



Interior Health
Every person matters

Infection Prevention & Control 2016 Fiscal Year Annual Report

June 22, 2016

EXECUTIVE SUMMARY

The Infection Prevention and Control (IPAC) program's 2016 fiscal year (FY) Annual Report, highlights the achievements and continued challenges facing infection prevention and control practices in Interior Health (IH). This report summarizes the progress of programs, the annual infection rates, and outlines the future strategic plans for the coming years.

Highlights in program development during FY 2016 include:

- Successfully participating in the 2015 Accreditation Canada survey of IH
- Surpassing the 80% performance target for hand hygiene compliance across IH
- Substantially increasing the hand hygiene audit data collection capacity
- Improving *Clostridium difficile* infection (CDI) control at some IH facilities
- Reducing healthcare-associated methicillin-resistant *Staphylococcus aureus* (MRSA) incidence well below the IH benchmark
- Successfully controlling MRSA transmission during a cluster of cases associated with an acute care unit
- Decreasing surgical site infection (SSI) rates in clean and clean-contaminated surgeries over the past five years
- Implementing a time-efficient prevalence surveillance system of healthcare-associated infections (HAIs) in residential care facilities

Strategic plans for the upcoming years (FY 2017 through FY 2019), with their objectives, include:

- CDI
 - To reverse the increase in healthcare-associated CDI that occurred in FY 2016
- Community programs
 - To provide IPAC education and consultation to healthcare providers (HCP) in the community
- Hand hygiene
 - To improve hand hygiene compliance in all areas and focus on those with low rates
- HAI surveillance
 - To improve the process of surveillance to identify and address gaps in infection control practices
- Education/Accreditation
 - To improve knowledge transfer to HCPs
 - To ensure the program is prepared for the 2019 Accreditation Canada survey

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

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INTRODUCTION

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

The Infection Measurement Prevention and Control Team (IMPACT) reports to the Health Authority Medical Advisory Committee (HAMAC) and through the Senior Executive Team (SET) 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 or by written report. The Vice President, Medicine/Quality reports to the SET 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.

MEMBERS OF TEAM AND FACILITIES

Vice President, Medicine/ Quality

Dr. Jeremy Etherington
Dr. Alan Stewart (interim)

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 (Oct. 2015)
Jason Wiens (Jan. 2016)

Project Lead, IPAC

Joy Pyett

Co-op Student, IPAC

Jasmin Chatrath
Eric Ho
Mandy Yeung

Infection Control Practitioners:

Missy Blackburn
Debbie Cosgrove-Swan
Kelly Dillon
Sandie McKechnie
Krystal Fergus
Nancy Gawletz (Nov. 2015)
Wendy Herrington

Marion Kabatoff (Jan. 2016)
Eileen Lavoie
Lynden Lehman
Maureen McLean-Young
Lorena McLure
Andrea Neil
Evelyn Nicol

Suzanne Hyderman
Coleen Reiswig
Lisa Schwartz
Karen Stoopnikoff
Joanne Tench

Acute Care Hospitals:

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 and District
Invermere and District
Lillooet
Nicola Valley

Princeton General
Queen Victoria
South Okanagan General

Residential/Long Term Care Facilities:

Bastion Place
Brookhaven Care Centre
Columbia House
Columbia View Lodge
Cottonwoods Care Centre
David Lloyd Jones Home
Deni House
Dr. Andrew Pavilion
Dr. F. W. Green Memorial Home
Fischer Place/Mill Site Lodge
Forest View Place
Gateby Care Centre
Gillis House
Hardy View Lodge

Henry M. Durand Manor
Jackson House
Kimberley Special Care Home
McKinney Place Extended Care
Minto House
Mountain View Lodge
Mt. Cartier Court Cottages
Nelson Jubilee Manor
Noric House
Orchard Haven
Overlander Residential Care
Parkview Place
Pleasant Valley Manor
Polson Special Care Unit

Ponderosa Lodge
Poplar Ridge Pavilion
Ridgewood Lodge
Slocan Community Health Centre
Spintlum Lodge
Sunnybank Retirement Centre
Swan Valley Lodge
Talarico Place
Three Links Manor
Trinity Care Centre
Victorian Community of Kaslo
Extended Care
West View Place

GLOSSARY OF ACRONYMS AND TERMS

ABHR	Alcohol-based hand rub
Acute Care Facility	Care facilities in which patients are treated for brief but severe episodes of illness, for traumas and injuries, or recovery from surgery.
Alert level	A pre-determined facility-specific threshold [(i.e.) number of infections] within a specified time period that identifies a high transmission potential and triggers actions to be taken
ALH	Arrow Lakes Hospital
ARO	Antibiotic Resistant Organism
BDH	Boundary District Hospital
Benchmark	A point of reference for judging value, quality, change, or standard to which others can be compared
CA	Community Associated
CAUTI	Catheter-associated urinary-tract infection
CDI Unit	Communicable Disease Unit
CDI	<i>Clostridium difficile</i> Infection
CIC	Certified in Infection Control
CLABSI	Central Line Associated Bloodstream Infection
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
GI	Gastrointestinal Illness
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
i-Learn	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
MRSA	Methicillin-resistant <i>Staphylococcus aureus</i>
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
RI	Respiratory Illness
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

FISCAL YEAR 2016 STRATEGIC PLAN ACCOMPLISHMENTS

Five main strategies were identified for the fiscal year (FY) 2016 with plans extending to the FY 2018 ([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 FY 2016. IPAC collaborated with stakeholders to improve the management of CDI across departments and facilities.

The *Best Practice Checklist for Management of CDI* continues to be used by ICPs to help identify gaps in best practice for all admitted patients and residents with known or suspect CDI. Education action plans developed by ICPs target units/facilities with CDI rates over benchmark.

Refer to [Actions Implemented](#) for more information on CDI in acute facilities.

HAND HYGIENE

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

- The number of co-op students performing HH audits increased from one to two
- A new patient and visitor HH pamphlet was developed and published
- In preparation for yearly credentialing of physicians, a mandatory HH module was developed
- Two patient representatives were added to the interdisciplinary HH working group

Refer to HH Program section [Accomplishments/Priorities Met](#), for more information.

COMMUNITY PROGRAMS

The IPAC team met to discuss the role of the ICP in the community setting. The following priority areas were identified:

- Education
- Consultation
- IPAC practice assessments in wound care clinics and diagnostic and treatment centres

IPAC PROGRAM EVALUATION

The ICPs roles and responsibilities were redefined across the continuum of care. This improved IPAC coverage in acute and residential care. The development of a healthcare provider perception survey began. This will be used to determine the IPAC needs of our customers.

To improve IPAC surveillance, various initiatives were launched in FY 2016. The objectives of these initiatives were to improve efficiency in data collection and to increase the relevancy of the reports generated from the surveillance program. Refer to Surveillance section [Accomplishments/Priorities Met](#), for more information.

EDUCATION

Training modules based on the IPAC Manual were updated to support IPAC practice changes. Refer to Education section [Accomplishments/Priorities Met](#), for more information.

PROGRAMS AND INITIATIVES

ACCREDITATION CANADA

Accreditation Canada, *Better Quality, Better Health*: “Accreditation is an ongoing process of assessing your organization against standards to identify what you do well, where you can make improvements, and how to make them happen.”¹

During the 2015 Accreditation Canada IH survey, the following strengths of the IPAC program were noted in the Accreditation Report:

- “Management and staff members report that they receive timely and excellent support from the infection control service, and this feedback was consistent at all the sites visited during this survey.”²
- Collaborative working relationships
- Well-developed hand hygiene program
- Improving hand hygiene compliance and overall infection rates
- Well-developed education program

Three unmet high-priority criteria within the Infection Prevention and Control Standards were noted (listed below); responses were provided and actions taken where applicable.

- The organization’s staff, service providers, and volunteers have access to dedicated hand-washing sinks
- The organization has a quality improvement plan for the IPAC program
- The organization seeks input from staff, service providers, volunteers, clients, and families on components of the IPAC program

EDUCATION

An integral part of the IPAC program is the ongoing education, training, and support by ICPs to all HCPs, volunteers, and nursing and medical students within IH.

ACCOMPLISHMENTS/PRIORITIES MET

HCPs were educated on various IPAC topics (Table 1). Education highpoints within the IPAC program included:

- Developed Emerging Pathogens Training Plan which included:
 - i-Learn module for Emerging Pathogens
 - Instructional videos for donning and doffing PPE

¹ Accreditation Canada. (2013). *Become a Client*. Retrieved April 26, 2016, from Accreditation Canada: <https://accreditation.ca/become-client>

² Accreditation Canada. (2016, March 1). *Accreditation Survey Report*. Retrieved April 2016, from Interior Health: <https://www.interiorhealth.ca/AboutUs/QualityCare/Documents/AccreditationSurveyReport2015.pdf>

- Respiratory illness (RI) and gastrointestinal illness (GI) outbreak toolkits developed in collaboration with the CD Unit and made available to internal and external partners
- IPAC Manual:
 - Revisions completed
 - New guideline for Carbapenemase Producing Organism (CPO) developed
- CPO educational toolkit for HCPs developed
- Developed ICP orientation checklists for roles and responsibilities for acute facilities and residential facilities to facilitate cross continuum coverage for all ICPs
- Four issues of *Infection Reflections* released (a quarterly publication that shares information and updates on the latest IPAC issues)
- Two ICPs recertified their Certification in Infection Control (CIC)
- IPAC members attended two two-day education meetings in Kelowna
- ICPs attended a three day meeting which included:
 - Canadian Standards Association (CSA) Fundamentals of Infection Control During Construction and Renovation or Maintenance of Health Care Facilities
 - Practical Applications in Infection Control During Construction, Renovations or Maintenance of Health Care Facilities
 - Personal Protective Equipment training for emerging pathogens
- IPAC Manager and two ICPs attended the IPAC Canada National Conference
- IPAC Corporate Director and three ICPs attended the PICNet Annual Education Conference
- Ongoing educational sessions attended by ICPs:
 - Webber Training
 - Grand Rounds
 - Public Health Rounds

Table 1: Count of Education Provided by IPAC

Education topics	Number of HCPs educated
Hand Hygiene	5,319
CDI*	706
Routine Practices/Additional Precautions/PPE*	2,051
Outbreaks* (GI and/or RI)	977
Tuberculosis	107
Ebola	149
Miscellaneous* (including: orientation, updates to manual/ guidelines, skill fairs, risk assessments, and AROs)	2,770
Hand Hygiene for Healthcare Workers, IH i-Learn course	2,256
Hand Hygiene for Medical Staff, IH i-Learn course	152
Emerging Pathogens, IH i-Learn course	104
Emerging Pathogens, Initial Training, IH i-Learn course	65

*These topics include additional HH components

GOING FORWARD

IPAC educational materials are evaluated and revised annually. These materials are readily available to ICPs and HCPs online (IH intranet) and are standardized across the health authority.

The development of additional IPAC i-Learn modules, such as *Routine Practices*, *Point of Care Risk Assessment*, and *Personal Protective Equipment (PPE)* will be finalized within the next fiscal year. It is intended that these modules will be completed by HCPs on an annual basis.

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.

ACCOMPLISHMENTS/PRIORITIES MET

The fourth quarter HH overall compliance rates increased to 81% in acute care facilities, which is above the provincial performance target of 80%. Refer to [Results](#) for more information on all HH audit results.

As a result of the HH program evaluation survey, it was identified that staff were not aware that ABHR was the preferred method of hand hygiene. Hence, the education module 'Save Lives...Save Time...Sanitize' was implemented throughout the health authority facilities in April 2015.

The IH Hand Care Program was released in the spring of 2015. This program was developed to provide IH employees with the tools they need to maintain healthy hands while ensuring proper hand hygiene techniques. This was a partnership between Workplace Health and Safety and IPAC.

August 2015 marked the end date for the program's first co-op student and the start date of the next two HH auditor co-op students (both eight month terms). With the hiring of two students, IPAC was able to substantially increase the total number of observations completed quarterly across the health authority. The students developed an orientation package for future co-op students.

The *Best Practices for Hand Hygiene Facilities & Infrastructure in Healthcare Settings: Facilities & Infrastructure Checklist* was completed in all IH acute and residential facilities by September 2015.

In January 2016 public posting of residential HH audit results commenced at each of the 39 IH residential facilities. The rate was compiled as an IH overall rate.

All new hires are required to complete the i-Learn HH module during the IH Regional Orientation. All physicians will be required to complete the online HH module yearly as part of the application for credentialing in IH.

The *Hand Hygiene Audit Feedback Tool for Unit Leaders* must now be completed when the compliance rate for a unit for a quarter is below 69%. In conjunction with the tool, a 'Close the Loop' process has been developed to aid ICPs to ensure the feedback tool is completed and interventions implemented in a timely fashion.

The Interior Health Hand Hygiene Working Group (IHWWG) met quarterly to discuss and make recommendations on various HH topics. Two patient representatives have become valuable members of the working group. This multidisciplinary group developed an education module titled 'Patients and Hand Hygiene' and revised the Patient and Visitor Hand Hygiene pamphlet.

The Provincial Hand Hygiene Working Group's Risk Assessment Scoring Tool was trialed by ICPs at several sites. The tool was developed to aid the selection of highest priority clinical services for hand hygiene auditing. Feedback was provided to the provincial group regarding its usefulness.

GOING FORWARD

Actions will be directed at continual improvement of HH compliance rates.

The infrastructure audit outcomes will be evaluated and recommendations will be made to the senior leadership team.

The current education module 'Patients and Hand Hygiene' will be promoted by the ICPs for the six months following its release in April 2016.

RESULTS

There was a 3% increase in HH compliance this year. The FY 2016 HH compliance for IH was 78% (95% confidence interval {CI}, 77% - 78%), which represented a significant increase compared to FY 2015 ($p < 0.01$, Figure 1). This increase was primarily driven by a strong increase at Royal Inland Hospital, which was the only facility with a significant improvement in HH (Figure 1). In addition, there were increases in data collection, with more than twice as many HH observations performed in the current year (27,601) compared to the past year (12,397).

