Infection Prevention & Control 2015 Fiscal Year Annual Report

September 18, 2015

EXECUTIVE SUMMARY

The Infection Prevention and Control (IPAC) program's 2015 fiscal year (FY) Annual Report, highlights the achievements and continued challenges facing infection prevention and 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 (74% to 75%).

IH's acute care healthcare associated infection (HAI) rates all report a decrease from the previous FY. *Clostridium difficile* infection (CDI) (4.3 per 10,000 patient-days), methicillin-resistant *Staphylococcus aureus* (4.2 per 10,000 patient-days), vancomycin-resistant enterococcus (1.2 per 10,000 patient-days) and ventilator associated pneumonia (1.3 per 1000 ventilator-days) infection rates were below benchmark (Appendix E), while clean contaminated surgical site infection rate (1.0%) and clean surgical site infections (1.0%) were at benchmark.

This 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, IPAC expansion into the Community, evaluation of the IPAC program, and education. The IPAC program will aim to build its capacity, knowledge and awareness among staff and stakeholders.

It is anticipated that increasing collaboration with stakeholders will address infection control issues more efficiently and effectively while ensuring the highest quality of care for patients.

TABLE OF CONTENTS

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 Measurement 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 the Health Authority Medical Advisory Committee agenda at which the Medical Director of IPAC reports in person. The Vice President, Medicine/Quality reports to the Senior Executive Team as required. The minutes of the Infection Measurement 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 of 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 hired new staff, extended its Hand Hygiene (HH) program and made significant changes and updates to guidelines contained in the Infection Prevention and Control Manual. All this was in addition to the need for Ebola training at all sites to select HCPs. This report highlights the accomplishments of the IPAC program and sets out the future directions for the coming year.

MEMBERS OF TEAM AND FACILITIES

Vice President, Medicine/ Quality
Dr. Jeremy Etherington

Medical Director, IPAC
Dr. Bing Wang

Epidemiologist, IPAC
Dr. Julie Mori

Educator, IPAC
Nicki Gill

Manager, IPAC
Marijke Henkemans

Corporate Director, IPAC
Janice de Heer

Administrative Assistant, IPAC
Connie Bergen

Surveillance Information Assistant, IPAC
Jennifer Tchir

Project Lead, IPAC
Joy Pyett

Co-op Student, IPAC
Mandy Yeung (start Jan. 2015)

Infection Control Practitioners:

Missy Blackburn
Diane Cordonier (to May 2014)
Karen Stoopnikoff (start Sept 2014)
Debbie Cosgrove-Swan
Kelly Dillon
Sandie McKechnie (start Dec 2014)
Krystal Fergus
Nancy Gawletz
Wendy Herrington
Marian Kabatoff (to Aug 2014)
Eileen Lavoie
Lynden Lehman
Maureen McLean-Young
Lorena McLure
Andrea Neil
Evelyn Nicol
Suzanne Hyderman (start May 2014)
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

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
CPO	Carbapenemase Producing Organisms
CVH	Creston Valley Hospital
DHH	Dr. Helmcken Memorial Hospital
EKH	East Kootenay Hospital
EVD	Ebola Virus Disease
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
IPAC	Infection Prevention and Control
KBH	Kootenay Boundary Regional 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

PPE	Personal Protective Equipment
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 2015 STRATEGIC PLAN ACCOMPLISHMENTS

Five main strategies were identified for the 2015 fiscal year (FY) with plans extending to the 2018 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 CDIs in the health authority continued into the 2015 FY. IPAC collaborated with stakeholders to improve the management of CDI across departments and facilities.

The *Best Practice Checklist for Management of CDI* was finalized and implemented in the past year. This tool is completed by ICPs to help identify gaps in best practice for all admitted patients/residents with known/suspect CDI. This has resulted in improved practices by HCPs, thereby reducing CDI transmission and improving patient/resident outcomes.

Education action plans were also developed and implemented by ICPs. Targeted education was provided to units/facilities that were experiencing CDI rates over benchmark. A total of 83 education sessions were provided by ICPs, educating more than 460 HCPs (Table 1).

Refer to Actions Implemented, for more information on CDI in acute facilities.

HAND HYGIENE

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

Refer to HH Program section Accomplishments/ Priorities Met, for more information.

OUTBREAKS IN ACUTE CARE FACILITIES

During FY 2015 there were a limited number of outbreaks declared in acute care facilities. In collaboration with Outbreak Management Teams (OMT), immediate investigations and education were provided to those areas experiencing outbreaks. This resulted in the majority of outbreaks being contained and declared over in a timely manner.

As a result of acute care outbreaks being well managed and the limited number declared, it was determined that *Outbreaks in Acute Care Facilities* are no longer a top priority and will be removed from the FY 2016 Strategic Plan (figure 11) but will continue to be monitored.

Refer to Outbreak Surveillance and Management section Accomplishments/ Priorities Met, for more information.

COMMUNITY

Initial meetings with the CD Unit have taken place to narrow the gap identified by IPAC within the Community and Public Private Partnership (P3) settings. The number of consultations provided by ICPs to P3 facilities within the IH region has increased over the last number of years placing strain on ICP availability within IH. The majority of these consultations are provided during flu season when outbreaks are at a seasonal high and these consultations are outside the current definition of ICP roles.

During Quarters 3 and 4 of FY 2015 (flu season) ICPs documented details of each consultation provided. These details will be tabulated and evaluated to identify the scope of IPAC in the community setting. This will allow for a more streamlined approach when collaborating in the community and P3 settings.

IPAC PROGRAM EVALUATION

The initial process of cross training all ICPs across the continuum of care began in the winter of 2014 with the relocation of specific ICPs to co-locations. Cross training will enable IPAC to standardize, redefine and clarify the roles of ICPs within IH, Community and P3 settings. Once the education and standardization of ICP positions has been completed, an evaluation of the changes will take place within a year of implementation.

January 2015 marked the start of IPAC's first co-op student (8 month term). This enabled IPAC to reallocate some resources alleviating time requirements put on the ICPs to complete HH audits. For more information on co-op students see Accomplishments/ Priorities met in the HH Program section.

In late FY 2015 a review of the residential surveillance indicators and reporting process began. This review will carry on into FY 2016 and identify incident rates of HAIs in residential facilities and epidemiologically significant organisms. It is intended that the revised surveillance indicators and reporting process for residential facilities will be in place by the end of FY 2016.

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 Infection Prevention and Control Canada will be used to evaluate the program and services in the fall of 2015.

Preliminary work, such as a review of the *Required Organizational Practices Handbook 2014* and an IPAC program self-assessment, was completed. All gaps identified in the review and self-assessment have since become priorities and work has started to implement changes for the Accreditation Canada survey in September 2015.

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.

ACCOMPLISHMENTS/ PRIORITIES MET

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)
- All IPAC members attended three 2-day education meetings in Kelowna
- IPAC Educator presented a poster at IPAC Canada
- An additional two ICPs attended IPAC Canada
- One ICP attended the Association for Professionals in Infection Control and Epidemiology Conference
- IPAC Epidemiologist and two ICPs attended PICNet Annual Conference
- Ongoing educational sessions attended by ICPs:
    - Webber Training
    - Critical Care Rounds
    - Grand Rounds
    - Public Health Rounds

Table 1: Count of Education Provided by IPAC

Education type	# of HCPs Educated
Hand Hygiene	2856
*Clostridium difficile**	463
Routine Practices/ Additional Precautions/ PPE*	1169
Outbreaks* (GI and/or RI)	1039
Tuberculosis	49
Ebola	857
IPAC intranet site visits	73575
IPAC HH intranet site visits	18125
Miscellaneous* (including: orientation, updates to manual/ guidelines, skill fairs, risk assessments and AROs)	2840

*These topics include additional HH components

GOING FORWARD

IPAC educational materials presented by ICPs will be reviewed and updated within the next fiscal year. Once updated, these materials will be made available to ICPs and HCPs online (IH intranet). Updating these materials will ensure that all HCPs are receiving standardized information across the health authority. Education materials will be reassessed annually by an IPAC working group and reviewed by the IPAC Educator.

The development of a new IPAC iLearn module, such as *Routine Practices*, will be completed within the next fiscal year. It is intended that this module will be completed by HCPs on an annual basis. The iLearn platform allows managers to track completion and holds HCPs more accountable in their professional development and maintaining clinical/professional competency. Decreased HCP attendance to ICP in-person education sessions and HCPs that work outside regular office hours has been identified as areas of concern by IPAC. The iLearn platform provides an alternative method to ensure HCPs receive continuous IPAC education.

In an additional effort to ensure HCPs maintain their clinical/professional competency; IPAC will explore new technology for HCP education and competency assessments. The first method that will be investigated are instructional videos for personal protective equipment.

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 facilities in making the delivery of healthcare safer for everyone

The key program components include a variety of ongoing education modules, including basic orientation, promotional material, and HH auditing.

The 4th *Physician Ask Me Campaign was* rolled out at Cariboo Memorial Hospital. An exciting addition to this campaign was two life sized cardboard cut-outs of a long-time Cariboo Memorial Hospital physician. The cut-outs feature the physician holding a blank plaque that allows for interchangeable messages. The first message reads 'Please Clean Your Hands' followed by two aboriginal translations of the same message. The cut-outs are placed at entrances and other high traffic areas within the facility. The cut-outs also accompany the local ICP to various educational sessions and skills fairs.

Customized elevator wraps promoting HH have proven to be very popular. Ten facilities have had wraps installed on their elevator doors, bringing the total number of wraps to 38.

Finalization of the Provincial HH online education modules to the IH iLearn online education platform was completed in July 2014. These two online modules, for HCPs and medical staff, feature a short quiz at the end of the education sessions. These online modules provide HCPs and medical staff 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. Planning is currently underway to make the medical staff module and quiz a part of Physician Credentialing. This will require physicians to complete both the module and quiz on an annual basis. Additionally, the HCP module and quiz is scheduled to be part of the IH Regional Orientation (for new hires) in early FY 2016.

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 product installation completed in all IH facilities by December 2014. Following IPAC guidelines, site surveys were performed before installation of the new dispensers. This ensured that product was made available in ideal locations for all HCPs, patients/residents and visitors. Additional work in residential care facilities took place to ensure product is available at point-of-care.

As part of the HH program evaluation an online survey was made available to all IH staff in October 2014. Results have been analyzed and the report is currently in draft. The purpose of this evaluation was to ensure the program is meeting its goals while identifying HH behaviours, knowledge, barriers and areas for improvement.

January 2015 marked the start date of the first HH auditor co-op student (eight month term). In hiring this student, IPAC was able to alleviate some of the pressure placed upon ICPs to complete HH audits and increase the total number of observations across the health authority. Increases in observation requirements were made taking into consideration:

- Number of beds and nursing staff per unit
- Ease of auditing
- Travel distance to facility

- Scheduling of the co-op student

Planning is currently underway to hire an additional co-op student at the end of the current student's term.

March of 2015 marked the end of the *trial period* for residential HH auditing. The BC Ministry of Health has proposed the first quarter of FY 2016 will mark the start of public reporting of HH compliance rates at IH's 40 residential care facilities.

The IH Hand Care Program is planned for release in early FY 2016. This Program was developed to provide IH employees with the tools they need to maintain healthy hands while ensuring proper hand hygiene techniques. It is the result of a partnership between Workplace Health and Safety – Health & Wellness Department and IPAC.

GOING FORWARD

New promotional items, to reward performance and promote HH, 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 within IH.

The IH HH Working Group continues to meet quarterly to discuss and make recommendations on 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 in collaboration with Quality, Risk & Accreditation and Patients as Partners – Patient Voices Network to investigate the feasibility of adding a patient representative as a member of the working group.

The *Best Practices for Hand Hygiene Facilities & Infrastructure in Healthcare Settings: Facilities & Infrastructure Checklist*, released by the BC Ministry of Health, will be completed by ICPs in collaboration with Facilities Management in all IH facilities by the end of next fiscal year. As of March 2015, checklists have been completed in three IH facilities.

In an effort to reach the 100% HH compliance rate goal, a revision to the *Hand Hygiene Audit Feedback Tool for Unit Leaders* will take place.

LIMITATIONS

The overall aim of presenting HH compliance results is to give an indicator 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.

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, Co-op Student and the Surveillance Information Assistant.

