13th January 2022

[redacted]

[redacted]

Official Information Act Request for – Covid-19 Summer Predictions

I write in response to your Official Information Act request received by us 2nd December 2021, you requested the following information:

- **Under section 12 of the Official Information Act 1982 I request all original communications from July 26 – July 31 including briefings, reports, memos, aides memoirs, cabinet papers, data and texts regarding the following information:**
- **Or other such communications around coronavirus modelling of coronavirus case numbers, hospitalisations and health system capacity during the Christmas - New year holiday period including from Dec 1 2021 to Mar 1 2022. This will include implications for the impact of holiday makers, anticipated timing for peak numbers, the number of holiday makers and options to manage coronavirus and the health system over this period. All and any modelling estimates and projections for this period are also requested.**

Counties Manukau Health Response:
For context Counties Manukau Health (CM Health) employs over 8,500 staff and provides health and support services to people living in the Counties Manukau region (approx. 601,490 people). We see over 118,000 people in our Emergency Department each year, and over 2,000 visitors come through Middlemore Hospital daily.

Our services are delivered via hospital, outpatient, ambulatory and community-based models of care. We provide regional and supra-regional specialist services i.e. for orthopaedics, plastics, burns and spinal services. There are also several specialist services provided including tertiary surgical services, medical services, mental health and addiction services.

Te Pūnaha Matatini released a modelling paper on the 30th June 2021 which includes likely Covid-19 rates once the vaccination programme has finished and borders have re-opened. Based on a large number of assumptions drawn from the world literature and their own modelling the researchers derived likely case numbers over many scenarios. Attached as **appendix 1** is an internal paper which draws on the scenarios considered most likely to occur, matched with projected vaccination rates by age and ethnicity in Counties Manukau to suggest plausible scenarios for hospital planning purposes for 2022.

This paper is an internal paper which was written on 29th July 2021 for potential scenarios for 2022, this paper was then re-written for the Northern region in September 2021. The paper only relates to numbers for the year of 2022 not specifically for the December 2021 to March 2022 period. In addition to this, the paper provided scenarios, not predictions and it did not look into capacity or holiday makers.

I trust this information answers your request. You are entitled to seek a review of the response by the Ombudsman under section 28(3) of the Official Information Act. Information about how to make a complaint is available at www.ombudsman.parliament.nz or Freephone 0800 802 602.

Please note that this response or an edited version of this may be published on the Counties Manukau Health website. If you consider there are good reasons why this response should not be made publicly available, we will be happy to consider this.

Yours sincerely

Fepulea'i Margie Apa
Chief Executive Officer
Counties Manukau Health

Appendix 1

Post-vaccine New Zealand:
Counties Manukau hospital planning scenarios for covid-19 in 2022

Dr Gary Jackson
29 July 2021

Summary

Te Pūnaha Matatini has recently released a modelling paper[1] which includes likely covid-19 rates once the vaccination programme has finished and borders re-opened. Based on a large number of assumptions drawn from the world literature and their own modelling the researchers derived likely case numbers over many scenarios. This paper draws on the scenarios considered most likely to occur, matched with projected vaccination rates by age and ethnicity in Counties Manukau to suggest plausible scenarios for hospital planning purposes for 2022. Broadly:

1 NZ is considered 'fully vaccinated' by Dec 2021
2 Borders are opened 1 Jan 2022 to most countries, but restrictions remain on some
3 Lockdowns and border closures no longer used, but case tracking and isolation used as per other notifiable diseases
4 Delta variant is main circulating virus
5 Vaccination rates in adults might achieve 80% coverage for those aged 16+
6 risks equivalent to seasonal influenza will be accepted by the health system and general public.

Based on the parameters used Middlemore might expect between **1 admission a day to 1 a week**. This is well de-coupled from expected case numbers (35-170 per week in CM) due to the effectiveness of the vaccine at preventing serious disease. At the base scenario of 5 hospitalisations per week, with an ALOS of 6 days, allowing for overlaps, would suggest around 7 'covid-19' beds will be required over and above the usual bed needs. Rates are likely to be higher over the winter months, concomitant with other respiratory infections.