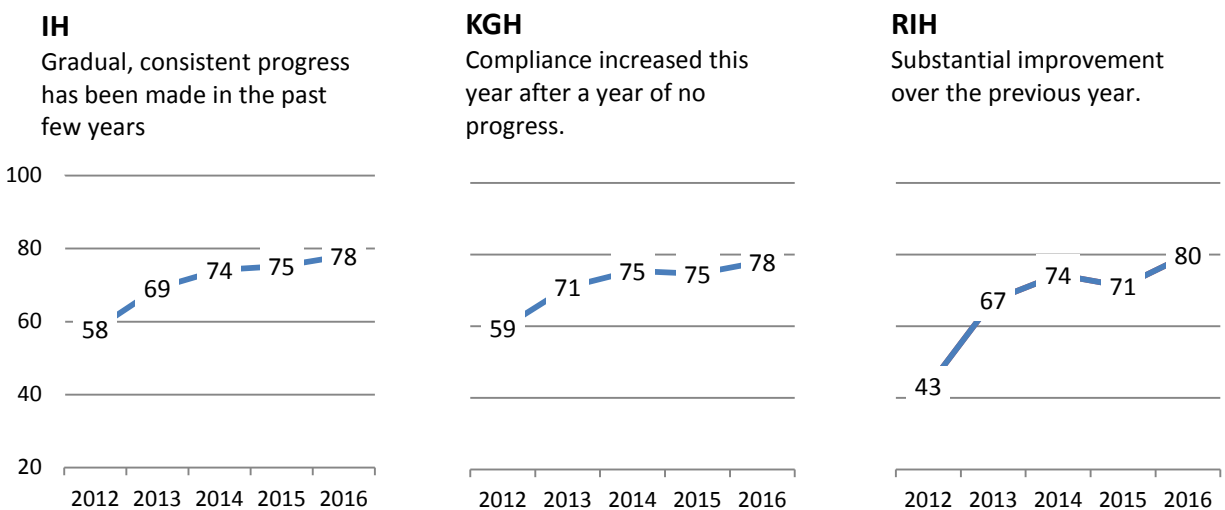
Nursing staff make up the vast majority of HH observations in acute care (72% of all observations). This may explain the relative lack of fluctuation in their HH compliance over time (Figure 2). Their performance has been strong, but has plateaued for several years. In contrast, other healthcare worker groups continued a general upward trend.

In Quarter 4 the compliance for IH exceeded 80% (Figure 3). Quarter 1 of this year was the only quarter in which compliance among observations before patient contact reached 80%. In contrast, compliance among after-contact observations has been consistently at or above 80% for the past few years.

The overall HH compliance in IH residential care facilities was the same as in acute care facilities, 78% (95% CI, 77% - 78%). There has been no substantial improvement over the past year (Figure 3).

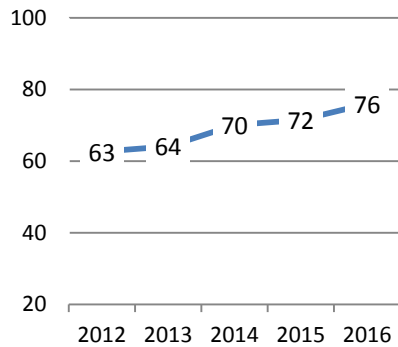
It is important not to compare groups due to individual differences in sample sizes (number of observations), patient care needs, and other characteristics that are unique to each group. It has been recognized that ‘being observed’ in practice, e.g. during auditing, can lead to falsely elevated compliance rates. To minimize this effect, audits are completed in twenty to thirty (20-30) minute intervals (acute care) with no greater than six (6) observations made of the same HCP within this period. In an effort to maintain consistency in audit practices, HH audits are currently only observed by ICPs and co-op students.

Figure 1: HH compliance rate (%) by fiscal year for IH and tertiary, service area, community, and smaller facilities. Order of graphs based on hospital size.

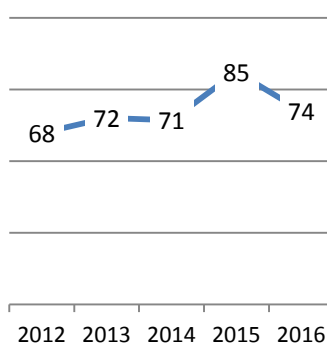


VJH

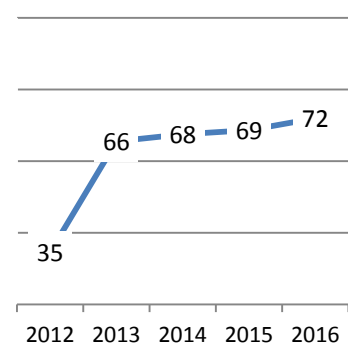
Steady improvement over the past 5 years.

**PRH**

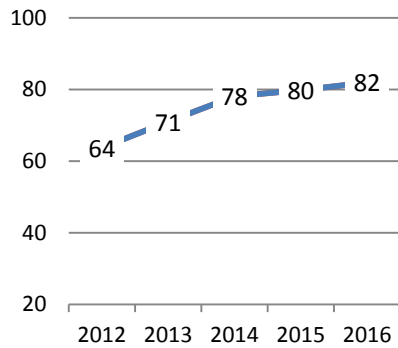
After great performance last year, compliance dropped significantly.

**EKH**

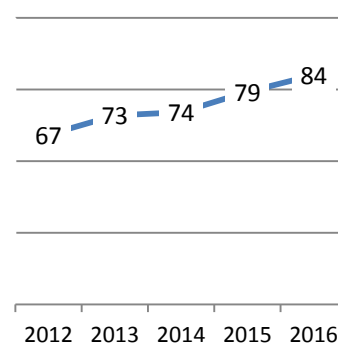
Slow and steady improvement continued this year.

**KBH**

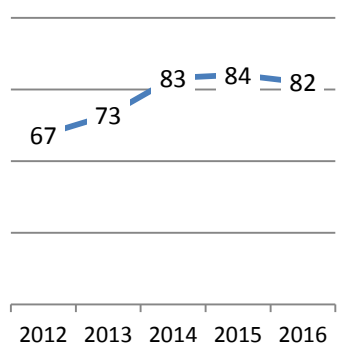
Gradual improvement in compliance.

**SLH**

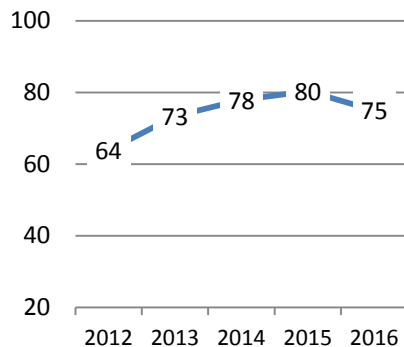
Very steady increase in compliance over time.

**KLH**

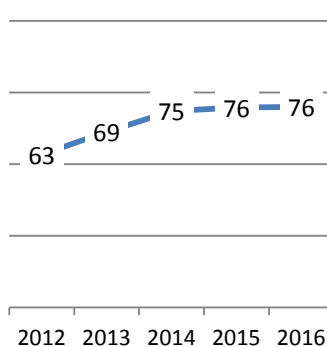
A history of strong compliance that appears to have leveled off.

**CMH**

After years of steady improvement, there was a drop in compliance.

**Smaller facilities***

Compliance has been level the past few years at around 75%.



* Includes 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.

Figure 2: HH compliance rates by fiscal year for IH by healthcare provider group, FY 2012 through FY 2016

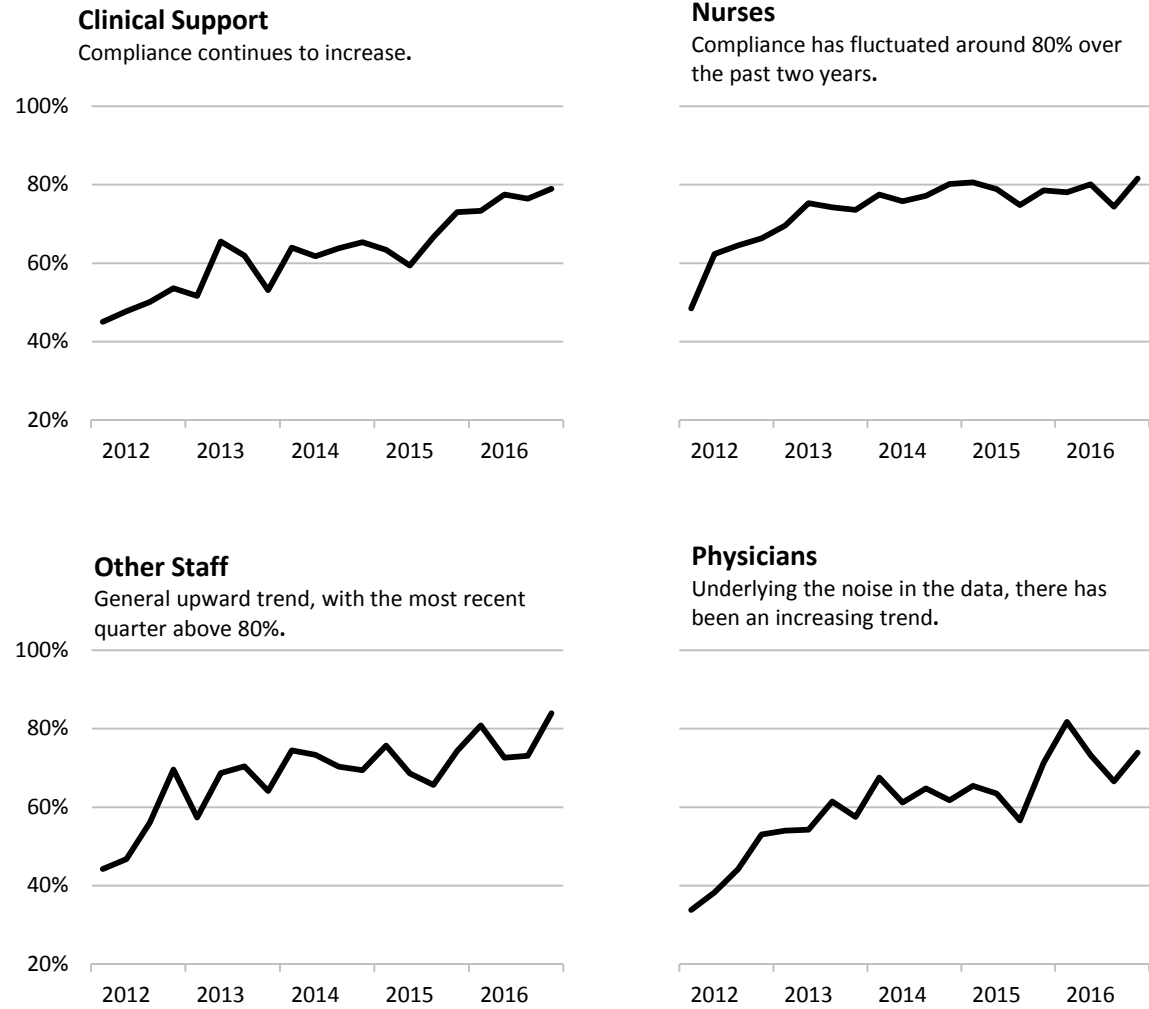
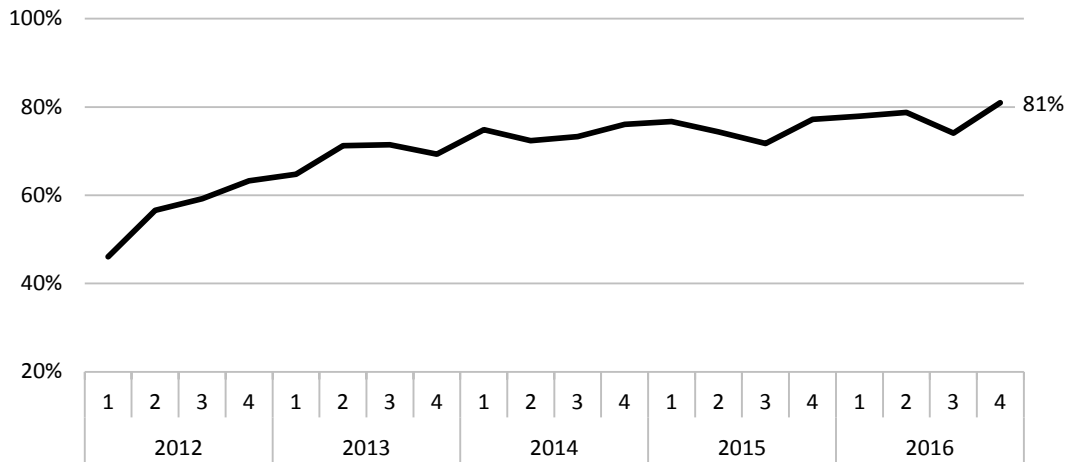
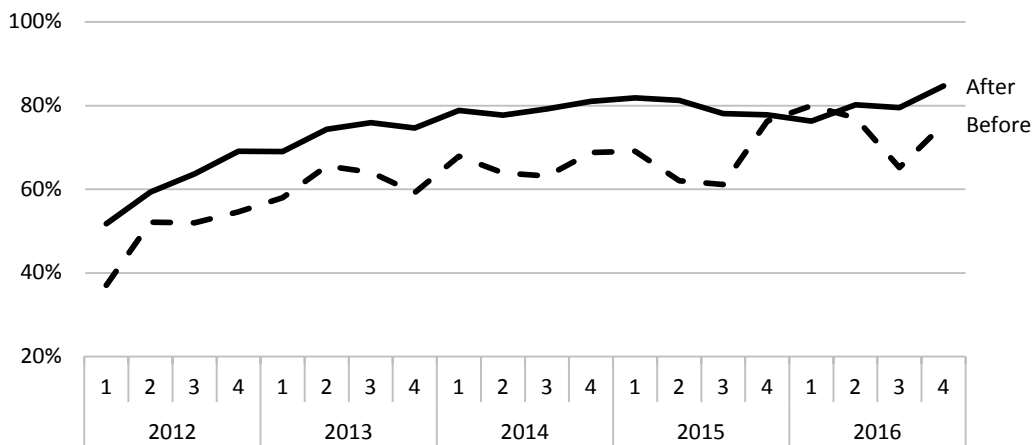


Figure 3: HH compliance rates for IH by fiscal quarter

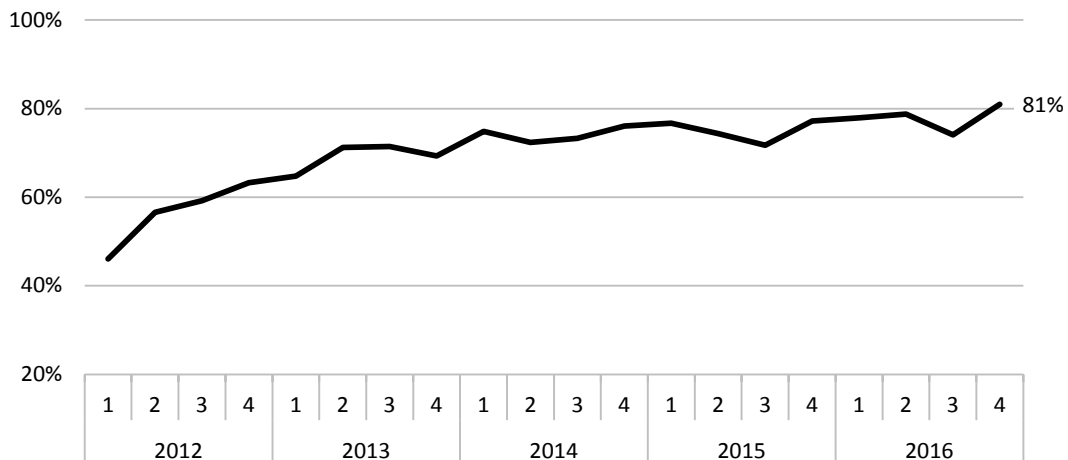
Improvement in IH hand hygiene compliance slowed over the past couple years, but exceeded 80% in the most recent quarter.