DATA ANALYSIS

There was no significant change in HH compliance across IH in FY 2015 (75.3%; 95% confidence interval (CI 74.6% - 76.1%) compared to the previous year (74.2%; 95% CI 73.4% - 75.0%; *p* >0.03). This year there were 12,408 HH observations, which was 6% higher than in the previous year.

There was a very significant increase in HH compliance at Penticton Regional Hospital (*p* <0.001) where HH compliance in the current year was the highest among the larger facilities (Table 2).

Across IH, physicians had significantly lower HH compliance compared to other healthcare providers (Appendix D), while nursing staff had significantly higher compliance (Table 3). Penticton Regional Hospital and Kootenay Boundary Regional Hospital had significantly higher HH compliance than other facilities and East Kootenay Regional Hospital, Royal Inland Hospital, Vernon Jubilee Hospital had significantly lower HH compliance. Difference between before and after patient interaction was very significant (Table 4) but there was no significant change between FY 2014 and FY 2015.

Table 2: HH Compliance Rate by Facility

Facility type	Facility	FY 2012	FY 2013	FY 2014	FY 2015	Change from 2014
All	IH	58%	69%	74%	75%	1.1%
Tertiary hospital	KGH	59%	71%	75%	75%	-0.8%
	RIH	43%	67%	74%	71%	-3.1%
Service area hospital	EKH	35%	66%	68%	69%	1.1%
	KBH	64%	72%	78%	80%	1.8%
	PRH	68%	72%	71%	85%	13.6% †
	VJH	63%	64%	70%	71%	1.2%
Community level hospital	CMH	64%	73%	78%	80%	2.2%
	KLH	67%	73%	83%	84%	1.5%
	SLH	67%	73%	74%	79%	5.7%
	Other*	63%	69%	75%	76%	1.0%

† Significant change from FY 2014 to FY 2015

* 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 C)	FY 2012	FY 2013	FY 2014	FY 2015	Change from 2014✧
Clinical Support Staff	50%	58%	64%	66%	2%
Nursing Staff	62%	73%	78%	78%	0%
Other	56%	65%	72%	71%	-1%
Physicians	44%	57%	64%	64%	0%

✧ Percent rounded to the nearest whole number

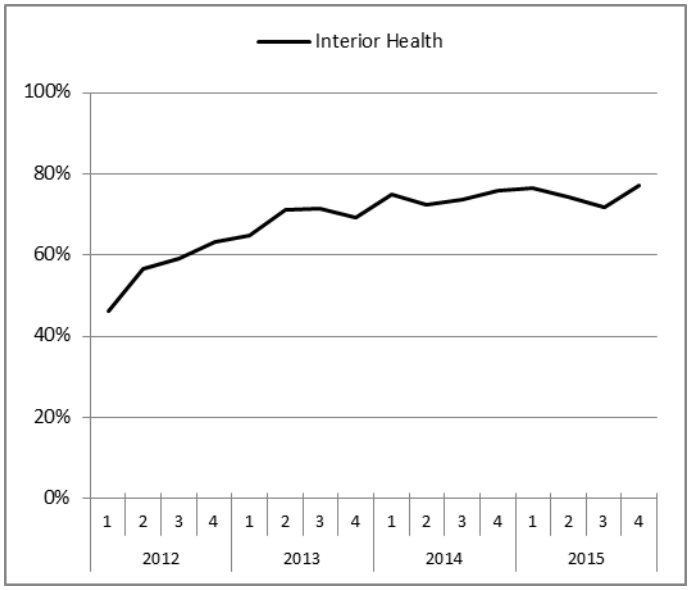
Table 4: HH Compliance Rate for Interior Health by Contact Timing

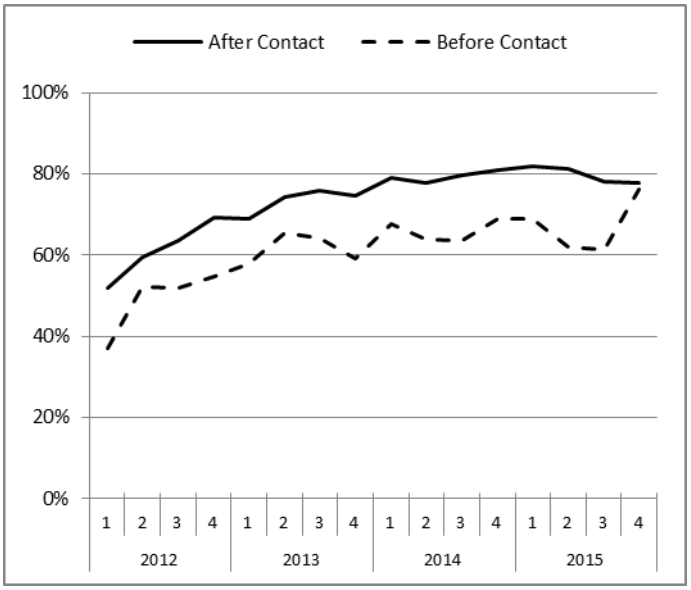
Contact Timing	FY 2012	FY 2013	FY 2014	FY 2015	Change from 2014✧
Before Contact	51%	62%	66%	68%	2%
After Contact	62%	74%	79%	80%	1%

† Significant change from FY 2014 to FY 2015

✧ Percent rounded to the nearest whole number

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





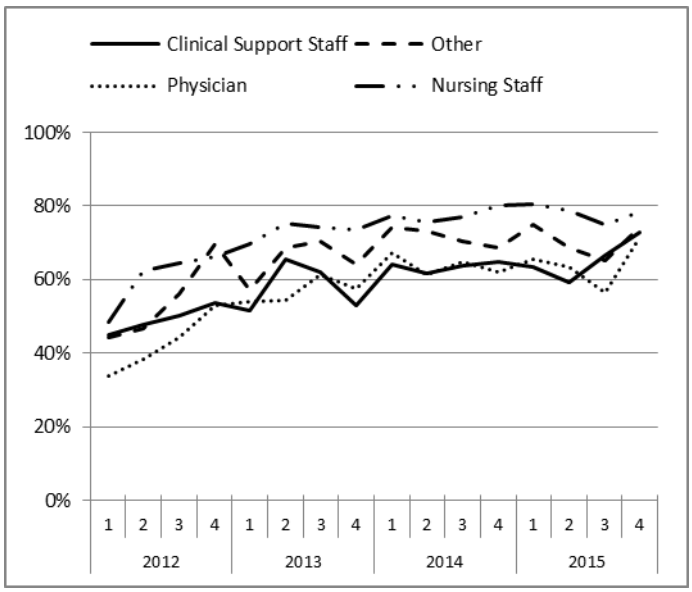
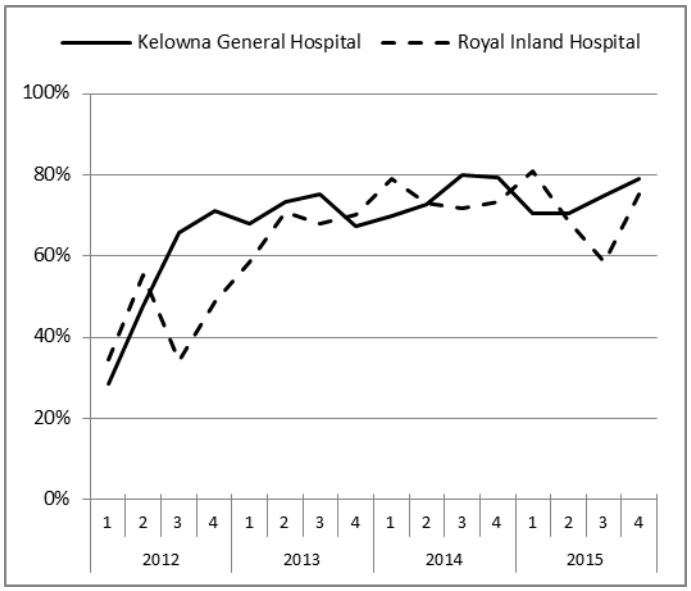
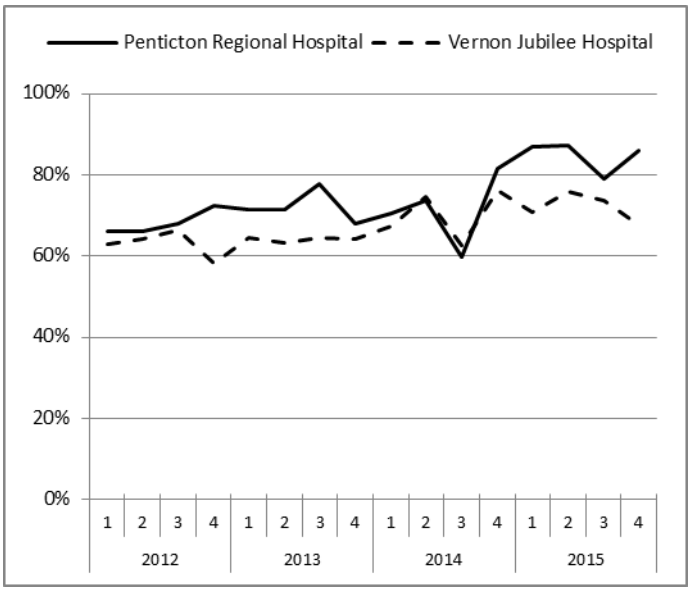
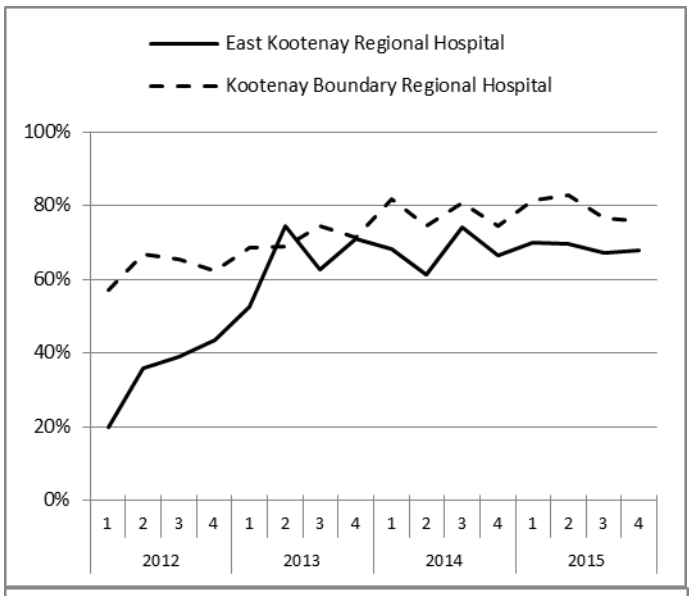
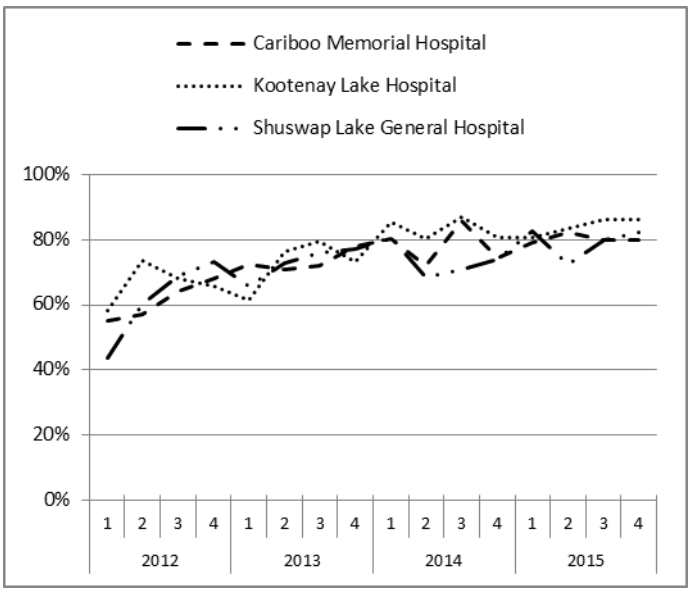


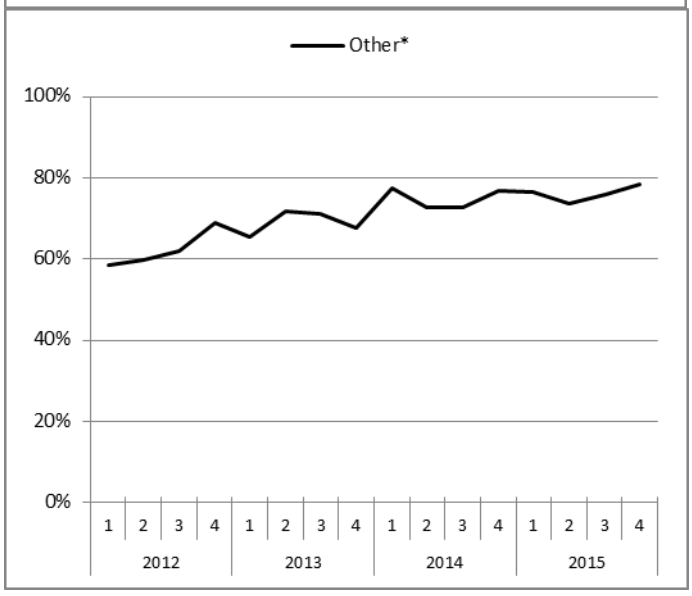
Figure 2: HH Compliance Rates for Acute Facilities by Fiscal Quarter











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 Link Nurse (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

Since the inception of the LN program, at Royal Inland Hospital and Kelowna General Hospital, 65 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.