There will be a particular risk in 2022 of a worse than normal influenza year, given two years now of low to no exposure. One might plan for Ward 7 to be a respiratory infections' ward for winter 2022.

An anticipated 10-60 deaths due to covid-19 per year is expected in Counties Manukau, similar to seasonal influenza impacts in past years.

[1] Steyn N, Plank MI, Binny RN, Hendy SC et al. A COVID-19 Vaccination Model for Aotearoa New Zealand. Pre-print, 30 June 2021. [and Supplement Paper]

Introduction

There is an expectation that once the vaccination programme is completed life will return to 'normal' and oversea travel will be reinstated - for example, the much heralded 'freedom day' in England. The modellers at Te Pūnaha Matatini have considered a variety of parameters associated with 'unmitigated travel' following a 90% vaccination achievement for the 16+ population[2]. For most scenarios considered New Zealand will not be at 'herd immunity' and the Delta variant covid-19 virus will easily be able to establish and spread. The case numbers shown in their modelling would suggest an ongoing need for some border controls, so in this report the lower estimates from their papers are used – that is stepping back from the 'unmitigated' assumption of around five travellers arriving per day infectious to one or less. This matches the work done by Blakely et al for the state of Victoria[3]. The exact settings will be determined by the government of the day, but the current indications are of a very conservative approach.

Method

As noted above, the results of the Te Pūnaha Matatini modelling have been used to construct these post-vaccine scenarios for CM Health. Key assumptions from the modelling are listed in Appendix 1. The modelling gave a wide range of plausible results – here it is assumed that the higher case number scenarios would not be accepted by the government of the day or the public. We thus assume controls remain in place such that the risks approximate the equivalent of seasonal influenza – these were accepted by the health system and general public in the past, and perhaps provide a median space between economic and health considerations going forward.

Appendix 1 also notes where the base assumptions have been varied for this report. The main differences are:

1. Tighter border and outbreak controls are assumed for the 'tight' scenario. This is effected empirically by using the 'R0=3' scenario in the original paper (Table 5)
2. The 90% vaccine coverage in ages 16+ is reduced to 80% in CM, and other lower coverage scenarios considered. The difference from 90% to 80% is assumed to be taken up in the tighter controls noted in 1, so is not adjusted for separately
3. Some heterogeneity is assumed in coverage across CM Health. Based on responses seen in the UK and other western countries higher coverage in older/more vulnerable people is expected. Based on past vaccination campaigns slighter lower rates in Maaori and Pacific people are likely. Appendix 2 shows the modelled vaccination coverage figures. No added transmission effect for the heterogeneity due to uneven vaccine coverage across the different communities is included – 'pockets of susceptibility' might be expected to lead to easier infection spread.
4. The lower vaccine scenarios have been sized using the vaccine effectiveness modelling (original model Table 6)
5. The addition of ages 12-15 in the vaccinated cohort is modelled using Table S5 in supplement to the original paper
6. Population denominators used are based on the 2020 Health Service User population – see Appendix 2.

[2] Steyn N, Plank MI, Binny RN, Hendy SC et al. A COVID-19 Vaccination Model for Aotearoa New Zealand. Pre-print, 30 June 2021. [and Supplement Paper]

[3] blogs.otago.ac.nz/pubhealthexpert/whats-the-right-covid-19-risk-to-live-with-an-australian-perspective/

Results

The main results are shown in the table below.

