# A Review of COVID-19 Vaccination Mandates in Australian Residential Aged Care Facilities

***evaluating regulatory objectives against real-world outcomes***

A Thoughtful and Concerned Citizen

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## Executive Summary

Australian Residential Aged Care Facilities (RACFs) provide a home and care for approximately 190,000 residents with a weighted average age of 84.8 years.

Up until 04 June 2021, mandatory COVID-19 vaccination of workers within RACFs was not recommended by the Australian Health Protection Principal Committee (AHPPC). In an unexplained change of direction, AHPPC on 29 June 2021 recommended the mandatory COVID-19 vaccination of all workers within Australian RACFs. By 17 September 2021, 99% of staff were fully (two-dose) vaccinated.

In conjunction with this, by 01 October 2021 the resident COVID-19 two-dose vaccination level was 87%, by 09 February 2022 the resident COVID-19 three-dose vaccination level was 81%, by 05 May 2022 the resident three-dose vaccination level was 90.5%, and by 27 May 2022 97% of residents had received at least one dose, the three-dose vaccination level was 90.5%, and the four-dose vaccination level was 6%.

This highly vaccinated 'RACF ecosystem' was further protected by significant regulatory requirements, supplemented by an industry code of conduct, for the COVID-19 vaccination of visitors.

Our first observation is that the expected outcomes of these vaccination mandates, as articulated by AHPPC and state Public Health Orders (PHOs), were all couched in terms that were varying, non-specific, difficult to quantify, problematic to evaluate, and incapable of providing learning signals and feedback to the various health departments.

Despite this, with a detailed review of the various national directives and state Public Health Orders (PHOs) we were able to surface and articulate four 'outcome-themes' of COVID-19 vaccination mandates of RACF workers. These were:

1. To break, or at least mitigate, the nexus between staff and resident infection;
2. To break, or at least mitigate, the nexus between infection in the broader community and infection amongst staff and residents in RACFs;
3. To control the scope, scale, and intensity of outbreaks of SARS-CoV-2 in RACFs; and
4. In conjunction with the vaccination of residents, to control and mitigate the consequences of COVID-19 amongst residents of RACFs, in particular mortality.

This paper evaluates the extent to which these regulatory 'outcome-themes' have been matched by real-world outcomes during the mandatory staff vaccination period from 17 September 2021 to 27 May 2022. The evaluation is based on analyses of data provided by the Australian Government's Department of Health in its weekly reports on COVID-19 outbreaks in Australian residential aged care facilities.

Based on these analyses:

1. **Mandatory staff vaccination did not mitigate or break the nexus between staff and resident infection**. During the mandatory staff vaccination period, active staff cases explain 90.89% of the variability in active resident cases, and on average 10 staff cases generate 8.0 resident cases. Furthermore, during this same period cumulative staff cases explains 98.69% of the variability in cumulative resident cases; where cumulative staff and resident cases are summed from March 2020. Finally, in a sign of the very strong causal relationship between staff and resident cases, and with a lag of eight days between cases and deaths, weekly *staff* cases explain 82.53% of the variability in weekly *resident* deaths.
2. **Mandatory staff vaccination did not mitigate or break the nexus between infection in the broader community and infection amongst staff and residents in RACFs**. During the mandatory staff vaccination period, active staff cases and active resident cases lag daily new cases in the broader community by 14 days. Accounting for this lag, daily new cases in the broader community explain 76% of the variability in active staff cases, and 90% of the variability in active resident cases. Furthermore, during the mandatory staff vaccination period, COVID-19 deaths per week across Australia explains 76% of the variability in COVID-19 deaths per week within RACFs; clearly this association is mediated through community cases and subsequent resident infection.
3. **Mandatory staff vaccination did not control the scope, scale, and intensity of outbreaks of SARS-CoV-2 in RACFs**. During the mandatory staff vaccination period, the total number of active outbreaks at RACFs increased by 1,409% and the total number of RACFs that had an outbreak increased by 712%. Furthermore, the number of active outbreaks explains 92% of the variability in the number of active staff cases. And the number of RACFs that have had an outbreak in the previous week explains 87% of the variability in the number of active staff cases. In addition two measures of outbreak intensity were evaluated (a) the number of active resident cases per active staff case, and (b) the number of cases, staff plus resident, per outbreak. The number of active resident cases per active staff case was the highest in the first three months of the staff vaccination mandate period. And the number of active resident cases per active staff case has increased by 130% from January 2022 to May 2022. During this same period, the number of cases per outbreak has increased by 44% from 5.6 to 8.0; and going as high as 19.0 in January 2022. Finally, during the mandatory staff vaccination period, the number of vaccine doses administered to residents in a given week was a very poor predictor of cases per outbreak 14 days later ($r^2$=2.2%).

4. **Mandatory staff vaccination did not control the consequences of COVID-19 amongst residents of RACFs, in particular mortality**. From 11 September 2020 (the date that the Federal Department of Health stared reporting on outbreaks in RACFs) to 27 May 2022, 98% of cases and 94% of deaths occurred during the mandatory staff vaccination period (i.e. September 2021 to May 2022). Both resident cases ($r^2$=83%) and staff cases ($r^2$=82%) are strong predictors of resident deaths. During this same period, and despite a highly and rapidly vaccinated resident population, the number of resident cases increased by 1,862%, the number of resident deaths increased by 251%, the number of outbreaks increased by 1,409%, the number of RACFs that had an outbreak increased by 712%, and the cumulative percentage of residents and staff testing positive increased 4.4-fold from 0.50% to 2.2%.

In summary, based on the observations and analyses contained in this paper, it is not possible to conclude that the regulatory promises and objectives of mandatory RACF staff COVID-19 vaccination were matched by real-world outcomes.

If they are to be believed, at some point in time assumption-riddled epidemiological models, flimsy observational trials, and deeply-flawed and under-powered randomised control trials, claimed to underpin mandatory COVID-19 vaccination, must translate into population level benefits. And if this is their picture of success, what does failure look like?

# Part A Data Sources, Profiles, and Vaccination Levels

## Data Sources and Items Extracted

To evaluate the effectiveness of mandatory COVID-19 vaccination of staff and contractors in Australian Residential Aged Care Facilities (RACFs), the weekly reports published by the Australian Government's Department of Health 'COVID-19 outbreaks in Australian residential aged care facilities' were downloaded from 11 September 2020 to 22 April 2022 [1].

Table 1 details the data that was extracted from each weekly report.

**Table 1**. Data extracted from weekly reports on COVID-19 outbreaks in Australian residential aged care facilities.
Source https://www.health.gov.au/resources/collections/covid-19-outbreaks-in-australian-residential-aged-care-facilities

| | |
|---|---|
| 1 | Report Date |
| 2 | Number of Active outbreaks |
| 3 | Number of Active resident cases |
| 4 | Number of Active staff cases |
| 5 | Total Number of Resident Cases (since March 2020) |
| 6 | Total Number of Staff Cases (since March 2020) |
| 7 | Deaths this calendar year |
| 8 | Total Number of Resident Deaths (since March 2020) |
| 9 | Total number of residential aged care facilities that have had an outbreak |
| 10 | Total number of outbreaks at residential aged care facilities |
| 11 | Number of residential aged care facilities with resolved outbreaks |
| 12 | Number of residential aged care facilities with resolved outbreaks with only one case (resident or staff member) of COVID-19 |
| 13 | Total resident cases |
| 14 | Total staff cases |
| 15 | Date Number of Sonic Tests Conducted was Reported |
| 16 | Total Number of Sonic Tests Conducted (since March 2020) |
| 17 | Total Number of Sonic Positive Tests (since March 2020) |
| 18 | Number of Quality Assessment and Monitoring Activities (Site Visits) |
| 19 | Number of Quality Assessment and Monitoring Activities (Non-Site Activities) |
| 20 | Date Number of Doses Administered to Residents is reported |
| 21 | Total Vaccine Doses administered to Residents (since March 2021) |

This data was augmented with the daily number of COVID-19 cases and deaths extracted from 'COVID Live', an independent data gathering foundation, whose date is verified daily against government sources [2].

The terms "Active" and "Outbreaks" in Table 1 refer to outbreaks of SARS-CoV-2 in Australian RACFs. An active outbreak is defined as occurring when: [3]

a. Two or more residents of a residential care facility who have been diagnosed with COVID-19 via RAT or PCR test within 5 days, and have been onsite at the residential care facility at any time during their infectious period; or
b. Five or more staff, visitors, and/or residents of the residential care facility have been diagnosed with COVID-19 through RAT or PCR test within the past 7 days who worked/visited during their infectious period.

A symptomatic case is considered infectious from 48 hours prior to symptom onset to 7 days after the date on which the first positive specimen was collected.

And, an asymptomatic case is considered infectious, from 48 hours prior to the collection date of the first positive specimen to 7 days after the date on which the first positive specimen was collected.

## Australian RACFs – Resident Profile

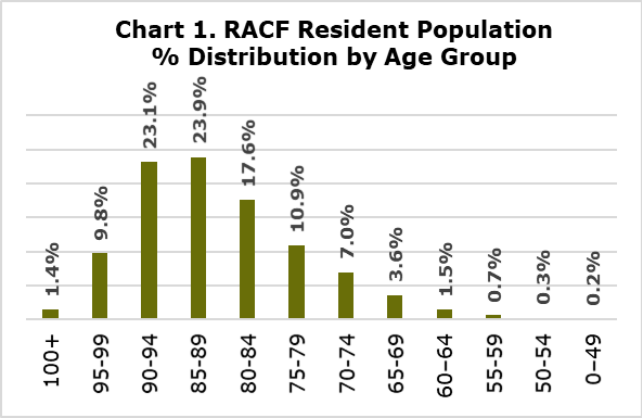
According to the latest data from the Australian Institute of Health and Welfare [4],

> "*In the 10 years between 30 June 2010 and 30 June 2020 the number of people using permanent residential aged care increased by 13% (from 162,578 people to 183,989 people*)."

This increase over time shows a very simple linear trend which we will use to estimate resident population beyond 30 June 2020 in Tables 2 to 5 below.

Based on this it is estimated that by 30 June 2022 the number of people using permanent residential aged care will be approximately 190,000. And as of 30 June 2020, there are 2,722 residential aged care services providing 217,145 places.

As of 30 June 2020, Charts 1 and 1A provide the age distributions of residents within Australian RACFs [5].



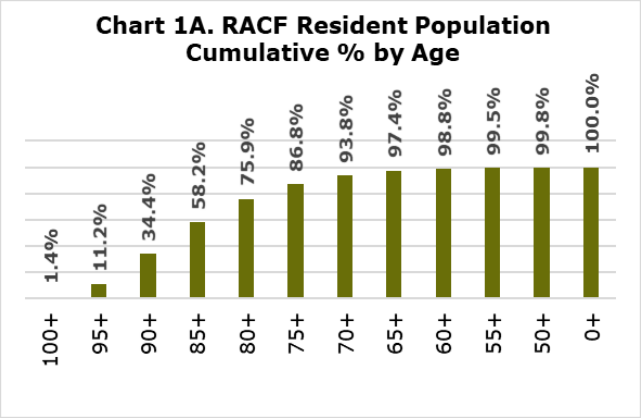
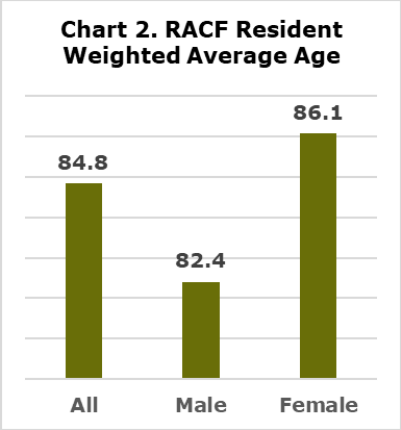
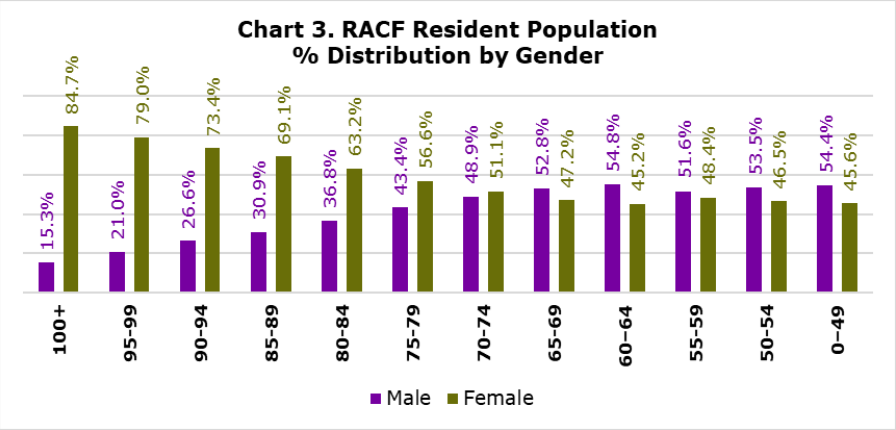



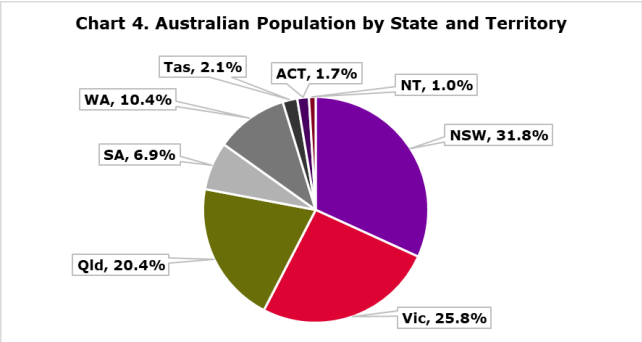
Chart 1 shows that the two largest age groups are 85-89 and 90-94. While Chart 1A shows that 87% of residents are aged 75 and above, and 97% are aged 65 and above.