The LN Evaluation was completed in FY 2015.

Key findings based on survey results indicated:

- Significant differences between the two sites due to conflicting priorities
- The program was more successful at Royal Inland Hospital
- In order for the LN Program to be sustainable the program must be supported by site administration in collaboration with IPAC

GOING FORWARD

The LN Program will continue at Royal Inland Hospital and additional staff will be recruited.

Kelowna General Hospital will be maintaining the existing program but will not support an intake of new staff.

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 renovation begins. To facilitate the risk assessment, Facilities Management and/or Capital Planning and

Projects inform IPAC regarding the location of all areas requiring renovation and construction and an ICP will be involved in this planning process.

ACCOMPLISHMENTS/ PRIORITIES MET

IPAC provides vital direct education and educational material on infection prevention and control related to construction.

Over 275 new construction and renovation permits were issued by ICPs across IH during FY 2015. 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 of the new Interior Heart and Surgical Centre
- Planning for the new Patient Care Tower at Penticton Regional Hospital
- Construction of the new Clinical Support Building at Royal Inland Hospital
- Construction of the Community Health Services Centre in Kelowna
- Construction of airborne isolation rooms in one facility
- Renovation projects in multiple facilities

Based on ICP feedback, modifications to the permit form were completed.

CURRENT STATUS

Numerous new construction and renovation projects continue in acute, residential and community care facilities throughout the health 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 developed standard permit forms. These will be trialed during FY 2016. Electronic permit forms will be developed and implemented.

TUBERCULOSIS

The IPAC program works in collaboration with various IH programs to standardize screening processes and Tuberculosis management.

The construction of additional airborne isolation rooms remain a priority.

EBOLA VIRUS DISEASE

Ebola Virus Disease (EVD) is spread by direct contact of non-intact skin or mucous membranes with infected blood, body fluids or tissues of infected persons or indirectly through contact with contaminated medical equipment or environmental surfaces.

An Ebola outbreak was declared in West Africa in March 2014 by the World Health Organization. Initially, all cases were confined to West Africa; however two imported cases, including one death, and two locally acquired cases in healthcare workers were reported in the United States in September 2014.

In October 2014, a number of Ebola preparedness initiatives were announced by the BC Ministry of Health, including the establishment of health authority Emergency Operations Centres (EOCs). Representatives from Interior Health participated in a provincial task force, led by the Provincial Health Officer, to collaborate and ensure consistency in the response across British Columbia.

An IH working group, co-led by a Medical Health Officer and the IPAC Corporate Director, focused on EVD preparedness and addressed a number of key areas, including:

- Triage and assessment
- Diagnosis and treatment
- Infection prevention and control, including Personal Protective Equipment education and training
- Lab processes
- Workplace health and safety requirements

While the probability of EVD in Interior Health was low, preparedness to ensure HCPs can safely and effectively care for patients is essential.

Kelowna General Hospital is designated as the Interior Health Type 2 site which will receive any patients who are suspect for EVD. Emergency departments and front-line staff at all IH hospitals and some health-care centres have been trained to receive, isolate, and triage any symptomatic individual with risk of exposure to Ebola.

Refer to BC Ministry of Health, Office of the Provincial Health Officer for more information.

Table 5: Ebola Virus Disease Training for Interior Health

Site	EVD Awareness Training	Low Risk PPE Training	High Risk PPE Training – Option 1	High Risk PPE Training – Option 2	N-95 Fit Tests*	Clinical Staff Trained in Housekeeping Procedures	Total by Site**
Type 1 & 2	2054	695	695	370	927	0	4741

*Previously IH has been Fit testing HCPs on an ongoing basis. These numbers are from November 1, 2014 onwards.
**Educated HCPs include, but not limited to: Physicians, Nursing, Laboratory Technicians, Diagnostic Imaging, Housekeeping, Respiratory Therapists, Patient Care Coordinators, and Students

CARBAPENEMASE PRODUCING ORGANISMS

Carbapenemase Producing Organisms (CPOs) are emerging gram-negative bacilli that are resistant to all beta-lactam antibiotics. Infections with these organisms are very difficult to treat. At risk persons include those who have been hospitalized or had a medical procedure in countries outside of Canada where these types of organisms are prevalent.

In BC there have been increasing numbers of patients identified as CPO carriers. Transmission of CPOs between patients has occurred in acute care facilities. The BC Ministry of Health has mandated all acute care facilities screen patients for CPOs. A CPO toolkit was developed and implemented. On March 2, 2015 IH began screening all patients admitted to acute care sites for CPOs. As of March 31, 2015 no cases of CPO have been identified in IH.

SURVEILLANCE

Surveillance for HAIs is an IH-wide strategy that is carried out by IPAC and ICPs. Ongoing surveillance is important to ensure increasing trends and clusters are quickly identified and addressed. It also provides a useful indication of the effectiveness of IPAC efforts in the prevention of HAIs and control of their transmission. Finally, surveillance can support the implementation of risk-reduction strategies and monitor the effectiveness of the interventions.

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. These reports and analyses are reviewed by site specific IPAC Committees (where available) and the Infection Measurement Prevention and Control 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

The IPAC Educator and Medical Systems Programmer/ Systems Analyst developed a manual for the electronic surveillance system for ICP/ IPAC orientation and reference. This manual, currently in draft format, was trialed during the orientation of two new ICPs.

GOING FORWARD

A review of HAI benchmarks was completed during FY 2015 as a result of decreasing HAI rates in acute care facilities. Once approved, revisions will be implemented in FY 2016.

Strategies for improved dissemination of HAI information with site leaders and physician groups will be explored.

LIMITATIONS

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 in the analysis. Nevertheless, the results from comparisons presented here are useful as indicators of trends and differences.

HAI rates for small facilities may not be reported in this report due to insufficient data.

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].

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. 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 CDI (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[2], the population under CDI surveillance are inpatients admitted to IH acute care facilities (Appendix B). 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 B).

[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] PICNet Surveillance Protocol for *Clostridium difficile* Infection (CDI) in BC Acute Care Facilities, July 2013. Provincial Infection Control Network of British Columbia

ACTIONS IMPLEMENTED

In an effort to decrease the spread of CDI, stakeholders are expected to treat each CDI case was treated with strict adherence to the IH Strategic Plan for CDI.

Facility specific alert levels, which trigger an investigation and preventative actions to reduce transmission, have been effective in preventing CDI outbreaks at IH facilities. Since its introduction only 5 acute care facilities exceeded their alert level during the last fiscal year and zero CDI outbreaks were declared.

A predictive model for the incidence of healthcare-associated CDI in IH acute care facilities was developed with the assistance of a graduate student from the University of British Columbia – Okanagan, Department of Engineering. This model used facility-level data on:

- Incidence of all types of CDI in the previous time period
- CDI sporicidal housekeeping product purchasing data
- Antimicrobial purchasing data (third-generation cephalosporins and fluoroquinolones)
- Nursing-to-bed ratios
- HH compliance

Fuzzy-logic and decision-tree modeling methods were used as much of the input data is inherently imprecise. Performance of this predictive model was promising. Further validation (testing the model with newer data) is required to ensure the accuracy and usefulness of the model.

FUTURE PLANS

IH's zero tolerance for CDI continues to be one of IPAC's top priorities in the 2016 FY Strategic Plan (Figure 11). During the next FY, ICPs will again develop and implement education plans for their areas of responsibility. In doing so, targeted education can be efficiently delivered to units with rates over the benchmark.

A review of the current CDI alert levels will be carried out and alert levels will be adjusted appropriately. Facilities will continue to be monitored and alerted as required.

For more information see *Clostridium difficile* Infection in the Fiscal Year 2016 Strategic Plan section.

Table 6: Interior Health new healthcare associated CDI status, FY 2014

Incidence (95% confidence interval)	Five-year trend *	FY 2015 benchmark	Status
4.3/10,000 patient-days (3.8/10,000 – 4.9/10,000 patient-days)	-1.03/10,000 patient-days/year	6.0/10,000 patient-days	Below 2015 benchmark

*Linear regression coefficient, p <0.001

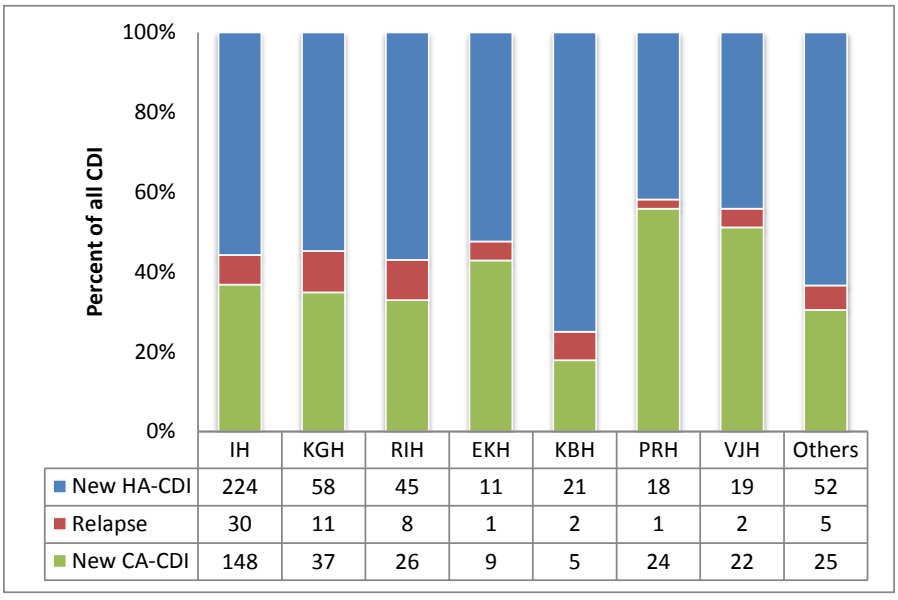
Current Year:

Cases:

Across IH there were 224 cases of new healthcare associated CDI (HA-CDI) (55.7% of total), 148 new cases of community-associated CDI (36.8% of total), and 30 cases of relapse CDI (7.5% of total; Figure 3). Community-associated CDI accounts for a larger proportion of total CDI this year (36.8%) compared to the previous year (26.2%). The distribution of CDI types across facilities in IH was varied (Figure 3). This year, the proportion of CA-CDI ranged from 17.9% in Kootenay Boundary Hospital to 51.1% in Vernon Jubilee Hospital. The distribution of CDI among the three classifications of CDI was similar to the distribution reported across BC in FY 2014[3].

A cluster of CDI was identified at Cariboo Memorial Hospital involving 4 cases. These cases accounted for 16% of the patient population in the affected unit. See Zero Tolerance Program strategies for more information.