				Over the 2022 year			Per week on average		
Scenario	Travel/ outbreak control	Adult vaccination rate	12-15 year olds vaccinated	Cases in CM	Hospitali-sations	Deaths	Cases in CM	Hospitali-sations	Deaths
1	Tight	High	N	8,810	261	47	169	5	0.9
2	Tight	High	Y	1,819	58	10	35	1	0.2
3	Tight	Mod	N	18,716	660	118	360	13	2.3
4	Tight	Mod	Y	9,810	370	66	189	7	1.3
5	Tight	Low	N	31,748	1,220	216	611	23	4.2
6	Tight	Low	Y	20,672	847	150	398	16	2.9
7	Looser	High	N	65,187	1,932	344	1.254	37	7
8	Looser	High	Y	53,102	1,702	304	1.021	33	6
9	Looser	Mod	N	86,963	3,065	548	1.672	59	11
10	Looser	Mod	Y	72,582	2,740	490	1.396	53	9
11	Looser	Low	N	113,267	4,353	772	2.178	84	15
12	Looser	Low	Y	96,052	3,935	698	1.847	76	13

Travel – 'tight' = 1 or less positive case per day enters NZ, strong track, trace and isolate procedures
Travel – 'looser' = ~5 positive cases per day enters NZ, good track and trace and isolate procedures
High vaccination = 80% of 16+ in CM vaccinated by Dec 2021
Moderate vaccination = 70% of 16+ vaccinated by Dec 2021
Low vaccination = 60% of 16+ vaccinated by Dec 2021
If 12-15 year olds are vaccinated by Feb 2022 = 'Y'.

Current planning is to exceed an 80% vaccination coverage in ages 16+. so the best case point for planning for 2021 would be Scenario 2. This has covid-19 in the community - around 35 new cases per week, with 1-2 hospitalisation per week on average, and 10 deaths over the year in Counties Manukau. If teenagers (12-15 year olds) are not vaccinated, per Scenario 1 these numbers would increase to 5 hospitalisation per week on average, and 47 deaths over the year in Counties Manukau. This is similar to the seasonal influenza load. These two scenarios are highlighted in yellow as the most likely, and therefore forming a basis for 2022 capacity planning.

If vaccine rates are lower, the impact of covid-19 spreading in the community is naturally higher. A 10 percentage point fall in coverage for the 16+ age group is estimate to result in an added 6-7 hospitalisations per week, so maybe 15 beds-worth, and more than twice the number of deaths. Lower vaccination rates are proportionately worse.

Overshadowing the exact vaccination levels, the world situation and border controls have the largest impact on the modelling. Compare the tight versus loose scenarios in the table, with a 5 to 10 fold increase in numbers.

Discussion

If the CM population were at 80% of the 16+ population vaccinated (the "high" rate here) the overall population coverage would only be 60%, due to the large number of children in CM. This is insufficient to create 'herd immunity' even against the standard covid-19 variety, and certainly not for the later variants. It appears unlikely that the Government (or public) would countenance the

looser travel scenario, despite pressures to do so from the business community. This suggests the tighter scenario is in play, with border controls such as MIQ/home isolation remaining for countries with larger numbers of cases. The 'tight' scenarios assume that there averages less than one case per day entering the community. An 80% average coverage of 16+ year olds does appear attainable for CM Health, suggesting Scenario 1 or 2 is possible. It is likely there is enough vaccine and vaccination capacity by December to cover the 12-15 year olds, though no decision has been made to date, so Scenario 2 seems quite possible as long as the vaccine supply holds up.

The hospitalisation rates shown are well less than what might have been expected from earlier outbreaks given the expected case numbers, due to the effectiveness of the vaccine at preventing serious disease. It would also be anticipated that many of the community cases would be asymptomatic or have milder impacts. At Scenario 1 with 5 hospitalisations a week, taking an average length of stay of 6 days, allowing for overlaps, would suggest around 7-8 'covid-19' beds will be required. Rates are likely to be higher over the winter months, concomitant with other respiratory infections – maybe double?

In England 92% of ages 50+ are fully vaccinated (as at 20 July 2021), giving an indication of what is possible in the general population given sufficient motivation and access to vaccines. A lower rate of coverage has been assumed here – any upside would reduce risk.

