



Interior Health  
*Every person matters*

# Infection Prevention & Control 2017 Fiscal Year Annual Report

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December 21, 2017

## EXECUTIVE SUMMARY

The Infection Prevention and Control (IPAC) program's 2017 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 2017 include:

- Slight decrease in *Clostridium difficile* infection (CDI) rate to 4.3/10,000 patient-days, and significant decreasing trend from FY 2013 through FY 2017
  - CDI rates for this year at Royal Inland Hospital (RIH), Vernon Jubilee Hospital (VJH), and Cariboo Memorial Hospital were below the IH CDI benchmark.
- The methicillin-resistant *Staphylococcus aureus* (MRSA) rates at most acute care facilities across IH were below the IH MRSA benchmark
  - MRSA cluster investigation in one unit at Kelowna General Hospital (KGH) ended following infection prevention improvements using a Lean 5S strategy, resulting in a substantial decrease in frequency of MRSA.
- Surgical site infection (SSI) rates in clean and clean-contaminated surgery at RIH and VJH were below the IH SSI benchmark.
  - SSI investigations followed observations of increased SSI frequency at KGH and Penticton Regional Hospital within specific surgery categories
- Hand hygiene compliance rates in acute and residential care have strived to meet the provincial target of 80% and rates are posted in all sites
- Several large scale construction and renovation projects have received ongoing IPAC guidance
  - Construction permits are being developed electronically to assist in documentation of projects
- Increased number of RI outbreaks throughout Interior Health and the province resulting in extended length of duration of the outbreaks and increased attack rates
  - Collaborative work with the Communicable Disease Unit and senior leadership will be targeted to improve outbreak management processes
- Ongoing educational initiatives include:
  - Emerging Pathogens Training ongoing with new trainer education and yearly refresher training
  - Certification in Infection Control education for Infection Control Practitioners (ICPs) writing their initial certification or recertifying
  - Development and implementation of provincial Additional Precautions signage
  - Development of provincial IPAC education modules for implementation in 2017/18

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 SET as required. The minutes of the IMPACT 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 Communicable Disease (CD) and Workplace Health & Safety regarding 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. Alan Stewart

### **Corporate Director, IPAC**

Janice de Heer

### **Manager, IPAC**

Marijke Henkemans

### **Medical Director, IPAC**

Dr. Bing Wang

### **Epidemiologist, IPAC**

Dr. Julie Mori

### **Educator, IPAC**

Nicki Gill

### **Project Lead, IPAC**

Joy Pyett

### **Administrative Assistant, IPAC**

Connie Bergen

Corrie Cardon

### **Surveillance Information Assistant, IPAC**

Jason Wiens

### **Co-op Student, IPAC**

Courtenay Pearce

Charlie White

Gabriel Ramirez

Jessica Grewal

### **Infection Control Practitioners:**

Missy Blackburn

Debbie Cosgrove-Swan

Kelly Dillon

Sandie McKechnie

Krystal Fergus

Wendy Herrington

Marion Kabatoff

Eileen Lavoie

Lynden Lehman

Maureen McLean Young

Lorena McLure

Andrea Neil

Evelyn Nicol

Suzanne Hyderman

Roberta Barron

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 Hospital

West View Place

## GLOSSARY OF ACRONYMS AND TERMS

<b>ABHR</b>	Alcohol-based hand rub
<b>Acute Care Facility</b>	Care facilities in which patients are treated for brief but severe episodes of illness, for traumas and injuries, or recovery from surgery
<b>Alert level</b>	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
<b>ALH</b>	Arrow Lakes Hospital
<b>ARO</b>	Antibiotic Resistant Organism
<b>BDH</b>	Boundary District Hospital
<b>Benchmark</b>	A point of reference for judging value, quality, change, or standard to which others can be compared
<b>CA</b>	Community Associated
<b>CAUTI</b>	Catheter-associated urinary-tract infection
<b>CD Unit</b>	Communicable Disease Unit
<b>CDI</b>	<i>Clostridium difficile</i> Infection
<b>CIC</b>	Certified in Infection Control
<b>CLABSI</b>	Central Line Associated Bloodstream Infection
<b>CMH</b>	Cariboo Memorial Hospital
<b>CPO</b>	Carbapenemase Producing Organism
<b>CVH</b>	Creston Valley Hospital
<b>DHH</b>	Dr. Helmcken Memorial Hospital
<b>EKH</b>	East Kootenay Hospital
<b>EVD</b>	Ebola Virus Disease
<b>EVH</b>	Elk Valley Hospital
<b>FY</b>	Fiscal Year
<b>GDH</b>	Golden District Hospital
<b>GI</b>	Gastrointestinal Illness
<b>HA</b>	Healthcare Associated
<b>HAI</b>	Healthcare Associated Infection
<b>HCP</b>	Healthcare Provider
<b>HH</b>	Hand Hygiene
<b>ICP</b>	Infection Control Practitioner
<b>ICU</b>	Intensive Care Unit
<b>IDH</b>	Invermere District Hospital
<b>IH</b>	Interior Health
<b>i-Learn</b>	Interior Health online education platform
<b>IPAC</b>	Infection Prevention and Control
<b>KBH</b>	Kootenay Boundary Regional Hospital
<b>KGH</b>	Kelowna General Hospital
<b>KLH</b>	Kootenay Lake Hospital
<b>LIH</b>	Lillooet Hospital
<b>Limitations</b>	Limits or restrictions
<b>LN</b>	Link Nurse
<b>MRSA</b>	Methicillin-resistant <i>Staphylococcus aureus</i>
<b>NVH</b>	Nicola Valley Hospital

