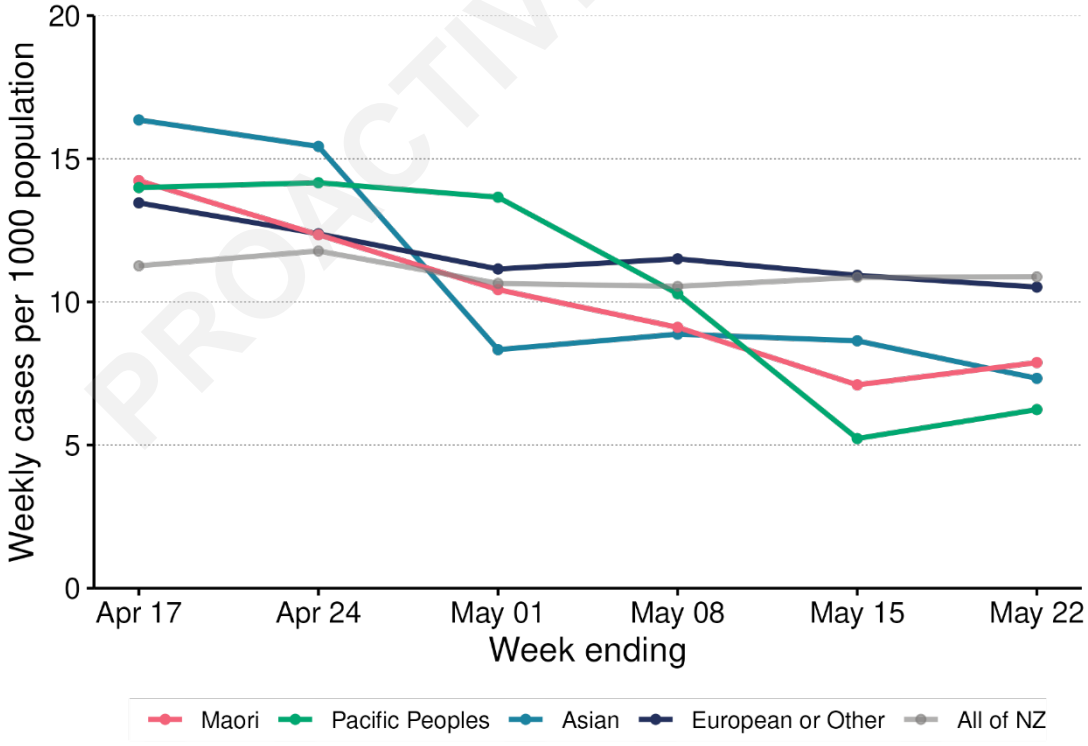
Hawke's Bay DHB



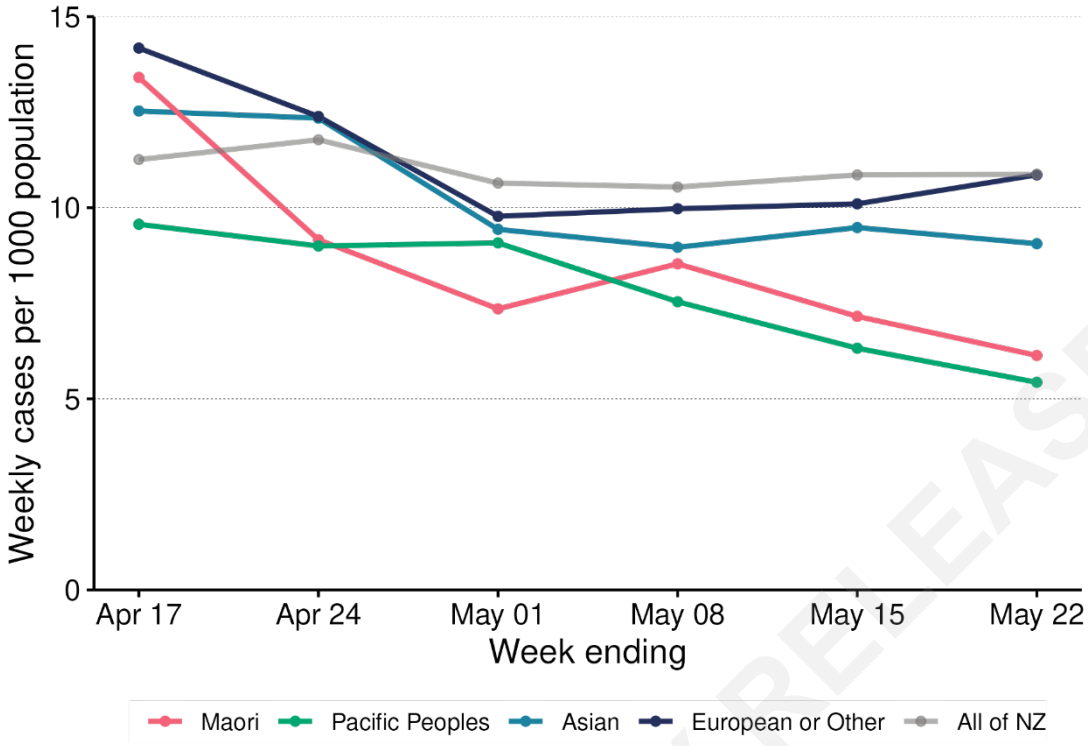
Whanganui DHB



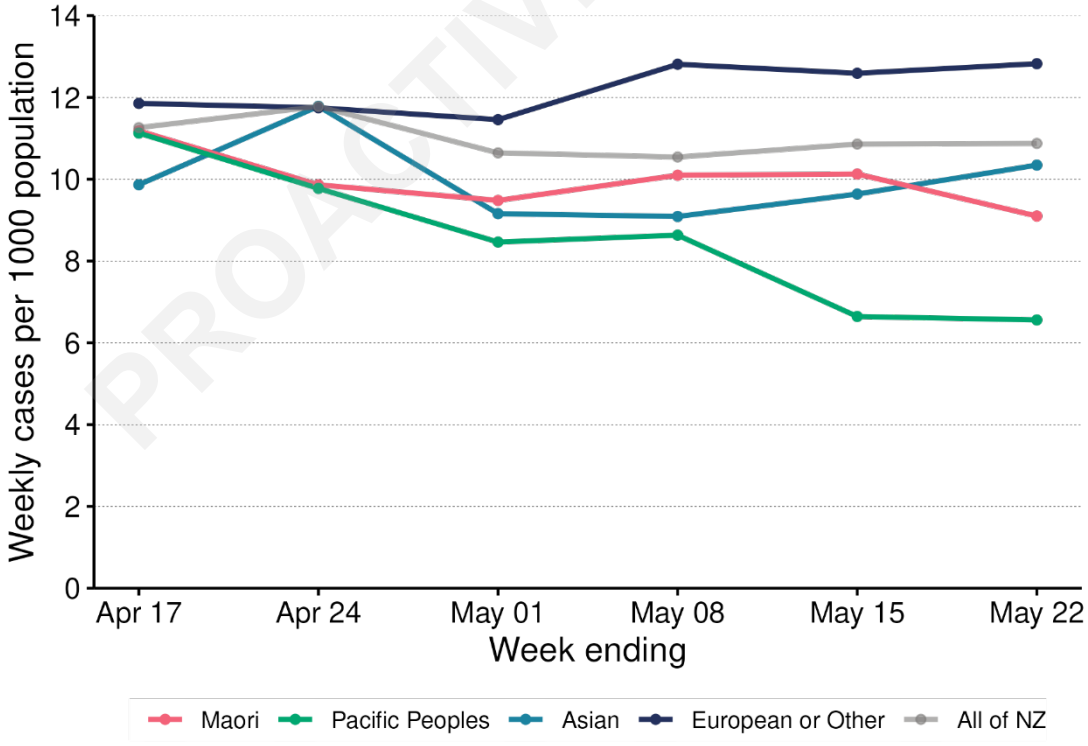
MidCentral DHB



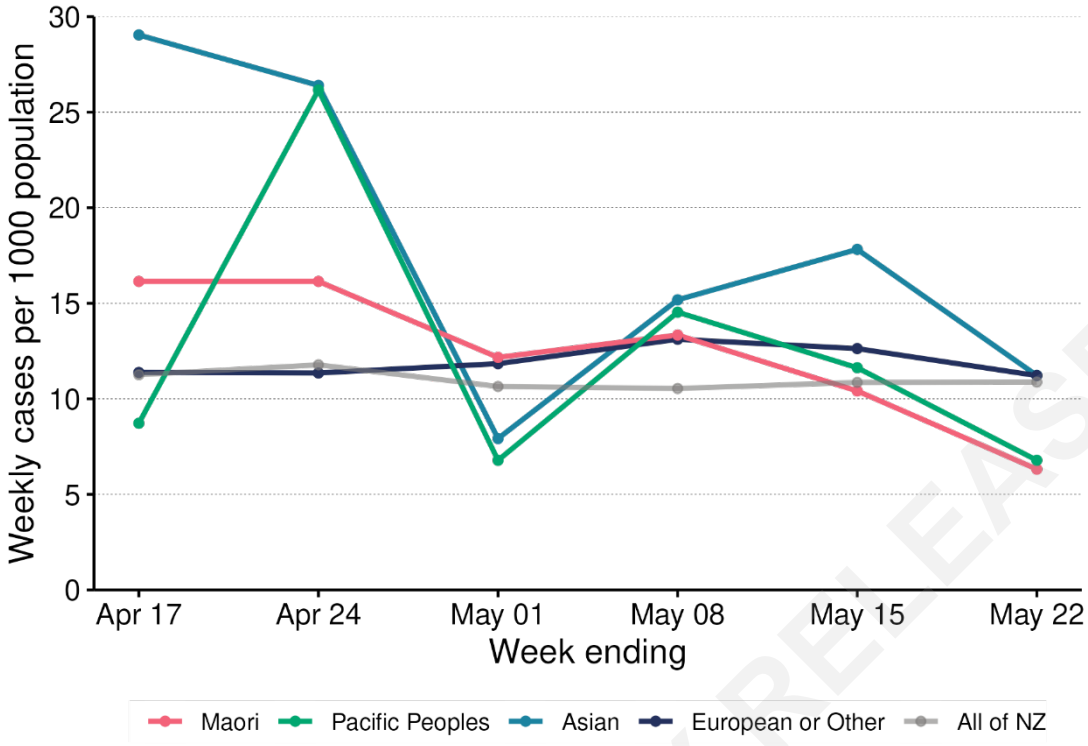
Hutt Valley DHB



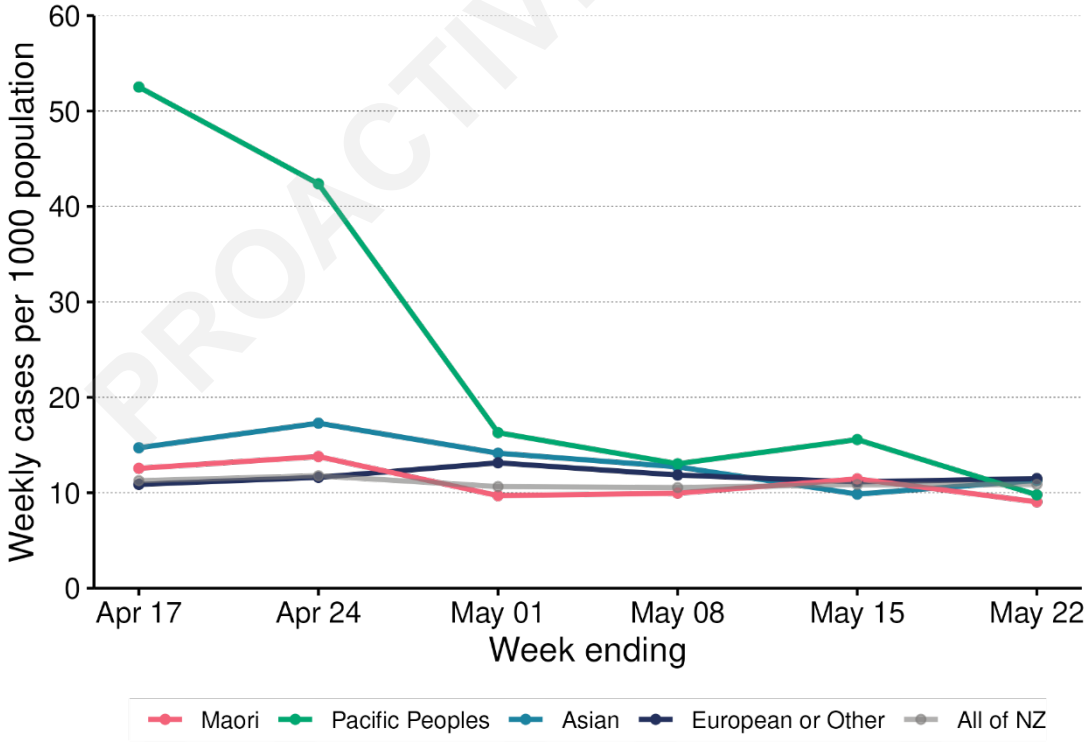
Capital and Coast DHB



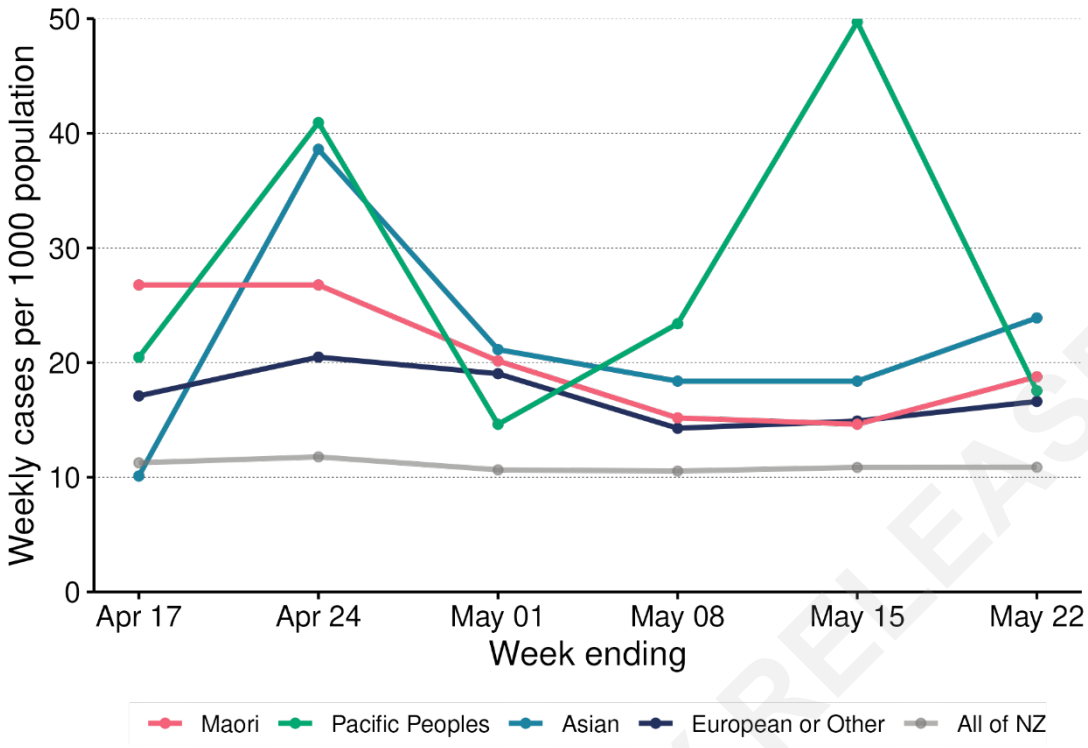
Wairarapa DHB



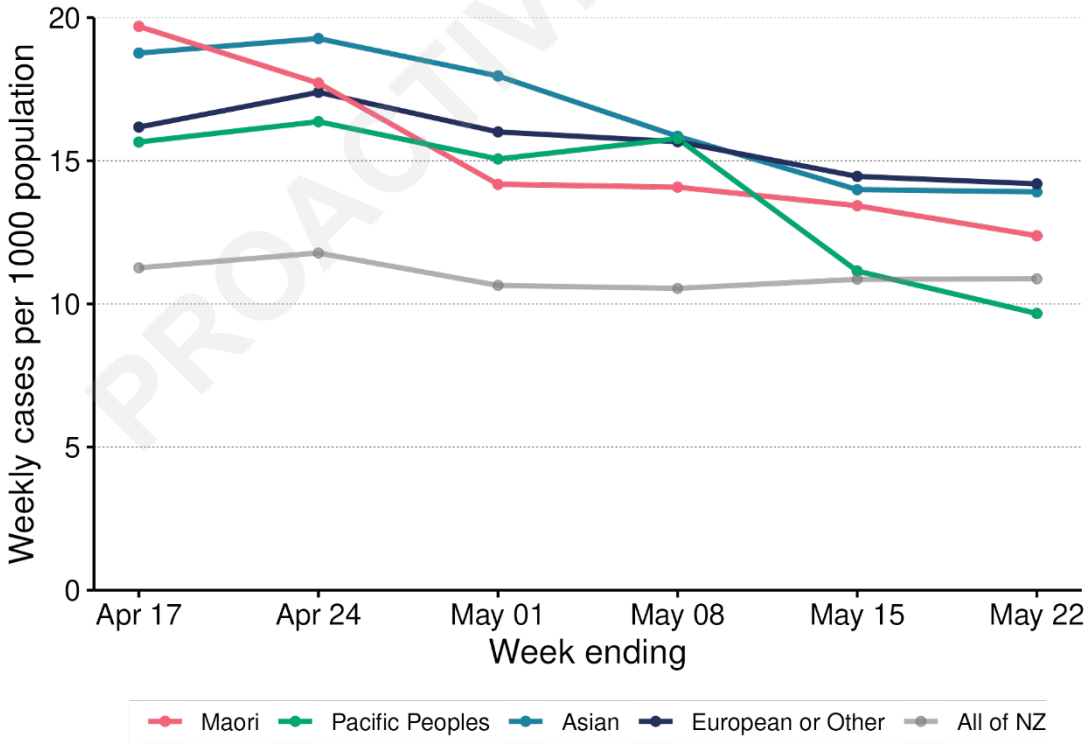
Nelson Marlborough DHB



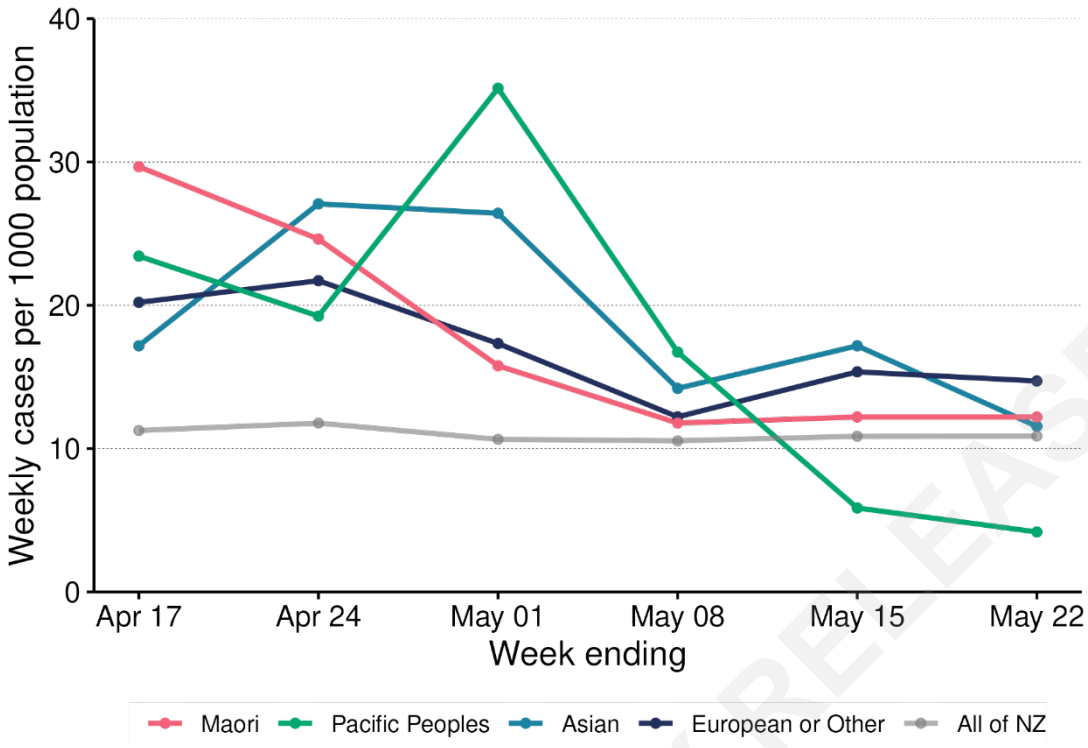
West Coast DHB



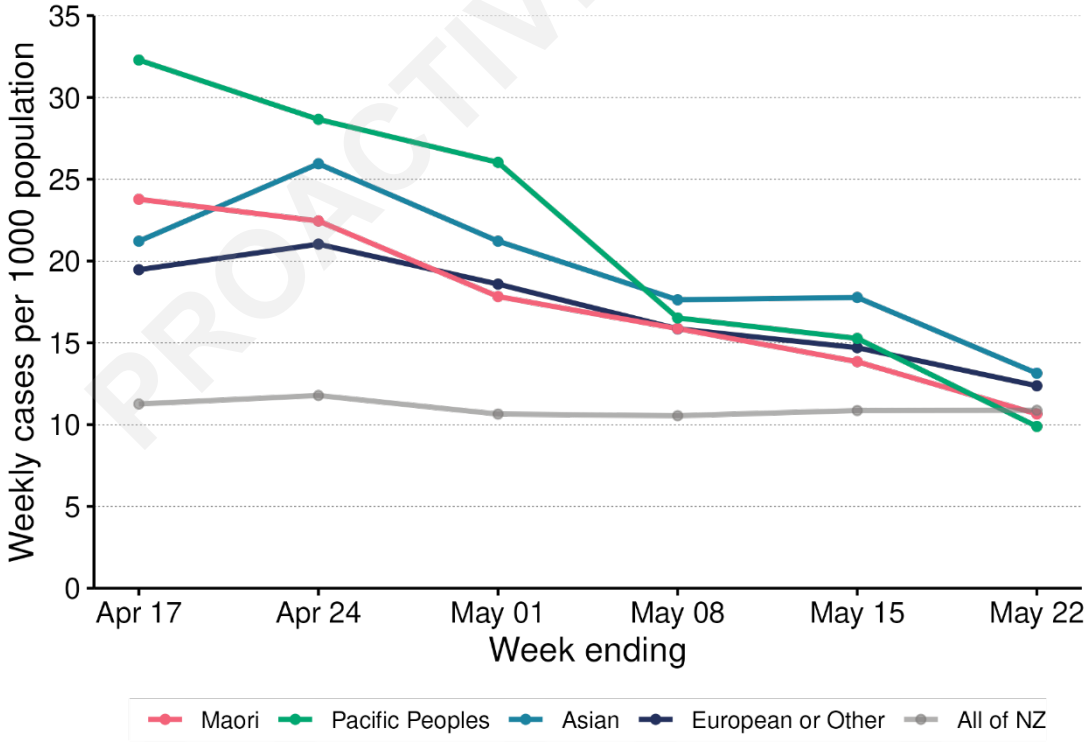
Canterbury DHB



South Canterbury DHB



Southern DHB



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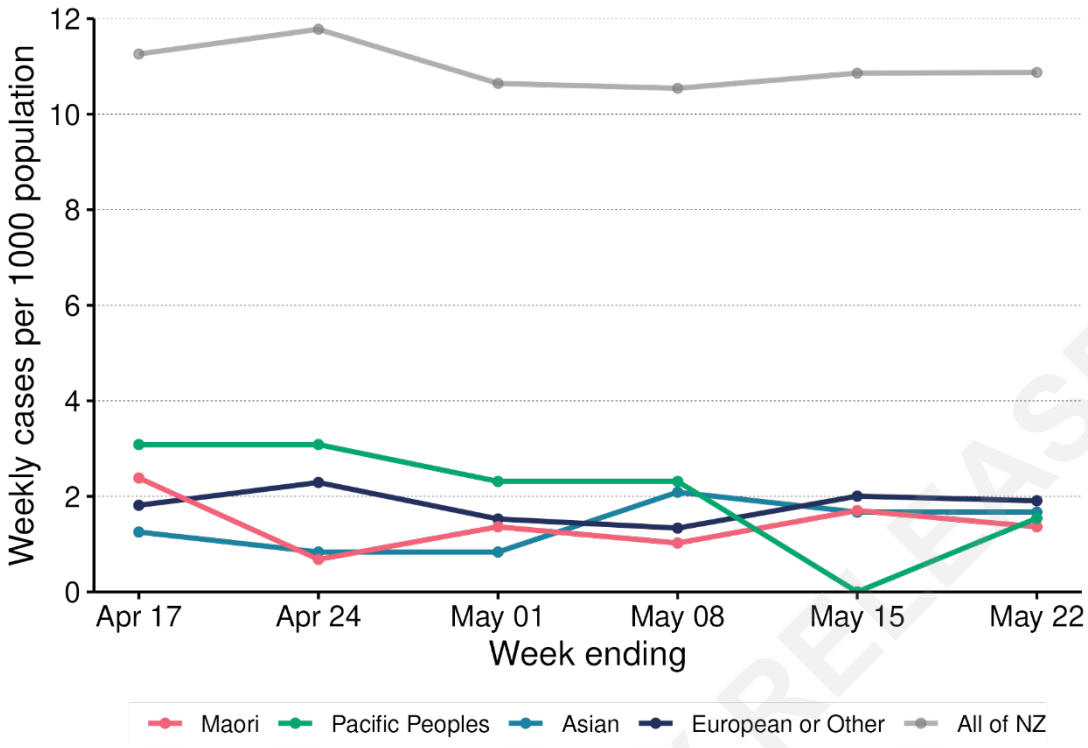
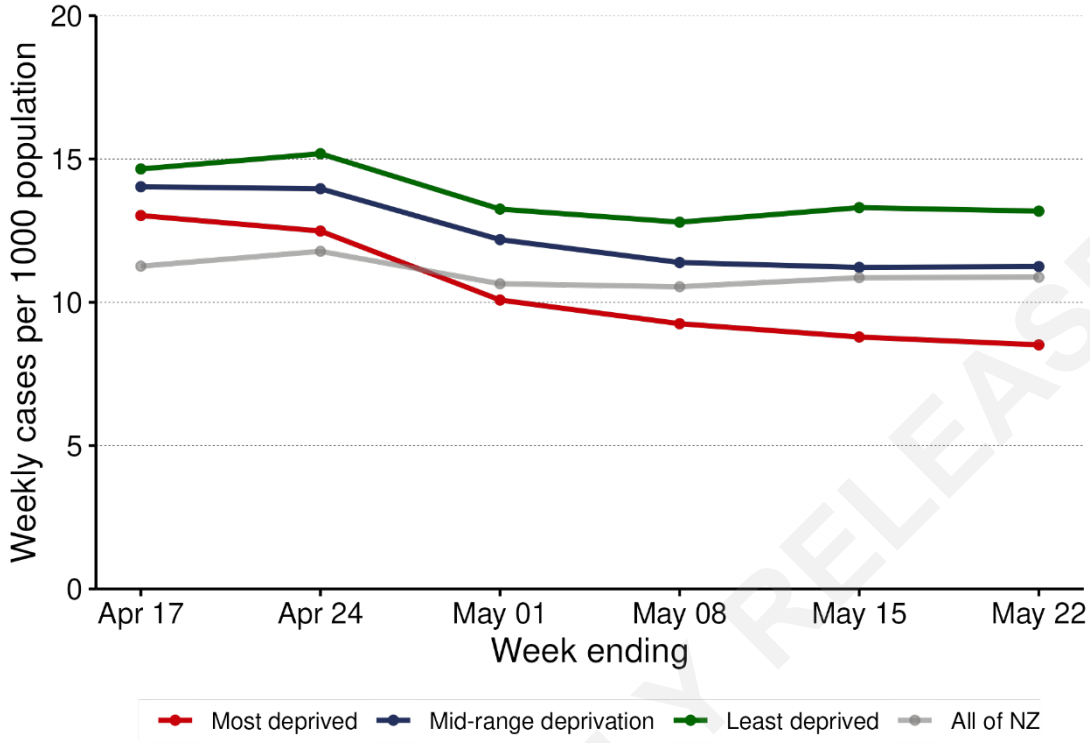
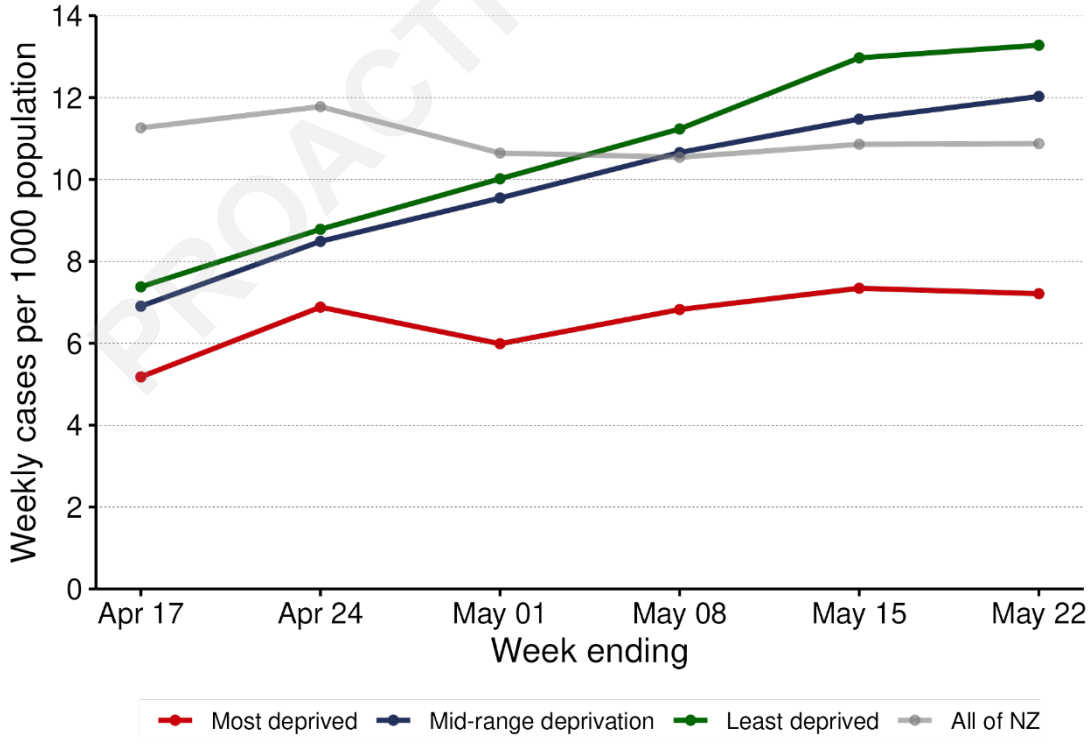