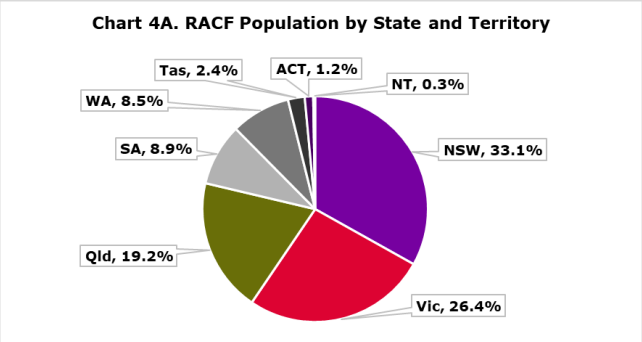
Chart 2 shows the weighted average age by gender. While Chart 3 shows the percentage split by gender by age group. Chart 3 shows that up to age group 65-69 males are in the majority and beyond that age group females begin to dominate. By age group 75-79 females begin to significantly outnumber males.




Finally, Charts 4 and 4A show the distribution of the Australian population [6] and the RACF resident population by State and Territory [5].




## Australian RACFs – Resident Vaccination Levels

To develop robust estimates of residential vaccination levels, at critical dates, we rely on three sources:

1. The population data detailed above (i.e. item 21 in Table 1);
2. The three statements detailed below; and
3. The COVID-19 vaccination daily rollout reports published by the Australian Government Department of Health [7].

**Statement 1**

On 29 June 2021 the Australian Health Protection Principal Committee (AHPPC) issued a statement laying the foundation for mandatory COVID-19 vaccination of staff and contractors within RACFs [8]. It said:

*"AHPPC recommends to National Cabinet that the residential aged care workforce be vaccinated against COVID-19, as a condition of working in a residential aged care facility, by 17 September 2021."*

**Statement 2**
In a follow up statement on 01 October 2021 [9], AHPPC stated

*"Mandatory vaccination of residential aged care workers which is at more than 99 per cent along with the more than 90 per cent vaccination rate of residents, plus improved infection control training and processes, will assist in mitigating the risk of COVID-19 in RACFs."*

**Statement 3**
On 10 February 2022 the Federal Minister for Health, Greg Hunt, in a media release [10] advised that:

*"As at 9 February 2022, providers reported that 19 per cent of eligible residents who have received a second dose are yet to receive a booster dose."*

Based on the population data detailed above, these three statements, and the COVID-19 vaccination daily rollout reports published by the Australian Government Department of Health [7], the following tables provide robust estimates of residential vaccination levels at critical dates between 17 September 2021 and 26 May 2022.

**Residential Vaccination Levels as of 17 September 2021**. This is substantiated in Table 2 and shows a one-dose level of 4% and a two-dose level of 86%.

**Table 2.** 17 September 2021. Estimated Resident Vaccination Levels

| | |
|---|---|
| Estimated number of residents - 17 September 2021 | 186,618 |
| Estimated number of residents vaccine free (10%) | 18,662 |
| Estimated number of residents with one dose (4%) | 7,465 |
| Estimated number of residents with two doses (86%) | 160,491 |
| Estimated number of doses administered to estimated resident population as of 17 September 2021 | 328,447 |
| Total number of doses administered to residents in RACFs by 17 September 2021, as reported by Federal Department of Health | 326,768 |
| Difference in Number of Doses (Estimated vs Reported) | 0.51% |

**Residential Vaccination Levels as of 01 October 2021.** This is substantiated in Table 3 and shows a one-dose level of 3% and a two-dose level of 87%.

| **Table 3.** 01 October 2021. Estimated Resident Vaccination Levels | |
|---|---|
| Estimated number of residents - 01 October 2021 | 186,701 |
| Estimated number of residents vaccine free (10%) | 18,670 |
| Estimated number of residents with one dose (3%) | 5,601 |
| Estimated number of residents with two doses (87%) | 162,430 |
| Estimated number of doses administered to estimated resident population as of 01 October 2021 | 330,461 |
| Total number of doses administered in RACFs by 01 October 2021, as reported by Federal Department of Health | 329,302 |
| Difference in Number of Doses (Estimated vs Reported) | 0.35% |

**Residential Vaccination Levels as of 09 February 2022.** This is substantiated in Table 4 and shows a one-dose level of 1%, a two-dose level of 8.5%, and a three-dose level of 81%.

| **Table 4.** 09 February 2022. Estimated Resident Vaccination Levels | |
|---|---|
| Estimated number of residents - 09 February 2022 | 187,480 |
| Estimated number of residents vaccine free (9.5%) | 17,811 |
| Estimated number of residents with one dose (1%) | 1,875 |
| Estimated number of residents with two doses (8.5%) | 15,936 |
| Estimated number of residents with three doses (81%) | 151,859 |
| Estimated number of doses administered to estimated resident population (inc. one, two, and three dose residents as of 09 Feb 2022) | 489,323 |
| Total number of doses administered in RACFs by 11 February 2022, as reported by Federal Department of Health | 483,647 |
| Difference in Number of Doses (Estimated vs Reported) | 1.17% |

**Residential Vaccination Levels as of 05 May 2022.** This is substantiated in Table 5 and shows a one-dose level of 1% and a three-dose level of 90.5%.

| **Table 5.** 05 May 2022. Estimated Resident Vaccination Levels | |
|---|---|
| Estimated number of residents - 05 May 2022 | 187,986 |
| Estimated number of residents vaccine free (8.5%) | 15,979 |
| Estimated number of residents with one dose (1%) | 1,880 |
| Estimated number of residents with three doses (90.5%) | 170,127 |
| Estimated number of doses administered to estimated resident population (inc. one and three doses as of 05 May 2022) | 512,261 |
| Total number of doses administered in RACFs by 05 May 2022, as reported by Federal Department of Health | 511,282 |
| Difference in Number of Doses (Estimated vs Reported) | -0.2% |

**Residential Vaccinations Levels as of 26 May 2022.** This is substantiated in Table 6 and shows a one-dose level of 0.5%, a three-dose level of 90.5% and a four-dose level of 6%.

| **Table 6.** 27 May 2022. Estimated Resident Vaccination Levels | |
|---|---|
| Estimated number of residents - 27 May 2022 | 188,113 |
| Estimated number of residents vaccine free (3.0%) | 5,643 |
| Estimated number of residents with one dose (0.5%) | 941 |
| Estimated number of residents with three doses (90.5%) | 170,242 |
| Estimated number of residents with four doses (6%) | 11,287 |
| Estimated number of doses administered to estimated resident population (inc. one, three, and four doses as of 27 May 2022) | 556,815 |
| Total number of doses administered in RACFs by 27 May 2022, as reported by Federal Department of Health | 557,873 |
| Difference in Number of Doses (Estimated vs Reported) | 0.2% |

Table 7 summarises residential vaccination levels from 17 September 2021 to 26 May 2022.

| **Table 7**. Residential Vaccination Levels at Critical dates | | Number of Doses | | | |
|---|---|---|---|---|---|
| | Vaccine Free | One | Two | Three | Four |
| 17-Sep-21 | 10.0% | 4.0% | 86.0% | | |
| 1-Oct-21 | 10.0% | 3.0% | 87.0% | | |
| 9-Feb-22 | 9.5% | 1.0% | 8.5% | 81.0% | |
| 5-May-22 | 8.5% | 1.0% | | 90.5% | |
| 27-May-22 | 3% | 0.5% | | 90.5% | 6.0% |

# Part B. Vaccination Mandates – Background and Objectives

## Background and Rationale – Staff and Contractors

The vaccination of residents, and the mandatory COVID-19 vaccination of workers and contractors, have been the primary measures aimed at infection and mortality control with Australian RACFs.

On **23 January 2021** the Australian Health Protection Principal Committee (AHPPC) issued a statement on COVID-19 and influenza vaccination requirements for aged care workers [11]. It stated:

> "*While AHPPC strongly encourages COVID-19 vaccination, at this time AHPPC does not recommend mandating COVID-19 vaccination for the aged care workforce at this stage. Evidence about effectiveness of the vaccines in preventing transmission is not yet available*."

The statement went on to say:

> "*It is anticipated that as the vaccine rollout begins in Australia and continues overseas, additional data on* ***the effectiveness of the vaccine in reducing transmission will become available***. *AHPPC will continue to monitor the situation and provide advice to National Cabinet*."

On **04 June 2021** AHPPC confirmed its recommendation against the compulsory COVID-19 vaccination of aged care workers [12]. It stated:

> *"AHPPC does not recommend compulsory COVID-19 vaccines for aged care workers. AHPPC recommends work to understand barriers to, and enablers of, vaccination, informed by monitoring of vaccine uptake. Mandating COVID-19 vaccination must balance the rights of an individual in the workplace against the public health benefits of vaccination at the time and must take into account any unintended consequences such as impacts on workforce availability and delivery of care to residential aged care residents."*

However, on **29 June 2021** AHPPC issued a follow-up statement [13] to those above. This statement laid the foundation for mandatory COVID-19 vaccination within Residential Aged Care Facilities (RACF) when it stated:

> *"In January 2021, AHPPC strongly encouraged the uptake of COVID-19 vaccination by the residential aged care workforce and notes ongoing efforts to facilitate access for aged care workers. AHPPC notes less restrictive*

*measures have not yet achieved high levels of residential aged care worker coverage."*

*"AHPPC also notes increased rates of community transmission, particularly now the Delta variant is present in Australia, increases the risk of exposure to residents in aged care facilities.* ***AHPPC recommends to National Cabinet that the residential aged care workforce be vaccinated against COVID-19, as a condition of working in a residential aged care facility, by 17 September 2021****."*

The statement went on to say

*"In an outbreak, vaccinated individuals are less likely to be* ***significant*** *drivers of spread, and transmission will be* ***dominated*** *by unvaccinated people."*

But it was also cognisant of the fact that this may not be the case into the future when it stated:

*"It is important to note this may differ between different variants and may change with emergence of new variants of concern that show greater transmissibility and/or vaccine escape."*

And finally, the 29 June 2021 statement went on to confirm the source of infections by saying:

*"In Australia to date, most residents who have contracted COVID-19 have been infected through the virus being imported into the Residential Aged Care Facilities (RACF) by staff or visitors."*

On **15 February 2022**, AHPPC issued another statement on boosters for workers and contractors within RACFs [14]. It stated:

*"The Australian Technical Advisory Group on Immunisation (ATAGI) has now advised that three doses of a COVID-19 vaccine are required to be up to date in order to provide protection against both infection and severe disease. It is important that our most vulnerable people in residential aged care, are protected from the devastating effects of COVID-19.*

*The Australian Health Protection Principal Committee (AHPPC) has previously advised that an important part of that protection is a requirement for residential aged care staff to be fully and recently vaccinated. In view of the changed ATAGI advice, this should now include three rather than two vaccine doses."*

These four statements by AHPPC (on 23 January 2021, 04 June 2021, 29 June 2021, and 15 February 2022) summarise and encapsulate the background and rational of mandatory COVID-19 vaccination for workers in RACFs in Australia as of May 2022.

## Mandates and Guidelines – RACF Visitation

We know turn to summarising the visitation mandates and guidelines for Australian RACFs across all States and Territories.

Visitation Code of Conduct – COTA Australia

In conjunction with consumers and aged care peak bodies, COTA Australia (Council on the Ageing) established an industry code for visitations in aged care homes.

This industry code is primarily for guidance as public health authorities within state or territory's retain ultimate decision-making authority. The code was developed to give clear guidance where that information is not available. It was prepared in discussion with health authorities and agreed between representatives of providers, residents, and carers.

The most current Code (6.1) dated 22 March 2022 [15] reflects the earlier positions that:

> "*The organisations that have developed and endorsed this Code support requiring that **all** visitors (with defined exceptions) be vaccinated against influenza and COVID-19, noting the AHPPC Statement of 1 October 2021 and noting that not all state or territory governments will mandate vaccination*."

Visitation Guidelines – NSW

In NSW, and as of 01 March 2022, and reflecting previous guidelines, residents are permitted to have two fully vaccinated visitors aged 12 years and over, plus two children aged under 12 years per day. Visitors aged 12 years and over must have received a second dose of a COVID vaccination at least 14 days prior to their visit. [16]

Furthermore, staff, health practitioners and students entering an RACF are required to have three doses of a COVID-19 vaccine. [16]

Visitation Guidelines – Victoria

Victoria does not mandate COVID-19 vaccination of visitors to RACFs; however it does strongly endorse the COTA industry code detailed above [17].

Visitation Guidelines – Queensland

Queensland has mandated COVID-19 vaccination for RACF visitors subject to a number of exemptions [18]. These mandates and exemptions are detailed below.

Visitors, staff, students or volunteers at a residential aged care facility should not be anyone who is unvaccinated and not visiting for a permitted purpose. Permitted purposes include:

- under 16 years of age; or
- unable to receive a COVID-19 vaccination because of a medical contraindication and has evidence of a recognised medical contraindication; or
- is a COVID-19 vaccine trial participant, where the administration of a Therapeutic Goods Administration approved COVID-19 vaccine would impact the validity of the trial. The medical certificate must not have expired.
- visiting a resident of shared disability accommodation service for one of the following purposes:
    - end of life visit (you do not need an exemption)
    - in an emergency
    - maintaining continuity of care to a resident, including advocacy services, that cannot be delivered by electronic or non-contact means - for example a visitor providing support for a resident to eat their meals.

Visitation Guidelines – Western Australia

As of 17 March 2022, Western Australia does not mandate COVID-19 vaccination for RACF visitors. However clause 9, of 'VISITORS TO RESIDENTIAL AGED CARE FACILITIES DIRECTIONS (NO 11) [19] made under PUBLIC HEALTH ACT 2016 (WA), states

> *"A person who enters or remains on the premises of a residential aged care facility in the State of Western Australia and is not a resident or staff member of the facility must comply with any instruction given to the person by the supervisor unless the person has a reasonable excuse for failing to comply with the instruction."*

It is not inconceivable that this clause may be used to enforce COVID-19 vaccination in line with the COTA industry code.

Visitation Guidelines – South Australia

South Australia has mandated COVID-19 vaccination as a requirement of visiting an RACF. And as of 29 January 2022, this includes a booster to be received within the prescribed time. Exemptions based on age and medical contra-indication are included [20].

Visitation Guidelines – Tasmania

Tasmania has mandated *proof* of COVID-19 vaccination, including being up to date, as a requirement of visiting an RACF in Tasmania. It is the only state that provides an exemption to this *proof* mandate with evidence of a negative result from a PCR COVID-

19 test taken within the 72 hours prior to visit or a negative Rapid Antigen Test (RAT) result within 24 hours prior to visit [21].

Visitation Guidelines – ACT

From 26 February 2022, there are no public health mandated visitor restrictions for ACT RACFs [22]. However, facilities can implement their own visitor policies in response to their specific circumstances; which may devolve to the COTA industry Code.

