Infection Prevention & Control 2014 Fiscal Year Annual Report

November 6, 2014

EXECUTIVE SUMMARY

The Infection Prevention and Control (IPAC) program's 2014 fiscal year (FY) Annual Report, highlights the achievements and continued challenges facing infection control practices in Interior Health (IH). The report summarizes the progress of programs, the annual infection rates and outlines the future strategic plans for the coming years.

The progress of the Hand Hygiene (HH) Program, Link Nurse Program, Electronic Surveillance Project and construction projects are summarized with key highlights reported. The continued success of the HH program has increased HH compliance from the previous FY (69% to 74%).

IH's acute care healthcare associated infection (HAI) rates all report a decrease from the previous FY. *Clostridium difficile* infection (CDI) (5.3 per 10,000 patient-days), methicillin-resistant *Staphylococcus aureus* (4.5 per 10,000 patient-days) and ventilator associated pneumonia (1.9 per 1000 ventilator-days) report infection rates below benchmark (Appendix F), while clean contaminated surgical site infection rate (1.1%) reports at benchmark. Clean surgical site infections (1.2%) and vancomycin-resistant enterococcus (9.7 per 10,000 patient-days (9 full periods)) infection rates reports above benchmark.

The report also addresses developments in education and communication, residential care and outbreak management.

Finally, the annual report describes the five strategic areas for action during the next few years, focusing on CDI, HH, outbreaks in acute care, IPAC expansion into the community, and an evaluation of the IPAC program. The IPAC program will aim to build its capacity, knowledge and awareness among staff and stakeholders. The continued efforts to ensure the comprehensiveness, efficiency and reliability of the IPAC electronic surveillance system will be geared to making informed decisions to improve patient outcomes.

It is anticipated that broadening the IPAC audience and increasing the knowledge of IPAC practices through these strategic initiatives will build capacity across the health authority and increase collaboration to address infection control issues more efficiently and effectively while ensuring the highest quality of care for patients.

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INTRODUCTION

Infection Prevention and Control (IPAC) is a corporate program under the administrative direction of the Vice President, Medicine and Quality. The overarching goal of IPAC is to prevent infections from occurring in patients, residents, clients, visitors, volunteers, physicians and employees. Several strategies that have been implemented to achieve this goal are summarized in this annual report.

The Infection Monitoring Prevention and Control Team reports to the Health Authority Medical Advisory Committee, and through the Senior Executive Team to the Board Quality Care Committee. IPAC has a standing time on each Health Authority Medical Advisory Committee agenda and the Medical Director of IPAC reports in person while the Vice President, Medicine/Quality reports to the Senior Executive Team as required. The minutes of the Infection Monitoring Prevention and Control Team meetings are sent to the Board and presentations on various infection control strategies and issues are made to these committees as scheduled throughout the year. IPAC liaises across the continuum with other programs such as Public Health and Workplace Health & Safety in regards to communicable diseases and outbreak management. In addition, there is an extensive network of committees responsible for IPAC across the health authority.

The IPAC program functions in accordance with international, national and provincial guidelines and best practices across the continuum of care. The IPAC program influences practice through direct actions by managing infection surveillance and disseminating data to appropriate stakeholders. IPAC also develops and recommends policies, procedures and best practices including but not limited to routine practices, additional precautions, asepsis, equipment cleaning, disinfection and sterilization, product selection and evaluation, and construction consultation as it pertains to IPAC. Education and training healthcare providers (HCPs), patients and nonmedical caregivers is also an important part of the IPAC program.

Key improvements to monitoring IPAC practices and improving safety for patients/residents/clients have been made in the past year. The IPAC program implemented a new electronic surveillance system; hired new staff; extended its Hand Hygiene (HH) and Link Nurse (LN) programs; and made significant changes and updates to guidelines contained in the Infection Control Manual. This report highlights the accomplishments of the IPAC program and sets out the future directions for the coming year.

MEMBERS OF TEAM AND FACILITIES

President and Chief, Executive Office
Dr. Robert Halpenny

Medical Director, IPAC
Dr. Edith Blondel-Hill (to Feb/14)
Dr. Bing Wang (start Feb/14)

Epidemiologist, IPAC
Julie Mori (start June/13)

Educator, IPAC
Nicki Gill

Manager, IPAC
Marijke Henkemans

Vice President, Medicine/ Quality
Dr. Jeremy Etherington

Corporate Director, IPAC
Janice de Heer

Administrative Assistant, IPAC
Connie Bergen

Surveillance Information Assistant, IPAC
Jennifer Tchir

Project Lead, IPAC
Joy Pyett

Infection Control Practitioners:

Missy Blackburn
Diane Cordonier (start Jan/14)
Debbie Cosgrove-Swan
Kelly Dillon
Bonny Duncan (to July/13)
Krystal Fergus
Nancy Gawletz
Wendy Herrington
Marian Kabatoff (start Sept/13)
Eileen Lavoie
Lynden Lehman
Kim Leslie (to Dec/13)
Maureen McLean-Young
Lorena McLure
Andrea Neil
Evelyn Nicol
Meg Rao
Coleen Reiswig
Lisa Schwartz
Joanne Tench

Acute Care Facilities:

Cariboo Memorial
East Kootenay Regional
Kelowna General
Kootenay Boundary Regional
Kootenay Lake
Penticton Regional
Royal Inland
Shuswap Lake General
Vernon Jubilee

Rural Acute Care Facilities (≤20 beds):

100 Mile District
Arrow Lakes
Boundary District
Creston Valley
Dr. Helmcken Memorial
Elk Valley
Golden & District
Invermere & District
Lillooet
Nicola Valley
Princeton General
Queen Victoria
South Okanagan General

Residential/ Long Term Care Facilities:

Ashcroft Hospital
Bastion Place
Brookhaven
Columbia House
Columbia View Lodge
Cottonwoods
David Lloyd Jones
Deni House
Dr. Andrew Pavilion
Dr. F. W. Green Home
Fischer Lodge/ Mill Site Lodge
Forestview
Gillis House
Hardy View Lodge
Henry Durand Manor
Kimberley Special Care Home
McKinney Place
Minto House
Mountainview Lodge
Mt. Cartier Court
Nelson Jubilee Manor
Nordic House
Orchard Haven
Overlander
Parkview Place
Pleasant Valley Manor
Polson Place
Ponderosa Lodge
Poplar Ridge
Ridgewood Lodge
Slocan Community Health Centre
Spintlum Lodge
Sunnybank Care Home
Swan Valley Lodge
Talarico Place
The Gateby
Three Links Manor
Trinity Care Centre
Victorian Hospital
Westview Extended Care

GLOSSARY OF ACRONYMS AND TERMS

ABHR	Alcohol Based Hand Rub
Acute Care Facility	Care facilities in which patients are treated for brief but severe episodes of illness, for traumas and injuries, or recovery from surgery.
Alert level	A pre-determined facility-specific threshold [(i.e.) number of infections] within a specified time period that identifies a high transmission potential and triggers actions to be taken
ALH	Arrow Lakes Hospital
ARO	Antibiotic Resistant Organism
BDH	Boundary District Hospital
Benchmark	A point of reference for judging value, quality, change, or the like, standard to which others can be compared.
CA	Community Associated
CAUTI	*Catheter-associated urinary-tract infection*
CDI	*Clostridium difficile* Infection
CIC	Certified in Infection Control
CMH	Cariboo Memorial Hospital
CVH	Creston Valley Hospital
DHH	Dr. Helmcken Memorial Hospital
EKH	East Kootenay Hospital
EVH	Elk Valley Hospital
FY	Fiscal Year
GDH	Golden District Hospital
HA	Healthcare Associated
HAI	Healthcare Associated Infection
HCP	Healthcare Provider
HH	Hand Hygiene
ICP	Infection Control Practitioner
ICU	Intensive Care Unit
IDH	Invermere District Hospital
IH	Interior Health
iLearn	Interior Health online education platform
IMIT	Information Management Information Technology
IPAC	Infection Prevention and Control
KBH	Kootenay Boundary Hospital
KGH	Kelowna General Hospital
KLH	Kootenay Lake Hospital
LIH	Lillooet Hospital
Limitations	Limits or restrictions.
LN	Link Nurse
LTC	Long-term Care
MRSA	Methicillin-resistant *Staphylococcus aureus*
NVH	Nicola Valley Hospital
OMH	100 Mile House Hospital
P3	Public Private Partnership
PGH	Princeton General Hospital
PICNet	Provincial Infection Control Network of British Columbia

PRH	Penticton Regional Hospital
QVH	Queen Victoria Hospital
RIH	Royal Inland Hospital
RN	Registered Nurse
SLH	Shuswap Lake General Hospital
SOG	South Okanagan General Hospital
SSI	Surgical Site Infection
TB	Tuberculosis
Trend	General movement or direction of change.
VAP	Ventilator Associated Pneumonia
VJH	Vernon Jubilee Hospital
VRE	Vancomycin Resistant Enterococci
Working group	A group of stakeholders working together to achieve a specified goal within a finite timeline
ZTS	Zero Tolerance Strategy

FISCAL YEAR 2014 STRATEGIC PLAN ACCOMPLISHMENTS

Six main strategies were identified for the 2014 fiscal year (FY) with plans extending to the 2016 FY (Appendix A). These strategic initiatives support the ongoing IPAC program and were specifically aimed at addressing current and emerging issues.

CLOSTRIDIUM DIFFICILE INFECTION

The strategic initiative that focused on promoting a Zero Tolerance Program for all *Clostridium difficile* infections (CDIs) in the health authority continued into the 2014 FY. IPAC collaborated with stakeholders to improve the management of CDI across departments and facilities.

A total of 102 education sessions were provided by Infection Control Practitioners (ICPs), educating more than 600 HCPs (Table 1). Two additional educational PowerPoint presentations (nursing and housekeeping) were created and made available on the IPAC InsideNet webpage for HCP self-development.

During a Board Quality meeting the IPAC Corporate Director held an information session on the current status of CDI within the Authority.

In addition to following the CDI guidelines in the IPAC Manual, additional strategies were implemented to enhance the control and prevention of CDI. The focus was directed at HH, environmental source controls and staff education.

Refer to page 22, Actions Implemented, for more information.

HAND HYGIENE

The HH program saw additional efforts placed on all areas of the program including education, auditing processes and overall awareness.

Refer to page 8, Accomplishments/ Priorities Met, for more information.

SURVEILLANCE

The electronic surveillance system saw multiple improvements made to increase data reliability and eliminate system error, reducing ICP workload burden.

Refer to page 18, Accomplishments/ Priorities Met, for more information.

COLLABORATION WITH QUALITY

By collaborating with the Interior Health (IH) Quality, Risk and Accreditation portfolio IPAC continued to address the recommendations made by auditors during the 2012 Accreditation Canada evaluation of IH.

More details on Accreditation Canada can be found under the Programs and Initiatives section, page 7.

ANTIBIOTIC RESISTANT ORGANISMS

During the second quarter of FY 2014 a patient chart audit was performed by ICPs to determine the presence and completion of the *Acute Care Admission Screening for Antibiotic Resistant Organisms (AROs)* Tool. This audit was to be performed at most IH acute care facilities on a single day. The results varied from unit to unit and facility to facility. Of the 1028 inpatient charts that were reviewed, 88% had the tool present. Of the 88% that had the tool present, only 65% were completed, resulting in an overall completion rate of 57%. All missing or incomplete tools were brought to the attention of the unit for follow up.

Effective December 1, 2013 IH discontinued screening patients for vancomycin resistant enterococci (VRE). Going forward, only patients with VRE infections will be flagged with an ARO alert. Patients previously identified as colonized with VRE had the alert removed.

In the fourth quarter of FY 2014, program planning for the IH Antimicrobial Stewardship Program was set in motion.

TUBERCULOSIS

Tuberculosis (TB) is now a Provincial initiative and recommendations from the IH TB Report are being addressed at this level.

Refer to page 17 for more information.

PROGRAMS AND INITIATIVES

ACCREDITATION CANADA

Standards built on previous Accreditation Canada IPAC recommendations; updated research and best practice in the field, as well as standards from the Canadian Standards Association, the Public Health Agency of Canada, and the Community and Hospital Infection Control Association-Canada were used to evaluate the program and services.

Unmet criteria, from the September 2012 on-site survey, that became a priority for the IPAC program, included:

1. Easier access for staff to unit-specific infection rates and recommendations from outbreak reviews:
    - Quarterly public reporting to Provincial Infection Control Network of British Columbia (PICNet) of CDI and methicillin-resistant *Staphylococcus aureus* (MRSA) rates continued in FY 2014. IPAC also developed a template for internal reporting of all healthcare associated infection (HAI) rates to be introduced at the beginning of FY 2015. These reports will be updated quarterly and made available on the IPAC InsideNet webpage.
    - Introduced in June 2013, all active outbreaks at IH facilities were made available on the IH public website. This list is updated on a daily basis and includes all outbreaks in acute and residential facilities.
    - An Outbreak Summary Report template was also developed and implemented in FY 2014. This report includes details on: total number of cases, background information, actions/ investigation, attack rate outcome, causative agent, laboratory confirmation, discussion and recommendations. These Outbreak Summary Reports are distributed to facility managers who are to post and discuss the findings with HCPs in their areas of responsibility.
2. Standardized cleaning practice for mobile equipment across the health authority:
    - The Best Practise Equipment Cleaning Guidelines were updated in late March 2013 and made available in the IPAC Manual in early April 2013. A poster communicating the updated Guideline was created and placed in nursing unit stations to advise HCPs.
3. Improved collaboration with community staff as more invasive care is now provided in the home:
    - As the IPAC program is currently unable to obtain additional resources to expand the program into the Community, this topic has since become a new strategy in the programs 2015 FY Strategic Plan (figure 8).

EDUCATION

An integral part of the IPAC program is the ongoing education, training and support by ICPs to all HCPs, nursing and medical students within IH. Training modules based on the IPAC Manual are regularly updated to stay current with Best Practices in IPAC. Corresponding tools are designed and implemented to support practice changes as well as support new processes.

Table 1: Count of Education Provided by IPAC

Education type	# of Education Sessions	# of HCPs Educated
Hand Hygiene	167	1497
*Clostridium difficile**	102	646
Routine Practices/ Additional Precautions*	216	1784
Outbreaks* (GI and/or RI)	118	958
Tuberculosis	27	144
Miscellaneous* (including: orientation, updates to manual/ guidelines, skill fairs, risk assessments and AROs)	475	17347

*These topics include additional HH components

Education highpoints within the IPAC program included:

- Four issues of *Infection Reflections* were released *(*a quarterly publication that shares information and updates on the latest IPAC issues)
- One ICP received Certification in Infection Control (CIC) and three ICPs recertified in CIC
- All IPAC members attended three 2-day team-building meetings in Kelowna
- IPAC Educator presented at CHICA BC
- Additional education sessions were completed by ICPs

HAND HYGIENE PROGRAM

The main goals of the HH program include:

- Reducing the occurrence of HAIs by improving HH compliance
- Improving patient safety
- Meeting Provincial and Accreditation Canada requirements
- Educating HCPs, patients, and visitors about the importance of practicing optimal HH
- Supporting organizations in making the delivery of healthcare safer for everyone

The key program components include a variety of ongoing education modules, including basic orientation; promotion through instructional signage; and HH auditing.

ACCOMPLISHMENTS/ PRIORITIES MET

Developed in FY 2014, the HH program introduced its own InsideNet webpage, now a subsection to the IPAC InsideNet webpage. By developing this HH topic specific webpage more information, such as HCP self-development education can be shared with all internal IH stakeholders.

A total of 167 HH specific education sessions were provided by ICPs, educating more than 1400 HCPs (Table 1). Specialized topic specific educational materials were also created and made available on the HH InsideNet webpage for HCP self-development. These materials included:

- Two education modules (*Cleaning Matters* and *Residential Care)*
- Contractor Frequently Asked Questions (physical copy provided at the beginning of each new project)
- HH Auditing Frequently Asked Questions

Implemented in the fourth quarter of FY 2014, public posting of audit results expanded to include unit level reporting. This was done in an additional effort to expand HH awareness to all stakeholders.

