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BRIEF COMMUNICATION

Residential aged care facility COVID-19 outbreaks and magnitude of spread among residents: observations from a Victorian residential in-reach service

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Abstract

There is a paucity of Australian literature exploring the spread of COVID-19 among residents living in residential aged care facilities (RACF). In this case series of COVID-19 outbreaks in six RACF, we collected data on the cumulative proportion of residents who tested positive for COVID-19 within 21 days of the index case being identified. We describe the observations of a Residential In-Reach service within these six RACF and found that rapid cohorting strategies, personal protective equipment availability and adequacy of use, embedded infection control staff, and adequate outbreak preparedness plans may have influenced the differences observed between RACF in the containment and minimisation of the spread of COVID-19 amongst residents.

As of November 2020, Australia recorded over 27 000 cases of COVID-19 with the bulk of cases occurring within the state of Victoria during the 'second wave' from July to September 2020.[1] Of these, over 2000 cases occurred within residential aged care facilities (RACF) with outbreaks leading to almost 700 deaths.[2]

In this article, we describe our recent experiences with six separate Victorian RACF outbreaks that our Residential In-Reach (RiR) service was involved with. RiR services in Victoria typically consist of a small team of geriatric medicine doctors and nurse specialists operating out of each public hospital network. The RiR team provides consultative support to general practitioners and RACF staff to assist with managing chronic, complex and acute-on chronic conditions for older people living in RACF within the hospital catchment area. During the COVID-19 pandemic, access to general practitioners was limited to Telehealth consultations for the majority of older people living in RACF. RiR teams were required to take on a greater role in this setting especially during COVID-19 outbreaks in RACF. Our RiR team members visited outbreak facilities daily during the outbreaks to review goals of care, provide medical treatment, liaise with medical treatment decision-makers and general practitioners, and to arrange transfers to a hospital where clinically indicated or when basic care needs could not be met due to staff furloughing.

In this case series, we collected data on the cumulative proportion of residents who tested positive for COVID-19 over 21 days after the index case was identified in the first six RACF outbreaks in our catchment area (Fig. 1). The facilities requested assistance from us to manage the clinical care of residents after a COVID-19 outbreak was declared. An outbreak was defined by the presence of a positive SARS-COV-2 polymerase chain reaction nasooropharyngeal swab in one staff member or resident. In this communication, we present data on resident cases only. Ethics approval was obtained via Northern Health Research and Ethics Committee (ALR 62.2020).

Qualitative information about individual RACF outbreak management was collected by the RiR team including strategies to contain and minimise spread as well as reported staffing and management issues faced by RACF. This information is summarised in Table 1 and specifically included:

1 Age of the facility and associated infrastructure.
2 Whether or not the index case was extricated to hospital.
3 Personal protective equipment (PPE) availability and adequacy as perceived by RiR staff in the context of working guidelines at the time.

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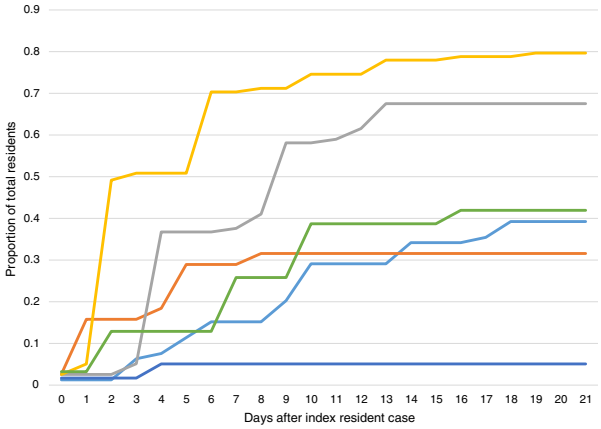

Figure 1 Proportion of total residents in residential aged care facility positive for COVID-19. (——), Facility A; (——), facility B; (——), facility C; (——), facility D; (——), facility E; (——), facility F.

4 Whether PPE use included aerosol protection (N95)
5 The presence of embedded infection prevention control staff as noted by local management.
6 Whether or not local management had an outbreak contingency plan they were confident in enacting as perceived by RIR staff.
7 The rapidity of cohorting as observed by RIR staff.

Discussion

As evidenced by Figure 1, there was variable magnitude and spread of COVID-19 in the six facilities. This is likely related to multiple different factors.

