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The official journal of the Community and Hospital Infection Control Association – Canada • Association pour la prévention des infections à l'hôpital et dans la communauté – Canada

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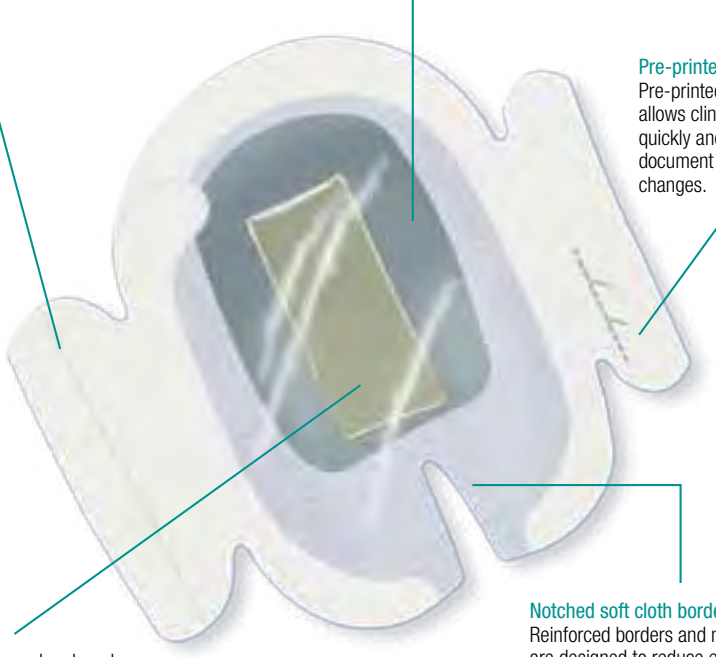

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FEATURES

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CHICA-Canada will lead in the promotion of excellence in the practice of infection prevention and control.

MISSION

CHICA-Canada is a national, multidisciplinary, voluntary association of professionals. CHICA-Canada is committed to improving the health of Canadians by promoting excellence in the practice of infection prevention and control by employing evidence-based practice and application of epidemiological principles. This is accomplished through education, communication, standards, research and consumer awareness.

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The H1N1 pandemic:
Doing what we do best – back to basics

Pat Piaskowski, RN, HBScN, CIC
Clinical Editor, *Canadian Journal of Infection Control*

As we (hopefully) near the end of the second wave of the 2009 H1N1 pandemic in Canada it is clear that some key infection prevention and control messages have now become mainstream through media and the popular press. Although we, as infection control professionals, have shared these messages many times, in many venues, and in many ways we are now seeing the messages amplified to reach the general public and a much wider audience. All infection control professionals know these messages well. We await a revised and updated national Routine Practices and Additional Precautions document which will assist in ensuring consistent messaging and practices across the country. There are many clear examples of how these messages are being shared to a wide audience and impacting public behaviours:

- Religious leaders providing messages prior to the start of worship services such as: clean your hands, stay home if you are sick, get the flu shot and cover your cough.
- The sudden placement of alcohol-based hand sanitizers in public locations such as malls, grocery and department stores as well as prominent displays of these products for retail sale.
- Massive line-ups at vaccine clinics in Canada and around the world.
- Observing members of the public coughing or sneezing into their sleeves.
- Media messages from national, provincial and local/regional public health agencies.
- Major news sites with full pages or sections devoted to how to prevent the spread of H1N1.

There are likely many more examples of how the public is receiving and responding to these messages.

Our challenge as members of CHICA-Canada is to consistently reinforce that these are not new messages in response to a public health crisis, but rather that these are key measures to prevent the transmission and spread of any current and future infectious threat.

As the news reports of H1N1 become few and far between and public health and media messaging diminish in response to the waning of the pandemic, it is important that we as professionals in infection prevention and control help to keep the messages alive.

- Clean your hands.
- Get your flu shot and keep other important immunizations current.
- Stay home or away from others when you are sick.
- Protect yourself from sprays or splashes of body fluids and encourage others to cover or contain theirs.

In the immortal words of Margaret Mead: "Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has."

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A survey of infection prevention and control resources in acute care facilities across British Columbia

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ABSTRACT

Background: To determine the gaps in infection prevention and control (IPAC) resources and the disparities between rural and urban areas, the Provincial Infection Control Network surveyed the current resources in British Columbia (BC).