Deprivation Graphs

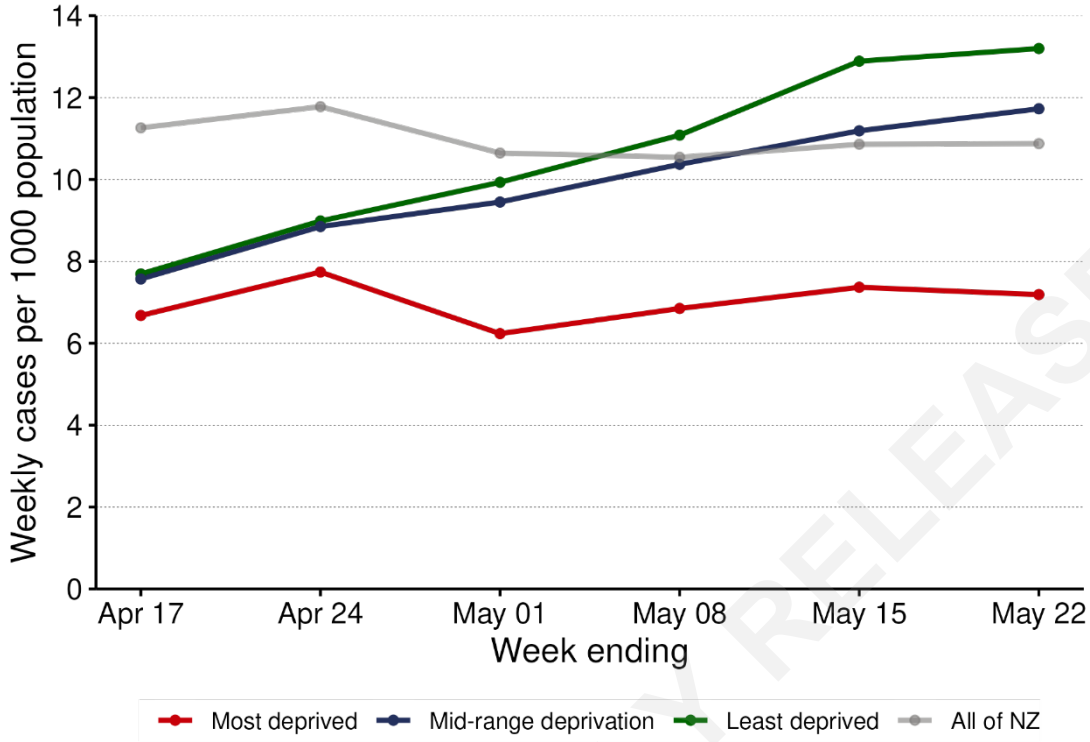
NZ Excluding Auckland Region



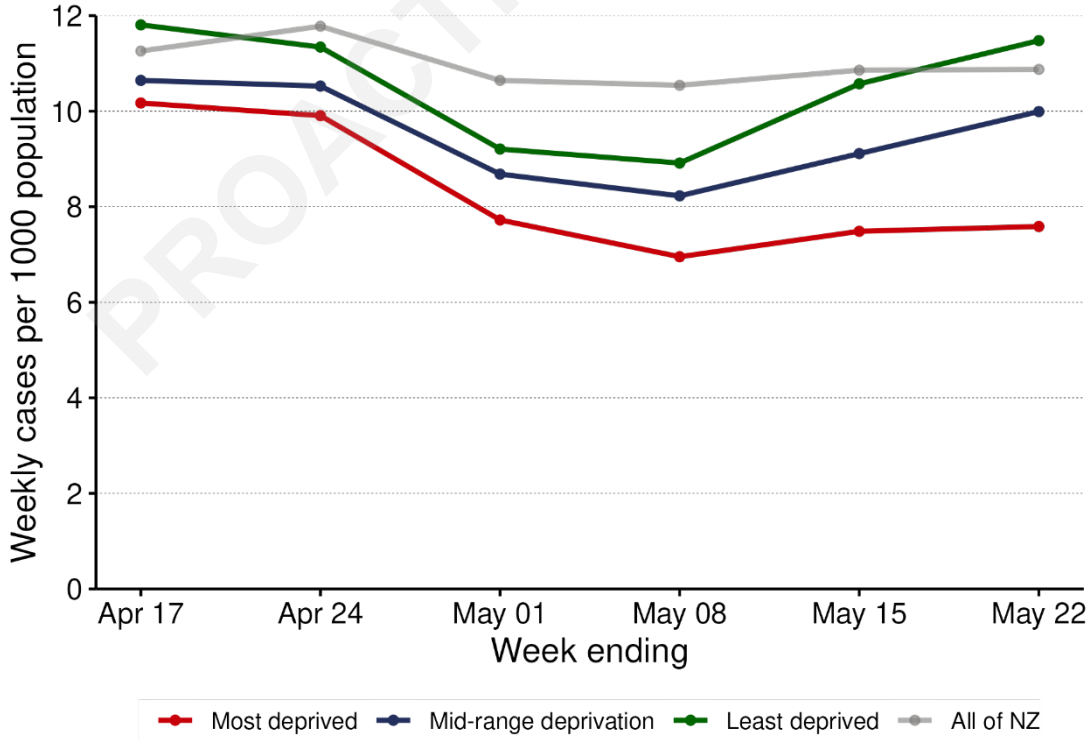
Auckland Region



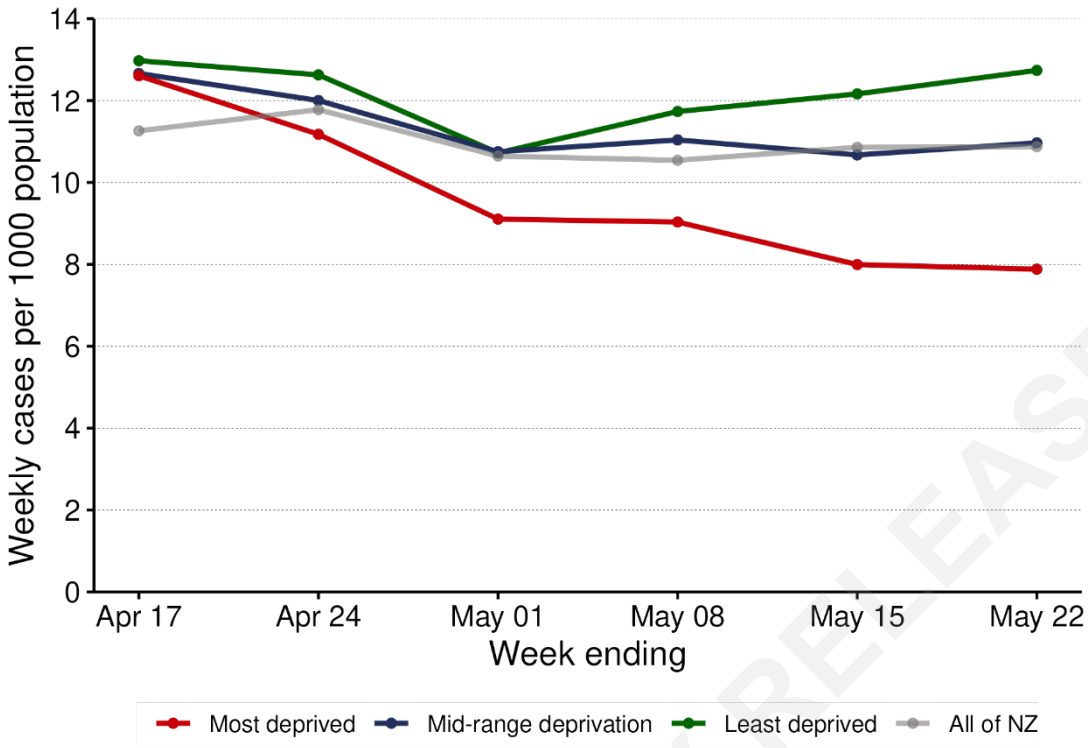
Northern Region



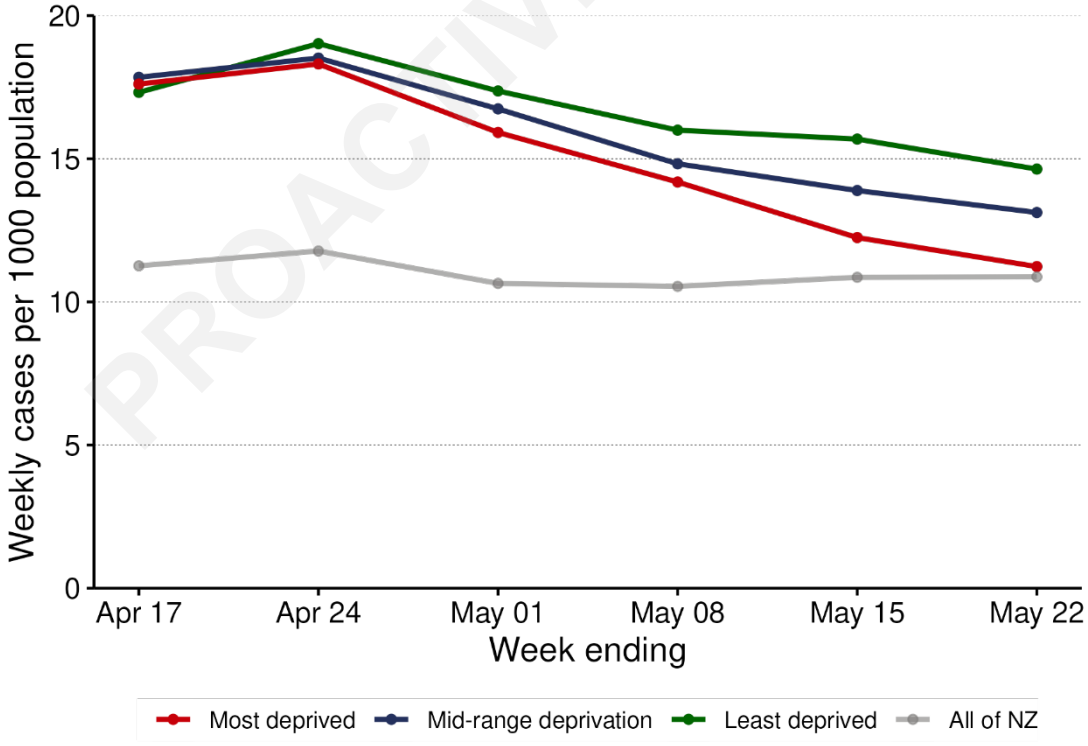
Te Manawa Taki



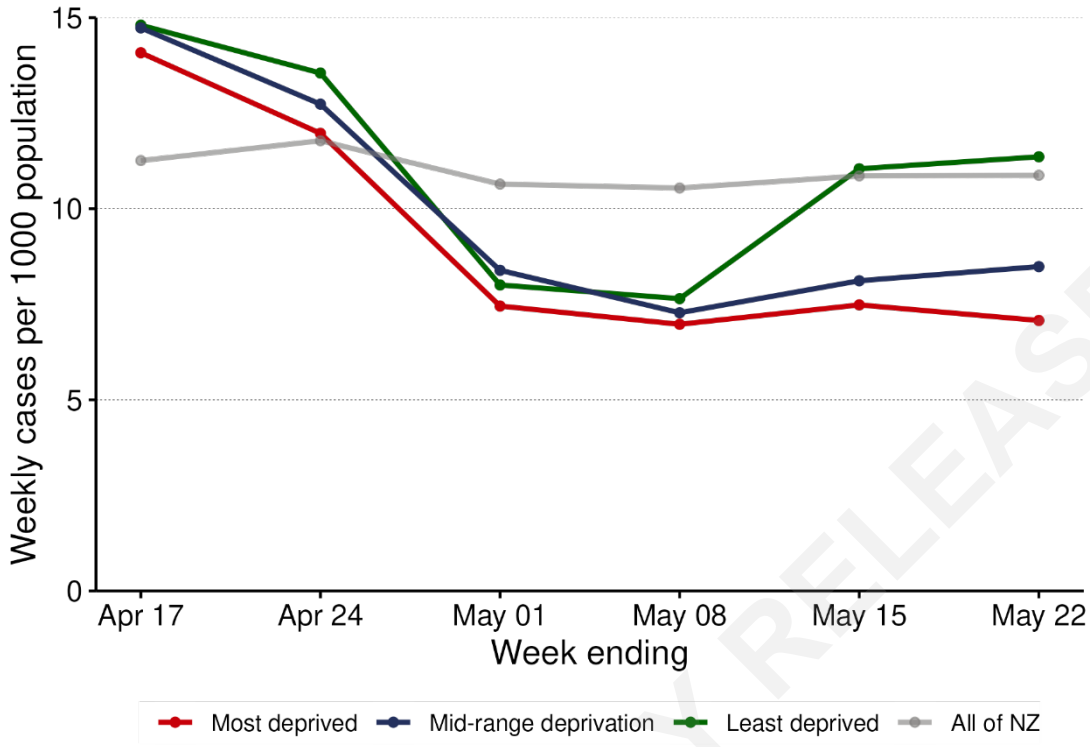
Central Region



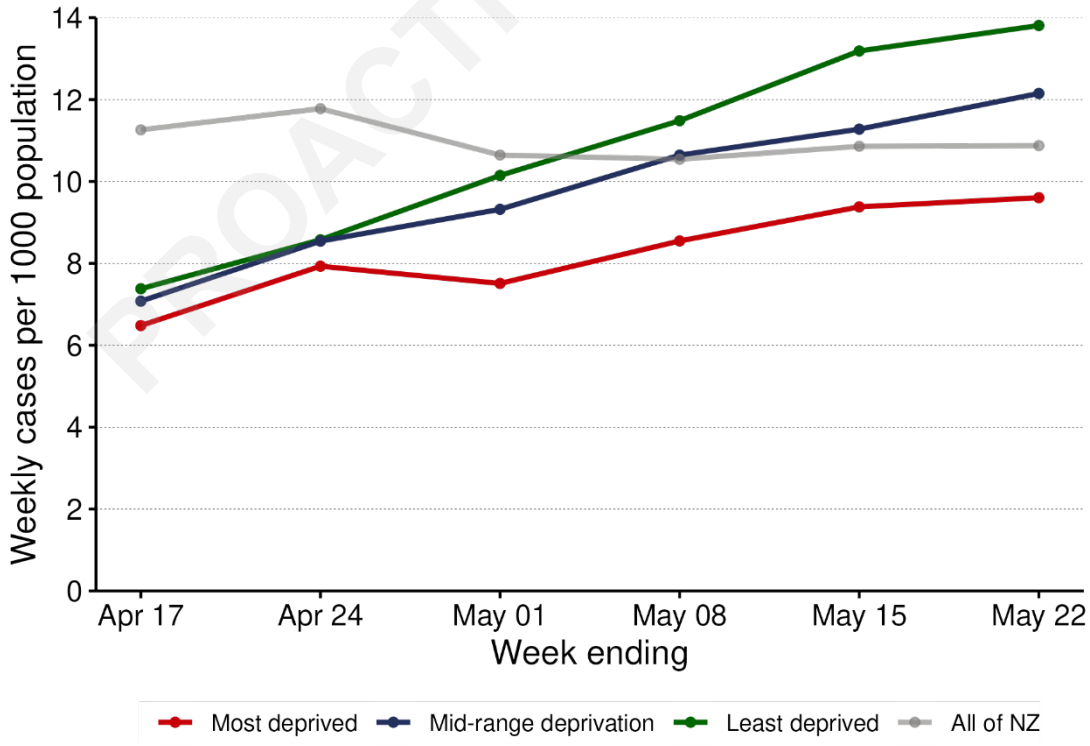
Southern Region



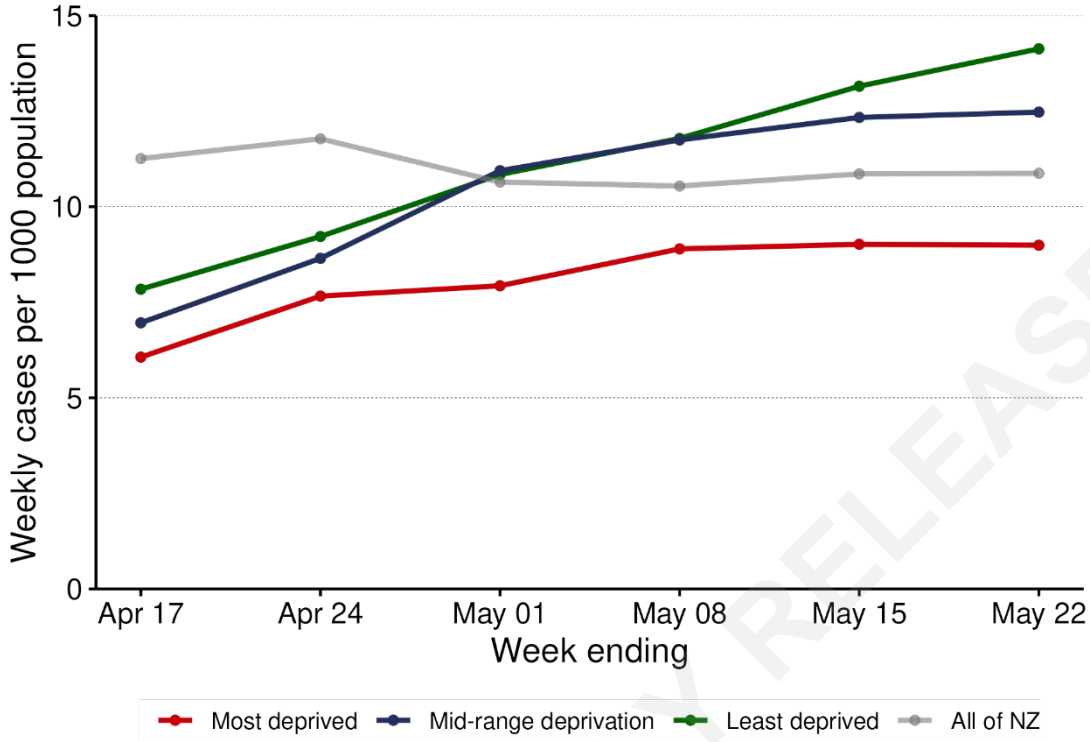
Northland DHB



