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Lessons from a successful public health response to COVID-19 in a New South Wales residential aged care facility, 2020

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Outbreaks of Coronavirus Disease 2019 (COVID-19) in residential aged care facilities (RACF) have been responsible for approximately 75% of all COVID-19-related deaths in Australia, including 61 deaths in New South Wales (NSW) and 644 deaths in Victoria (as of 6 October 2020).[1] While risks for the elderly and those in RACFs are well described, there is limited literature documenting effective public health responses to COVID-19 in RACF settings. In this commentary, we analyse the preparation for, and response to, the detection of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) in a healthcare worker (HCW) of a large RACF in Sydney, Australia. We reflect on the lessons learned and make recommendations to support others' response efforts and support regulatory reform.

SARS-CoV-2 was first detected in NSW, Australia, on 25 January 2020. As of 6 October 2020, NSW had identified 4,060 cases of Coronavirus Disease 2019 (COVID-19),[2] including several outbreaks in RACFs.[1,3]

Severe manifestations of COVID-19 disproportionately affect older people,[4–6] and RACFs are considered high-risk settings, given the relatively high density of older people with comorbidities.[7] European surveillance has shown that COVID-19 attack rates in RACFs can be as high as 50% and mortality rates as high as 60%.[8]

The case and facility description

In April 2020, a HCW (hereafter 'the case'), who worked at an RACF in Sydney, NSW, developed mild symptoms commensurate with the Australian COVID-19 case definition.[9] Following symptom onset, the case self-isolated at home and sought COVID-19 testing. Within 48 hours of symptom onset, SARS-CoV-2 was detected in the case's clinical specimens by nucleic acid testing (NAT). Complying with COVID-19 guidelines for HCWs at the time,[9] the case remained in home isolation until two negative NAT tests were received, a total of 16 days.

COVID-19 cases are considered infectious for the 48 hours before symptom onset.[9] The case worked while unaware of their illness at the RACF during this pre-symptomatic period.

The RACF at which the case worked was home to 114 older people and employed approximately 130 staff. Residents were accommodated in multiple buildings. The main building had four 'sections'. The case worked exclusively in one section (hereafter 'section A'), providing care for 20 residents with high-level needs. Residents of section A lived in individual rooms with a single bathroom shared between two residents. A kitchen prepared food centrally and meals were delivered and served to residents in section-specific dining areas. Staff took breaks and conducted shift handovers in section-specific staffrooms.

Facility's preparedness for COVID-19

In early 2020, the RACF established an Outbreak Preparedness and Response Committee that met weekly. The Committee developed a facility COVID-19 response plan and exercised specific response procedures.

The Committee oversaw a range of facility-based preparedness activities including: i) the restriction of visitors to the facility, including entry screening for temperature and symptoms and denial of access for visitors that met specific risk criteria; ii) restricting person movement between sections of the facility, including rostering staff to work exclusively in a single section; and iii) enhancing infection prevention and control (IPC) procedures, including procurement of additional personal protective equipment (PPE) stock, installation of signage, the establishment of hand hygiene stations throughout the facility, enhanced facility cleaning, and IPC refresher training for staff. Also, the Committee projected stock and staffing needs should a COVID-19 outbreak occur at the facility, procured extra stock and identified sources of surge staff. An internal communication campaign was implemented encouraging staff to stay home and seek testing if even mildly unwell. The communication made explicit management's commitment to job security and to paying staff if they were unable to work due to COVID-19-related isolation.

Public health response

The Local Health District (LHD) Public Health Unit (PHU) in which the RACF is located received notification of the case and immediately advised the RACF and the NSW Ministry of Health's Public Health Emergency Operations Centre (PHEOC), tasking the PHEOC to lead the response. Within three hours of notification, the PHEOC established an incident management team (IMT) comprising representatives of the PHEOC, PHU, RACF and its service provider, the LHD, and the residential aged care sector regulatory authority. Under the national *Aged Care Act 1997* (Cth), the facility's management had oversight of response activities undertaken within their institution. The IMT provided advice and support to facility management. The PHEOC and PHU coordinated the public health response. The IMT met daily throughout this response to coordinate the activities described in this paper.

Public health investigations

NSW Health staff interviewed the case to identify potential sources of illness and any close contacts. As per the national guidelines, close contacts were defined as any person who had face-to-face contact with a confirmed case for ≥15 minutes, or

any person who had shared a closed space with a confirmed case for ≥2 hours during the infectious period.[9] Close contacts identified included the case's household family members, work colleagues and all facility residents from section A. Close contacts were required to isolate for 14 days from the last contact with the case.