Preliminary work to identify and address potential challenges for HH auditing in residential care facilities was completed in FY 2014.

Development of the Provincial HH Education Modules for iLearn, the IH self-paced electronic learning system, began in the fourth quarter.

Feedback from the first Physician *Ask Me Campaigns* occurred in May 2013. Overall, the physicians reported the campaigns were well received and that the campaigns would continue informally at their facilities going forward. To date campaigns are running at: Kootenay Lake Hospital, Kootenay Boundary Hospital, Royal Inland Hospital, Kelowna General Hospital, and East Kootenay Regional Hospital.

In order to ensure proper hand washing is done not only by HCPs, but also by patients, residents and visitors, 6-step hand washing instructional vinyl stickers were developed in FY 2013. With the assistance of housekeeping staff, these stickers were placed on paper towel holders in all acute care and residential facilities during FY 2014. Additional 6-step stickers, when funding allowed, were shared with Public Health Protection Services. These stickers were very well received in the public setting.

In the 3rd quarter of FY 2014, at the request of Emergency Health Services, paramedics were added as a 5th provider category and observations were to be recorded during HH auditing. The very few observations that were recorded during the 3rd and 4th quarter were excluded from all reporting processes.

In accordance with the *Provincial Hand Hygiene Policy Communiqué* (April 2012), the IH HH Policy was completed in June 2013 and inserted into the IH Administrative Policy Manual. This HH Policy is intended to protect patients and HCPs by ensuring high-quality HH is practiced. The policy outlines the minimum provincial expectations for the HH Program in all healthcare settings, including requirements for best practices, auditing, reporting and quality assurance.

A customizable application was created by the Surveillance Information Assistant to facilitate residential care facility HH audits. In an effort to be more efficient and environmentally friendly, the IPAC program purchased additional electronic devices for residential care ICPs.

GOING FORWARD

New promotional items to reward performance will be purchased. It is expected that these promotional items will motivate HCPs to achieve higher goals, increase awareness, and create excitement and friendly competition with IH.

The IH HH Working Group continues to meet quarterly to discuss various HH topics. This Working Group provides valuable discussion, input and feedback to the HH program from all areas within IH. Currently, work is being done to create an educational document that will be shared with university/ college students who will complete any part of their practicum within an IH facility.

The next *Physician Ask Me Campaign,* to be rolled out at Cariboo Memorial Hospital, is currently in the planning stage. An exciting addition to this campaign will be two life sized cardboard cut-outs of a long-time Cariboo Memorial Hospital physician. The cut-outs will have the physician holding a blank plaque that will allow for interchangeable messages. The first message will read 'Please Clean Your Hands' followed by two aboriginal translations of the same message. The cut-outs will be placed at main entrances and other high traffic areas within the facility.

At the end of FY 2014, development of customized elevator wraps for IH facilities was started. These elevator wraps promoting HH have proven to be very popular and effective at other health authorities in BC. Interest has already been expressed to have the elevator wraps

installed at Vernon Jubilee Hospital and Kelowna General Hospital with plans to roll these out at other facilities.

DEB Canada, a national preselected vendor, was awarded the provincial contract for HH products after the recent expiration of the previous vendor's contract. As a result, customized IH HH dispensers were developed with products to be installed during FY 2015. Following IPAC guidelines, site surveys will be performed before installation of the new dispensers. This will ensure that product is available in ideal locations for all HCPs, patients/residents and visitors.

During the fourth quarter of FY 2014 preliminary planning began for the formal evaluation of the IH HH program. The purpose of this evaluation is to ensure the program is meeting its goals while identifying barriers and any areas for improvement.

In the fall of 2013, the Provincial HH Working Group released the document *Best Practices for Hand Hygiene Facilities & Infrastructure in Healthcare Settings.* This guideline shall be referred to for all new construction and renovation projects. The document includes guidelines on appropriate placement of HH sinks and HH product placement. Referring to this document will be a joint effort between ICPs, Capital Planning and Projects and Facilities Management.

Finalization of the Provincial HH online education modules to the IH iLearn online education platform is scheduled for the first half of FY 2015. These two online modules, for HCPs and medical staff, feature a short quiz at the end of the education sessions. By having these modules available online, HCPs and medical staff, who are unable to attend ICP education sessions due to working outside ICP coverage time, will allow for an additional method of self-development. The iLearn platform allows managers to track completion of the module among HCPs for their areas of responsibility. This tracking of completion could prove useful for areas that experience low HH compliance rates and/or high HAI rates.

On-going auditing, education and promotion of HH will continue into FY 2015.

LIMITATIONS

The overall aim of presenting HH compliance results is to give an indication of the compliance amongst staff and allow facilities to compare their own data over time. Audit results are primarily aimed at monitoring and comparing trends within facilities. Audit results do not present the same robust scientific data as surveillance data; instead they, aim to provide valuable and contextual information that can help target HH activities to improve compliance where required in each area.

It has been recognized that 'being observed' in practice, e.g. during auditing, can lead to falsely elevated compliance rates. To minimize this effect, audits are completed in twenty to thirty (20-30) minute intervals with no greater than six (6) observations made of the same

HCP within this period. In an effort to maintain consistency in audit practices, HH audits are currently only observed by ICPs and the Surveillance Information Assistant.

DATA ANALYSIS

Overall, IH's HH compliance rate in acute care facilities for FY 2014 was 74%. This was a very significant increase of 5% in compliance from the previous year (p <0.001). Additionally, there was a 1% increase in the total number of observations obtained across the authority.

Kootenay Lake Hospital and Royal Inland Hospital saw the largest change in compliance rates from the previous year. Overall increases were 10% (73% to 83%) and 7% (67% to 74%) respectively. Increases in compliance were very significant at Royal Inland Hospital (p <0.01) and marginally significant among the smaller facilities (p = 0.05, Table 2).

Compliance improved significantly among nursing (p = 0.001) and among physicians (p <0.05).

Table 2: HH Compliance Rate by Facility

Facility type	Facility	FY 2012	FY 2013	FY 2014	Change from 2013✧
All	IH	58%	69%	74%	5% †
Tertiary hospital	KGH	59%	71%	75%	5%
	RIH	43%	67%	74%	7% †
Service area hospital	EKH	35%	66%	68%	2%
	KBH	64%	72%	78%	6%
	PRH	68%	72%	71%	-1%
	VJH	63%	64%	70%	6%
Community level hospital	CMH	64%	73%	78%	5%
	KLH	67%	73%	83%	10%
	SLH	67%	73%	74%	1%
	Other*	63%	69%	75%	6% †

† Significant change from FY 2013 to FY 2014

✧ Percent rounded to the nearest whole number

* Indicates rural acute care facilities with ≤20 beds: 100 Mile Hospital, Arrow Lakes Hospital, Boundary District Hospital, Creston Valley Hospital, Dr. Helmcken Memorial Hospital, Elk Valley Hospital, Golden District Hospital, Invermere and District Hospital, Lillooet Hospital, Nicola Valley Hospital, Princeton General Hospital, Queen Victoria Hospital, South Okanagan General Hospital.

Table 3: HH Compliance Rate for Interior Health by Provider

Provider category (see appendix F)	FY 2012	FY 2013	FY 2014	Change from 2013✧
Clinical Support Staff	50%	58%	64%	5%
Nursing Staff	62%	73%	78%	4% †
Other	56%	65%	72%	6%
Physicians	44%	57%	64%	7% †

† Significant change from FY 2013 to FY 2014

✧ Percent rounded to the nearest whole number

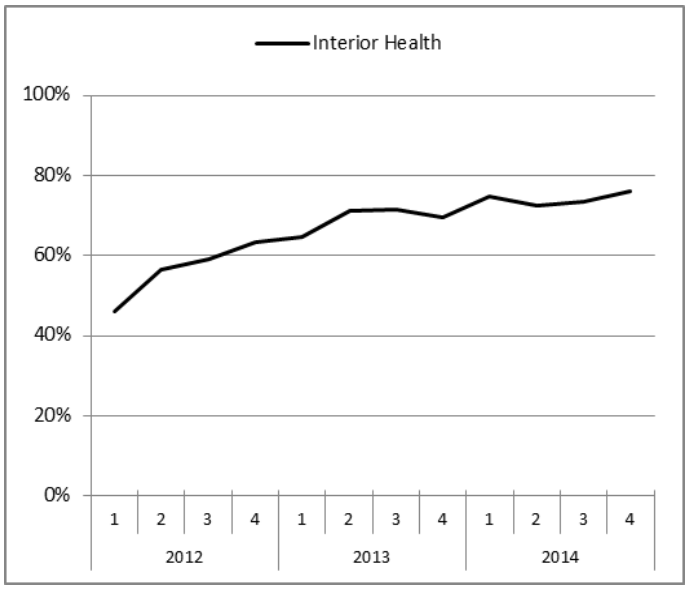
Table 4: HH Compliance Rate for Interior Health by Contact Timing

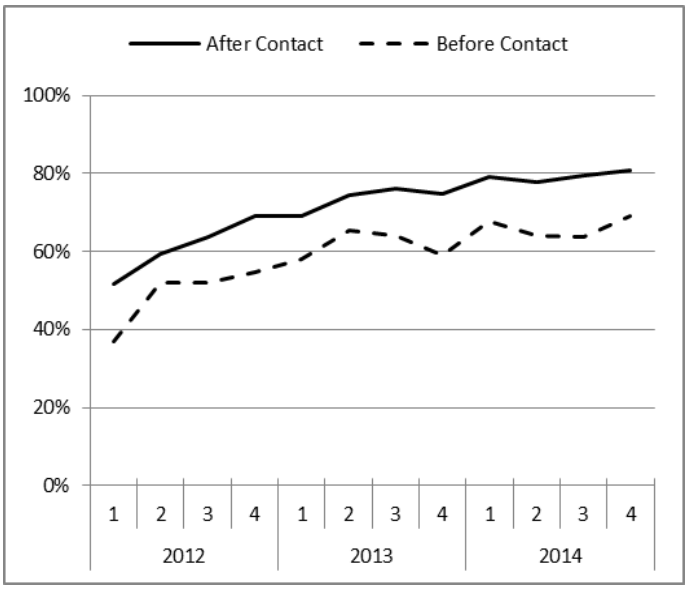
Contact Timing	FY 2012	FY 2013	FY 2014	Change from 2013✧
After Contact	62%	74%	79%	6% †
Before Contact	51%	62%	66%	4% †

† Significant change from FY 2013 to FY 2014

✧ Percent rounded to the nearest whole number

Figure 1: HH Compliance Rates for Interior Health by Fiscal Quarter





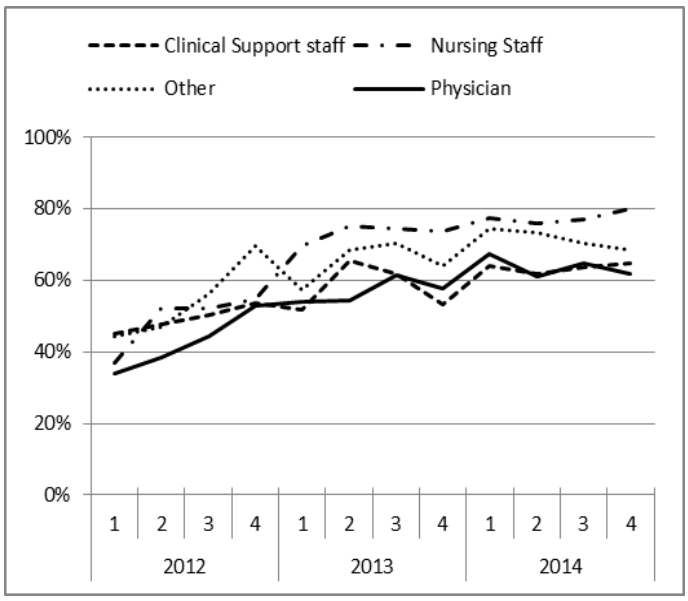
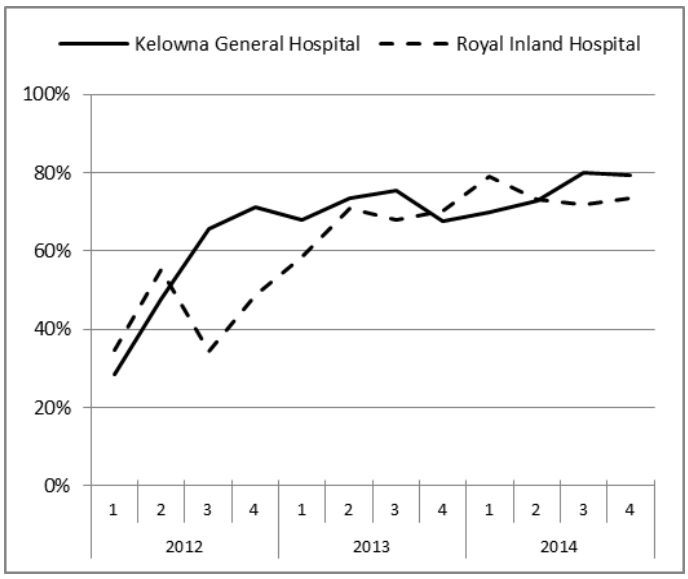
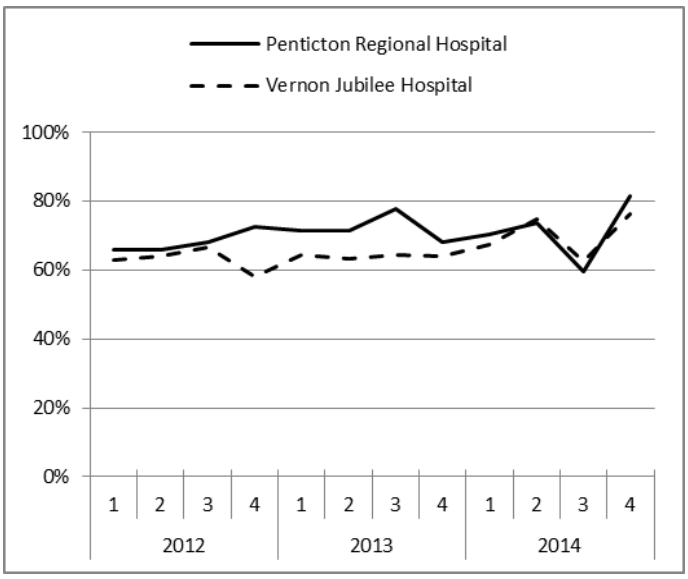
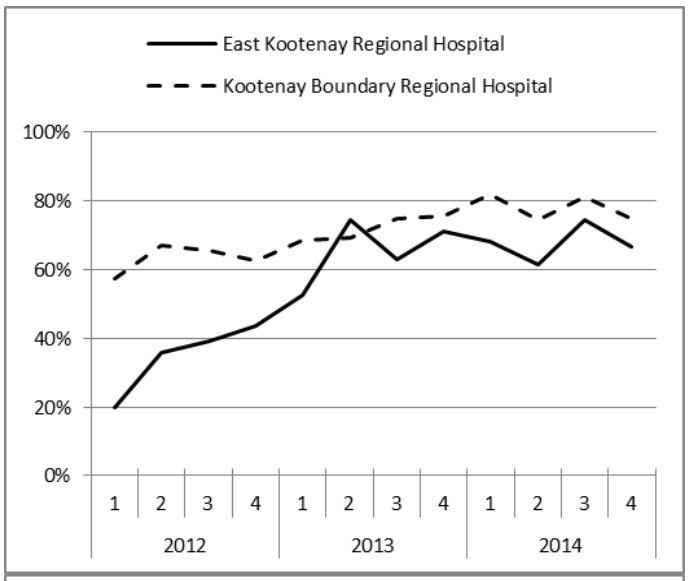
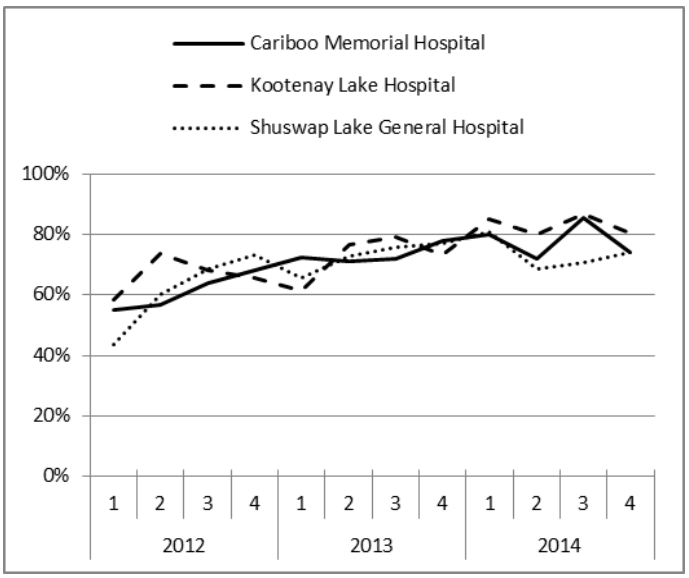


