

Outbreak management in residential aged care facilities –prevention and response strategies in regional Australia

AUTHORS

Rachel Latta

Bachelor of Nursing, Masters of Public Health
Clinical Nurse Consultant, Communicable Diseases
Hunter New England Population Health, Booth Building,
Longworth Avenue, Wallsend, NSW, Australia
Rachel.latta@hnehealth.nsw.gov.au

Peter D Massey

DrPH, GCPH, RN
Program Manager Health Protection, Clinical Nurse Consultant,
Hunter New England Population Health,
Booth Building, Longworth Avenue, Wallsend, NSW, Australia
Peter.Massey@hnehealth.nsw.gov.au

Tony Merritt

FAFPHM, MPH&TM, MBBS
Current position: Public Health Physician, Health Protection,
Hunter New England Population Health,
Booth Building, Longworth Avenue, Wallsend, NSW, Australia
Tony.Merritt@hnehealth.nsw.gov.au

Keith Eastwood

DrPH, MAppEpi, BAppSci
Epidemiologist, Health Protection, Hunter New England
Population Health, Booth Building, Longworth Avenue,
Wallsend, NSW, Australia
Keith.Eastwood@hnehealth.nsw.gov.au

Fakhrul Islam

MBBS, FCGP, MBA, MSS
Analyst, Health Protection, Hunter New England
Population Health, Booth Building, Longworth Avenue,
Wallsend, NSW, Australia
Fakhrul.Islam@hnehealth.nsw.gov.au

David N Durrheim

MBChB, DTMH, DCH, MPH&TM, DrPH, FAFPHM
Director, Health Protection, Hunter New England
Population Health, Booth Building, Longworth Avenue,
Wallsend, NSW, Australia
David.Durrheim@hnehealth.nsw.gov.au

Acknowledgements

Hunter New England would like to thank all RACFs who participated in the study.

KEY WORDS

aged care; disease outbreaks; influenza; gastroenteritis

ABSTRACT

Objective

To identify the outbreak prevention and response preparedness of residential aged care facilities (RACFs) in the Hunter New England area of New South Wales (NSW).

Design

A cross-sectional telephone survey.

Setting

RACFs who provide full time nursing care in regional NSW.

Subjects

Twenty randomly selected RACFs including nine metropolitan and 11 rural facilities within the regional Hunter New England (HNE) district of NSW.

Main outcome measures

Percentage of staff and residents vaccinated against influenza in 2013; availability and use of a surveillance system to detect outbreaks; knowledge of national outbreak resources; and presence of a facility outbreak management plan.

Results

Across the 20 facilities more than 85% of residents were vaccinated against influenza in 2013. Staff influenza vaccination rates varied from less than 50% in six facilities to greater than 80% in nine facilities. Overall, 18/20 (90%) facilities reported having outbreak management plans available; however only 5/20 (25%) facilities reported having an outbreak surveillance system in place.

Conclusion

RACFs in this sample reported varying levels of outbreak prevention and preparedness strategies. Nursing staff working in RACFs need to ensure strategies are in place to prevent and respond to communicable disease outbreaks. In particular all facilities are encouraged to have an outbreak surveillance system in operation, especially during the peak seasons. RACF accreditation should consider including outbreak prevention, preparedness and management outcomes in the review measures to ensure all RACFs have strategies in place to protect vulnerable residents from common communicable disease outbreaks.

INTRODUCTION

Respiratory and gastroenteritis outbreaks within residential aged care facilities (RACFs) cause considerable morbidity and distress, and impact negatively on staff, resources and residents' activities (Kirk et al 2010; McCall et al 2007). Outbreaks within RACFs are frequent, with an estimated 17% of RACFs in Australia experiencing an outbreak of gastroenteritis each year, most of these occurring in Australia's winter (June – August) (Kirk et al 2010). Surveillance conducted in Australia, between 2002 and 2008, identified 3257 reported outbreaks in RACFs affecting 84,769 people; and resulting in 1577 hospitalisations and 209 deaths (Kirk et al 2010). The potential severity of outbreaks is highlighted by an influenza-like-illness outbreak in a RACF in New South Wales (NSW) which affected 26 residents, resulted in 14 hospital admissions and was associated with six deaths (Turahui et al, 2008). The reported number of outbreaks likely under-represents the actual number of outbreaks within facilities (Eastwood et al 2008).