Hand hygiene compliance has typically been lower before patient contact than after patient contact.



Improvement in IH hand hygiene compliance slowed over the past couple years, but exceeded 80% in the most recent quarter.



LINK NURSE PROGRAM

The IPAC Link Nurse (LN) program continues at Royal Inland Hospital. 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

There were three education sessions for 22 LNs at Royal Inland Hospital. Comments provided by participants following each education session help direct development of educational modules for additional training sessions.

GOING FORWARD

The LN Program will continue at Royal Inland Hospital. Due to the lack of support, the LN Program will no longer continue at Kelowna General Hospital.

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 education to contractors and staff on IPAC related to construction. Over 235 new construction and renovation permits were issued by ICPs across IH during FY 2016. Of these issued permits, construction and renovation projects ranged in size, completion time, and health risk.

Some of the more significant projects included:

- Completion 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 new Intensive Care Unit at East Kootenay Regional Hospital

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.

GOING FORWARD

A complete revision of the IPAC Construction Guidelines, including the permit, is currently underway.

EBOLA VIRUS DISEASE (EVD) – EMERGING PATHOGENS

Since March 2014, West Africa has experienced the largest outbreak of Ebola in history, with multiple countries affected. While the probability of EVD in Interior Health remains low, preparedness to ensure HCPs can safely and effectively care for patients has remained an essential component of the IPAC program.

On March 29, 2016, the World Health Organization (WHO) terminated the Public Health Emergency International Concern (PHEIC) for the Ebola outbreak in West Africa. There have been no cases of EVD reported in Canada. The risk to Canadians remains very low.

ACCOMPLISHMENTS/PRIORITIES MET

In July 2015, the newly formed Emerging Pathogens and Pandemic Planning Committee (EPPPC) commenced. The EPPPC is responsible for all aspects of Ebola preparedness in IH and has representation on provincial Ebola preparedness committees. BC conducts surveillance of EVD cases and contacts. The Medical Health Officers are informed of all individuals returning to the IH region from EVD affected countries as these individuals are monitored for 21 days.

An EVD i-Learn education module was developed and implemented in September 2015 and is accessible by all HCPs. Appropriate fluid impermeable personal protective equipment (PPE) has been allocated to all designated facilities. Educational plans and resources have been developed to reflect the change from 'Ebola' to Emerging Pathogens Training. In January 2016, the Initial Emerging Pathogens Training commenced using the IH i-Learn platform, which provides reminders to HCPs of the annual training requirements and allows for ongoing tracking of participants.

GOING FORWARD

The ‘train the trainer’ strategy will be used for Emerging Pathogens Training with the ICPs being responsible for all trainer education, then the trainers being responsible for training the Emergency Department staff (including nurses, respiratory technologists, physicians, and housekeepers).

COMMUNICATION AND PROMOTION

IPAC publishes a quarterly *Infection Reflections* newsletter that is distributed to all staff. Promotional tools and informational resources are utilized to increase IPAC awareness among staff, patients, and visitors. The program participates in national IPAC awareness campaigns such as Infection Control Week and Stop! Clean Your Hands Day.

ACCOMPLISHMENTS/PRIORITIES MET

There were 16,126 visits to the IPAC InsideNet website and 3,748 visits to the IPAC HH website on the InsideNet. In addition, there were 1,337 visits to the Infection Control website and 382 visits to the IPAC Manual website on the external IH website. IPAC-related articles have been published in various IH newsletters and messaging has appeared on the banner on the InsideNet home page.

GOING FORWARD

As per the program’s Communication Plan, the IPAC team will continue to work closely with the Communications and Public Engagement Team. Refer to the IPAC Communication Plan in [Appendix B](#).

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.

An automated electronic surveillance system assists ICPs to identify potential HAI cases based on predetermined case definitions. Standardized reports are available to all staff and the public.

ACCOMPLISHMENTS/PRIORITIES MET

New HAI reporting processes were established this year. Facility-specific reports for the nine larger IH acute care facilities were developed and posted on the InsideNet and external IH-IPAC website. These reports provide facility-specific and IH HAI rates, as well as a summary of IPAC actions taken at the facilities.

To improve the time efficiency of HAI surveillance data collection in residential care facilities, a prevalence survey system was initiated. Two rounds of surveys were completed, September 2015 and March 2016, that captured data from 24 IH residential care facilities.

Based on the recent history of declining HAI rates in IH, the benchmarks for CDI and MRSA were reduced. The benchmark for CDI was lowered to 3.5/10,000 patient-days (from 6.0/10,000 patient-days) and the benchmark for MRSA was lowered to 4.0/10,000 patient-days (from 5.6/10,000 patient-days).

GOING FORWARD

A more effective system of unit-level surveillance will be implemented. Unit-specific CDI and MRSA HAI rates will be generated and posted for the larger sites (KGH, RIH, VJH, PRH, EKH, and KBH). A standard IPAC surveillance report will become a standing item on all Local Medical Advisory Committee agendas. In addition, SET and IH Board reporting will be revised.

ACUTE CARE FACILITIES

CLOSTRIDIUM DIFFICILE INFECTION

C. difficile is a Gram-positive spore-forming bacterial species. 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 hospitals³. *C. difficile* spores are resistant to common types of disinfectants and the use of sporicidal chemicals is required when cleaning the patient environment.

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. CDI case definition and population under surveillance are in alignment with PICNet protocol⁴ ([Appendix C](#)).

ACTIONS IMPLEMENTED

In an effort to decrease the spread of CDI, stakeholders are expected to treat each CDI case with strict adherence to the IH Strategic Plan for CDI. See [Zero Tolerance Program](#) strategies for more information. In addition, facility-specific alert levels, which trigger an investigation and preventative actions to reduce transmission, have been effective in preventing CDI outbreaks at IH facilities. In the past year facility-specific alert levels were exceeded once at each of the following facilities:

- Royal Inland Hospital, June 2015
- Creston Valley Hospital, November 2015
- Kootenay Lake Hospital, January 2016
- Penticton Regional Hospital, February 2016
- Shuswap Lake General Hospital, March 2016

³ 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.

⁴ PICNet Surveillance Protocol for *Clostridium difficile* Infection (CDI) in BC Acute Care Facilities, July 2013. Provincial Infection Control Network of British Columbia

Throughout the year, ICPs worked with their facilities on many interventions to reduce HA-CDI. The interventions addressed the following deficiencies:

- Cleaning of patient environment and nursing areas (additional actions at Kootenay Boundary Hospital)
- Commode cleaning (additional actions at East Kootenay Regional Hospital)
- Use of contact precautions based on point-of-care risk assessment
- Use of personal protective equipment
- Daily monitoring of all CDI cases (additional actions at Kootenay Lake Hospital)
- Antimicrobial stewardship

GOING FORWARD

Emphasis on CDI control will be increased. Based on positive changes at Royal Inland Hospital, effective interventions will be identified and considered for implementation at other facilities. In addition, the use of the CDI checklist will continue to be used to identify gaps in best practice and provide staff education. For more information see [Clostridium difficile Infection](#) in the Fiscal Year 2017 Strategic Plan section.

LIMITATIONS

Because CDI rates are not risk-adjusted to account for differences in risk factors for CDI, comparisons between facilities is not advised.

RESULTS

Table 2: Interior Health new healthcare associated CDI status, FY 2016

Incidence (95% confidence interval)	Five-year trend	FY 2016 benchmark	Status
5.0/10,000 patient-days (4.3/10,000 – 5.6/10,000 patient-days)	Decreasing	3.5/10,000 patient-days	Above benchmark

Current Year:

Cases:

Across IH there were 229 cases of new healthcare associated CDI (HA-CDI), 145 new cases of community-associated CDI, and 22 cases of relapse CDI. The proportion of community-associated CDI (CA-CDI, 36.6%) was very similar to the proportion last year (36.8%) and similar to the proportion reported across BC in FY 2015⁵. Across facilities, the proportion varies (Figure 4) with PRH having the lowest proportion (27%) and VJH having the highest (50%).

⁵ Annual Surveillance Report of Healthcare-Associated Infections in BC Acute Care Facilities, Fiscal Year 2014/15. Provincial Infection Control Network of British Columbia

Rates:

The incidence of new HA-CDI in IH for FY 2015 was 5.0/10,000 patient-days (95% confidence interval, 4.3/10,000 patient-days – 5.6/10,000 patient-days, Figure 5, [Appendix E](#)).

Compared to this rate, the HA-CDI incidence at Kootenay Boundary Hospital was significantly higher ($p < 0.05$) and the rate at Royal Inland Hospital was significantly lower ($p < 0.05$). It should be noted that comparisons presented here do not control for case mix of the patient population nor the CDI burden in those two 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 IPAC practices and/or antimicrobial prescribing practices.

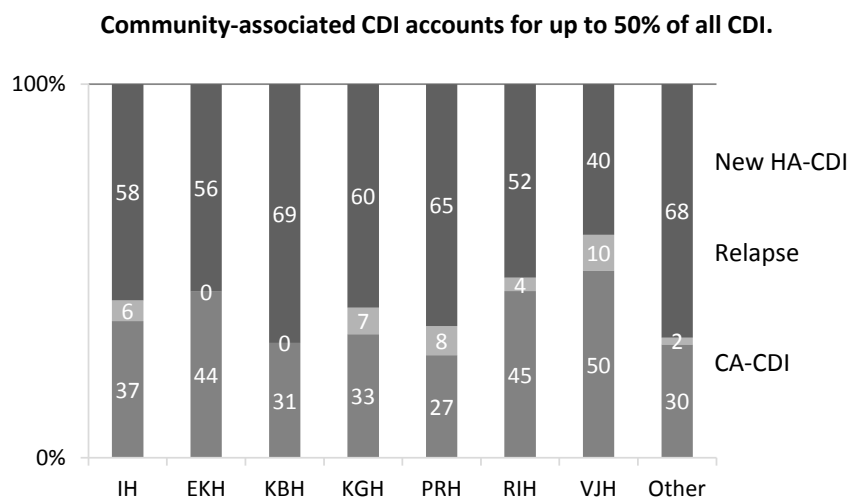
Comparison to 2015:

The incidence of new HA-CDI in IH did not change significantly this year compared to the past year (Figure 5, [Appendix E](#)). The only facility with a significant change was Penticton Regional Hospital, where the incidence increased by 3.4/10,000 patient-days ($p < 0.05$). Cariboo Memorial Hospital had a marginally significant drop from 13.6/10,000 patient-days to 4.6/10,000 patient-days ($p = 0.05$). The IH short-term trend in HA-CDI is similar to the most recent trend in BC⁶.

LongTerm Trend:

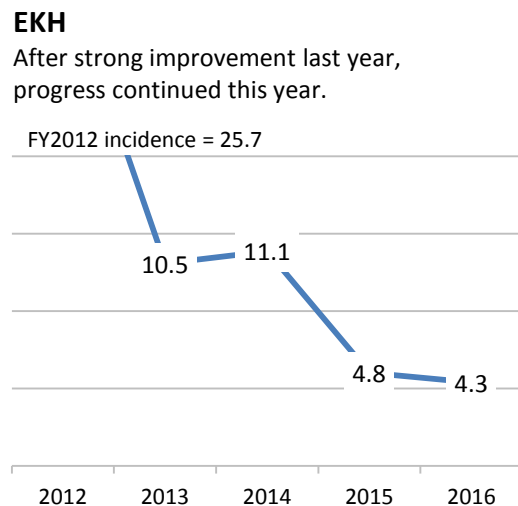
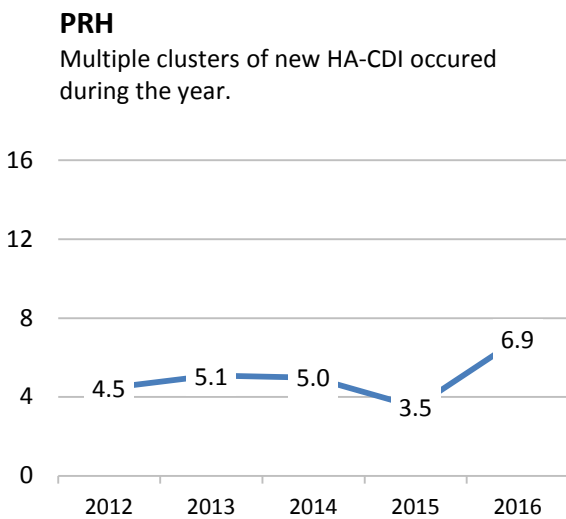
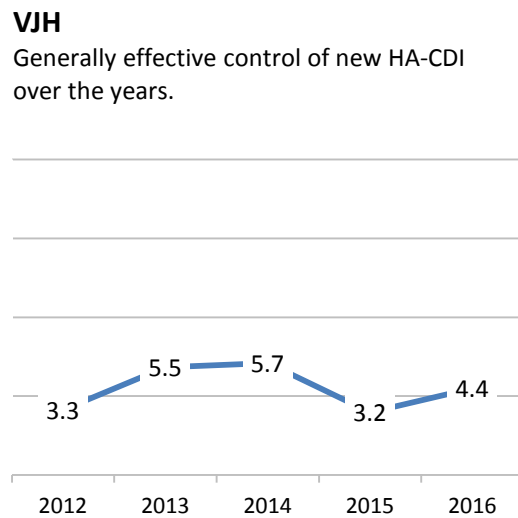
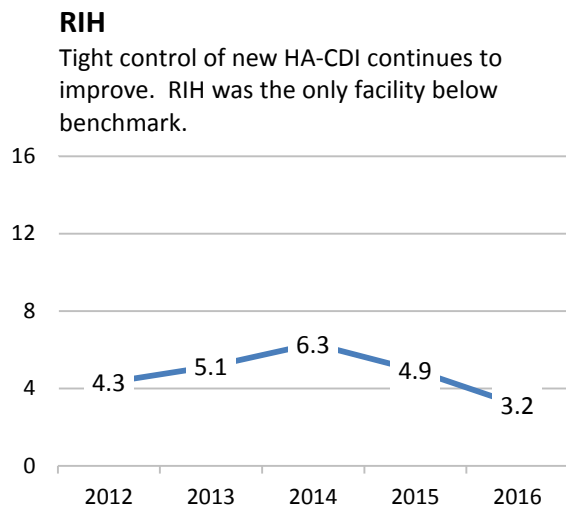
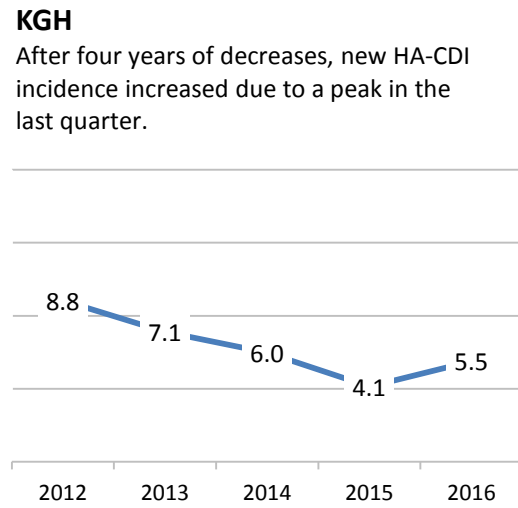
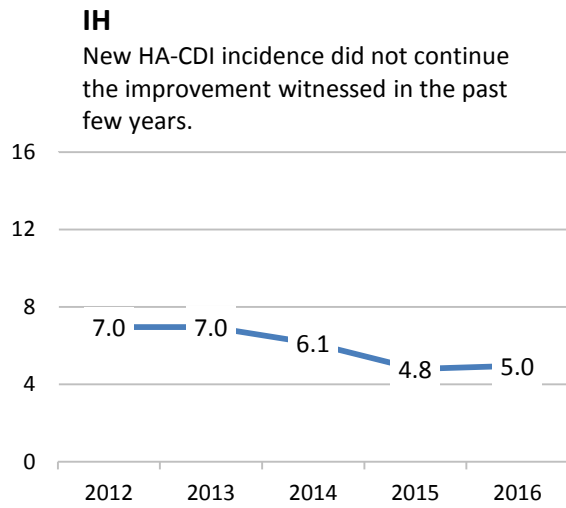
Over the past five years, there has been a statistically significant decrease in new HA-CDI rate in IH ($p < 0.01$; Figure 5). There have also been strongly significant decreasing trends at Kelowna General Hospital and East Kootenay Regional Hospital ($p < 0.001$).