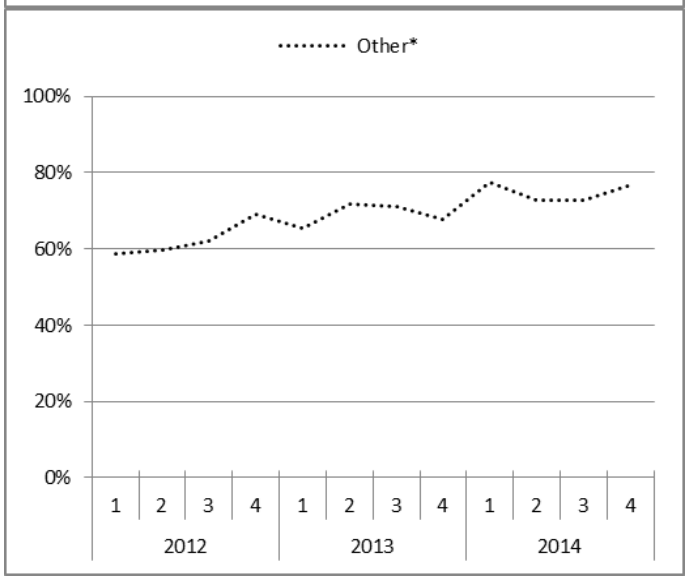
Figure 2: HH Compliance Rates for Acute Facilities by Fiscal Quarter











Other* indicates rural acute care facilities with ≤20 beds: 100 Mile Hospital, Arrow Lakes Hospital, Boundary District Hospital, Creston Valley Hospital, Dr. Helmcken Memorial Hospital, Elk Valley Hospital, Golden District Hospital, Invermere and District Hospital, Lillooet Hospital, Nicola Valley Hospital, Princeton General Hospital, Queen Victoria Hospital, South Okanagan General Hospital.

LINK NURSE PROGRAM

The IPAC LN program was implemented in March 2011 to augment IPAC practices in IH. The LN program was designed to increase IPAC resources for staff in clinical areas by training volunteer nursing staff to promote patient safety and collaborate with ICPs within their facility. The program sought to have two IPAC LNs on each unit, working to increase awareness of IPAC issues in their area and motivate staff to improve practice. The LNs are provided with specialized education sessions designed to enable them to cascade information back to their colleagues.

ACCOMPLISHMENTS/ PRIORITIES MET

Two four-hour follow-up sessions were held in June and November of 2013 to provide further support and guidance to first year LNs at Kelowna General Hospital. In December 2013, an additional four-hour education session took place for the current pool of LNs at Royal Inland Hospital.

GOING FORWARD

Since the inception of the LN program, 63 Registered Nurses have received IPAC training through the LN program. Comments provided by participants following each education session help direct development of educational modules for additional training sessions.

In the summer of 2013, work began on the evaluation of the LN program. The primary focus of this evaluation is to assess the benefit of the current LN program within Royal Inland Hospital and Kelowna General Hospital. This sets the stage for revisions, expansion to other facilities/clinical areas, or termination of the program and will provide an objective and descriptive investigation of the potential barriers and benefits of these early years.

There is potential for the program to expand to additional hospitals and clinical areas such as other community hospitals, residential care facilities and perhaps even rural clinics, as these are often areas that have limited access to ICPs. However, any expansion would depend upon the benefit of the program in its current state and the adaptability of this program to these settings.

CONSTRUCTION

Construction projects, in particular renovation projects, pose potential health risks for patients, staff, visitors and construction personnel that may lead to HAIs. These risks most commonly develop when dust particles contaminated with bacteria and fungi are dispersed into adjacent patient care areas. The primary fungus associated with these infections is *Aspergillus* while the major bacterium is *Legionella*.

Early planning in construction and renovation projects must integrate IPAC, engineering services, and building design to prevent HAIs, and minimize allergen load and other workplace hazards. An *IPAC Risk Assessment* is required before construction or renovations begin. To facilitate an assessment, Facilities Management and/or Capital Planning and Projects informs IPAC regarding the location of all areas of renovation and construction.

ACCOMPLISHMENTS/ PRIORITIES MET

Having IPAC educational documents readily available is vital to promote best practices within IH. As such, the development of an external contractor topic specific document was created for any new construction or renovation work. This included *Hand Hygiene Frequently Asked Questions for Contractors.* This document, along with the HH pamphlet, is distributed to contractors at the beginning of each new project.

Over 285 new construction and renovation permits were issued by ICPs across IH during FY 2014. Of these issued permits, construction and renovation projects ranged in size, completion time, and health risk. Some of the projects included:

- Installation of new hand-washing sinks and countertops in multiple facilities
- Construction started for the new Interior Heart and Surgical Centre
- Project planning started for new towers at Royal Inland Hospital and Penticton Regional Hospital
- Airborne isolation rooms in multiple facilities
- Renovation projects in multiple facilities

CURRENT STATUS

Numerous new construction and renovation projects continue in acute, residential and community care facilities throughout the authority.

FUTURE PLANS

Due to the growing number of permits issued for data drops and installation of ceiling lifts for residential and acute sites, IPAC will develop and trial standard permits.

TUBERCULOSIS

Construction of multiple airborne isolation rooms were either in the planning stage or completed during FY 2014. The need for increased signage and respiratory stations at all facility entrances, including emergency rooms, was recognized and addressed. More signs and respiratory station were purchased. A total of 27 TB education sessions were provided by ICPs, educating more than 140 HCPs (Table 1). Education was also provided to HCPs by Public Health.

The automated Patient Contact Tracing Tracking Tool was developed in FY 2014 with the assistance of Information Management Information Technology (IMIT).

SURVEILLANCE

Surveillance for HAIs is an IH-wide strategy that is carried out by IPAC and ICPs. Infectious disease surveillance can be helpful in the identification of patient populations or time periods in which infection frequency is of increased concern. Surveillance of HAI provides a useful indication of the effectiveness of IPAC efforts in the prevention of HAIs and control of their transmission. As such, surveillance data are used to guide performance improvement activities such as healthcare practices, as well as measured clinical outcomes. Finally, surveillance can support the implementation of risk-reduction strategies and monitor the effectiveness of the interventions. Ongoing surveillance is important to ensure increasing trends and clusters are quickly identified and addressed.

In acute care settings, the system identifies potential infection cases based on predetermined HAI case definitions. In residential care settings, ICPs collect data based on predetermined HAI case definitions and enter the data into the computerized surveillance program.

Standardized electronic reports are generated on a regular basis and reviewed by site specific and corporate IPAC Committees. Analysis and interpretation of infection data are reported to a facility's IPAC Committee or other advisory body by the IPAC Team.

HAIs can be expressed as total counts or as a rate; three elements are required to generate HAI rates:

- Number of cases (i.e. persons developing a particular infection)
- Number of patient-days, surgeries or ventilator-days
- Time period involved

ACCOMPLISHMENTS/ PRIORITIES MET

In early 2013, the Center for Disease Control (CDC), National Healthcare Safety Network (NHSN), and PICNet released new surveillance definitions and protocols for HAIs. In order to facilitate these modifications, working groups within IPAC were created. In conjunction with the Medical Systems Programmer/ Systems Analyst and IPAC working groups, revisions to all worksheets and electronic reports were made to incorporate the latest HAI definitions. Completion of the new HAI definitions, protocols and more comprehensive reports were put into place at the beginning of Period 7 (September 2013).

GOING FORWARD

Going forward the IPAC Educator and Medical Systems Programmer/ Systems Analyst plan to develop a manual for the electronic surveillance system for ICP/ IPAC orientation and reference.

LIMITATIONS

The System Surgical Data Warehouse Load that refreshes each day has, on occasion, failed to load correctly. As a result, HAI data are not current for a period of time (usually lasting a few hours). This can be problematic as it can cause delays in reporting out data and/or errors should the (IMIT) email alert be missed.

Changes made in other IH program reports can affect how IPAC reports run. When changes are made and not reported correctly to the Medical Systems Programmer/ Systems Analyst errors may occur.

Caution should be exercised in interpreting rates for small facilities. When denominators (patient-days, surgeries or ventilator-days) are low, the resulting rates may be high with poor reliability. When the confidence interval for a rate is given, reliability can be judged by the confidence interval. Rates with wider confidence intervals are less reliable than rates with narrower confidence intervals.

Results from statistical comparisons of rates across facilities or across time periods that are presented in this section take into account comparisons with small denominators. However, other factors that may impact infection rates, such as variation across comparison groups with respect to infection prevention practices, community infection rates, and susceptibility to infection in patient populations are not accounted for. Nevertheless, the results from comparisons presented here are useful as indicators of trends and differences.

During an IH wide system upgrade in the fall of 2011, multiple facilities in the East Kootenay and Kootenay Boundary regions experienced electronic data availability issues with the standardized electronic reports. Data from Quarters 3 and 4 in FY 2011 and Quarters 1 and 2 in FY 2012 may not correctly reflect actual HAI rates shown in this report; however, this was accounted for in all analyses reported (Appendix B). This data are available upon request in archived hard-copy documents.

CLOSTRIDIUM DIFFICILE INFECTION

C. difficile is a Gram-positive spore-forming bacillus. Some strains of *C. difficile* produce toxins that can cause diarrheal infections in persons in acute and residential care facilities, and in the community. CDI is one of the most common HAIs among patients in Canadian hospitals[1]. In a study including 176 hospitals across the country, the median CDI prevalence among the inpatient population was 1%[1]. Since 2000, outbreaks of CDI, primarily due to the North American pulsotype 1strain of *C. difficile* have increased concern because of its increased virulence[2].

C. difficile spores are resistant to common types of disinfectants and their elimination may require the use of sporicidal chemicals in addition to thorough cleaning of the patient environment and HH using either soap and water or alcohol based hand rub (ABHR). Risk factors for CDI include a history of antibiotic usage (particularly clindamycin, fluoroquinolones, cephalosporins and ampicillin), bowel surgery, chemotherapy, age greater than 65, prolonged hospitalization and serious underlying illness or debilitation.

WHAT IS BEING MEASURED?

CDI surveillance includes cases of new healthcare-associated CDI (HA-CDI), relapse CDI, and community-associated (CA-CDI) among inpatients. CDI rates are the number of cases divided by the total number of inpatient days expressed as a ratio per 10,000 patient-days.

As per PICNet protocol[3], the population under CDI surveillance are inpatients admitted to IH acute care facilities (Appendix C). Excluded from the population are:

- Outpatient visits to an acute care facility
- Emergency room patients not admitted to an acute care inpatient unit
- Patients in extended care beds or in mental health beds housed in the acute care facility
- Patients less than one year old

CDI definitions are determined by the CDI PICNet protocol (Appendix D).

ACTIONS IMPLEMENTED

In an effort to decrease the spread of CDI, enforcement was heightened by all stakeholders to ensure that each CDI case was treated the same as per the IH Strategic Plan for CDI.

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[1] Simor A, Williams V, McGeer A, Raboud J *et al.* Prevalence of colonization and infection with methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant *Enterococcus* and of *Clostridium difficile* infections in Canadian hospitals. *Infect Control Hosp Epidemiol* 2013;34:687-693.
[2] Barbut F, Jones G, Eckert C. Epidemiology and control of *Clostridum difficile* infections in healthcare settings: an update. *Curr Open Infect Dis* 2011;24:370-376.
[3] PICNet Surveillance Protocol for *Clostridium difficile* Infection (CDI) in BC Acute Care Facilities, July 2013. Provincial Infection Control Network of British Columbia

Since IH adopted a zero tolerance for CDI acquired in facilities a number of actions continue to be implemented to prevent and address CDIs within IH. These include:

HH:

- Reinforced current guidelines that either ABHR or soap and water is acceptable when caring for patients with CDI
- Reinforced point of care ABHR availability at each patient's bedside and additional locations as identified by front line staff
- Reinforced staff education regarding the need for appropriate HH practice before and after contact with the patient and/or patient environment and before and after glove use
- Emphasized importance of staff doing HH prior to assisting patients with their meals and prior to distributing medications
- Posted quarterly HH audits on the IH website and units helped foster engagement with HCPs and the public

Environmental Source Controls:

- Worked collaboratively with Housekeeping Services to implement IH wide processes for cleaning environments and equipment contaminated with or potentially contaminated with *C. difficile*
- Reinforced use of dedicated equipment for patients with CDI and that it is cleaned and disinfected
- Implemented de-cluttering initiatives
- Reinforced clean and dirty utility rooms are clearly identified and used appropriately to minimize the possibility of cross contamination
- Asked managers to consider purchasing extra equipment to dedicate to patient rooms and patients (i.e.) vital sign machines, commodes

Staff Education:

- Reminded staff to implement contact precautions immediately for all patients with diarrhea
- Included all pertinent points made under HH and environmental cleaning

Continuous education is provided by ICPs for both HCPs and patients. The IPAC manual is reviewed and updated regularly.

FUTURE PLANS

IH's zero tolerance for CDI continues to be one of IPAC's top priorities in the 2015 FY Strategic Plan (Figure 8). During the next FY, ICPs will develop and implement education plans for their areas of responsibility. In doing so, targeted education can be efficiently delivered to units with rates over benchmark.

The Best Practice Checklist for Management of CDI will be finalized and implemented in early FY 2015. This checklist will be completed by ICPs for all inpatients/ residents with known or suspect CDI for both HA-CDI and CA-HAI.

Once defined, facility specific alert levels will notify ICPs at a given facility and triggers actions to reduce transmission. The objective of these alert levels is to minimize the potential for CDI outbreaks in IH facilities.

In the next few FYs, IPAC plans to reduce the CDI benchmark and continue to increase education to all stakeholders.