Elderly people living in RACFs are more vulnerable to gastroenteritis and respiratory illness due to physiological reasons (Slotwiner-Nie and Brandt 2001); comorbid medical conditions associated with ageing (Gavazzi and Krause 2002); close living arrangements; and frequent contact with visitors and staff (Strausbaugh et al 2003). Infectious diseases may be introduced into RACFs through staff, visitors from the community, hospital admissions and transfers from other facilities (Strausbaugh et al 2003).

Early recognition of outbreaks by nurses, and implementation of outbreak control measures, is important for reducing the spread of infectious gastrointestinal and respiratory diseases within RACFs. Early recognition by RACF nurses allows the timely implementation of outbreak control measures including: environmental cleaning and disinfection; use of personal protective equipment; infection control signage and education; isolation of ill residents; and cohorting of ill residents and staff (Department of Ageing and Aged Care, 2014). In addition, RACFs can minimise the transmission of infectious enteric and respiratory diseases to staff and residents through outbreak prevention and preparedness strategies, which include: annual influenza vaccination of residents and staff (Communicable Disease Network Australia (CDNA), 2017); discouraging ill visitors and staff attending the facility; and provision of hand washing facilities for residents, staff and visitors (Jefferson et al 2010). Outbreak preparedness can include outbreak management plans, communicable disease surveillance and awareness of outbreak resources (Eastwood et al 2008).

The Hunter New England Local Health District is located in northern NSW and the Public Health Unit (HNE PHU) has worked with RACFs within the district over the past decade to provide advice and to strengthen the capacity of RACFs to respond to communicable disease outbreaks. Support to RACFs by the HNE PHU includes:

- telephone advice from nurse consultants to RACFs following the notification to the PHU of a respiratory or gastroenteritis outbreak;
- promoting national outbreak guidelines and resources including line listing templates on the HNE PHU website;
- RACF site visits if requested by the facility or if indicated by the course of the outbreak;
- dissemination of a monthly RACF-specific report identifying current communicable disease issues and links to outbreak management resources;
- annual RACF teleconference discussing outbreak prevention and preparedness strategies prior to influenza season; and
- periodic review of preparedness. Computer assisted telephone interviews were conducted in 2004, 2005 and 2006 with over 100 RACFs in the HNE region.

In NSW, gastroenteritis outbreaks in institutions and laboratory-confirmed influenza cases are notifiable under the NSW Public Health Act, 2010 (NSW Parliament 2010). During the period 2010-2012, 150 gastroenteritis outbreaks and 12 influenza outbreaks were reported to the HNE PHU.

There are limited published evaluation reports of outbreak preparedness strategies in RACFs in Australia and nurses roles in outbreaks. In this study we explored outbreak prevention and preparedness strategies used by RACFs within a regional area of NSW, Australia.

The project aimed to:

1. review outbreak prevention and response preparedness of RACFs;
2. identify opportunities for the public health unit to work with RACFs to reduce the burden of gastrointestinal and respiratory outbreaks; and
3. compare outbreak prevention and preparedness between regional, metropolitan and rural RACFs.

METHOD

Setting

The Hunter New England Health Local Health District (HNELHD) in northern NSW includes metropolitan, rural and remote areas; covering an area of 130,000km² it includes the coastal cities of Newcastle and Lake Macquarie, and inland regional centres of Maitland, Tamworth and Armidale. The district has a population of approximately 875,000 people (Health Statistics NSW 2013) and 131 RACFs comprising 58 metropolitan and 73 rural facilities.

Design

A short telephone survey assessing outbreak domains was developed which included questions relating to outbreak prevention and preparedness measures; outbreak surveillance systems; and resident and staff immunisation coverage. The survey was developed using a combination of validated questions from a previous RACF questionnaire used by the HNE PHU in 2005 (Eastwood et al 2008) and additional questions developed by the project team.

