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Roles, responsibilities and scope of practice: describing the 'state of play' for infection control professionals in Australia and New Zealand

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Abstract. ***Background*:** In the past decade the policy and practice context for infection control in Australia and New Zealand has changed, with infection control professionals (ICPs) now involved in the implementation of a large number of national strategies. Little is known about the current ICP workforce and what they do in their day-to-day positions. The aim of this study was to describe the ICP workforce in Australia and New Zealand with a focus on roles, responsibilities, and scope of practice.

***Methods*:** A cross-sectional design using snowball recruitment was employed. ICPs completed an anonymous web-based survey with questions on demographics; qualifications held; level of experience; workplace characteristics; and roles and responsibilities. Chi-squared tests were used to determine if any factors were associated with how often activities were undertaken.

***Results*:** A total of 300 ICPs from all Australian states and territories and New Zealand participated. Most ICPs were female (94%); 53% were aged over 50, and 93% were employed in registered nursing roles. Scope of practice was diverse: all ICPs indicated they undertook a large number and variety of activities as part of their roles. Some activities were undertaken on a less frequent basis by sole practitioners and ICPs in small teams.

***Conclusion*:** This survey provides useful information on the current education, experience levels and scope of practice of ICPs in Australia and New Zealand. Work is now required to establish the best mechanisms to support and potentially streamline scope of practice, so that infection-control practice is optimised.

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Introduction

Infection control professionals (ICPs) play a vital role in preventing healthcare-associated infections (HAI) worldwide. Since the landmark Study on the Efficacy of Nosocomial Infection Control (SENIC) Project in the 1970s, hospitals and health services have taken a proactive approach in establishing infection control services, and employing ICPs to undertake a range of activities aimed at reducing risk of HAI in both patients and staff.[1–4]

Internationally, there has been an increased focus on national infection control guidelines, standards and initiatives.[5,6] In Australia and New Zealand we now rely on ICPs to undertake the important role of implementing and evaluating initiatives to reduce HAIs, including policies, in a range of settings. In Australia, the Australian Commission on Safety and Quality in Healthcare (ACSQHC) was established in 2006. In New Zealand, the Health Quality and Safety Commission (HQSC) was formed in 2010. Both commissions have infection prevention and control strategies that focus on hand hygiene, prevention of central line-associated bacteraemia and surveillance. From a professional perspective, in New Zealand, many ICPs are members of the

Implications

- This is the first study in 15 years to comprehensively describe the ICP workforce in Australia and New Zealand, and their scope of practice.
- It will be useful for decision-makers to design and target strategies aimed at improving infection control practice and implementation of national policy.

Infection Prevention and Control Nurses College of the New Zealand Nursing Organisation. ICPs from both countries are eligible, and encouraged, to join the Australasian College of Infection Prevention and Control (ACIPC).

In order for these government agencies and the ACIPC to make informed policy decisions and recommendations for optimal infection control practice, there is a need to understand the ICP workforce and establish what educational levels, and scope of practice currently exist. Little is currently known about who ICPs are and what they do in their day-to-day jobs. The ACSQHC has commissioned several reviews into Australian infection control programs and scope of infection control practice.[7,8] A comprehensive report by the ACSQHC in 2009 found a lack of literature to underpin recommendations for a model for infection prevention and control in acute hospitals.[4] All these reports have identified major gaps in contemporary evidence, and called for research into the role of the Australian ICP to be undertaken.

The aim of this study was to describe the ICP workforce in Australia and New Zealand with a focus on roles, responsibilities, and scope of practice.

Methods

Study design

A cross-sectional design was employed. A secure, anonymous, online survey was developed using validated questions from international and state-based surveys.[3,9–12] The survey included questions on demographics (including age, qualifications, and years of experience), workplace characteristics, and roles and responsibilities undertaken. The survey was pilot-tested by a small number of ICPs with varying levels of experience.

We were particularly interested in how ICPs as individuals described their own practice. We understand that many ICPs work in teams to deliver services; however, tasks are usually completed by individuals. Participants were asked to identify their job responsibilities from a list covering: prevention and control of transmission of infectious agents (seven activities); surveillance and epidemiological investigations (nine activities); education (three activities); communication and/or organisational support (11 activities); administration (four activities); and research (two activities).[13,14] We collected data on the source of service funding (public *v.* private) and size of the infection control team in full-time-equivalents to allow us to compare tasks undertaken by ICPs in these different team environments.

