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Research paper

Organisation and governance of infection prevention and control in Australian residential aged care facilities: A national survey

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Abstract *Background:* Individuals in residential and aged care facilities (RACFs) are at risk of developing health care-associated infections (HAIs) due to factors such as age-related changes in physiology, immunity, comorbid illness and functional disability. The recent establishment of an Australian Royal Commission into the Quality of Residential and Aged Care Services highlights the challenges of providing care in this sector. This national study identified infection prevention and control (IPC) services, practice and priorities in Australian RACFs.
Methods: A cross-sectional study of 158 Australian RACFs comprising a 42-question survey incorporating five key domains relating to IPC namely governance, education, practice, surveillance, competency and capability was undertaken in 2018.
Results: Of the 131 respondents, the majority 92.4% of respondents reported having a documented IPC program, 22.9% (n = 30) operated with a dedicated infection control committee The majority of RACFs reported lacking specialist and qualified experienced IPC professionals (n = 67). The majority of RACFs (90.1%, n = 118) reported the existence of a designated employee with IPC responsibilities. Of these 118 staff members with IPC responsibilities, 42.5% had a qualification in IPC. The reported average funded hours per month for IPC

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professional or an external provider of IPC activities was 14 (95% CI 9.6—18.9 h).
Conclusion: The overwhelming majority of RACFs deliver IPC services and report doing so in ways that meet the needs of their own specific contexts in the absence of the lack of formal guidelines when compared to the hospital sector. Quality residential and aged care free from HAIs requires formal structure and organization strategies.

Highlights

- A cross-sectional study of 158 Australian residential and aged care facilities (RACFs).
- Majority of RACFs have an infection control program and an employee with infection prevention and control responsibilities.
- Support for RACF staff who are responsible for infection prevention and control could be enhanced.

Introduction

Every year, there are approximately 160,000 cases of healthcare-related infection (HAI) in Australian hospitals, and 1.9 million hospital bed days are used to treat them [1,2]. The Australian Commission on Safety and Quality in Health Care (ACSQHC) acknowledges that in the hospital context, the success of its multi-million dollar HAI program depends almost entirely on the ability of infection control professionals (ICPs) to implement recommended strategies [3]. There are different national guidelines for infection prevention and control in hospitals [4] and residential aged care facilities (RACFs) [5]. Residential aged care is delivered to older people in Australia by service providers who are approved under the *Aged Care Act 1997*. A range of care options and accommodation are available for older people who are unable to continue living independently in their own homes [6]. The term 'nursing home' is not used in Australia.

There are studies that have examined infection control in the RACFs outside of Australia [7—10], however there are few published Australian studies. The peer-reviewed research literature that does exist on infection control in RACFs in Australia is limited to infection data, antimicrobial use and stewardship [11—15]. None peer-reviewed literature include a report undertaken by the Australian Aged Care Quality Agency [16]. Limited or no information has been published on access to advice and support, how infection-control services are organised and descriptions of infection-control programs, practices, policies and education in RACFs. This is not surprising, as until recently there was limited information regarding organisational support, ICP skills and education and the staffing and resources used to deliver infection-control programs in Australian hospitals [17]. These are all important elements of improving healthcare quality [18], and it is critical that these issues be understood if implementation of infection-control strategies is to succeed.

We sought to address specific gaps in our understanding of infection control services in the Australian aged care sector and to build on internationally published work and recent explorations of infection-control units in Australian hospitals [19—28]. In this paper, we present our findings on the governance structures and processes within Australian RACFs and details regarding their infection control programs, including who is responsible for delivering them.

Methods

Study design

In 2018, we conducted an online cross-sectional survey of RACFs across all Australian states and territories.

Participants

All RACFs in Australia were eligible for inclusion in the study. Contact details were derived from a database operated by the Australian Government that is meant to be inclusive of all RACFs in Australia. An invitation to participate and promotional material were sent via post to all RACFs listed in the database. For multicentre RACFs, only the primary location of the RACF was invited to participate. Subsequently, 40% (n-493) of the RACFs in each state and territory were randomly chosen to be followed up with phone calls that encouraged participation. Incentives were also used to promote participation. At the end of the online survey, respondents could choose to enter a drawing for prizes, including textbooks, an iPad and a one-year paid membership in the Australasian College of Infection Prevention and Control.