RACFs included in this study were defined as nursing homes and hostels located in the Hunter New England area of northern NSW that provide full time nursing care. Twenty RACFs were randomly selected from the 131 RACFs using Excel randomisations in two strata, metropolitan and rural. The sample of 20 was used to fit with the available resources to complete the study and provide a reasonable snapshot of current practice. The same researcher conducted all interviews. Pilot testing of the survey was conducted with two RACFs that were not selected in the randomisation process and these results are not included in the analysis.

Data collection

In June 2013 a letter was sent to all 20 selected RACFs inviting them to participate in the study. A copy of the questionnaire was also included to assist facilities to have appropriate information available for the telephone interview. The person interviewed at each RACF was either the facility manager; facility care manager; or infection control delegate. The phone interviews were conducted over a period of three weeks with each interview taking between 20-30 minutes.

Analysis

All questionnaire responses were recorded in a Microsoft Excel worksheet. Frequencies were generated using SAS software version 9.1.3 for Windows. Relative risks with 95% confidence intervals were calculated in Excel, and compared vaccination coverage, staff vaccination availability and access. To allow meaningful comparison the vaccination coverage was divided into three categories >80%, 50-80% and <50%.

Ethics

The HNE Local Health District Human Research Ethics Committee classified this research project as a quality improvement project.

FINDINGS

The participating facilities included nine metropolitan and 11 rural facilities. Seven were hostel-based facilities, six were nursing home facilities and seven offered both nursing home and hostel-based care; the participating facilities differed in sizes (table 1). The nursing workforce varied according to the size of the facility with 18/20 facilities employing up to 100 nursing care staff. Sixteen of the facilities were owned by private organisations, thirteen of these being not for profit organisations, while the remaining four facilities were run by local government councils (table 1). Half (10/20) of the RACFs reported that over 80% of nursing staff were permanently employed and in the remaining 10 facilities 50 – 80% of nursing staff were permanently employed. Nursing agency use was relatively infrequent with 10 facilities reporting they never used nursing agency staff and six facilities stating they used agency staff less than once per month.

Table 1: Residential Aged Care Facility location, level of care provided, size and attachment to larger organisation, Hunter New England, June 2013

	Metropolitan	Rural	Total
No. of facilities (n = 20)	9	11	20
Level of care provided			
Hostel	3	4	7
Nursing Home	3	3	6
Nursing Home and Hostel	3	4	7
Size of facility			
Small (0-50 residents)	2	8	10
Medium (51 – 100 residents)	5	2	7
Large (more than 100 residents)	2	1	3
Ownership			
Private	3	0	3
Private, Not-for-Profit	6	7	13
Public	0	4	4

Nineteen facilities reported having an influenza vaccination register for residents and 80% (16/20) of facilities reported having an influenza vaccination register for staff that was updated annually. The reported percentage of residents immunised against influenza across all facilities in 2013 was above 85%, with 15 RACFs stating that greater than 95% of residents had been vaccinated during that year (table 2). A higher proportion of metropolitan RACFs reported having vaccination coverage over 95% (RR = 1.4 (95% CI 0.84 – 2.31)) compared to rural RACFs for the 2013 influenza season however the difference was not statistically significant.

Table 2: Influenza vaccination coverage for Hunter New England RACF residents in 2013 by location, June 2013

	Number and percentage of RACFs		
	<i>Metro</i>	<i>Rural</i>	<i>Total</i>
Percentage of residents who received influenza vaccination in 2013			
Less than 85%	0	0	0/20 (0%)
85 to 95%	1	4	5/20 (25%)
More than 95%	8	7	15/20 (75%)

Reported staff vaccination rates were less than 50% for six RACFs and more than 80% for nine RACFs (table 3). The majority of facilities (15/20) reported they offered influenza vaccine at no cost to staff and made it available at the workplace. Staff vaccination coverage using the three categories is described in table 3. The majority of sites with staff vaccination coverage >80% offered free vaccine to staff however this did not reach statistical significance (RR = 1.17 (CI 0.35 -3.88)).