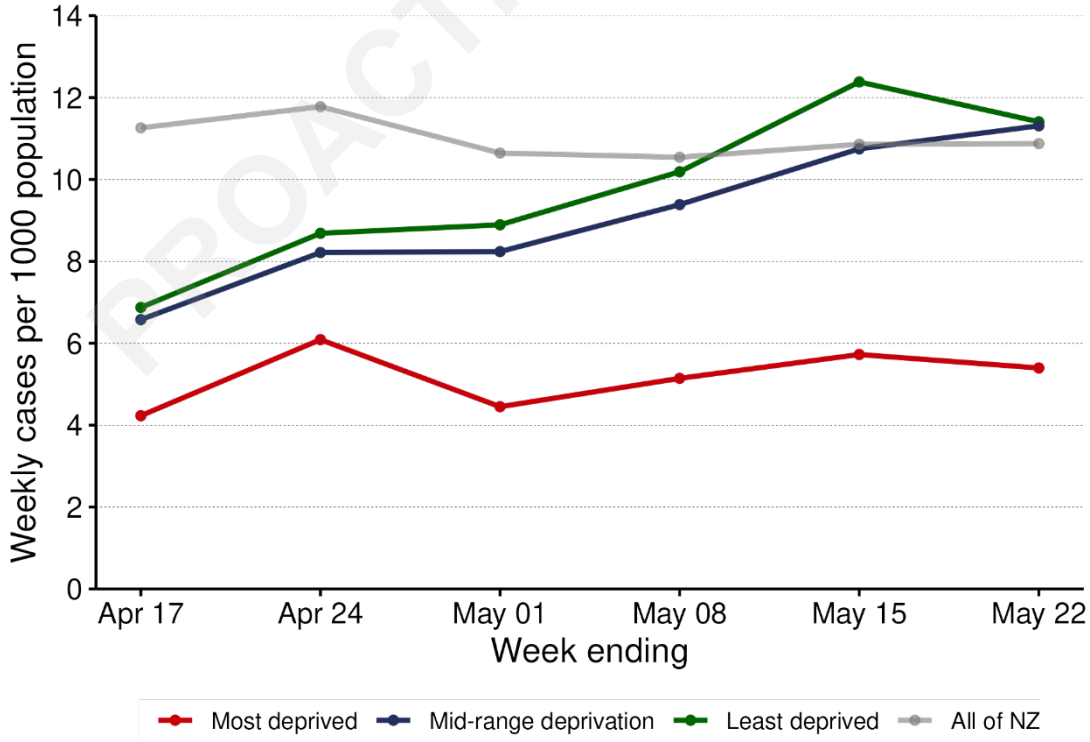
Waitemata DHB



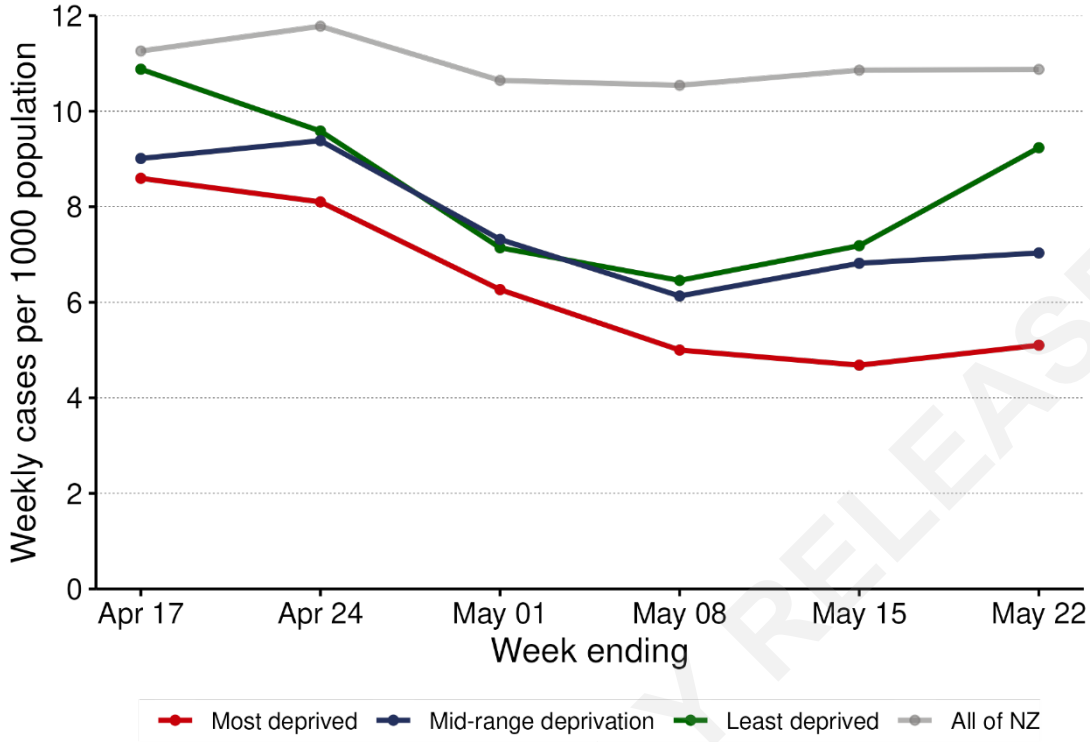
Auckland DHB



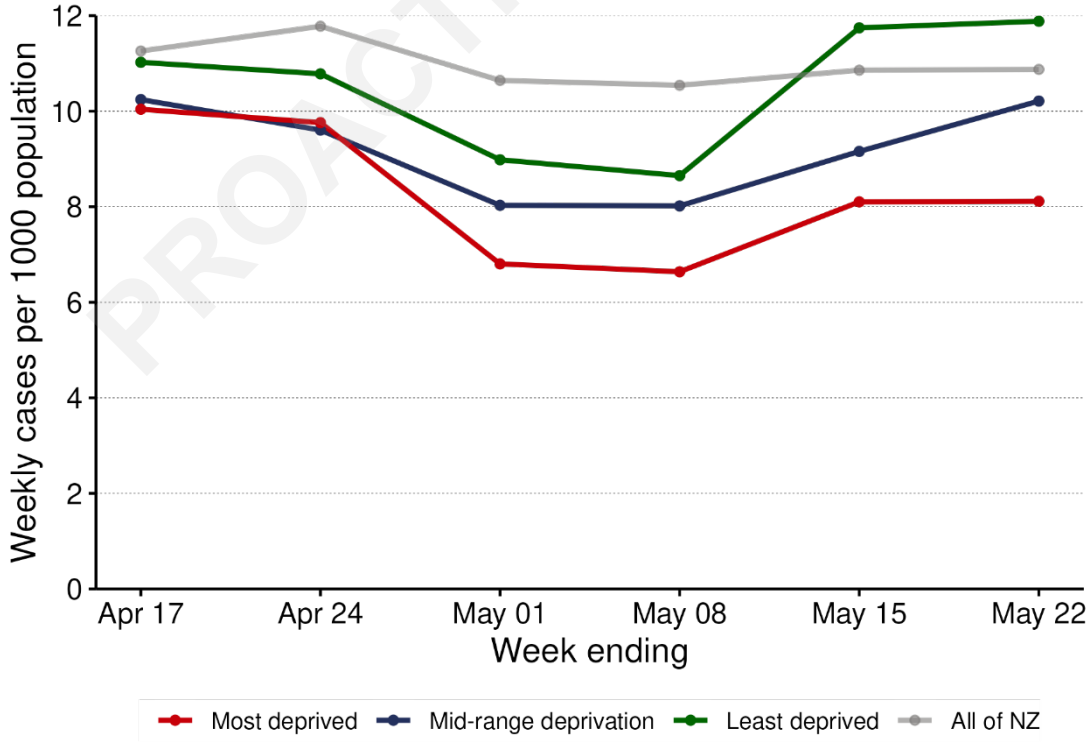
Counties Manukau DHB



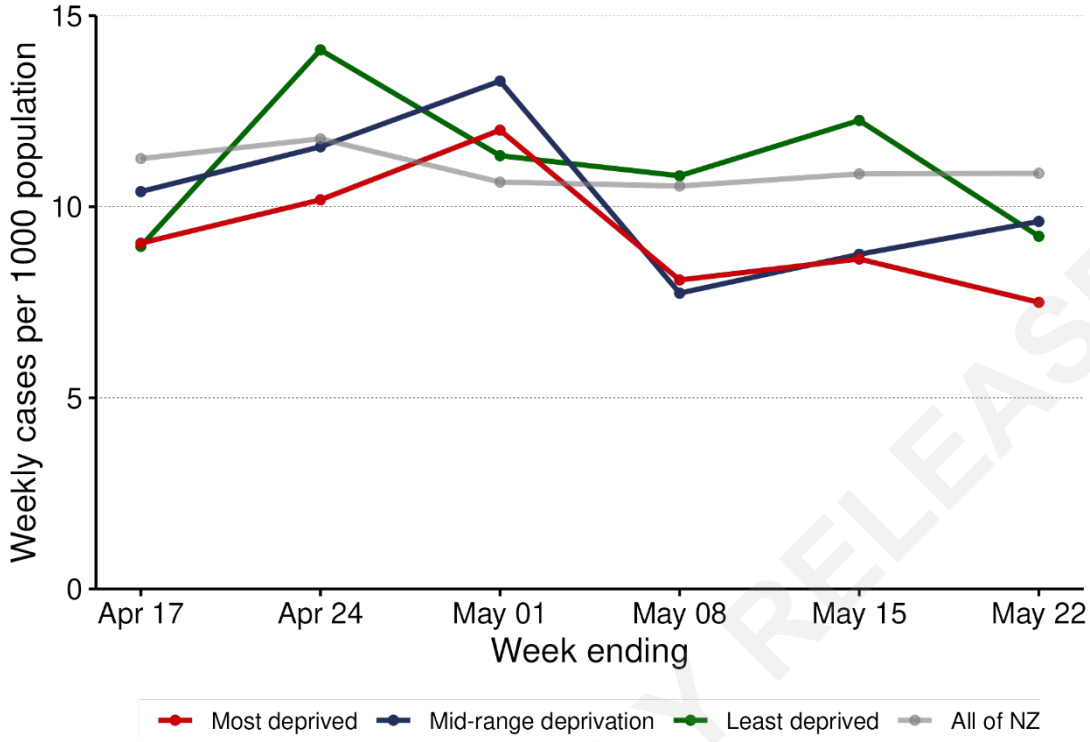
Bay of Plenty DHB



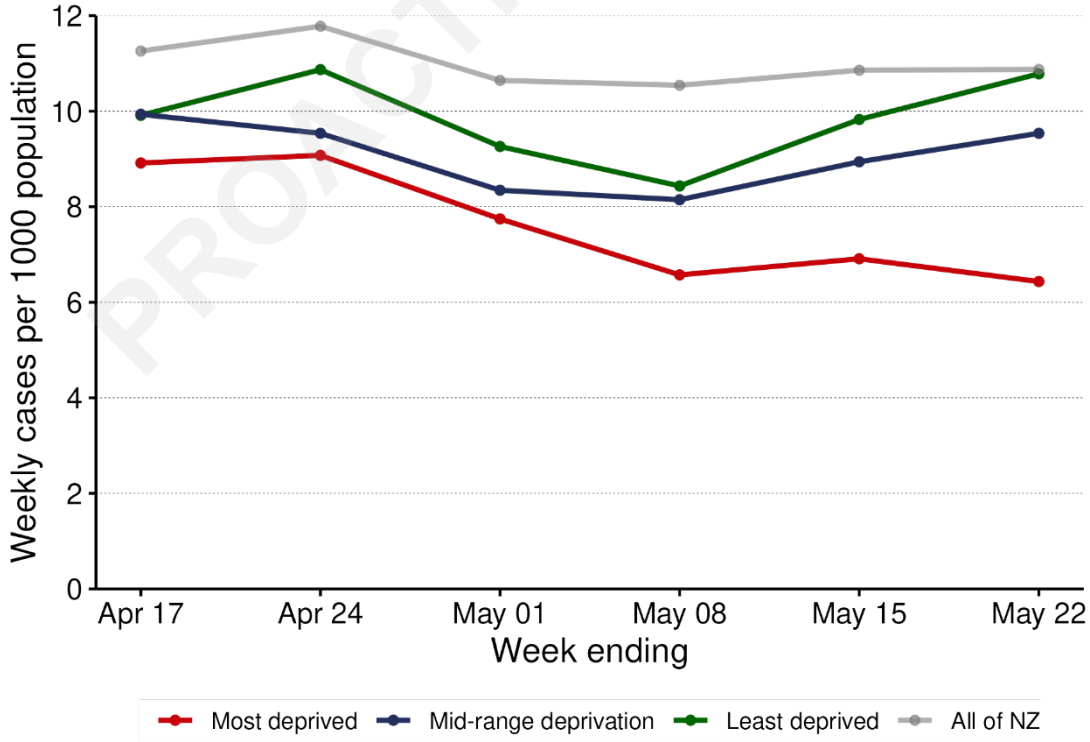
Waikato DHB



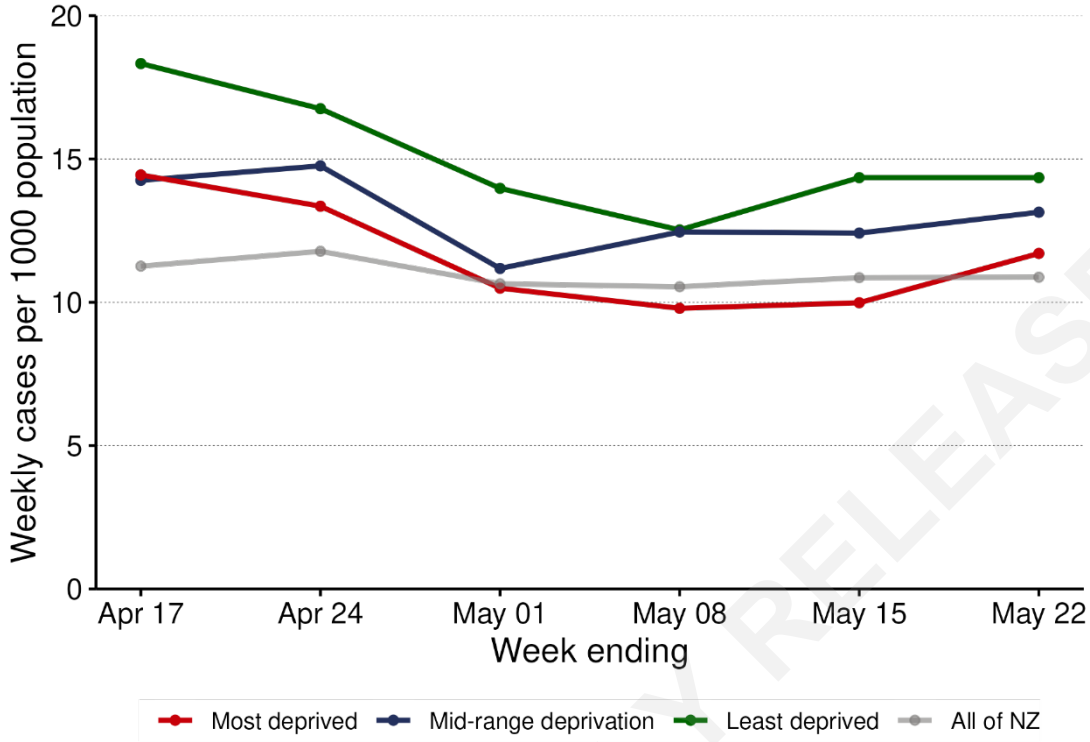
Tairawhiti DHB



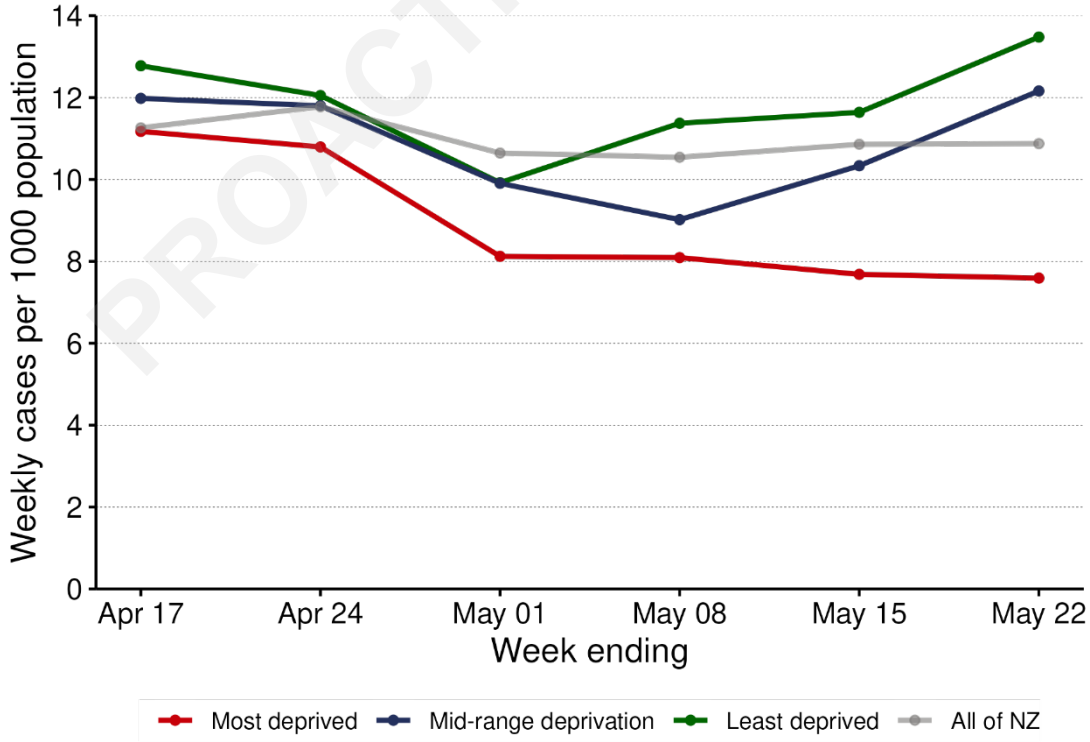
Lakes DHB



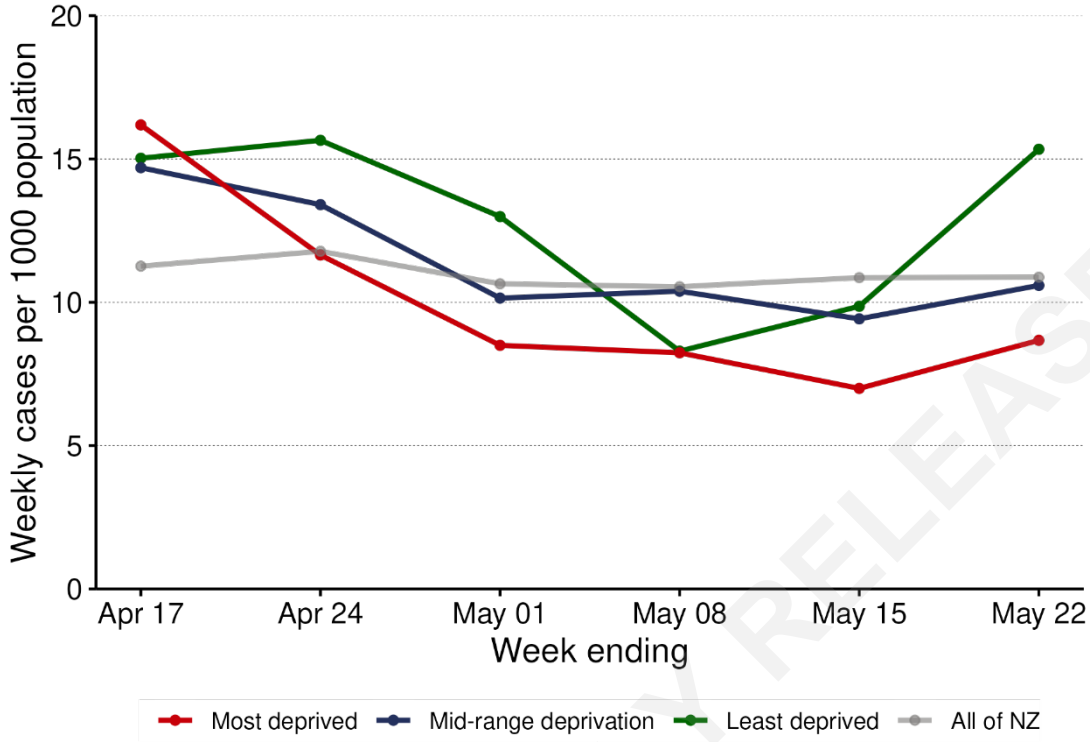
Taranaki DHB