Data collection

A confidential web-based, cross-sectional survey was developed based on standardised instruments used in previous studies from the USA and UK and on work undertaken in Australia to explore similar themes [23,26]. Two members of the research team have extensive experience in developing a suitable tool, having recently completed a similar program in Australian hospitals [21,27,29]. The

survey included sections on the demographics of the facility and the person there responsible for infection control, as well sections asking for details about policies, education, surveillance and infection-control services. No personally or organisationally identifiable or re-identifiable information was collected. In the invitation letter, each RACF was allocated a unique code that enabled the researchers to determine coverage and identify duplicate survey responses.

Data analysis

The data were analysed using the SPSS statistical software program. After data cleaning, descriptive statistics and frequencies for all relevant variables were calculated. In addition, 95% confidence intervals (CIs) were calculated using Fisher's exact test. When calculating the mean full-time equivalent (FTE) staff supporting IPC activities, it was assumed that an FTE worked 38 h per week. Bootstrapping 1000 intervals was used to determine the CIs for the mean FTE hours per 100 funded beds. A word cloud, using an online software package (WordArt) [30] was used to illustrate the frequency of common the work undertaken by designated IPC staff: infection prevention and control activities.

Results

Participants

A total of 1230 RACFs received a postal invitation to participate in the study. Of those, 40% (n = 493) were followed up with a reminder phone call. A total of 134 (10.9%) of the RACFs completed the survey, which in total equated to 11,899 funded beds. Responses were received from every state and territory in Australia, as follows: New South Wales (n = 45), Queensland (n = 23), Victoria (n = 31), Tasmania (n = 8), Western Australia (n = 10), South Australia (n = 11), Northern Territory (n = 2) and Australian Capital Territory (n = 4). The response rates ranged from 9% (Victoria) to 33% (Australian Capital Territory). The types of care provided by the facilities included residential, respite, dementia and palliative. The mean number of funded beds among the participant RACFs was 88.8 (SD = 50.26, range 5–450, n = 134). In terms of direct patient-care staff employed in the facilities, excluding non-clinical staff, the facilities reported an average of 81.2 employed clinical staff (SD = 43.52, range 9–300, n = 134).

Person completing the survey

The average age of the person completing the survey was 51 years (SD = 11.26, range 21–74, n = 129), and the majority were female (82%). The respondents were most commonly employed in the broad categories of manager (30.5%), clinical manager (21.4%) or nurse manager (20.6%). A Bachelor of Nursing was most often reported as the highest qualification (49/132, 37.1%), although 3 respondents (2.3%) reported holding a PhD and 4 (3.1%) reported that their highest qualification was a diploma from a program other than nursing.

Infection prevention and control governance

Table 1 presents a summary of the governance structures reported by participating RACFs. Of note, 22.9% stated that they have a specific IPC Committee on site (30/131), whilst 77.1% reported that their IPC was encompassed by a different committee (101/131), for example, a Quality/Safety Committee.

Infection prevention and control activities and designated infection prevention and control professional staff

The average reported funded hours per month for a support person or an external provider of IPC activities was 14 (95% CI 9.6–18.9 h). This ranged from no funded hours for IPC to 150 h per month. Across all participating facilities, the mean FTE of staff that supported IPC activities was 0.41 per 100 funded beds (95% CI 0.31–0.52).

The survey responses indicated that 90.1% of RACFs (118/131) reported the existence of a designated employee with IPC responsibilities. Of these 118 staff members who had IPC responsibilities, 42.5% had a qualification in IPC, and 27.4% of respondents reported that they did not know this information. Most (59.8%; 67/112) of these designated personnel were not members of any IPC professional association. A detailed breakdown of activities and frequencies is provided in Table S1. Of note, there was limited involvement in policy development, research and IPC program development.

The respondents were asked how they accessed IPC advice in their facilities, and 90.1% (118/131) reported having a designated employee or other person on site who provided IPC-related advice. There was no difference

Table 1 Support for IC-Related activities in RACFs according to size (N = 131).

Element	Total
	N (%)
IC Committee	
Specific IPC committee	30 (22.9)
Other committee encompassing IPC	101 (77.1)
IPC Program	
Documented IPC program	121 (92.4)
No documented IPC program	10 (7.6)
Nominated person for IPC support	
On site	108 (82.4)
Within parent organisation	30 (22.9)
External	24 (18.3)
None	9 (3.1)
Other	4 (3.1)

Note: RACF = Residential Aged Care Facility, IPC = Infection Prevention & Control. Respondents were able to select multiple options for the 'Nominated person for IPC support question.

among facilities of different sizes in how advice was sought. Fig. 1 provides a breakdown of the sources of IPC advice.