<b>OMH</b>	100 Mile House Hospital
<b>PGH</b>	Princeton General Hospital
<b>PICNet</b>	Provincial Infection Control Network of British Columbia
<b>PPE</b>	Personal Protective Equipment
<b>PRH</b>	Penticton Regional Hospital
<b>QVH</b>	Queen Victoria Hospital
<b>RI</b>	Respiratory Illness
<b>RIH</b>	Royal Inland Hospital
<b>RN</b>	Registered Nurse
<b>SLH</b>	Shuswap Lake General Hospital
<b>SOG</b>	South Okanagan General Hospital
<b>SSI</b>	Surgical Site Infection
<b>TB</b>	Tuberculosis
<b>Trend</b>	General movement or direction of change.
<b>VAP</b>	Ventilator Associated Pneumonia
<b>VJH</b>	Vernon Jubilee Hospital
<b>VRE</b>	Vancomycin Resistant Enterococci
<b>Working group</b>	A group of stakeholders working together to achieve a specified goal within a finite timeline



## FISCAL YEAR 2017 STRATEGIC PLAN ACCOMPLISHMENTS

Five main strategies were identified for the FY 2017 with plans extending to the FY 2019 ([Appendix A](#)). These strategic initiatives support the 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 2017. 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 HH program lead presented to the Hospital and Community Integration Services (HCIS). Leaders were asked by the vice-president HCIS to ensure HH rates are shared regularly with staff.
- Physician HH rates provided at quarterly Regional Medical Advisory Committee meetings.
- Continually having two co-op students performing HH audits
- A new 'Hand Hygiene for Healthcare Workers' pamphlet was developed and published.
- Two patient representatives continue to be valuable members of 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 identified in FY 2016 were completed:

- Staff education is being delivered.
- Consultations are being done.

- IPAC practice assessment for wound care clinics has been developed.

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## HAI SURVEILLANCE

Unit-level surveillance processes have been developed and trialed on the electronic surveillance database. Action plans were created and implemented by ICPs and facility staff where needed. Residential care HAI surveillance was conducted using prevalence surveys every two months.

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## EDUCATION/ACCREDITATION

A standing item was added to IPAC meetings for an ICP to provide updates on Accreditation.

IPAC education was provided to ICPs at monthly IPAC meetings and at face-to-face meetings.

The Provincial Additional Precaution signs were rolled out:

- Educational boards regarding new signs were created and distributed across IH.
- ICPs educated staff and physicians across IH.
- Updates were made to guidelines and educational materials.
- Ongoing communication was provided to IH leadership and staff regarding the roll-out process.

Refer to Education section [Accomplishments/Priorities Met](#), for more information Programs and Initiatives

## 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.

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## ACCOMPLISHMENTS/PRIORITIES MET

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

- Refresher Training for Emerging Pathogens commenced in January 2017
- Respiratory illness (RI) outbreak guidelines were updated and education to stakeholders was provided in collaboration with the CD Unit.
- IPAC Manual:
  - New guidelines were developed for pertussis and respiratory viruses
  - Updates were made to the ARO guidelines, TB screening and Additional Precautions guidelines with new signage