RACF Visitation Guidelines – Northern Territory

The Northern Territory does not have any COVID-19 vaccination mandates for visitors to RACFs in the NT. However, nothing precludes facilities from attempting to enforce vaccination based on the COTA industry Code.

Visitation Guidelines and Mandates – Summary

As of 31 May 2022, Table 8 summarises the requirements for COVID-19 vaccination for visitation to Australian RACFs.

| **Table 8.** Australian Population by State as of September 2021. ABS | Population | % of Total | Cumulative Percentage of Total | Express COVID-19 Vaccine Mandate for RACF Visitation (as of April 2022) |
|---|---|---|---|---|
| New South Wales | 8,186,800 | 31.8% | 31.8% | Yes |
| Victoria | 6,643,100 | 25.8% | 57.6% | No |
| Queensland | 5,240,500 | 20.4% | 78.0% | Yes |
| Western Australia | 2,685,200 | 10.4% | 88.4% | No |
| South Australia | 1,772,800 | 6.9% | 95.3% | Yes |
| Tasmania | 540,800 | 2.1% | 97.4% | Yes* |
| Australian Capital Territory | 430,500 | 1.7% | 99.0% | No |
| Northern Territory | 245,900 | 1.0% | 100.0% | No |
| | 25,745,600 | 100.0% | | |
| | | | | |
| * Exemptions for negative PCR/RAT test | | | | |

Finally, on 01 Oct 2021, AHPPC agreed all jurisdictions will revise their public health orders to remove restrictions on visitation to RACF, including for prospective residents and their families or representative, and to promote safe visitation. This includes allowing daily face-to-face visits as well as trips outside the RACF. [23]

## Articulated Objectives – RACF COVID-19 Vaccination Mandates

The Public Health Order of NSW, dated 21 March 2022, extending the mandatory COVID-19 vaccination of staff at NSW RACFs [24], states:

> *"employees of residential aged care facilities and other workers who come into contact with residents, persons with a disability or persons receiving aged care services, are vaccinated will reduce—*
>
> *(i) the risk of infection, severe disease and death of the worker, and*
>
> *(ii) the **risk of transmission of infection from workers to residents**, persons with a disability or persons receiving aged care services and other workers"*

The COVID-19 Mandatory Vaccination (Specified Facilities) Order 2022 (No. 7) of Victoria states [25]:

> *"This Order requires operators of specified facilities to manage the vaccination status of workers, in order **to limit the spread of COVID-19 within the population** in the following settings:*
>
> *(1) residential aged care facilities;*
>
> *Amongst other things, this Order requires operators of specified facilities to:*
>
> *(1) collect, record and hold certain vaccination information of workers;*
>
> *(2) take reasonable steps to prevent entry of unvaccinated or partially vaccinated workers to the specified facility for the purposes of working;*
>
> *(3) if a booster deadline is specified in relation to a worker and the worker is aged 18 years or over, take reasonable steps to prevent entry of workers, **unless the worker is fully vaccinated (boosted)** or an excepted person or unless an exception applies to the worker; and*
>
> *(4) notify current and new workers that the operator is obliged to collect, record and hold certain vaccination information about the worker and to take reasonable steps to prevent a worker who is unvaccinated or partially vaccinated or not fully vaccinated (boosted) from entering or remaining on the premises of a specified facility for the purposes of work, as applicable."*

Finally, the Workers in a healthcare setting (COVID-19 Vaccination Requirements) Direction (No. 4) of Queensland states [26]:

> *"Further to this declaration, I, Dr John Gerrard, Chief Health Officer, reasonably believe it is necessary to give the following directions pursuant to*

*s362B of the Public Health Act 2005* ***to assist in containing, or to respond to, the spread of COVID-19 within the community****."*

"A *residential aged care worker* must not enter, work in, or provide services at a *residential aged care facility* unless the *residential aged care worker:*

*a. has an up-to-date vaccination status; or*
*b. they meet the requirements for an exception*

In view of these statements, the objectives and purpose of mandatory COVID-19 vaccination of staff at RACFs can be described as:

1. To break, or at least mitigate, the nexus between staff and resident infection;
2. To break, or at least mitigate, the nexus between infection in the broader community and infection in workers and residents of RACFs;
3. To control the scope, scale, and intensity of outbreaks of SARS-CoV-2 in RACFs; and
4. In conjunction with the vaccination of residents, to control and mitigate the consequences of COVID-19 amongst residents of RACFs (in particular mortality).

# Part C. Mandate Effectiveness – A Focus on Nexus and Control

In Part C of this paper we evaluate the extent to which mandatory COVID-19 vaccination of staff at RACFs has met its objectives and intended outcomes as expressed by:

1. the national AHPPC statement of 29 June 2021 [13Ref12]; and
2. the articulated objectives of the three largest states of Australia that encompass just under 80% of the resident population of RACFs.

The focus of Part C is the nexus between infections of various groups and the control of SARS-CoV-2outbreaks in RACFs.

This evaluation is based on the analysis of data provided by the Australian Federal Department of Health on COVID-19 outbreaks in RACFs [1].

## Nexus – Staff and Resident Infection

The 29 June 2021 statement of the AHPPC confirmed the predominate source of infections of residents in RACFs as [13]:

> *"In Australia to date, most residents who have contracted COVID-19 have been infected through the virus being **imported** into the Residential Aged Care Facilities (RACF) by staff or visitors."*

This is essentially a statement of directional causation of infection from staff to residents. Table 9 gives the distribution of cases and deaths before, during, and after the introduction of mandatory staff COVID-19 vaccination.

| **Table 9**. Distribution of cases and deaths before, during, and after mandatory staff vaccination | Residents | | Staff | | Residents | |
|---|---|---|---|---|---|---|
| | Cases | % of Total | Cases | % of Total | Deaths | % of Total |
| Pre Mandate (11 Sep 2020 to 29 June 2021) | 1,001 | 1.3% | 428 | 0.6% | 98 | 5.1% |
| Mandate Ramp Up (30 June 2021 to 17 Sept 2021) | 464 | 0.6% | 298 | 0.4% | 24 | 1.3% |
| Post Mandate Completion (18 Sept 2021 to 26 May 2022) | 72,965 | 98.0% | 71,131 | 99.0% | 1,785 | 93.6% |
| | 74,430 | 100.0% | 71,857 | 100.0% | 1,907 | 100.0% |

From 11 September 2020, 98% of residential cases and 93.6% of residential deaths occurred during the staff vaccination mandate period of 18 September 2021 to 26 May 2022.

This distribution of residential cases and deaths must be viewed in the context of the rapid and near total full and ongoing vaccination of all residents in RACFs (refer Table 7).

Chart 5 shows cumulative staff and resident cases summed from March 2020. The chart shows weekly cumulative figures starting 17 September 2021; the date when 99% of staff at RACFs were fully vaccinated.

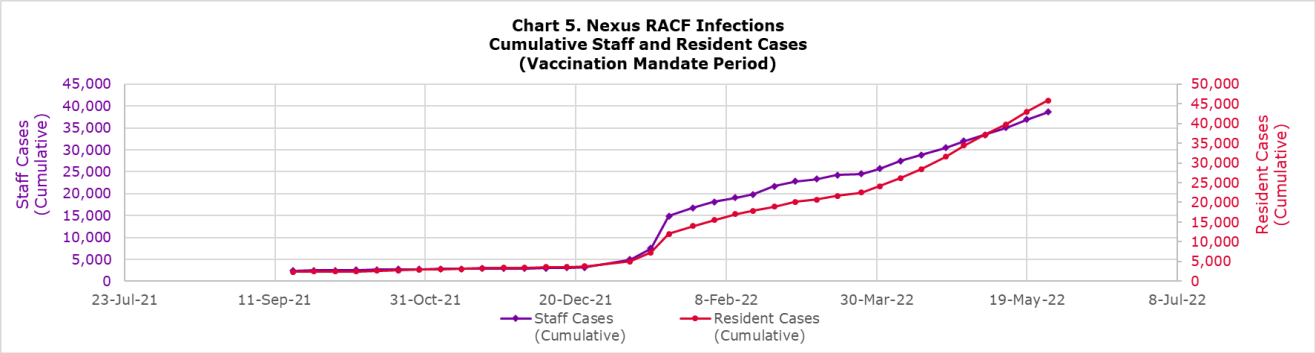
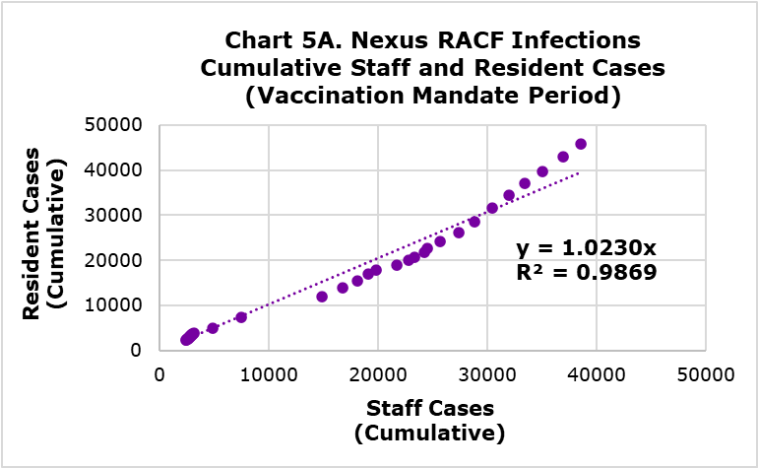


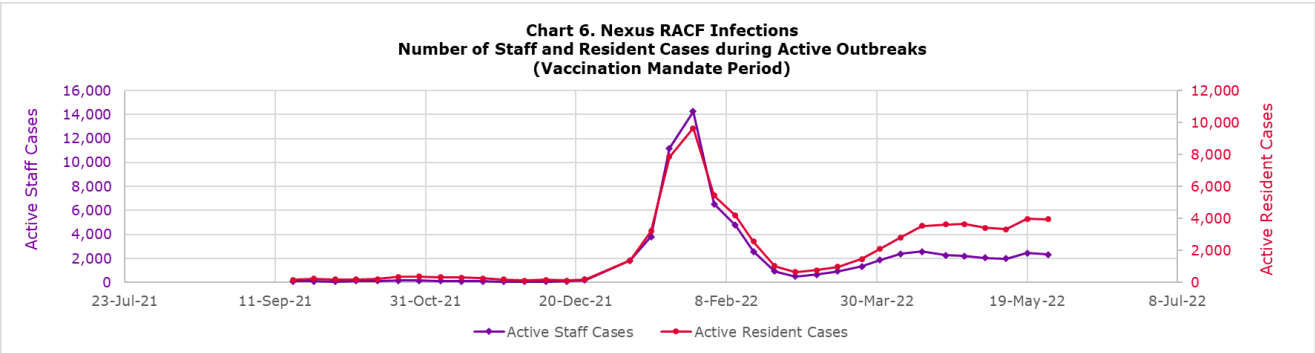

Chart 5A plots cumulative resident cases against cumulative staff cases from 17 September to 26 May 2022.




Charts 5 and 5A show a very strong causal and increasing relationship between cumulative staff cases and cumulative resident cases. Chart 5A shows no attenuation of cumulative resident cases as cumulative staff cases increases. As the cumulative number of staff cases increases, the cumulative number of resident cases increases in nearly similar proportion.

Finally, during the staff vaccination mandate period, cumulative staff cases explain 98.69% of the variability in cumulative resident cases.

Chart 6 shows the number of active staff and active resident cases during active outbreaks by week from 17 September 2021 to 26 May 2022.



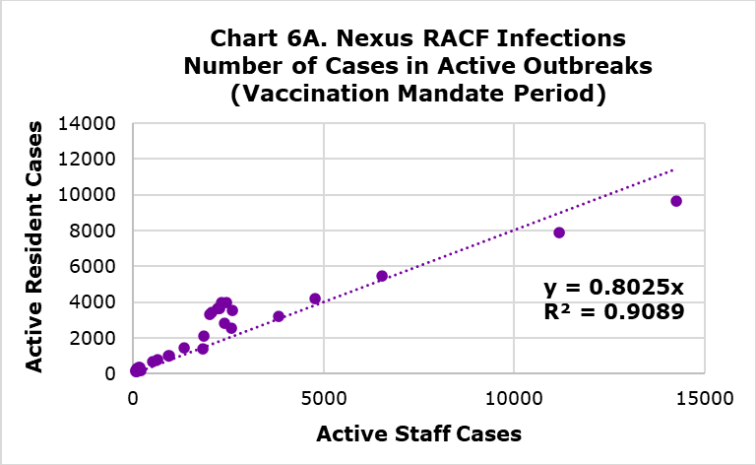
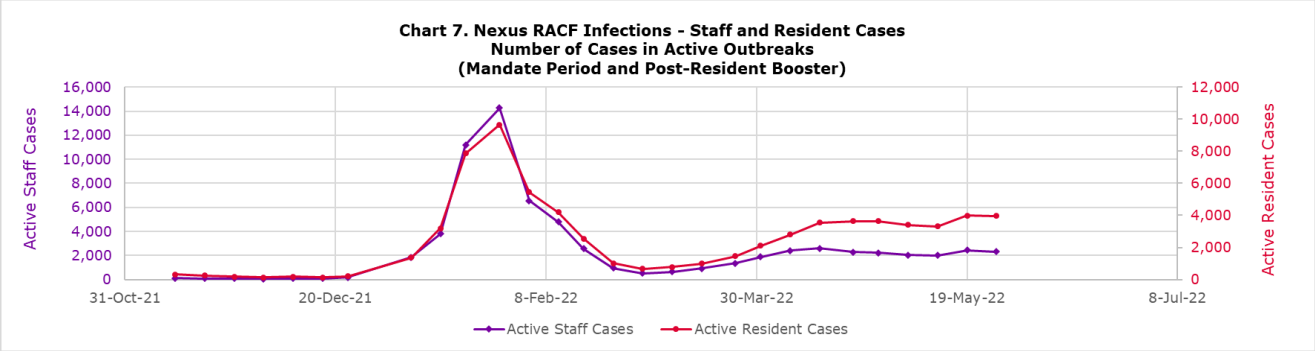



Chart 6A plots active resident cases against active staff cases from 17 September to 26 May 2022.