Public health physicians from PHEOC visited the facility within 12 hours of event notification to provide an initial assessment of the effectiveness of existing IPC procedures, provide public health advice, consult with staff and develop a working relationship with the facility's management, and review residents' clinical records. As the manifestations of illness in older people can be subtle, PHEOC staff looked for symptoms as vague as behaviour change, drowsiness and loss of appetite to identify any other potential cases. None were identified.

Infection prevention and control

The Local Health District's head infectious disease physician was deployed to the facility within 12 hours of event notification to further the public health physician's IPC assessment, oversee the immediate enhancement of IPC, provide IPC training to staff, support the facility management's response and coordinate an NAT testing strategy. The infectious disease physician was supported in these activities by an IPC nurse specialist.

Enhanced IPC measures included the cessation of all non-essential movement of residents and staff around the facility; cleaning in accordance with NSW Health recommendations;[10] and halting of non-essential visitors. All staff wore surgical masks when on campus. Social distancing was practised and monitored across the facility including during handovers, mealtimes and breaks. All staff were screened for COVID-19 symptoms on arrival at the facility. For residents of section A, additional IPC measures were implemented as residents were isolated in individual rooms for 14 days from the date of their last exposure to the case. Staff used full PPE[11] when in close contact with residents of section A. PPE donning and doffing stations and increased signage were installed outside residents' rooms. Shared bathroom hygiene protocols were implemented, including providing additional commodes. Meals were served in residents' rooms and all cutlery, crockery, and food and medication delivery trolleys were treated as fomites. Where possible, unidirectional movement of goods and equipment was implemented to minimise fomite transmission risk.

Across the facility, group activities were suspended. A location to cohort residents, should they develop COVID-19, was identified and prepared. Compassionate and end-of-life visits were arranged in consultation with the IMT.

Video conferencing facilities were established to enable residents to maintain social contact with their families. Staff spent additional time with isolated residents daily for additional psychosocial support.

Clinical assessment and testing

On day 1 of the response, the infectious disease physician clinically assessed all residents and, with the IPC nurse specialist's and RACF staff's support, collected throat and nasopharyngeal specimens from all residents for NAT testing. Samples were also collected from staff who currently worked or had worked at the facility during the case's incubation period. Testing was prioritised and results were available within 12 hours. Specimen collection and NAT testing were repeated at day four and seven for residents of section A, based on best knowledge of an average incubation period range for COVID-19. All other residents and staff were tested if clinically indicated. Table 1 summarises the testing regime. No additional cases were identified.

Table 1: Staff and resident testing schedule.

		Day of response test conducted							
		Day 0	Day 1	Day 2	Day 3	Day 4	Day 7	Other dates	Total tests collected
Staff*	(n=130)	6	108	2	7	1	2	4	130
Residents	'Section A' residents (n=20)		20			20	20		60
	Other residents (n-=94)		94			5	1	3	103

Note:

** Staff: active staff working at the facility only, excluding those staff on leave or did not work during the case's incubation period.*

The infectious disease physician also trained staff to collect specimens and self-collect, which allowed many specimens to be collected quickly. The training involved a combination of face-to-face instruction and supervision of both self-collection and collecting from another person. The team reported excellent understanding of and compliance with testing.

On the advice of the IMT, including the infectious disease physician, and noting that symptoms may be more subtle in older people, staff were provided training on the clinical manifestations of SARS-CoV-2 infection in the elderly. On day one of the response, a regime of four-hourly vital sign monitoring and documentation for all residents was implemented. Directives to take a precautionary approach and escalate suspicion of infection immediately were provided, and active surveillance was implemented.

Communications

The RACF management prioritised early and open two-way communication with staff, residents and their families through different media. Of note, on the day of case notification, the facility explained the situation and the planned control measures to every resident and, by phone, to their nominated family contact. Subsequently, the facility provided updates on testing results and openly engaged in discussions with residents and their families. The PHEOC and the service provider's communications specialists supported the facility-led communication with the broader public. Feedback from staff, residents and their families were positive.

Outcomes

No additional COVID-19 cases were identified among staff, residents or close contacts of the case. As a precautionary measure, section A residents were closely monitoring for an additional seven days after release from isolation, including twice-daily vital sign observations. No concerns were identified in this period. The IMT declared the response closed 21 days after the first detection of the case.