Looking at the difference between scenarios 1 or 2 and 7 or 8 it is clear that the border management policies will be fundamental to the expected caseloads in the community. If the intent is to minimise hospitalisations and deaths then removal of all travel restrictions would not be possible until:

1. World caseloads decrease , decreasing the border impact
2. All children are able to be vaccinated - ie 1-11 year olds as well
3. Adult vaccination rates get to 90% or more.

Comparing the alternate scenarios, vaccinating 12-15 year olds has a surprisingly strong effect on case numbers. Teenagers are high socialisers, and key spreaders of viruses. The higher hospitalisations and deaths are in older groups being exposed to more infections. It is also worth noting that when the R0 is approaching 1 small changes in parameters can have seemingly large changes in case numbers – being just below 1 limits outbreak spread cf just above 1 where it will propagate.

Within each triad of High, Moderate and Low vaccination rates - 80% of 16+, 70%, 60% respectively, there is fall in the numbers of cases, hospitalisations and deaths as expected. The effect is moderated somewhat in that:

1. The vaccine reduces but does not stop onwards transmission – higher coverage slows but does not stop spread
2. Breakthrough cases occur, and while hospitalisation and death rates are markedly reduced with the vaccine, they are not eliminated
3. Children 0-11 are not covered, creating a reservoir for cases to spread in all scenarios
4. The Delta variant is so infectious - R0 4-6, so more than 90% coverage of the whole population will be needed
5. The predicted uptake is patterned such that the elderly/most vulnerable are expected to have the higher coverage, blunting the effect of the reductions in overall coverage (see Appendix 2).

Other viral illnesses kept at bay with border quarantine are also expected to increase (for example the current RSV surge) and will need to be managed as if they are covid until viral panel diagnoses are confirmed – eg RSV, influenza. Further spikes in viral illnesses mimicking potential covid-19 infection seem reasonably likely especially if the influenza vaccination drive is less successful with covid-19 vaccinations taking precedence.

There will be a particular risk in 2022 of a worse-than-normal influenza year, given two years now of low to no exposure. One might plan for Ward 7 to be a respiratory infections' ward for winter 2022.

ICU beds have not been explicitly modelled. The vaccine appears very protective from serious disease; if we assumed 1 in 10 admissions needed ICU care (compared with 1 in 5 in past outbreaks), then CM might be expected to have an admission to ICU every 2 weeks. With an ALOS of ~14 days (again patterned on past experience) this would equate to an average of one ICU bed occupied by a covid-19 patient throughout the year.

An anticipated 10-60 deaths per year are expected in Counties Manukau, similar to influenza.

Conclusion

The results here are entirely dependent on the risk appetite for the government and public to allow covid-19 into the country as other countries are planning in the post-vaccine world. The Te Pūnaha Matatini modelling had provided plausible scenarios as to how that might play out. Taking a conservative but not draconian approach – ie some opening of the borders is allowed, and the country moves to a 'Manage it' rather than the current 'Keep it Out' strategy, small volumes of cases, hospitalisations and deaths would be expected.

Appendix 1 Key assumptions

Main assumptions are based on the Te Pūnaha Matatini modelling paper, especially Table 3 in the main paper[4]. Key assumptions are noted here, along with any modifications made.