Figure 4. Distribution of CDI across MRSA classification groups by facility, FY 2016



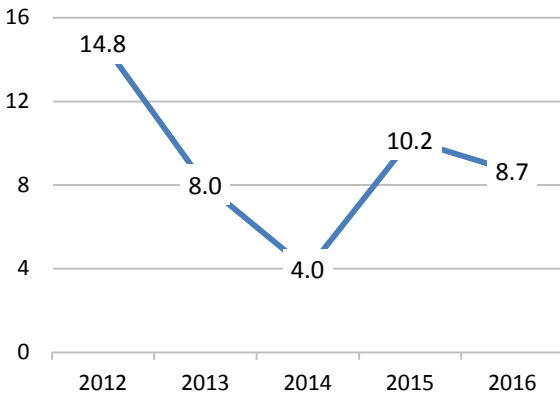
⁶ *Clostridium difficile* Infection Surveillance Report for the Fiscal Year 2014/2015. Provincial Infection Control Network of British Columbia

Figure 5. New HA-CDI incidence (1/10,000 patient-days) for IH and tertiary, service area, community, and smaller facilities, FY 2012 through FY 2016. Order of graphs based on hospital size.

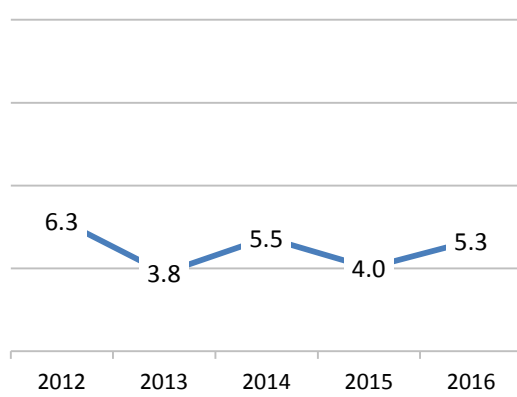


KBH

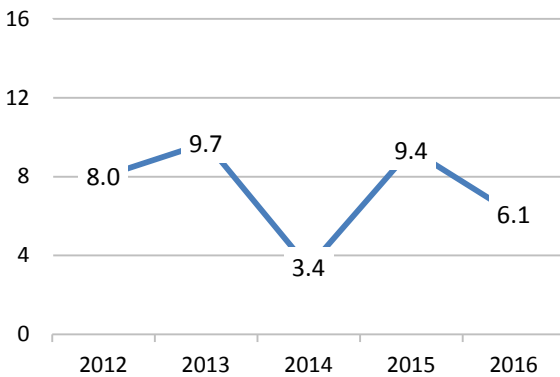
There was a decrease in new HA-CDI incidence this year.

**SLH**

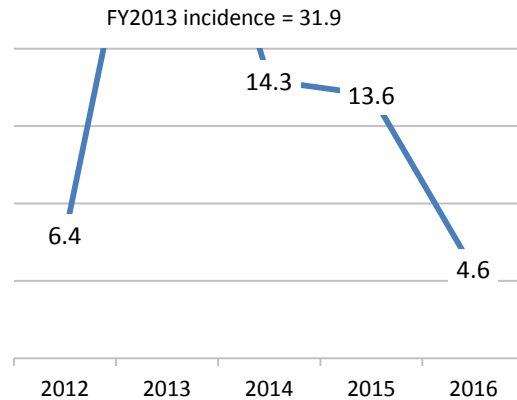
Generally consistent new HA-CDI rates over time, with a small increase this year.

**KLH**

HA-CDI rate fluctuated over the years, but some improvement occurred this year.

**CMH**

Very significant improvement in controlling new HA-CDI.



METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS*

MRSA are bacteria that are 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 by direct contact, or indirectly with items contaminated by the bacteria.

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 facilities⁷ ([Appendix C](#)). MRSA cases are classified as either colonization or infection, based on presence or absence of clinical evidence of infection. Cases are identified through the MRSA inpatient screening program or through clinical specimens.

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. ICPs worked with facility staff to improve practice on the units. Examples of specific actions that may have helped reduce HA-MRSA rates this year are listed below.

- Focussing on the cleaning and de-cluttering of isolation carts (additional efforts at Cariboo Memorial Hospital and East Kootenay Regional Hospital)
- Ensuring contact precautions were implemented for all MRSA patients (additional efforts at Kootenay Boundary Hospital, Penticton Regional Hospital, and Royal Inland Hospital)
- Increasing ICP presence and different education strategies implemented at Kelowna General Hospital during cluster investigation
- Conducting an audit of the completion of the ARO screening tool

LIMITATIONS

Compliance with MRSA screening practice may vary across acute care settings. This variability impacts the number of colonization cases captured and the overall MRSA rate.

RESULTS

Table 3: Interior Health HA-MRSA status, FY 2016

Incidence (95% confidence interval)	Five-year trend	FY 2016 benchmark	Status
3.1/10,000 patient-days (2.6/10,000 – 3.6/10,000 patient-days)	No trend	4.0/10,000 patient-days	Below benchmark

⁷ PICNet Surveillance Protocol for Methicillin-Resistant *Staphylococcus aureus* (MRSA) in BC Acute Care Facilities, July 2013. Provincial Infection Control Network of British Columbia

Current Year:

Cases:

In total, there were 219 cases of MRSA reported in acute care in IH during FY 2016. A large majority of these were healthcare-associated MRSA (HA-MRSA, Figure 6), with smaller contributions from pre-existing and community-associated MRSA (CA-MRSA). CA-MRSA appears to be a large component of all MRSA in Vernon Jubilee Hospital. In general, the majority of new HA-MRSA cases in IH were colonizations (Figure 7); however, in Kootenay Boundary Regional Hospital, infections are more common.

An investigation of a cluster of MRSA cases at Kelowna General Hospital revealed transmission of MRSA on one unit. Several successful strategies were implemented, including environmental de-cluttering and enhanced cleaning of the unit.

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 only facility with a HA-MRSA rate that was significantly different than the IH rate was 100 Mile House Hospital, where there were 10 cases in the year (rate given in [Appendix E](#), $p < 0.001$)

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).

Comparison to 2015:

This year's HA-MRSA rate (colonization and infection) in IH was significantly lower than the rate of FY 2015 (Figure 8, 4.2/10,000 patient-days, $p < 0.01$). The rates at Royal Inland Hospital, and East Kootenay Regional Hospital were also significantly lower than their rates of FY 2015 ($p < 0.05$). The rate of MRSA infections though, were not significantly different this year compared to last.

The IH short-term trend differed from the recent trend across BC, where the new HA-MRSA incidence has increased over the past two fiscal years⁸.

Long Term Trend:

Across IH, there was no statistically significant trend in HA-MRSA rates (Figure 8). There has however been a decreasing trend over the past five years at Royal Inland Hospital ($p < 0.01$) and increasing trends at Vernon Jubilee Hospital and Penticton Regional Hospital ($p < 0.05$).

⁸ Provincial Infection Control Network. Methicillin-resistant *Staphylococcus aureus* (MRSA) Surveillance Report for Fiscal Year 2014/2015. 2015,

Figure 6: Distribution of MRSA across classification groups by facility, FY 2016

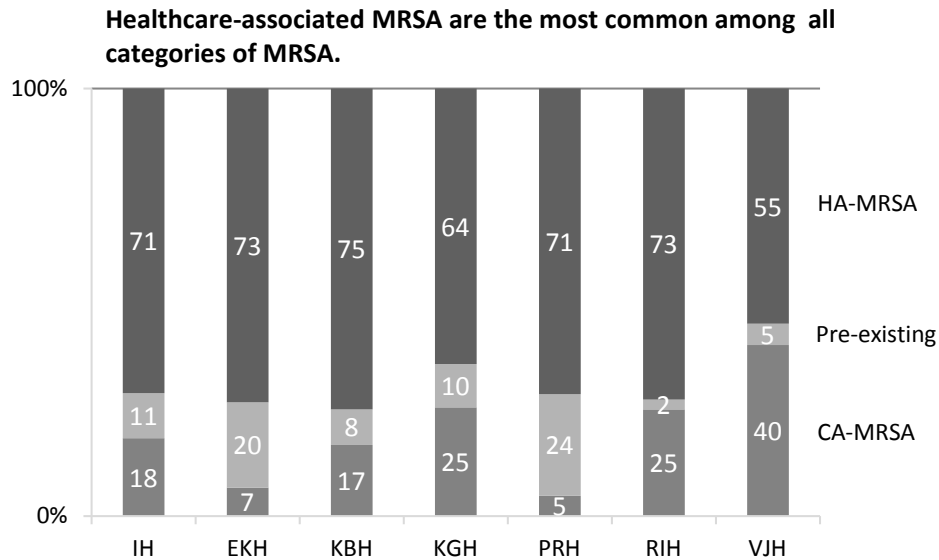


Figure 7: Distribution of new healthcare-associated MRSA between colonization and infection by facility, FY 2016

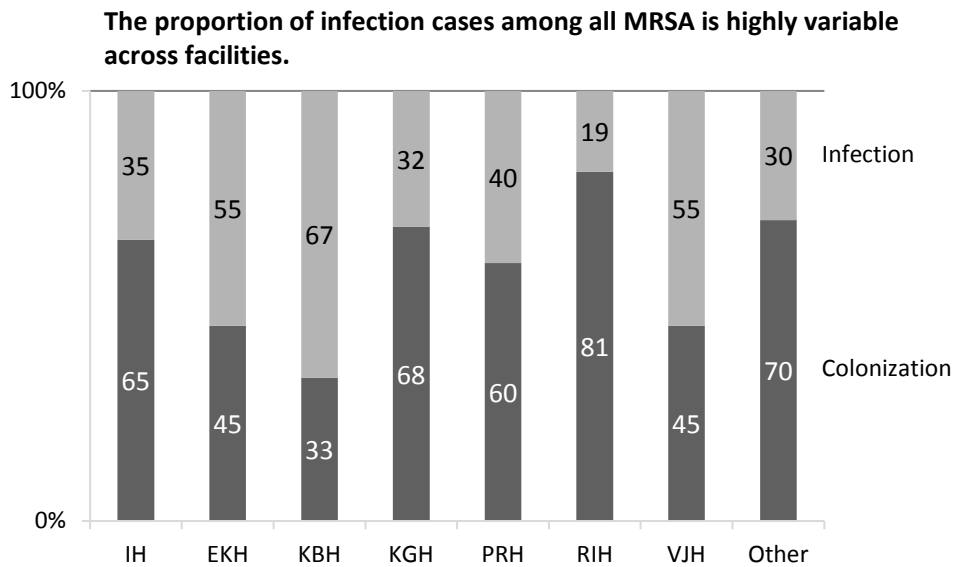
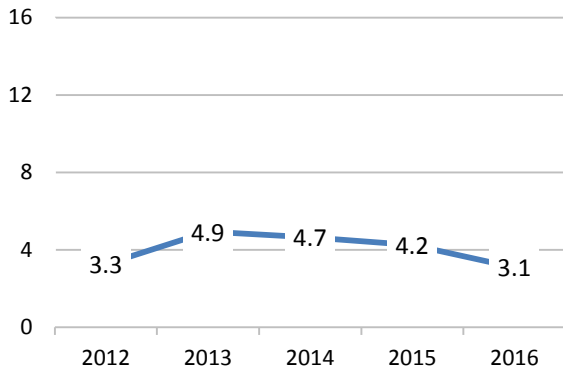


Figure 8: Long-term incidence of HA-MRSA, FY 2012 through 2016. Order of graphs based on hospital size.

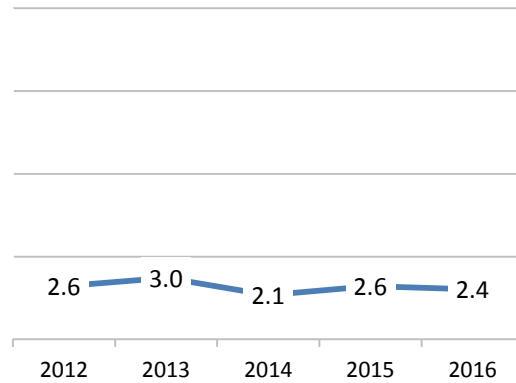
IH

Improvement in HA-MRSA control continued this year.



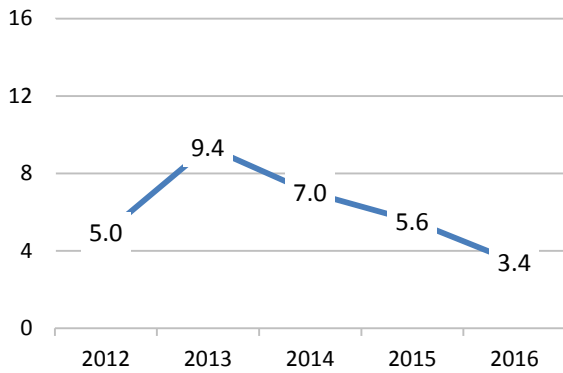
KGH

HA-MRSA continued to be well-controlled overall in KGH.