Charts 6 and 6A show a very strong causal and increasing relationship between active staff cases and active resident cases. Chart 6A shows no attenuation of active resident cases as active staff cases increases. As the number of active staff cases increases, the number of active resident cases increases in nearly similar proportion. Finally, during the staff vaccination mandate period active staff cases explain 90.89% of the variability in active resident cases. And, on average 10 staff cases causes 8.0 resident cases.

Chart 7 shows active staff and active resident cases during active outbreaks by week from 05 November 2022, the start of the resident booster program, to 26 May 2022.



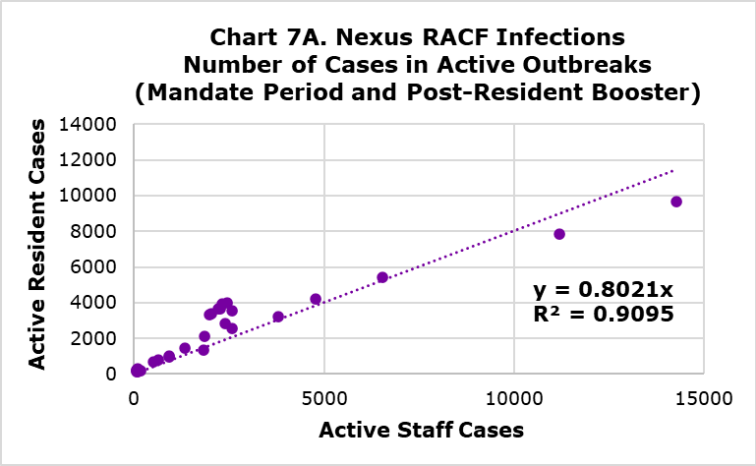




Chart 7A plots active resident cases against active staff cases from 05 November to 26 May 2022.

Charts 7 and 7A show a very strong causal and increasing relationship between active staff cases and active resident cases. Chart 7A shows no attenuation of active resident cases as active staff cases increases. As the number of active staff cases increases, the number of active resident cases increases in nearly similar proportion. Finally, during the staff vaccination mandate and residential booster period, active staff cases explain 90.95% of the variability in active resident cases. And, on average 10 staff cases causes 8.0 resident cases.

## Nexus – RACF and Broader Community

Chart 8 shows active staff cases in RACFs and daily new cases across Australia, by week from 17 September to 26 May 2022. To eliminate any confounding effects, the number of active staff cases has been subtracted from daily new cases.

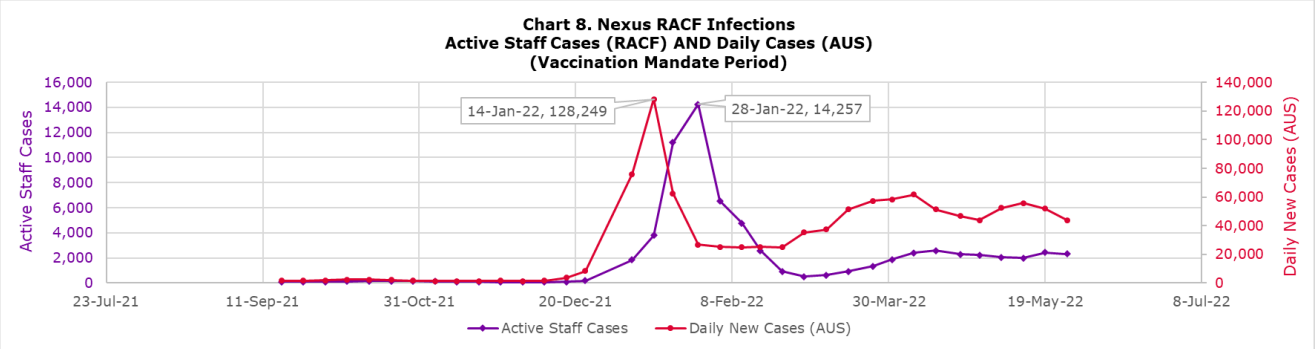



Chart 8 shows that the RACF staff infection curve lags the infection curve of the broader community by approximately 14 days.

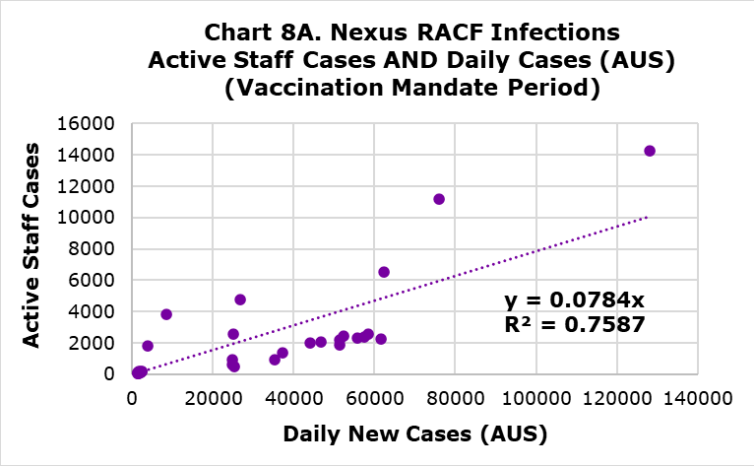



Chart 8A plots active staff cases against daily new cases across Australia from 17 September to 26 May 2022; with a 14-day lag between daily new cases across Australia and active staff cases.

Charts 8 and 8A show a very strong causal and increasing relationship between active staff cases and daily new cases across Australia. Chart 8A shows no attenuation of active staff cases as daily new cases increases across Australia. As the number of daily new cases across Australia increases, the number of active staff cases increases.

Finally, during the staff vaccination mandate period, daily new cases across Australia explain 75.87% of the variability in active staff cases.

Chart 9 shows active resident cases in RACFs and daily new cases across Australia, by week from 17 September 2021 to 26 May 2022. To eliminate any confounding effects, the number of resident cases has been subtracted from daily new cases.

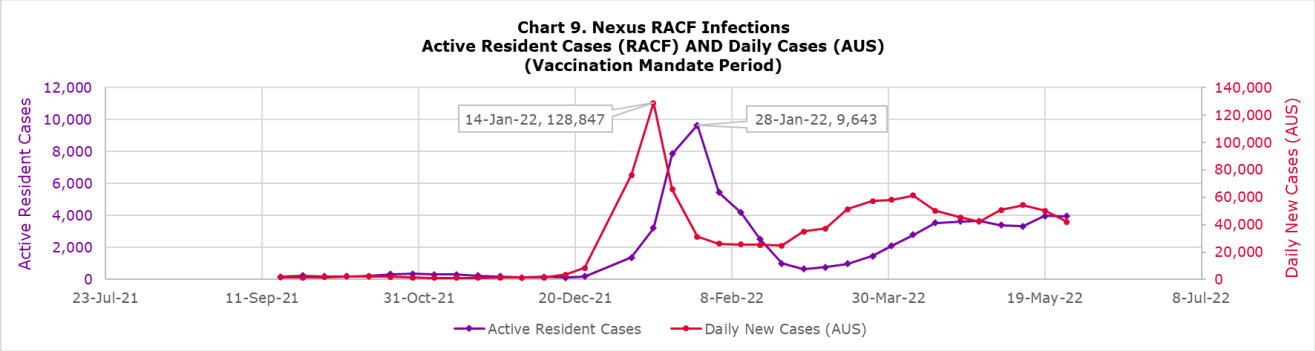



Chart 9 shows that the RACF resident infection curve lags the infection curve of the broader community by approximately 14 days.

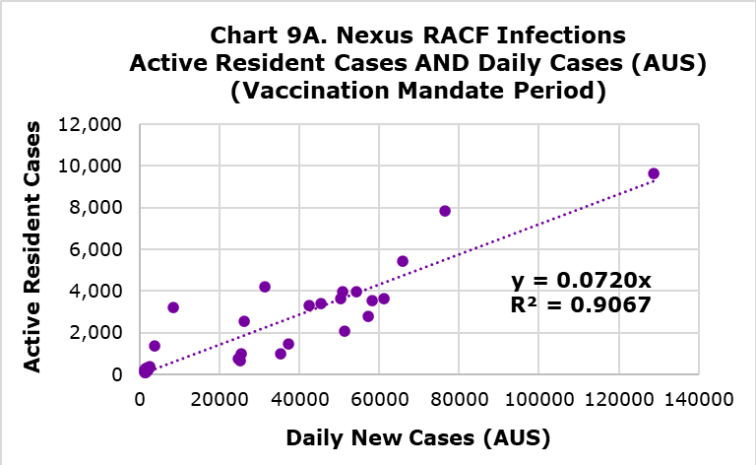
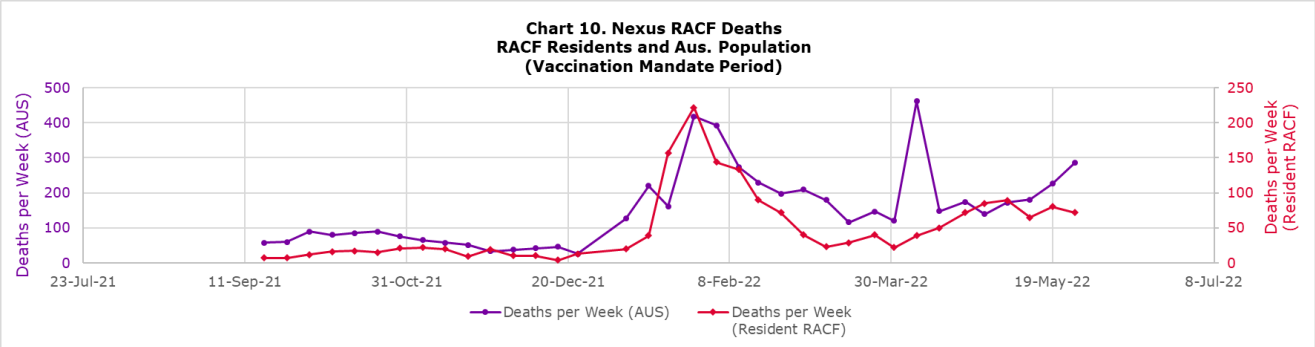



Chart 9A plots active resident cases against daily new cases across Australia from 17 September to 26 May 2022; with a two-week lag between daily new cases across Australia and active resident cases.

Charts 9 and 9A show a very strong causal and increasing relationship between active resident cases and daily new cases across Australia. Chart 9A shows no attenuation of active resident cases as daily new cases increases across Australia. As the number of daily new cases across Australia increases, the number of active resident cases increases.

Finally, during the vaccination mandate period, daily new cases across Australia explain 90.67% of the variability in active resident cases.

Chart 10 shows deaths per week within RACFs and for the broader Australian population, for each week from 17 September to 26 May 2022. To eliminate any confounding effects,



the number of deaths within RACFs deaths has been subtracted from the number of deaths within the broader Australian population.

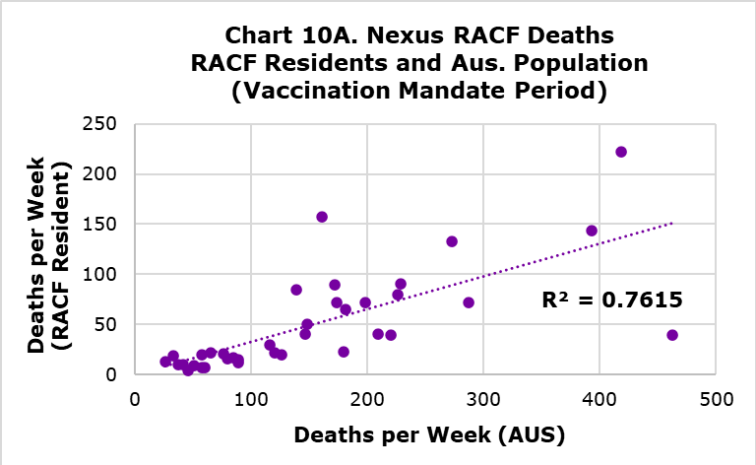


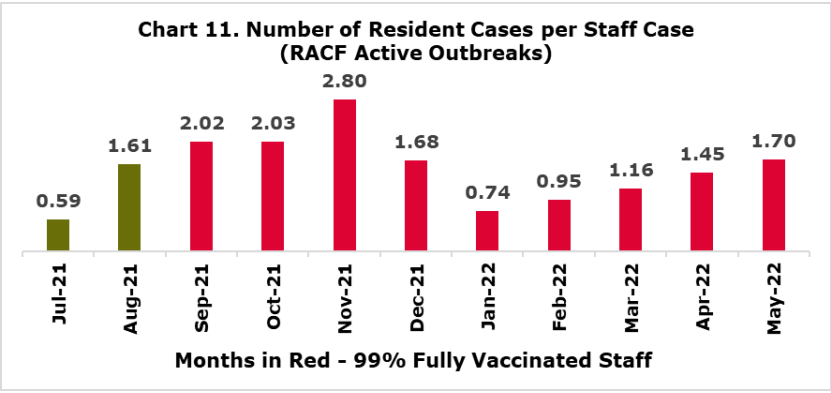

Chart 10A plots deaths per week within RACFs against deaths per week across Australia from 17 September to 26 May 2022.

Charts 10 and 10A show a very strong and increasing relationship between RACF deaths per week and deaths per week across Australia. Chart 10A shows no attenuation of deaths per week in RACFs as deaths per week increases across Australia. As the number of deaths per week increases across Australia, the number of deaths per week in RACFs similarly increases.

Finally, during the vaccination mandate period, deaths per week across Australia explain 76.15% of the variability in deaths per week within RACFs. Clearly this association is mediated through cases in the Australian community, staff cases in RACFs, resident cases in RACFs and ultimately resident deaths.