DATA ANALYSIS

Table 5: Interior Health new healthcare associated CDI status, FY 2014

Incidence (95% confidence interval)	Five-year trend	FY 2014 benchmark	Status
5.3/10,000 patient-days (4.7/10,000 – 6.0/10,000 patient-days)	-0.9/10,000 patient-days/year	6.0/10,000 patient-days	Below 2014 benchmark

Current Year:

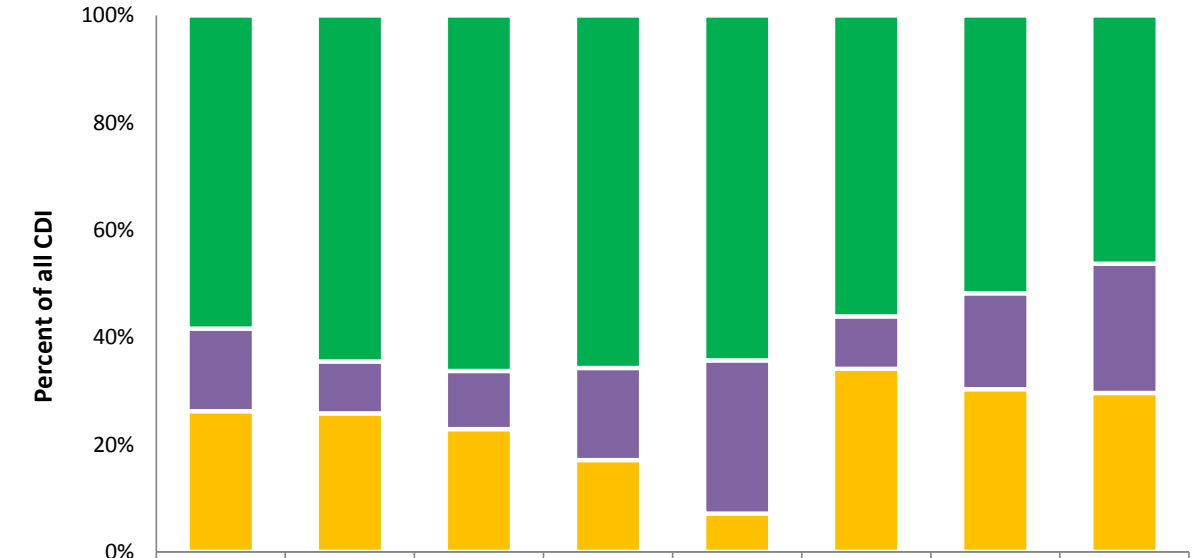
Cases:

In the 2014 FY, cases of CDI were reported at all IH acute care facilities except Elk Valley Hospital. Across IH there were 461 cases of CDI, including 269 cases of new healthcare associated CDI (HA-CDI) (58.4% of total), 121 new cases of community-associated CDI (26.2% of total), and 71cases of relapse CDI (15.4% of total; Figure 3).

The distribution of CDI among the three classifications of CDI was similar to the distribution reported across BC in FY 2013[4]. The distribution in IH varies considerably across facilities (Figure 3). For example, the proportion of CA-CDI varied from very little (7.1% in Kootenay Boundary Hospital) to substantial (34.1% in Penticton Regional Hospital).

[4] *Clostridium difficile* Infection Surveillance Report for the Fiscal Year 2012/2013. Provincial Infection Control Network of British Columbia

Figure 3: Distribution of CDI across classification groups by facility, FY 2014



	IH	KGH	RIH	EKH	KBH	PRH	VJH	Community-level hospitals
New HA-CDI	269	80	55	23	9	23	29	50
Relapse	71	12	9	6	4	4	10	26
New CA-CDI	121	32	19	6	1	14	17	32

Rates:

The rate of new HA-CDI in IH for FY 2014 was 5.3/10,000 patient-days (95% confidence interval, 4.7/10,000 patient-days – 6.0/10,000 patient-days, Table 5).

Compared to the IH-wide incidence, rates at two individual facilities were notable: Cariboo Memorial Hospital, where the rate was much higher ($p < 0.01$) and East Kootenay Regional Hospital, where the incidence of new HA-CDI was marginally higher ($p = 0.05$). There was an outbreak of CDI at Royal Inland Hospital (Appendix D); however, their incidence of HA-CDI in 2014 was not significantly different than the overall rate in IH incidence.

Table 6: New HA-CDI, FY 2014

Facility type	Facility	Count	Patient-days	Rate, 1/10,000 patient-days [1]	95% confidence interval of rate	Difference in rate from 2013 FY [2]
All	IH	269	503736	5.3	4.7 – 6.0	-0.8
Tertiary hospital	KGH	80	155392	5.2	4.0 - 6.3	-1.0
	RIH	55	94067	5.9	4.3 - 7.4	1.2
Service area hospital	EKH	23	27341	8.4	5.0 - 11.8	-0.2
	KBH	9	27719	3.3	1.1 - 5.4	-3.3
	PRH	23	53037	4.3	2.6 - 6.1	-0.1
	VJH	29	63941	4.5	2.9 - 6.2	-0.1
Community level hospital	ALH	0	1176	NA	-	-8.3
	BDH	2	3749	NA	-	5.3
	CMH	13	9734	13.4	6.1 - 20.6	-15.8 *
	CVH	6	5679	10.6	2.1 – 19.0	2.7
	DHH	1	1661	NA	-	0.1
	EVH	0	5062	NA	-	-14.9 *
	GDH	2	2174	NA	-	9.2
	IDH	0	2613	NA	-	-22.1
	KLH	4	12503	3.2	0.1 - 6.3	-6.0
	LIH	1	1551	NA	-	6.5
	NVH	4	3533	11.3	0.2 - 22.4	8.3
	OMH	3	5172	NA	-	-1.8
	PGH	1	1663	NA	-	-5.5
	QVH	1	3051	NA	-	3.3
	SLH	9	16789	5.4	1.9 - 8.9	1.7
	SOG	3	6129	NA	-	1.6

[1] NA: Not available due to lack of insufficient data

[2] * indicates statistical significance, p <0.05

Comparison to 2013:

Compared to the IH incidence of new HA-CDI in FY 2013 (6.2/10,000 patient-days), the incidence in 2014 decreased although the change was not statistically significant. While the new HA-CDI rate increased at some IH facilities, it decreased at others (Table 6). Although some challenges in CDI control continued at Cariboo Memorial Hospital, their new HA-CDI rate decreased significantly from their 2013 rate (29.2/10,000 patient-days).

Longer Term Trend:

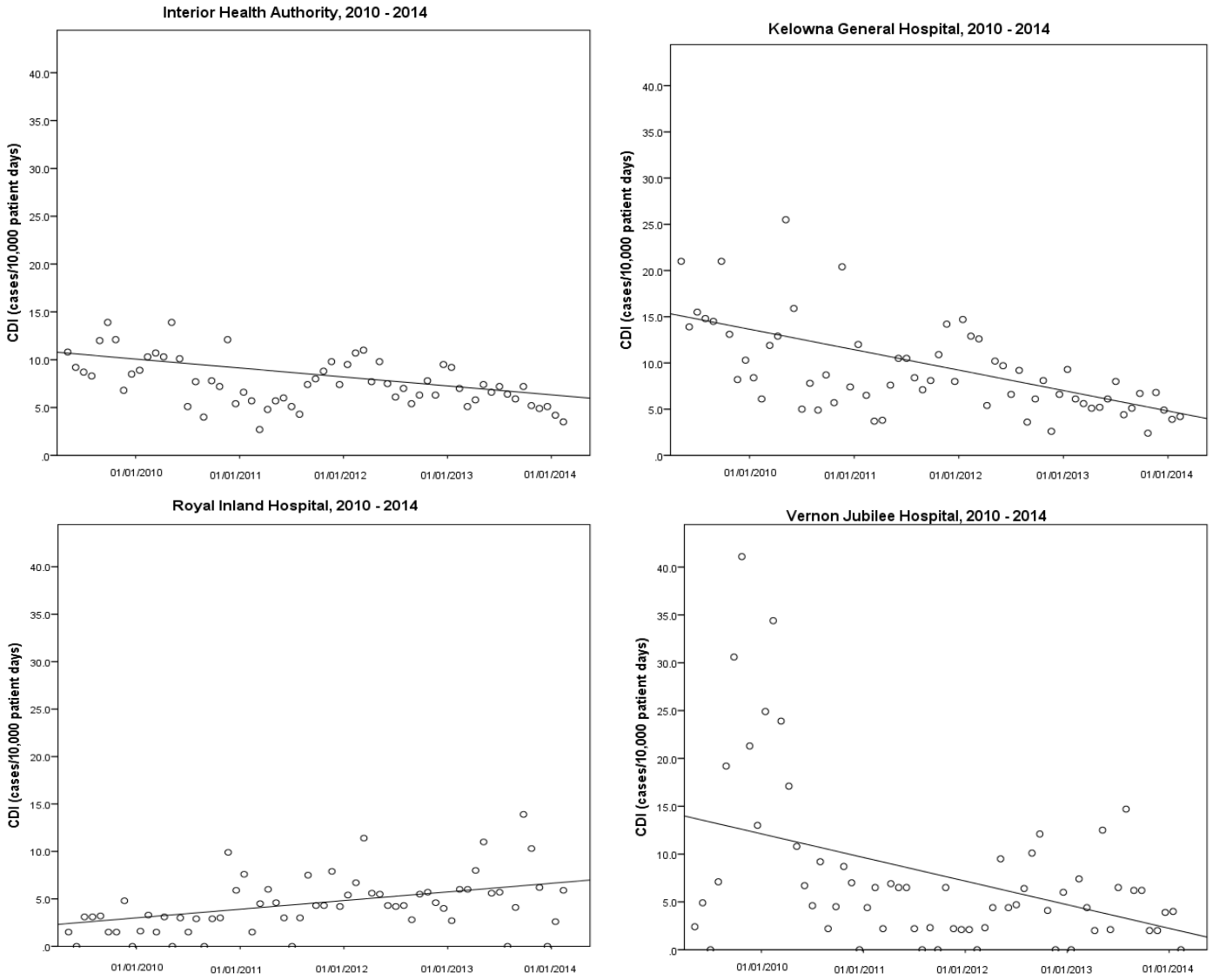
There were general fluctuations in the incidence of new HA-CDI within IH since 2010 that appear somewhat seasonal and there were generally lower rates in FY 2012 (Figure 4). Overall, there has been a slow, steady, but significant decrease from 2010 through 2014. The average decrease per period was 0.1/10,000 patient-days. This is equivalent to a decrease of 0.9/10,000 patient-days per year.

Within individual facilities, there have been significant long-term decreases in incidence at Kelowna General Hospital (-2.3/10,000 patient-days per year) and Vernon Jubilee

Hospital (-2.5/10,000 patient-days per year): however, there was a significant increase at Royal Inland Hospital (0.9/10,000 patient-days per year, Figure 4). Rates at the other service area hospitals did not demonstrate a significant or reliable long-term trend.

It should be noted that in 2010 and 2011 there was considerable period-to-period variability in new HA-CDI rates at Kelowna General Hospital and Vernon Jubilee Hospital (Figure 4), while there was little variability at Royal Inland. However, even after restricting the long-term analyses to data from 2011 forward, the overall findings for facilities do not differ much from the analyses of 2010 to 2014 data.

Figure 4: Long-term incidence of new HA-CDI, 2010 through 2014



METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS*

MRSA is a bacterial species that is resistant to penicillin antibiotics, including methicillin and amoxicillin. MRSA have been recognized as a major medical issue for the past 20 years, as people infected with MRSA are more difficult to treat.

These bacteria are spread easily in healthcare settings as they are readily transmitted via skin-to-skin contact or contact with items contaminated by the bacteria. Examples of MRSA transmission include person-to-person transmission via unwashed hands of HCPs and contact with contaminated environmental surfaces and equipment.

In the US, the incidence of healthcare associated MRSA (HA-MRSA) infection steadily dropped between 2005 and 2011[5]. In contrast, HA-MRSA infection rates across western Canadian provinces increased from 2005 to 2006, but then remained relatively stable through to 2009[6].

WHAT IS BEING MEASURED?

MRSA surveillance includes the number of new cases of MRSA acquired by patients, divided by the total number of inpatient days over a specified time frame, expressed as a ratio per 10,000 patient-days.

The population under MRSA surveillance are inpatients admitted to IH acute care facilities[7] (Appendix C). Patients excluded from the population are:

- Outpatient visits to an acute care facility
- Emergency room patients not admitted to an acute care inpatient unit
- Patients in extended care beds housed in an acute care facility

ACTIONS IMPLEMENTED

A number of actions continue to be implemented to address MRSA infections within IH. The *Acute Care Admission Screening* tool is completed as part of the initial patient admission history and assessment. The use of dedicated patient equipment and the placement of patients in private rooms, where feasible, are actions taken in addition to ongoing staff and patient education.

[5] Dantes R, Mu Y, Belflower R, Aragon D, Dumyati G, *et al.* National burden of invasive methicillin-resistant *Staphylococcus aureus* infections, United States, 2011. *JAMA Intern Med.* 2013. 173:1970-1978.
[6] Public Health Agency of Canada. Results of the surveillance of methiciliin-resistant *Staphylococcus aureus* – from 1995 to 2009 – a project of the Canadian Nosocomial Infection Surveillance Program (CNISP). 2011
[7] PICNet Surveillance Protocol for Methicillin-Resistant *Staphylococcus aureus* (MRSA) in BC Acute Care Facilities, July 2013. Provincial Infection Control Network of British Columbia

LIMITATIONS

MRSA analyses reported here are subject to limitations due to a number of factors. MRSA screening can vary from hospital to hospital as screening protocols may not always be adhered to. Secondly, MRSA colonization may not be identified by screening protocols in some populations such as surgical pre-screening.

Starting in the second half of 2014, MRSA cases were classified as cases of colonization or infection, but MRSA data prior to Period 7 of 2014 did not include this level of classification. Consequently, long-term analysis of infections is not available.

DATA ANALYSIS

Table 7: Interior Health HA-MRSA Status

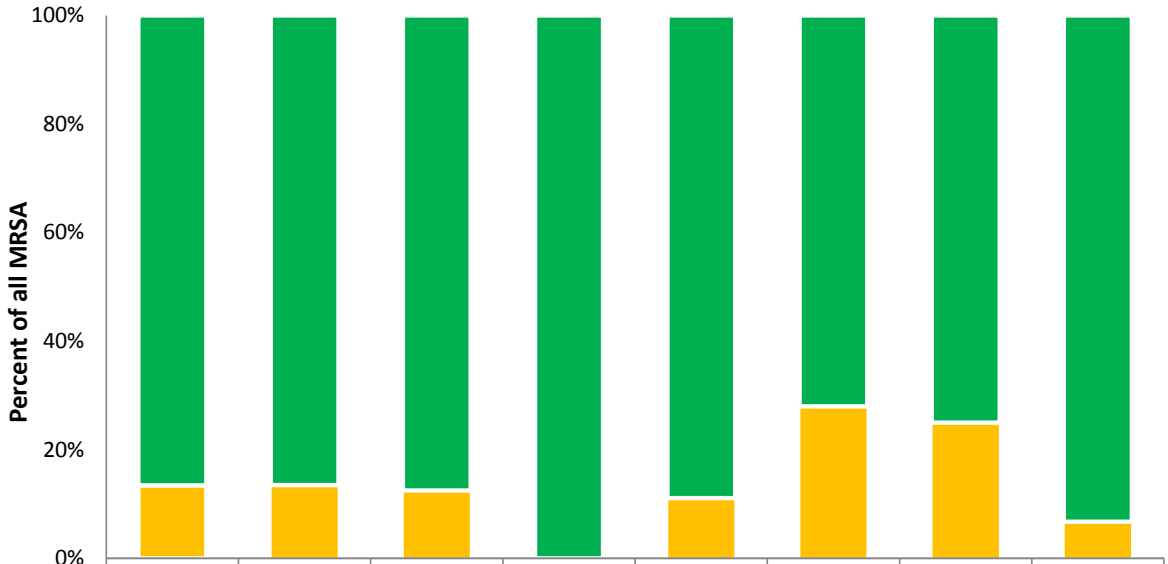
Incidence, (95% confidence interval)	Five-year trend	FY 2014 benchmark	Status
4.5/10,000 patient-days (3.9/10,000 – 5.1/10,000 patient-days)	-0.3/10,000 patient-days per year	5.6/10,000 patient-days	Below 2014 benchmark

Current Year:

Cases:

In total, there were 260 cases of MRSA reported in acute care in IH during FY 2014. Of these, 35 were community associated cases (13.5%). The distribution between community and healthcare associated cases differed somewhat across facilities (Figure 5). As with CDI, the proportion of cases with onset in the community was highest at Penticton Regional Hospital (28.0%).

Figure 5: Distribution of MRSA across classification groups by facility, FY 2014



	IHA	IHKGH	IHRIH	IHEKH	IHKBH	IHPRH	IHVJH	Community -level hospitals
HA-MRSA	225	32	63	11	8	18	24	69
CA-MRSA	35	5	9	0	1	7	8	5

Rates:

Across IH, the incidence of community and healthcare associated MRSA combined was 5.2/10,000 patient-days (95% confidence interval, 4.5/10,000 patient-days – 5.8/10,000 patient-days). This is similar to the rate in FY 2013, 5.5/10,000 patient-days.