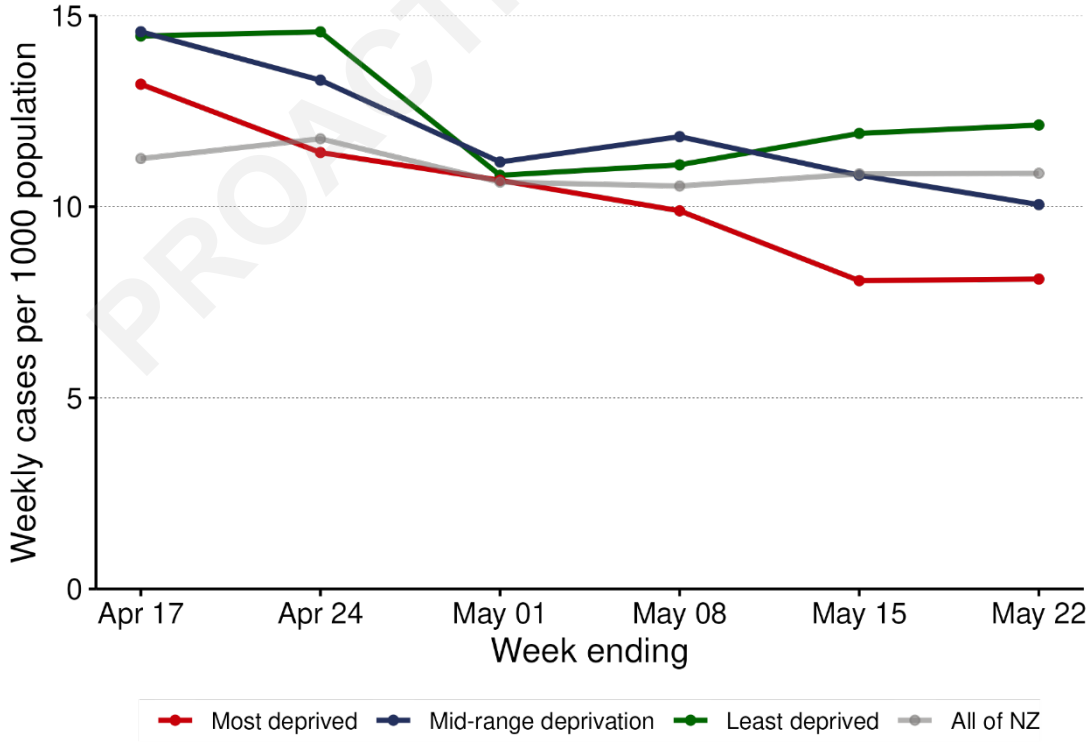
Hawke's Bay DHB



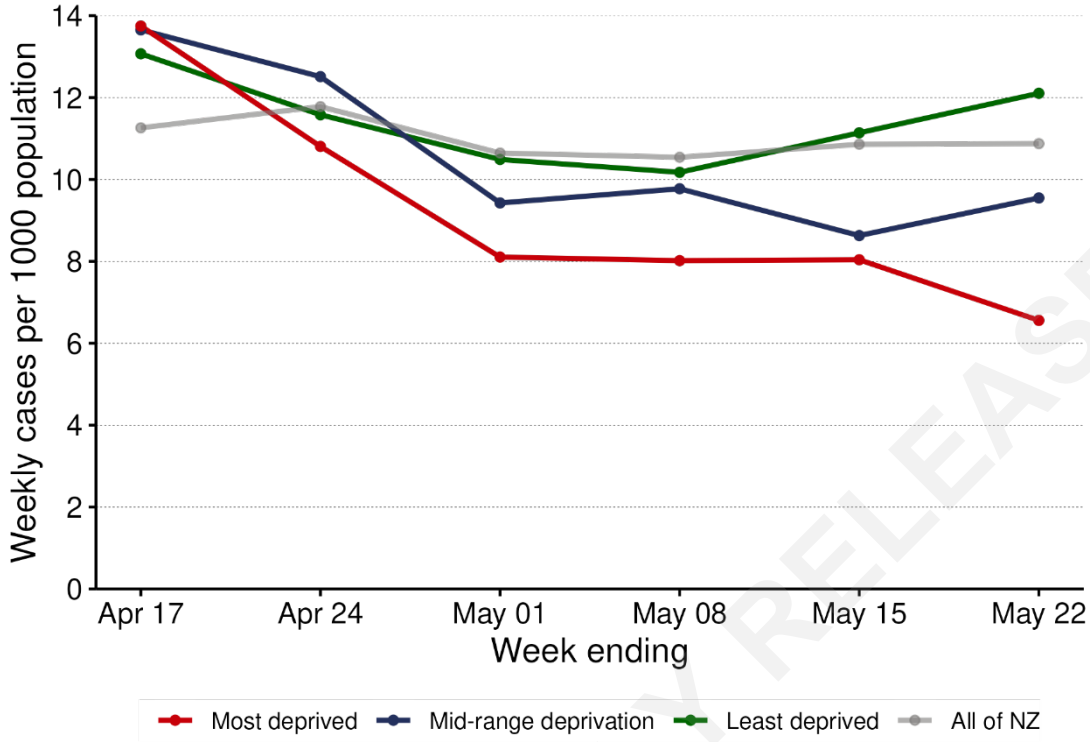
Whanganui DHB



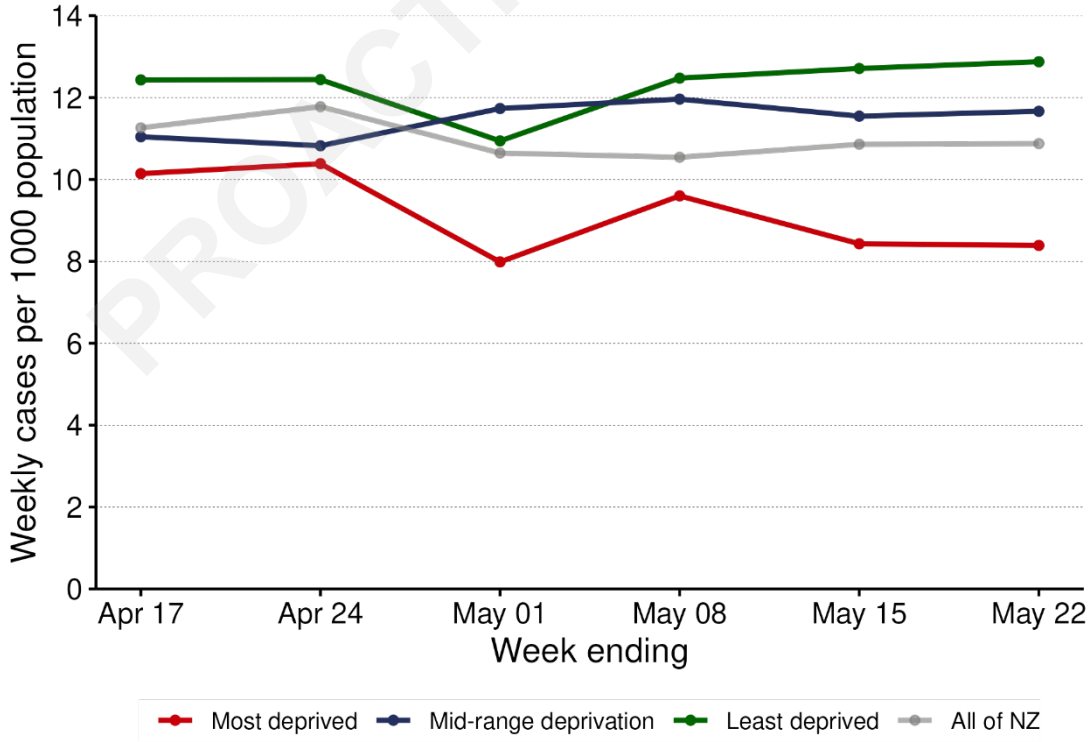
MidCentral DHB



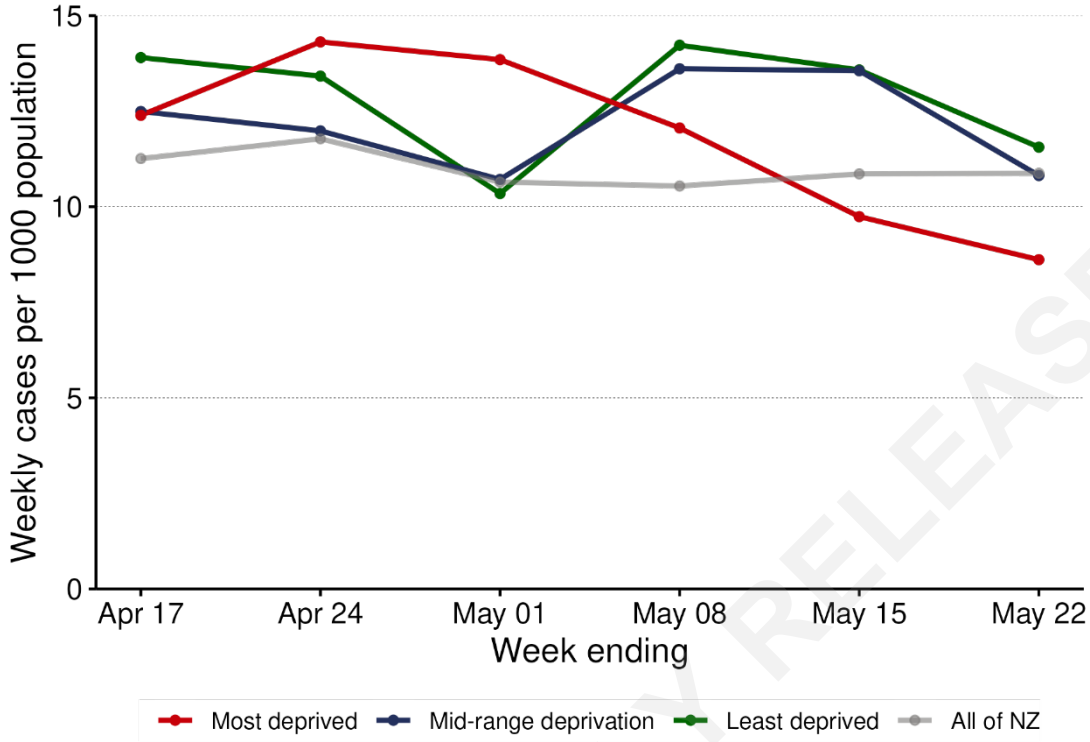
Hutt Valley DHB



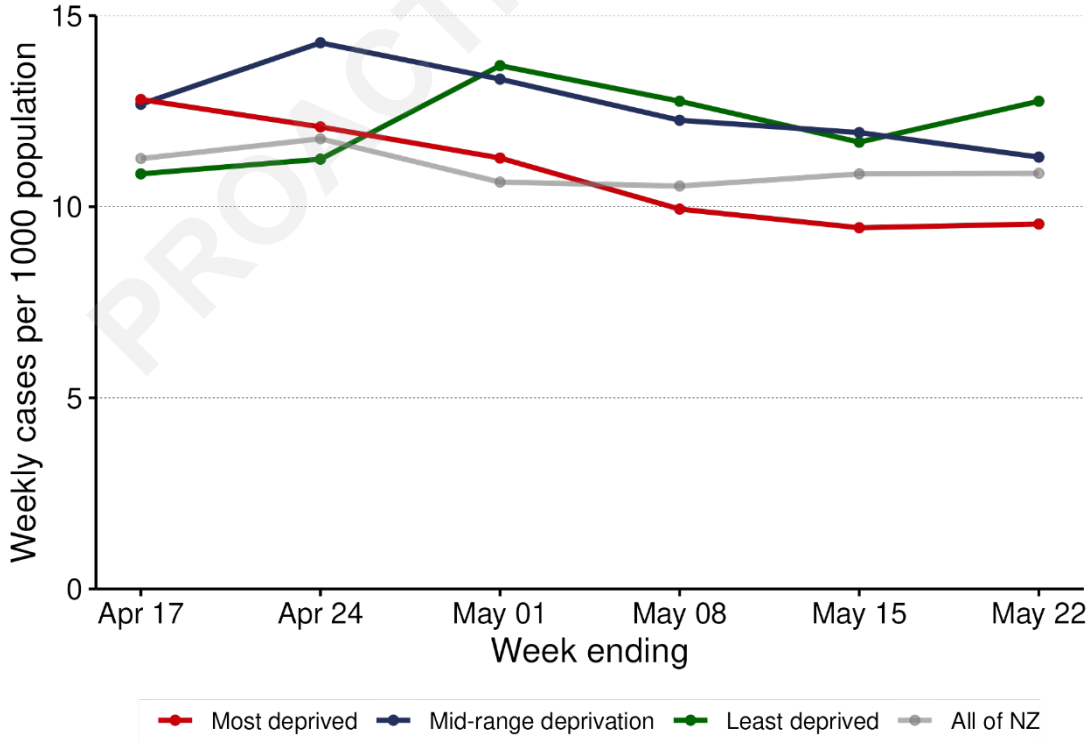
Capital and Coast DHB



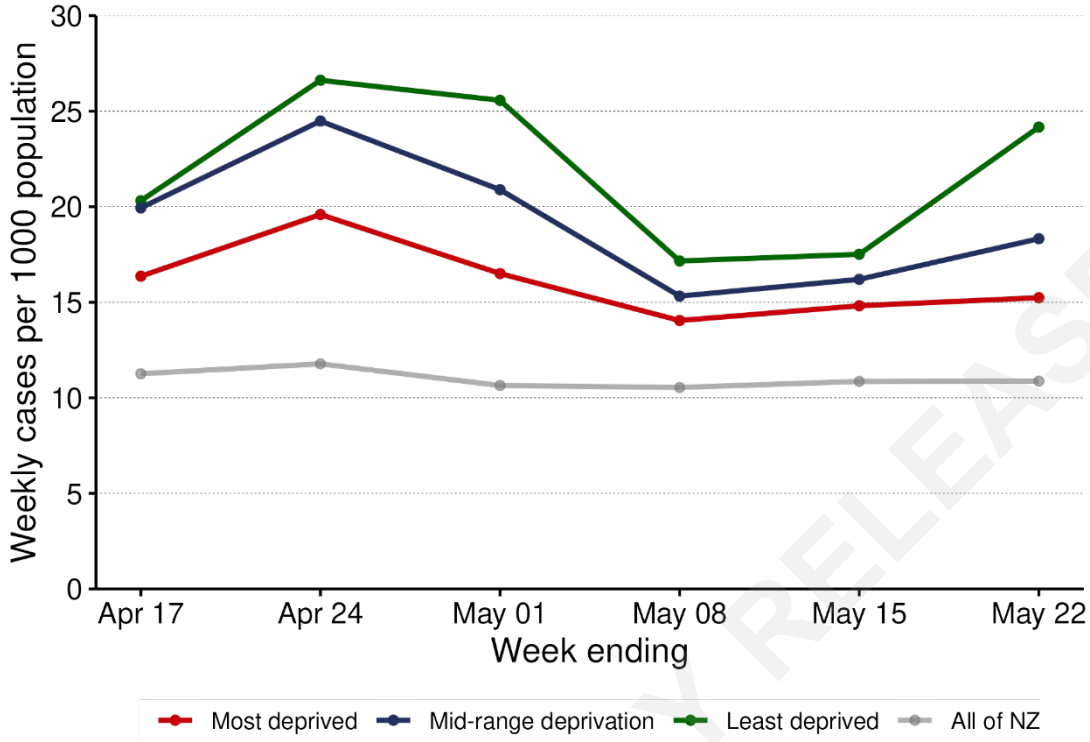
Wairarapa DHB



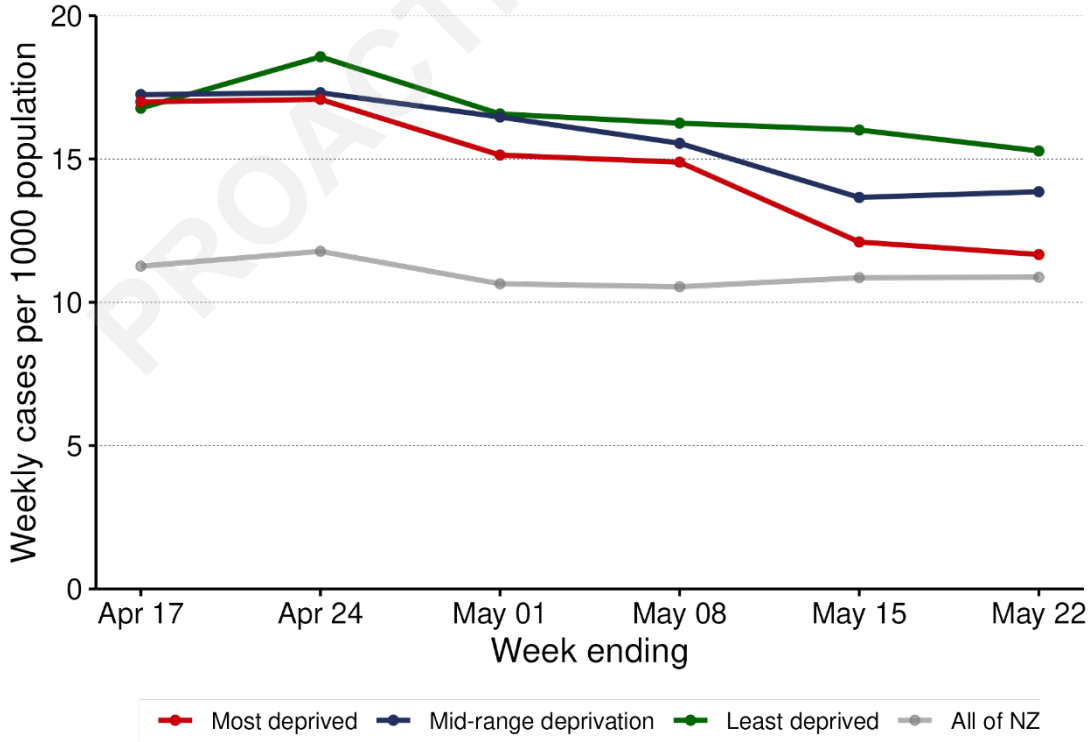
Nelson Marlborough DHB



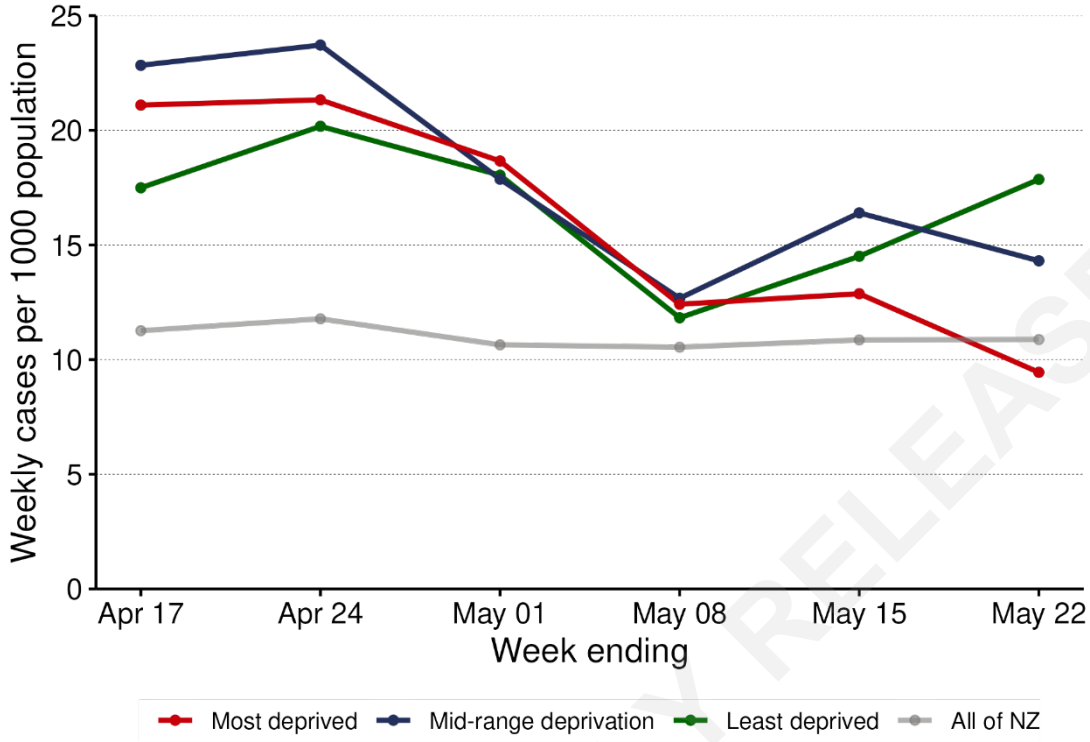