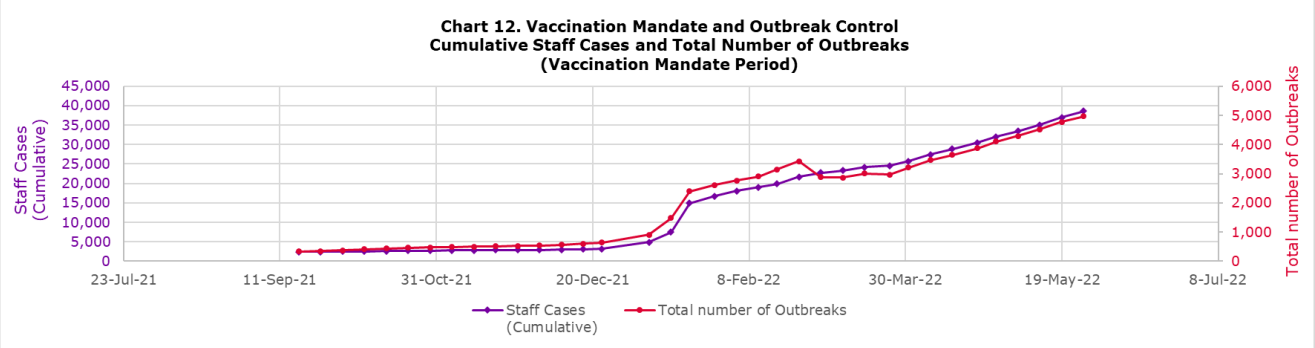
## Vaccination Mandates and Outbreak Control

For the mandatory staff vaccination period (i.e. 17 September 2021 to 26 May 2022), and the two months prior, Chart 11 shows the number of residents cases per staff case. This ratio was the highest during the first three months of the staff vaccination mandate period, i.e. for the months of September, October, and November 2021. After a drop in the ratio during December 2021 and January 2022, the ratio has been increasing each month from January 2022 (0.74) to May 2022 (1.70).




This ratio must be viewed from the context of near total vaccination of staff and the rapid and near total full and ongoing vaccination of all residents in RACFs (refer Table 7).

Chart 12 shows the cumulative number of staff cases and the total number of outbreaks, totalled from March 2020, for each week from 17 September 2021 to 26 May 2022.



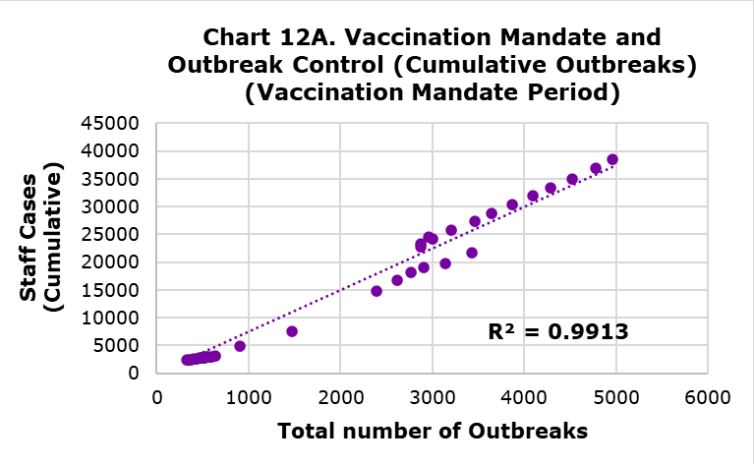
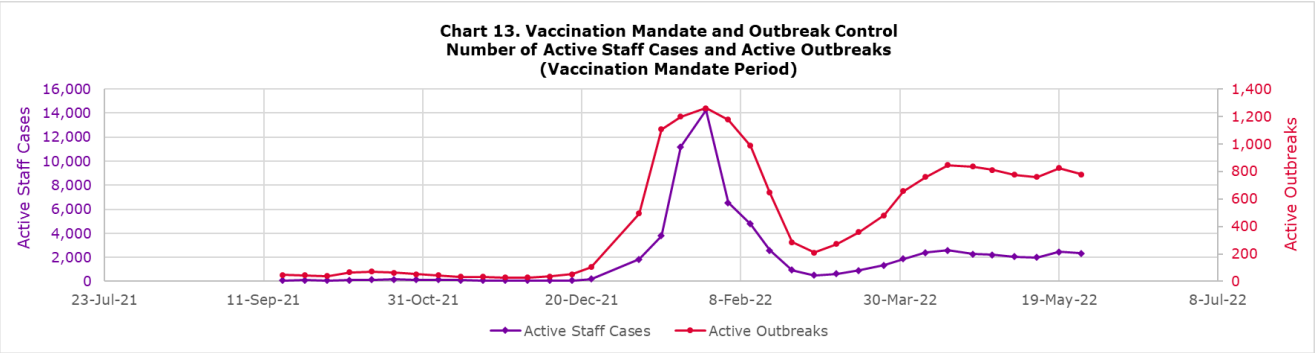




Chart 12A plots the total number of outbreaks against the cumulative number of staff cases, totalled from March 2020, for each week from 17 September 2021 to 26 May 2022.

Charts 12 and 12A show a very strong causal and increasing relationship between the total number of outbreaks and the cumulative number of staff cases. Chart 12A shows no attenuation in the total number of staff cases as the number of outbreaks. As the total number of outbreaks increases the cumulative number of staff cases increases linearly.

Finally, during the staff vaccination mandate period, the total number of outbreaks explains 99.13% of the variability in the cumulative number of staff cases.

Chart 13 shows the number of active staff cases and the number of active outbreaks, by week from 17 September 2021 to 26 May 2022.



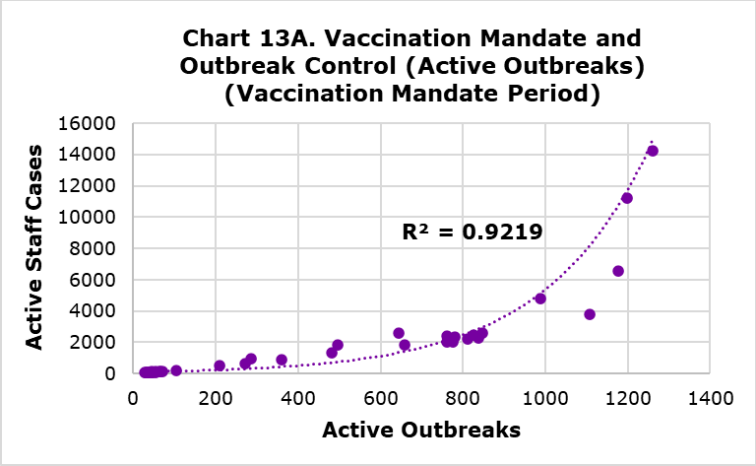
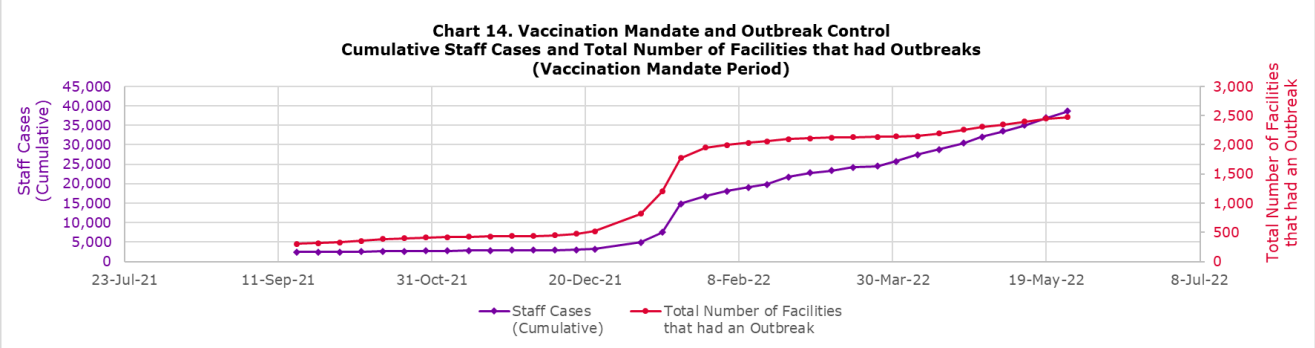



Chart 13A plots the number of active staff cases against the number of active outbreaks from 17 September 2021 to 26 May 2022.

Chart 13A shows an exponential and causal relationship between the number of active outbreaks and the number of staff cases. During the staff vaccination mandate period, the number of active outbreaks explains 92.19% of the variability in the number of active staff cases.

Chart 14 shows the cumulative number of staff cases and the total number of facilities that have had an outbreak, totalled from March 2020, for each week from 17 September 2021 to 26 May 2022.



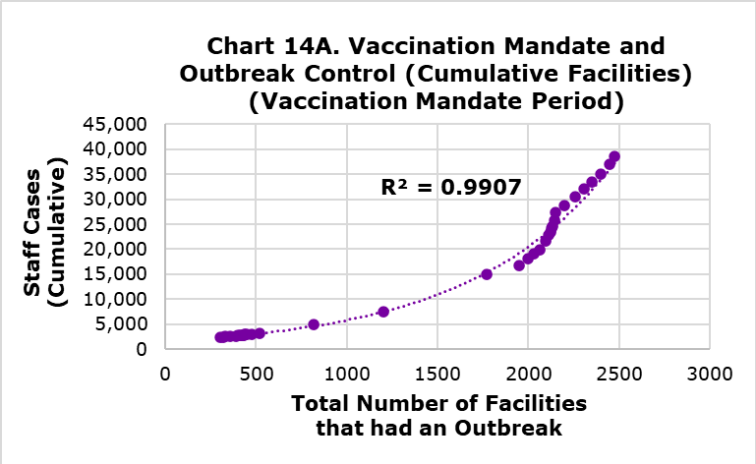
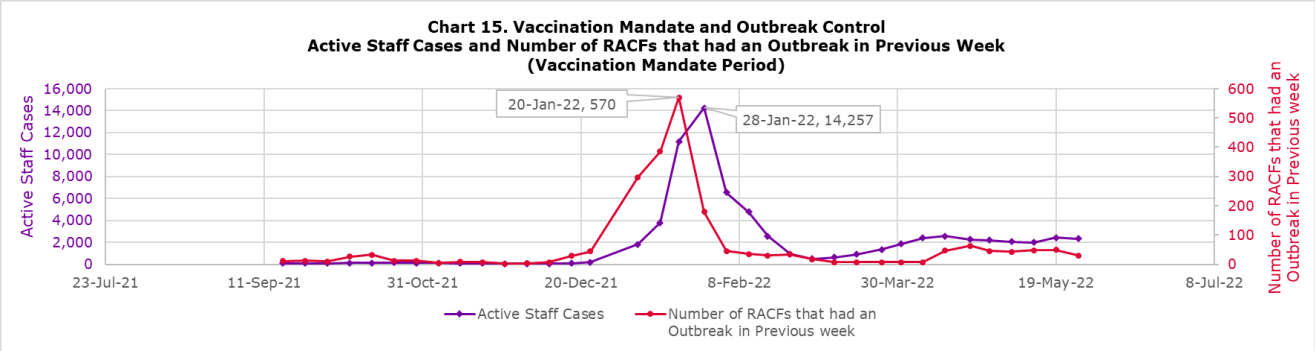




Chart 14A plots the cumulative number of staff cases against the total number of facilities that have had an outbreak.

Chart 14A shows an increasing exponential, and potentially, causal relationship between the total number of facilities that have had an outbreak and the cumulative number of staff cases. Finally, during the staff vaccination mandate period, the total number of facilities that have had an outbreak explains 99.07% of the variability in the cumulative number of staff cases.

Chart 15 shows the number of active staff cases and the number of facilities that have had an outbreak in the previous week by week from 17 September 2021 to 26 May 2022. The chart shows that once an outbreak is declared at an RACF, the number of active staff cases peeks 8 days later.



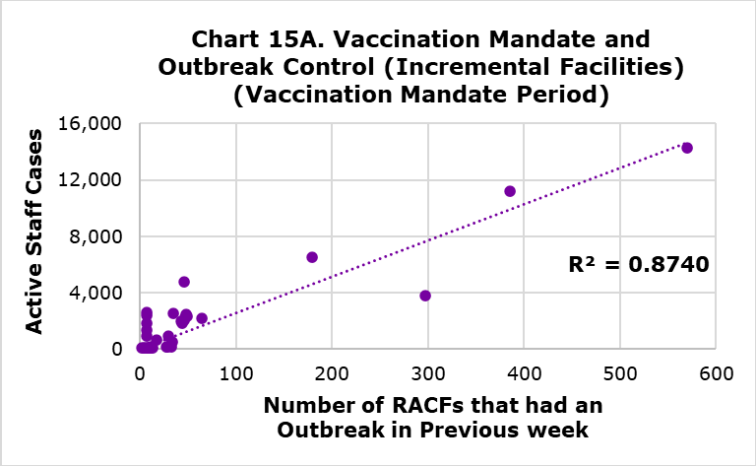




Chart 15A plots active staff cases against the number of facilities that have had an outbreak in the previous week, from 17 September 2021 to 26 May 2022.

Chart 15A shows an increasing linear, and potentially causal, relationship between the number of facilities that have had an outbreak over the previous week and the number of active staff cases.

During the staff vaccination mandate period, the number of facilities that have had an outbreak over the past week explains 87.40% of the variability in the number of active staff cases.

# Part D. Mandate Effectiveness – A Focus on Outcomes

In Part D of this paper we evaluate the extent to which mandatory COVID-19 vaccination of staff at RACFs has met its objectives and intended outcomes as expressed by:

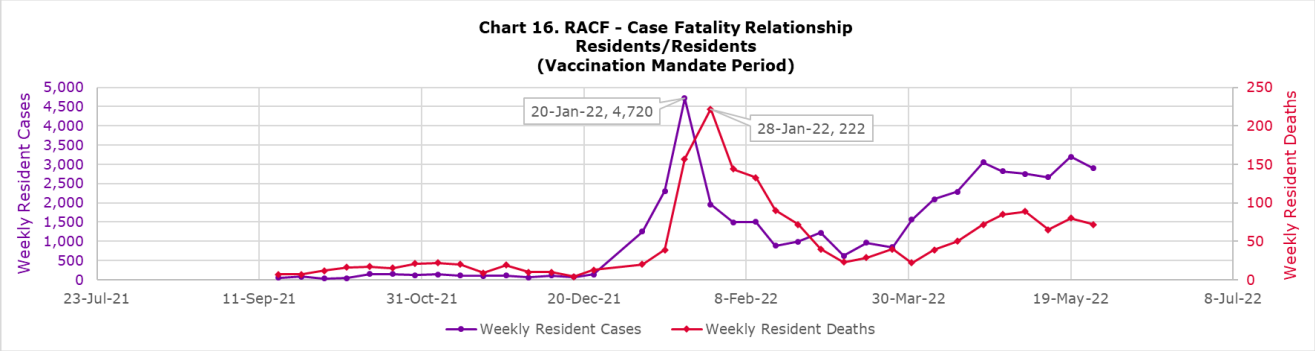
1. the national AHPPC statement of 29 June 2021 [13Ref12]; and
2. the articulated objectives of the three largest states of Australia that encompass just under 80% of the resident population of RACFs.