Surveillance

Other key areas evaluated were the infection surveillance and epidemiological investigations undertaken in each facility. The majority of RACFs (93.5%; 116/124) stated that they have IPC-related reporting procedures for reconciling infection rates among residents, determining trends and/or reporting the success of the IC procedures in place. This trend was consistent across all states and territories and across all facility sizes. The majority of respondents (64.5%; 80/124) indicated that external IPC auditing was not performed in their facility.

The majority of RACFs (84.5%, n = 93) reported that auditing or surveillance of the frequency of infections in residents occurred at least monthly. The types of infections monitored included urinary tract infections, gastroenteritis, influenza, pneumonia, common colds, upper/lower respiratory tract infections, bronchitis, eyes/ears/nose infections, bloodstream infections, skin infections, multiresistant infections and viral infections.

Most respondents (75.2%, n = 91) also indicated that the data from surveillance and audit practices regarding the frequency of infections in residents was generally reported only internally, meaning to staff, including in bulletins and on noticeboards, in internal staff meetings and in formal reports to the head office or the board of directors.

Infection prevention and control barriers, challenges and priorities

The respondents were asked to use a Likert scale to rate their level of agreement that a number of issues were barriers, challenges or priorities regarding IPC. A full dataset is provided in Table 2 and Table S2. The majority of respondents agreed or strongly agreed that they had access to a range of IPC resources, except for epidemiological support. As for epidemiological support, 32% (n = 35) agreed that they had access to it, and 38% (n = 4 6) did not know.

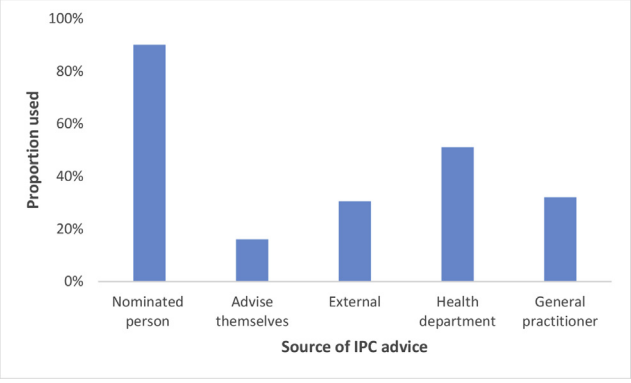

Figure 1 Advice processes in residential aged care facilities. Note: For each item, respondents were asked if they use this source for advice. 'Nominated person' refers to a person within their organisation. 'External' refers to an external person or company.

The biggest challenges indicated by respondents were a lack of interest in IPC by residents (39%, n = 47) and a lack of interest in IPC within the facility (36%, n = 43). The respondents were also asked to choose from a list provided the one additional resource that they would want (Fig. 2). Increased access to an IPC professional ranked as the highest priority (40%, n = 49), followed by increased support for their designated IPC person (27%, n = 23).

Discussion

This paper describes how IPC activities in Australian RACFs are reported to be governed and resourced and is based on the results of a survey that included a broad range of facilities from all Australian states and territories. We also aimed to highlight the challenges faced by RACFs, their priorities and the opportunities that these may present in the future. Therefore, the survey results may help define the future direction of IPC in the RACFs in Australia.

It is important to note that RACFs are formally designed as traditional healthcare facilities but rather social care settings [31]. This distinction makes examining a health topic such as IPC difficult, particularly when the context is critical to any risk assessment for HAI. In view of this some findings from our study are of particular interest. By and large, the majority of RACFs appear to be engaged in IPC, a conclusion consistent with one from a large survey of Australian RACFs conducted several years ago [32]. We found that the average reported hours in support of IPC activities was 14 per month, a number consistent with the one found by a 2016 survey of Victoria RACFs [33].