Figure 3: Distribution of CDI across classification groups by facility, FY 2015



	IH	KGH	RIH	EKH	KBH	PRH	VJH	Others
New HA-CDI	224	58	45	11	21	18	19	52
Relapse	30	11	8	1	2	1	2	5
New CA-CDI	148	37	26	9	5	24	22	25

Rates:

[3] *Clostridium difficile* Infection Surveillance Report for the Fiscal Year 2013/2014. Provincial Infection Control Network of British Columbia

The incidence of new HA-CDI in IH for FY 2015 was 4.3/10,000 patient-days (95% confidence interval, 3.8/10,000 patient-days – 4.9/10,000 patient-days, Table 6 and 7).

Compared to this rate, HA-CDI incidence at Cariboo Memorial Hospital, Kootenay Lake Hospital, and Kootenay Boundary Hospital were significantly higher (p <0.05). It should be noted that comparisons presented here do not control for case mix of the patient population or the CDI burden in those 3 communities, which can increase the risk of developing CDI in these hospital settings. Nevertheless, HA-CDI incidence can also reflect lack of compliance with recommended infection prevention or antimicrobial prescribing practices.

Comparison to 2014:

Compared to the IH incidence of new HA-CDI in FY 2014 (5.3/10,000 patient-days), the incidence in 2015 decreased significantly (p =0.02). While new HA-CDI rates decreased somewhat at most IH facilities, there was a significant increase at Kootenay Boundary Hospital (Table 7) where this issue was examined. Specific improvements in housekeeping have begun in a unit with a high proportion of cases, and monitoring of this unit will continue in the next year.

Table 7: New HA-CDI, FY 2015

Facility type	Facility	Count	Patient-days	Rate, 1/10,000 patient-days [1]	5% confidence interval of rate	Difference in rate from 2014 FY [2]
All	IH	224	517,146	4.3	3.8 – 4.9	-1.01 *
Tertiary hospital	KGH	58	160,970	3.6	2.7 – 4.5	-1.55
	RIH	45	96,492	4.7	3.3 – 6.0	-1.18
Service area hospital	EKH	11	27,578	4.0	1.6 – 6.4	-4.42
	KBH	21	25,572	8.2	4.7 – 11.72	4.97 *
	PRH	18	55,700	3.2	1.7 – 4.7	-1.10
	VJH	19	65,141	2.9	1.6 – 4.2	-1.62
Community level hospital	ALH	0	1,001	0.0	NA	0.00
	BDH	3	3,541	NA	NA	3.14
	CMH	14	10,981	12.8	6.1 – 19.4	-0.61
	CVH	3	5,431	NA	NA	-5.04
	DHH	0	1,895	0.0	NA	-6.02
	EVH	2	4,897	NA	NA	4.08
	GDH	1	2,086	NA	NA	-4.41
	IDH	0	2,417	0.0	NA	0.00
	KLH	11	12,571	8.7	3.6 – 13.9	5.55
	LIH	0	1,412	0	NA	-6.45
	NVH	2	3,284	NA	NA	-5.23
	OMH	2	6,457	NA	NA	-2.70
	PGH	1	1,703	NA	NA	-0.14
	QVH	0	3,540	0.0	NA	-3.28
	SLH	7	17,746	3.9	1.0 – 6.9	-1.42
	SOG	6	6,731	4.3	3.8 – 4.9	4.02

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

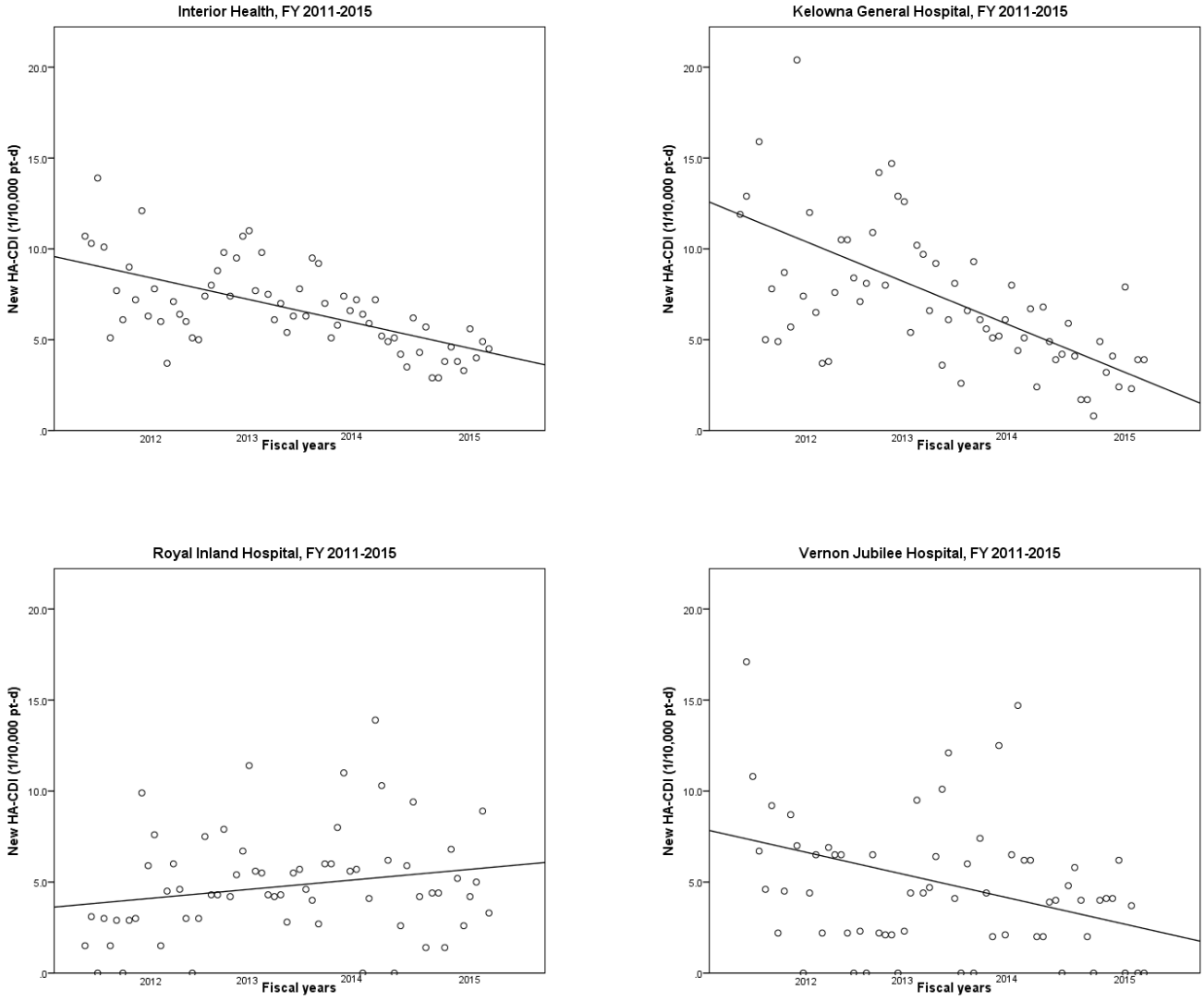
[2] * Indicates statistical significance, p <0.05. Differences without * are not significant.

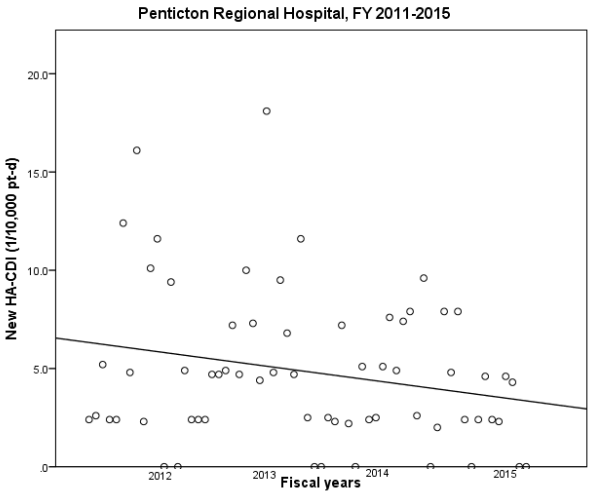
Longer Term Trend:

Analysis of the moving average of new HA-CDI incidence across IH demonstrated a continuing and significant downward trend from FY 2011 through the current year (p <0.001, Figure 4). The average decrease per period was 0.08/10,000 patient-days. This is equivalent to a decrease of 1.03/10,000 patient-days per year.

There have been significant long-term decreases in incidence at Kelowna General Hospital (-1.87/10,000 patient-days per year), Vernon Jubilee Hospital (-1.25/10,000 patient-days per year), and Penticton Regional Hospital (-0.47/10,000 patient-days per year). Over the same time period, however, there was a significant increase at Royal Inland Hospital (0.46/10,000 patient-days per year, Figure 4). Multiple factors could contribute to these changes. Rates at the other service area hospitals did not have sufficient data to test for long-term trend.

Figure 4: Long-term incidence of new HA-CDI, 2011 through 2015





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 contaminated hands of HCPs and contact with contaminated environmental surfaces and equipment.

More recently, in BC, new HA-MRSA incidence has not changed over the past 2 fiscal years, with the provincial annual rate of 4.6/10,000 patient-days [4].

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[5] (Appendix B). 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

[4] Provincial Infection Control Network. Methicillin-resistant *Stapylococcus aureus* (MRSA) Surveillance Report for Fiscal Year 2013/204. 2014,

[5] PICNet Surveillance Protocol for Methicillin-Resistant *Staphylococcus aureus* (MRSA) in BC Acute Care Facilities, July 2013. Provincial Infection Control Network of British Columbia

MRSA are classified as either cases of colonization or infection, based on presence or absence of clinical evidence of infection. Specimens are collected for the MRSA screening programme or for clinical diagnoses.

ACTIONS IMPLEMENTED

A number of actions continue to be carried out to address MRSA infections within IH. The *Acute Care Admission Screening* tool is completed as part of the initial patient admission history and assessment.

LIMITATIONS

Compliance with MRSA screening practice within acute care settings is challenging to maintain and strategies to improve this continue, including education and compliance reviews.

RESULTS

Table 8: Interior Health HA-MRSA Status

Incidence, (95% confidence interval)	Five-year trend	FY 2015 benchmark	Status
4.2/10,000 patient-days (3.6/10,000 – 4.8/10,000 patient-days)	No trend	5.6/10,000 patient-days	Below 2015 benchmark

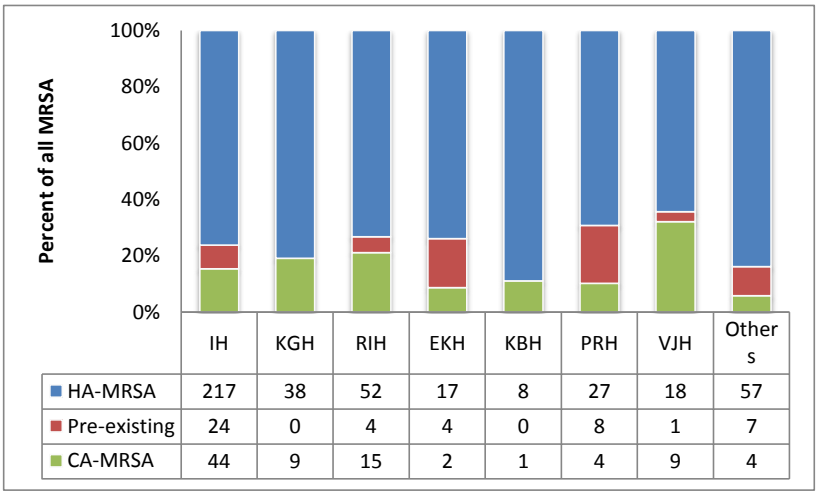
Current Year:

Cases:

In total, there were 285 cases of MRSA reported in acute care in IH during FY 2014. Of these, 217 were new healthcare-associated MRSA (HA-MRSA, 76.1%), 44 were community associated cases (13.5%), and 24 were cases of pre-existing MRSA (8.4%). The distribution between community and healthcare-associated cases differed somewhat across facilities (Figure 5).