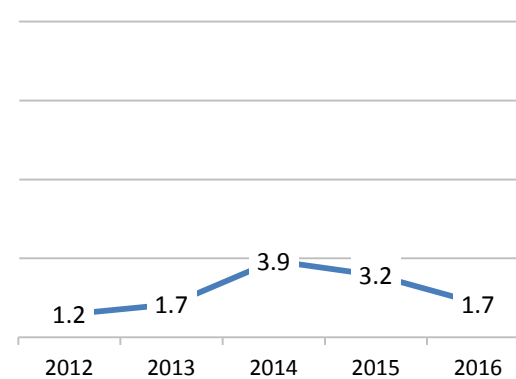
RIH

Strong improvement in HA-MRSA rate continued at RIH.



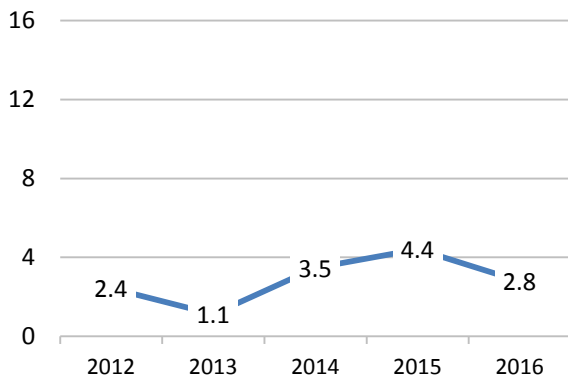
VJH

Excellent performance at VJH this year.



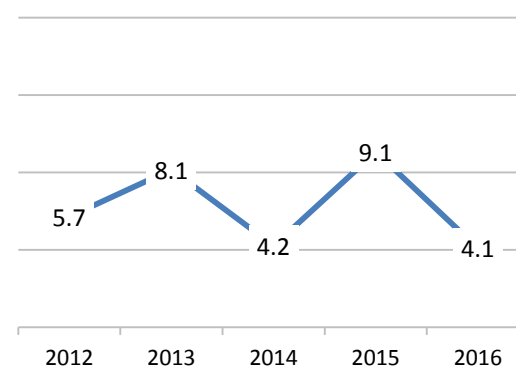
PRH

Progress was made in controlling HA-MRSA, with current rate now below benchmark.



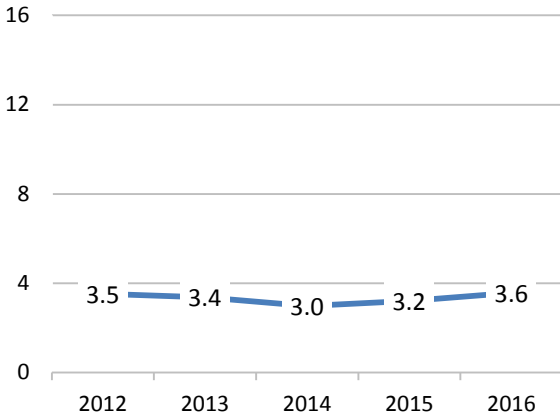
EKH

After a higher rate in the last year, HA-MRSA control significantly improved.

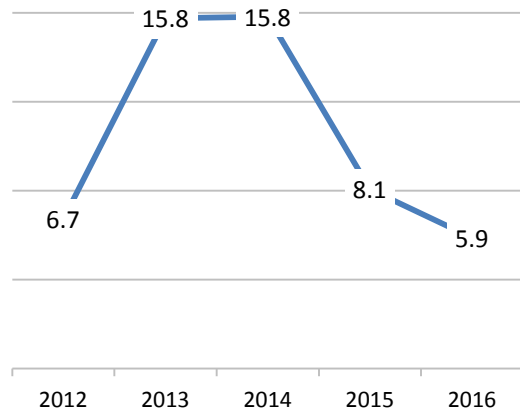


KBH

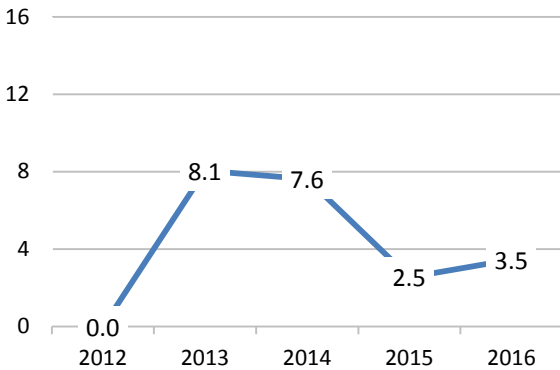
Steady rates, but room to improve.

**SLH**

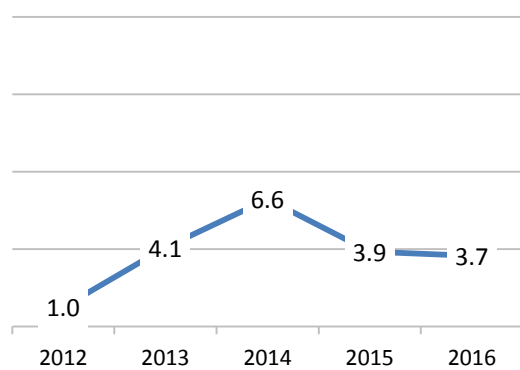
HA-MRSA rate continued to improve this year.

**KLH**

HA-MRSA continued to be well-controlled compared to past.

**CMH**

HA-MRSA rate was similar to the rate in the past year and still below benchmark.



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, VRE can become a problem and cause infection, especially among those who are immunocompromised.

WHAT IS BEING MEASURED?

VRE surveillance in IH included only clinical cases of VRE and does not include urine cultures. The incidence rate of VRE is the number of new cases of VRE acquired by patients during their stay in hospital divided by the total number of inpatient days over a specified time frame, expressed as a ratio per 10,000 patient-days. The population under VRE surveillance are inpatients admitted to IH acute care facilities ([Appendix C](#)).

ACTIONS IMPLEMENTED

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

RESULTS

There were 34 cases of VRE reported in IH. Of these, 73.5% were cases of infection and 26.5% were cases of colonization. The rate of healthcare-associated VRE (HA-VRE) was 0.7/10,000 patient-days (95% CI: 0.4/10,000 patient-days – 0.9/10,000 patient-days).

CARBAPENEMASE-PRODUCING ORGANISMS

Carbapenemase-producing organisms (CPO) are bacteria with the ability to transmit multi-drug resistance to other species of bacteria and are an emerging concern due to their association with outbreaks within hospital settings. Because CPOs 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.

A notification process for BC has been implemented to ensure healthcare facilities are aware when patients with CPO are being transferred so that appropriate precautions can be taken. All suspect and/or confirmed CPO cases are placed on Contact Precautions in a private room for the duration of their stay.

WHAT IS BEING MEASURED?

CPO cases are identified from inpatient clinical specimens and from inpatient screening specimens. For surveillance purposes, CPO cases are classified based on their genes that encode carbapenemase production. Possible genes include NDM, KPC, OXA-48, VIM, and SME.

ACTIONS IMPLEMENTED

The provincial communication plan for notification of CPO outbreaks and/or inter-facility transfers of patients with CPO was implemented.

GOING FORWARD

Screening for new CPO cases will continue.

RESULTS

There were two CPO cases identified in IH.

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 C](#)).

ACTIONS IMPLEMENTED

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

Specific initiatives to prevent SSIs this year included:

- Investigation of SSI clusters at Penticton Regional Hospital
- Working with perioperative managers to develop patient discharge teaching material and reviewing sterile dressing technique at Kootenay Boundary Hospital
- Reviews of pre-operative hair removal and skin preparation at East Kootenay Regional Hospital, Kootenay Boundary Hospital, and Kelowna General Hospital

GOING FORWARD

IPAC will work collaboratively with the site perioperative management to review surgical areas of concern. Full epidemiological reports of SSI rates will be provided to the six larger sites on a biannual basis.

LIMITATIONS

Surveillance of healthcare-associated SSI does not include contaminated or dirty procedures as these have inherently higher risks of infection that are not necessarily affected by infection control interventions. The program does not have a consistent post-discharge data collection system; therefore, SSIs may be occurring but are not included in these data.

SSIs that resulted from implant surgeries performed mid-February through April 2016, and that were identified towards the end of the 90 day surveillance period, were not included in the data analyzed here.

Table 4: IH SSI status, FY 2016

Rate (95% CI)	Five-year trend	FY 2016 benchmark	Status
Clean 1.1% (0.9% - 1.2%)	No trend	1.0%	Above benchmark
Clean-contaminated 1.1% (0.9% - 1.3%)	No trend		

Clean Surgery SSI:

Current Year:

There were 237 clean SSIs in IH. The majority of cases were superficial incisional (Figure 9). The rate of SSI in clean surgeries was 1.1% (95% CI: 0.9% – 1.2%; Figure 9; [Appendix E](#)).

There were clear differences in clean SSI rates across facilities. Compared to the rate of all other facilities, the rates at Kootenay Boundary Regional Hospital and East Kootenay Regional Hospital were significantly higher, even after accounting for duration of surgery ($p < 0.05$). Although some low-volume surgery categories (such as Vascular and Neurosurgery) increase the facility-specific rates, the majority of procedures at these two facilities are Orthopedic Surgeries and this category has the strongest influence on the facility's SSI rate. The clean SSI rate at Royal Inland Hospital was significantly lower than the IH rate ($p < 0.01$).

Across IH, the surgical categories with the highest clean SSI rate were Cardiac Surgery, Vascular Surgery, and Plastic Surgery, but these are only performed at specific hospitals (3.5%, 1.5%, and 1.4%, respectively). Across the 6 larger hospitals, there was a wide range of SSI rates in Orthopedic Surgery and General Surgery (Figure 10).

Comparison to 2015:

Within IH and in individual facilities, there was no statistically significant change in the 2015 clean surgery SSI rate for IH compared to the previous year (Figure 11; [Appendix E](#)).

Longer term trend:

Over the past five years there was a small, but statistically significant, downward trend in clean SSI rates in IH and in Kelowna General Hospital (Figure 11; $p < 0.05$).

Clean-Contaminated:

Current Year:

There were 146 clean-contaminated SSIs in IH and the rate was 1.1% (95% CI: 0.9 – 1.3; Figure 9; [Appendix E](#)). Three facilities had significantly higher rates compared to other facilities after adjusting for duration of surgery ($p < 0.05$). These included East Kootenay Regional Hospital, Kelowna General Hospital, and Kootenay Boundary Regional Hospital. Royal Inland Hospital's rate was significantly lower than others ($p < 0.01$).

Unlike clean SSI rates, there was a very strong difference in clean-contaminated SSI rate across procedure categories (Figure 10). Compared to all other clean-contaminated procedures, General Surgeries were over three times more likely to result in an SSI, regardless of the duration of surgery (odds ratio, 3.5; $p < 0.001$). The majority of clean-contaminated SSIs were deep or organ/space type infections (Figure 9).

Comparison to 2015:

Similar to clean surgeries, there was no change from 2015 to 2016 in the SSI rate among clean-contaminated surgeries in IH, or in any facility (Figure 11; [Appendix E](#)).

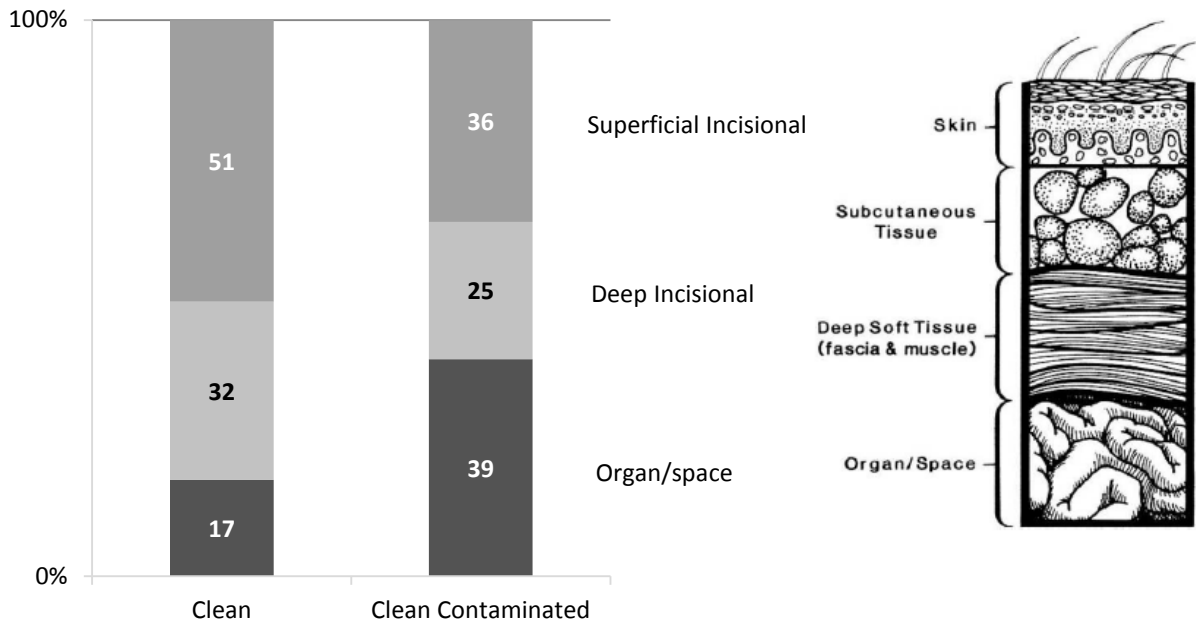
Long term trend:

Over the past five years, there has been a significant decreasing trend in clean-contaminated SSI rates at Kelowna General Hospital (Figure 11; $p < 0.01$) and increasing trends at Penticton Regional Hospital and East Kootenay Regional Hospital ($p < 0.05$).