Sampling frame and recruitment

All ICPs in Australia and New Zealand who identified as being actively employed in the profession were eligible to participate. Since the true number of ICPs in Australia and New Zealand is not known, a snowball approach was employed to maximise recruitment. First members of ACIPC were contacted via a posting on their online list-server forum, which triggers an email to subscribers. Subscribers include both Australian and New Zealand ICPs. New Zealand ICPs were also emailed by the Infection Prevention and Control Nurses College of the New Zealand Nursing Organisation. Flyers were distributed at the ACIPC annual national conference in October 2013, and the survey was promoted at the ACIPC's Annual General Meeting. Each ICP was only eligible to complete one survey; this was monitored using data on the Internet Protocol (IP) address of the computer used to fill in the survey, cross-checked against demographic data provided.

To reduce the possibility that only senior ICPs, responsible for planning and managing infection control services, would complete the survey we proactively advertised the survey and its benefits to members broadly, and offered a range of small incentives (such as book vouchers and an IPad) to encourage participation.

Ethics

Ethics approval was obtained from the Human Research Ethics Committee of Avondale College of Higher Education (2013 : 37).

Data cleaning and analysis

Data was extracted from the online survey tool into IBM SPSS Statistics v21 where logic and consistency checks were performed to ensure data quality. Descriptive and stratified analysis using Chi-squared testing was undertaken to identify frequencies, patterns, and associations.

Results

Demographics

Overall, 300 infection control practitioners from all Australian states and territories and New Zealand completed the survey (see Table 1). Fifty-three percent of ICPs were aged over 50 years. Nearly all ICPs were female ($n = 281$, 94%). Many respondents, 32% ($n = 98$) have worked in infection prevention and control for more than 10 years.

Roles

Participants were asked to record a classification for their key position: 280 (93.3%) stated they held registered nursing and/or midwifery positions and three respondents were enrolled nurses. The remaining ICPs recorded that they worked in positions in research, microbiology, safety and quality, administration and management.

Table 1. Characteristics of survey participants ($n = 300$)

	Description	Frequency	
		n	%
Participant characteristics			
Age (years)	<30	4	1.3
	30–39	36	12.0
	40–49	98	32.7
	50–59	127	42.3
	60+	33	11.0
	Not recorded	2	0.7
Sex	Female	281	93.7
	Male	19	6.3
Jurisdiction	Australian Capital Territory	11	3.7
	New South Wales	94	31.3
	Northern Territory	3	1.0
	Queensland	44	14.7
	South Australia	31	10.3
	Tasmania	14	4.7
	Victoria	72	24.0
	Western Australia	21	7.0
	New Zealand	10	3.3
Qualification held	Certificate (Infection Control)	172	57.3
	Certificate (Education)	39	13.0
	Certificate (Public Health)	2	0.7
	Certificate (Other)	102	34.0
	Diploma of Nursing	54	18.0
	Diploma – other	35	11.7
	Bachelor of Nursing	161	53.7
	Bachelor of Medicine and Surgery	24	8.0
	Bachelor – other	40	13.3
	Masters Infection Control	1	0.3
	Masters Public Health	15	5.0
	Masters – other	26	8.7
	PhD	3	1.0
Years of infection control experience	≤5	93	31.0
	6–10	76	25.3
	11–15	64	21.3
	16–20	34	11.3
	>20	33	11.0
Employment characteristics			
Size of infection control team in full-time equivalents (FTE)	≤1	159	53.0
	1.1–3	84	28.0
	3.1–5	29	9.7
	>5	15	5.0
	Not recorded or not applicable	13	4.3
Source of service funding	Public	225	75.0
	Private	67	22.3
	Not recorded or not applicable	8	2.7

Qualifications

In order to understand different levels of formal training undertaken by ICPs, we examined all qualifications held by respondents. Most ICPs recorded having nursing qualifications, with 161 (53.7%) holding a Bachelor of Nursing and 54 (18%) holding a Diploma of Nursing, the qualification awarded when nursing training was hospital-based during the 1980s.[15] Nearly two-thirds of ICPs had completed additional infection control qualifications: 172 (57.3%) had a Certificate in Infection Control, and one had a Masters in Infection Control. Only 15% of ICPs had completed the ACIPC credentialing process.