Table 3: Staff influenza vaccination coverage in 2013 by location and availability of free vaccine on-site, Hunter New England, 2013

Percentage of staff who received influenza vaccination in 2013	Number and location of RACFs		Free vaccine offered on-site		Total
	<i>Metro</i>	<i>Rural</i>	<i>Yes</i>	<i>No</i>	
Less than 50%	1	5	3	3	6/20 (30%)
50 – 80%	4	1	5	0	5/20 (25%)
More than 80%	4	5	7	2	9/20 (45%)

All RACFs reported that alcohol hand gel or hand washing basins were provided at the entrance to the facility for visitor and staff use. The majority of facilities (18/20) reported having signage throughout the year at public entrances requesting ill (symptomatic) visitors not to enter the facility; the remaining two facilities displayed signage only during a facility outbreak. Five facilities reported verbal screening of visitors by staff prior to entry.

Only five facilities (25%) reported having a regularly reviewed and documented surveillance system for detecting an outbreak of gastroenteritis or respiratory illness. Nineteen facilities reported having a nominated infection control coordinator; however, in many of these facilities (12/19) this role was integrated with another nursing position with no set hours dedicated to infection control.

Nineteen facilities were aware of the Department of Health Ageing and Aged Care (DOHAAC) 'Gastro Kit' (DOHAAC 2014) and 18/20 facilities reported being aware of the Department of Health Ageing and Aged Care 'Influ Kit' (DOHAAC 2014). Ten facilities (50%) reported their awareness of the Communicable Diseases Network Australia 'Influenza Guidelines for Residential Aged Care Facilities' (Communicable Diseases Network Australia (CDNA) 2009).

Outbreak management response plans were available in 18/20 (90%) facilities, a similar proportion (106/108) to that identified in an earlier study within the local area (Eastwood et al 2008). Ten facilities reported they had an agreement with a single general practitioner who would coordinate medical services during an outbreak in their facility.

DISCUSSION

This RACF survey provided insight into various aspects of outbreak prevention and preparedness for metropolitan and regional RACFs in the study region of northern NSW. Nurses play an important role in reducing the risks of outbreaks in RACFs through high rates of resident influenza vaccination, awareness of national outbreak management guidelines and use of outbreak management plans. Weaknesses in outbreak prevention included low staff influenza vaccination rates at some facilities and the limited use of surveillance systems to detect communicable disease outbreaks.

Immunisation is regarded as one of the most effective ways to prevent and control seasonal influenza outbreaks (CDNA 2017). The Department of Health, Ageing and Aged Care recommends all residents and staff working in RACFs be provided with influenza vaccination annually (ATAGI 2015; DOHAAC 2014). Local RACFs reported higher resident influenza vaccine coverage than reported in an earlier study (Eastwood et al 2008) although both resident and staff vaccination levels in the study population remained below national RACF influenza vaccination targets and these were not validated by viewing records (CDNA 2017).

Staff influenza vaccination rates varied across the region. Studies have shown nursing and other staff vaccination coverage is associated with various factors including previous vaccination uptake, personal health issues, and concerns about side effects and doubts about vaccine effectiveness (Chalmers 2006; Halliday et al 2003). An internet survey of over 1,000 health care personnel (HCP) in the United States of America in 2014-2015 found that influenza vaccination coverage among health care personnel was 64.3% with the highest coverage amongst HCP working in hospitals (78.7%) and lowest amongst HCP working in long-term care facilities (54.4%) (Black et al 2014). An Australian study in 2000 found that just 28% of RACF nurses and other staff in the Australian Capital Territory received influenza vaccine (Halliday et al 2003), a similar percentage (27%) reported in a NSW RACF during an outbreak of influenza-like illness (Turahui et al 2008). Poor uptake of influenza vaccination amongst RACF nurses and other staff continues to occur despite national recommendations, and is a major gap in the ability to protect vulnerable residents from influenza transmission within their home environment. Strategies for increasing RACF staff influenza vaccination uptake need to be implemented and supported by managerial staff, in addition to addressing concerns about vaccine side effects, and providing targeted education on vaccination as a measure to reduce risk for patients and staff.