The focus of Part D is the nexus between mandatory staff vaccination and resident vaccination and COVID-19 outcomes amongst residents at Australian RACFs.

This evaluation is based on the analysis of data provided by the Australian Federal Department of Health on COVID-19 outbreaks in RACFs [1].

## Australian RACFs Case Fatality Relationships

Chart 16 shows the case fatality relationship between weekly resident cases and weekly resident deaths, by week from 17 September to 26 May 2022.




The chart shows that the curve of RACF resident deaths lags the resident infection curve by 8 days.

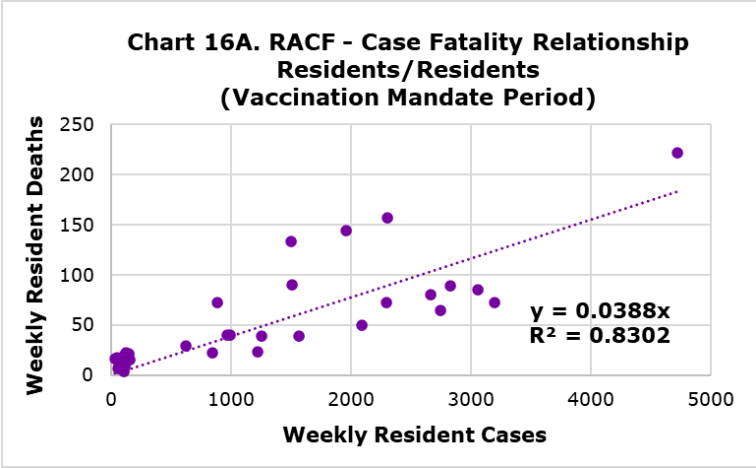



Chart 16A plots weekly resident deaths against weekly resident cases, with a one-week lag between cases and deaths, for the period 17 September 2021 to 26 May 2022.

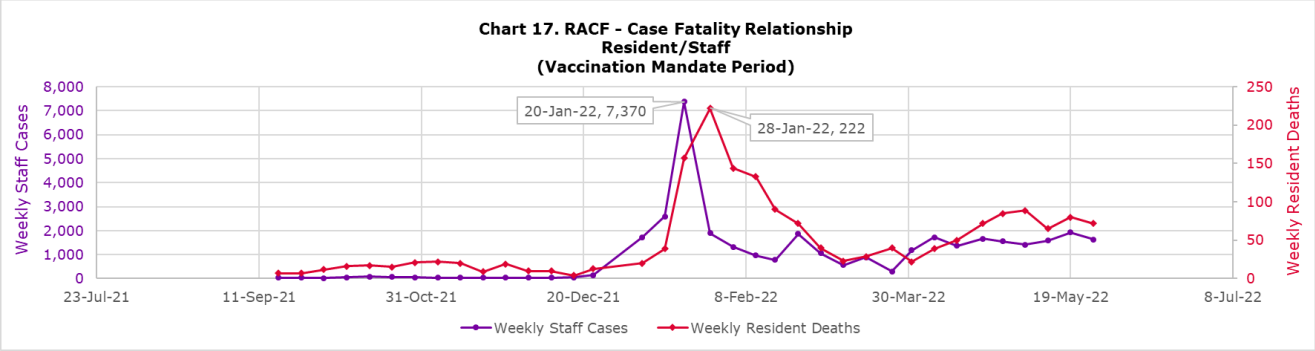
Chart 16A shows an increasing linear, and causal, relationship between the weekly resident deaths and weekly resident cases.

During the staff vaccination mandate period, weekly resident cases explain 83.02% of the variability in weekly resident deaths. Without further data from the Federal Department

of Health it is difficult to ascribe the remaining 16.98% unexplained variability. This potentially could be mis-attribution in the cause and/or timing of death.

Finally, chart 16A gives a regression-based estimate of the case fatality ratio as 3.88%. This will be explored in further detail in a forthcoming paper.

Chart 17 shows the case fatality relationship between weekly *staff* cases and weekly *resident* deaths, by week from 17 September to 26 May 2022.




The chart shows that the curve of RACF *resident* deaths lags the *staff* infection curve by 8 days.

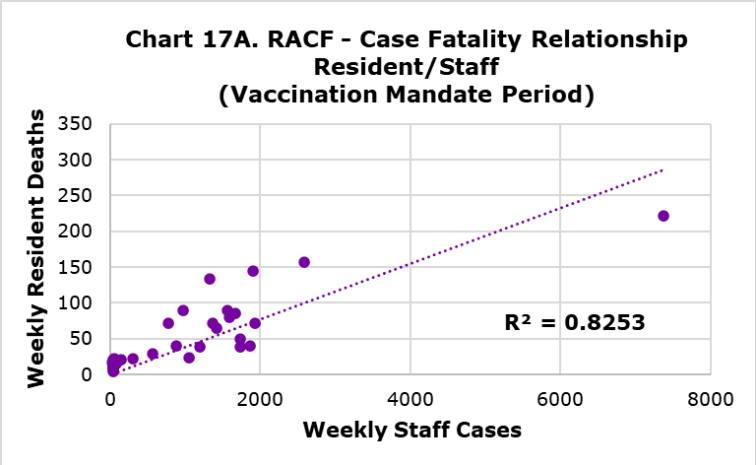



Chart 17A plots weekly *resident* deaths against weekly *staff* cases; with a one-week lag between *staff* cases and *resident* deaths.

Chart 17A shows an increasing linear, relationship between the weekly *resident* deaths and weekly *staff* cases. Cleary this relationship is mediated through resident cases.

During the vaccination mandate period, weekly *staff* cases explain 82.53% of the variability in weekly *resident* deaths. This high 'variance explained' is a direct consequence of the high correlation between active staff cases and active resident cases, refer charts 6 and 6A above.

## Mandates and Resident Vaccination – Impact on Cases and Mortality

Chart 18 shows the Total number of Doses Administered to residents across RACFs and the Total number of Resident Cases, by week from 04 March 2021 to 26 May 2022. The total number of resident cases is summed from March 2020, and the total number of doses is summed from the start of the resident vaccination program in March 2021.

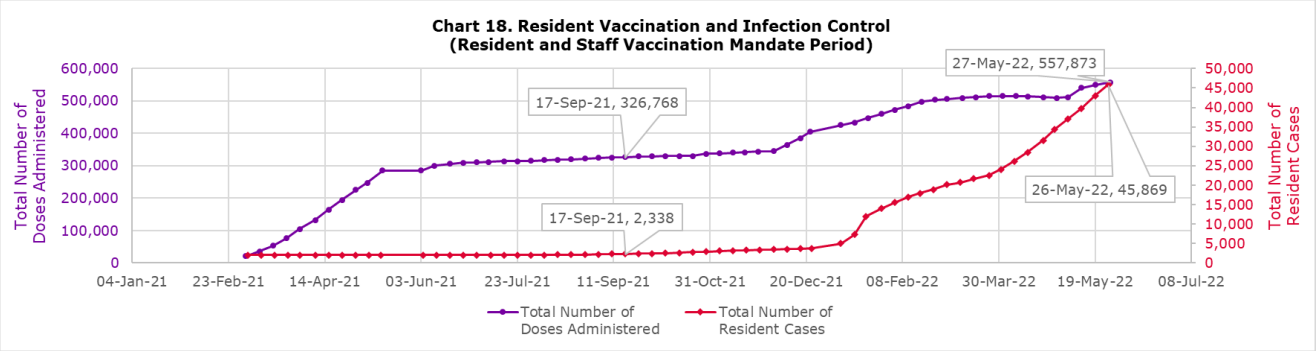



Chart 18 shows that from the beginning of the staff mandatory vaccination period on 17 September 2021 to 26 May 2022, cumulative resident cases increased by 1,862% from 2,338 to 45,869. During this same period the number of doses administered to residents increased by 71% from 326,768 to 557,873.

This exponential increase in resident cases occurred in the context of a staff vaccination level of 99% as of 17 September 2021 and a resident vaccination level of:

a. two-doses 87% as of 01 October 2021 (refer Table 7);
b. three-doses 81% as of 09 February 2022 (refer Table 7);
c. three-doses 90% as of 05 May 2022 (refer Table 7); and
d. three-doses 90% and four-doses 6% as of 27 May 2022 (refer Table 7).

In addition to all this staff and resident vaccination, strict visitor vaccination requirements (driven by government mandates and guidelines and a matching industry code of conduct) were in place during this period of exponential growth in residential cases.

Finally, Chart 18 shows that in the context of a near saturation level of residential vaccination, where only 3% of residents are vaccine free (refer Table 7), cumulative number of resident cases remains on a steeply upward trajectory.

The following tables deconstruct Chart 18 to examine the various critical periods contained within its 15-month timeframe.

**Table 10.** Resident Doses and Cases from start of resident vaccination program.

| | Resident Doses (Cumulative) | Resident Cases (Cumulative) |
|---|---|---|
| 04-Mar-21 | 20,814 | 2,029 |
| 27-May-22 | 557,873 | 45,869 |
| % Increase | 2580% | 2161% |

Table 10 shows that along with a 2580% increase in the number of doses administered from 04 March 2021 to 27 May 2022, there has been a commensurate 2161% increase in resident cases over the same period.

**Table 11.** Resident Doses and Cases during staff Vaccination Mandate period.

| | Resident Doses (Cumulative) | Resident Cases (Cumulative) |
|---|---|---|
| 17-Sep-21 | 326,768 | 2,338 |
| 27-May-22 | 557,873 | 45,869 |
| % Increase | 71% | 1862% |

Table 11 shows that from 17 September 2021, when 99% of RACF staff were full vaccinated, to 27 May 2022 along with a 71% increase in doses administered (i.e. a three-dose vaccination level of 97%) there has been a 1862% increase in resident cases.

**Table 12.** Resident Doses and Cases from start of Resident Booster Program

| | Resident Doses (Cumulative) | Resident Cases (Cumulative) |
|---|---|---|
| 8-Nov-21 | 338,711 | 3,060 |
| 27-May-22 | 557,873 | 45,869 |
| % Increase | 65% | 1399% |

Table 12 shows that from 08 November 2021, the start of the resident booster program, to 27 May 2022 along with a 65% increase in doses administered there has been a 1399% increase in resident cases.

**Table 13.** Resident Doses and Cases from 80% Resident Booster Level

| | Resident Doses (Cumulative) | Resident Cases (Cumulative) |
|---|---|---|
| 9-Feb-22 | 472,958 | 15,496 |
| 27-May-22 | 557,873 | 45,869 |
| % Increase | 18% | 196% |

Table 13 shows that from 09 February 2022, when resident three-dose levels reached 80% to 27 May 2022 along with a further 18% increase in doses administered there has been a commensurate 196% increase in resident cases.

Chart 19 shows the Total number of Doses Administered to residents across RACFs and the Total number of Resident Deaths, by week from 04 March 2021 to 26 May 2022. The total number of deaths is summed from March 2020, and the total number of doses is summed from the start of the resident vaccination program in March 2021.

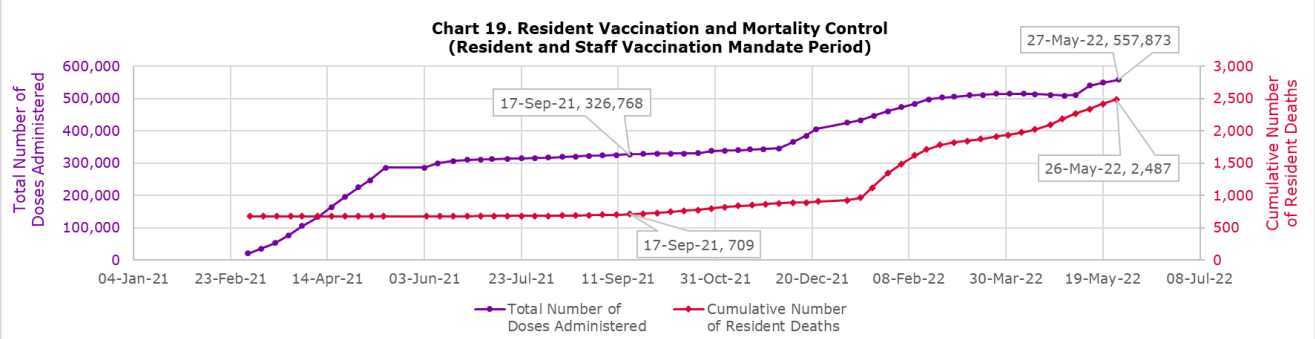


Chart 19 shows that from the beginning of the staff mandatory vaccination period on 17 September 2021 to 26 May 2022, cumulative resident deaths increased by 251% from 709 to 2,487. During this same period the number of doses administered to residents increased by 71% from 326,768 to 557,873.

This exponential increase in resident deaths occurred in the context of a staff vaccination level of 99% as of 17 September 2021 and a resident vaccination level of:

a. two-doses 87% as of 01 October 2021 (refer Table 7);
b. three-doses 81% as of 09 February 2022 (refer Table 7);
c. three-doses 90% as of 05 May 2022 (refer Table 7); and
d. three-doses 90% and four-doses 6% as of 27 May 2022 (refer Table 7).

In addition to all this staff and resident vaccination, strict visitor vaccination requirements (driven by government mandates and guidelines and a matching industry code of conduct) were in place during this period of exponential growth in residential deaths.

Finally, Chart 19 shows that in the context of a near saturation level of residential vaccination, where only 3% of residents are vaccine free (refer Table 7), the cumulative number of resident deaths remains on a steeply upward trajectory.

The following tables deconstruct Chart 19 to examine the various critical periods contained within its 15-month timeframe.

**Table 14.** Resident Doses and Deaths from start of resident vaccination program.

| | Resident Doses (Cumulative) | Resident Deaths (Cumulative) |
|---|---|---|
| 04-Mar-21 | 20,814 | 678 |
| 27-May-22 | 557,873 | 2,487 |
| | 2580% | 267% |

Table 14 shows that along with a 2580% increase in the number of doses administered from 04 March 2021 to 27 May 2022, there has been a commensurate 267% increase in resident deaths over the same period.

**Table 15.** Resident Doses and Deaths during staff Vaccination Mandate period.

| | Resident Doses (Cumulative) | Resident Deaths (Cumulative) |
|---|---|---|
| 17-Sep-21 | 326,768 | 709 |
| 27-May-22 | 557,873 | 2,487 |
| | 71% | 251% |

Table 15 shows that from 17 September 2021, when 99% of RACF staff were full vaccinated, to 27 May 2022 along with a 71% increase in doses administered there has been a commensurate 251% increase in resident deaths.

