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COVID-19 in a Sydney nursing home: a case study and lessons learnt

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Abstract.

The COVID-19 outbreak in the Dorothy Henderson Lodge nursing home, in Sydney, occurred early in the Australia's outbreak, when understanding and experience of the disease were limited. Prompt, decisive action, by public health authorities and organisational management, probably limited the outbreak's severity. Nevertheless, it was associated with understandable fear, uncertainty and suffering among residents, their relatives and staff. Among the most important lessons, was that optimal infection prevention and control (IPC) practice cannot be assumed, even among trained healthcare workers, in an outbreak setting. Ongoing training and advice, from experienced IPC professionals is needed.

Introline.

Lessons learnt from COVID-19 outbreaks in residential aged care facilities that can limit future impacts.

Background

Infectious disease outbreaks are a hazard of communal living in, among other places, military barracks, boarding schools, prisons and residential care homes. The risks are exacerbated when residents are vulnerable because of advanced age, comorbidities and/or frailty, or there are too few or inadequately trained staff. Neither the homelike settings, with carpets and soft furnishings, nor overcrowding and shared amenities, that are features of many residential aged care facilities (RACFs), are conducive to prevention or control of infectious diseases[1-3]. Respiratory infections are often responsible for hospitalisations and deaths of residents.

Early in the COVID-19 pandemic it was clear that older people would be most at risk of death[4, 5]. Internationally, estimates of case fatality ratios (CFRs), stratified by age, are more than three times higher in people over (4.5%), than under (1.4%), 60 years of age[6]. In Australia (to July 8th) most COVID-19 deaths (89 of 106) have been in people over 70, in whom the CFR is ~10%, compared with ~0.1% in younger people. The risks are concentrated in RACFs, where 31 of 71 (44%) residents diagnosed with COVID-19 have died[7].

Co-morbidities associated with increased risk of severe COVID-19, including diabetes, chronic kidney and cardiovascular disease, are more common among RACF residents[8]. The fact that clinical features of COVID-19 in older people are often atypical or absent, at least initially[9-11], means that infection can spread widely before being recognised. COVID-19 outbreaks in RACFs have been reported in many countries, with high attack rates, despite significant under-ascertainment[9, 10, 12-14].

An outbreak of COVID-19 in a Sydney nursing home.

The first major RACF outbreak in Australia was at the Dorothy Henderson Lodge (DHL), an 80-bed nursing home, which is part of a BaptistCare-operated retirement living complex, in Macquarie Park, a northern suburb of Sydney. The first case was diagnosed on March 3, 2020 when a positive SARS-CoV-2 RT-PCR was reported in a longstanding DHL frontline employee. She had mild respiratory symptoms, but no history of COVID-19 contact or recent travel and had not worked while unwell. A crisis team, comprising DHL managers and Northern Sydney Local Health District public health officers (PHOs) and the infection prevention and control (IPC) manager, immediately isolated the wing where the AIN had worked and implemented IPC precautions. The next day, an IPC specialist from the NSW Clinical Excellence Commission (CEC) took charge of IPC implementation.

Over the next few days, four residents and two additional staff members were diagnosed with COVID-19. All personal care staff were assessed as close contacts of one or more cases and furloughed to home-quarantine. A skeleton staff of BaptistCare managers and other volunteer staff, who had not had close contact with residents, provided care for several days, until agency staff were engaged. Residents were confined to their rooms and standard IPC precautions introduced for all staff, on entry to the facility, with additional contact and droplet precautions during close contact with residents. Enhanced cleaning and modified laundry and waste collection and food delivery practices were introduced. Medical rounds of symptomatic residents were conducted almost daily.

Between 8-16 March, four more residents were diagnosed with COVID-19; a nurse, who had cared for one of these residents before she was symptomatic, was diagnosed on March 20. By then, four staff and eight residents, including three residents who died, had been diagnosed with COVID-19. Apart from the nurse, who started work at DHL on March 8, they were probably infected before, or in the few hectic days after, IPC precautions were introduced. All COVID-19 infected residents were admitted to hospital, including two, with unknown diagnoses, before the first case was confirmed.

By March 20th residents had been confined to their rooms for 17 days and were becoming increasingly distressed; a few, with dementia, repeatedly wandered from their rooms and were often very reluctant to return. Clearly, there was some urgency to provide relief. Therefore, although they were apparently free of acute symptoms, all 68 residents were tested, with a view to allowing them brief periods of supervised exercise outside their rooms, if COVID-19 were excluded. Unexpectedly, six had positive SARS-CoV-2 RT-PCR results. Review of their medical records showed that two had had mild respiratory

symptoms or fever, during the preceding days; they and three who remained asymptomatic stayed at DHL. The sixth, who was asymptomatic when tested, subsequently deteriorated and died in hospital. Ten days later, three more residents were confirmed to have COVID-19 and two later died.