Methods: Acute care facilities (ACF) in six health authorities (HA) were surveyed for IPAC staff; distribution of work; infection prevention and control professional (ICP) to bed ratios; and teaching activities. HAs were designated as either urban or rural.

Results: Responses represented 54 (68%) of the ACF in BC. Rural HAs showed a significantly higher number of inexperienced ICPs (68% vs. 17%; $p<0.001$). Only 22 (60%) of eligible ICPs were Certification Board of Infection Control certified. Five out of six HAs (83%) reported having an IPAC physician. Acute care ICP to bed ratios ranged from one per 67 to one per 175 and combined acute and long-term care ICP to bed ratios ranged from one per 270 beds to one per 525 beds. The number of ICPs who reported working overtime on a consistent basis ranged from 20 to 100%.

Conclusions: ACFs surveyed did not meet the recommended standards for staffing and IPAC resources in order to function as an effective program. Surveys of infection control resources are valuable tools to identify needs and assist in acquiring the resources to fill the identified gaps within a health authority.

Background: The Province of British Columbia (BC), Canada, with a population of just over four million people, is served by six health authorities (HA), reporting to the Ministry of Health. Figure 1 provides a geographic breakdown of the five regional HAs. The sixth HA, Provincial Health Services Authority, is comprised of facilities that have a provincial mandate. In 2005, all the HAs collaborated to create The Provincial Infection Control Network (PICNet) of BC. PICNet's purpose is to provide advice and strategic intervention on relevant policy, procedure and issues relating to the prevention and control of healthcare-associated infections (HAI) across the continuum of health care. Recognizing that the basis of a good infection prevention and control (IPAC) program includes adequate human and fiscal resource capacity, PICNet initiated a review of the scope and nature of the IPAC resources currently in place in the province.

Methods: An IPAC resources questionnaire was developed by the PICNet Needs Assessment Working Group based on current Canadian and American recommendations for IPAC programs in health care settings and the expert opinion of the working group members (1, 2, 3). The questionnaire incorporated data in the following areas: infection prevention and control professional (ICP) and medical staff resources; administrative and technical support; ICP distribution of work; ICP to bed ratios; and teaching activities.

A data collection form was developed to reflect a minimal data set in order to enhance compliance with survey return. In November 2005, the IPAC programs in all acute care facilities

from the six HAs in BC were asked to complete and return the form. All data were submitted to PICNet's central office for analysis. A copy of the data collection form is available on request at **picnet@phsa.ca**.

Data received was analyzed in Microsoft Excel® (Microsoft Corporation, Edmonds, WA). For the purposes of data analysis, the HAs were designated as either urban (population density greater than 100 people/km^2) or rural (population density less than 100 people/km^2). It is recognized that in all HAs the population density exceeds this level within cities, but not when the larger geographic area served by the HAs designated as rural is taken into account. For the purposes of analysis HAs A, B, C and D are designated urban, where HAs E and F are designated rural.

Results: There were 80 acute care facilities (ACF) in BC at the time of the survey. These facilities ranged in size from as few as 10 beds to greater than 500 beds. Surveys were sent to the ICPs who work in these facilities and 21 responses were received. For HAs A and E, the respondents filled out the questionnaire on behalf of all the facilities falling within their geographic region. As a result, the total number of responses represented 54 (68%) of the ACFs in the province.

To preserve individual facility confidentiality, the data presented is aggregated at the HA level. It should be noted that the process of aggregating the data eliminates the variability seen between facilities within the HA and it may thus appear as if the resources are evenly spread across the region, where in most instances this was not the case.

a) ICP staff

Data on ICPs, by HA, is presented in Table 1. The median years of experience of ICPs attained from the surveys was six years. This ranged from zero to 25 years. The proportion of ICPs with two years of experience or less ranged from zero in one HA to 80% in another. Comparison between rural and urban designated HAs showed that the proportion of ICPs with less than or equal to two years experience was significantly higher in rural HAs than urban HAs (68% vs. 17%; $p<0.001$). Of those ICPs with greater than two years' experience, 22 (60%) were Certification Board of Infection Control (CBIC) certified. On average 40% of the ICPs in urban centres were CBIC certified as compared to 26% of ICPs in rural areas. This difference was not found to be significant ($p=0.28$).