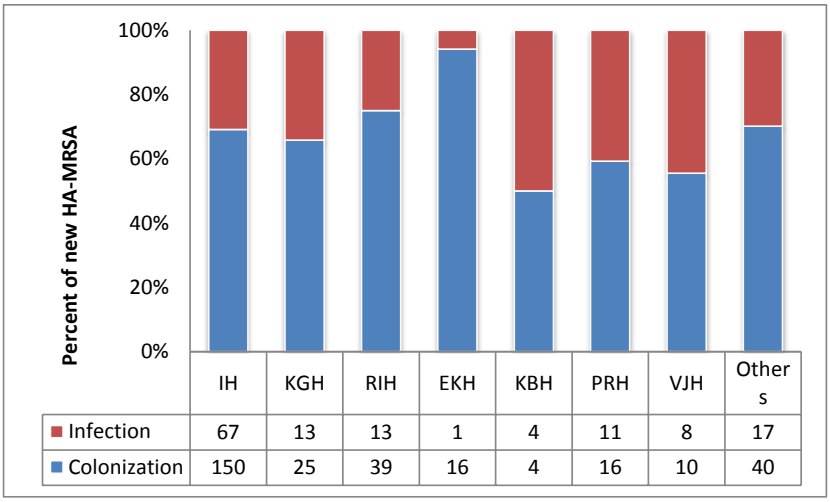
Among new HA-MRSA in IH, 30.9% were cases of infection (Figure 6). Most cases of colonization are captured through the MRSA screening program; the proportion of colonization among all HA-MRSA was the highest at East Kootenay Hospital (Figure 6). The number and proportion of MRSA infections from blood cultures appeared to be higher in the current year than in the previous year (Figure 7).

Figure 5: Distribution of MRSA across classification groups by facility, FY 2015



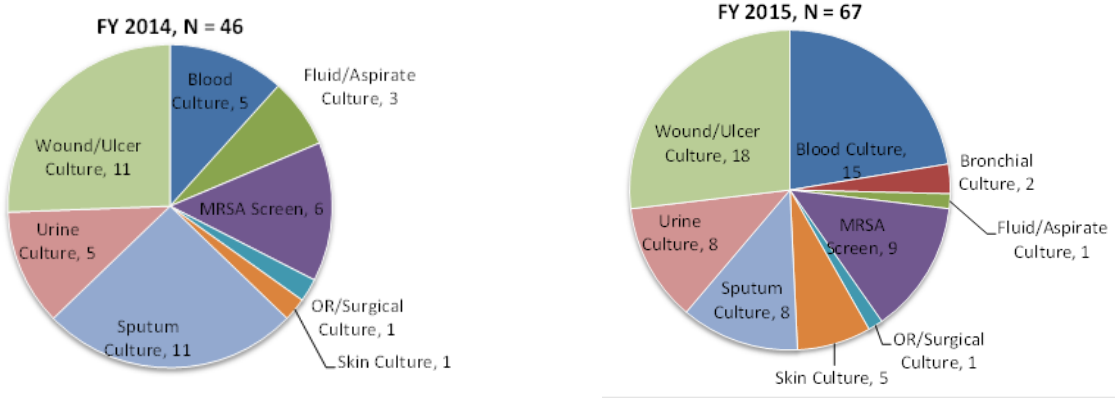
	IH	KGH	RIH	EKH	KBH	PRH	VJH	Others
HA-MRSA	217	38	52	17	8	27	18	57
Pre-existing	24	0	4	4	0	8	1	7
CA-MRSA	44	9	15	2	1	4	9	4

Figure 6: Distribution of new healthcare-associated MRSA between colonization and infection by facility, FY 2015



	IH	KGH	RIH	EKH	KBH	PRH	VJH	Others
Infection	67	13	13	1	4	11	8	17
Colonization	150	25	39	16	4	16	10	40

Figure 7: Specimen types of MRSA infections by fiscal year



Rates:

Across IH, the incidence of new HA-MRSA (colonization and infection) was 4.2/10,000 patient-days (95% confidence interval, 3.6/10,000 patient-days – 4.8/10,000 patient-days, Table 8). The rate of new HA-MRSA at Kelowna General Hospital was significantly

lower than the IH rate, while the rates at Creston Valley Hospital, Invermere District Hospital, 100 Mile House Hospital, and Shuswap Lake Regional Hospital were significantly higher (p <0.05)

The incidence of new HA-MRSA *infection* within IH was 1.3/10,000 patient-days (95% confidence interval, 1.0/10,000 patient-days – 1.6/10,000 patient-days). Compared to IH, the incidence of infection was significantly greater at Shuswap Lake General Hospital (p <0.01).

Table 9: New HA-MRSA, FY 2015

Facility type	Facility	Count	Patient-days	Rate, 1/10,000 patient-days [1]	95% confidence interval of rate	Difference in rate from 2014 FY[2]	Infection rate, 1/10,000 patient-days
All	IH	217	517146	4.2	3.6 – 4.8	-0.3	1.3
Tertiary hospital	KGH	38	160970	2.4	1.6 – 3.1	0.3	0.8
	RIH	52	96492	5.4	3.9 – 6.9	-1.3	1.4
Service area hospital	EKH	17	27578	6.2	3.2 – 9.1	2.1	0.4
	KBH	8	25572	3.1	1.0 – 5.3	0.2	1.6
	PRH	27	55700	4.9	3.0 – 6.7	1.5	2.0
	VJH	18	65141	2.76	1.5 – 4.0	-1.0	1.2
Community level hospital	ALH	0	1001	0.0	NA	-8.5	0.0
	BDH	1	3541	2.8	NA	-5.2	0.0
	CMH	5	10981	4.6	0.6 – 8.5	-1.6	2.7
	CVH	7	5431	12.9	3.4 – 22.4	9.4	0.0
	DHH	0	1895	0.0	NA	-6.0	0.0
	EVH	0	4897	0.0	NA	-11.9 *	2.0
	GDH	1	2086	4.8	NA	0.2	4.8
	IDH	5	2417	20.7	2.6 – 38.8	20.7	0.0
	KLH	4	12571	3.2	0.1 – 6.3	-4.0	2.4
	LIH	0	1412	0.0	NA	-6.5	0.0
	NVH	0	3284	0.0	NA	-5.7	0.0
	OMH	7	6457	10.8	2.8 – 18.9	-0.8	1.6
	PGH	1	1703	5.9	NA	5.9	0.0
	QVH	0	3540	0.0	NA	-3.3	0.0
	SLH	16	17746	9.0	4.6 – 13.4	-6.5	3.9
	SOG	4	6731	5.9	0.1 – 11.8	-0.6	1.5

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

[2] * indicates statistical significance, p <0.05

Comparison to 2014:

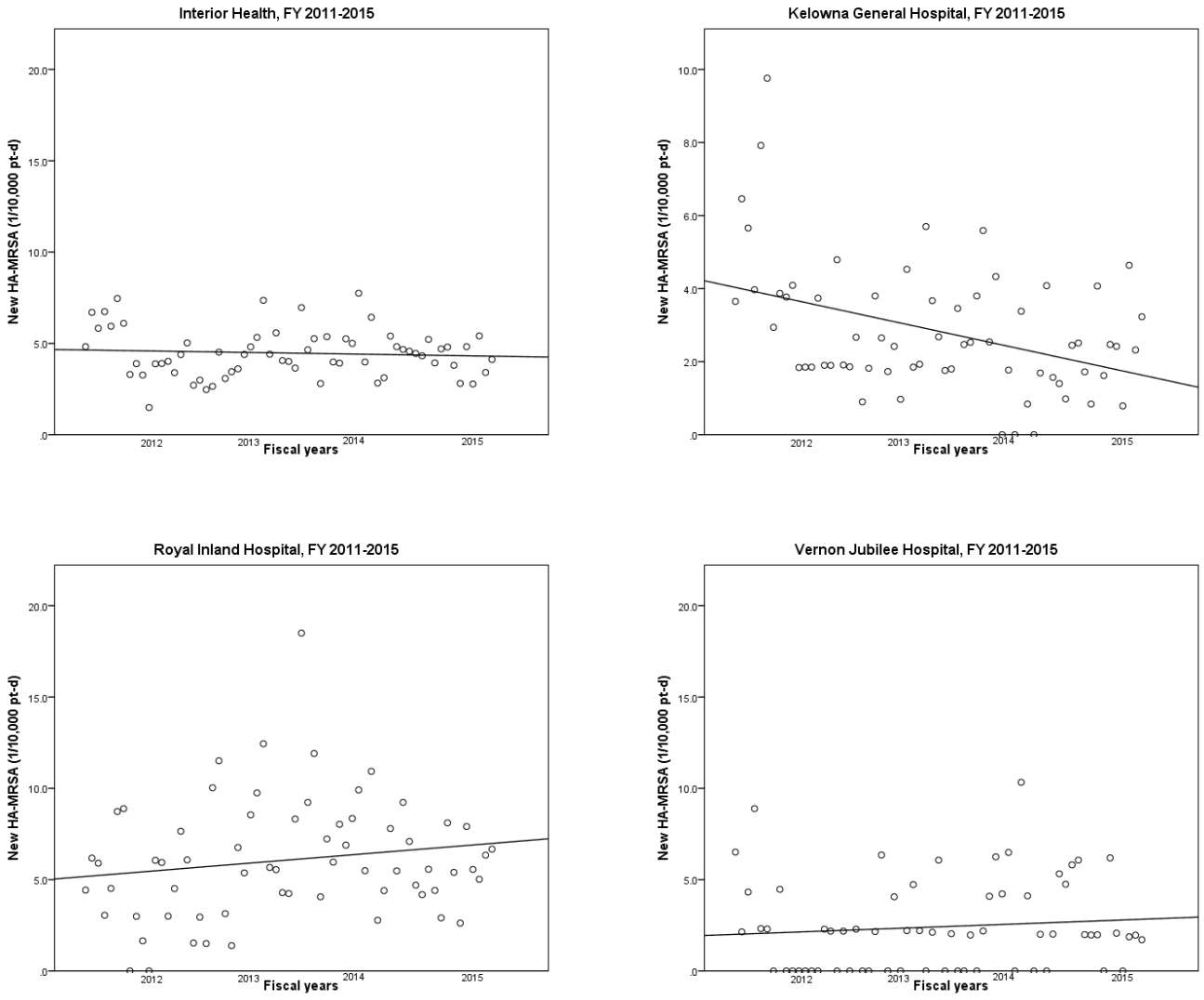
The IH incidence rate of new HA-MRSA in FY 2014 was 4.5/10,000 patient-days, which was not significantly different from this year's rate. Elk Valley Hospital had a significant decrease in the rate of HA-MRSA, from 4.4/10,000 patient-days in FY 2014 to zero in the current year.

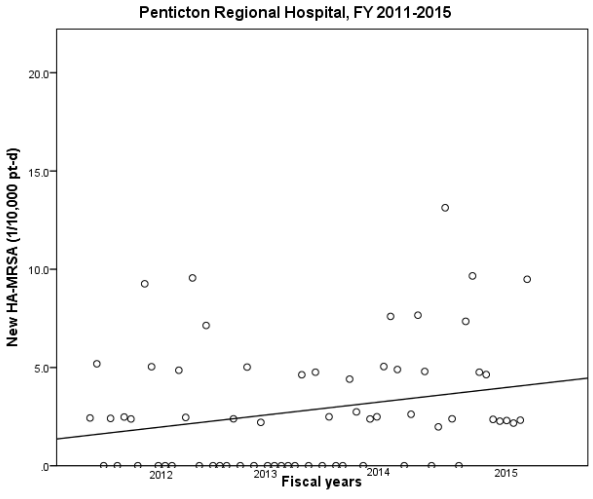
Longer Term Trend:

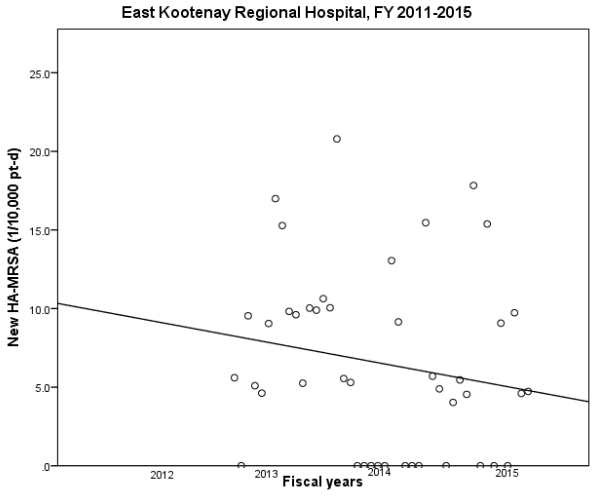
HA-MRSA Trend:

Over the past 5 years, the incidence of HA-MRSA has been flat with no significant increases or decreases over time (Figure 8). Trends in HA-MRSA rate varied across facilities. Significant decreases over the years have been observed at Kelowna General Hospital (-0.51/10,000 patient-days per period) and East Kootenay Regional Hospital (-1.31/10,000 patient-days per year).