- ‘Prevention & Control of Catheter Associated Urinary Tract Infections (CAUTI)’ guidelines were removed. Information now available in the “Urinary Catheter in Adults” toolkit
- Microbiology guidelines were removed. Information now available on the Microbiology Guide to Specimen Collection and Transport guideline.
- Four issues of *Infection Reflections* released (a quarterly publication that shares information and updates on the latest IPAC issues)
- Three ICPs recertified their Certification in Infection Control (CIC)
- IPAC members attended two two-day education meetings in Kelowna
- Four 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	2,664
CDI*	1,078
Routine Practices/Additional Precautions/PPE*	3,650
Outbreaks* (GI and/or RI)	1,431
Tuberculosis	441
<b>Miscellaneous* (including: orientation, updates to manual/ guidelines, skill fairs, risk assessments, isolation, housekeeping, construction, and AROs)</b>	3,697
Hand Hygiene for Healthcare Workers, IH i-Learn course	3,419
Hand Hygiene for Medical Staff, IH i-Learn course	110
Emerging Pathogens, IH i-Learn course	626
Emerging Pathogens Initial Training, IH i-Learn course	298
Emerging Pathogens Refresher Training, IH i-Learn course	103

\*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 InsideNet) and are standardized across the health authority.

The development of Provincial IPAC education modules is underway and includes *Routine Practices*, *Point of Care Risk Assessment*, *Personal Protective Equipment (PPE)* and *Additional Precautions*. These modules will be designed for clinical and non-clinical staff. Modules will be finalized within the next fiscal year. The plan is that these IPAC education modules will be made

available on the i-Learn platform, will be part of all new staff orientation and will be a requirement for all current clinical and non-clinical staff to review.

## 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 IH HH compliance rate met the provincial performance target of 80% in two quarters. Refer to [Results](#) for more information on all HH audit results.

Since the HH program began hiring auditor co-op students, the program has had six HH auditor co-op students. The hiring has now been staggered to allow one senior student to mentor the in-coming student. Both are eight-month terms. Student auditors continued to enable the program to increase total numbers of observations. The students updated the co-op student orientation package.

The data from the completed *Best Practices for Hand Hygiene Facilities & Infrastructure in Healthcare Settings: Facilities & Infrastructure Checklists* for all IH acute and residential facilities were compiled. The infrastructure audit information was compiled and results shared with the Corporate Director.

The FY 2017 HH rates for individual facilities will be publicly posted at all IH residential facilities.

The Interior Health Hand Hygiene Working Group met quarterly to discuss and make recommendations on various HH topics. This multidisciplinary group revised the 'Gloves, Hand Hygiene, and You' module and the 'Hand Hygiene for Healthcare Worker' pamphlet. The group also developed a new education module, titled 'Hand Hygiene in the Operating Room'.

## GOING FORWARD

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

The new education module 'Hand Hygiene in the Operating Room' will be promoted by the ICPs for the six months following its release in April 2016.

An East Kootenay Regional Hospital physician HH pilot project will provide in-the-moment feedback to physicians for missed HH opportunities noticed during auditing.

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## RESULTS

The annual HH compliance increased again this year across IH (Figure 1). The FY 2017 HH compliance for IH was 79% (95% confidence interval {CI}, 78% - 79%), which was not a significant increase compared to FY 2016. While compliance increased from year to year at most facilities, no changes were statistically significant.