Figure 9. Surgical site infection rates by wound class and facility, FY 2016

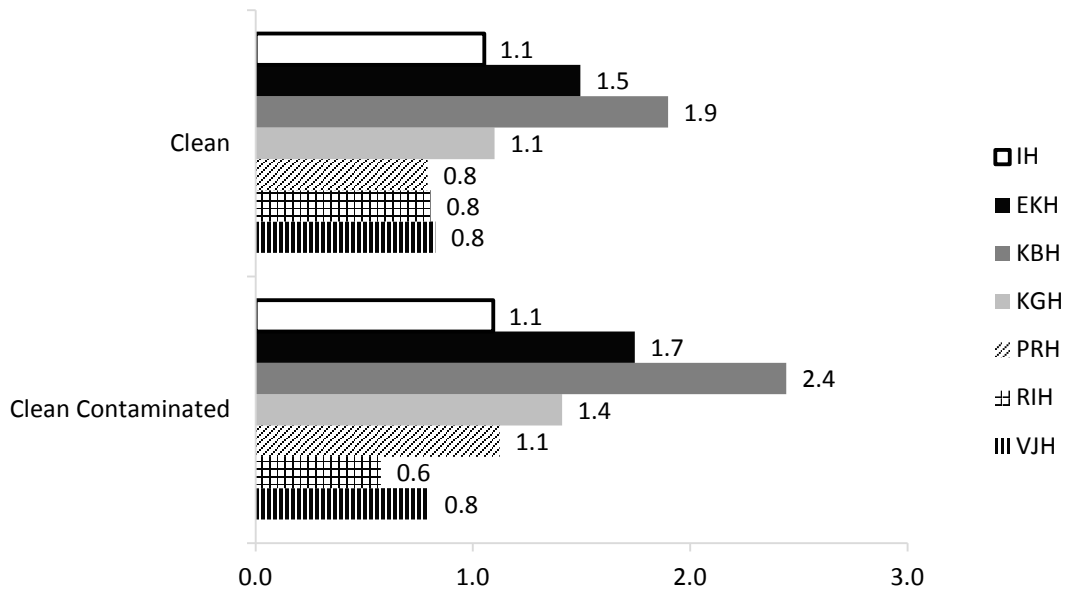
Proportion of SSIs by infection type and wound class, %

The majority of clean SSIs were superficial.



SSI rates (%) by wound class, n>700

There was more of a difference in SSI rates between facilities than between the two wound classes.

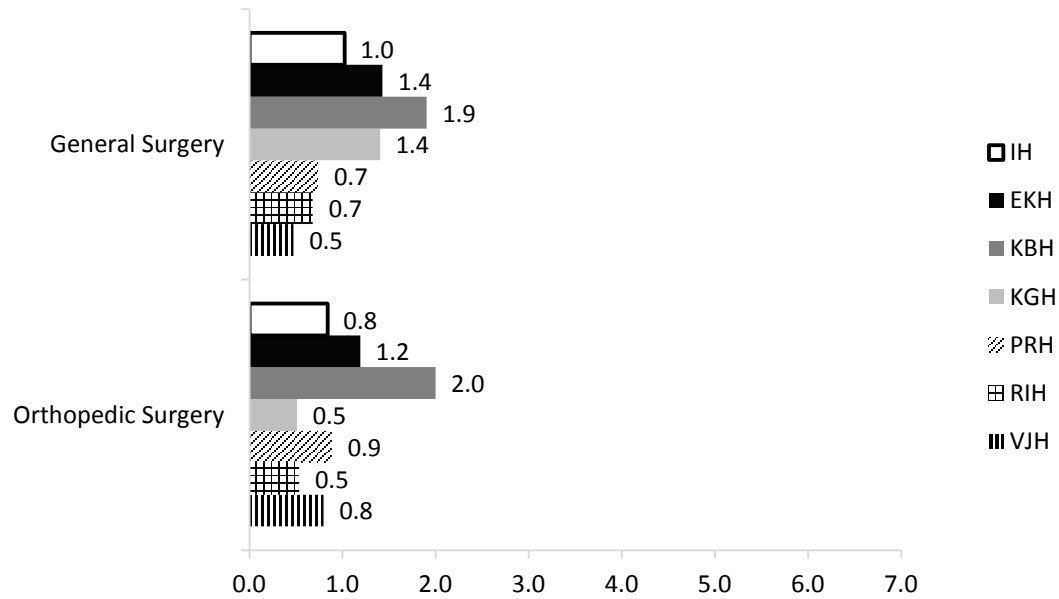


⁹ Anderson, D.J., et al (2008). Strategies to Prevent Surgical Site Infection in Acute Care Hospitals. *Infection Control and Hospital Epidemiology*, S52.

Figure 10. Surgical site infection rates by procedure category, FY 2016

SSI rates (%) in clean surgeries, n>100

Performance varied across acute care facilities. The SSI risk was similar between Orthopedic and General Surgery procedures, except at KGH.



SSI rates (%) in clean-contaminated surgeries, n>100

General Surgery procedures at several facilities had a high risk of SSI.

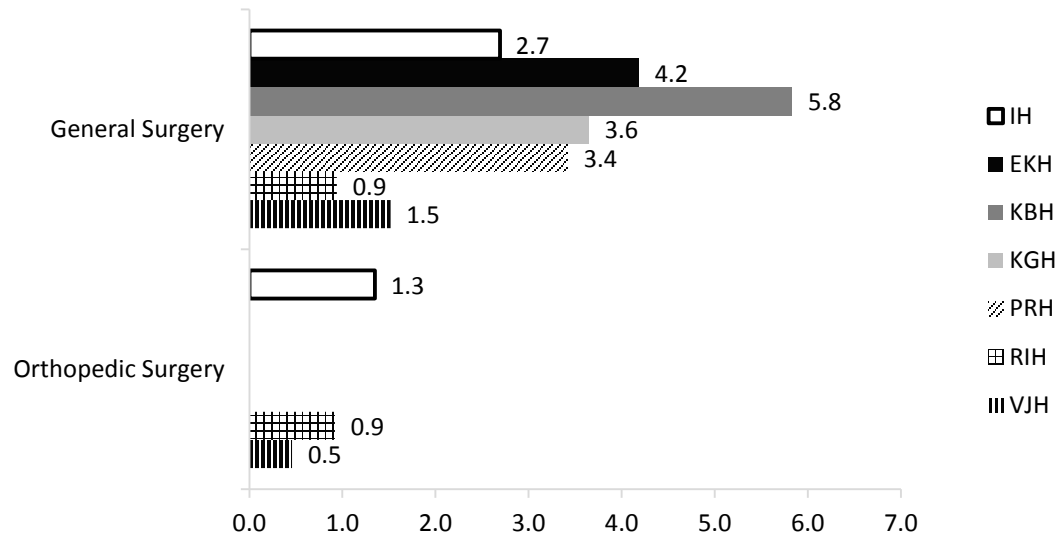
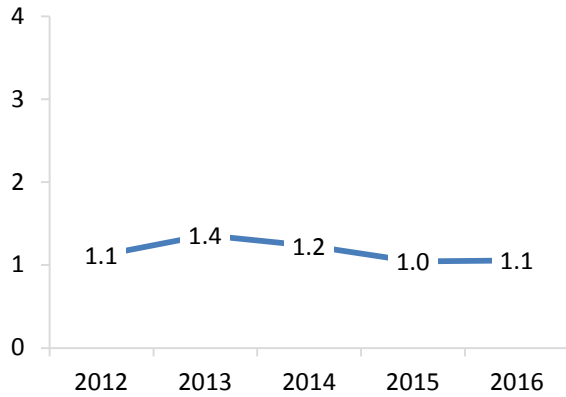


Figure 11: Long-term incidence of SSIs among clean surgeries, FY 2012 through 2016

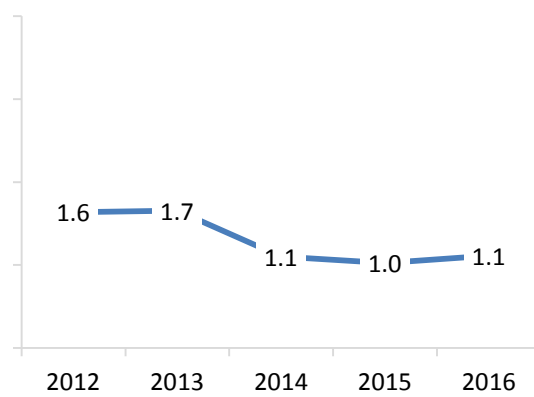
IH

SSI rates in clean surgeries have been consistent over the past 5 years.



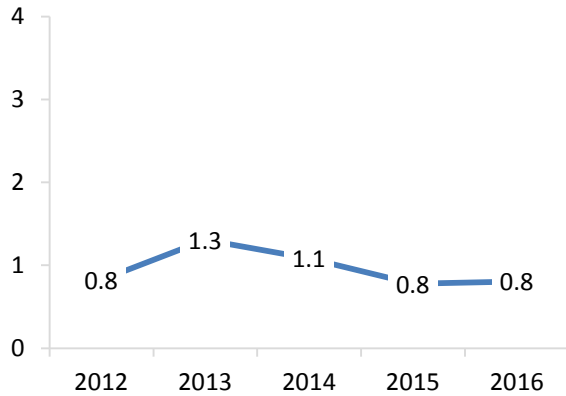
KGH

Past improvement in clean SSI rate has not continued in more recent years.



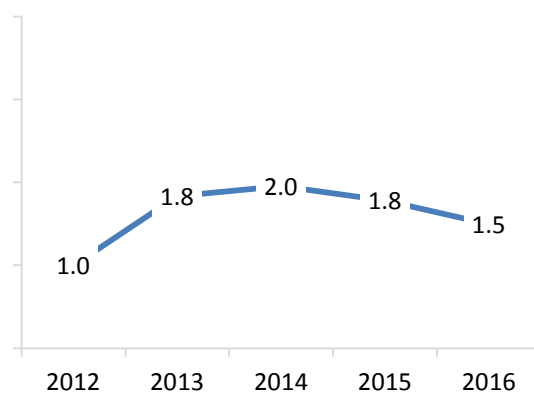
RIH

Clean SSI rates have been below benchmark over the past two years.



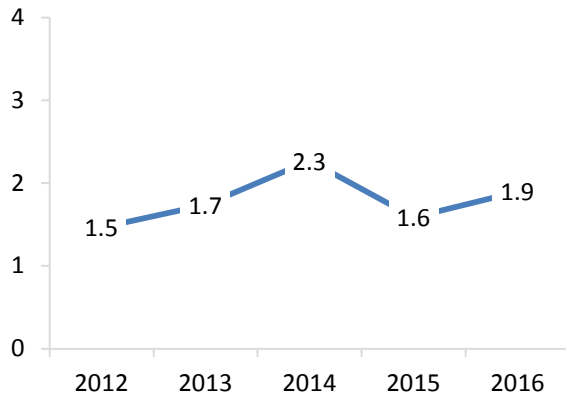
EKH

Some improvement has brought clean SSI rate closer to the IH rate.



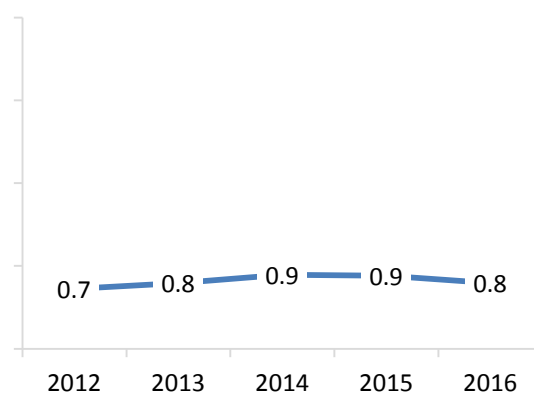
KBH

Clean SSI rate increased in the past year and was significantly higher than IH.



PRH

Consistent performance in clean SSI control.



VJH

Steady control of SSIs in clean surgery continued.

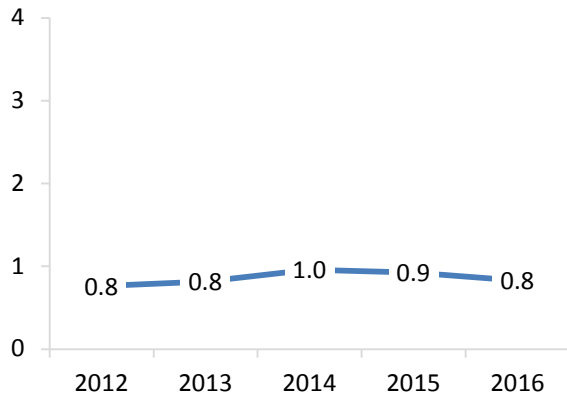
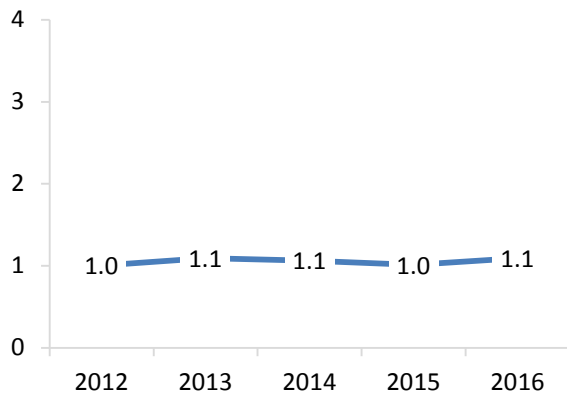


Figure 12: Long-term incidence of SSIs among clean-contaminated surgeries, FY 2012 through 2016

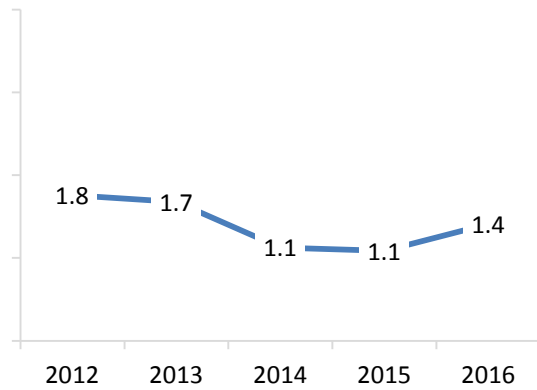
IH

SSI rates in clean-contaminated surgeries have been very consistent.



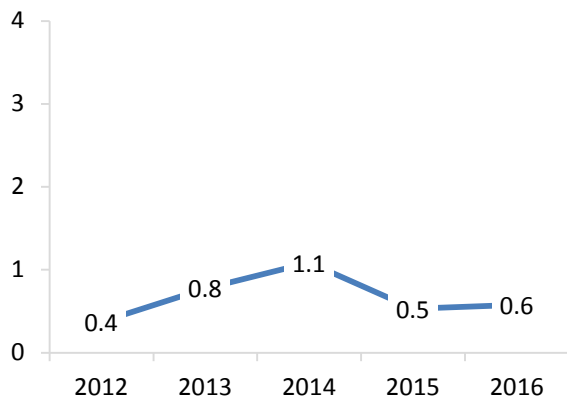
KGH

The control of clean-contaminated SSI rate was weaker this year.



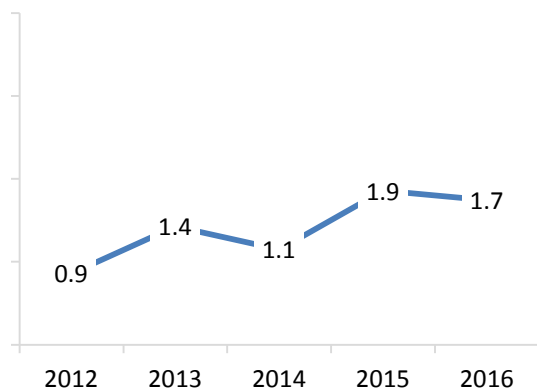
RIH

Clean-contaminated SSI rates have been well controlled in the past two years.