Figure 8: Long-term incidence of HA-MRSA, FY 2011 through 2015







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?

VRE surveillance in IH included only clinical cases of VRE. Unlike MRSA surveillance, there was no screening component to VRE surveillance. The incidence rate of VRE 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. Classification of VRE as infection or colonization was made based on clinical evidence for each case.

The population under VRE surveillance are inpatients admitted to IH acute care facilities (Appendix B). 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

There are a number of preventative actions including the use of dedicated patient equipment and the placement of patients in private rooms, where feasible, and staff and patient education.

RESULTS

There were 61 cases of VRE reported in IH. Of these, 80.3% were cases of infection and 18.0% were cases of colonization. The rate of healthcare-associated VRE (HA-VRE) was 1.2/10,000 patient-days (95% CI: 0.9/10,000 patient-days – 1.5/10,000 patient-days). The rates at Royal Inland Hospital, Kelowna General Hospital, Vernon Jubilee Hospital, and Penticton Regional Hospital ranged from 1.0/10,000 patient-days to 2.0/10,000 patient-days. Other facilities had <5 VRE in FY 2015.

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 for facilities that use the surgical electronic data collection system.

SSI rates are the number of infected surgical operative sites over the number of surgical procedures performed, expressed as a percentage (Appendix B). Surgeries are stratified based on the *Surgical Wound Classification*[6]:

Clean wounds: Uninfected operative wound in which no inflammation is encountered, and the respiratory, alimentary, genital, or uninfected urinary tract is not entered. There is no break in sterile technique.

Clean-contaminated wounds: Those in which respiratory, alimentary, 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.

Based on CDC/ NHSN definitions (Appendix B), 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 is related to the operative procedure. Excluded procedures are those surgeries without an incision and surgeries performed in ambulatory care or diagnostic imaging.

[6] Interior Health Surgical Services Practices: Operative Wound Classification Reference Guide (May 2011)

ACTIONS IMPLEMENTED

When increasing SSI trends are identified, assessments of processes and practices related to the surgical procedure are completed in collaboration with the facility operating room manager, staff, surgeons and other stakeholders. Recommendations are made and followed up by the site ICP.

GOING FORWARD

IPAC will work collaboratively with the Surgical Services Executive and site perioperative management teams to review surgical areas of concern.

LIMITATIONS

Surveillance results do not include contaminated or dirty procedures, excluded procedures, or infection that could only be identified through post-discharge surveillance.

Classification of surgical procedures is done by the operating room staff upon completion of the surgery in consultation with the surgeon. On occasion, an incorrect wound class is entered for a given surgery. If these errors occur in a consistent, systematic manner, SSI rates may be biased.

DATA ANALYSIS

Table 10: IH SSI Status

Interior Health Rate	Interior Health Trend	Interior Health Benchmark	Interior Health Status
Clean 1.0%	No trend	=1.00%	Meeting 2015 Benchmarks
Clean-contaminated 1.0%	No trend		

Clean Surgery SSI:

Current Year:

SSIs were identified in 1.0% of clean surgeries in FY 2015. Clean procedures at Kootenay Boundary Regional Hospital (SSI rate = 1.6%) and East Kootenay Regional Hospital (SSI rate = 1.8%) were associated with significantly higher SSI risk, after accounting for duration of surgery (p <0.001 for each facility).

SSIs were most commonly found among orthopedic surgical procedures, general surgeries, and vascular surgeries. SSI rates vary across procedure categories and facilities; Table 12 shows rates when statistically reliable rates were available. Although the SSI rates in IH were above benchmark for several categories, there was no increased time-adjusted risk of SSI among clean procedures in the General, Orthopedic, or Vascular categories.

Across IH, the most common type of SSI among clean surgeries was superficial incisional and the least common was organ space. The most common pathogen was *Staphylococcus aureus.*

Comparison to 2014:

Within IH and in individual facilities, there was a no change in the 2015 clean surgery SSI rate for IH compared to the previous year (Table 11).

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 9). 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 9).

Table 11: SSI among clean surgical surgeries, FY 2015

Facility type	Facility	Count	Surgeries	Rate, %	95% confidence interval of rate [1]	Difference in rate from 2014 FY [2]
All	IH	236	23,397	1.0	0.9 – 1.1	-0.2
Tertiary hospital	KGH	76	7,608	1.0	0.8 – 1.2	-0.1
	RIH	34	5,066	0.7	0.4 – 0.9	-0.3
Service area hospital	EKH	32	1,802	1.8	1.2 – 2.4	-0.2
	KBH	34	2,083	1.6	1.1 – 2.2	-0.6
	PRH	18	2,042	0.9	0.5 – 1.3	-0.0
	VJH	30	3,249	0.9	0.6 – 1.3	-0.0
Community hospital	CMH	1	414	0.2	NA	-0.7
	KLH	1	141	0.7	NA	-1.8
	QVH	1	139	0.7	NA	0.7
	SLH	9	793	1.1	0.4 – 1.9	0.8

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

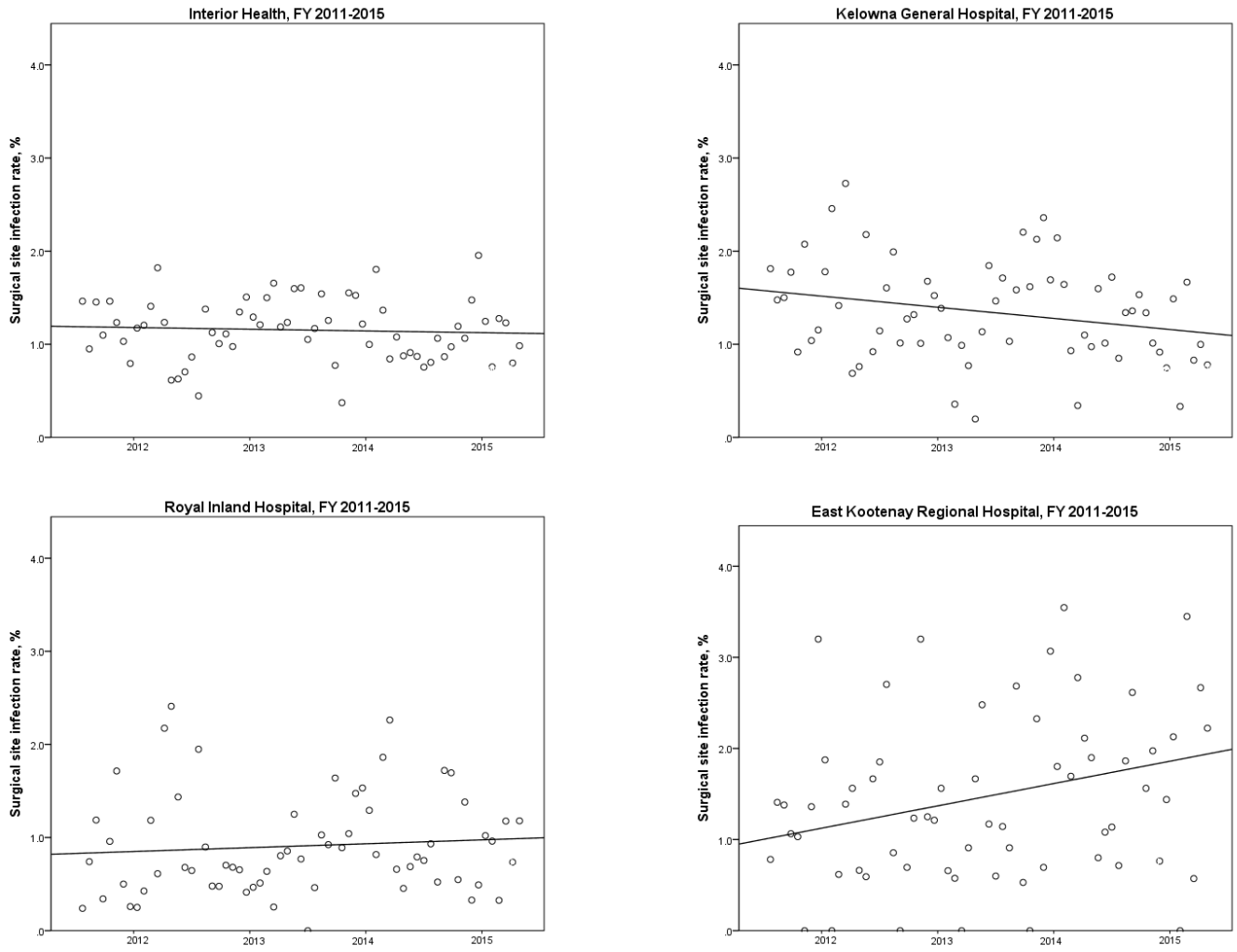
[2] * indicates statistical significance, p <0.05

Table 12: Clean surgeries: SSIs by procedure category, % (N) 1, FY 2015

Procedure Category	All	Tertiary hospital		Service area hospital			
	Interior Health	KGH	RIH	EKH	KBH	PRH	VJH
General Surgery	1.2 (4,512)	0.9 (1,036)	1.3 (776)	2.8 (325)	1.8 (397)	NA	0.9 (851)
Neurosurgery	0.6 (1,902)	0.6 (846)	NA	NA	NA	NA	1.8 (217)
Orthopedic	0.9 (10,899)	0.5 (2,766)	0.4 (2,376)	1.6 (1,086)	1.5 (1,356)	1.1 (1,165)	0.8 (1,671)
Vascular	1.5 (1,967)	2.0 (985)	1.3 (530)	NA	NA	NA	NA

[1] NA: Not available due to unreliable rate; Dashes indicate facilities where the procedures are not performed.

Figure 9: Long-term incidence of SSIs among clean surgeries, FY 2010 through 2015



Clean Contaminated:

Current Year:

The rate of SSI among clean-contaminated surgeries in IH was 1.0% (Table13). There was a significantly lower risk of SSI at Royal Inland Hospital, compared to other facilities after adjusting for duration of surgery (60% reduced risk, p =0.001). The only facility where the clean-contaminated SSI risk was higher than IH was Kootenay Boundary Regional Hospital (odd ratio, 2.2; p <0.001).

There was a significant difference in SSI risk across procedure categories (Table14). Across IH, clean-contaminated general surgeries were significantly more likely to result in an SSI, regardless of the duration of surgery (odds ratio, 2.4; p <0.001). General surgeries performed at Kootenay Boundary Regional Hospital had a significantly higher risk of SSI than those performed at other IH facilities, even after adjusting for surgery time (odds ratio, 2.0; p <0.001).

Similar to clean surgery SSIs, *S. aureus* was the predominant pathogen identified. While 44% of all clean-contaminated SSIs were superficial, 43% of clean-contaminated SSIs from general surgeries were in organ/space sites.

Comparison to 2014:

Similar to clean surgeries, there was no change from 2014 to 2015 in the IH-wide SSI rate among clean-contaminated surgeries (Table 12). The rate significantly decreased at Royal Inland Hospital (p <0.05).