Comprehensive resources are available to assist RACFs prepare outbreak response plans but not all facilities reported being familiar with them. Public health units have a role in connecting RACFs to key national resources and encouraging the management of outbreaks within these guidelines.

The use of a surveillance system, which is regularly reviewed and easily identifies clusters of similar illness across the facility, can assist in early outbreak identification and response (Eastwood et al 2008). An effective outbreak surveillance system identifies residents or staff members with respiratory or gastroenteritis symptoms which may precede or indicate early stages of an outbreak. "Facilities should have the capacity to count those with ILI (influenza like illness) each day and identify a potential influenza outbreak (i.e. 3 cases of ILI in a 3-day period)" (CDNA 2017, p12). The current study identified limited use of surveillance systems amongst RACFs. Surveillance in RACFs can be challenging due to high patient to staff ratios, limited numbers of nurses with experience in surveillance, high staff workloads, inability of residents to communicate symptoms and atypical symptoms in the elderly. There is substantial room for improvement in ensuring the development and use of a surveillance tool to identify disease clusters within RACFs.

Since 2014, all RACFs within Australia are subject to accreditation by the Australia Aged Care Quality Agency (AACQA). Facilities are assessed under four standards comprising of 44 outcomes to ensure residents across Australia are provided with optimal and standardised care (Australian Government ComLaw 2014). The

accreditation process offers a unique opportunity to directly monitor RACFs outbreak prevention, response and management practices and ensure facilities have strategies in place to prevent and respond to communicable disease outbreaks. Public health agencies could advocate with the AACQA to develop standards within these accreditation outcomes that include outbreak prevention and management strategies. Currently the accreditation standards for RACF infection control are inadequate. The standards must include reportable indicators for staff and resident influenza vaccination alongside effective disease surveillance systems if real change is to occur. Passive interventions such as monthly reports, promotion of resource documents and telephone communications have been used extensively in the HNE district with an inadequate effect and it is evident that more active measures may need to be employed.

There are a number of limitations to this study. Due to small numbers of facilities participating in the study the results may not be representative of all RACFs either in the study area or elsewhere. The majority (17/20) of local RACFs interviewed were small to medium sized facilities with less than 100 residents which may differ with other health regions. Larger facilities may have a higher risk of respiratory and gastrointestinal disease outbreaks due to the difficulty in managing a greater number of patients, but may also have greater resources to prepare response plans. We did not attempt to verify responses through alternative data sources; however, response bias is likely to favour improved performance such as reporting higher vaccination coverage and knowledge of resources.

CONCLUSIONS

RACFs across a regional area of New South Wales demonstrated variable quality of outbreak prevention and preparedness, and some RACFs did not have adequate outbreak preparedness measures in place. Nursing staff working in RACFs play an important role in ensuring facilities are adequately prepared to respond to communicable disease outbreaks through high resident and staff vaccination rates; a robust surveillance system to detect clusters of illness; and implementation of guidance from national outbreak resources. RACF accreditation should include assessment of the RACFs capacity in outbreak prevention, preparedness and management. Robust prevention strategies are critical to protect vulnerable residents from communicable disease outbreaks.