Responsibilities and scope of practice

Of particular interest was the number and variety of activities that ICPs undertook. Of the seven listed prevention and control activities, 192 respondents (65.3%) undertook at least six of these; 140 (47.3%) undertook all nine surveillance activities, and 167 (56.8%) undertook more than eight of the 11 communication activities. To get a better sense of the

scope of practice we also created a word cloud of all 36 activities – the size of each word demonstrates the number of ICPs undertaking each activity (Fig. 1). Nearly all words are of a medium to large size, with only 'internal policy work' (41 respondents) and 'leading research' (43 respondents) representing activities undertaken by less than 50 individuals.

We asked respondents to record how often they would spend time on each broad type of activity (Table 2). Most activity types were undertaken by ICPs on at least a daily basis – the exceptions were education, which was most likely to be undertaken on a weekly basis, and research which was most likely only undertaken 'as instructed or required'.

We also examined the association between the frequency of activities undertaken and the following key characteristics potentially linked to scope of practice: source of service funding; size of infection control team in FTE; years of infection control experience; and whether the ICP had completed an infection control qualification (Table 3).

There was very little difference between publicly and privately funded IC services, however ICPs from publicly funded services undertook surveillance activities more frequently ($\chi^2 = 44.6$, $P = 0.05$) than those from privately funded services.

The size of IC team was significantly associated with frequency of a range of activities undertaken: ICPs who were part of a larger team were more likely to undertake prevention and control activities ($\chi^2 = 40.1$, $P = 0.05$), surveillance ($\chi^2 = 44.6$, $P = 0.001$), education ($\chi^2 = 32.1$, $P = 0.04$), and research ($\chi^2 = 40.7$, $P = 0.004$), on a frequent basis than ICPs who worked alone or in small teams of between 0 1 and 0 3 FTE.

ICPs who held an infection control qualification undertook research more frequently ($\chi^2 = 20.9$, $P = 0.001$). There was also an association observed between years of IC experience and frequency of prevention and control activities undertaken. These activities were more likely to be undertaken by those with 6 to 15 years of experience, compared with less experienced or more experienced ICPs ($\chi^2 = 31.1$, $P = 0.05$).

Discussion

This research is the first study to provide a comprehensive insight into the ICP workforce in Australia and New Zealand since the formation of ACIPC in 2012 and the first comprehensive survey in 15 years. The last survey of a similar population (the former Australian Infection Control Association) was carried out in 1999.[10,16]

As such this survey is in a unique position to describe the current 'state-of-play' for ICPs in Australia and New Zealand. In the last 10 years there have been several national strategies implemented with the aim of providing a coordinated, evidence-based approach to the prevention of HAIs. These include: the establishment of national initiatives by Hand Hygiene New Zealand in 2008 and Hand Hygiene Australia in 2009;[17] the publication of updated New Zealand Infection Prevention and Control Standards in 2008[18] and Australian National Infection Control Guidelines in 2010;[19] and the introduction of Australian National Safety and Quality Health Service Standards in 2011.[20]

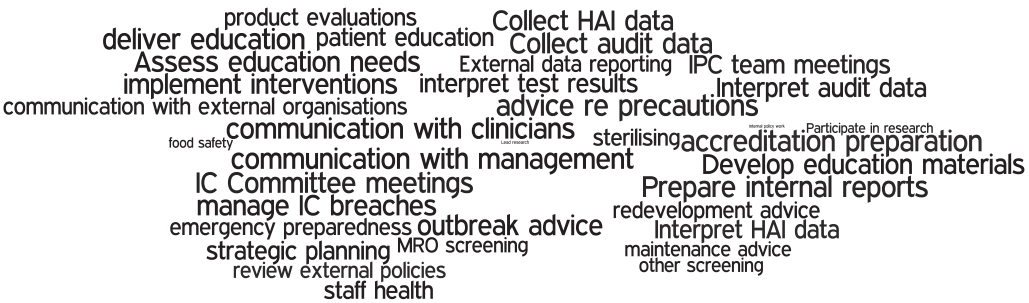

Fig. 1. Word Cloud of ICP activities. The size of the word is representative of the number of ICPs undertaking each activity.