The number of vacant FTE (full time equivalent) positions for ICPs varied between HAs and ranged from zero to four FTEs and, over 18% of all positions were unfilled at the time of the survey. In two HAs, at least one of the positions has been vacant for more than a year. The primary reason given for not filling these positions was the inability to find a suitable candidate to fill the role. The shortage of ICPs was also reflected in that, on average 70% (ranging from 20-100%) of ICPs from all HAs reported working overtime on a consistent basis. In BC overtime is defined as working greater than 36 hours per week.

b) Medical staff

Five out of six HAs (83%) reported having a physician who provided service to the facility's IPAC program, however, the number and medical specialty of these physicians varied by HA. In the two rural designated HAs, one had no physician support for their IPAC program while the other HA reported access to only one infectious disease physician for the entire HA as well as access to an additional physician leader for infection control if needed. In the regions designated as urban, the number of physicians ranged from one to seven with specialties in infectious diseases, internal medicine, medical microbiology and pathology. The number of medical hours provided to the IPAC programs by all physicians ranged from zero hours per week in one rural HA to 57.5 hours per week in one urban HA.

Figure1: BC Health Authorities Map

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c) Administrative and technical support

Administrative support provided to the IPAC programs surveyed was minimal. The median number of administrative support hours per week provided to the IPAC programs surveyed was three hours (mean 4.7 hours; range: 0-12 hours).

Fifteen (71%) respondents reported access at their facilities to a computer projector, laptop and overhead projector. Eleven (52%) respondents reported access to a slide projector and 16 (76%) had access to teleconference facilities.

d) ICP distribution of work

The distribution of ICP work hours among IPAC programs is presented in Table 2. Included in the table for comparison purposes is the 2002 Delphi project results, which made recommendations for the distribution of workload for ICPs (3). The intensity of activity reported by the various IC programs was open to responder interpretation. In some cases the respondents were reporting activity for their entire HA and in others they were reported by individual facility. No apparent association between the size of facility and IPAC activity was noted. In the facilities surveyed the majority of ICP time was dedicated to surveillance activities (mean 24%), education (mean 15%), policy revision and review (mean 8%), consultation (mean 7%), outbreak management (mean 8%) and meetings (mean 11%). These activities varied within and across HA, but universally there was very little time spent on IPAC research (mean 2%).

Of note, in two of the HAs designated as rural, a large portion of time was used for traveling between facilities (mean 10%), reflected by limited personnel covering various facilities spread out over large geographic areas. As compared with the HAs designated as urban (mean 5%), ICPs in rural areas spend almost twice as much time in travel ($p=0.55$).

In two HAs, ICPs reported 20% of their work time spent on "other" activities. In one HA, this included 20% of time spent on Workplace Health and Safety duties while in another HA, 75% of one ICPs' work time was spent dealing directly with construction and housekeeping issues. Also of note, ICPs are asked to provide consultation when outbreaks occur in community settings such as long-term care (LTC) facilities. Even though this activity falls outside of their job description, there was an expectation among the HAs that ACF based ICPs provide this service.

e) ICP to beds ratios

The reported ratios of ICPs per acute care beds by HA are presented in Table 3 based on the number of ICP FTEs allocated and based on the actual number (i.e. filled positions). Current staff to acute care bed ratios varied between HAs ranging from one ICP per 67 acute care beds to one ICP per 175 acute care beds. The majority of ICPs in the HAs reported having responsibility for more than one facility and many had dual responsibilities for both ACF and LTC beds within these facilities. For comparison's sake the total number of ACF and LTC beds within each HA was combined to provide a more accurate ratio of ICP service provision. The ratio of ICPs for both ACF and LTC combined ranged from one per 270 beds to one per 525 beds. One

Table 1:
Health Authority IPAC resources (excludes management)

HA	Number of ICPs	N (%) Nurses	Median (range) years of experience	N (%) CBIC certified	N(%) working more than 36hrs/week	Filled FTE positions	Vacant FTE positions	Total No. of FTE ICPs
A	10	10 (100)	10 (0.5-19)	3 (30)	10 (100)	9.6	2	11.6
B	14	13 (93)	10 (0.08-25)	8 (57)	11(79)	12.7	0	12.7
C	6	6 (100)	6 (0.5-20)	3 (50)	5 (83)	5.8	3.5	9.3
D	8	6 (75)	10 (0-20)	2 (25)	4 (50)	6.9	2.1	9.0
E	5	5 (100)	0 (0-7)	1 (20)	1 (20)	2.1	1	3.1
F	16	16 (100)	1 (0-20)	5 (31)	14 (88)	14.5	2.4	16.9