Table 13: SSIs among clean-contaminated surgical surgeries, FY 2015

Facility type	Facility	Count	Surgeries	Rate, %	95% confidence interval of rate [1]	Difference in rate from 2014 FY [2]
All	IH	135	13,670	1.0	0.8 – 1.2	-0.1
Tertiary hospital	KGH	47	4,240	1.1	0.8 – 1.4	-0.0
	RIH	14	2,842	0.5	0.2 – 0.8	-0.6 *
Service area hospital	EKH	19	1,023	1.9	1.0 – 2.7	0.7
	KBH	21	801	2.6	1.5 – 3.7	0.7
	PRH	15	1,551	1.0	0.5 – 1.5	0.3
	VJH	10	1,660	0.6	0.2 – 1.0	-0.3
Community hospital	CMH	2	860	0.2	NA	-0.4
	KLH	2	258	0.8	NA	-0.0
	QVH	0	15	0.0	NA	NA
	SLH	5	225	2.2	0.3 – 4.1	0.4

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

[2] * indicates statistical significance, p <0.05

Table 14: Clean-contaminated surgeries: SSIs by procedure category, % (n = procedure category counts)[1], FY 2015

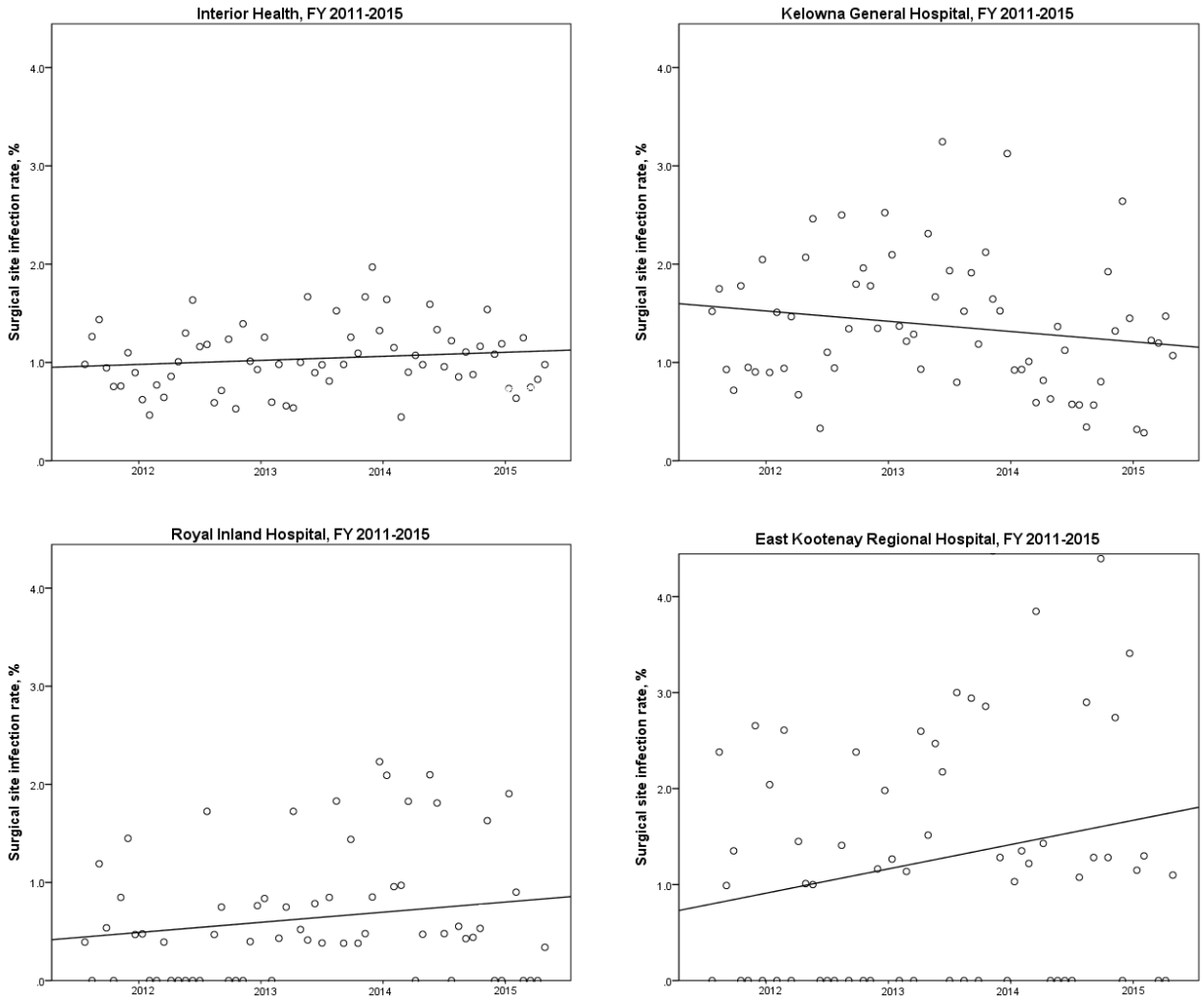
Procedure Category	All	Tertiary hospital		Service area hospital			
	Interior Health	KGH	RIH	EKH	KBH	PRH	VJH
General Surgery	2.4 (3,312)	3.3 (1,017)	1.1 (458)	3.5 (255)	4.9 (268)	2.0 (406)	1.2 (541)
Gynecology	0.5 (3,712)	NA	NA	NA	NA	0.9 (468)	NA
Obstetrics	0.9 (995)	NA	NA	NA	NA	NA	NA
Orthopedic	0.9 (812)	NA	NA	NA	NA	NA	NA

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

Longer term trend:

There was no significant 5-year trend in clean-contaminated surgery SSI rates across IH overall. There was, however, a downward trend at Kelowna General Hospital, where the SSI rate decreased at approximately 0.08% per year (Figure 9). There were 5-year upward trends at Shuswap Lake Hospital, East Kootenay Hospital, and Royal Inland Hospital (0.39% per year, 0.21% per year, and 0.09% per year, respectively).

Figure 10: Long-term incidence of SSIs among clean-contaminated surgeries, FY 2011 through 2015



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?

The incidence rate of VAP is the number of new cases of pneumonia acquired by ventilated patients in the intensive care unit (ICU) divided by 1000 ventilator days (Appendix B).

ACTIONS IMPLEMENTED

Upon the identification of each VAP case, an investigation is done 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.

DATA ANALYSIS

There were 6 VAPs throughout IH; three at Kootenay Boundary Regional Hospital, two at Penticton Regional Hospital, and one at Vernon Jubilee Hospital. The overall rate was 1.3/1,000 ventilator-days, which was not significantly different than the rate of FY 2014 1.9/1,000 ventilator-days.

Table 135: IH VAP Status

Interior Health Rate	Interior Health Benchmark	Interior Health Status
1.3/1000 ventilator-days	<5 Per 1000 ventilator-days	Below 2015 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 and mortality.

Residential care surveillance includes data on CDI, lower respiratory infections, skin and soft tissue infections, and catheter-associated urinary tract infections.

CDIs are tracked using the same definition as acute 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.

Revisions to the residential surveillance processes are currently under review to improve the reliability and value of the residential surveillance system.

LIMITATIONS

Unlike data collection in acute care, much of residential surveillance data collection is not laboratory result-driven, but based on signs and symptoms, antibiotic use, and anecdotal information supplied by residential facility HCPs. Consequently, data consistency may be lacking. Measurement and limitations for residential care CDI surveillance are the same as acute care CDI surveillance.

Table 146: Healthcare-associated infection rates (1/10,000 resident-days), selected IH residential care facilities with >50 beds, FY 2015

City	Facility	Beds	CDI	Lower respiratory illness	Skin and soft-tissue infection	CAUTI Urinary tract infection
Talarico Place	Castlegar	60	1.0	12.0	24.5	8.6
Dr F.W. Green Home	Cranbrook	58	0.0	9.4	12.3	6.4
Swan Valley Lodge	Creston	90	0.7	6.0	16.7	5.0
Pleasant Valley Manor	Enderby	82	0.3	24.2	26.6	10.1
Hardy View Lodge	Grand Forks	80	0.3	9.8	23.1	3.5
Overlander	Kamloops	183	0.6	15.1	10.0	2.6
Ponderosa	Kamloops	92	1.0	16.7	10.8	4.5
Brookhaven	Kelowna	84	0.5	17.9	5.6	2.4
Cottonwoods	Kelowna	213	4.1	19.5	8.0	3.1
David Lloyd Jones	Kelowna	64	1.7	34.5	18.5	0.9
Three Links Manor	Kelowna	82	3.0	41.2	15.2	0.7
Kimberley Special Care Home	Kimberley	55	0.5	24.3	16.9	9.0
Coquihalla Gillis House	Merritt	74	0.8	15.1	8.7	1.6
McKinney Place	Oliver	75	0.0	17.4	10.6	3.0
Sunnybank	Oliver	51	0.0	21.6	14.9	1.1
Trinity Care Centre	Penticton	75	0.0	27.3	8.9	2.6
Westview Extended Care	Penticton	102	0.8	16.2	13.0	2.4
Bastion Place	Salmon Arm	80	3.2	16.7	16.7	16.4
Columbia View Lodge	Trail	78	0.0	22.9	17.4	3.3
Gateby	Vernon	75	0.8	23.4	33.9	23.0
Noric House	Vernon	84	0.0	34.7	35.0	13.9
Polson Residential	Vernon	84	0.7	42.7	40.8	32.7

OUTBREAK SURVEILLANCE AND MANAGEMENT

From August 2014 – March 2015, there was a very high level of influenza activity in the community and in residential care facilities across BC. During this time period, there were 59 respiratory illness (RI) outbreaks in residential care facilities in IH (none in acute care). Forty-seven RI outbreaks were in IH facilities and the remaining 12 were in private facilities. In IH residential care facilities, the yearly count of residential RI outbreaks in the past four years has ranged from 8 to 22.

Control of spread from the initial RI outbreak cases within facilities was very effective. The average attack rate in RI outbreaks was 21.0%. To put that in context, attack rates of the previous 4 years ranged from 18.1% to 28.3%. Influenza A was identified from 25 outbreaks, the second most common pathogen identified was respiratory syncytial virus (RSV) (six outbreaks). Influenza A (H3N2) was identified in all influenza A outbreaks in BC in the current influenza surveillance year [7].

Gastrointestinal illness (GI) outbreak activity this year was typical. There were 12 GI outbreaks in IH residential care facilities and two in acute care. Norovirus was identified in most GI outbreaks.

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, Workplace Health & Safety, administration, Communications, nursing, medical staff, support services and external resources such as the Communicable Disease Unit, 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

In response to outbreaks, the MHO requested ICP on-call coverage on weekends and statutory holidays. This was implemented in the fall of 2014.

Updates to the *Outbreak Summary Report* were completed during FY 2015. These reports are pivotal in the management, prevention and education of outbreaks in both acute and residential care facilities. Targeted outbreak education was provided by ICPs focusing on outbreak debriefing

[7] BC Influenza Surveillance 2014-15, Bulletin #21.

recommendations. A total of 94 outbreak education sessions were provided by ICPs, educating more than 1030 HCPs (Table 1).

Working in collaboration with the CD Unit, updates to the *Quick Reference Guide: Healthcare Facilities GI Outbreak Guidelines* and *Quick Reference Guide: Healthcare Facilities RI Outbreak Guidelines* were completed in the fall of 2014. These guides provide HCPs with a checklist of correct processes and related links to:

- Confirm and declare outbreak
- Notify stakeholders
- Collect and send specimens
- Implement precautions and additional measures
- Declare outbreak over

GOING FORWARD

A meeting between the Operation Manager of the CD Unit, the Corporate Director IPAC and the Manager IPAC will take place to discuss roles and responsibilities of the two programs. This will include education, communication and reporting, in order to streamline processes and deliver consistent education and outbreak support to all IH and non IH residential care facilities.

For additional information, see Fiscal Year 2015 Strategic Plan Accomplishments section Outbreaks in Acute Care Facilities.

FISCAL YEAR 2016 STRATEGIC PLAN

Future directions for the IPAC program are illustrated in the 2016 FY Strategic Plan (Figure 11) and are aimed at improving IPAC's ability to meet the growing demands placed on the program. Moreover, these strategic initiatives are geared towards effective utilization of current resources while enabling the program to tap into the broader health system to build capacity in IPAC across the health authority.

Five main strategies have been identified for the 2016 FY with plans extending to the 2018 FY. These strategic initiatives support the ongoing IPAC program but are specifically aimed at addressing current and emerging issues.

CLOSTRIDIUM DIFFICILE INFECTION

Some facilities without an on-site ICP experienced difficulty completing the *Best Practice Checklist for Management of CDI*. As this tool has proven successful in the management of CDI in multiple facilities, ICPs will provide targeted education to those sites.

For additional information, see CDI section Future Plans.

HAND HYGIENE

For additional information, see HH section *Going Forward*.

COMMUNITY PROGRAMS

A gap has been identified by IPAC within the community and private residential facilities. A number of consultations have been provided by ICPs to private facilities within the IH region. The majority of these consultations 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.