West Coast DHB



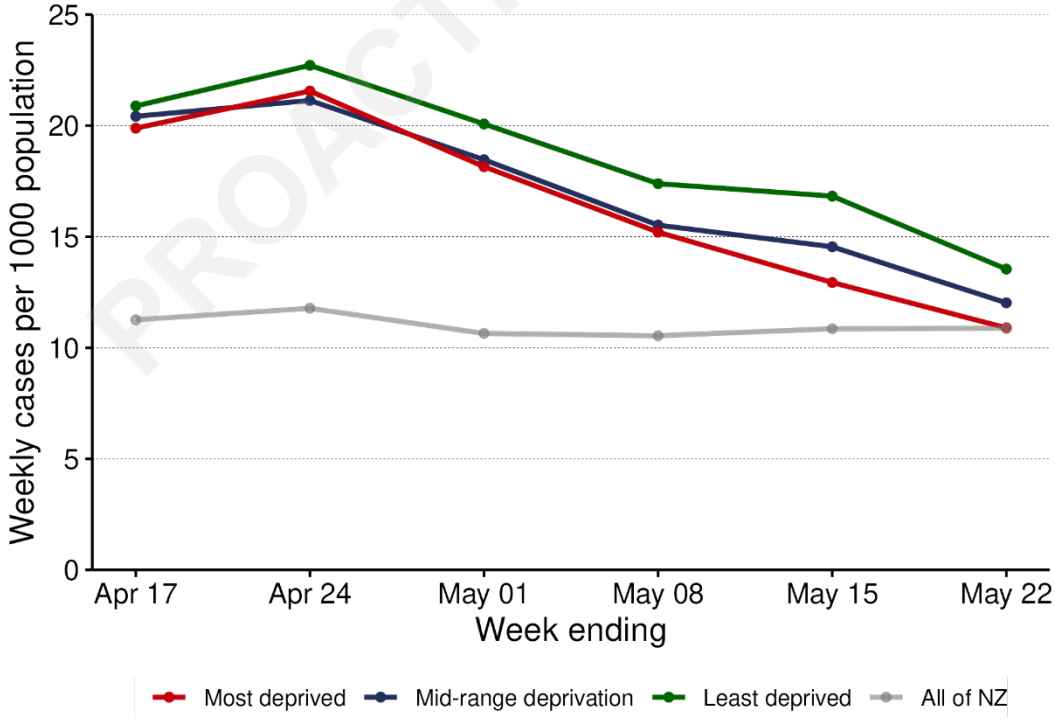
Canterbury DHB



South Canterbury DHB

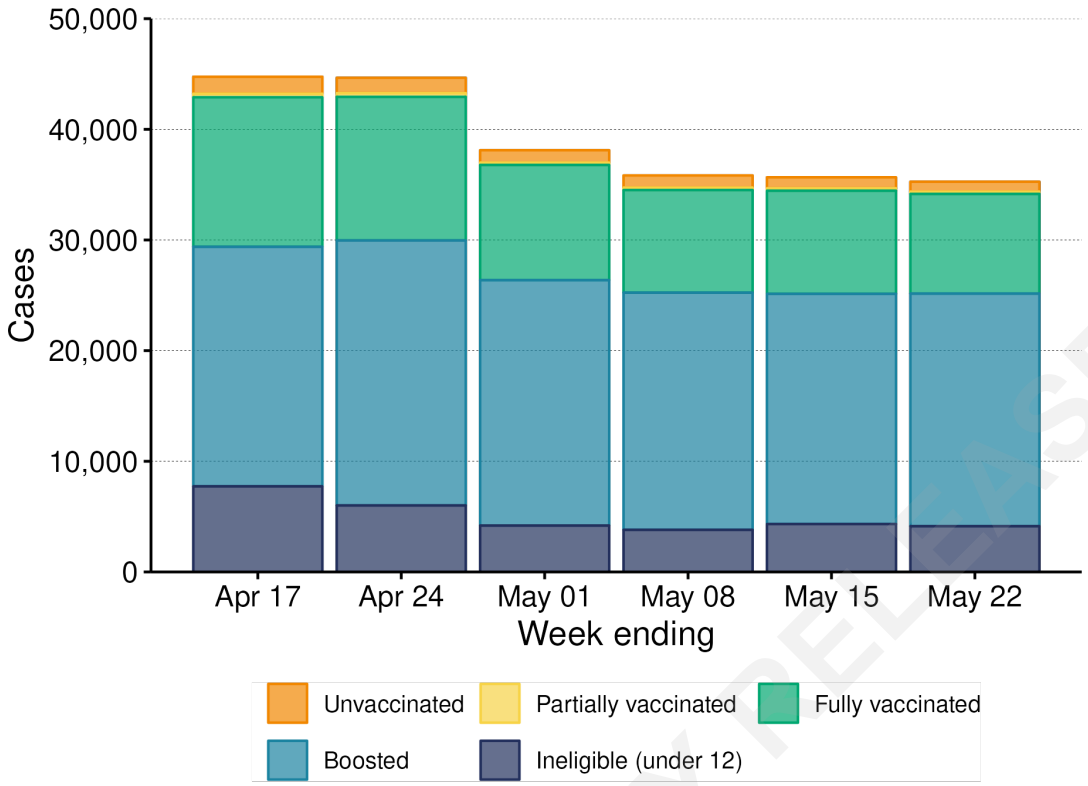


Southern DHB

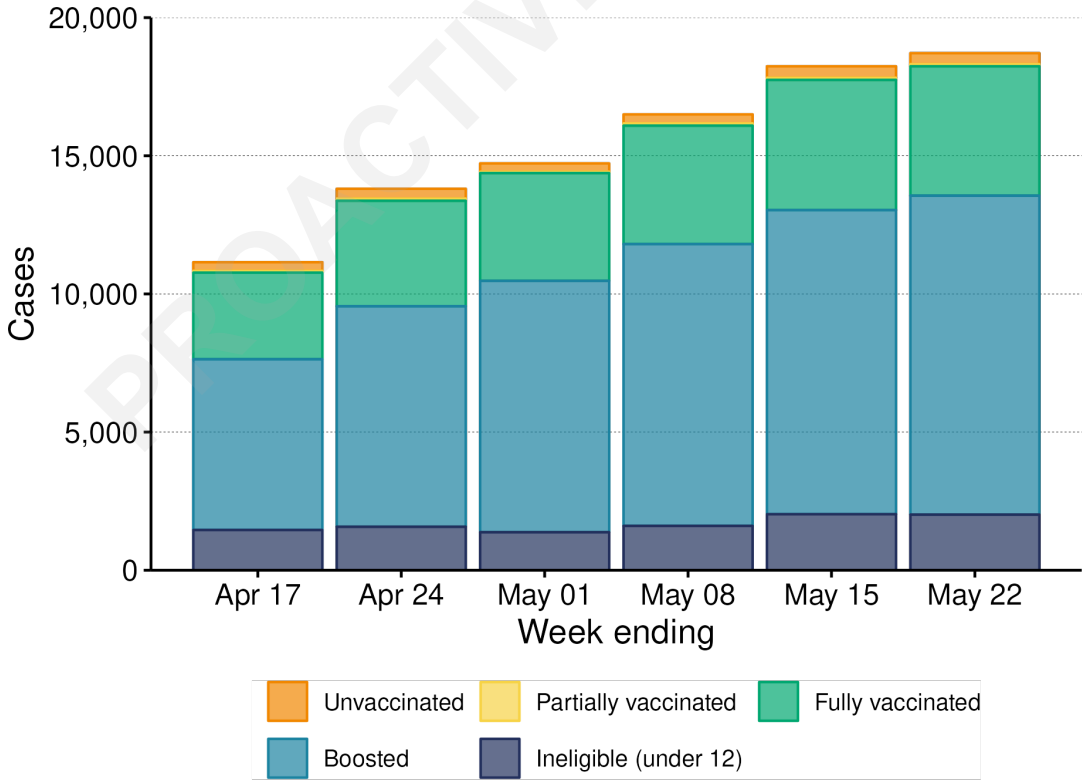


Vaccination Graphs

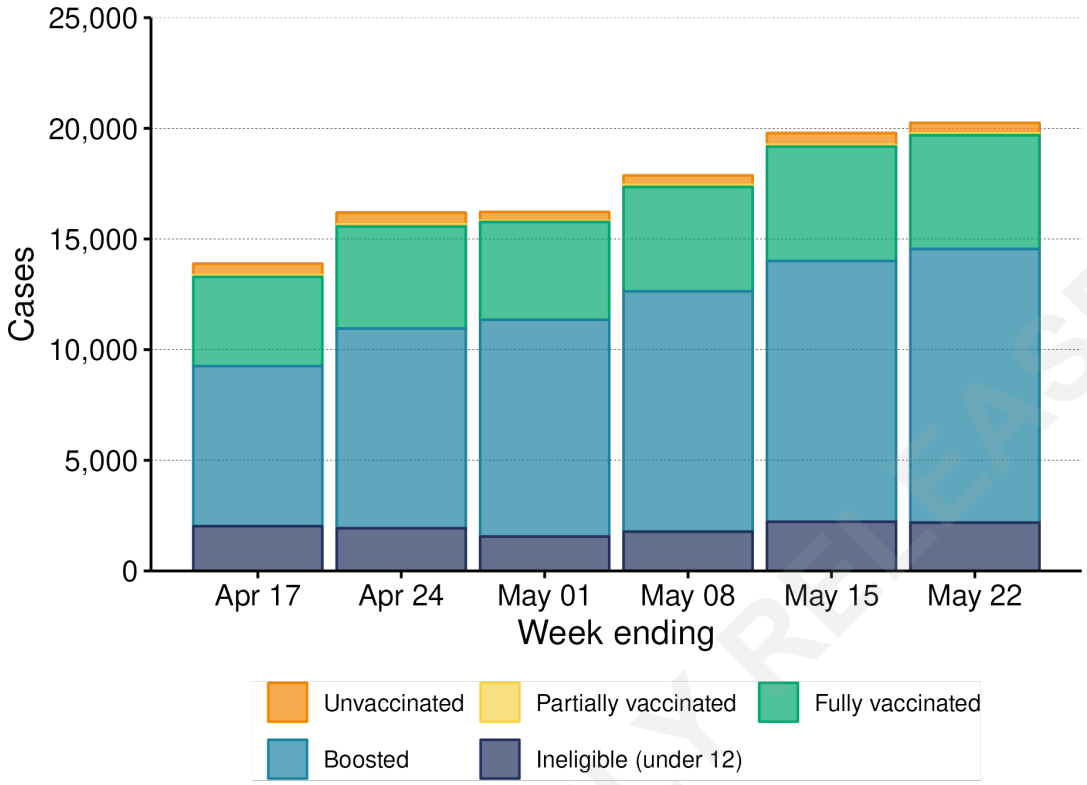
NZ Excluding Auckland Region



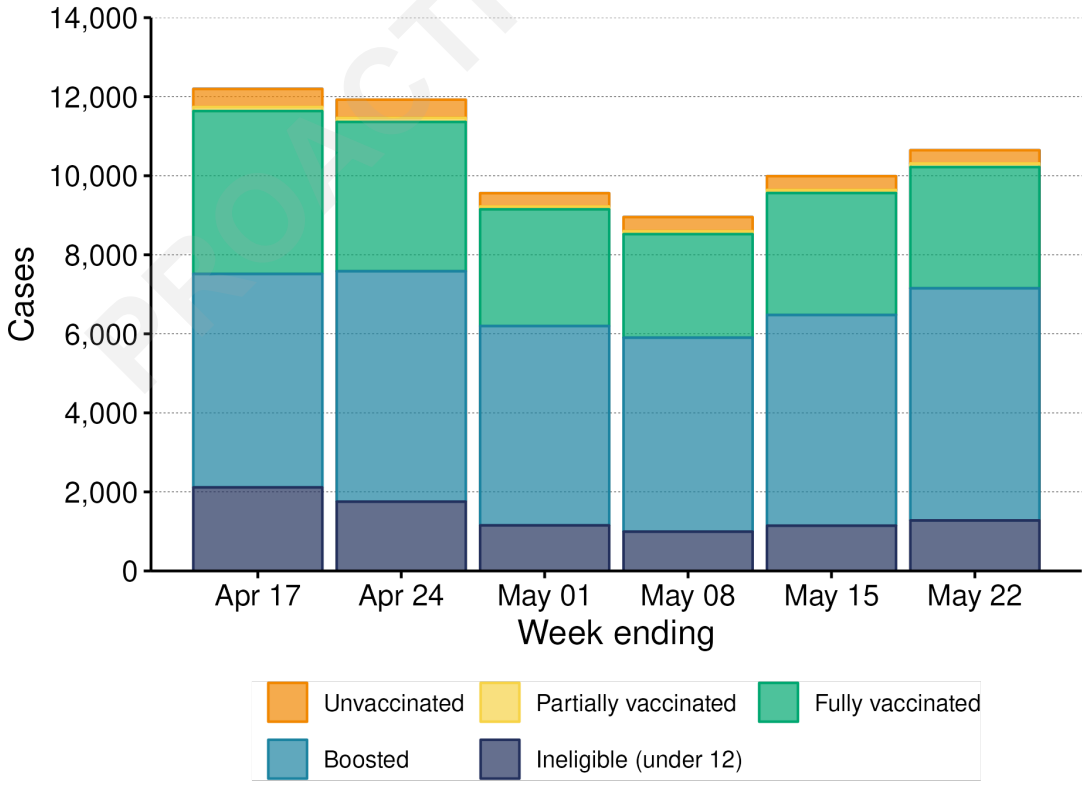
Auckland Region



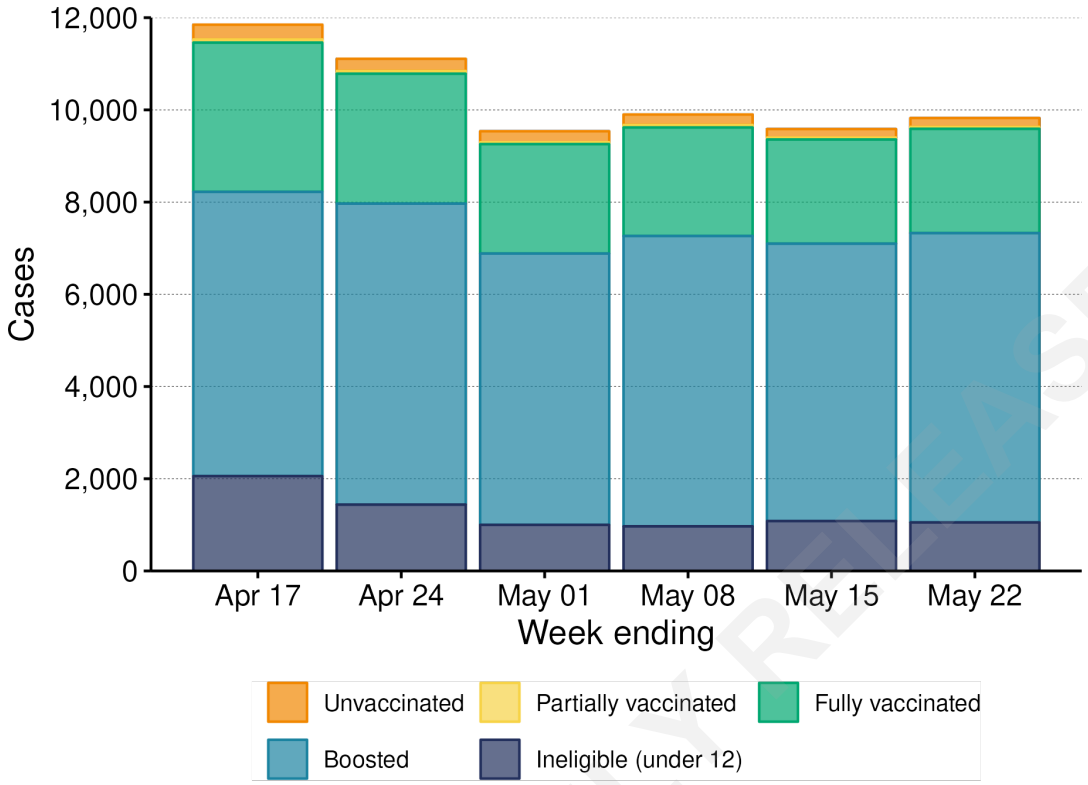
Northern Region



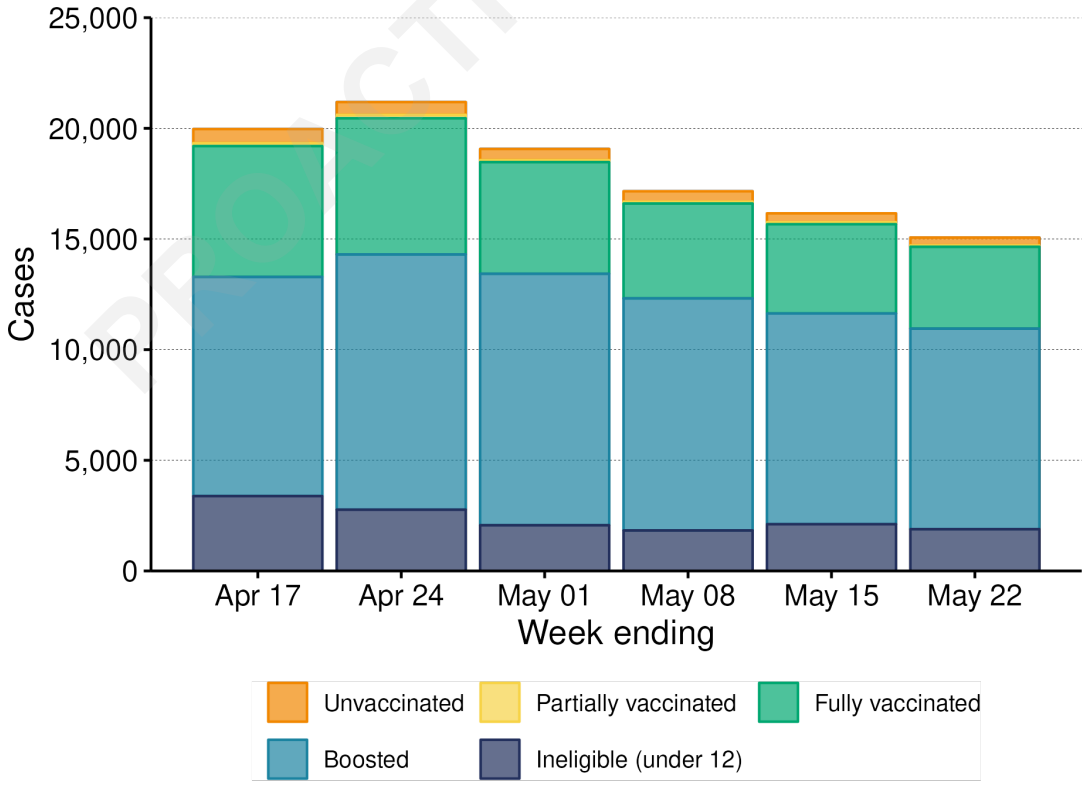