HA reported no LTC beds within its facilities so this comparison could not be made.

f) Teaching activities

Respondents from four HAs reported on the number of formal teaching events held in the past year. Formal teaching sessions exclude ad hoc advisory conversations, and include pre-arranged educational in-services and information sessions. The number of sessions held varied by HA and ranged from 76 to 300 teaching events. The ratio of teaching events to ICP is presented in Table 4. This ranged from 31 to one to 11 to one. Unfortunately this data was not available from the two HAs designated as rural and therefore no comparison between rural and urban areas can be made. Nor could the relationship between the years of experience of ICPs in the HAs or amount of travel time be explored. Ninety percent of the facilities from these regions reported keeping attendance records at these events.

Respondents from only two regional HAs monitored the effectiveness of teaching activities in their health care facilities. In the remaining HAs, facilities reported varying levels of completion of evaluations of teaching activities.

DISCUSSION

The basis of a good infection prevention and control program includes both adequate financial and human resources. This includes an effective working team of ICPs and physicians trained in IPAC; the human resources needed to collect, enter and analyze data on the surveillance of HAI; the ability of qualified staff to set and recommend policies and procedures based on synthesis of surveillance data, clinical practice guidelines and literature review and the resources to directly intervene to interrupt the transmission of infectious diseases; and resources needed to educate and train healthcare workers and providers in basic IPAC procedures (4).

With the increased focus on IPAC following the 2003 Severe Acute Respiratory Syndrome outbreak and increasing rates of antimicrobial resistant organisms, the roles of ICPs have expanded as have the

Table 2:
Distribution (%) of total proportion of ICP work hours by IPAC activity

Activity	Delphi %	Health Authority					
		A	B*	C*	D*	E	F*
Teaching	16	10	5-30	5-30	5-10	30	8-13
Surveillance: collect/analyze/ interpret data	27	55	10-40	15-40	1-20	10	21-29
Write/review IPAC policy	14 (total)	2	2-20	1-10	3-10	10	7-17
Product evaluation		1	1-5	1-6	1-5	5	1-2
Consultation		1	2-10	2-20	5	2	13-15
Regional IPAC activities		5	3-17	1-10	1-5	5	20-31
Meetings		8	4-20	5-20	5-25	5	8-9
Outbreak management (Delphi = 8%)	8	10	4-15	2-20	1-5	10	2
Research		4	0-5	0-5	0-5	3	0
Travel		4	3-10	1-10	2-5	10	7-12
Other		0	3-20	0-2	10-75	10	5-20

*% range provided for HAs where regional values were not provided

requirements for depth of knowledge. The demands for IPAC services have substantially increased the need for resources to provide educational programs and surveillance activities. Multiple responsibilities and lack of resources may hinder essential infection control activities such as assessing healthcare workers' educational needs or incorporating infection prevention strategies based on best practices. Therefore, staffing recommendations must take into account not only the number of occupied beds within a facility, but also the type of care provided, characteristics of the patient population, the specific needs of the facility and geographic distances between sites (5).

The increasing complexity of IPAC programs is reflected in the recommended ratio of ICPs to acute care beds that has changed over time. In 1985, the CDC recommended there be a minimum of one ICP per every 250 acute care beds (4). In 2001 the Canadian Infection Prevention Control Alliance recommended ratios of one ICP per 150-175 acute care beds and one ICP per 150-250 LTC beds (2). In 2002, *APIC (Association for Professionals in Infection Control and Epidemiology)* recommended that for an IPAC program to be effective, it should have a ratio of one ICP per 100 to 120 beds regardless of setting (3). Even if all vacant positions were filled in all HAs, the number of allocated FTE staff does not meet the recommended ratio of one ICP per 100 to 120 beds set by APIC. In addition, as the majority of IPAC resources are focused in acute

Table 3:
ICP: bed ratio in acute and long-term care by Health Authority

Health Authority	Total Allocated FTE ICPs	ICP: Acute care beds*	ICP: Acute +LTC beds**	Actual FTE positions	Actual ICP: Acute care beds*	Actual ICP: Acute + LTC beds**
A	11.6	1:147	1:302	9.6	1:193	1:332
B	12.7	1:102	1:270	12.7	1:102	1:270
C	9.3	1:108	N/A***	5.8	1:173	N/A
D	9.0	1:164	1:371	6.9	1:215	1:486
E	3.1	1:175	1:525	2.1	1:258	1:775
F	16.9	1:67	1:304	14.5	1:78	1:354

*assumes all ICPs are dedicated to acute care
**assumes even distribution of ICPs across both acute and long-term care
***This HA has no LTC beds.