REFERENCES

- Australia. ComLaw. 2014. Quality of Care Principles 2014. <https://www.comlaw.gov.au/Details/F2014L00830/Explanatory%20Statement/Text> (accessed 04. 02.16).
- Australian Government. Department of Ageing and Aged Care. 2014. *Gastro-Info Gastroenteritis Kit for Aged Care: resources to assist residential aged care homes in preventing, identifying & managing outbreaks of gastroenteritis*. <https://agedcare.govcms.gov.au/publications-articles/resources-learning-training/gastro-info-gastroenteritis-kit-for-aged-care-resources-to-assist-residential-aged-care-homes-in-preventing-identifying-managing-outbreaks-of-gastroenteritis> (accessed 07.07.16).
- Australian Government. Department of Ageing and Aged Care. *Influ-Info Influenza Kit for Aged Care 2014*. <https://agedcare.govcms.gov.au/publications-articles/resources-learning-training/influ-info-influenza-kit-for-aged-care> (accessed 07.07.16).
- Australia. New South Wales Government. 2010. *Public Health Act 2010 No 127*. NSW Legislation.
- Australian Technical Advisory Group on Immunisation (ATAGI). 2015. *The Australian Immunisation Handbook (10th ed 2015 update)*. Australian Government Department of Health: Canberra.
- Black, C.L., Yue, X., Donahue, S.M., Ball, S.W., Izrael, D., Lu, P., Williams, W.W., Graitcer, S.B., Bridges, C.B., Lindley, M.C., Laney, A.S., A dePerio, M. and Greby S. 2014. *Health Care Personnel and Flu Vaccination, Internet Panel Survey, United States*. <http://www.cdc.gov/flu/fluview/hcp-ips-nov2014.htm> (accessed 27.05.2016).
- Chalmers, C. 2006. Understanding healthcare worker uptake of influenza vaccination: a survey. *British Journal of Infection Control*, 7(2):12–17.
- Communicable Diseases Network Australia. 2009. *A Practical Guide to assist in the Prevention and Management of Influenza Outbreaks in Residential Care Facilities in Australia*. <http://www.health.gov.au/internet/main/publishing.nsf/Content/cdna-flu-guidelines.htm> (accessed 10.02.16).

- Communicable Diseases Network Australia. 2017. A practical Guide to assist in the Prevention and Management of Influenza Outbreaks in Residential Care Facilities in Australia. <http://www.health.gov.au/internet/main/publishing.nsf/Content/cdna-flu-guidelines.htm> (accessed 19.10.17).
- Eastwood, K., Osbourn, M., Francis, L., Merritt, T., Nicholas, C., Cashman, P., Durrheim, D. and Wiggers, J. 2008. Improving communicable disease outbreak preparedness in residential aged care facilities using an interventional interview strategy. *Australasian Journal of Ageing*, 27(3):143-149.
- Gavazzi, G. and Krause, K.H. 2002. Ageing and infection. *Lancet Infectious Diseases*, 2:659-666.
- Halliday, L., Thomson, J., Roberts, L., Bowen, S. and Mead, C. 2003. Influenza vaccination of staff in aged care facilities in the ACT: how can we improve the uptake of influenza vaccine? *Australian and New Zealand Journal of Public Health*, 27(1):70-75.
- Health Statistics New South Wales. http://www.healthstats.nsw.gov.au/Indicator/dem_pop_lhnmap/dem_pop_lhn_snap?filter1ValueId=&filter2ValueId (accessed 10.02.16).
- Jefferson, T., Del Mar, C., Dooley, L., Ferroni, E., Al-Ansary, L.A., Bawazeer, G.A., VanDriel M.L., Nair, S., Foxlee, R. and Rivetti, A. 2010. Physical interventions to interrupt or reduce the spread of respiratory viruses (Review). *The Cochrane Database of Systematic Reviews*, Issue 1. Art. No.: CD006207. DOI: 10.1002/14651858.CD006207.pub3.
- Kirk, M.D., Fullerton, K.E., Hall, G.V., Gregory, J., Stafford, R., Veitch, M.G. and Becker, N. 2010. Surveillance for Outbreaks of Gastroenteritis in Long-Term Care Facilities, Australia, 2002 – 2008. *Clinical Infectious Diseases*, 51(8):907-914.
- McCall, B.J., Mohr, C.M. and Jarvinen, K.A.J. 2007. Observations on managing an outbreak of influenza A infection in an aged care facility. *Clinical Infectious Diseases*, 34(4):410-412.
- Slotwiner-Nie, P. K. and Brandt, L. J. 2001. Infectious diarrhoea in the elderly. *Gastroenterology clinics of North America*, 30(3):625-635.
- Strausbaugh, L. J., Sukumar, S. R. and Joseph, C. L. 2003. Infectious Disease Outbreaks in Nursing Homes: An Unappreciated Hazard for Frail Elderly Persons. *Ageing and Infectious Diseases*, 36: 870 – 876.
- Turahui, A., Wallace C., Corben, P. and Osbourne R. 2008. Lessons from a respiratory illness outbreak in an aged-care facility. *NSW Public Health Bulletin*, 19: 9-10.