Discussion

We report the public health response to a HCW diagnosed with COVID-19 who, unknowingly, attended an RACF while infectious before symptom onset. We

describe a well-implemented response to COVID-19 in the RACF setting of a high-resource country, characterised by: i) rigorous pandemic preparedness at the RACF; ii) immediate exclusion and testing of symptomatic RACF staff; iii) a prompt and cautious public health response that included comprehensive IPC procedures that were closely monitored, frequent clinical assessments and widespread testing of asymptomatic patients and staff; and iv) effective two-way communications with stakeholders and open and collaborative relationships between RACF and response agencies.

The RACF's pandemic planning meant that management was able to implement facility-based response activities quickly and smoothly. This planning, combined with the early establishment of a multi-stakeholder IMT with a clear hierarchy, roles and responsibilities and means of communication were key to the coordinated and well-executed response seen. The IMT structure used has served NSW well in response to acute emergencies, including outbreaks of COVID-19 in RACFs. It may be of value in other settings, such as schools, correctional facilities, or where multiple jurisdictions are involved in response.

Isolating residents in single rooms, while an effective IPC strategy, raises concern for the mental and physical health of residents,[12] and the welfare of residents and their families. IMTs must take these issues into consideration when determining a course of action, find solutions to mitigate the impacts and balance them against the risk posed to the individual and broader community. Strategies to minimise the impact of isolation on residents must feature in response plans, as must clear and open communication with residents and their families about what and why response decisions are being made. The use of technology to facilitate 'safe' social interaction, delivery of physical health programs, and support two-way communication with residents and family should be explored.

Widespread NAT testing and enhanced clinical monitoring played an important role in the response, raising the IMT's confidence that any new cases would be identified and responded to early. Further, these strategies meant IPC measures, such as isolation within rooms, applied for close contacts were not required in other sections of the facility, meaning residents in these sections could continue relatively normal activities.

Facility-wide testing allowed the IMT to cautiously exclude the RACF as the source of the case's infection and allowed public health investigation to focus on other potential sources.

While integral to this response, widespread NAT testing can be labour intensive and logistically challenging, and hence requires careful planning involving the facility, local public health authority, and testing laboratory. The development of standing localised arrangements to guide testing during outbreaks in RACF would be beneficial.

The source of the case's infection was not ascertained. In the context of known local community transmission at the time, the case was presumed to have acquired COVID-19 in the community. Serology testing was not recommended for RACF staff and residents because it would not have changed public health management within the RACF. Given that widespread NAT was prompt and returned negative results, and review of clinical records did not reveal notable illness or exposures in preceding weeks, the IMT determined that the RACF was unlikely to be the source of infection.

In our experience, IPC may also be indirectly compromised by staffing-related challenges, including the low levels of training provided for casual or surge staff, and little incentive to remain at home while unwell (i.e. no pay for staff if they call in sick).[13] An important strength of this response was the RACF management's commitment to supporting staff, including effective communication, offers of psychological support during the event, provision of IPC and symptom identification training before and during the response, encouragement to escalate any concerns immediately and staff being paid if they had to stay home because of suspected COVID-19.

IPC in RACFs is complicated by the high prevalence of cognitive and functional impairment in residents, shared care arrangements and other environmental factors such as shared bathrooms.[14] Nevertheless, IPC must remain a priority. Early deployment of IPC specialists to the facility proved to be invaluable as it both provided expertise for enhanced IPC activities, including monitoring for compliance, and reassurance for the facility management, the IMT, and residents and their families that all was being done to prevent transmission within the facility.

Limitations and recommendations

This commentary is not without limitations. Experiences from a single event are not universally generalisable and hence readers need to contextualise these results. We acknowledge the potentially lower risk exposure to the facility given the case only worked during their pre-symptomatic period. Nevertheless, this case study offers insight into the impact that effective preparedness and public health response had on the implementation of a COVID-19 response in an RACF from which others may learn. Looking ahead, lessons for COVID-19 outbreaks in RACFs should be collected and analysed to inform best practice guidelines and regulatory frameworks to better protect the health of both residents and staff.

Ethics approval

This work was undertaken as part of an outbreak response that, under the *Public Health Act 2010* (NSW), does not require ethics approval. This work has been approved for publication by the Executive Director of Health Protection NSW, NSW Ministry of Health.

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