Rapid cohorting of infected patients is important to minimise spread and is a mainstay of infection prevention control.[3–5] We noted facilities that did not perform this in a timely fashion (within 24 h) ended up with higher case numbers (Facilities C and D). Cohorting in the RACF setting has to be assessed on a case by case basis as there is often heterogenous infrastructure (e.g. the size of individual wings, shared bedrooms and bathrooms, and the location of communal areas). Principles of cohorting, such as creating a 'Red' zone for confirmed infected cases, 'Orange' zone for suspected cases, and 'Green' zone for confirmed negative cases need to be tailored to the individual facility and form the basis for PPE deployment and use.

We noted PPE guidelines evolved as the second wave progressed. Once Government guidelines advised N95 mask provision from the beginning of an RACF outbreak, we observed less spread amongst residents in facilities who adopted this approach (Facilities B, E and F). Even so, we observed variations in education about and effective use of PPE. In particular: whether or not the equipment was being changed between patients; the appropriateness of fit and type of masks used; and location of donning and doffing stations. Facilities with perceived inadequacies in PPE use had greater numbers of cases (Facilities A, C and D). Where possible, reinforcement of PPE education was provided by RIR staff. However, it was observed that multiple different approaches were being recommended to facility staff from different sources involved in the outbreak management (including Australian Defence Force staff, private nursing first responders and health department officials).

Some facilities recognised the difficulties in maintaining standards of PPE use and engaged in the deployment of embedded infection control staff, either from within their RACF network or from the Public Health response. These were professional staff trained in infection prevention and control practice and solely dedicated to monitoring and ensuring the adequacy of infection control practices amongst all RACF staff. This only occurred in facilities B and E.

Ultimately, the factors described above can be planned for. The facilities with an established COVID-19 outbreak plan that was confidently and promptly enacted were observed to have the lowest magnitude of spread (A, B and E). Outbreak plans that included preparations for surge staffing capacity (to account for furloughing) in particular were hugely helpful as this was instrumental

Table 1 Comparison of residential aged care facility (RACF) factors

RACF	Age of facility infrastructure (years)	Index case hospitalised at time of diagnosis	PPE availability and adequacy	N95 use from onset	Imbedded infection control staff	Outbreak preparedness including surge staffing	Timely cohorting	% positive at Day 21
A	<15 years	Y	Good	N	N	Y	Y	39
B	<15 years	Y	Good	Y	Y	Y	Y	32
C	>30 years	N	Poor	N	N	N	N	68
D	<15 years	Y	Poor	N	N	N	N	80
E	<15 years	N	Good	Y	Y	Y	Y	5
F	>30 years	Y	Good	Y	N	N	Y	42

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in maintaining the quality of care of residents. We found that in facilities with inadequate staffing, basic care swiftly deteriorated and with it adequate infection control. This also impacted the care of non-infected residents.

We wish to highlight the fact that Facility E was the most successful facility at limiting the spread of COVID-19 and this may be related to our observations that it was the only facility that adhered to all the aforementioned factors – good PPE availability and use, N95 mask use from outset, embedded infection control staff, prompt enactment of a sound outbreak plan including surge staffing and timely cohorting of cases. This is despite Facility E having older infrastructure and the index case here was not hospitalised. Facilities C and D with the greatest magnitude of spread did not have prompt the implementation of any of these important strategies. We note that Facility E's outbreak occurred after A–D (and synchronously with F). It is possible Facility E may have learnt from the experience of previous facilities.

We note that given the multifactorial nature of a COVID-19 RACF outbreak it is unlikely that removing an index case as a sole strategy would be successful in containing and minimising spread. The question of whether or not all residents should be transferred to the hospital remains contentious. For example, in South Australia, at time of writing, a blanket policy exists to transport all positive residents to hospital immediately.[6] Current Victorian DHHS guidelines recommend transferring of residents based on clinical need.[7] We note that moving RACF residents to hospital (who are often older and frailer than the general population) puts them at risk of hospital acquired complications such as delirium[8] and therefore these risks need to be balanced with other factors such as the ability of the RACF to provide basic care needs to their residents.

It is likely that there are other variables influencing the magnitude of COVID-19 spread within a facility. While acknowledging the limitations of this study, it is evident that a prompt and well coordinated multifactorial approach is necessary for optimal management of a RACF COVID-19 outbreak. It is clear that relying on index case removal as a sole strategy is likely to fail, but when combined with other measures, may attenuate the magnitude of COVID-19 spread. This is a rapidly evolving area and the strategies described require further evaluation, refinement and research. We would recommend RiR services (or similar) be involved as soon as an outbreak is identified.

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