When restricted to healthcare associated cases, the IH incidence of HA-MRSA for FY 2014 was 4.5/10,000 patient-days (95% confidence interval, 5.0/10,000 patient-days – 6.3/10,000 patient-days, Table 7). Compared to this rate, the HA-MRSA incidence at Kelowna General Hospital was much lower (p <0.001). The incidence at Royal Inland Hospital and at Shuswap Lake General Hospital were both significantly higher than the IH incidence (p <0.01). These comparisons should however be interpreted with caution as they may be partly due to compliance with screening protocols across facilities.

During the last 7 periods of FY 2014, the incidence of HA-MRSA *infection* (i.e., not including HA-MRSA cases of colonization without infection) within IH was 3.0/10,000 patient-days (95% confidence interval, 2.4/10,000 patient-days – 3.7/10,000 patient-days). Compared to IH, the incidence of infection was not different at Royal Inland Hospital or Shuswap Lake General Hospital. The Kelowna General Hospital rate of infection was significantly less than the IH rate (p <0.01).

Table 8: HA-MRSA, FY 2014

Facility type	Facility	Count	Patient-days	Rate, 1/10,000 patient-days [1]	95% confidence interval of rate	Difference in rate from 2013 FY[2]	Infection rate [3], 1/10,000 patient-days
All	IH	225	503736	4.5	3.9 – 5.1	-0.3	3.0
Tertiary hospital	KGH	32	155392	2.1	1.7 - 3.2	-0.8	1.3
	RIH	63	94067	6.7	6.5 - 10.1	-1.9	3.9
Service area hospital	EKH	11	27341	4.0	1.9 - 6.9	-3.8	NA
	KBH	8	27719	2.9	1.1 - 5.4	-0.4	NA
	PRH	18	53037	3.4	3.8 - 7.9	2.3 *	3.8
	VJH	24	63941	3.8	3.4 - 6.9	2.1 *	3.4
Community level hospital	ALH	1	1176	NA	-	8.5	NA
	BDH	3	3749	NA	-	-3.8	NA
	CMH	6	9734	6.2	4.6 - 18	2.4	11.5
	CVH	2	5679	NA	-	1.5	0.0
	DHH	1	1661	NA	-	-5.8	0.0
	EVH	6	5062	11.9	2.4 - 21.3	4.4	NA
	GDH	1	2174	NA	-	-0.8	0.0
	IDH	0	2613	NA	-	-8.8	0.0
	KLH	9	12503	7.2	2.5 - 11.9	-0.4	NA
	LIH	1	1551	NA	-	1.3	NA
	NVH	2	3533	NA	-	5.7	NA
	OMH	6	5172	11.6	3.5 - 23.6	-5.6	NA
	PGH	0	1663	0.0	0 - 0	0.0	0.0
	QVH	1	3051	NA	-	-0.2	NA
	SLH	26	16789	15.5	10.5 - 22.8	0.1	8.8
	SOG	4	6129	6.5	2 - 17.6	4.9	NA

[1] NA: Not available due to lack of insufficient data

[2] * indicates statistical significance, p <0.05

[3] Data include Periods 7 through 13, FY 2014

Comparison to 2013:

The incidence rate of HA-MRSA in IH was 0.3/10,000 patient-days less than the HA-MRSA rate of 2013, but this difference was not significant (Table 8). HA-MRSA rates at Penticton Regional Hospital and at Vernon Jubilee Hospital were significantly higher this year than in 2013 (1.1/10,000 patient-days and 1.6/10,000 patient-days, respectively).

Longer Term Trend:

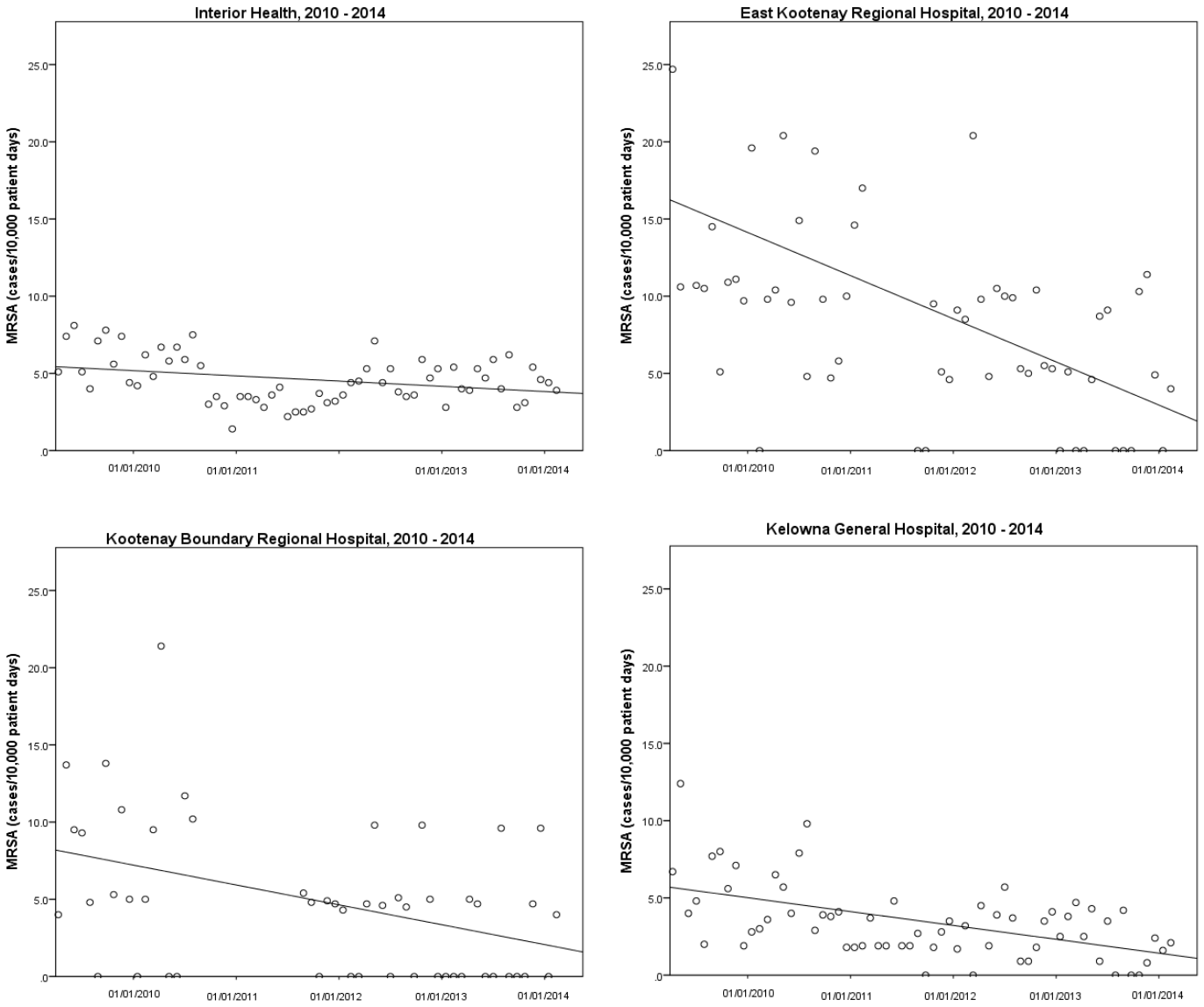
HA-MRSA Trend:

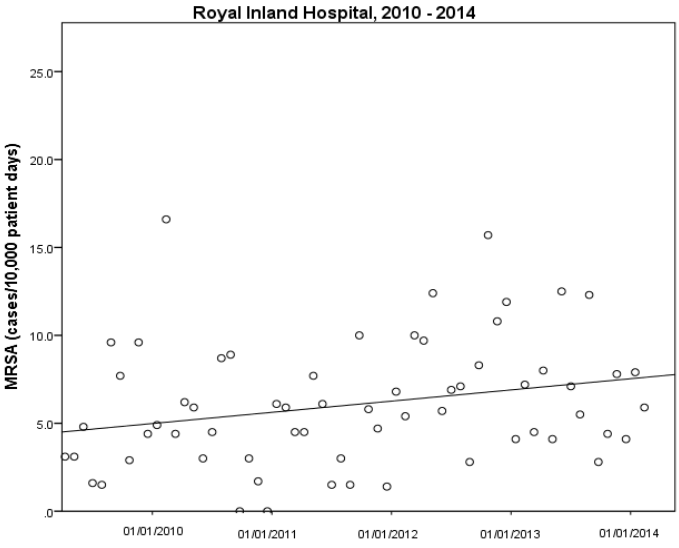
Similar to the HA-CDI rate, the incidence of HA-MRSA has been slowly, but significantly, decreasing from FYs 2010 through 2014 (Figure 6). The incidence declined on average at a rate of 0.03/10,000 patient-days per period. This is equivalent to a decline of 0.3/10,000 patient-days per FY. Interestingly, the drop in the IH HA-MRSA rate in the 2012 FY (Figure 6) mirrored the 2012 drop in IH HA-CDI (Figure 6).

Trends in HA-MRSA rate varied across facilities. Decreasing rates were observed at East Kootenay Regional Hospital (-2.8/10,000 patient-days per year), Kootenay Boundary Regional Hospital (-1.3/10,000 patient-days per year), and at Kelowna General Hospital (-0.9/10,000 patient-days per year; all p <0.001). In contrast, the HA-MRSA rate significantly increased over the 5 years at Royal Inland Hospital (0.6/10,000 patient-

days per year, p <0.01). It is unclear if these trends apply to infections of MRSA, as the earlier years' data do not differentiate between cases of infection and colonization.

Figure 6: Long-term incidence of HA-MRSA, FY 2010 through 2014




Royal Inland Hospital, 2010 - 2014
MRSA (cases/10,000 patient days)
25.0
20.0
15.0
10.0
5.0
.0
01/01/2010
01/01/2011
01/01/2012
01/01/2013
01/01/2014

VANCOMYCIN-RESISTANT ENTEROCOCCUS

VRE are bacteria that have developed resistance to many antibiotics, especially vancomycin. Enterococci live in our intestines and on our skin, usually without causing problems; however, enterococci can become a problem and cause infection. These infections can occur anywhere in the body. Some common sites include the intestines, the urinary tract, and skin wounds. For some people, especially those who are immunocompromised, these infections can become serious.

Examples of VRE transmission include person-to-person transmission via unwashed hands of HCPs and contact with contaminated environmental surfaces and equipment

WHAT IS BEING MEASURED?

The incidence rate of VRE is per 10,000 patient-days. This is the number of new cases of VRE acquired by patients as a result of their stay in hospital or previous contact with a healthcare facility or program, divided by the total number of inpatient days over a specified time frame, expressed as a ratio per 10,000 patient-days.

The population under VRE surveillance are inpatients admitted to IH acute care facilities (Appendix C). Patients excluded from the population are:

- Outpatient visits to an acute care facility
- Emergency room patients not admitted to an acute care inpatient unit
- Patients in extended care beds housed in the acute care facility

ACTIONS IMPLEMENTED

A number of actions continue to be implemented to address VRE infections within IH. The use of dedicated patient equipment and the placement of patients in private rooms, where feasible, are actions taken in addition to ongoing staff and patient education.

Effective December 1, 2013 IH discontinued screening patients for VRE. Going forward, only patients with VRE infections will be flagged with an ARO Alert. Patients previously identified as colonized with VRE by rectal swab screening had the alert removed.

Reasons for change in practice:

- The vast majority of VRE colonized patients never develop an infection with VRE
- VRE infections remain rare in IH and occur almost exclusively in immunocompromised patients who have received broad spectrum antibiotics
- IH Microbiology laboratories have protocols to ensure rapid identification of VRE infections especially from sterile body sites
- The majority of VRE infections were not detected through rectal screening

- Duration of VRE colonization can vary from days to years. As a result many VRE colonized patients are placed on contact precautions unnecessarily resulting in inconvenience for patients

Actions Implemented:

- An educational pamphlet was developed for patients to explain the change
- All reference to VRE rectal screening was removed from the admission form
- All patients previously identified as VRE colonized had their ARO Alert removed

Going forward, all patients with a VRE infection will continue to have an ARO Alert entered into the system and be placed on contact precautions.

DATA ANALYSIS

The rate of healthcare-associated VRE (HA-VRE) in IH during the first 9 periods in FY 2014 was 9.7/10,000 patient-days (95% CI: 8.6/10,000 patient-days – 10.7/10,000 patient-days). The rates at Royal Inland Hospital ($p < 0.001$), Kootenay Boundary Hospital ($p < 0.05$), and Shuswap Lake General Hospital ($p < 0.001$) were higher than the rate across IH. In contrast, the rate at Penticton Regional Hospital was much lower than the regional rate ($p = 0.001$). As VRE rates partly depend on screening compliance upon admission, comparisons among individual facilities should be interpreted with caution.

Compared to FY 2013, the VRE rates in Periods 1 – 9, FY 2014 were significantly higher at Kootenay Boundary Hospital, Kootenay Lake Hospital, Shuswap Lake General Hospital, and Vernon Jubilee Hospital (Table 9), while rates were lower at Kelowna General Hospital and Penticton Regional Hospital.

Comparisons in rates between periods before and after the change in surveillance practice can provide a crude indication of the influence that previous screening practice had on VRE rates (large differences may indicate previous screening practices were effective in capturing cases of colonization). The VRE rate decreased at Kelowna General Hospital, Royal Inland Hospital, Kootenay Boundary Hospital, and Shuswap Lake General Hospital ($p <0.01$), while the change affected other facilities to a lesser extent (Table 9).

Period 10 – 13 rate data are sufficient for only 3 IH facilities. These data suggest that, not only will rates decrease going forward, but, more importantly, facility-to-facility variation in VRE rates will be much less. Rates at Kelowna General Hospital, Royal Inland Hospital, and Vernon Jubilee Hospital were 2.4/10,000 patient-days, 1.7/10,000 patient-days, and 1.9/10,000 patient-days, respectively.

Table 9: HA-VRE, for Periods 1 – 9, FY 2014

Facility type	Facility	Count	Patient-days	Rate, 1/10,000 patient-days [1]	Difference in rates from FY 2013 [2]	Difference in rate from Periods 10 -13, FY 2014 [2]
All	IH	329	340765	9.7	-0.0	-7.9 ***
Tertiary hospital	KGH	79	104343	7.6	-3.0 *	-5.2 ***
	RIH	102	64314	15.9	-0.7	-14.2 ***
Service area hospital	EKH	14	18779	7.5	-2.8	-6.3
	KBH	31	18772	16.5	9.9 **	-15.4 **
	PRH	13	35633	3.7	-6.6 **	-1.9
	VJH	30	43202	6.9	4.4 **	-5.0 *
Community level hospital	ALH	0	763	0.0	0.0	NA
	BDH	2	2480	NA	-8.8	-0.2
	CMH	6	6495	9.2	-4.9	-9.2
	CVH	1	3891	NA	0.0	-2.6
	DHH	0	1019	0.0	-5.9	NA
	EVH	7	3628	19.3	9.3	-19.3
	GDH	1	1488	NA	-10.8	-6.7
	IDH	0	1822	0.0	0.0	NA
	KLH	9	8596	10.5	8.2 *	-7.9
	LIH	0	1115	0.0	-5.2	NA
	NVH	1	2341	NA	-6.0	-4.3
	OMH	3	3502	NA	-11.5	-8.6
	PGH	0	1113	0.0	-5.8	NA
	QVH	1	1846	NA	0.0	-5.4
	SLH	25	11581	21.6	16.1 ***	-21.6 **
	SOG	4	4042	9.9	6.6	-9.9

[1] NA: Not available due to lack of insufficient data

[2] * indicates statistical significance, p <0.05; ** indicates strong statistical significance p <0.01; *** very strong statistical significance, p <0.001

SURGICAL SITE INFECTIONS

Surgical site infections (SSI) occur as a complex interaction between the microbial contamination of the surgical site, the host response, and the local environment at the site of contamination. An SSI is generally considered to be present when purulent drainage is identified at the surgical site.

WHAT IS BEING MEASURED?