Te Manawa Taki



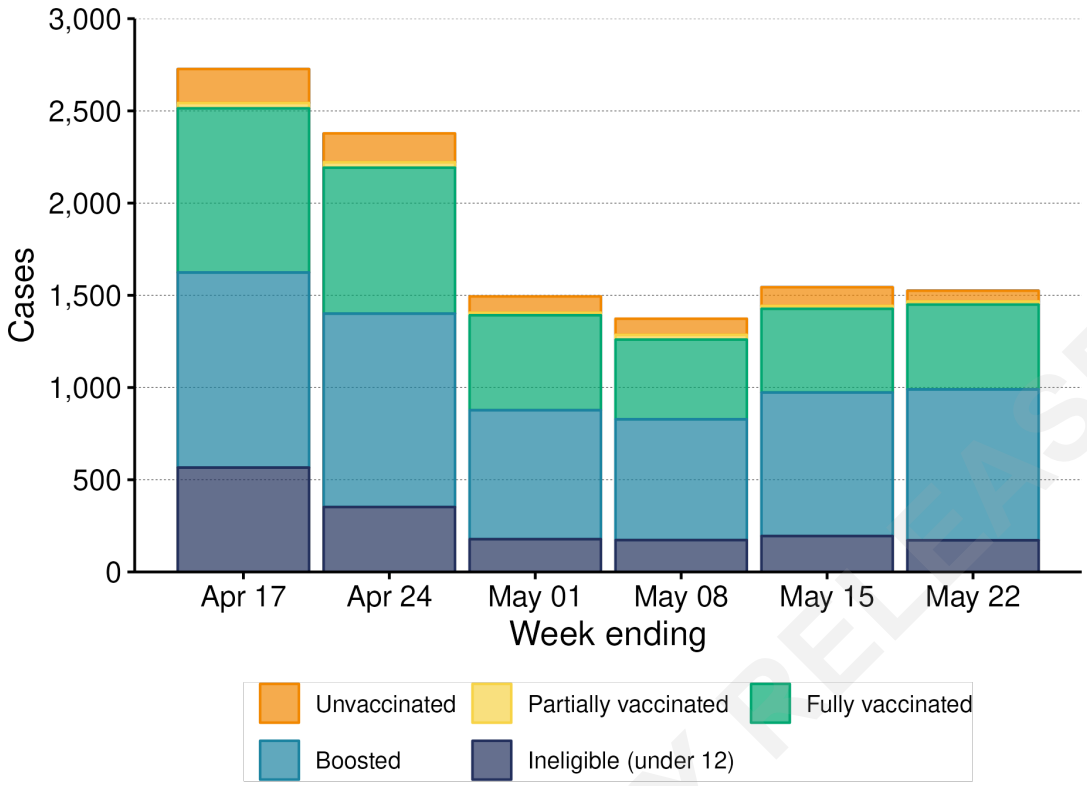
Central Region



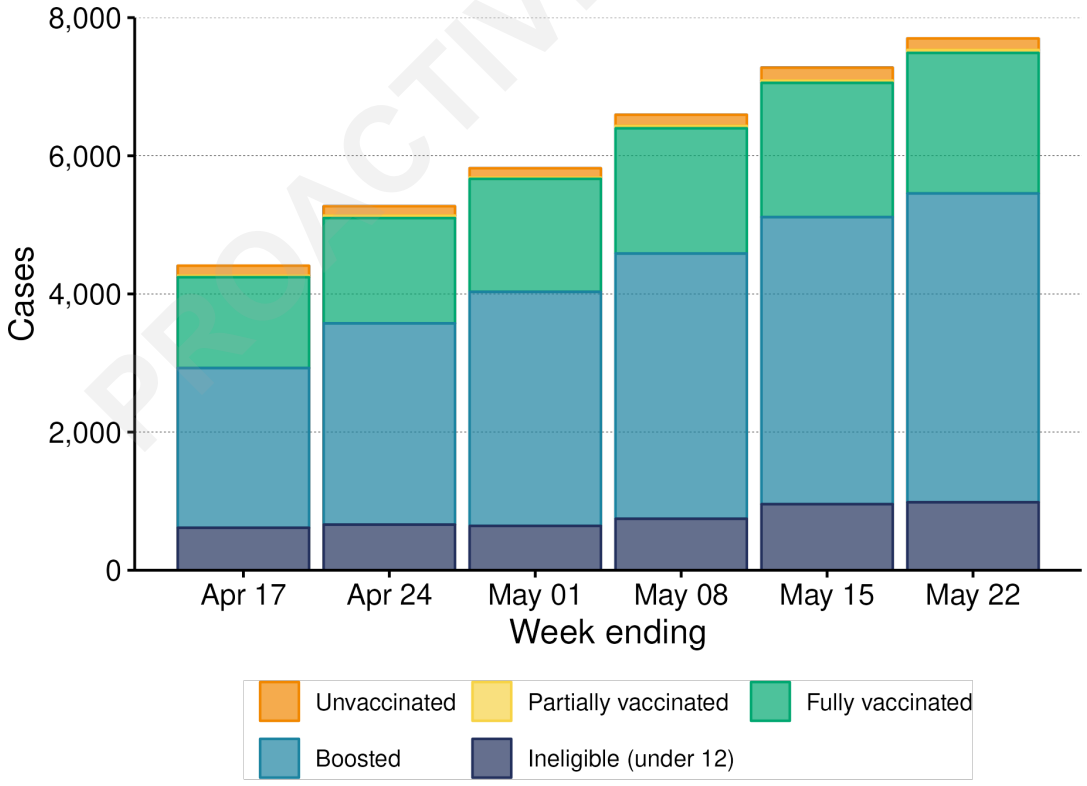
Southern Region



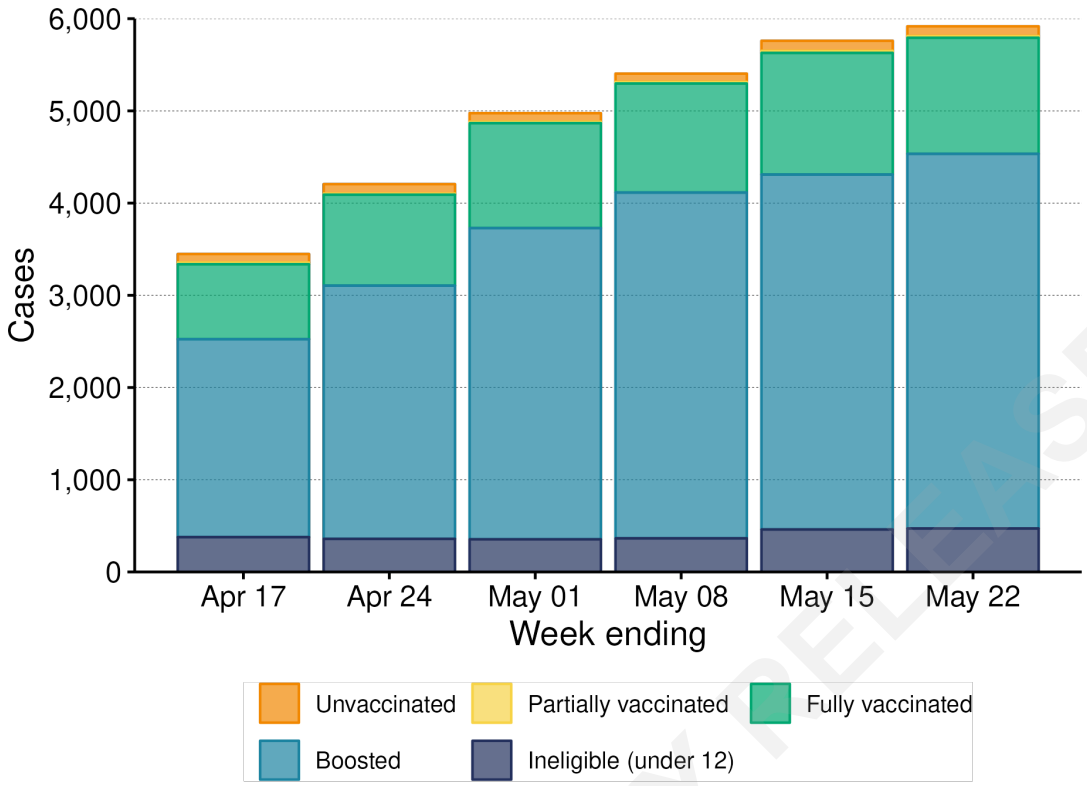
Northland DHB



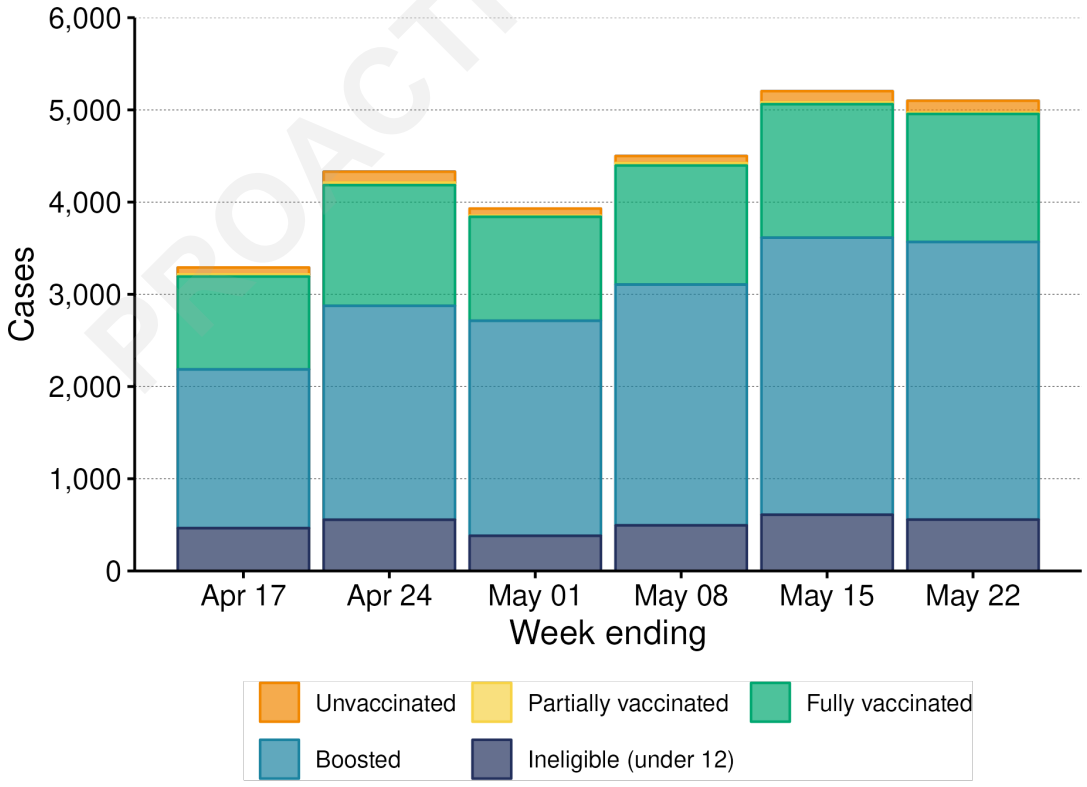
Waitemata DHB



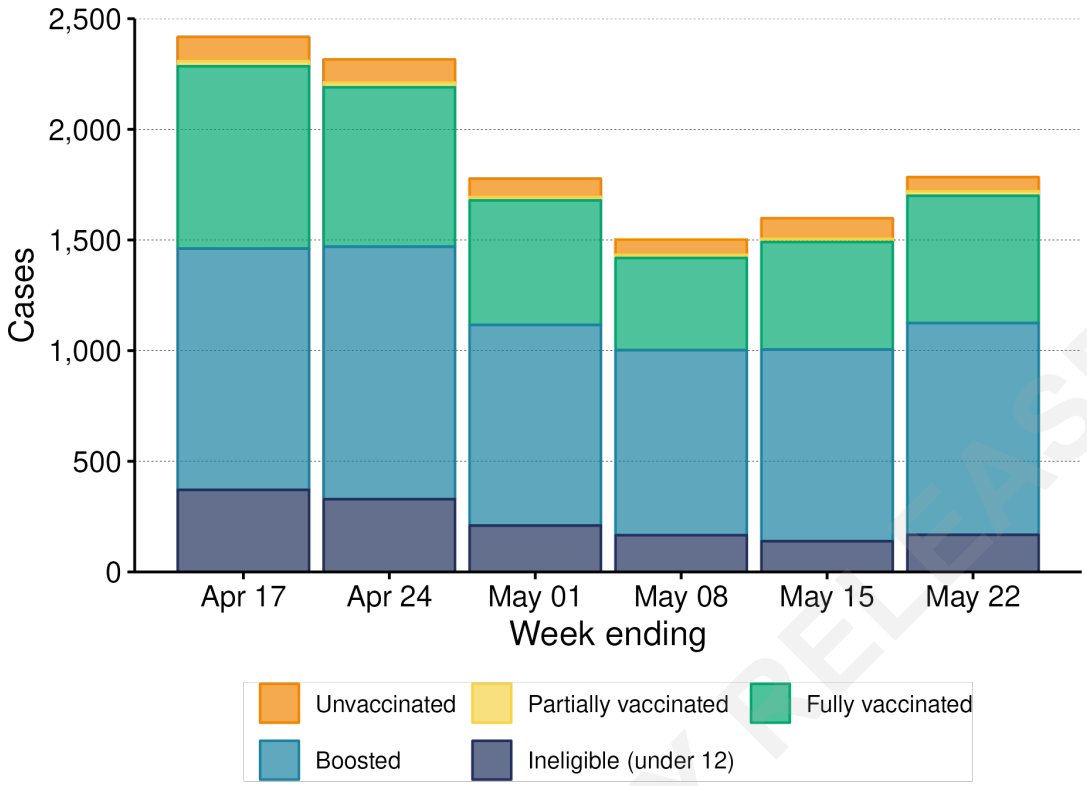
Auckland DHB



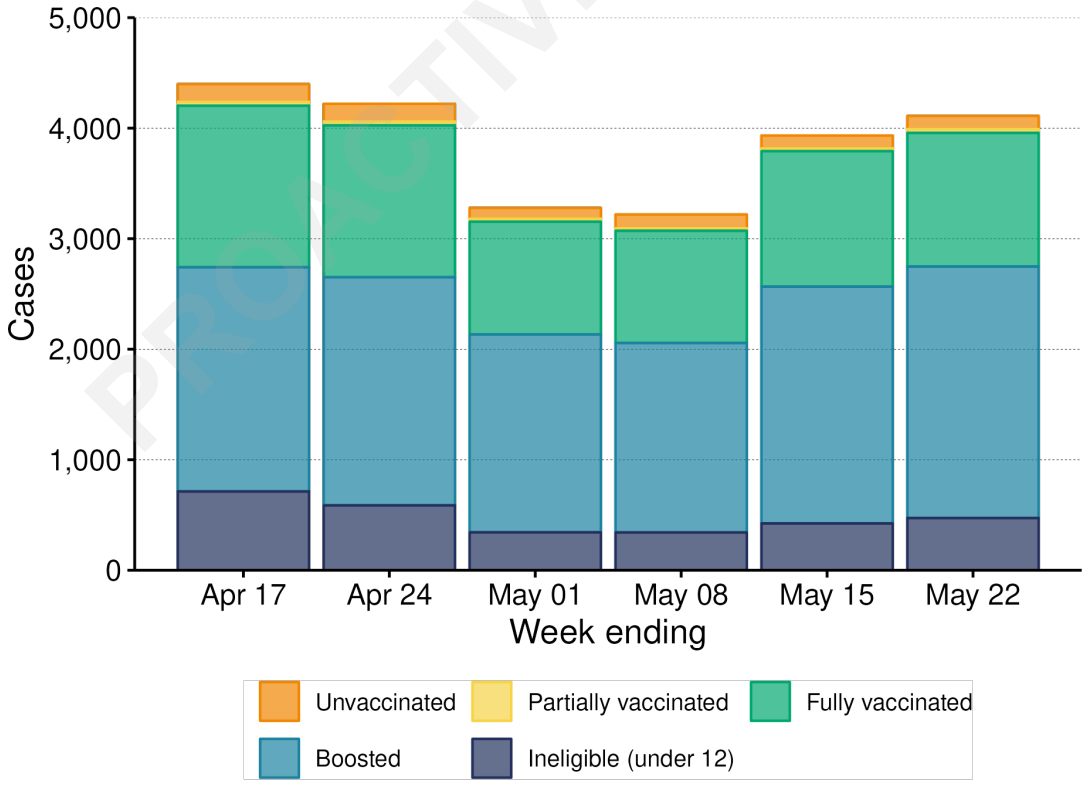
Counties Manukau DHB



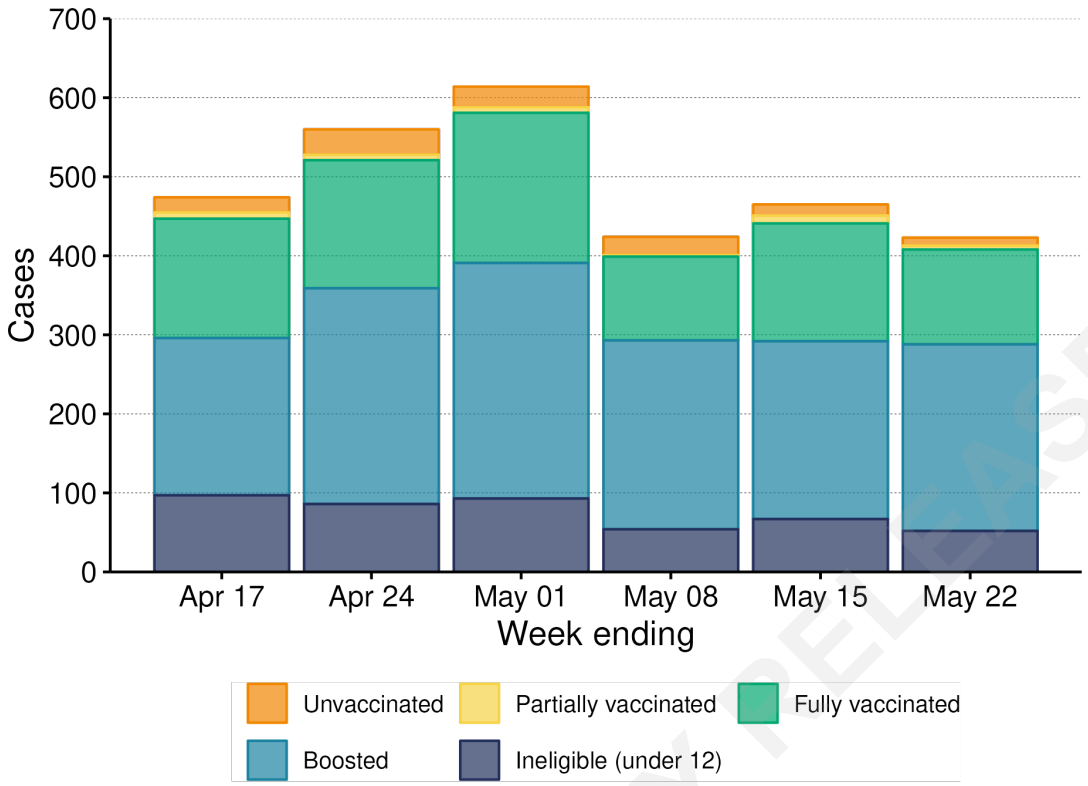
Bay of Plenty DHB