**Table 16.** Resident Doses and Deaths from start of Resident Booster Program

| | Resident Doses (Cumulative) | Resident Deaths (Cumulative) |
|---|---|---|
| 8-Nov-21 | 338,711 | 819 |
| 27-May-22 | 557,873 | 2,487 |
| | 65% | 204% |

Table 16 shows that from 08 November 2021, the start of the resident booster program, to 27 May 2022 along with a 65% increase in doses administered there has been a commensurate 204% increase in resident deaths.

| **Table 17.** Resident Doses and Deaths from 80% Resident Booster Level | | |
|---|---|---|
| | Resident Doses (Cumulative) | Resident Deaths (Cumulative) |
| 9-Feb-22 | 472,958 | 1,486 |
| 27-May-22 | 557,873 | 2,487 |
| | 18% | 67% |

Table 17 shows that from 09 February 2022, when resident three-dose levels reached 80%, to 27 May 2022 along with a further 18% increase in doses administered there has been a commensurate 67% increase in resident deaths.

## Mandates and Resident Vaccination – Impact on Outbreaks and Outbreak Intensity

Chart 20 shows the Total number of Doses Administered to residents across RACFs and the Total number of Outbreaks, by week from 04 March 2021 to 27 May 2022. The total number of outbreaks is summed from March 2020, and the total number of doses is summed from the start of the resident vaccination program in March 2021.

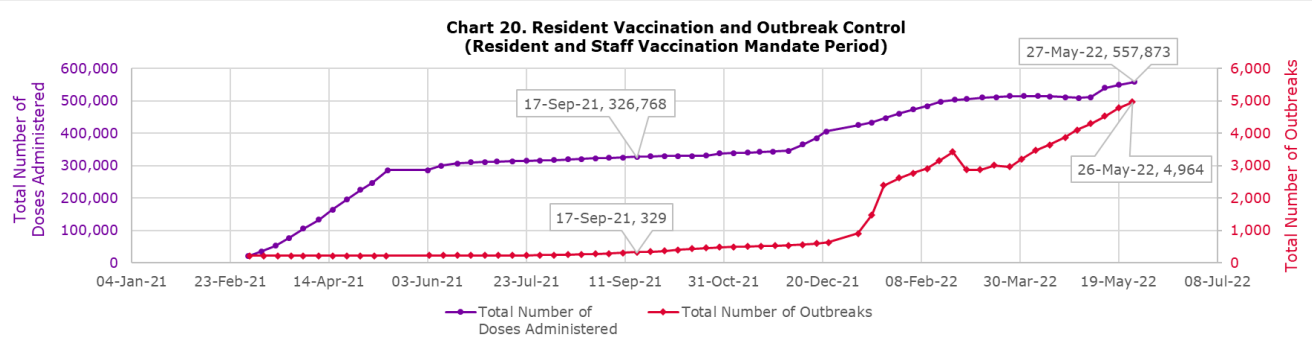



Chart 20 shows that from the beginning of the staff mandatory vaccination period on 17 September 2021 to 26 May 2022, the total number of outbreaks has increased by 1,409% from 329 to 4,964. During this same period the number of doses administered to residents increased by 71% from 326,768 to 557,873.

This exponential increase in the number of outbreaks occurred in the context of a staff vaccination level of 99% as of 17 September 2021 and a resident vaccination level of:

a. two-doses 87% as of 01 October 2021 (refer Table 7);
b. three-doses 81% as of 09 February 2022 (refer Table 7);
c. three-doses 90% as of 05 May 2022 (refer Table 7); and
d. three-doses 90% and four-doses 6% as of 27 May 2022 (refer Table 7).

In addition to all this staff and resident vaccination, strict visitor vaccination requirements (driven by government mandates and guidelines and a matching industry code of conduct) were in place during this period of exponential growth in the total number of outbreaks.

Finally, Chart 20 shows that in the context of a near saturation level of residential vaccination, where only 3% of residents are vaccine free (refer Table 7), the total number of outbreaks remains on a steeply upward trajectory.

Chart 21 shows the Total number of Doses Administered to residents across RACFs and the Total number of facilities that have had an outbreak, by week from 04 March 2021 to 27 May 2022. The total number of facilities that have had an outbreak is summed from March 2020, and the total number of doses is summed from the start of the resident vaccination program in March 2021.

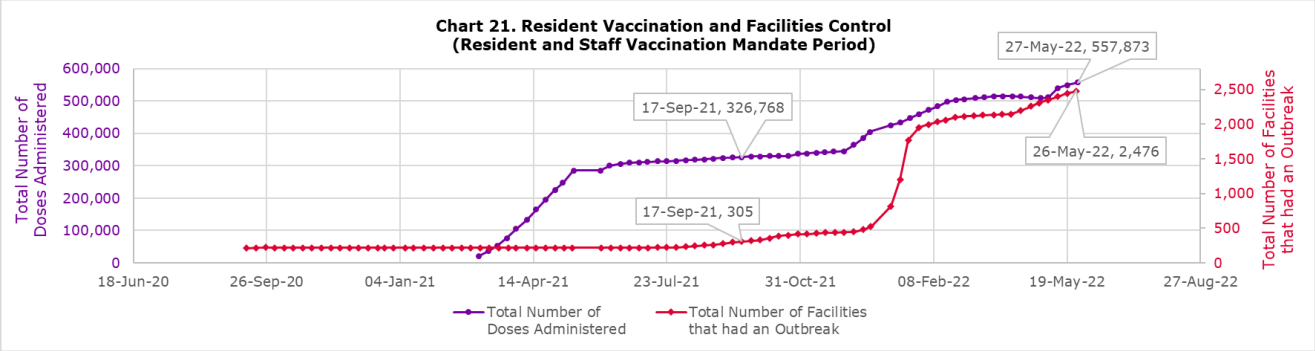



Chart 21 shows that from the beginning of the staff mandatory vaccination period on 17 September 2021 to 26 May 2022, the total number of RACFs that have had an outbreak has increased by 712% from 305 to 2,476. During this same period the number of doses administered to residents increased by 71% from 326,768 to 557,873.

This exponential increase in the number of RACFs that have had an outbreak occurred in the context of a staff vaccination level of 99% as of 17 September 2021 and a resident vaccination level of:

a. two-doses 87% as of 01 October 2021 (refer Table 7);
b. three-doses 81% as of 09 February 2022 (refer Table 7);
c. three-doses 90% as of 05 May 2022 (refer Table 7); and
d. three-doses 90% and four-doses 6% as of 27 May 2022 (refer Table 7).

In addition to all this staff and resident vaccination, strict visitor vaccination requirements (driven by government mandates and guidelines and a matching industry code of conduct) were in place during this period of exponential growth in the total number of RACFs that have had an outbreak.

Finally, Chart 21 shows that in the context of a near saturation level of residential vaccination, where only 3% of residents are vaccine free (refer Table 7), the total number of RACFs that have had an outbreak remains on a steeply upward trajectory.

Chart 22 shows the Total number of Doses Administered to residents across RACFs and the cumulative number of staff and residents who have tested positive as a percentage of the cumulative number of tests performed, by week from 04 March 2021 to 26 May 2022. The total number of doses is summed from the start of the resident vaccination program in March 2021 and the cumulative percentage testing positive is summed from the start of the testing program by Sonic Healthcare in September 2020.

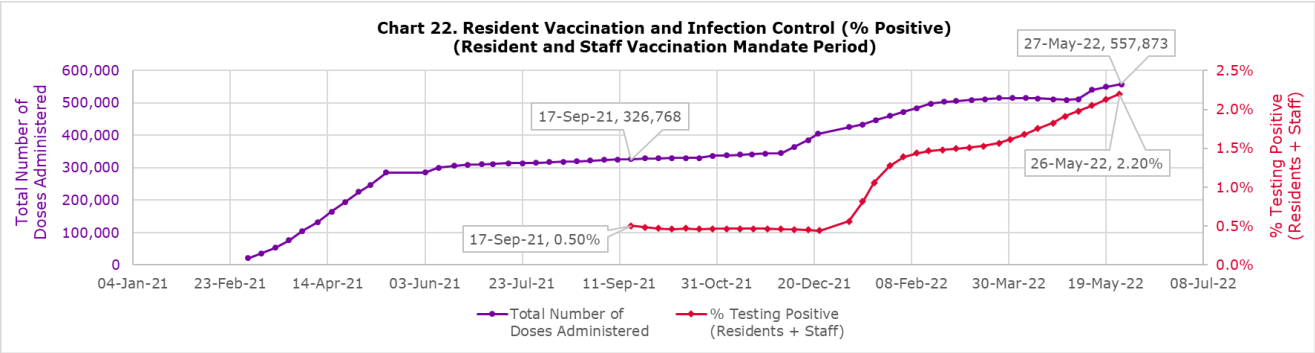



Chart 22 shows that from the beginning of the staff mandatory vaccination period on 17 September 2021 to 26 May 2022, the cumulative percentage of residents and staff testing positive has increased from 0.50% to 2.20%. During this same period the number of doses administered to residents increased by 71% from 326,768 to 557,873.

This 4.4-fold increase in the cumulative percentage of residents and staff testing positive occurred in the context of a staff vaccination level of 99% as of 17 September 2021 and a resident vaccination level of:

a. two-doses 87% as of 01 October 2021 (refer Table 7);
b. three-doses 81% as of 09 February 2022 (refer Table 7);
c. three-doses 90% as of 05 May 2022 (refer Table 7); and
d. three-doses 90% and four-doses 6% as of 27 May 2022 (refer Table 7).

In addition to all this staff and resident vaccination, strict visitor vaccination requirements (driven by government mandates and guidelines and a matching industry code of conduct) were in place during this period of exponential growth in the cumulative percentage of residents and staff testing positive.

Finally, Chart 22 shows that in the context of a near saturation level of residential vaccination, where only 3% of residents are vaccine free (refer Table 7), the cumulative percentage of residents and staff testing positive remains on a steeply upward trajectory.

Chart 23 shows the Total number of Doses Administered to residents across RACFs and the number of active cases (staff plus residents) per outbreak, by week from 04 March 2021 to 26 May 2022. The total number of doses is summed from the start of the resident vaccination program in March 2021.

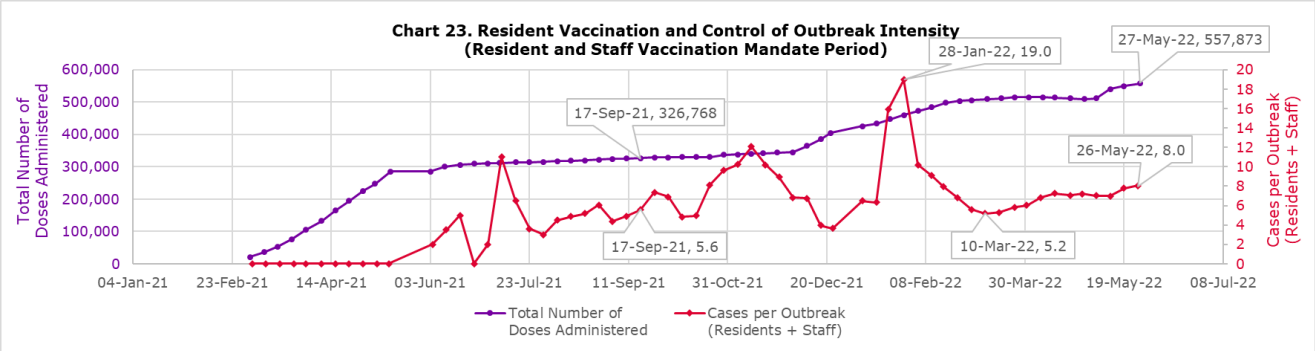



Chart 23 shows that:

1. From the beginning of the staff mandatory vaccination period on 17 September 2021 to 26 May 2022, cases per outbreak have increased by 44% from 5.6 to 8.0. During this same period the number of doses administered to residents increased by 71% from 326,768 to 557,873.
2. During the Christmas holiday season the number of cases per outbreak increased by 240% from 5.6 on 17 September 2021 to 19.0 on 28 January 2022.
3. After a significant fall from 28 January to 10 March 2022, cases per outbreak is once again trending upwards, with an increase of 55% from 5.2 on 10 March to 8.0 on 26 May 2022.

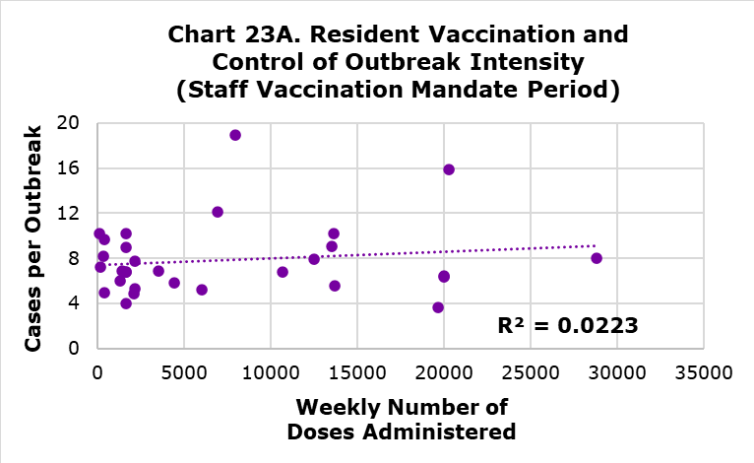



Chart 23A, plots the number of resident vaccine doses administered in a given week and the cases per outbreak 14 days later for the period 17 September to 26 May 2022. This 14-day lag is line with Australian Federal Department of Health information showing optimal vaccine efficacy occurs 12 to 14 days after vaccine administration [27].

Chart 23A shows the weekly number of resident doses administered explains only 2% of the variability in the number of cases per outbreak 14 days later.

This inability of 'vaccine doses administered' to explain 'cases per outbreak' must be considered in the context of a staff vaccination level of 99% as of 17 September 2021 and a resident vaccination level of:

a. two-doses 87% as of 01 October 2021 (refer Table 7);
b. three-doses 81% as of 09 February 2022 (refer Table 7);
c. three-doses 90% as of 05 May 2022 (refer Table 7); and
d. three-doses 90% and four-doses 6% as of 27 May 2022 (refer Table 7).