The overall incidence rate of clean SSIs and clean-contaminated SSIs are measured through the use of a surgical electronic data collection system by participating acute care facilities only.

SSI rates are the number of surgical operative sites that are infected over the number of surgeries, expressed as a percentage (Appendix C). Surgeries are stratified based on the *Surgical Wound Classification*[8]:

Clean wounds: Uninfected operative wound in which no inflammation is encountered, involve access only to the sterile body sites and carry the lowest risk of SSI.

Clean-contaminated wounds: Those in which respiratory, gastrointestinal, urinary, or genital tracts were involved under controlled conditions and without unusual contamination. A minor break in surgical sterile technique in an otherwise clean procedure would fit into this class.

Most surgeries involve multiple procedures and in some cases, procedures fall into more than one procedure category. For the purposes of comparison of SSI rates across procedure categories, the denominators used in Tables 9 and 11 are procedure categories, rather than surgeries.

Before September 13, 2013

Based on CDC/ NHSN definitions[9], infection must take place in the area affected by a surgery within 30 days of the procedure, or within 365 days if an implant is in place, and the infection appears to be related to the operative procedure. Surgeries that are excluded from this surveillance are those surgeries without an incision or surgeries performed in ambulatory care.

After September 13, 2013

Based on CDC/ NHSN definitions[9], infection must take place in the area affected by a surgery within 30 days of the procedure, or within 90 days if an implant is in place, and the infection appears to be related to the operative procedure. Surgeries that are excluded from this surveillance are those surgeries without an incision or surgeries performed in ambulatory care.

[8] Interior Health Surgical Services Practices: Operative Wound Classification Reference Guide (May 2011)
[9] Definitions have been modified to better meet IH IPAC Program needs.

ACTIONS IMPLEMENTED

A review of ambulatory care processes and practices was undertaken by IPAC and recommendations were forwarded to the Surgical Services Executive. Additionally, regular reviews and updates to the *Recommended Drug Regimens for Surgical Prophylaxis in Adult Patients* document were performed by the Antimicrobial Stewardship Medical Director.

When increasing SSI trends are identified throughout the reporting periods, assessments of processes and practices related to the surgical procedure are completed on an ongoing basis. To improve outcomes, ICPs provide recommendations and collaborate with facility operating room managers and HCPs, as well as, increase education to HCPs. The recommendations provided by the ICPs are followed up and evaluated to ensure proper implementation.

Requests for post discharge surveillance and surgeon specific infection rates have continued to occur throughout the last year. The feasibility of this was examined and at the decision of the Surgical Services Executive this surveillance was not feasible. This was due in part to the reliability of self-reporting by physicians.

LIMITATIONS

There is no consistent approach to reporting infections post discharge by physicians in IH.

Classification of surgical procedures is done by the operating room staff and is to be done upon completion of the surgery in consultation with the surgeon. On occasion, an incorrect wound class is entered for a given surgery. These errors will impact the validity of SSI rates.

Before September 13, 2013

> Since a SSI may be identified up to 365 days following surgery involving an implant, a reported SSI rate for a given period should not be considered final until fourteen full periods after its end date.

After September 13, 2013

> Since a SSI may be identified up to 90 days following surgery involving an implant, a reported SSI rate for a given period should not be considered final until four full periods after its end date.

Analysis cannot be generalized to all surgeries performed in IH due to the exclusion of surgical procedures that are not under surveillance.

Table 9: IH SSI Status

Interior Health Rate	Interior Health Trend	Interior Health Benchmark	Interior Health Status
Clean 1.2%	-0.01% per year	<1.00%	Above 2014 Benchmark
Clean-contaminated 1.1%	-0.01% per year		

Clean Surgery SSI:

Current Year:

Among all clean surgeries under surveillance, 1.2% of clean surgeries in IH had an SSI in FY 2014. Among individual facilities, Kootenay Boundary (rate = 2.3%, $p < 0.001$) and East Kootenay Regional Hospital (rate = 1.9%, $p < 0.01$) had significantly higher rates of SSI in clean surgeries, compared to IH overall (Table 10).

The majority of surgeries under SSI surveillance across IH are orthopedic surgeries. The next most common categories under which surgical procedures fall are general surgery, neurosurgery, and vascular surgery. SSI rates vary across procedure categories and across facilities; Table 8 shows rates by category for larger facilities. At Kelowna General Hospital, the highest SSI rate was among general surgeries, while the highest rate at Royal Inland was among neurosurgeries. SSI rates among orthopedic clean surgeries were elevated at both East Kootenay and Kootenay Boundary. In addition, the SSI rate among general surgeries at East Kootenay was high.

Since Period 7, SSIs were categorized as superficial incisional, deep incisional, or organ space infections. Across IH and at most facilities, the most common type of SSI among clean surgeries was superficial incisional and the least common was organ space. The exception to this was East Kootenay Regional Hospital, were the primary SSI type was organ space (8 of 17).

Comparison to 2013:

There was a no change in the 2014 clean surgery SSI rate for IH compared to the previous year. The only facility to report a significantly different SSI rate in 2014 was Shuswap Lake Hospital, where the rate decreased 1.4% (Table 10).

Longer term trend:

Over the past 5 years, there were small fluctuations in clean surgery SSI rates across IH, but no significant trend (-0.0% per year, Figure 7). Among individual facilities, there was a significant increasing trend at East Kootenay Regional Hospital (increasing 0.18% per year) and a significant decreasing trend at Kelowna General Hospital (decreasing at 0.08% per year, Figure 10).

Table 10: SSI among clean surgical surgeries, FY 2014

Facility type	Facility	Count	Surgeries	Rate, %	95% confidence interval of rate [1]	Difference in rate from 2013 FY [2]
All	IH	282	23627	1.2	1.1, 1.3	-0.0
Tertiary hospital	KGH	82	7539	1.1	0.9, 1.3	-0.3
	RIH	48	5014	1.0	0.7, 1.2	-0.2
Service area hospital	EKH	35	1847	1.9	1.3, 2.5	0.1
	KBH	54	2378	2.3	1.7, 2.9	0.5
	PRH	20	2241	0.9	0.5, 1.3	0.1
	VJH	31	3230	1.0	0.6, 1.3	0.1
Community hospital	CMH	4	374	1.1	0, 2.1	0.9
	KLH	4	158	2.5	0.1, 5	1.1
	QVH	1	110	NA	-	-0.1
	SLH	2	675	NA	-	-1.4*

[1] NA: Not available due to lack of sufficient data

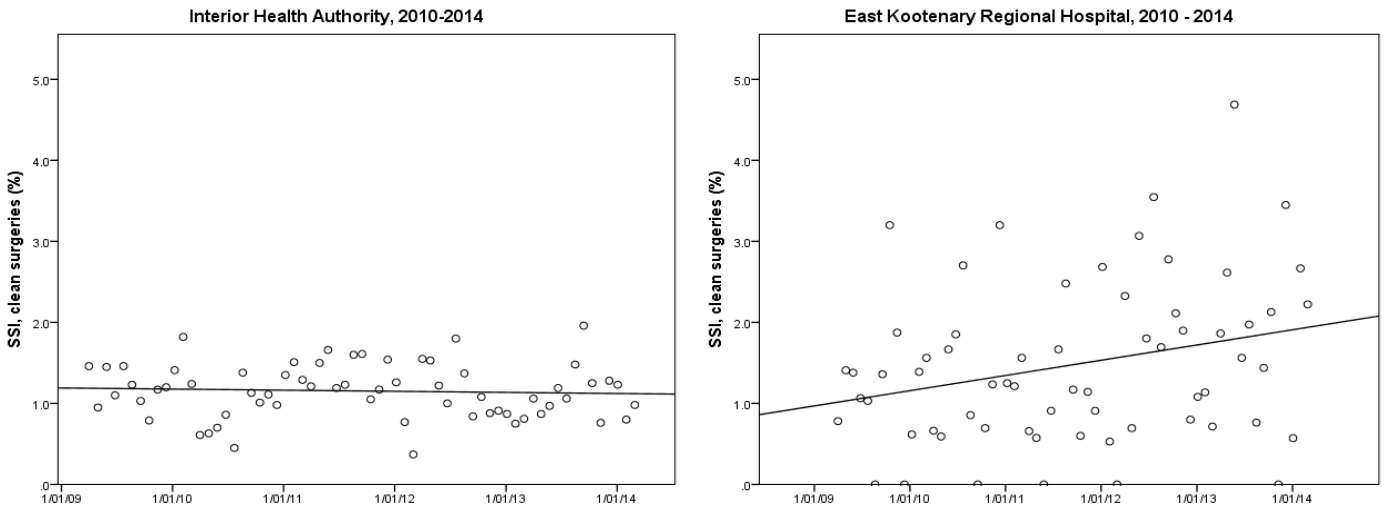
[2] * indicates statistical significance, p <0.05

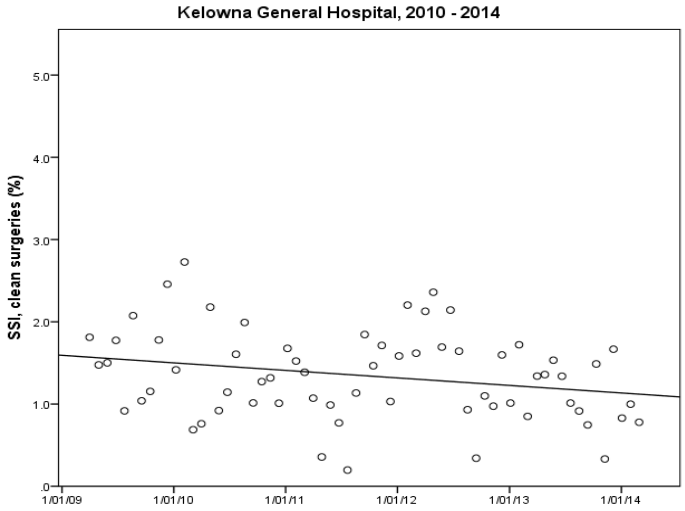
Table 11: Clean surgeries: SSIs by procedure category, % (n = procedure category counts)[1], FY 2014

Facility type	Facility	Orthopedic	General surgery	Neurosurgery	Vascular
Tertiary hospital	KGH	0.9 (2774)	1.0 (1249)	0.5 (858)	0.9 (961)
	RIH	0.8 (2286)	0.5 (827)	1.8 (665)	0.8 (506)
Service area hospital	EKH	1.6 (1058)	2.7 (441)	NA	NA
	KBH	1.8 (1586)	1.7 (466)	NA	NA
	PRH	1.0 (1280)	1.0 (582)	NA	NA
	VJH	1.0 (1754)	0.9 (817)	NA	NA

[1] NA: Not available due to lack of sufficient data

Figure 7: Long-term incidence of SSIs among clean surgeries, FY 2010 through 2014





Clean Contaminated:

Current Year:

The rate of SSI among clean-contaminated surgeries in IH was 1.1% (Table 10). There was considerable consistency in rates across facilities, except for Kootenay Boundary Hospital where the rate was significantly higher than it was throughout IH.

The most common procedure category among clean-contaminated procedures was general surgery, followed by gynecology, urology, and otolaryngology. SSI rarely occur in clean-contaminated surgeries in the latter 3 categories (Table 11), which is likely why the SSI rate among this wound class was lower than among clean surgeries at several facilities. General surgeries were the most problematic category of clean-contaminated surgery at all facilities, which was not the case for clean surgeries.

Similar to clean surgeries, superficial incisional SSIs were the most common SSI and organ space SSIs were the least common. This was generally true across all facilities.

Comparison to 2013:

Similar to clean surgeries, there was no change from 2013 to 2014 in the IH-wide SSI rate among clean-contaminated surgeries (Table 10). The rate significantly decreased at Kelowna General Hospital and increased at Vernon Jubilee Hospital (p <0.05 for both).

Table 10: SSIs among clean-contaminated surgical surgeries, FY 2014

Facility type	Facility	Count	Surgeries	Rate, %	95% confidence interval of rate [1]	Difference in rate from 2013 FY [2]
All	IH	148	14116	1.1	0.9, 1.2	-0.0
Tertiary hospital	KGH	48	4269	1.1	0.8, 1.4	-0.5*
	RIH	31	2861	1.1	0.7, 1.5	0.3
Service area hospital	EKH	12	1051	1.1	0.5, 1.8	-0.3
	KBH	16	848	1.9	1, 2.8	-0.7
	PRH	2	250	0.8	-0.3, 1.9	0.0
	VJH	10	1504	0.7	0.3, 1.1	0.6*
Community hospital	CMH	17	1883	0.9	0.5, 1.3	0.1
	KLH	5	860	NA	-	-0.1
	QVH	0	24	NA	-	-3.3
	SLH	7	375	1.9	0.5, 3.2	0.6

[1] NA: Not available due to lack of sufficient data

[2] * indicates statistical significance, p <0.05

Table 11: Clean-contaminated surgeries: SSIs by procedure category, % (n = procedure category counts)[1], FY 2014

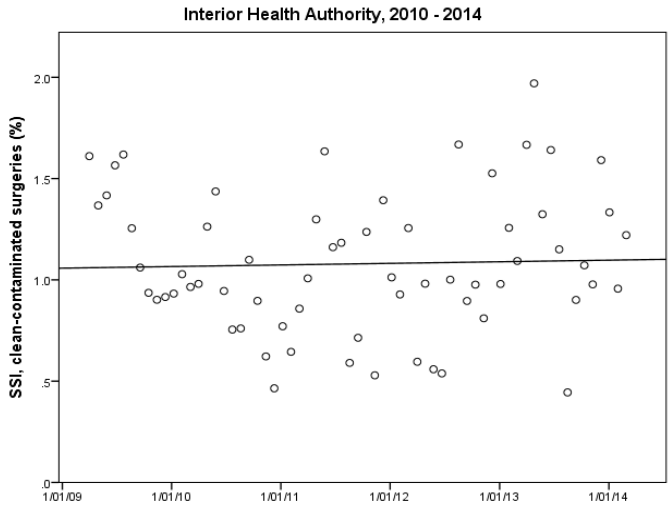
Facility type	Facility	General surgery	Gynecology	Urology	Otolaryngology
Tertiary hospital	KGH	3.3 (1031)	0.2 (992)	0.4 (973)	0.5 (414)
	RIH	2.3 (578)	1.2 (658)	0.0 (876)	0.0 (211)
Service area hospital	EKH	3.2 (317)	0.3 (304)	NA	NA
	KBH	4.4 (271)	0.6 (164)	0.0 (227)	NA
	PRH	2.3 (396)	0.0 (456)	0.0 (415)	0.0 (223)
	VJH	2.1 (569)	NA	0.0 (516)	NA

[1] NA: Not available due to lack of sufficient data

Longer term trend:

There were no significant 5-year trends in clean-contaminated surgery SSI rates for IH or any facility. While there appeared to be a decrease in rates between the FYs 2010 and 2012, the trend has flattened since then (Figure 9).

Figure 9: Long-term incidence of SSIs among clean-contaminated surgeries, FY 2010 through 2014



VENTILATOR ASSOCIATED PNEUMONIA

Ventilator associated pneumonia (VAP) is a sub-type of healthcare associated pneumonia which is restricted to patients undergoing mechanical ventilation while in a hospital.

WHAT IS BEING MEASURED?

Before September 13, 2013:

The incidence rate of VAP is per 1,000 ventilator days. This is the number of new cases acquired by patients as a result of their stay in intensive care unit (ICU) and being on a ventilator divided by the total number of ventilator days over a specified time frame, expressed as a ratio per 1,000 patient days (Appendix C).

After September 13, 2013:

VAP cases are only measured in ICU patients, although ventilators could be used in other areas (Appendix C).

ACTIONS IMPLEMENTED

Upon the identification of each VAP case, an investigation is made to determine potential risk factors. ICPs then make recommendations and increase education for HCPs to improve patient outcomes. The recommendations are followed up and evaluated to ensure proper implementation.

LIMITATIONS

Ventilator days are currently manually collected and tallied by ICU HCPs. This process can pose reporting problems should this daily task be missed or not submitted in a timely fashion to ICPs.