	Assumption in original paper	Modifications for this report
1	NZ is considered 'fully vaccinated' by Dec 2021	
2	Borders are opened 1 Jan 2022	
3	Restrictions remain on travel to some countries, but otherwise 'unmitigated' quarantine-free travel is occurring	The main model uses 5/day imports but this gives major case numbers. Assume tighter border controls to less than 1/day case imports
4	Assume Delta variant is main issue, medium R0 = 4.5	Potential for higher R0 assumed to be factored in to tightness of border control
5	Assume variation in coverage by community around the average vaccination coverages of 90%. Model does not account for heterogeneity of vaccine coverage	Vaccination coverage set by age and ethnicity in 3 scenarios Low 60%, Moderate 70% and High 80% of 16+ population. Assumed higher in older/more vulnerable, and slighter lower rates in Maaori and Pacific. No added transmission for the heterogeneity
6	Vaccine efficiency (Pfizer) against Delta variant is 88%, against severe disease 94% -	
7	Transmissibility by age, and severity proportions as noted [Table 3]	
8	Vaccine reduction in transmission - 85%	
9	No further community lockdowns, but case isolation and contact tracing eg as measles is currently managed now, drops R0 44% [p11]	
10	Children ages 12-15 are not vaccinated	Data in the supplemental paper (Table S5) used to model with and without 12-15 year olds being vaccinated
11	0-11 year olds not vaccinated	
12	Three scenarios for R0 are used, 3, 4.5 and 6.	Assume the R0 = 3 assumption is equivalent to a tighter border regime (recent political reporting suggests that fully open borders will not be occurring next year – possibly in response to this modelling paper). R0=4.5 used as the main estimate – if actual R0 proves to be higher it is likely tighter controls will be placed on border movements
13	With a 90% coverage of 15+, @ R0 = 4.5 REF noted 1.3m infections over 2 years	Assumed equivalent to 65,000 for CM for 1 year. Figures in the Supplement Paper, Table S5, used for scenarios where 12-15 year olds vaccinated
14	With a 90% coverage of 15+, @ R0 = 3 REF noted 150k infections over 2 years	Assumed equivalent to 8,800 for CM for 1 year
15	The model does not account for inequities in health outcomes for different groups (eg Māori and Pacific)	Maaori and Pacific have 2.5 and 3 times the rate of hospitalisation as European/Other[5]
16		Assume that the 80% 16+ coverage used here is equivalent to the 90% in the original model, but balanced by having a more controlled border

[4] Steyn N, Plank MI, Binny RN, Hendy SC et al. A COVID-19 Vaccination Model for Aotearoa New Zealand. Pre-print, 30 June 2021. [and Supplement Paper]

[5] Steyn N, Binny RN, Hannah K, Hendy SC, et al. Māori and Pacific people in New Zealand have a higher risk of hospitalisation for COVID. *NZ Med J* 9 July 2021, 19: 134.

17		Assume that the public and Government appetite for risk in circulating virus is measurable using seasonable influenza. Where choice on risk to accept is available this will be the balance between economic and health factors accepted.
18		Average length of stay for a hospital admission = 6 days – based on first and second wave results at Middlemore
19		Chance of entering ICU assumed reduced compared to previous outbreaks due to vaccine effectiveness in reducing severe disease – 1 in 10 hospitalisations expected, rather than 1 in 5.

Appendix 2 CM modelled vaccination coverage, and population used

High coverage - assumed vaccination rates to get to an 80% coverage for ages 16+

Age	Maaori	Pacific	Indian	Chinese	Other Asian	European/ Other	Overall
00	0	0	0	0	0	0	0
01-04	0	0	0	0	0	0	0
05-09	0	0	0	0	0	0	0
10-14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-19	0.52	0.52	0.60	0.60	0.60	0.60	0.56
20-24	0.70	0.70	0.75	0.75	0.70	0.75	0.72
25-29	0.70	0.70	0.80	0.80	0.75	0.75	0.74
30-34	0.70	0.75	0.80	0.80	0.75	0.80	0.77
35-39	0.75	0.75	0.80	0.85	0.80	0.80	0.79
40-44	0.75	0.75	0.85	0.85	0.80	0.80	0.80
45-49	0.75	0.80	0.90	0.90	0.80	0.80	0.81
50-54	0.80	0.80	0.90	0.90	0.80	0.80	0.82
55-59	0.80	0.80	0.90	0.90	0.85	0.80	0.82
60-64	0.80	0.80	0.90	0.90	0.85	0.80	0.82
65-69	0.80	0.80	0.90	0.90	0.85	0.85	0.85
70-74	0.85	0.85	0.90	0.90	0.85	0.85	0.86
75-79	0.85	0.85	0.90	0.90	0.85	0.85	0.86
80-84	0.85	0.85	0.90	0.90	0.85	0.85	0.86
85+	0.85	0.85	0.90	0.90	0.85	0.85	0.86
All ages	0.49	0.52	0.65	0.67	0.61	0.67	0.60
Ages 16+	0.74	0.75	0.83	0.86	0.79	0.80	**0.80**