Altogether, 17 of 76 (22%) DHL residents were infected with COVID-19 and six died; five were more than 90 years old. Twelve residents were admitted to hospital; of the five who remained at DHL four recovered and one died, with palliation.

By mid-April, most permanent staff had returned to work. Residents had been in quarantine or isolation for more than six weeks, with serious adverse effects on mental and physical well-being, despite efforts by staff to mitigate them. Strict IPC precautions remained in place, but quarantine was cautiously eased, first by allowing residents short walks outside their rooms, with a carer, and then by allowing them to spend time with fellow residents in the same wing. The outbreak was formally declared over on May 5th.

Major challenges.

The DHL COVID-19 outbreak occurred at a time when community transmission and experience with control were limited. The source of the outbreak was not identified (but, almost certainly, was not the first diagnosed case). Whole genome sequencing[15], confirmed that it was part of a local outbreak that also involved a nearby hospital, school and day care centre. The DHL outbreak was limited (22% attack rate), compared with reported RACF outbreaks overseas. For example, in an almost contemporaneous outbreak in King County, Washington, 101 of 130 (78%) residents were affected, and 34 died (CFR 34% or 26% of all residents)[12]. The CFR at DHL was similar (6/17; 35%) but the overall mortality (6/76; 8%) much less than in many RACF outbreaks overseas (25-30%)[9, 10]. The outcome reflects

BaptistCare management's leadership but was, nevertheless, associated with inevitable personal cost to residents, families and staff, and financial cost to the organisation.

1. *Staffing, IPC and medical support*: From the start, DHL staff and residents were supported by experienced IPC professionals and medical practitioners, who were crucial to the outbreak response. Strict IPC precautions were consistent with national guidelines and, while necessary, also costly and burdensome. The financial cost of outbreak control was mainly attributable to the need to replace quarantined permanent carers, with a greater number of agency staff, needed because of the extra workload involved in adherence to strict IPC precautions, including donning and removing personal protective equipment (PPE). An estimated 800 sets of PPE were used each day, generating enormous amounts of waste, which was initially disposed of as clinical waste, at great expense. Stressful and difficult working conditions, inevitably led to fatigue so it was unsurprising that a CEC review, following the cluster of cases in late March, found a number of IPC breaches. However, after additional training by IPC professionals compliance improved, and the outbreak was controlled.

2. *Effects on residents and relatives:* The long period of quarantine was immensely distressing for residents and relatives. DHL staff took pains to facilitate contact by phone, video, text messaging, voicemail or 'in-person' contact with physical distancing, from a balcony or behind a transparent barrier. Nevertheless, the lack of physical contact, exercise and fresh air seriously affected residents' mental and physical health. Some became depressed, withdrawn or physically deconditioned and refused to eat or later, when given the opportunity, to leave their rooms.

3. *Hospital admission.* Initially, residents with COVID-19, were admitted to hospital, appropriately in the context of a frightening new disease, of which the consequences, for individuals or the community, were uncertain. Later, mildly affected residents were successfully isolated at DHL. It also became clear that dying residents could be safely palliated at the facility, after consideration of their own and their families' wishes and the facility's resources.

4. *Testing and case detection.* Asymptomatic infection and atypical symptoms mean that clinical indicators are an unreliable guide to SARS-CoV-2 testing in high-risk settings such as a RACF. When COVID-19 is present in the neighbourhood of a RACF, frequent active monitoring of staff, residents' and visitors' health, for evidence of acute symptoms or fever, can identify suspicious cases, who need testing and isolation. A single confirmed case requires a prompt outbreak response.

Lessons learnt

- The most important lesson of the DHL COVID-19 outbreak was the need for early, ongoing leadership by facility management and guidance from an experienced IPC professional.
- The COVID-19 outbreak, in Australia, has highlighted a widespread lack of IPC competence and confidence among healthcare and RACF workers. Regular, targeted training of hospital and RACF staff is required to embed IPC principles in routine practice and enable rapid escalation to high-level outbreak precautions, when required.
- Contingency plans are needed to ensure outbreak surge capacity of appropriately qualified and experienced RACF staff to deal with sudden demand, due to absenteeism, from illness or quarantine, particularly if multiple facilities may be affected simultaneously.
- Proactive allied-health support is needed maintain social connection, mobility and nutrition to mitigate risks of prolonged isolation or quarantine of elderly residents.
- Hospital admission of RACF residents with COVID-19, can be determined, on a case-by-case basis, according to medical need, resident preference and facility resources.
- In a RACF, a single confirmed case of COVID-19, in a resident, staff member or frequent visitor, requires an immediate outbreak response, including testing of all staff and residents, isolation or quarantine, as required, and implementation of strict IPC measures.

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