DATA ANALYSIS

There were 12 VAPs in IH during this FY. Five were at Kelowna General Hospital, 4 at Royal Inland Hospital, and 3 at Kootenay Boundary Hospital. The overall rate was 1.9/1,000 ventilator-days. This represents a significant decrease from the previous year VAP rate of 4.6/1,000 ventilator-days (p <0.01). Most of this was attributed to rates at Royal Inland Hospital, where rates decreased from 6.1/1,000 ventilator-days to 2.0/1,000 ventilator-days.

While the overall VAP rate in IH decreased from 2.5/1,000 ventilator-days to 1.4/1,000 ventilator days after the change in VAP surveillance practice, data were insufficient to report that a significant decrease occurred.

Table 12: IH VAP Status

Interior Health Rate	Interior Health Benchmark	Interior Health Status
1.9/1000 ventilator-days	<5 Per 1000 ventilator-days	Below 2014 Benchmark

RESIDENTIAL CARE FACILITIES

The IH Residential Services IPAC program collects, analyses and disseminates HAI surveillance data based on clearly-defined indicators, and targets higher risk infections that are associated with increased morbidity, mortality and acute care admissions. Residential care surveillance includes data on CDIs; lower respiratory infections and pneumonia; skin and soft tissue infections; and catheter-associated urinary tract infections.

CDIs are tracked using the same definition as acute care, although fewer cases of CDIs are identified in residential facilities. Of the cases that are observed, residents have often had a recent admission to an acute care facility. Tracking of CDIs in residential care continues to be a priority; however, the electronic surveillance system requires improvements to enable the systematic reporting out of CDIs in residential care.

The surveillance of lower respiratory infections and pneumonia focuses on taking action where significant pathogens are identified or where clusters of cases exist. ICPs work directly with residential care facilities to address these cases.

Skin and soft tissue infections continue to be tracked as a measure of quality care. Catheter-associated urinary-tract infection (CAUTI) tracking continues, although device days to establish reliable rates are not always available.

LIMITATIONS

The collection of surveillance data for residential facilities is a retrospective manual process performed by ICPs and other HCPs which may result in inconsistencies. Different sources of information are combined to identify potential infections. Further investigation and follow-up by ICPs is conducted to confirm infection through total chart review and/or consultation with HCPs.

Due to ICPs having restricted access to private laboratory results and private pharmacy's antibiotic-utilization records, identifying an infection can prove difficult and time consuming. Private laboratories and pharmacies that make use of electronic information systems allow for prompt investigation of potential HAIs.

Catheter days, used as the denominator in the CAUTI rate calculation, are not accurately tracked, although some sites have had success in determining this figure.

Discrepancies in surveillance between each residential facility may occur. This can be attributed to:

- Facility population (variations in facility size, resident age, and services provided)
- Compiling of surveillance data (ICPs vs. HCPs at rural facilities reporting to ICP)
- Reduced frequency of ICP visits to rural facilities

OUTBREAK MANAGEMENT

IH uses Outbreak Management Teams to manage outbreaks; these are multidisciplinary teams that include representatives from all areas within the healthcare setting. These teams work collaboratively to ensure a timely and coordinated response to an outbreak. An Outbreak Management Team includes, but is not limited to: IPAC team, Workplace Health & Safety, administration, communications, nursing, medical staff, support services and external resources such as Public Health, as required.

The primary components of outbreak management include the confirmation of:

- Presence of an outbreak
- Notification of stakeholders
- Implementation of control measures
- Communication with all stakeholders
- Education

ACCOMPLISHMENTS/ PRIORITIES MET

Updates to both the Gastroenteritis Infection (GI) and Respiratory Infection (RI) Outbreak checklist were completed during FY 2014. These checklists are pivotal in the management of outbreaks in both acute and residential care facilities.

Updates to education materials were also completed during FY 2014. A total of 118 outbreak education sessions were provided by ICPs, educating more than 950 HCPs (Table 1).

Additional accomplishments/ priorities met can be found in Accreditation Canada, point 1, page 7.

GOING FORWARD

Working groups that were developed in late FY 2014 will continue to review, update and streamline outbreak reporting templates and tools that are utilized by HCPs, IPAC and the CD Unit. In doing so, this will lay the ground work for acute care outbreak management which has been identified as a top priority in the 2015 FY Strategic Plan (figure 8).

Targeted outbreak education plans will be designed by ICPs. This will allow outbreak debriefing recommendations to be addressed accordingly and followed up in a timely fashion.

A literature search will lead to the development of an Outbreak Toolkit. Once completed and implemented, this toolkit will allow for efficient management of outbreaks by all stakeholders within a given facility.

FISCAL YEAR 2015 STRATEGIC PLAN

Future directions for the IPAC program continues to be illustrated in the 2015 FY Strategic Plan (figure 8) and is aimed at improving IPAC's ability to meet the growing demands placed on the program. Moreover, these strategic initiatives are geared to effectively utilize current resources while enabling the program to tap into the broader health system to build capacity in IPAC across the health authority. This will also lay the groundwork for the vision of having Medical Health Officers and Public Health, Infectious Diseases, Medical Microbiology, Antimicrobial Stewardship and IPAC together as one corporate program.

Five main strategies have been identified for the 2015 FY with plans extending to the 2017 FY. These strategic initiatives support the ongoing IPAC program but are specifically aimed at addressing current and emerging issues.

CLOSTRIDIUM DIFFICILE INFECTION

See CDI section *Future Plans, page 23.*

HAND HYGIENE

See HH section *Going Forward*, page 10.

OUTBREAKS IN ACUTE CARE FACILITIES

See Outbreak Management section *Going Forward* page, 45.

COMMUNITY

A gap has been identified by IPAC within the community and Public Private Partnership (P3) settings. A number of consultations have been provided by ICPs as a courtesy to private facilities within the IH region. The majority of these courtesies are provided during flu season when outbreaks are at a seasonal high. Over time, the number of consultations has increased, putting strain on ICPs availability within IH.

By working with Public Health, CD Unit and Community Integrated Health Services creating a definition of community and clarifying roles will allow for a more streamlined approach when collaborating in the community and P3 settings.

During Quarters 3 and 4 of FY 2015 (flu season) ICPs will document details of each consultation provided which will be tabulated and evaluated to identify the scope of IPAC community services.

INFECTION PREVENTION AND CONTROL PROGRAM EVALUATION

Due to the changing recommendations and requirements of the IPAC program and ICP responsibilities a program evaluation will take place. This will ensure the program is working effectively and efficiently across the continuum of care.

As new HAIs are emerging, a review of current HAI surveillance will also be conducted to improve both clinical outcomes and healthcare practices.

April 1, 2014 - March 31, 2017 (Fiscal Year 2015 - 2017) Goal: To provide an Infection Prevention and Control Program that ensures safety of patients, residents, visitors, and employees from Infectious Agents.					
STRATEGY (FY 2015)	**STAKEHOLDER ENGAGEMENT (KEY PARTNERS)**	**PERFORMANCE MEASURES**	**SHORT-TERM GOALS (FY 2015)**	**MEDIUM-TERM GOALS (FY 2016-2017)**	**ULTIMATE OUTCOME**
CDI	PICNet, Pharmacy, Housekeeping, Site/Unit Managers, Healthcare Providers	# of education sessions	Develop and implement education plan at each site (ICPs)	Continue targeted educatation on units above benchmark	**Zero transmission of CDI in IH**
		# of Healthcare Providers educated	Target education to units over benchmark	Expand education to all Healthcare Providers	
		Ongoing surveillance	All facilities below benchmark	Lower benchmark to 3 or less per 10,000 pt days	
		100% completion of checklist	Implement Best Practice Checklist Identify gaps, develop and implement action plan	Ongoing process	
		# of times alert levels exceeded (TBD)	Remain under alert levels	Reduce alert levels	
Hand Hygiene	PHHWG, PICNet, Quality, Executive Medical Directors, Site/Unit Managers, HH Committee, Healthcare Providers, Educators, Maintenance	Quarterly observation for acute & residential quotas met	Implement residential auditing as per PHHWG	Continue auditing for acute & residential	**100% HH compliance rate for all Healthcare Providerss**
		# of new strategies introduced	Ongoing new promotions	Ongoing new promotions	
		# of Healthcare Providers educated	Develop and implement education modules & promotional materials	Healthcare Providers receive consistent messaging & education	
		# of education sessions			
		New HH product implemented	Assist with implementation		
		# of completed infrastructure audits	Assist with infrastructure audits	Assist with infrastructure audits	
		# of documented iLearn education sessions	Complete HH iLearn module	Targeted Healthcare Providers to complete iLearn module (Manager responsibility)	
			Promote HH iLearn module		
		Quarterly reporting to PICNet, Public & Healthcare Providers	Continue quarterly reporting to PICNet, Public & Healthcare Providers	Continue quarterly reporting to PICNet, Public & Healthcare Providers	
Outbreaks in Acute Care Facilities	VP Acute Services, Executive Directors, Site/Unit Managers, Chief of Staff, Communications, Lab, Pharmacy, Logistics, CD Unit, WH&S, Housekeeping, Volunteer Services, Healthcare Providers	Completed toolkit	Complete literature search	Implement toolkit	**Zero transmission**
		OMT implemented	Develop toolkit		
		Implemented debriefing recommendations	Targeted outbreak education	Develop and promote iLearn module	
		# of Healthcare Providers educated		Targeted Healthcare Providers to complete iLearn module (Manager responsibility)	
		Surveillance (# of outbreaks, attack rates, duration of outbreak)	Reduce # of outbreaks	Reduce # of outbreaks	
Community	CIHS Team, P3 Residential, CD Unit, IH Clinics, Contracted Services (Housekeeping), Provincial WH&S Call Centre, Healthcare Providers	Defined Community	Create a definition of Community		**Incorporate needs assessment results into IPAC Program Evalulation**
		Completed time study of Community/ CD Unit inquiries	ICPs to document the frequency/reason/ time spent (quarters 3 and 4)	Tabulate and evaluate	
		Completed needs assessment	Clarify the roles and responsibilities of CD Unit	Evaluate results and define the scope of IPAC community services	
			Review P3 residential services contract		
			Develop and implement needs assessment		
IPAC Program Evaluation	IMPACT, SET, Performance & Evaluation, Healthcare Providers, Healthcare Services/ Networks	Completed evaluation of Healthcare Provider perception survey	Develop and implement survey	Define image	**Improve patient/ resident/ client outcomes**
			Evaluate survey results and develop action plan	Implement action plan	
		Incidence rates of HAIs and epidemiologically significant organisms	Evaluate/ redefine surveillance indicators and reporting process	Implement revised surveillance indicators and reporting process	
		Completed decision brief	Evaluate the need for additional resources	Develop decision brief for additional resources	
		Revised ICP roles and responsibilities		Review and revise ICP roles and responsibilities	

APPENDICES

APPENDIX A: STRATEGIC PLAN FISCAL YEAR 2014

STRATEGY (FY 2014)	KEY PARTNERS	INITIATIVES	PERFORMANCE MEASURES	SHORT-TERM GOALS (1-2 years)	MEDIUM-TERM GOALS (2-3 years)	ULTIMATE OUTCOME
Clostridium *difficile* Infection	Physicians, Pharmacy, Nursing, Housekeeping, Site/Unit Managers	Zero Tolerance Strategy (ZTS)	Implementation of ZTS	Immediate reduction of CDI cases	Increase collaboration across IH to prevent/ manage CDI	**Zero cases of CDI in IH**
				Increase awareness & understanding of CDI		
		CDI Stakeholder Engagement	# Meetings/ Presentations	All facilities below benchmark	Lower benchmark	
Hand Hygiene	PHHWG, PICNet, Quality, Executive Medical Directors, Site/Unit Managers, HH Committee	Audits	Quarterly quotas met	Implement residential auditing as per PHHWG	HCWs receive consistent messaging & education	**100% HH compliance rate for all HCWs**
		Education	# of HCWs Educated	Standardized education & promotion materials		
Surveillance	IMIT, PICNet, Strategic Management, CNISP, HAMAC, SET, Lab, Site/Unit Managers, Site/ Unit Committees	IPAC Electronic Surveillance	Implemented Report Template	Increase data reliability & elimination of system error reducing ICP workload burden	Improved efficiency & reliability of electronic surveillance	**Comprehensive surveillance program to make informed decisions to improve patient outcomes**
		Public Reporting of Data	Quarterly Reporting to Stakeholders	Standardize surveillance/ public reporting and distribution to key stakeholders	Reports are used to inform decision makers to improve patient outcomes	
Collaboration with Quality	Quality, Executive Medical Director, Risk Management, clinical programs & networks	Accreditation	Targets met	Accreditation Requirement review completed	Work with key partners on future requirements	**Accreditation preparation kept up to date**
AROs	Med Micro, IMIT, Professional Practice, Pharmacy, Nursing, Physicians	ARO Screening	% of completed screening tools	Adoption of the revised screening tool, and consistent completion	Develop a report to monitor compliance of completing screening tool	**No transmission of AROs**
		Alert Process	Educational Toolkit Developed	Discontinue screening for VRE and Appropriate risk	Ongoing HCW education re existing and emerging	
		Antimicrobial Stewardship Program	Rate reduction of HAI AROs	Support the development of the program	Program developed	
Tuberculosis	BCCDC TB Control, Public Health, WH&S, Acute Care Site Administrators, Nursing, Physicians	TB Report Recommendations	# of Recommendations Implemented	Recommendations prioritized	Implement high priority recommendations	**Reduced risk of TB exposure and transmission**
		Education/ Awareness Campaign in Facilities	# Educated in TB prevention	Improve TB practices		
			% of ERs with Respiratory Stations			

APPENDIX B: SURVEILLANCE DATA AVAILABILITY

Facility	FY 2011 (Q3)	FY 2011 (Q4)	FY 2012 (Q1)	FY 2012 (Q2)
Arrow Lakes	N/A	N/A	N/A	N/A
Boundary District	N/A	N/A	N/A	N/A
Creston Valley	A	A	N/A	N/A
East Kootenay Regional	A	A	N/A	N/A
Elk Valley	A	A	N/A	N/A
Golden District	A	A	N/A	N/A
Invermere District	A	A	N/A	N/A
Kootenay Boundary	N/A	N/A	N/A	N/A
Kootenay Lake	N/A	N/A	N/A	N/A

A: Data Available
N/A: Data Not Available

APPENDIX C: HOSPITAL ASSOCIATED INFECTION CASE DEFINITIONS

CDI

Before September 13, 2013:

C. difficile toxin positive results and > 3 loose stools within 24 hr. period without another etiology, OR diagnosis of pseudo-membranes or toxic megacolon AND symptoms start more than 72 hours after admission or within 60 days of discharge from an IH facility.

New Infection: No history of CDI * for this patient

Relapse: New category established April 1 2009: "Healthcare Associated Relapse" defined as "A CDI* case with recurrence of diarrhea within 60 days of a previously resolved Healthcare Associated CDI* episode".