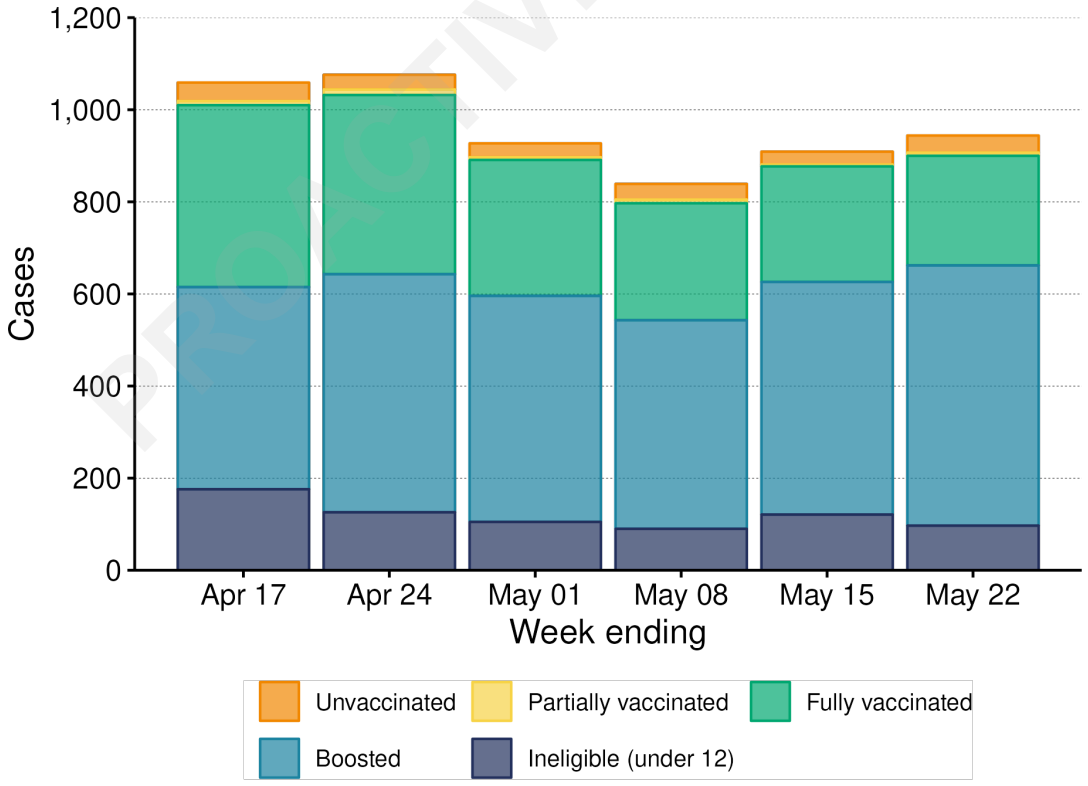
Waikato DHB



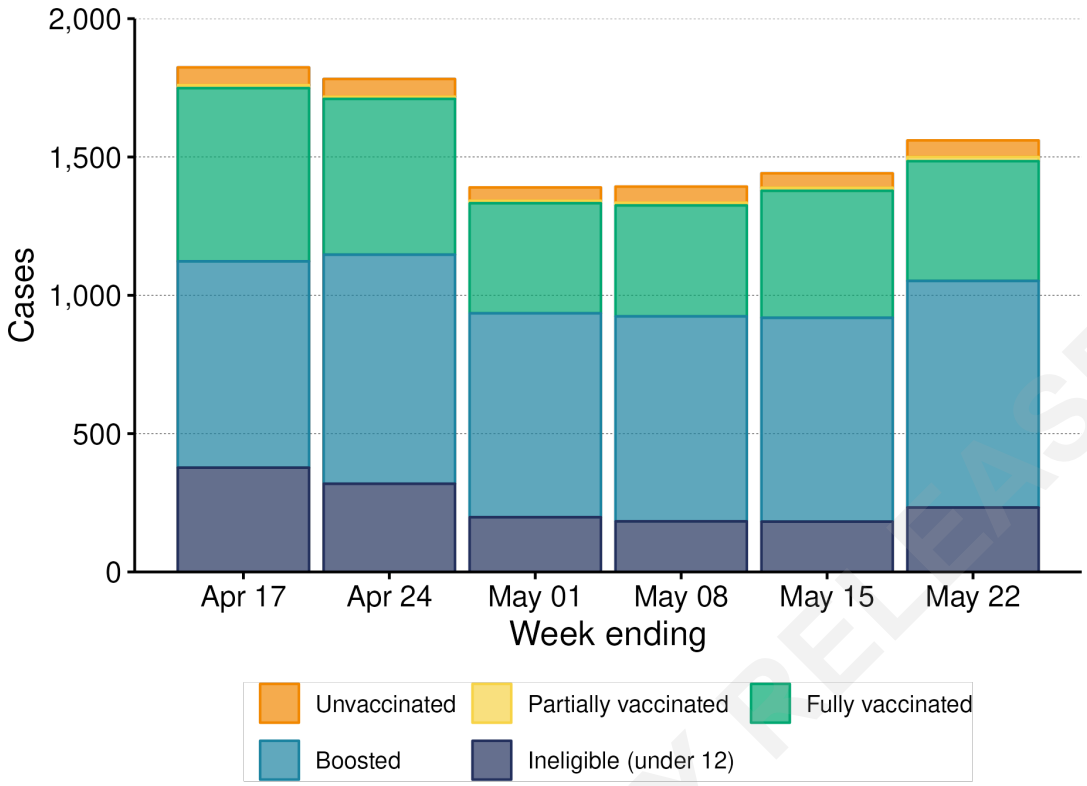
Tairawhiti DHB



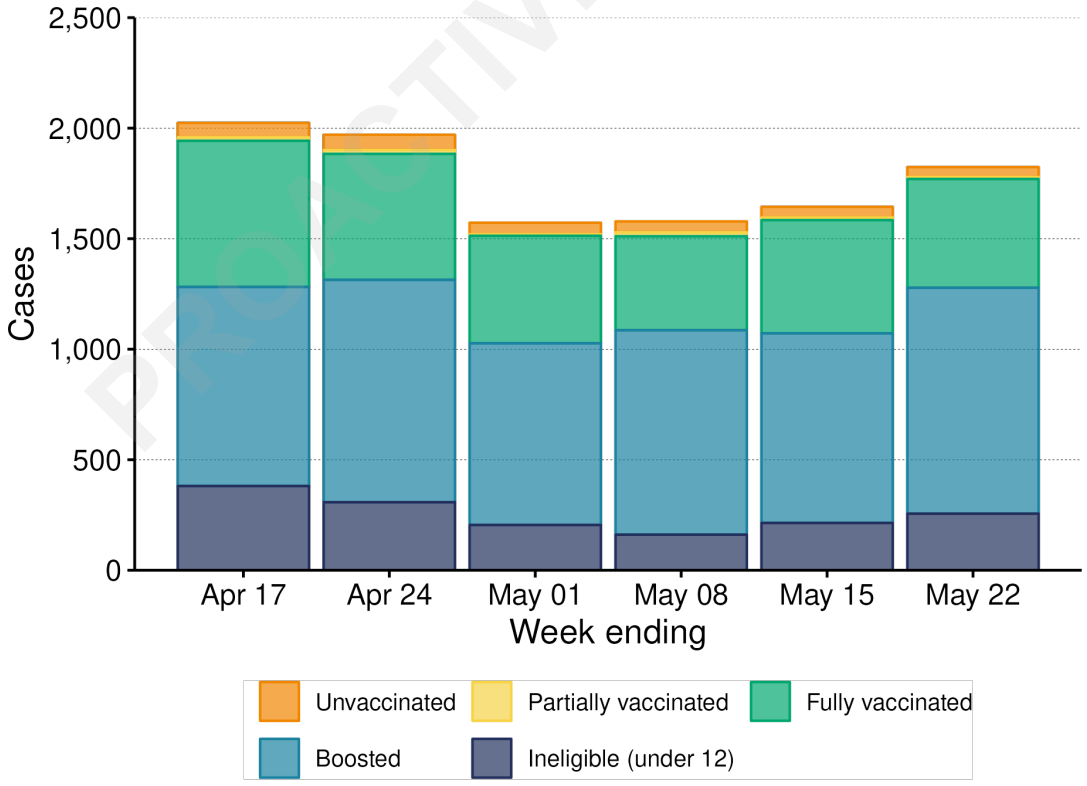
Lakes DHB



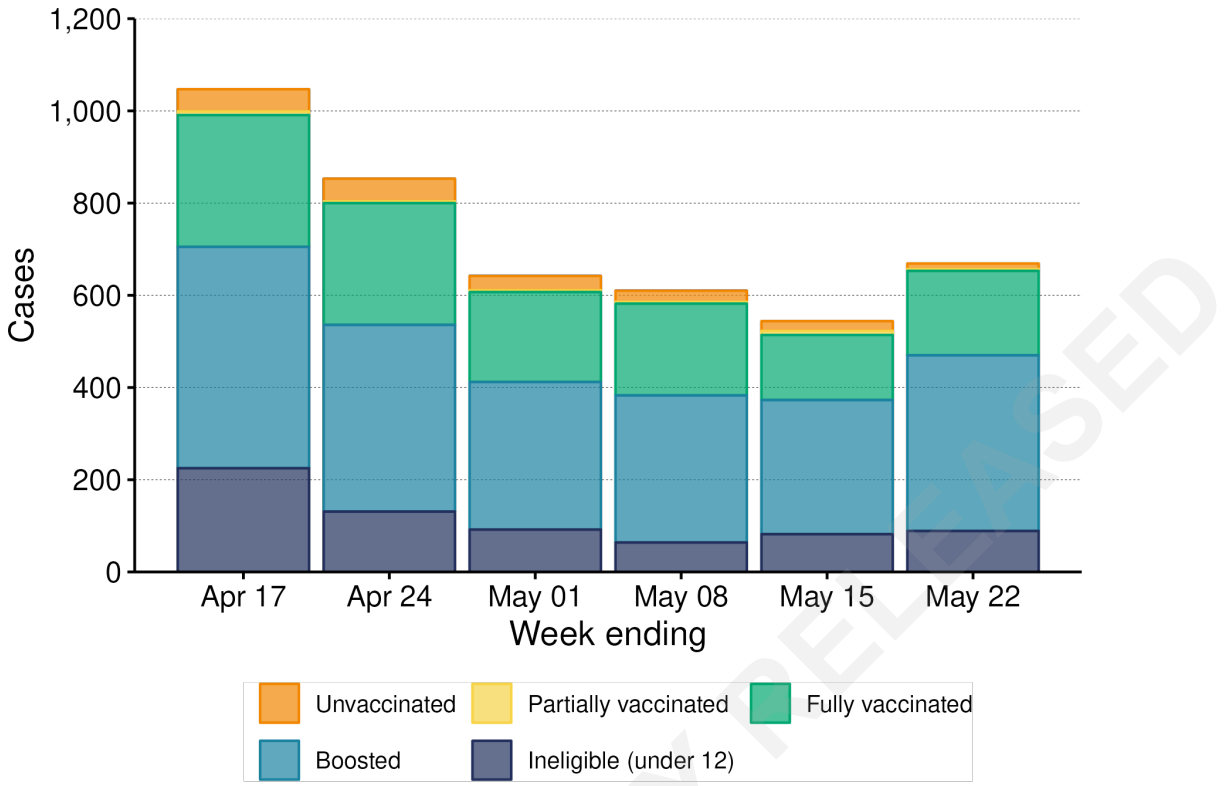
Taranaki DHB



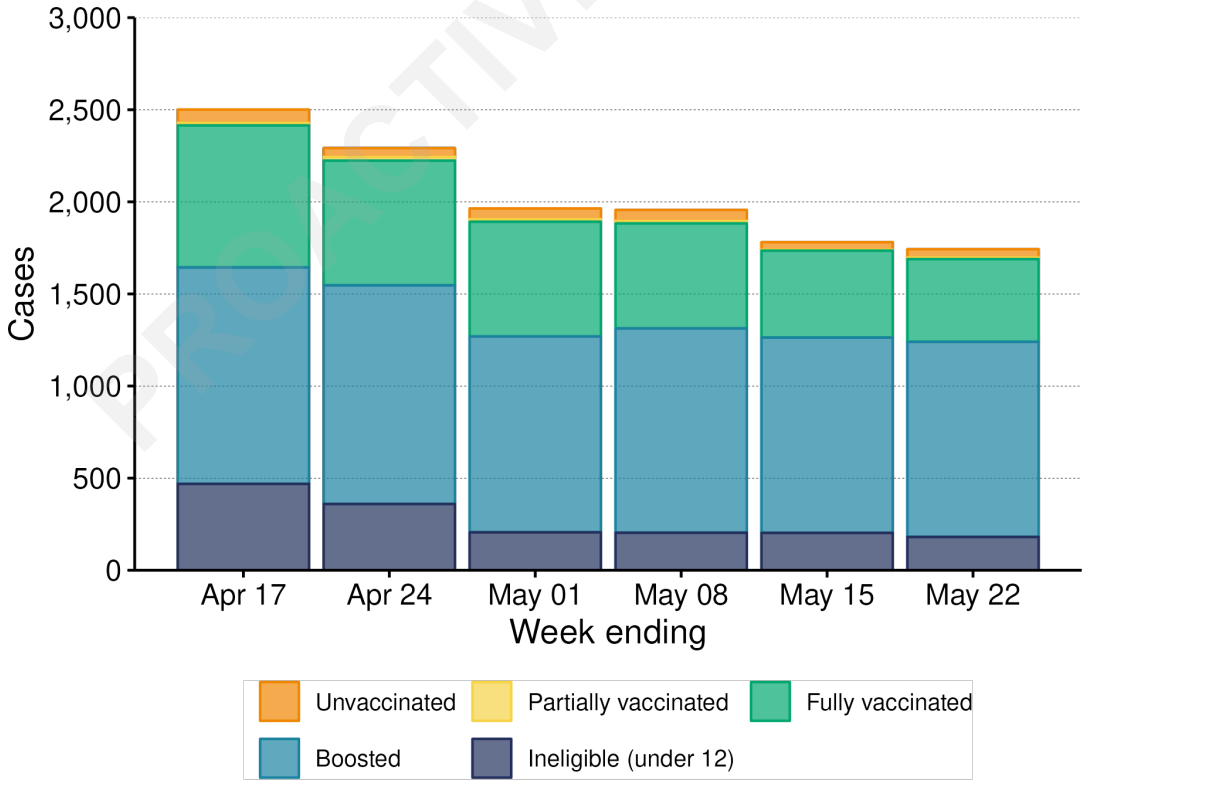
Hawke's Bay DHB



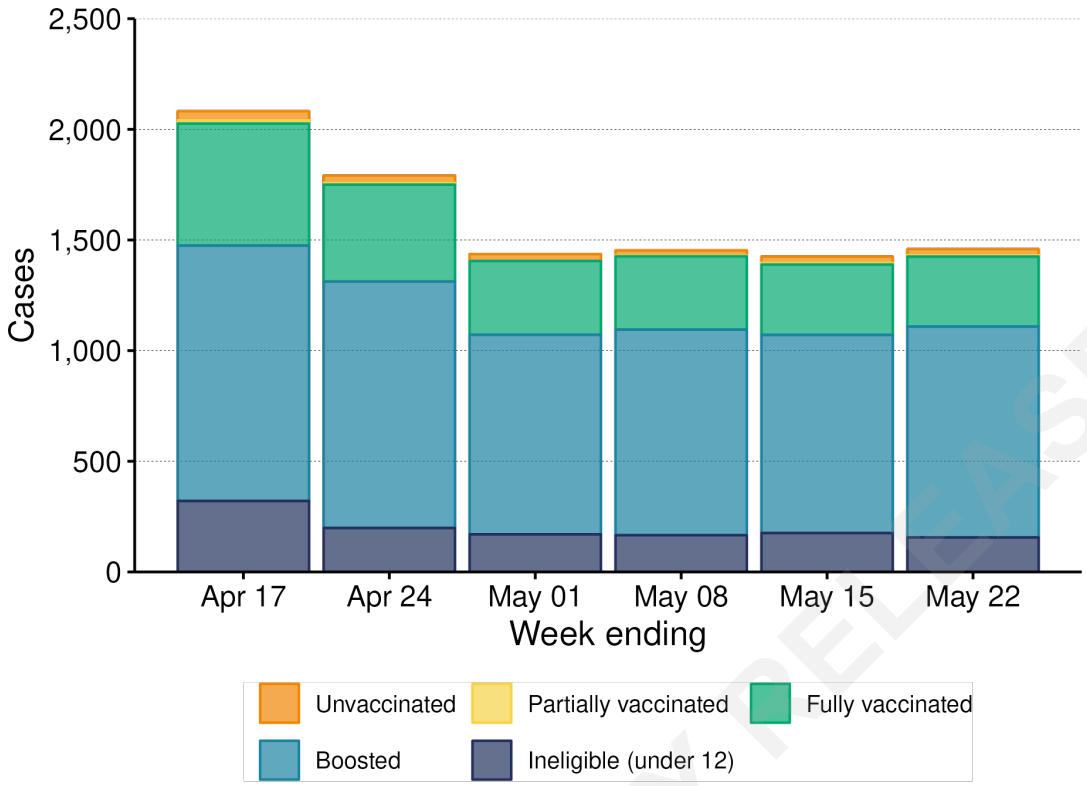
Whanganui DHB



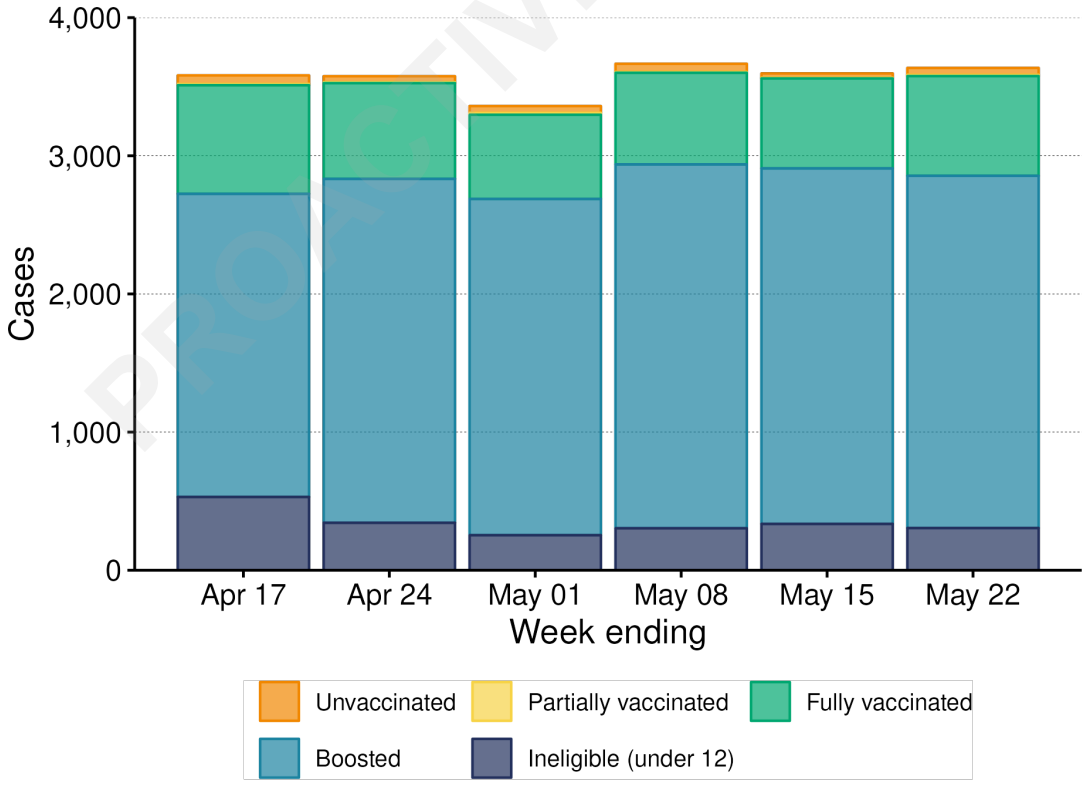
MidCentral DHB



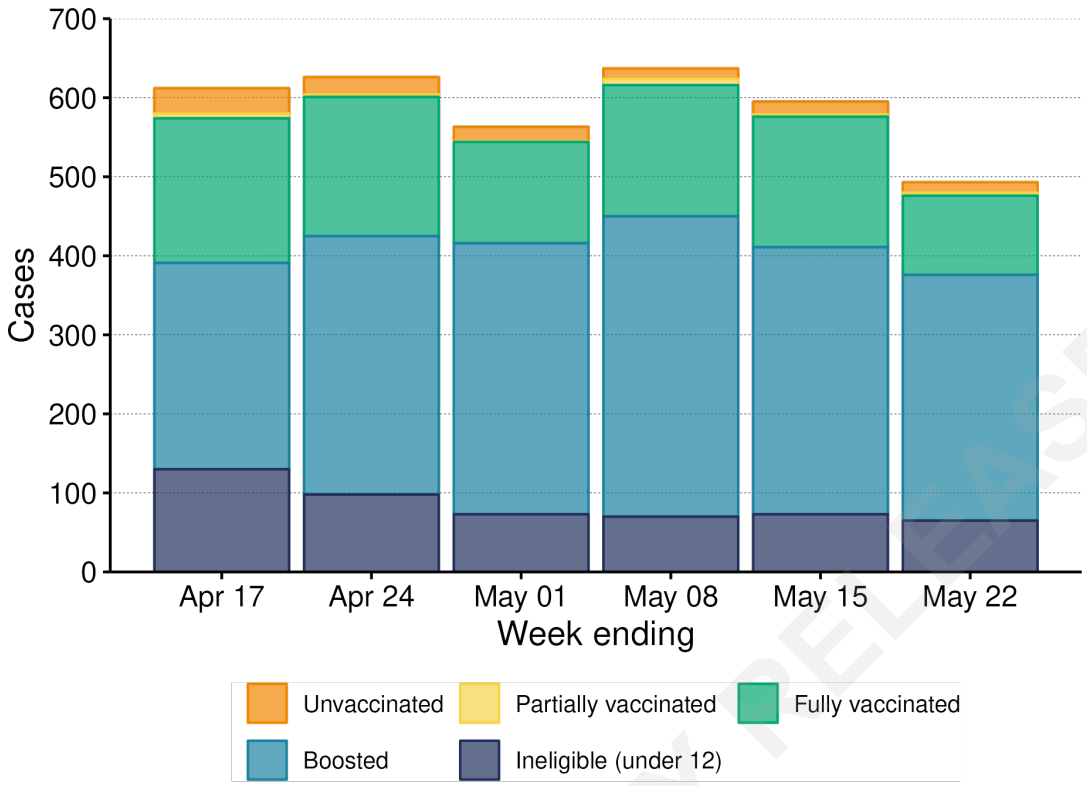
Hutt Valley DHB