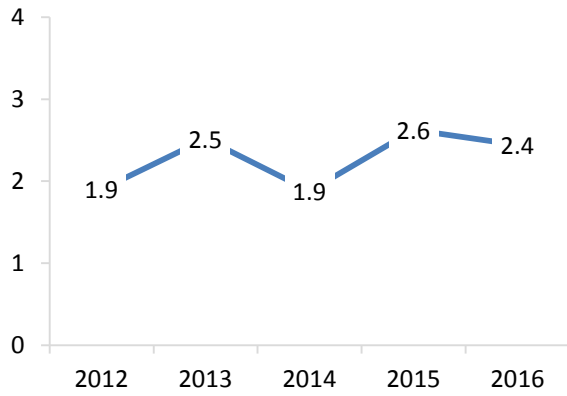
EKH

There was some improvement in control of clean-contaminated SSI.



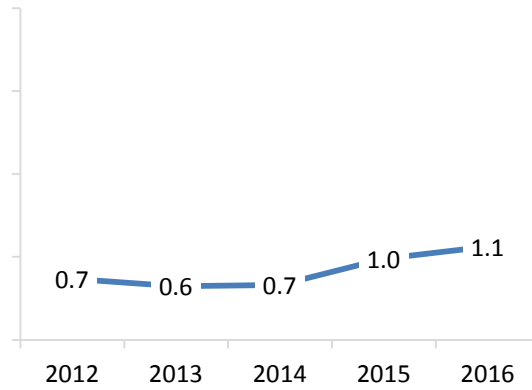
KBH

Small progress was made in the control of SSIs in clean-contaminated surgeries.



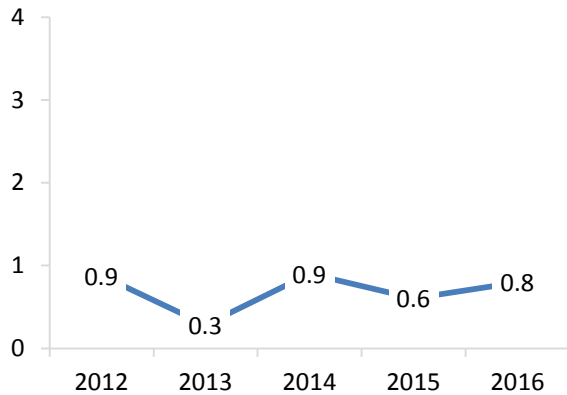
PRH

Clean-contaminated SSI rate has been slowly increasing.



VJH

There was continued effective control of SSIs in clean-contaminated surgery .



VENTILATOR ASSOCIATED PNEUMONIA AND CENTRAL LINE ASSOCIATED BLOODSTREAM INFECTION

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

Central line associated blood stream infection (CLABSI) is restricted to patients who have an intravascular catheter (central line) used for infusion or hemodynamic monitoring.

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 C](#)).

The incidence rate of CLABSI is the number of new cases of blood stream infection acquired by patients in the intensive care unit (ICU) with a central line divided by 1000 central line days ([Appendix C](#)).

ACTIONS IMPLEMENTED

Upon the identification of each VAP and/or CLABSI 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 and central line days are currently manually collected and tallied by ICU HCPs. CLABSIs may occur elsewhere in the hospital, but surveillance is limited to the ICU because there is no method of collecting accurate denominator data in other units.

RESULTS

There were no VAPs in IH this year.

There was one CLABSI this year.

RESIDENTIAL CARE FACILITIES

IPAC supports staff in IH residential care facilities through regular site visits and following up with laboratory-identified cases of infection.

WHAT IS BEING MEASURED?

Residential care surveillance includes: CDI, lower respiratory infections (LRI), skin and soft tissue infections (SSTI), and catheter-associated urinary tract infections (CAUTI). CDI in residential care facilities is monitored using the same definition as acute care.

ACTIONS IMPLEMENTED

In September 2015 and March 2016, prevalence surveys were conducted at select facilities to provide a snapshot of the proportion of residents with LRI, SSTI, and CAUTI. Survey data collection was based on the McGeer criteria¹⁰. The criteria are based on any signs and symptoms documented in resident nursing charts.

GOING FORWARD

Prevalence surveys will be done four times per year and will include the majority of the IH residential care facilities.

LIMITATIONS

Prevalence survey data collection did not capture all HAI cases throughout the year; however, it provided a time-efficient method to estimate the proportion of HAIs among residents at any time. Since the surveys relied on nursing chart data, any missing data may have resulted in missed cases. Limitations for residential care CDI surveillance are the same as acute care CDI surveillance.

RESULTS

These first two prevalence surveys suggested that HAIs were not common among residents in IH facilities (Table 5). There was very little variation in numbers of cases across the surveyed facilities.

Table 5. Residential care HAI prevalence survey results, FY 2016

	September 2015	March 2016
Number of residential care facilities surveyed	12	16
Number of residents surveyed	469	607
Lower respiratory infection, %	1.5	1.0
Pneumonia, %	0.0	0.2
Skin and soft tissue infection, %	3.8	2.1
Catheter-associate urinary tract infection, %	0.0	0.0
In-dwelling catheters	5.8	4.9

¹⁰ N. Stone, M. Ashraf, J. Calder, C. Crnich, K. Crossley and others, "Surveillance definitions of infections in long-term care facilities: revisiting the McGeer criteria," *Infect Control Hosp Epidemiol*, pp. 965-977, 2012

OUTBREAK SURVEILLANCE AND MANAGEMENT

IH uses Outbreak Management Teams to manage outbreaks. These are multidisciplinary teams that include representatives from all areas within the healthcare setting. These teams work collaboratively to ensure a timely and coordinated response to an outbreak. An Outbreak Management Team may include: IPAC, Workplace Health & Safety, Facility Administrator, Communications, nursing staff, medical staff, support services, and external resources, such as the Communicable Disease Unit, as required.

The primary components of outbreak management include:

- Confirmation of an outbreak
- Notification of stakeholders
- Implementation of control measures
- Communication with all stakeholders
- Education to HCPs

ACCOMPLISHMENTS/PRIORITIES MET

Targeted outbreak education was provided by ICPs focusing on outbreak debriefing recommendations. A total of 977 HCPs were educated on outbreak management (Table I).

Working in collaboration with the CD Unit, IPAC developed a RI Outbreak Toolkit and a GI Outbreak Toolkit. Toolkits contain all the checklists, reporting tools, and education resources. Education sessions were provided via the WebEx communication platform.

GOING FORWARD

IPAC will continue to work collaboratively with the CD Unit to deliver consistent education and outbreak support to all IH and non IH residential care facilities.

RESULTS

There were 31 outbreaks of gastrointestinal illness (GI) in IH residential care facilities and 25 outbreaks of respiratory illness (RI; Table 6). Norovirus was identified in the majority (52%) of GI outbreaks with no pathogen identified in the remaining outbreaks. Among RI outbreaks, the most commonly identified pathogens were respiratory syncytial virus (20%), influenza B (12%), and human metapneumovirus (12%).

Table 6. Residential care outbreak summary, FY 2016

	GI outbreaks	RI outbreaks
Count	31	25
Average duration, days	11.1	14.1
Average resident attack rate, %	25	15
Average staff attack rate, %	19	4

FISCAL YEAR 2017 STRATEGIC PLAN

Future directions for the IPAC program are illustrated in the 2017 FY Strategic Plan (Figure 11) and are aimed at improving IPAC's ability to meet the changing demands placed on the program. Moreover, these strategic initiatives are geared towards effective utilization of current resources while ensuring patient safety and improved outcomes.

Five main strategies have been identified for the 2017 FY with plans extending to the 2019 FY. These strategic initiatives support the IPAC program but are specifically aimed at addressing current and emerging issues.

CLOSTRIDIUM DIFFICILE INFECTION

After years of continuous improvement in CDI control, the CDI rate across IH has increased. Therefore, this will continue to be part of the Strategic Plan.

For additional information, see CDI section [Going Forward](#).

COMMUNITY PROGRAMS

Four of the IH Five Key Strategies address health needs in the community: Primary Health Care, Seniors Care, Rural Care, Mental Health and Substance Use. In compliance with these strategies, IPAC will develop a plan based on the results of the community needs assessment.

For additional information, see Fiscal Year 2017 Strategic Plan Accomplishments section [Community Programs](#).

HAND HYGIENE

The program strives to ensure HH compliance rates remain over 80% for all facilities.

For additional information, see HH section [Going Forward](#).

HAI SURVEILLANCE

With the objective of continued reduction of HAI rates, this strategy was developed with the following goals:

- Create and implement action plans for patient care areas of concern
- Reduce all facility rates below established benchmarks
- Implement revised surveillance reporting processes
- Develop a plan for unit-specific surveillance

EDUCATION/ACCREDITATION

All HCPs should receive standardized IPAC education. Education should be directed at gaps in best practice. Accreditation is a continual process and the program goals should align with the Accreditation Canada's criteria for Infection Prevention and Control Standards. The program will keep Accreditation active on a monthly basis to ensure the program is prepared for the Accreditation survey in 2019.

For more information, see Education section [Going Forward](#).

Figure 13: Strategic Plan FY 2017

STRATEGY	STAKEHOLDERS	PERFORMANCE MEASURES	SHORT-TERM GOALS (WITHIN 1 YEAR)	MEDIUM-TERM GOALS	ULTIMATE OUTCOME	
CDI	PICNet, Pharmacy, Housekeeping, Site/Unit Managers, HCPs, Antimicrobial Stewardship Committee	Ongoing surveillance	All facilities below benchmark	All facilities below benchmark	Zero transmission of CDI	
		Number of HCPs educated	Targeted education to units over benchmark Provide education based on gaps in best practice identified by the results of the CDI checklist Investigate facility successes for reducing CDI rates and implement on units over benchmark	Continue targeted education on units above benchmark Continue education based on gaps in best practice		
		Number of times alert levels exceeded	Review facility alert levels Zero outbreaks	Implementation of unit specific alert levels Zero outbreaks		
		Working group created	Create a working group and deliverables	Develop educational materials		
Community Programs (In Alignment with IHS Key Strategies)	Community Teams, P3 Residential, CD Unit, IH Clinics, Contracted Services (Housekeeping), HCPs, Clients, Mental Health, Seniors Care, Primary Health Care, Rural & Aboriginal Health	Completed needs assessment	Develop and implement a plan based on the results of the Working Group	ICPs to build relationships with home health knowledge coordinators and team leaders	Provide basic IPAC education and consultation for Community HCPs	
		Roles and responsibilities defined	Create roles and responsibilities of IPAC in the Community setting			
		Implementation plan developed	Determine ICP contact for each geographical area			Complete practice assessments in wound care and outreach clinics
		Quarterly observation quotas met for acute and residential	Each geographical area will have a needs assessment completed by ICP(s)			
Hand Hygiene	PHHWG, PICNet, Executive Medical Directors, Site/Unit Managers, HH Committee, HCPs, Educators, Maintenance, Medicine & Quality, Physicians, Patients, Residents, Clients	Number of HCPs educated	Engage acute, residential and community leadership teams to promote HH at all levels	All IH staff complete iLearn each year	100% HH compliance rate for all HCPs	
		Two education modules yearly	Provide annual HH education session (eg. skills fair)			
		Completion of infrastructure audits every three years	Develop and implement education modules			
		Number of documented iLearn education sessions	Evaluate outcome of infrastructure audits and make recommendations to senior leadership Request annual completion (%) of iLearn sessions Promote HH iLearn module			
HAI Surveillance	PICNet, Physicians, Housekeeping, Site/Unit Managers, HCPs, Patients, Residents, SET, Relevant Committees	Quarterly HH compliance rates	Consistent 80% compliance rate for all facilities	Consistent 85% compliance rate for all acute facilities	Continue completion of feedback tool for HH rates below 74% (including iLearn module)	
		Number of feedback tools completed	Completion of feedback tool for HH rates below 69% (including iLearn module)			
		Quarterly reporting to PICNet, Public & HCPs				
		Number of periods above benchmark	Create and implement action plans for patient care areas of concern			
Education/Accreditation	PICNet, Physicians, Housekeeping, Site/Unit Managers, HCPs, Patients, Residents, SET, Relevant Committees	Number of HCPs educated	All facilities below benchmark	Use lessons learned from previous action plans to continue to improve practices and reduce HAIs	Zero HAIs	
		Daily Surveillance	Implement revised surveillance indicators and reporting process			
		Implementation of revised indicators and process	Develop a plan for unit specific surveillance			Reduce benchmarks Implementation of unit specific surveillance
		Reporting of unit specific HAI rates	Revise/update all education materials (standardize content across IH) Investigate other methods of providing IPAC education (eg. videos)			Reassess annually
Education/Accreditation	ICPs, HCPs, Quality & Patient Safety	Number of materials revised/updated	Develop and implement routine practices iLearn module	Develop and implement iLearn module for Additional Precautions	All HCPs receive standardized IPAC educational information Program is prepared for accreditation in 2019	
		Number of new materials developed	Standing accreditation item on the monthly IPAC meeting agenda. Monthly rotating ICP presentations.			
		Number of HCPs that have completed routine practice iLearn module annually	Review, develop and implement action plans to address gaps in best practices			
		Monthly accreditation discussion at IPAC meetings				

APPENDICES

APPENDIX A: STRATEGIC PLAN FISCAL YEAR 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	Reduce benchmark to 3.5 per 10,000 pt days All facilities below benchmark	Expand education to all departments (eg. Lab, DI, physio)	
		Ongoing surveillance	Improve use of checklist in facilities w/o onsite ICP	Maintain benchmark of 3 or less per 10,000 pt days	
		100% completion of checklist	Review alert levels Remain under alert levels	Continue use of checklist Review 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	Develop and implement education modules		
		2 education modules	Complete infrastructure audits	Infrastructure audits required every 3 years	
		100% completion of infrastructure audits	Request quarterly completion (%) of iLearn sessions (post with quarterly HH rates)	All IH staff complete iLearn each year	
		# of documented iLearn education sessions	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)	
Community Programs	CIHS Team, P3 Residential, CD Unit, IH Clinics, Contracted Services (Housekeeping), Provincial WH&S Call Centre, HCPs	Quarterly reporting to PICNet, Public & HCPs	Continue quarterly reporting to PICNet, Public & HCPs	Continue quarterly reporting to PICNet, Public & HCPs	Incorporate Community Programs into IPAC Program
		Working group created	Create a working group and deliverables		
		Completed needs assessment	Based on the info provided by ICPs develop needs assessment	Implement a Program based on the results of the Working Group	
		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		
IPAC Program Evaluation	IMPACT, SET, Performance & Evaluation, HCPs, Healthcare Programs/ Networks	Implementation plan developed	Develop an implementation plan	Develop action plan and implement based on survey results	Improve patient/resident/ client outcomes
		Completed evaluation of Healthcare Provider perception survey	Develop and implement perception and needs survey		
		Implementation of revised indicators and process	Evaluate survey results		
		Reviewed ICP roles and responsibilities	Implement revised surveillance indicators and reporting process	Evaluate the need for additional resources based on review results	
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)		