Existing research has found that infection control programs and plans Australian hospital are in the main formally organised with strong alignment to prevailing jurisdictional requirements while also meeting relevant national standards [17]. For participating RACFs in this study, however, there is an absence of a robust, structured frameworks for IPC. While Australian hospitals are guided by different national and state-based jurisdictional standards and guidelines, most notably ACSQHC Standard 3 Preventing and Controlling Healthcare-Associated Infection [34], RACFs in this study report in effect managing IPC resources and governance arrangements themselves. This is partially reflected in the findings of our survey, which showed, for example, that IPC reporting is integrated into other governance arrangements and that IPC support is resourced and delivered in diverse ways. Others have come to similar conclusions, including the authors of the Victoria study, who noted that IPC programs and surveillance activities were generally supported and implemented at the facility level [33].

A study by Stuart and colleagues that explored infection-control and antimicrobial-stewardship practices in Australian RACFs identified that 91% of them had designated infection-control personnel [32]. However, only 31% of these had any certification in infection control [32]. Our survey explored this issue and found similar results, including that 44% of staff responsible for supporting IPC services have no qualifications in that field and that 60% were not members of any professional IPC association. These two findings point to the importance of supporting

Table 2 Barriers and priorities for infection prevention and control (N = 121).

Question	Strongly disagree		Disagree		Neutral		Agree		Strongly agree		Mean	95.0% CI
	n	%	n	%	n	%	n	%	n	%		
In my facility/organisation I have:												
Access to key decision makers for planning	1	0.8%	2	1.7%	10	8.3%	20	16.5%	88	72.7%	4.59	4.45–4.73
Access to key decision makers for problems	0	0.0%	2	1.7%	5	4.1%	17	14.0%	97	80.2%	4.73	4.62–4.84
Access to infectious disease physician if needed	8	6.6%	11	9.1%	16	13.2%	25	20.7%	61	50.4%	3.99	3.76–4.22
Access to microbiologist if needed	18	14.9%	16	13.2%	38	31.4%	27	22.3%	22	18.2%	3.16	2.92–3.39
Access to epidemiologist/statistical experience from external organisation	18	14.9%	16	13.2%	38	31.4%	27	22.3%	22	18.2%	2.83	2.60–3.06
Access to more IPC knowledgeable colleagues from facility	4	3.3%	5	4.1%	12	9.9%	35	28.9%	65	53.7%	4.26	4.07–4.44
Access to more IPC knowledgeable colleagues from ext organisation	6	5.0%	2	1.7%	13	10.7%	34	28.1%	66	54.5%	4.26	4.07–4.45
Access to epidemiologist/statistical experience from external organisation	24	19.8%	12	9.9%	46	38.0%	17	14.0%	22	18.2%	3.01	2.77–3.25
Authority to close beds in the event of an outbreak	4	3.3%	2	1.7%	7	5.8%	13	10.7%	95	78.5%	4.60	4.43–4.76
In your view, how important are the following challenges or issues?												
Lack of IPC interest within facility	32	26.4%	32	26.4%	14	11.6%	22	18.2%	21	17.4%	2.74	2.47–3.00
Lack of IPC interest external to facility	39	32.2%	23	19.0%	29	24.0%	21	17.4%	9	7.4%	2.49	2.25–2.72
Lack of IPC interest from residents	21	17.4%	37	30.6%	16	13.2%	28	23.1%	19	15.7%	2.89	2.65–3.14
Inability to access IPC advice	62	51.2%	28	23.1%	12	9.9%	10	8.3%	9	7.4%	1.98	1.75–2.20
Inability to access IPC education for staff	62	51.2%	29	24.0%	14	11.6%	6	5.0%	10	8.3%	1.95	1.72–2.18
Insufficient time to deliver IPC education to staff	41	33.9%	22	18.2%	20	16.5%	25	20.7%	13	10.7%	2.56	2.31–2.82
Inability to survey/audit IPC practice	55	45.5%	35	28.9%	15	12.4%	11	9.1%	5	4.1%	1.98	1.77–2.18
Inability to survey/audit infection rates at facility	61	50.4%	32	26.4%	14	11.6%	9	7.4%	5	4.1%	1.88	1.68–2.09
Lack of expertise in developing/ supporting IPC program/policies	44	36.4%	31	25.6%	25	20.7%	15	12.4%	6	5.0%	2.24	2.02–2.46
Poor literacy skills of workforce – Resource related challenges	39	32.2%	29	24.0%	19	15.7%	26	21.5%	8	6.6%	2.46	2.23–2.70
Poor IPC knowledge of workforce – Resource related challenges	38	31.4%	34	28.1%	18	14.9%	21	17.4%	10	8.3%	2.43	2.19–2.67