Moderate coverage - assumed vaccination rates to get to a 70% coverage for ages 16+

Age	Maaori	Pacific	Indian	Chinese	Other Asian	European/ Other	Overall
00	0	0	0	0	0	0	0
01-04	0	0	0	0	0	0	0
05-09	0	0	0	0	0	0	0
10-14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-19	0.45	0.45	0.52	0.52	0.52	0.52	0.48
20-24	0.60	0.60	0.65	0.65	0.60	0.60	0.61
25-29	0.60	0.65	0.70	0.70	0.65	0.65	0.66
30-34	0.60	0.65	0.70	0.70	0.65	0.65	0.66
35-39	0.65	0.65	0.70	0.75	0.65	0.65	0.67
40-44	0.65	0.65	0.75	0.75	0.70	0.65	0.68
45-49	0.65	0.65	0.75	0.75	0.70	0.70	0.69
50-54	0.65	0.65	0.75	0.75	0.75	0.70	0.70
55-59	0.70	0.70	0.80	0.80	0.75	0.70	0.72
60-64	0.70	0.70	0.80	0.80	0.75	0.70	0.72
65-69	0.70	0.70	0.80	0.80	0.75	0.70	0.73

70-74	0.75	0.75	0.80	0.80	0.75	0.75	0.76
75-79	0.80	0.80	0.85	0.85	0.75	0.75	0.78
80-84	0.80	0.80	0.85	0.85	0.80	0.80	0.81
85+	0.80	0.80	0.85	0.85	0.80	0.80	0.81
All ages	0.42	0.45	0.57	0.58	0.53	0.57	0.52
Ages 16+	0.64	0.65	0.73	0.75	0.69	0.69	**0.70**

Low coverage - assumed vaccination rates to get to a 60% coverage for ages 16+

Age	**Maaori**	**Pacific**	**Indian**	**Chinese**	**Other Asian**	**European/ Other**	**Overall**
00	0	0	0	0	0	0	0
01-04	0	0	0	0	0	0	0
05-09	0	0	0	0	0	0	0
10-14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15-19	0.30	0.30	0.30	0.30	0.30	0.30	0.30
20-24	0.45	0.45	0.55	0.55	0.50	0.50	0.48
25-29	0.45	0.45	0.55	0.55	0.50	0.50	0.49
30-34	0.50	0.50	0.60	0.60	0.50	0.50	0.53
35-39	0.50	0.50	0.60	0.60	0.55	0.55	0.55
40-44	0.55	0.55	0.65	0.65	0.60	0.55	0.58
45-49	0.55	0.55	0.65	0.65	0.60	0.60	0.59
50-54	0.55	0.55	0.65	0.65	0.60	0.60	0.59
55-59	0.60	0.60	0.65	0.70	0.60	0.60	0.61
60-64	0.60	0.60	0.70	0.70	0.65	0.65	0.65
65-69	0.60	0.60	0.75	0.75	0.70	0.65	0.66
70-74	0.65	0.65	0.75	0.75	0.70	0.65	0.67
75-79	0.70	0.70	0.75	0.80	0.75	0.70	0.71
80-84	0.70	0.70	0.80	0.80	0.75	0.70	0.72
85+	0.70	0.70	0.80	0.80	0.75	0.75	0.75
All ages	0.34	0.35	0.48	0.50	0.43	0.49	0.43
Ages 16+	0.51	0.51	0.61	0.64	0.56	0.58	**0.60**