Table 2. How often ICPs spend time on each type of activity ($n = 294$)

Activities	How often each activity is undertaken					
	Daily or more *n*, %	Weekly *n*, %	Monthly *n*, %	Yearly *n*, %	Never *n*, %	As instructed and/or required *n*, %
Prevention and control of transmission of infectious agents	167 (56.8)	73 (24.8)	18 (6.1)	2 (0.7)	7 (2.4)	27 (9.2)
Surveillance and epidemiological investigations	160 (54.4)	64 (21.8)	37 (12.6)	1 (0.3)	8 (2.7)	24 (8.2)
Education	52 (17.7)	147 (50.0)	65 (22.1)	14 (4.8)	2 (0.7)	14 (4.8)
Communication and/or organisational support activities	168 (57.1)	72 (24.5)	31 (10.5)	5 (1.7)	3 (1.0)	15 (5.0)
Administration	203 (69.0)	51 (17.3)	20 (6.8)	1 (0.3)	1 (0.3)	18 (6.1)
Research	11 (3.7)	44 (15.0)	52 (17.7)	45 (15.3)	66 (22.4)	76 (25.9)

Table 3. Association between frequency of infection control activities undertaken and ICP characteristics

Activities	Is there an association between how often infection control activities are undertaken and. . .			
	. . .source of service funding (public *v.* private)?	. . .increasing size of ICP Team (in FTE)?	. . .increasing years of infection control experience?	. . .completion of infection control qualifications?
Prevention and control of transmission of infectious agents	No $\chi^2 = 8.8$, $P = 0.12$	Yes $\chi^2 = 40.1$, $P = 0.05$	Yes $\chi^2 = 31.1$, $P = 0.05$	No $X^2 = 2.1$, $P = 0.84$
Surveillance and epidemiological investigations	Yes $\chi^2 = 11.8$, $P = 0.04$	Yes $\chi^2 = 44.6$, $P = 0.001$	No $\chi^2 = 17.3$, $P = 0.63$	No $X^2 = 4.4$, $P = 0.50$
Education activities	No $\chi^2 = 6.2$, $P = 0.29$	Yes $\chi^2 = 32.1$, $P = 0.04$	No $\chi^2 = 18.5$, $P = 0.55$	No $X^2 = 6.1$, $P = 0.30$
Communication and organisational support activities	No $\chi^2 = 7.4$, $P = 0.19$	No $\chi^2 = 22.4$, $P = 0.32$	No $\chi^2 = 26.9$, $P = 0.14$	No $X^2 = 5.4$, $P = 0.38$
Administration	No $\chi^2 = 6.4$, $P = 0.27$	No $\chi^2 = 25.5$, $P = 0.18$	No $\chi^2 = 27.6$, $P = 0.12$	No $X^2 = 8.0$, $P = 0.16$
Research	No $\chi^2 = 5.5$, $P = 0.36$	Yes $\chi^2 = 40.7$, $P = 0.004$	No $\chi^2 = 12.1$, $P = 0.91$	Yes $X^2 = 20.9$, $P = 0.001$

Given the changing policy and practice context it is perhaps not surprising to note the extent of the scope of practice outlined in the results. Overall, as our word cloud shows, most ICPs have a large number and variety of responsibilities. Upon study design, we believed that the majority of ICPs would have a focused scope of practice. We also envisaged that some infection control activities would be intermittently carried out by ICPs. However we found that most ICPs undertook nearly all activities listed. Broad activity types were also carried out on a daily or weekly basis by the majority of respondents. This diversification of responsibilities represents a major change from the 1999 survey which identified that the majority of ICP time was spent on surveillance activities, in line with a SENIC-based approach.[10,21]

Although having such a varied scope of practice makes infection control an interesting speciality, there may be disadvantages to this. Even though many ICPs have additional qualifications and several years of experience, it is difficult to imagine the training, support and governance that will be required to ensure that ICPs are able to maintain the contemporary skills, knowledge, and capacity to undertake each of these complex tasks effectively.[22–26] In addition, by having such a large number of responsibilities, job burnout is a possible risk, as ICPs strive to keep up without compromising the quality and timeliness of their work.[27,28] This has potential to further reduce the size of the experienced ICP workforce.