Note: IPC = Infection Prevention and Control. Mean = mean Likert score (1–5), 1 being strongly disagree. 95%CI = 95% confidence intervals.

those who work in IPC. This is further evidenced by the findings that only 40% of respondents agreed that they had access to microbiologist and epidemiologist support (Table S2) and that more than three-fourths agreed that increased IPC support for their designated IPC person was a high or moderate priority (Table S3). Professional associations, including colleges and societies, play an important role in supporting the flow of ideas, education and training and in facilitating support networks and advocacy, including the development of public policy [35]. Another valuable contribution of professional organisations is their ability to provide quick, two-way communication among members [35]. Importantly, the findings of a systematic review suggested that a cohesive, collaborative professional network can facilitate and contribute to the improved quality and safety of care [36]. Support for RACF staff who are responsible for IPC could be increased through enhanced training in IPC and membership in a relevant professional association. Consistent with the results of a study conducted in Australian hospitals, the present survey found that respondents identified as one of their challenges a perceived lack of interest in IPC [27]. Such a lack of interest has also been found to pose a challenge to implementing evidence-based practice [29].

Surveillance of HAIs appears to be undertaken by the majority of RACFs. Surveillance of infections requires training, support, validation and feedback processes for it to add value [37,38]. Several research projects have

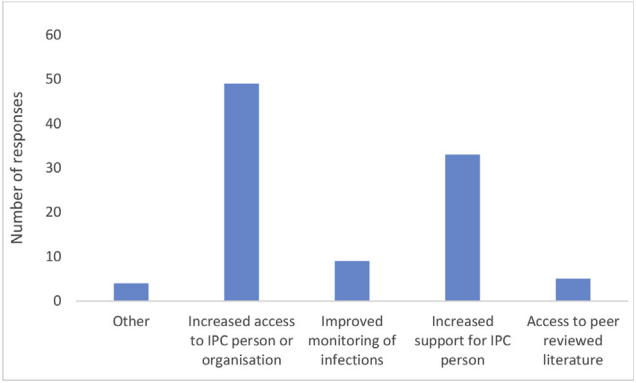

Figure 2 Preferences regarding one additional infection prevention and control (IPC) resource.

explored the incidence or point prevalence of infection in Australian RACFs [13—15,19,29]. The majority of these have been conducted in just one state: Victoria. At present, there is no nationally coordinated approach to continuously collecting and analysing infection-surveillance data in Australian RACFs. In Victoria, there has been a concerted effort to both develop IPC quality indicators and standardise data collection [33]. We commend national efforts to support RACFs in delivering IPC programs, particularly surveillance and feedback on useful indicators that can contribute to quality improvement.

Our study has some limitations. As a cross-sectional study, it focused on only a single point in time. It also had the potential for selection bias, given that RACFs could choose whether to participate. We obtained a list of RACFs from a government website at the time of study preparation. That agency no longer appears on the government website and newer lists have different numbers of facilities listed. Therefore, response rate comparison between our study and other studies are limited. In addition, the reliability of the responses depended on the knowledge of the survey respondents. Finally, the data are self-reported and are not verifiable. Nonetheless, the study provides a snapshot of current IPC arrangements in Australian RACFs and identifies ways to support and improve IPC processes, based on the perceived challenges and priorities of RACF staff.

RACFs provide vital health and social care services to a large proportion of the population, here in Australia and around the world. Despite the lack of formal guidelines compared to the hospital sector, the overwhelming majority of RACFs deliver infection prevention and control services and report doing so in ways that meet the needs of their own specific contexts. More research is needed to assist RACFs in their efforts to prevent healthcare-associated infection in their patients and clients as the leading healthcare-associated complication in formal hospital settings.

Ethics

Ethics approval for this study was granted by Avondale College of Higher Education Human Research Ethics Committee (Approval 2017.23).

Authorship statement

BM, RS, DB and PR designed the project. BM is the Chief Investigator for the project. BM drafted the paper. All authors provided critical input into the paper. All authors approved the manuscript.

Conflicts of interest

Two of the authors have editorial affiliations with the journal, while two other authors are editorial board members. All authors were blinded to this submission in the journal's electronic editorial management system and none of the authors played any editorial role in handling this paper whatsoever.

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Provenance and peer review

Not commissioned; externally peer reviewed.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.idh.2019.06.004.

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