- Infection Rates Expressed Per 10,000 Patient Days
- Only healthcare associated cases are reported

It is assumed that any stool sent to the laboratory for C. *difficile* testing is from a patient that has had a least 3 episodes of loose stools in a 24 hour period. It is accepted that the surveillance protocol may overestimate the number of cases, as some patients may have had only one or two loose stools prior to a specimen being collected

After September 13, 2013:

Presence of diarrhea or toxic megacolon without other known etiology AND laboratory confirmation of *C. difficile* toxin A and/or B OR Diagnosis of pseudo-membranous colitis on sigmoidoscopy or colonoscopy OR Histological/pathological diagnosis of CDI with or without diarrhea

New CDI Associated with Your Facility: Symptom onset > 72 hours after admission OR symptom onset in community or occurring ≤ 72 hours after admission AND patient admitted for at least ≥ 24 hours in past 4 weeks before hospitalization AND symptom onset less than 4 weeks after last discharge from your facility

New CDI Associated with Another Healthcare Facility: Symptom onset in community of occurring ≤ 72 hours after admission to your facility AND patient admitted to another healthcare facility (including acute or long term care) for ≥ 24 hours in past 4 weeks after discharge from that facility

Community Associated CDI Case: Symptom onset in the community or occurring within 72 hours (≤ 72 hours) after admission to acute care facility where CDI identified, provided that the case had no encounter with any healthcare facility

(including acute care and long term care) in past the 4 weeks before onset of CDI symptoms

Relapse CDI Case: Occurs between 2 - 8 weeks after previous CDI episode. Associated with Your Facility, with another Healthcare Facility, or Community

Notes:

- CDI rate expressed per 10,000 patient-days
- CDI case identified less than 2 weeks after previous episode is considered to be a continuation of previous CDI case
- Population excludes outpatients not admitted to facility, patients in extended care beds or mental health beds, inpatients under one year of age
- Reported complications of CDI occurring within 30 days include ICU admission due to CDI or complication, toxic megacolon, total or partial colectomy

Antibiotic Resistant Organism (ARO) for MRSA, VRE

Before September 13, 2013:

Healthcare associated definition includes:

- Not previously positive for ARO and current hospitalization > 3 calendar days (unless an indwelling medical device in place) OR
- Prior contact with any healthcare facility including surgery, dialysis & long term care admissions in the previous 12 months OR
- Newborns if mother not known to be a case on admission or suspected to be colonized
- Infection Rates Expressed Per 10,000 Patient-Days
- Only healthcare associated cases are reported

Does not include Emergency room and Ambulatory Care outpatient visits.

After September 13, 2013:

Healthcare-associated definition includes:

Not previously positive for ARO and:

1. Healthcare associated with current admission to Your Facility
    - Identified > 48 hours after patient admitted to your facility OR Newborn, if mother not known to be a case on admission or suspected to be positive
2. Healthcare associated with previous encounter to Your Facility

- Identified ≤ 48 hours after admission and admitted to your facility at least overnight (≥24 hours) within the last 12 months

OR

- Indwelling catheters or medical device at time of admission, which was inserted by your facility

OR

- Documented weekly visits to outpatient clinic, (i.e. dialysis, oncology) in your facility in the last 12 months.

3. Healthcare associated with Another Facility

- Identified ≤ 48 hours after admission and had contact with another healthcare facility as inpatient (acute/ long term care) or as outpatient (i.e. dialysis, oncology) within the last 12 months

OR

- Any medical device at time of admission, which was inserted by another facility

Notes:

- Rates expressed per 10,000 patient-days
- Only Inpatient Healthcare Associated Cases are reported, including Newborns less than 28 days

4. Community associated MRSA case

- Any case without documented history of healthcare exposure including admission to acute care, long term care or rehab, weekly visits to an outpatient clinic (dialysis, oncology, i.e. use of indwelling catheter or other medical device)

SSI (Clean/ Clean Contaminated)

Before September 13, 2013:

An infection in the area affected by a surgery within 30 days of the procedure, or within 365 days if an implant is in place and infection related to operative procedure. This report includes SSI's related only to those surgeries under with a Wound Class of "Clean" and "Clean Contaminated".

Surgeries under Surveillance do not include those with no incision or Surgeries performed in Ambulatory Care.

After September 13, 2013:

An infection involving the surgical site within 30 days of the procedure, or within 90 days (previously 365) if an implant is in place and the infection is related to the operative procedure. 3 categories of SSIs:

Superficial Incisional Infection occurs within 30 days of procedure and involves only skin and subcutaneous tissue of incision

Deep Incisional Infection occurs within 30 or 90 days of surgery and has implant if after the 30 days and involves deep soft tissues of incision (i.e. fascial and muscle layers)

Organ/Space Surgical Site Infection occurs within 30 or 90 days of surgery and has implant if after the 30 days and involves any part of the body excluding the skin incision, fascia or muscle layers, that is opened or manipulated during the operative procedure

This report includes SSIs related only to those surgeries classified as 'Clean' or 'Clean-Contaminated'.

Surveillance does not included procedures with no incision or those done in Ambulatory Care.

Primary source for definition: CDC/NHSN (National Healthcare Safety Network) guidelines, 2013.

Notes:

May 2013 – 120 procedures were added to the 'Excluded Procedure List'.

Sept 2013 – Deep/Organ Space category of SSIs divided into two categories – see definitions above – data will be presented in three categories – Superficial, Deep, Organ/Space infections

Sept 2013 – For surgeries with multiple incisions, identified as 'Primary' and 'Secondary' incision.

VAP

<u>Before September 13, 2013:</u>

Clinical presentation meets criteria for Pneumonia, including x-ray confirmation. There is no minimum time for a patient to be on a ventilator.

Pneumonia is identified by using a combination of the following criteria:

- Radiologic - two or more serial chest x-rays with new or progressive & persistent infiltrate, consolidation, cavitation (only one x-ray if no lung/heart disease)
- Clinical sign and symptoms - breath sounds, fever, altered mental status, sputum, cough, increased respiratory rate or oxygen needs.
- Laboratory - sputum culture, elevated white blood count.
- Healthcare associated VAP Infection rate calculation: (Cases/Ventilator-Days) * 1,000
- Does not include Emergency room and Ambulatory Care outpatient visits

<u>After September 13, 2013:</u>

Chest x-ray not included in the definition

Minimum time on the Ventilator ≥ 3 calendar days

Must be > 14 days since last Ventilator Associated event

Ventilator Associated Pneumonia is identified by a combination of the following Criteria:

After a period of stability or improvement for 2 or more days:

- Increase FIO2 of ≥ 20 or PEEP ≥ 3cm for ≥ 2 days
- Changes in temperature OR white blood cell count AND a new antimicrobial agent started for ≥ 4 days
- Positive laboratory cultures or other diagnostic tests (organisms excluded include: Candida, Coagulase-negative Staphylococcus species and Enterococcus species)

Notes:

- VAP rate calculation per 1000 Ventilator days
- Primary source for definition: CDC/NHSN (National Healthcare Safety Network) guidelines, 2013.
- Population: ICU Patients only

APPENDIX D: ROYAL INLAND HOSPITAL *CLOSTRIDIUM DIFFICILE* INFECTION OUTBREAK

Epidemiological Summary, Outbreak of *Clostridium difficile* Infection, Royal Inland Hospital, October/November, 2013

Population and Setting

Patients infected by healthcare-associated *C. difficile* infection (CDI) while admitted to Royal Inland Hospital (RIH), with symptom onset dates ranging from October 20 through November 13, 2013. Infections are new or relapse cases of CDI. All laboratory tests to identify CDI and presumptive North American pulsed-field type 1 (NAP1) strains were conducted in Interior Health.

Cases of CDI and NAP1 strain CDI

In total there were 18 cases of diarrhea investigated. Of those, 13 were laboratory-confirmed cases of CDI. Among these cases, strains of NAP1-CDI were isolated from 10. Given the historical levels of CDI in RIH and the documented association of NAP1-CDI with hospital-based outbreaks, the *a priori* assumption is that NAP1 strains were outbreak strains, while non-NAP1 were non-outbreak strains.

Epidemiological Curve

Onset data for an expanded data set are provided here to put the outbreak into historical context. In RIH, there are typically 1 or 2 CDI cases within a 7-day interval, which contrasts against the outbreak period (Figure 1). Outbreak NAP1 infections occurred within the period of October 27 through November 7 (Figure 2).

Case Description and Risk Factor Analysis

Mean age of outbreak case patients was 72.7 years and 70% were male (Table). Two of the outbreak cases were relapse CDI. Previous infections in relapse cases were in February and April, 2013. All CDI cases were immunocompromised with various conditions.

Medication data were obtained from interview data by RIH pharmacy staff. For the purposes of this analysis, patients were considered to be exposed if medications were taken in days before onset (i.e. medication use post-onset without pre-onset use was not considered an exposure). Statistical comparisons cannot be conducted with the small number of patients; however, it can be noted that in this small population quinolone use was more common among non-NAP1 cases (100%) than among NAP1 cases (40%).

Location and Timing of Cases

All outbreak cases were admitted to rooms in 7 North within 4 to 9 days prior to their symptom onset (CDI incubation period). Among these cases, the number of days of occupancy in 7 North ranged from 1 to 6 days. One of the 3 non-outbreak cases had been admitted to 7 North for 1 day within the incubation period, but the others had not been in 7 North.

The first 3 symptomatic outbreak cases had symptom onset of October 26 and 27, and all had been in room 755 for at least 8 days. Two cases had been in 758 during their incubation periods and had onset dates of November 2 and 3. Two others were in 759, but had onset dates 8 days apart. Single cases were in rooms 750, 753, and 763. The majority of cases were generally clustered spatially, but all areas of 7N were affected (Figure 3).

Table 13: Cases of CDI, Royal Inland Hospital, October – November 2013

				Medication exposure		
	Sex (% male)	Mean age	Age range	Proton-pump inhibitor (%)	Third-generation cephalosporin (%)	Quinolone (%)
NAP1 cases (n = 10)	70.0	72.7	53-89	50.0	80.0	40.0
Non-NAP1 cases (n = 3)	33.3	56.7	42-76	66.7	66.7	100.0

Figure 9: Historical epidemiological curve of HA-CDI, Royal Inland Hospital, January 1, 2013 through November 26, 2013.

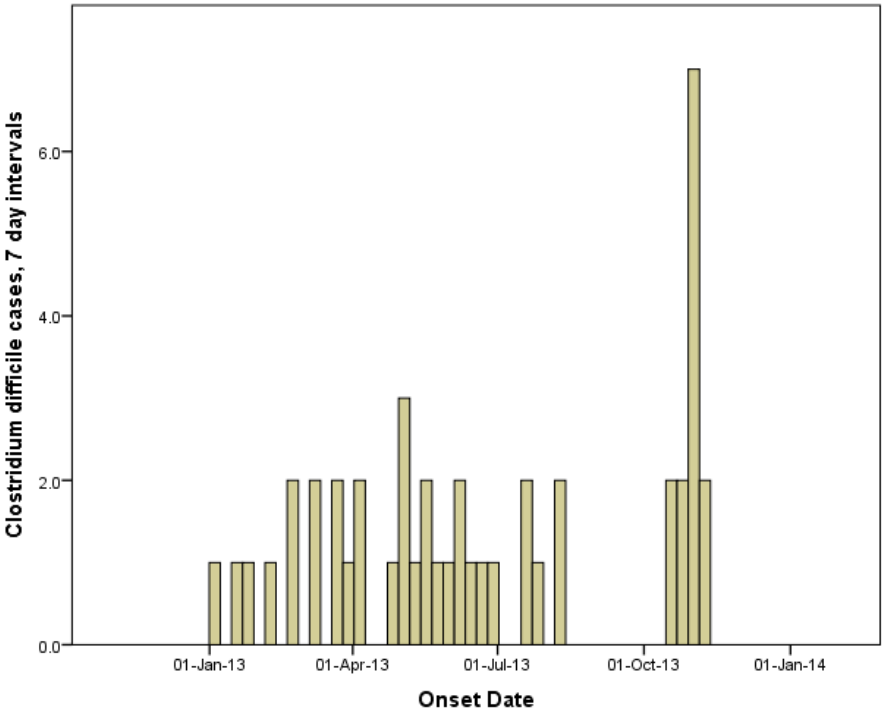


Figure 10: Epidemiological curve of Clostridium difficile and other strains, Royal Inland Hospital, October – November, 2013.

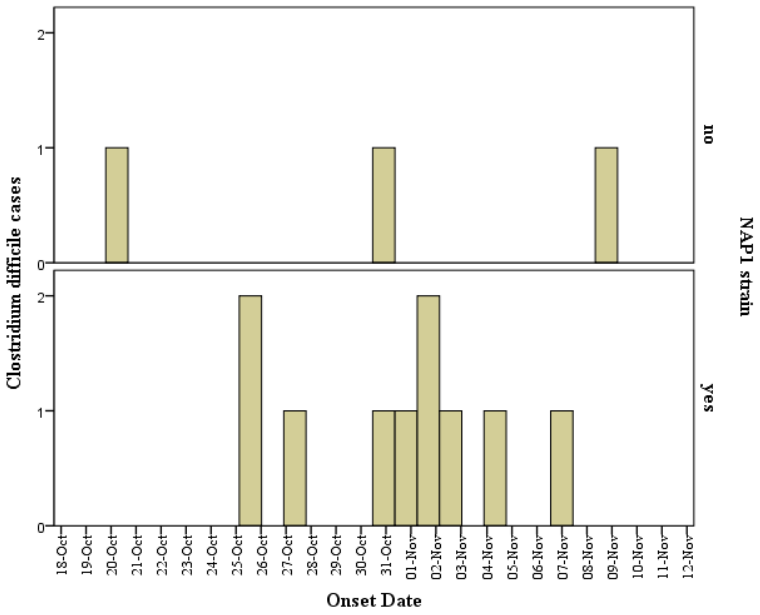
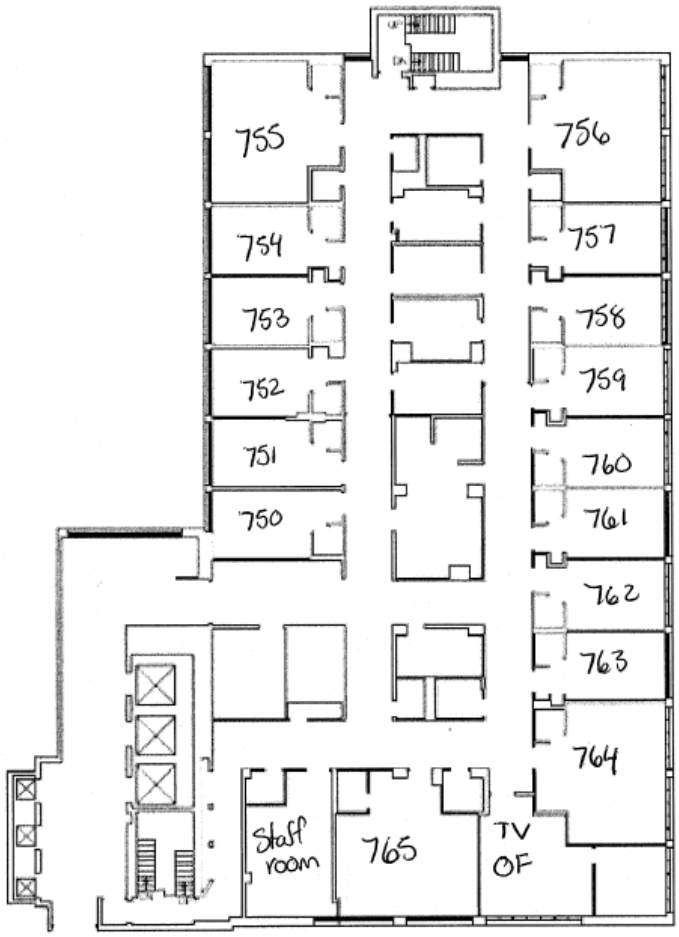


Figure 11: Map of 7 North, Royal Inland Hospital



APPENDIX E: HAND HYGIENE PROVIDER BY DISCIPLINE

Provider category	Provider occupation (but not limited to)
Clinical Support Staff	Occupational Therapist, Physiotherapist, Respiratory Therapist, Speech Therapist, Social Work, Dietician, Psychologist, Audiologist, Porter, Pastoral Care, Radiology, Technicians (e.g. EKG, EEG, etc.), Laboratory: Phlebotomy
Nursing Staff	Registered Nurse, Registered Psychiatric Nurse, Midwife, Licenced Practical Nurse, Care Aide, Nursing/ Midwife Student
Other	Housekeeping, Food Services, Clerk, Volunteer, Security, Plant Maintenance
Physicians	Medical Doctor, Resident, Fellow, Medical Student

APPENDIX F: HOSPITAL ASSOCIATED INFECTION BENCHMARKS

HAI	Benchmark
CDI	<6.0 per 10,000 patient-days
MRSA	<5.6 per 10,000 patient-days
VRE	<1.1 per 10,000 patient-days
SSI (clean and clean contaminated)	<1.0%
VAP	<5 per 1000 ventilator-days

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