Counties Manukau Health Service User (HSU) population 2020

Age	Maaori	Pacific	Indian	Chinese	Other Asian	European/ Other	Overall
00	1,745	2,633	1,394	490	563	1,687	8,512
01-04	7,401	10,324	5,231	2,785	2,365	7,209	35,315
05-09	9,829	13,850	5,330	4,036	2,904	10,208	46,157
10-14	9,348	13,950	4,307	2,990	2,569	11,256	44,420
15-19	7,669	12,703	3,487	2,381	2,319	10,927	39,486
20-24	7,559	13,053	4,462	1,982	2,266	10,260	39,582
25-29	7,281	12,023	9,813	2,498	2,740	10,960	45,315
30-34	6,374	10,141	10,534	3,761	3,469	11,469	45,748
35-39	4,669	8,419	7,855	4,980	3,825	11,356	41,104
40-44	4,346	7,717	5,599	3,484	3,279	11,664	36,089
45-49	4,704	7,471	4,237	2,754	2,797	14,018	35,981
50-54	4,616	7,427	3,636	2,804	2,364	14,952	35,799
55-59	4,069	6,398	3,422	2,977	2,233	14,936	34,035
60-64	3,016	4,862	3,104	2,922	1,712	13,364	28,980
65-69	2,049	3,598	2,543	3,195	1,175	11,011	23,571
70-74	1,317	2,680	1,766	1,972	753	10,237	18,725
75-79	733	1,671	1,089	1,132	362	7,637	12,624
80-84	428	937	584	772	233	5,339	8,293
85+	183	561	329	477	156	4,841	6,547
Total	87,336	140,418	78,722	48,892	38,084	193,331	586,283
Total 16+	57,479	97,120	61,763	37,615	29,219	160,786	443,982
As % 16+	*13%*	*22%*	*14%*	*8%*	*7%*	*36%*	*100%*

HSU = All people who received at least one of the following services: inpatient, outpatient, community labs, pharmaceutical dispensing, mental health services, had a new cancer registration, or recorded in the PHO register in the Jan 2021 or had contact with PHO/ made GMS claim in 2020. Deaths up to end of 2020 were excluded.

Ethnicity is prioritised in the order given, as recorded in the health datasets. This differs from the Stats NZ estimated resident population ethnicity distribution, and is thought to better match the ethnicity used in the vaccination data.

Those not immunised in the 'High' vaccination scenario

Age	Maaori	Pacific	Indian	Chinese	Other Asian	European/ Other	Overall
00	1,745	2,633	1,394	490	563	1,687	8,512
01-04	7,401	10,324	5,231	2,785	2,365	7,209	35,315
05-09	9,829	13,850	5,330	4,036	2,904	10,208	46,157
10-14	9,348	13,950	4,307	2,990	2,569	11,256	44,420
15-19	3,681	6,097	1,395	952	928	4,371	17,424
20-24	2,268	3,916	1,116	496	680	2,565	11,039
25-29	2,184	3,607	1,963	500	685	2,740	11,678
30-34	1,912	2,535	2,107	752	867	2,294	10,468
35-39	1,167	2,105	1,571	747	765	2,271	8,626
40-44	1,087	1,929	840	523	656	2,333	7,367
45-49	1,176	1,494	424	275	559	2,804	6,732
50-54	923	1,485	364	280	473	2,990	6,516
55-59	814	1,280	342	298	335	2,987	6,055
60-64	603	972	310	292	257	2,673	5,108
65-69	410	720	254	320	176	1,652	3,531
70-74	198	402	177	197	113	1,536	2,622
75-79	110	251	109	113	54	1,146	1,783
80-84	64	141	58	77	35	801	1,176
85+	27	84	33	48	23	726	942
All ages	44,947	67,775	27,324	16,171	15,007	64,247	235,471
Total 16+	15,888	25,799	10,783	5,679	6,421	33,013	97,582
As % 16+	*16%*	*26%*	*11%*	*6%*	*7%*	*34%*	*100%*