IPAC will collaborate with the CD Unit and Community Integrated Health Services to clarify roles that will allow for a more streamlined approach when providing IPAC services in the community and to private residential settings.

For additional information, see Fiscal Year 2015 Strategic Plan Accomplishments section Community Programs.

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 IPAC practices.

For additional information, see Fiscal Year 2015 Strategic Plan Accomplishments section IPAC Program Evaluation.

EDUCATION

For more information, see Education section Going Forward.

Figure 11: Strategic Plan FY 2016

STRATEGY	STAKEHOLDER ENGAGEMENT	PERFORMANCE MEASURES	SHORT-TERM GOALS	MEDIUM-TERM GOALS	ULTIMATE OUTCOME
CDI	PICNet, Pharmacy, Housekeeping, Site/Unit Managers, HCPs	# of education sessions	Targeted education to units over benchmark	Continue targeted education on units above benchmark	**Zero transmission of CDI in IH**
		# of HCPs educated		Expand education to all departments (eg. Lab, DI, physio)	
		Ongoing surveillance	Reduce benchmark to 3.5 per 10,000 pt days	Maintain benchmark of 3 or less per 10,000 pt days	
			All facilities below benchmark		
		100% completion of checklist	Improve use of checklist in facilities w/o onsite ICP	Continue use of checklist	
		# of times alert levels exceeded	Review alert levels	Review alert levels	
			Remain under alert levels	Remain under alert levels	
Hand Hygiene	PHHWG, PICNet, Quality, Executive Medical Directors, Site/Unit Managers, HH Committee, HCPs, Educators, Maintenance, Medicine & Quality, Physicians	Quarterly observation quotas met for acute & residential	Continue auditing for acute & residential	Continue auditing for acute & residential	**100% HH compliance rate for all HCPs**
		# of new promotions introduced	Ongoing new promotions	Ongoing new promotions	
		# of HCPs educated	Provide annual HH education session (eg. skills fair)	Healthcare Providers receive consistent messaging & education	
		# of education sessions			
		2 education modules	Develop and implement education modules		
		100% completion of infrastructure audits	Complete infrastructure audits	Infrastructure audits required every 3 years	
		# of documented iLearn education sessions	Request quarterly completion (%) of iLearn sessions (post with quarterly HH rates)	All IH staff complete iLearn each year	
			Promote HH iLearn module		
		Completion of iLearn module for physicians	Collaborate with Medicine & Quality to complete physician iLearn	Ongoing review and revision of physician iLearn	
		Quarterly HH compliance rates	Consistent 80% compliance rate for all acute facilities	Consistent 85% compliance rate for all acute facilities	
		# of feedback tools completed	Completion of feedback tool under 69% (including iLearn module)	Continue completion of feedback under 69% (including iLearn module)	
		Quarterly reporting to PICNet, Public & HCPs	Continue quarterly reporting to PICNet, Public & HCPs	Continue quarterly reporting to PICNet, Public & HCPs	
Community Programs	CIHS Team, P3 Residential, CD Unit, IH Clinics, Contracted Services (Housekeeping), Provincial WH&S Call Centre, HCPs	Working group created	Create a working group and deliverables	Implement a Program based on the results of the Working Group	**Incorporate Community Programs into IPAC Program**
		Completed needs assessment	Based on the info provided by ICPs develop needs assessment		
		R&R defined	Create roles and responsibilities of IPAC in the Community setting following the clarification by the CD Unit and using information from needs assessment		
		Implementation plan developed	Develop an implementation plan		
IPAC Program Evaluation	IMPACT, SET, Performance & Evaluation, HCPs, Healthcare Programs/ Networks	Completed evaluation of Healthcare Provider perception survey	Develop and implement perception and needs survey	Develop action plan and implement based on survey results	**Improve patient/ resident/ client outcomes**
			Evaluate survey results		
		Implementation of revised indicators and process	Implement revised surveillance indicators and reporting process	Evaluate the need for additional resources based on review results	
		Reviewed ICP roles and responsibilities	Based on: perception survey, surveillance indicators and reporting process, the responsibilities of the ICPs will be reviewed and may be revised		
Education	ICPs, HCPs	# of materials revised	Revise all education materials (standardize across IH)	Reassess annually	**All HCPs receive standardized IPAC educational information**
		# of materials updated	Update education materials on Team Site and IPAC InsideNet		
		iLearn module completed	Develop routine practices iLearn module to be completed by HCWs on an annual basis	Implementation of iLearn module	
		Methods investigated	Investigate other methods of providing IPAC education (eg. videos)		

APPENDICES

APPENDIX A: STRATEGIC PLAN FISCAL YEAR 2015

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	Assist with infrastructure audits	
		# of completed infrastructure audits	Assist with infrastructure audits	Targeted Healthcare Providers to complete iLearn module (Manager responsibility)	
		# of documented iLearn education sessions	Complete HH iLearn module 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	Tabulate and evaluate Evaluate results and define the scope of IPAC community services	**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)		
		Completed needs assessment	Clarify the roles and responsibilities of CD Unit		
			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	

APPENDIX B: HEALTHCARE ASSOCIATED INFECTION CASE DEFINITIONS

ACUTE

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 or 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 include 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

Before September 13, 2013:

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

RESIDENTIAL

Catheter Associated Urinary Tract Infection

Must have ONE of the following:

- Fever, rigors OR new onset hypotension with NO alternate site of infection
- Acute change in mental status OR acute functional decline, with NO alternate diagnosis AND Leukocytosis (WBC above 14,000)
- New onset suprapubic pain or costovertebral angle pain or tenderness

- Purulent discharge from around the catheter or acute pain, swelling or tenderness of the testes, epididymis, or prostate

AND

Urine Culture >10^6 CFU/L of any organism(s) - specimen obtained after catheter replaced if in > 14 days

OR

Positive Blood and Urine culture with the same organism without an alternate source

Note:

- RESIDENTIAL POPULATION ONLY
- Rate calculated per 10,000 resident days as device day data not yet available
- SHEA / CDC Position Paper "Surveillance Definition of Infections in Long Term Care Facilities: Revisiting the McGeer Criteria", October 2012

CDI

Case Definition:

Presence of diarrhea or toxic megacolon without other known etiology AND lab confirmation of C.diff 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 occurring ≤ 72 hours after admission to your facility AND patient admitted to another healthcare facility (including acute or LTC) 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 LTC) 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 resident days
- CDI case identified less than 2 weeks after previous episode is considered to be a continuation of previous CDI case
- RESIDENTIAL POPULATION ONLY
- Reported complications of CDI occurring within 30 days include ICU admission due to CDI or complication, toxic megacolon, total or partial colectomy
- Case definitions changed as required for PICNet reporting as of Sept 13 2013

Lower Respiratory Infection

Must have TWO of the following:

new or increased cough,

new or increased sputum production,

Oxygen saturation < 94% or <3% from baseline

abnormal lung exam new or changed,

pleuritic chest pain,

respiratory rate > 25 breaths/min

AND

One Constitutional Criterion

Pneumonia Case Definition:

Must have ONE of the following:

new or increased cough,

new or increased sputum production,

Oxygen saturation < 94% or <3% from baseline

abnormal lung exam new or changed,

pleuritic chest pain,

respiratory rate > 25 breaths/min

AND

One Constitutional Criterion

AND

Chest x-ray indicates pneumonia

Constitutional Criteria include:

- Fever: > 37.8 once OR repeated temperatures > 37.2 or rectal temperatures > 37.5 OR single temperature > 1.1 over baseline from any site (oral, tympanic, axillary)
- Leukocytosis (new) >14,000 WBC OR left shift (>6% bands or >15000 bands/mm3)
- Confusion Assessment Method: acute change in mental status from baseline, fluctuating course, inattention AND either disorganized thought or altered level of consciousness
- Acute functional decline must have a decline in 3 of the following Activities of Daily Living (ADLs): bed mobility, transfers, locomotion, dressing, eating, toileting, personal hygiene
- Other conditions that could account for symptoms (ie: CHF and COPD) are ruled out

Note:

- RESIDENTIAL POPULATION ONLY
- Rate calculated per 10,000 resident days as device day data not yet available
- SHEA / CDC Position Paper "Surveillance Definition of Infections in Long Term Care Facilities: Revisiting the McGeer Criteria", October 2012

Skin Soft Tissue Infection

includes cellulitis, wound, or decubitus ulcer infections

Must have ONE of the following:

- Pus present at a wound, skin or soft tissue site

OR

- New or increasing presence of at least FOUR of the following site S&S: heat, redness, swelling, tenderness or pain, serous drainage, one constitutional criterion – fever, leukocytosis, confusion or functional decline

Constitutional Criteria include:

- Fever: > 37.8 once OR repeated temperatures > 37.2 or rectal temperatures > 37.5 OR single temperature > 1.1 over baseline from any site (oral, tympanic, axillary)
- Leukocytosis (new) >14,000 WBC OR left shift (>6% bands or >15000 bands/mm3)
- Confusion Assessment Method: acute change in mental status from baseline, fluctuating course, inattention AND either disorganized thought or altered level of consciousness
- Acute functional decline must have a decline in 3 of the following Activities of Daily Living (ADLs): bed mobility, transfers, locomotion, dressing, eating, toileting, personal hygiene

Note:

- RESIDENTIAL POPULATION ONLY
- Rate calculated per 10,000 resident days
- SHEA / CDC Position Paper "Surveillance Definition of Infections in Long Term Care Facilities: Revisiting the McGeer Criteria", October 2012

APPENDIX C: 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 D: HAND HYGIENE COMPLIANCE RATE BY DISCIPLINE

Facility type (see appendix C)	Facility	HCP	FY 2012	FY 2013	FY 2014	FY 2015	Change from 2014✧
All	IH	Clinical Support Staff	50%	58%	64%	66%	
		Nursing Staff	62%	73%	78%	78%	
		Other	56%	65%	72%	71%	
		Physicians	44%	57%	64%	64%	
Tertiary Hospital	KGH	Clinical Support Staff	52%	55%	66%	62%	
		Nursing Staff	62%	74%	79%	77%	
		Other	51%	66%	66%	72%	
		Physicians	53%	66%	61%	66%	
	RIH	Clinical Support Staff	35%	60%	59%	57%	
		Nursing Staff	49%	70%	79%	75%	
		Other	36%	63%	70%	50%	
		Physicians	19%	57%	65%	66%	
Service Area Hospital	EKH	Clinical Support Staff	29%	54%	64%	54%	
		Nursing Staff	40%	70%	72%	75%	
		Other	27%	62%	51%	59%	
		Physicians	18%	43%	56%	58%	
	KBH	Clinical Support Staff	60%	73%	66%	77%	
		Nursing Staff	71%	75%	82%	83%	
		Other	N/A	N/A	N/A	86%	
		Physicians	40%	51%	69%	65%	
	PRH	Clinical Support Staff	61%	60%	49%	80%	
		Nursing Staff	72%	77%	76%	86%	
		Other	60%	N/A	N/A	91%	
		Physicians	54%	62%	50%	60%	
	VJH	Clinical Support Staff	55%	52%	67%	66%	
		Nursing Staff	66%	69%	74%	75%	
		Other	N/A	69%	69%	71%	
		Physicians	43%	48%	57%	61%	
Community Level Hospital	CMH	Clinical Support Staff	61%	N/A	N/A	N/A	
		Nursing Staff	64%	73%	77%	79%	
		Other	N/A	N/A	N/A	N/A	
		Physicians	70%	83%	83%	81%	
	KLH	Clinical Support Staff	69%	N/A	N/A	N/A	
		Nursing Staff	71%	77%	86%	88%	
		Other	N/A	N/A	N/A	N/A	
		Physicians	47%	N/A	N/A	N/A	
	SLH	Clinical Support Staff	61%	67%	N/A	86%	
		Nursing Staff	72%	77%	77%	82%	
		Other	65%	N/A	N/A	N/A	
		Physicians	54%	48%	52%	N/A	
	Other*	Clinical Support Staff	50%	56%	61%	67%	
		Nursing Staff	68%	75%	77%	78%	

	Other	56%	52%	80%	78%	
	Physicians	44%	51%	70%	68%	

N/A indicates less than 50 observations

APPENDIX E: HEALTHCARE 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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