Table 4:
Teaching events per ICP by Health Authority

Health Authority	No. FTE ICPs	No. of Teaching Events	ICP: Teaching Events
A	9.6	300	1:31
B	12.7	156	1:12
C	5.8	145	1:25
D	6.9	76	1:11

care facilities, there is little support for LTC facilities. Compounding the problem is the fact that ACF-based ICPs are also expected to provide consultation to the community.

ICPs are most often nurses, with at least a bachelor's degree, or medical technologists. Often ICPs have master's degrees, as well as specialized training in infection control surveillance and in epidemiology. Newly recruited ICPs often do not have this specialized training and a minimum of two years is the estimated time needed for an ICP to become proficient at his/her job (6). Certification in IPAC through CBIC is available after two years of work experience. In our study, 22 (60%) of ICPs with more than two years of experience were not CBIC certified. Completion of other courses in IPAC was not measured. As noted in the results, the proportion of experienced ICPs working in those HAs designated as rural was significantly lower than those designated as urban. As with other healthcare professions, it is difficult to recruit experienced practitioners to work in these areas. A 2003 Canadian Institute for Health Information study of loss of nurses due to retirement has projected a 13% shortfall of nurses needed to fill vacant positions (7). As with all health sectors, the number of experienced ICPs available to fill vacancies is becoming limited due to a high proportion of nurses reaching retirement age. Succession planning is needed to utilize existing expertise and to prevent shortages. With a lack of human resources, especially in rural HAs, ICPs must spread their services thinly over wide geographic areas. This is reflected in the amount of time spent travelling between facilities and the amount of time spent on regional, as opposed to facility based activities. It must also be noted that with a lack of experienced ICPs available to act as mentors, the time required for inexperienced ICPs working in facilities to receive adequate training and perform their duties independently is prolonged.

Another disparity in IPAC staff resources noted in the results was the availability of physicians to provide service to the facility's IPAC program. One HA designated as rural had no access to physician support and the other HA had one infectious disease physician covering the entire HA. Clearly this disparity in resources needs to be addressed. As in many situations, it is difficult to recruit physicians to work in rural and remote areas as this is not seen as a desirable career choice (8).

Administrative support is essential for an IPAC program. Without this support, ICPs' work time is taken away from other essential activities. Even though IPAC resources in the HAs are limited, teaching health care providers the essentials of infection prevention and control practice must remain a priority – an area often neglected when resources are limited.

CONCLUSION

The purpose of performing this survey was to review the existing IPAC resources currently available in BC, to identify gaps in those resources and to measure the disparity of resources available in rural regions of the province as compared to urban areas.

The results of this survey have been valuable to the IPAC programs in the HAs for the purposes of preparing business cases to acquire the resources to fill these gaps. As a result of the survey, PICNet developed a framework for staffing and core competencies training designed for IPAC programs. This framework is available at **www.picnetbc.ca**.

A large gap identified during this survey is the lack of IPAC resources available in LTC settings and the fact that ACF based ICPs have taken on the additional task of providing resources to these facilities in their communities. PICNet will be undertaking an in depth assessment of the IPAC needs for these settings with the hope of informing HAs and advocating on their behalf in the future.

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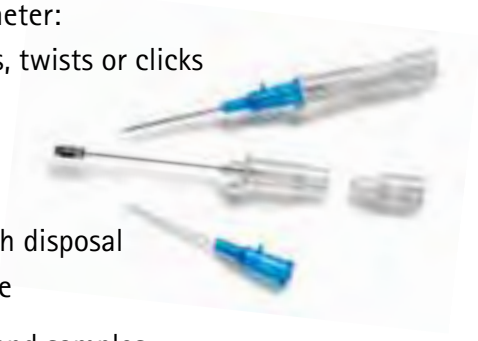

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