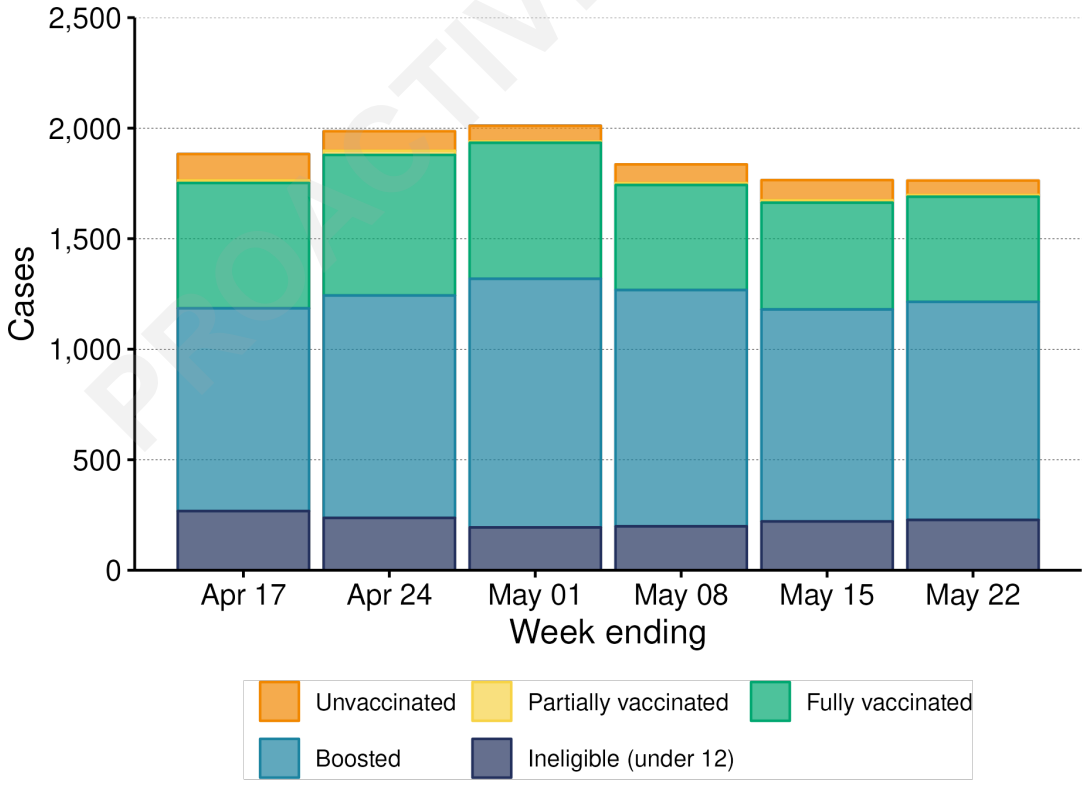
Capital and Coast DHB



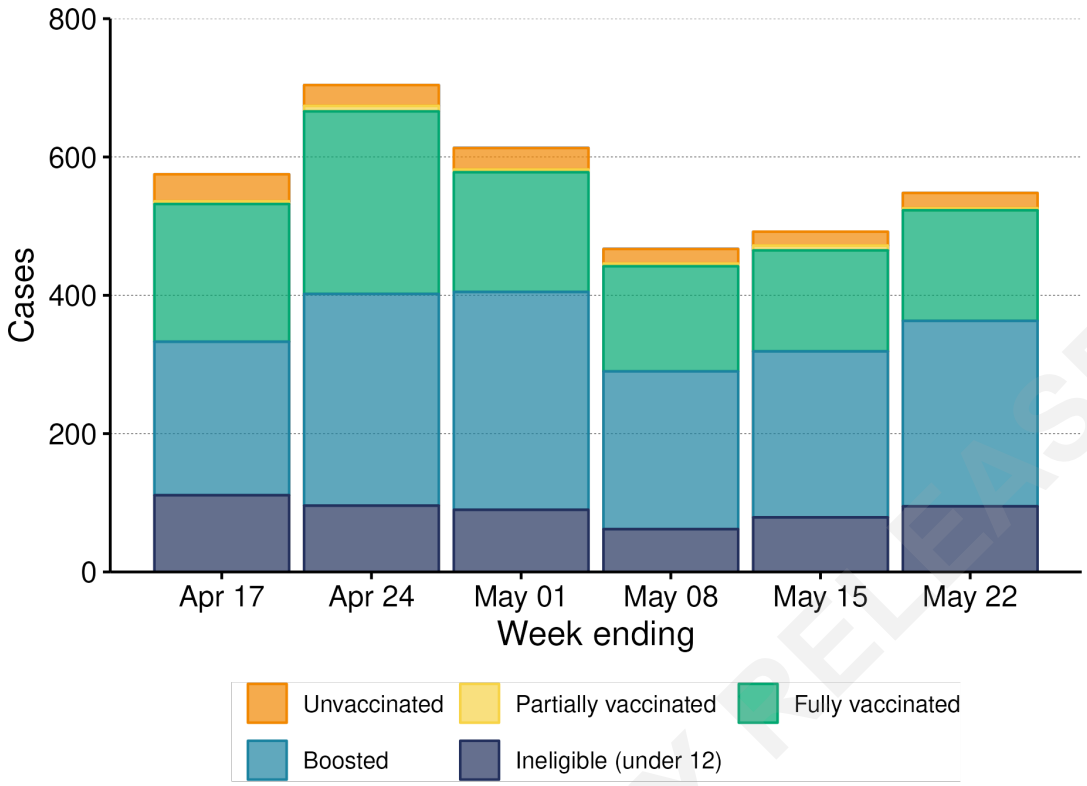
Wairarapa DHB



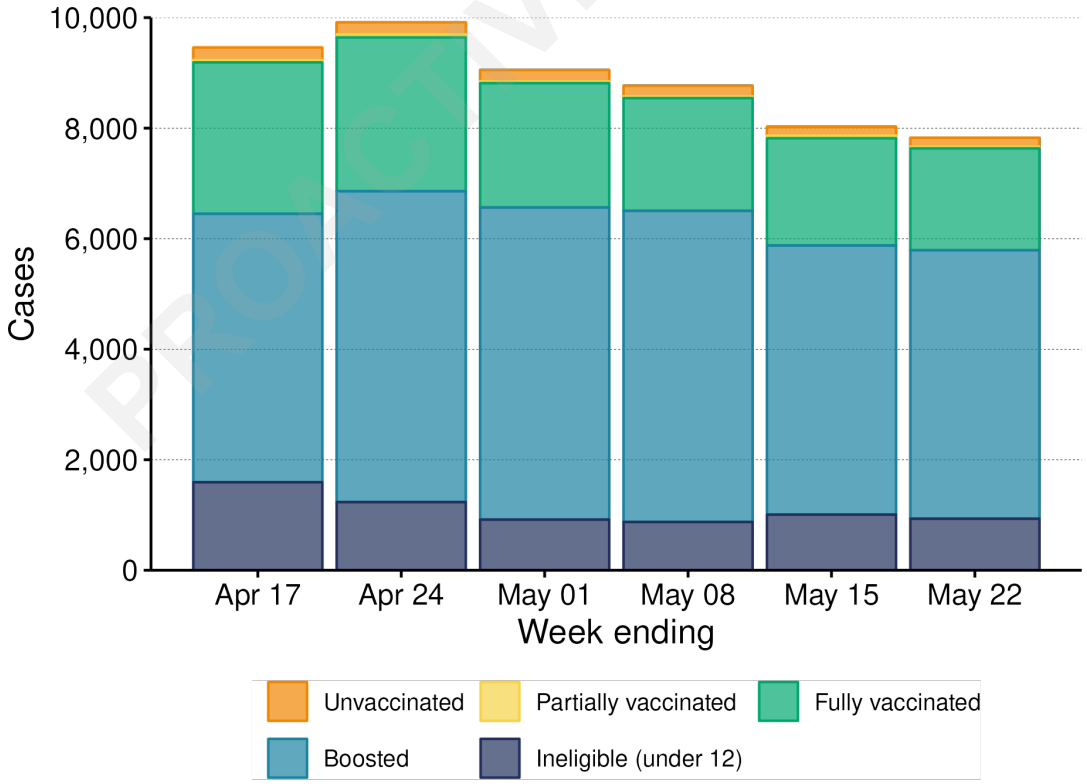
Nelson Marlborough DHB



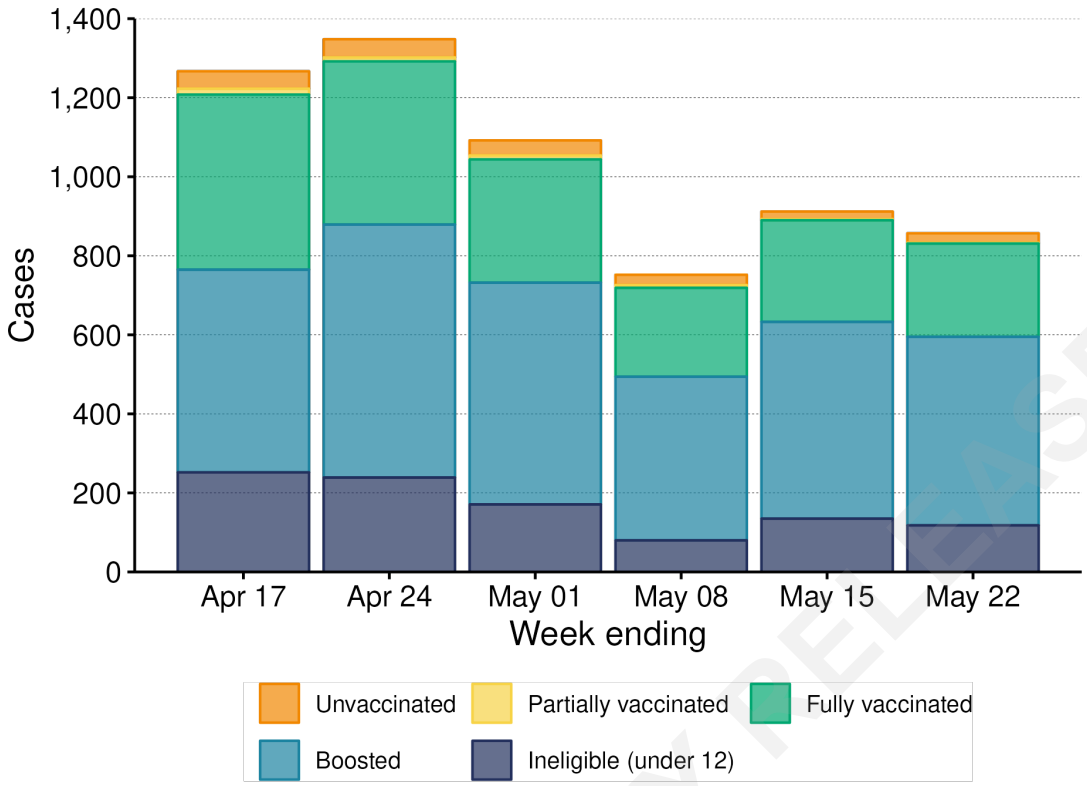
West Coast DHB



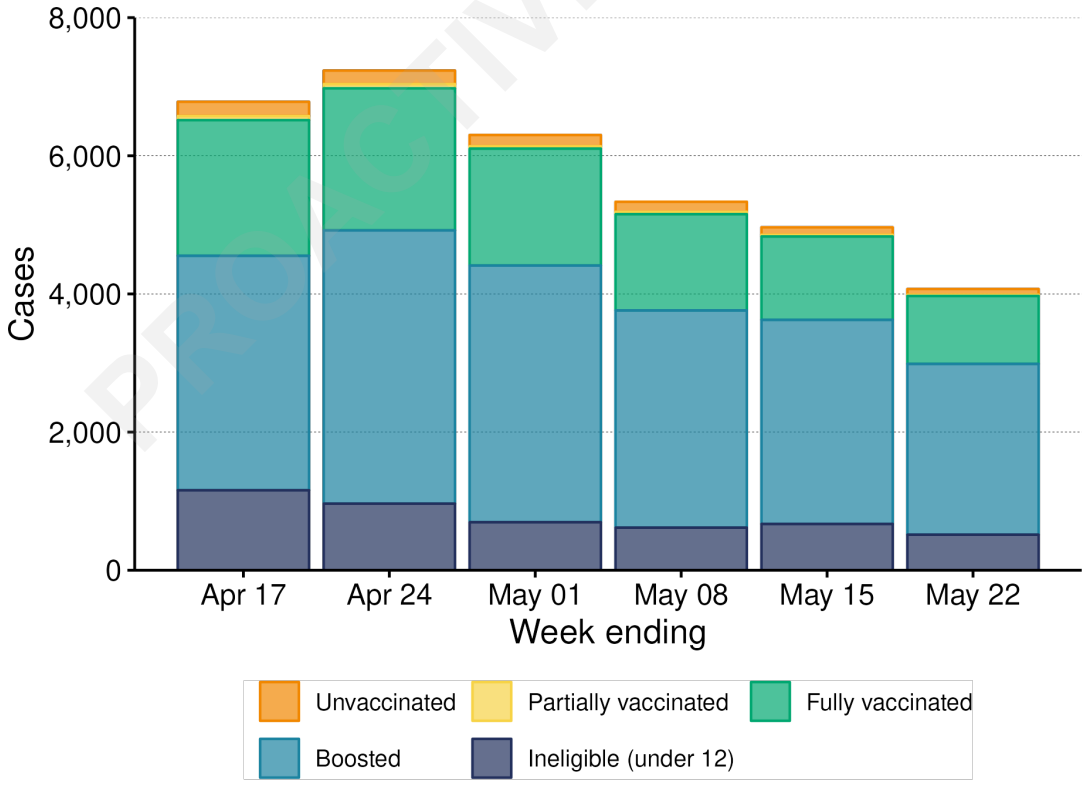
Canterbury DHB



South Canterbury DHB



Southern DHB



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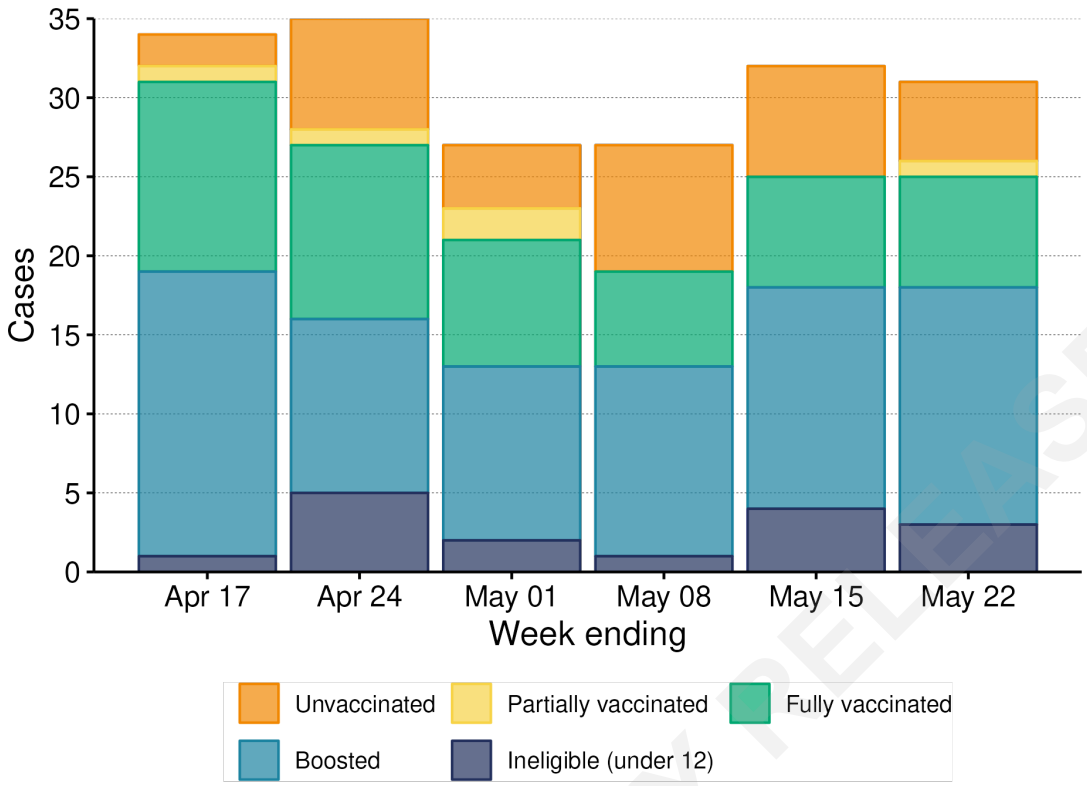

PCR Testing Rates