APPENDIX B: COMMUNICATIONS ACTION PLAN AND TIMELINE

Target Audience	Tactic / Vehicle	Objective(s)	Timelines	Responsible
All IH staff	Link on IPAC web page Link in In the Loop...	Infection reflections newsletter To share the latest information about Infection Control issues and the IAPC team members, inaugural Christmas edition.	January 15, 2016	Content: Andrea Neil Distribution: Communications
Public Community All IH staff Physicians	Public Website In the Loop Twitter	Hand Hygiene Compliance results To provide the public, the community, staff and physicians with an update on Hand Hygiene compliance results within IH.	January 15, 2016	Content: Julie Mori Distribution: Communications
Public Community All IH staff Physicians	Public Website In the Loop Twitter	Healthcare Acquired Infections (HAI) results To provide the public, the community, staff and physicians with an update on HAI results within IH.	January 15, 2016	Content: Julie Mori Distribution: Communications
All IH staff	IPAC web page In the Loop...	Infection reflections newsletter To share the latest information about Infection Control issues and the IAPC team members.	April 15, 2016	Content: Andrea Neil Distribution: Communications
Public Community All IH staff Physicians	Public Website In the Loop Twitter	Hand Hygiene Compliance results To provide the public, the community, staff and physicians with an update on Hand Hygiene compliance results within IH.	April 15, 2016	Content: Julie Mori Distribution: Communications
Public Community All IH staff Physicians	Public Website In the Loop Twitter	Healthcare Acquired Infections (HAI) results To provide the public, the community, staff and physicians with an update on HAI results within IH.	April 15, 2016	Content: Julie Mori Distribution: Communications
All IH staff	InsideNet In the Loop IPAC web page	Hand Hygiene education blitz To provide 6 months of targeted hand hygiene related education blitz to all staff that is guided by the quarterly HH audit results.	April 1 – September 30, 2016	Content: Joy Pyett Distribution: Communications
All IH staff	Facebook “share” In the Loop Twitter	WHO "Save Lives: Clean Your Hands" To support awareness of the WHO campaign to wash your hands.	May 5, 2016	Content: Joy Pyett Distribution: Communications
All IH staff	IPAC web page In the Loop	Infection reflections newsletter To share the latest information about Infection Control issues and the IAPC team members.	July 15, 2016	Content: Andrea Neil Distribution: Communications
Public Community All IH staff Physicians	Public Website In the Loop Twitter	Hand Hygiene Compliance results To provide the public, the community, staff and physicians with an update on Hand Hygiene compliance results within IH.	July 15, 2016	Content: Julie Mori Distribution: Communications
Public Community All IH staff Physicians	InsideNet In the Loop IPAC web page	Healthcare Acquired Infections (HAI) results To provide the public, the community, staff and physicians with an update on HAI results within IH.	July 15, 2016	Content: Julie Mori Distribution: Communications
All IH staff	InsideNet In the Loop IPAC web page	Hand Hygiene education blitz To provide 6 months of targeted hand hygiene related education blitz to all staff that is guided by the quarterly HH audit results.	October 1 – March 31, 2016	Content: Joy Pyett Distribution: Communications

All IH staff, members of public	InsideNet Rotating ad Facebook posting (with pictures after the fact)	Infection Control week <ul style="list-style-type: none"> • International focus on Infection prevention and control • Will have a specific theme (not aware what this is yet) 	October 17 – 23, 2016	Content: Nicki Gill Distribution: Communications
All IH staff Public	Facebook “share” Twitter	Global handwashing day To support awareness of Global handwashing day” and tie it into Infection Control week.	October 15, 2016	Content: Joy Pyett Distribution: Communications
Public Community All IH staff Physicians	InsideNet In the Loop IPAC web page	Hand Hygiene Compliance results To provide the public, the community, staff and physicians with an update on Hand Hygiene compliance results within IH.	October 15, 2016	Content: Julie Mori Distribution: Communications
Public Community All IH staff Physicians	InsideNet In the Loop IPAC web page	Healthcare Acquired Infections (HAI) results To provide the public, the community, staff and physicians with an update on HAI results within IH.	October 15, 2016	Content: Julie Mori Distribution: Communications
All IH staff	IPAC web page In the Loop	Infection reflections newsletter To share the latest information about Infection Control issues and the IAPC team members	December 15, 2016	Content: Andrea Neil Distribution: Communications

CDI

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

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)

CPO (Carbapenemase Producing Organisms)

Patients confirmed to be positive for a CPO are reported to PICNet using their surveillance forms.

SSI (Clean/ Clean Contaminated)

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. Three 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

Surgeries are stratified based on the *Surgical Wound Classification*¹¹. Clean wounds are 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 are 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.

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.

¹¹ Interior Health Surgical Services Practices: Operative Wound Classification Reference Guide (May 2011)

VAP

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 ≥ 3 cm 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

CLABSI

The central line was in place for > 2 calendar days when all elements of a CLABSI were first present together

- Elements required for adult case include:
 - Fever $> 38^{\circ}$ C
 - OR chills
 - OR hypotension (systolic < 90)
 - AND positive lab results that are not related to an infection at another site
 - AND common commensal is cultured from 2 or more blood cultures, drawn on separate occasions
 - AND criterion elements occurred within a timeframe that does not exceed a gap of 1 calendar day
- Elements required for patient < 1 year of age same except:
 - Fever $> 38^{\circ}$ C
 - OR hypothermia $< 36^{\circ}$ C (core)
 - OR apnea
 - OR bradycardia

Notes:

- CLABSI rate calculation per 1000 central line days
- Primary source of infection (same as VAP)
- Population ICU patients only

APPENDIX D: HAND HYGIENE COMPLIANCE RATE BY DISCIPLINE

Facility type	Facility	HCP*	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	Change from 2015 [†]
All	IH	Clinical Support Staff	50%	58%	64%	66%	77%	11%
		Nursing Staff	62%	73%	78%	78%	79%	1%
		Other	56%	65%	72%	71%	77%	6%
		Physicians	44%	57%	64%	64%	73%	9%
Tertiary Hospital	KGH	Clinical Support Staff	52%	55%	66%	62%	72%	10%
		Nursing Staff	62%	74%	79%	77%	79%	2%
		Other	51%	66%	66%	72%	83%	11%
		Physicians	53%	66%	61%	66%	76%	10%
	RIH	Clinical Support Staff	35%	60%	59%	57%	83%	26%
		Nursing Staff	49%	70%	79%	75%	81%	6%
		Other	36%	63%	70%	50%	65%	15%
		Physicians	19%	57%	65%	66%	72%	6%
Service Area Hospital	EKH	Clinical Support Staff	29%	54%	64%	54%	61%	7%
		Nursing Staff	40%	70%	72%	75%	74%	-1%
		Other	27%	62%	51%	59%	78%	19%
		Physicians	18%	43%	56%	58%	62%	4%
	KBH	Clinical Support Staff	60%	73%	66%	77%	77%	0%
		Nursing Staff	71%	75%	82%	83%	82%	-1%
		Other	N/A	N/A	N/A	86%	87%	1%
		Physicians	40%	51%	69%	65%	80%	15%
	PRH	Clinical Support Staff	61%	60%	49%	80%	71%	-9%
		Nursing Staff	72%	77%	76%	86%	76%	-10%
		Other	60%	N/A	N/A	91%	68%	-23%
		Physicians	54%	62%	50%	60%	63%	3%
	VJH	Clinical Support Staff	55%	52%	67%	66%	83%	17%
		Nursing Staff	66%	69%	74%	75%	75%	0%
		Other	N/A	69%	69%	71%	73%	2%
		Physicians	43%	48%	57%	61%	71%	10%
Community Level Hospital	CMH	Clinical Support Staff	61%	N/A	N/A	N/A	N/A	N/A
		Nursing Staff	64%	73%	77%	79%	75%	-4%
		Other	N/A	N/A	N/A	N/A	N/A	N/A
		Physicians	70%	83%	83%	81%	N/A	N/A
	KLH	Clinical Support Staff	69%	N/A	N/A	N/A	72%	N/A
		Nursing Staff	71%	77%	86%	88%	84%	-4%
		Other	N/A	N/A	N/A	N/A	76%	N/A
		Physicians	47%	N/A	N/A	N/A	74%	N/A
	SLH	Clinical Support Staff	61%	67%	N/A	86%	92%	6%
		Nursing Staff	72%	77%	77%	82%	83%	1%
		Other	65%	N/A	N/A	N/A	84%	N/A
		Physicians	54%	48%	52%	N/A	79%	N/A
	Other*	Clinical Support Staff	50%	56%	61%	67%	75%	8%
		Nursing Staff	68%	75%	77%	78%	76%	-2%
		Other	56%	52%	80%	78%	74%	-4%
		Physicians	44%	51%	70%	68%	74%	6%

N/A indicates less than 50 observations

***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:** 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 E: HEALTHCARE ASSOCIATED INFECTION RATES

New Healthcare-associated <i>Clostridium difficile</i> Infection						
Facility type	Facility	Count	Patient-days	Rate, 1/10,000 patient-days ¹	95% CI ¹	Difference in rate from 2015 FY ²
All	IH	229	461124	5.0	4.3 – 5.6	0.2
Tertiary hospital	KGH	76	137897	5.5	4.3 – 6.8	1.4
	RIH	29	91623	3.2	2.0 – 4.3	-1.8
Service area hospital	EKH	10	23183	4.3	1.6 – 7.0	-0.5
	KBH	18	20763	8.7	4.7 – 12.7	-1.5
	PRH	33	47684	6.9	4.6 – 9.3	3.4*
	VJH	25	56942	4.4	2.7 – 6.1	1.2
Community level hospital	ALH	0	953	NA	NA	0.0
	BDH	2	3908	NA	NA	-3.4
	CMH	5	10857	4.6	0.6 – 8.6	-9.0*
	CVH	1	5661	NA	NA	-3.9
	DHH	1	1547	NA	NA	6.5
	EVH	4	4591	8.7	0.2 – 17.2	4.4
	GDH	2	1970	NA	NA	5.1
	IDH	1	2389	NA	NA	4.2
	KLH	7	11449	6.1	1.6 – 10.6	-3.3
	LIH	1	1399	NA	NA	7.1
	NVH	0	2606	NA	NA	-6.1
	OMH	1	6230	NA	NA	-1.5
	PGH	1	1987	NA	NA	-0.9
	QVH	1	3920	NA	NA	2.6
	SLH	9	16911	5.3	1.8 – 8.8	1.3
SOG	2	6654	NA	NA	-5.9	

¹ NA: Not available due to lack of insufficient data

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

Healthcare-associated Methicillin-resistant <i>Staphylococcus aureus</i>							
Facility type	Facility	Count	Patient-days	Rate, 1/10,000 patient-days 1	95% CI 1	Difference in rate from 2015 FY ²	Infection rate, 1/10,000 patient- days
All	IH	156	504319	3.1	2.6 – 3.6	-1.2*	1.1
Tertiary hospital	KGH	38	157485	2.4	1.6 – 3.2	-0.2	0.8
	RIH	32	93136	3.4	2.2 – 4.6	-2.1*	0.6
Service area hospital	EKH	11	26952	4.1	1.7 – 6.5	-5.0*	2.2
	KBH	9	25196	3.6	1.2 – 5.9	0.4	2.4
	PRH	15	53681	2.8	1.4 – 4.2	-1.6	1.1
	VJH	11	64271	1.7	0.7 – 2.7	-1.4	0.9
Community level hospital	ALH	0	963	NA	NA	0.0	NA
	BDH	2	3912	NA	NA	-0.6	NA
	CMH	4	10935	3.7	0.1 – 7.2	-0.2	NA
	CVH	2	5723	NA	NA	-2.1	NA
	DHH	0	1574	NA	NA	0.0	NA
	EVH	3	4664	NA	NA	2.1	NA
	GDH	0	1973	NA	NA	-5.1	NA
	IDH	1	2400	NA	NA	4.2	NA
	KLH	4	11573	3.5	0.1 – 6.8	0.9	NA
	LIH	0	1411	NA	NA	0.0	NA
	NVH	1	2606	NA	NA	0.8	NA
	OMH	10	6232	16.0	6.1 – 26.0	2.0	NA
	PGH	0	1987	0.0	NA	-5.9	NA
	QVH	3	4006	NA	NA	7.5	NA
SLH	10	16969	5.9		-2.2	NA	
SOG	0	6670	NA	NA	-7.4	NA	

¹ NA: Not available due to lack of insufficient data

² * indicates statistical significance, $p < 0.05$

Surgical Site Infection, Clean Surgeries						
Facility type	Facility	Count	Surgeries	Rate ¹ , %	95% CI ¹	Difference in rate from 2015 FY ²
All	IH	237	22,294	1.1	0.9 – 1.2	0.1
Tertiary hospital	KGH	84	7,545	1.1	0.9 – 1.4	0.1
	RIH	36	4,470	0.8	0.5 – 1.1	0.0
Service area hospital	EKH	26	1,740	1.5	0.9 – 2.1	-0.3
	KBH	41	2,160	1.9	1.3 – 2.5	0.3
	PRH	17	2,146	0.8	0.4 – 1.2	-0.1
	VJH	25	3,021	0.8	0.5 – 1.2	-0.1
Community hospital	CMH	1	377	NA	NA	0.0
	KLH	1	140	NA	NA	0.0
	QVH	1	134	NA	NA	0.0
	SLH	6	798	0.8	0.2 – 1.4	-0.4

¹ NA: Not available due to lack of sufficient data

² * indicates statistical significance, $p < 0.05$

Surgical Site Infection, Clean-contaminated Surgeries						
Facility type	Facility	Count	Surgeries	Rate ¹ , %	95% confidence interval of rate ¹	Difference in rate from 2015 FY ²
All	IH	146	13,211	1.1	0.9 – 1.3	0.0
Tertiary hospital	KGH	58	4,114	1.4	1.1 – 1.8	0.3
	RIH	18	3,115	0.6	0.3 – 0.8	0.0
Service area hospital	EKH	18	1,032	1.7	1.0 – 2.5	-0.1
	KBH	19	778	2.4	1.4 – 3.5	-0.2
	PRH	16	1,424	1.1	0.6 – 1.7	0.1
	VJH	12	1,505	0.8	0.4 – 1.3	0.2
Community hospital	CMH	2	838	NA	NA	-0.1
	KLH	1	210	NA	NA	-0.3
	QVH	0	16	NA	NA	0.0
	SLH	2	325	NA	NA	-1.6

¹ NA: Not available due to lack of sufficient data

² * indicates statistical significance, $p < 0.05$