In addition to all this staff and resident vaccination, strict visitor vaccination requirements (driven by government mandates and guidelines and a matching industry code of conduct) were in place during this entire period.

# Part E. Evaluating Mandate Objectives against Outcomes

## Introduction

Over the period September 2020 to April 2021, Australian Residential Aged Care Facilities (RACFs) provided care for approximately 185,000 to 1900,000 residents. The weighted average age of residents was 84.8 years (82.4 for males and 86.1 for females). Across all RACFs, 87% of residents were aged 75 and above, and 97% were aged 65 and above. By age group 75-79, females begin to significantly outnumber males.

Mandatory COVID-19 vaccination of workers within RACFs was announced in June 2021 and by 17 September 2021 99% of staff were fully vaccinated. In conjunction with this, by 01 October 2021 the resident two-dose COVID-19 vaccination level was 87%, by 09 February 2022 the resident three-dose COVID-19 vaccination level was 81%, and by 27 May 2022 the resident three-dose COVID-19 vaccination level was 90.5% and the four-dose COVID-19 vaccination level was 6%. This 'RACF ecosystem' was further protected by significant regulatory requirements and an industry code of conduct for COVID-19 vaccination of visitors.

Observation 1 – Loosely Defined and Varying Mandate Objectives

As detailed in the AHPPC statement of 29 June 2021 [13] and the various public health orders of NSW [24], Victoria [25], and Queensland [26], we observe that the objectives and desired outcomes of mandatory RACF staff COVID-19 vaccination are expressed in terms that are non-specific, difficult to quantify, problematic to evaluate, and incapable of providing learning signals and feedback to the various health departments.

Furthermore, the various statements and public health orders vary significantly in their loosely defined objectives. In particular:

a. AHPPC "notes increased rates of community transmission, particularly now the Delta variant is present in Australia, increases the risk of exposure to residents in aged care facilities" [13]
b. NSW asserts "vaccination will *reduce the risk of transmission* of infection from *workers to residents*" [24];
c. Victoria orders facility managers to "manage the vaccination status of workers, in order to *limit the spread of COVID-19 within the population*" [25]; and
d. Queensland makes orders to "*assist in containing, or to respond to, the spread of COVID-19 within the community*" [26].

Based on a detailed review of the various national directives and state Public Health Orders (PHOs) we surfaced and articulated four 'outcome-themes' for the mandatory COVID-19 vaccination of RACF workers. These were:

1. To break, or at least mitigate, the nexus between staff and resident infection;
2. To break, or at least mitigate, the nexus between infection in the broader community and infection of staff and residents at RACFs;
3. To control the scope, scale, and intensity of outbreaks of SARS-CoV-2 in RACFs; and
4. In conjunction with the vaccination of residents, to control and mitigate the consequences of COVID-19 amongst residents of RACFs; in particular mortality.

Observation 2 – Highly Vaccinated 'RACF Ecosystem'

During the RACF mandatory staff vaccination period (i.e. 18 September to 27 May 2022), we observe an RACF ecosystem that is highly vaccinated against COVID-19.

Mandatory COVID-19 vaccination of workers within RACFs was announced in June 2021 and by 17 September 2021 99% of staff were fully vaccinated. In conjunction with this, by 01 October 2021 the resident two-dose COVID-19 vaccination level was 87%, by 09 February 2022 the resident three-dose COVID-19 vaccination level was 81%, and by 27 May 2022 the resident three-dose COVID-19 vaccination level was 90.5% and the four-dose COVID-19 vaccination level was 6%. This 'RACF ecosystem' was further protected by significant regulatory requirements, and an industry code of conduct, for COVID-19 vaccination of visitors.

## Mandate Evaluation 1 – Nexus Staff/Resident Infection

Observation 3 – Causal Relationship between Staff and Resident Infections

During the RACF mandatory staff vaccination period (i.e. 18 September to 27 May 2022), we observe that the number of staff cases during an active outbreak has an immediate, significant, direct (i.e. linearly increasing) and causal effect on active resident cases.

The time-series plots of staff and resident cases (both cumulative and for active outbreaks) track each other very closely over time, and the percentage change trough-to-peak-to-trough are identical.

During this period, active staff cases explain 90.89% of the variability in active resident cases, and cumulative staff cases explain 98.69% of the variability in cumulative resident cases. In addition, during this mandatory staff vaccination period, on average 10 active staff cases cause 8.0 active resident cases.

Furthermore, in a sign of the very strong causal relationship between staff and resident cases, and with a lag of eight days between cases and deaths, weekly *staff* cases explain 82.53% of the variability in weekly *resident* deaths.

In conclusion, given the highly vaccinated 'RACF ecosystem' and the significant causal relationships between staff cases and resident cases and deaths, the AHPPC statement of 29 June 2021 [13] that "in an outbreak, vaccinated individuals are less likely to be significant drivers of spread, and transmission will be dominated by unvaccinated people" is entirely unsupported.

In addition, the results summarised in this observation, and throughout this paper, provide no real-world evidence that mandatory RACF staff vaccination delivered on its first objective, i.e. to break, or at least mitigate, the nexus between staff and resident infection.

## Mandate Evaluation 2 – Nexus RACF/Australian Population Infection

Observation 4 – Causal Relationship between Australian and Staff Cases

During the RACF mandatory staff vaccination period (i.e. 18 September to 27 May 2022), we observe that, with a 14-day lag, active staff cases very closely track daily new cases across Australia.

Accounting for this lag, there is a strong ($r^2$ = 0.7587), direct (i.e. linearly increasing), and causal relationship between daily new cases across Australia and active RACF staff cases.

Observation 5 – Causal Relationship between Australian and Resident Cases

During the RACF mandatory staff vaccination period (i.e. 18 September to 27 May 2022), we observe that, with a 14-day lag, active resident cases very closely track daily new cases across Australia.

Accounting for this lag, there is a strong ($r^2$ = 0.9067), direct (i.e. linearly increasing), and causal relationship between daily new cases across Australia and active RACF resident cases. This relationship is most likely mediated through active staff cases.

Observation 6 – Significant Association between Australian and RACF Deaths

During the RACF mandatory staff vaccination period (i.e. 18 September to 27 May 2022), we observe that deaths per week within RACFs closely tracked deaths per week across Australia.

There is a strong ($r^2$ = 0.7615) and direct (i.e. linearly increasing) association between deaths per week across Australia and deaths per week in RACFs. Clearly this association

is mediated through cases in the Australian community, staff cases in RACFs, resident cases in RACFs and ultimately resident deaths.

In conclusion, given the highly vaccinated 'RACF ecosystem' and the significant causal relationships and associations summarised in observations 4,5, and 6, and throughout this paper, there is no real-world evidence that mandatory RACF staff vaccination delivered on its second objective, i.e. to break, or at least mitigate, the nexus between infection in the broader community and infection of staff and residents within RACFs.

## Mandate Evaluation 3 – Control of Scope, Scale, and Intensity of Outbreaks

Observation 7 – Exponential Growth in Number of Outbreaks

During the RACF mandatory staff vaccination period (i.e. 18 September to 26 May 2022), we observe that the total number of active outbreaks increased by 1,409% from 329 on 17 September to 4,964 on 26 May 2022.

During this same period, we also observe that there is a direct and causal relationship between:

a. The total number of outbreaks and the total number of staff cases ($r^2$=0.9913); and
b. The number of active outbreaks and the number of active staff cases ($r^2$=0.9219).

Observation 8 – Exponential Growth in Facilities that have had an Outbreak

During the RACF mandatory staff vaccination period (i.e. 18 September to 26 May 2022), we observe that the total number of RACFs that had an outbreak increased by 712% from 305 on 17 September to 2,476 on 27 May 2022.

During this same period, we also observe that there is a direct and causal relationship between:

a. The total number of RACFS that have had an outbreak and the total number of staff cases ($r^2$=0.9907); and
b. The total number of RACFs that have had an outbreak in the previous week and the number of active staff cases ($r^2$=0.8740).

Observation 9 – Uncontrolled Outbreak Intensity

During the RACF mandatory staff vaccination period (i.e. 18 September to 26 May 2022), we evaluated two measures of outbreak intensity:

a. The number of active resident cases per active staff case.

   We observe that the number of active resident cases per active staff case was the highest in the first three months of the mandatory staff vaccination period i.e.

September 2.02, October 2.03, and November 2.08 active resident cases per active staff case.

We also observe that the number of active resident cases per active staff case has increased by 130% from January 2022 (0.74) to May 2022 (1.7).

b. The number of cases (staff plus resident) per outbreak.
From the beginning of the staff mandatory vaccination period on 17 September 2021 to 26 May 2022, the number of cases per outbreak has increased by 44% from 5.6 to 8.0.

During the 2021/2022 Christmas season the number of cases per outbreak increased by 240% from 5.6 on 17 September 2021 to 19.0 on 28 January 2022.

After a significant fall from 28 January to 10 March 2022, the number of cases per outbreak is once again trending upwards, with an increase of 55% from 5.2 on 10 March to 8.0 on 26 May 2022.

Finally, we also observe that during the staff vaccination mandate period, and in the context of a highly vaccinated 'RACF ecosystem', the number of vaccine doses administered to residents in a given week was a very poor predictor of cases per outbreak 14 days later ($r^2$=2.23%).

In conclusion, given the entirety of the analysis in this paper, and in particular:

a. the highly vaccinated 'RACF ecosystem';
b. the exponential growth in the number of outbreaks and the number of RACFs that have had an outbreak;
c. the significant causal relationships between the number of outbreaks and the number of RACFs that have had an outbreak and staff cases;
d. the number of active resident cases per staff case being highest in the first three months of the mandatory staff vaccination period;
e. the 130% increase in the number of active resident cases per active staff case from January 2022 to May 2022;
f. the 44% increase in cases per outbreak from September 20211 to May 2022;
g. the 240% increase in cases per outbreak from September 2021 to January 2022; and
h. the number of vaccine doses administered to residents in a given week being a very poor predictor of cases per outbreak 14 days later ($r^2$=2.23%)

there is no real-world evidence that mandatory RACF staff vaccination delivered on its third objective, i.e. to control the scope, scale, and intensity of outbreaks of SARS-CoV-2 in RACFs.

## Mandate Evaluation 4 – Control of Resident COVID-19 Consequences

Observation 10 – Majority of Cases and Deaths Occurred within Mandate Period

We observe that from 11 September 2020 to 26 May 2022, 98% of residential cases and 93.6% of deaths occurred during the mandatory staff vaccination period of 18 September 2021 to 26 May 2022. During this period there was a staff vaccination level of 99% as of 17 September 2021, a resident two-dose vaccination level of 87% as of 01 October 2021, a resident three-dose vaccination level of 81% as of 09 February 2022, a resident three-dose vaccination level of 90.5% and a four-dose vaccination level as of 27 May 2022.

Observation 11 – Resident and Staff Cases Strong Predictors of Resident Deaths

During the RACF mandatory staff vaccination period (i.e. 18 September to 26 May 2022), we observe that the curve of weekly resident deaths lags weekly resident cases by 8 days.

Accounting for this lag, we observe that weekly resident cases explain 83.02% of the variability in weekly resident deaths. We observe a linear and direct causal relationship between weekly resident cases and weekly resident deaths, with a regression-based case fatality ratio of 3.88%.

During the same period we also observe that weekly *resident* deaths lags weekly *staff* cases by 8 days.

Accounting for this lag, we observe that weekly *staff* cases explain 82.53% of the variability in weekly *resident* deaths. We observe a linear and direct relationship between weekly *staff* cases and weekly *resident* deaths. Cleary this relationship is mediated through resident cases and subsequent resident deaths.

Observation 12 – Incongruous Outcomes in a Highly Vaccinated Ecosystem

During the RACF mandatory staff vaccination period (i.e. 18 September to 26 May 2022) the number of doses administered to residents increased by 71% from 326,768 to 557,873 doses. This resulted in resident vaccination levels of:

a. two-doses 87% as of 01 October 2021;
b. three-doses 81% as of 09 February 2022;
c. three-doses 90% as of 05 May 2022; and
d. three-doses 90% and four-doses 6% as of 27 May 2022.

During this same period, and in the context of this highly vaccinated 'RACF ecosystem', we observe that:

a. The total number of resident cases has increased by 1,862%;
b. The total number of resident deaths has increased by 251%;
c. The total number of outbreaks has increased by 1,409%;
d. The total number of RACFs that have had an outbreak has increased by 712%;

e. the cumulative percentage of residents and staff testing positive increased 4.4-fold from 0.50% to 2.20%.

Observation 13 – Incongruous Outcomes of Residential Booster Program

From the start of the resident booster program on 08 November 2021 to 27 May 2022 there has been a 65% increase in the number of doses administered to residents; with a significant acceleration of vaccine administration beginning 03 December 2021 and again on 05 May 2022. This resulted in resident vaccination levels of:

a. three-doses 81% as of 09 February 2022;
b. three-doses 90% as of 05 May 2022; and
c. three-doses 90% and four-doses 6% as of 27 May 2022.

During this same period, and in the context of this highly vaccinated 'RACF ecosystem', we observe that:

a. The total number of resident cases has increased by 1,399%;
b. The total number of resident deaths has increased by 204%;
c. The total number of outbreaks has increased by 919%;
d. The total number of RACFs that have had an outbreak has increased by 494%;
e. the cumulative percentage of residents and staff testing positive increased 4.7-fold from 0.46% to 2.20%.

Given that:

a. the majority of cases and deaths occurred during the mandatory staff vaccination period;
b. both resident and staff cases are strong predictors of resident deaths; and
c. the exponential increases in cases, deaths, number of outbreaks and RACFs that have had an outbreak all within a highly vaccinated RACF ecosystem;

it is extremely difficult to conclude that there is any real-world evidence that mandatory RACF staff vaccination delivered on its fourth objective, i.e. to control and mitigate the consequences of COVID-19 amongst residents of RACFs; in particular mortality.

Summary Observation

In summary, based on the observations and analyses contained in this paper, it is not possible to conclude that the regulatory promises and objectives of mandatory RACF staff COVID-19 vaccination were matched by real-world outcomes.

If they are to be believed, at some point in time assumption-riddled epidemiological models, flimsy observational trials, and deeply-flawed and under-powered randomised control trials, claimed to underpin mandatory COVID-19 vaccination, must translate into population level benefits. And if this is their picture of success, what does failure look like?

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