Research activities were the least undertaken type of activity – 22% of respondents never undertake research activities, 15% only on a 'yearly' basis and 26% only when 'instructed or required'. This is of interest, as the ACSQHC encourages research to underpin evidence-based practice in infection control NSQHS standard 3.[20] Hospitals who undertake research tend to have a culture of quality improvement; for this reason research is recognised by accreditation agencies as being more likely to result in better outcomes for patients.[29] Involvement in research is also a key component of the ACIPC credentialing process.[30]

There was little difference in the activities undertaken by ICPs in small versus large teams. We expected that in larger teams there may have been more specialisation, with responsibilities shared across the team, e.g. ICPs allocated particular responsibilities, such as surveillance, or staff health. This was not observed in this study, but may go some way to explaining why a few specialised tasks such as leading research and policy development were only undertaken by a small number of ICPs. It is possibly a reflection of the reactive nature of the role in all settings: on any given day an ICP can be called upon to undertake many activities, regardless of what portfolio they hold.

We did find that ICPs from larger teams undertook most types of activity on a more frequent basis than those in a small team. This may be because having this support allows each ICP to actually undertake a larger number of tasks more often.

ICPs in the private sector were more likely to operate as sole practitioners or in a team with less than one FTE (69%) than those in the public sector (49%). It was interesting that our study identified little difference between how often ICPs undertook each type of activity between the public and private sector. Surveillance was more likely to be undertaken weekly rather than daily, but this may be due to the different types of patients and procedures undertaken in the private sector.

Nearly 95% of respondents reported that their position was categorised within the nursing workforce. Our survey shows that the demographics of the ICP workforce in Australia and New Zealand mirror that of the nursing profession as a whole: most respondents were female and a substantial number were aged over 50 years. The challenge that this represents has been well described in the literature, but is worth mentioning here again. More work is still required to encourage men to train as nurses and choose infection control as a speciality.[31] In addition, given the ageing workforce, pathways should be considered that encourage nursing graduates to consider infection control as a speciality and succession planning is desperately needed to ensure newer

graduates can benefit from the many years of experience their colleagues possess.[32,33]

There were some limitations to our study. This research set out to describe the ICP workforce in Australia and New Zealand, the target population for ACIPC membership. One challenge of investigating such a population is that there is no way of accurately identifying the sampling frame. As such, we are unable to calculate a true response rate. We received responses from 300 ICPs; 240 (80%) of these reported they were members of ACIPC. We are aware that the current ACIPC membership sits at ~1000, and not all of these people would have been eligible to participate, so we are satisfied that the results from this survey are representative of individual ICPs working in Australia and New Zealand as a whole.

It is also possible that certain pockets of the population may be more interested and more likely to respond. However we received responses from ICPs in all age groups, all jurisdictions, from both public and private funded services, and with a wide range of years of infection control experience, so believe that selection bias has been minimised.

We were unable to determine response rates for each jurisdiction, but are aware that this may have differed between states, territories and countries. As a result, we thought it prudent to not examine associations by jurisdiction as the generalisability at this level may have varied. We suggest the findings of this study may be used to prompt further mixed methods research at a local level to determine what contextual factors may be influencing scope of practice.

As we were interested in activities undertaken by individual ICPs, and responses were anonymous, the study was not designed to extrapolate or determine what models of infection control service existed at a team or hospital level. This question is the subject of a second, complementary survey of ICP managers at acute care facilities in Australia. This work has also been undertaken by the authors and is expected to be published later in 2015.

Conclusion

This study provides new evidence about the current ICP workforce in Australia and New Zealand. It will be useful for decision-makers to design and target strategies aimed at improving the practice of ICPs and implementation of national policy. Given our results, further work is now required to identify what guidelines, education and resourcing are needed to support ICPs to optimise and potentially streamline their scope of practice.

Conflicts of interest

Three of the authors have editorial affiliations with the journal. They played no role in reviewing or decision-making processes related to this article.

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