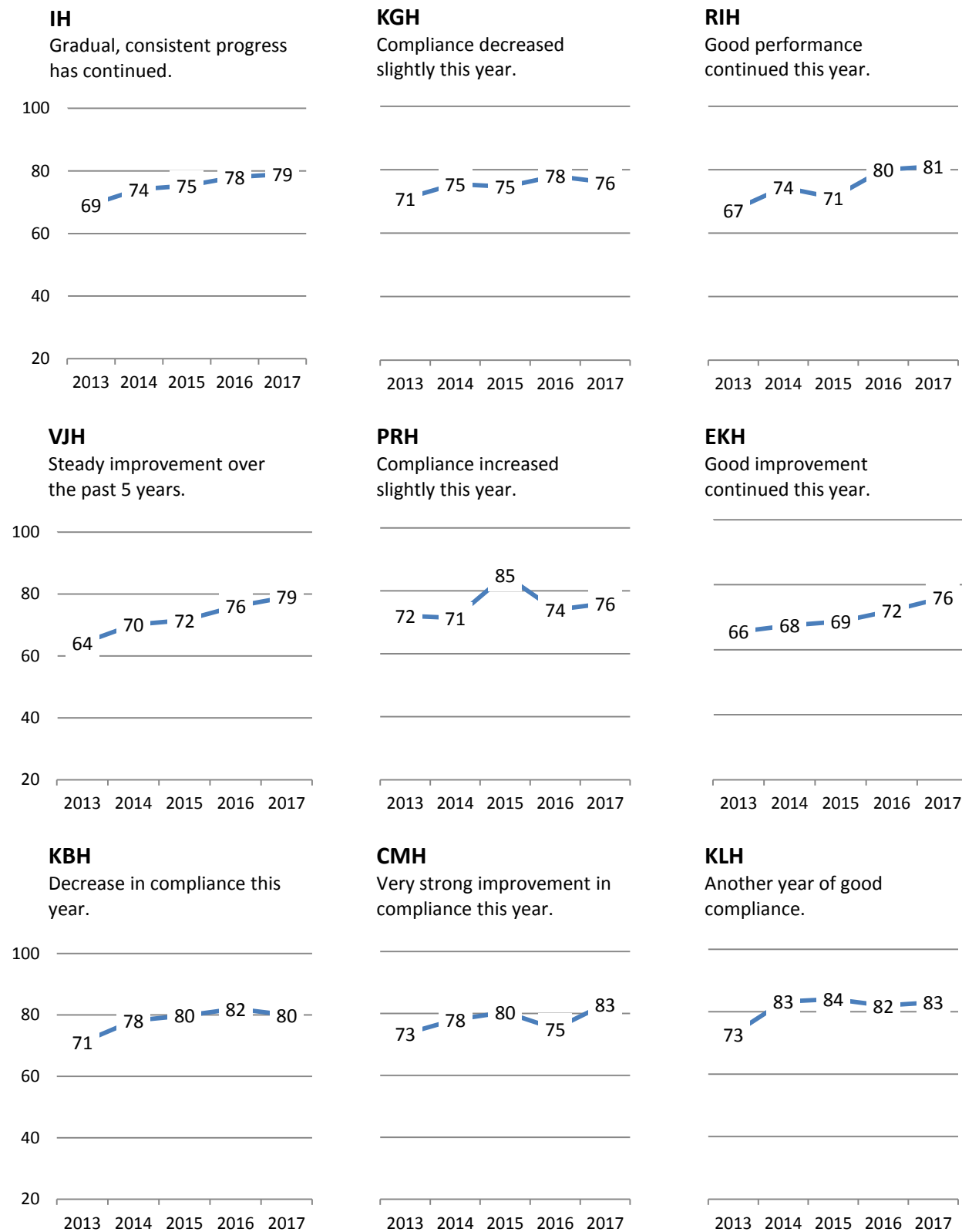
Nursing staff make up the vast majority of HH observations in acute care (74% of all observations) and their rate reached 80% this year. The group labeled "Other Staff", which are largely housekeeping staff, had the highest compliance of all healthcare worker groups (Figure 2). Compliance among physicians was the same as last year.

Over the past two years, the overall HH compliance rate has been fluctuating around 80% (Figure 3, top panel). Maintaining a rate above 80% has been a challenge. Typically there is a difference between HH compliance observed before and after contact with the patient environment, with compliance usually higher after contact. The difference narrowed in the last two quarters of this year (Figure 3, bottom panel). The improvement in HH compliance before patient contact is encouraging.

The HH compliance rate in IH residential care facilities did reach 80% in the last quarter of this year (Figure 4). For the year, the IH residential care HH compliance rate was 77% (95% CI, 76% - 78%). There has been no change over the past year (Figure 4).

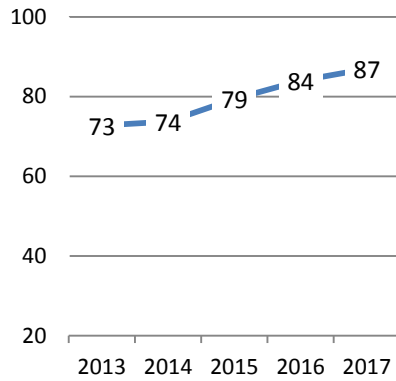
It is important not to compare groups due to individual differences in sample sizes (number of observations), patient care needs, and other characteristics that are unique to each group. It has been recognized that 'being observed' in practice, e.g. during auditing, can lead to falsely elevated compliance 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.



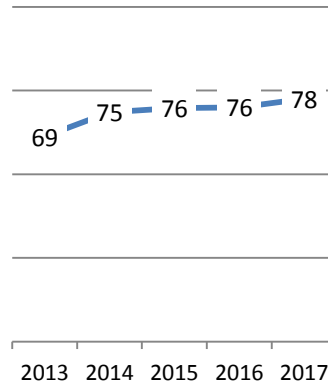
### SLH

Another year of strong improvement



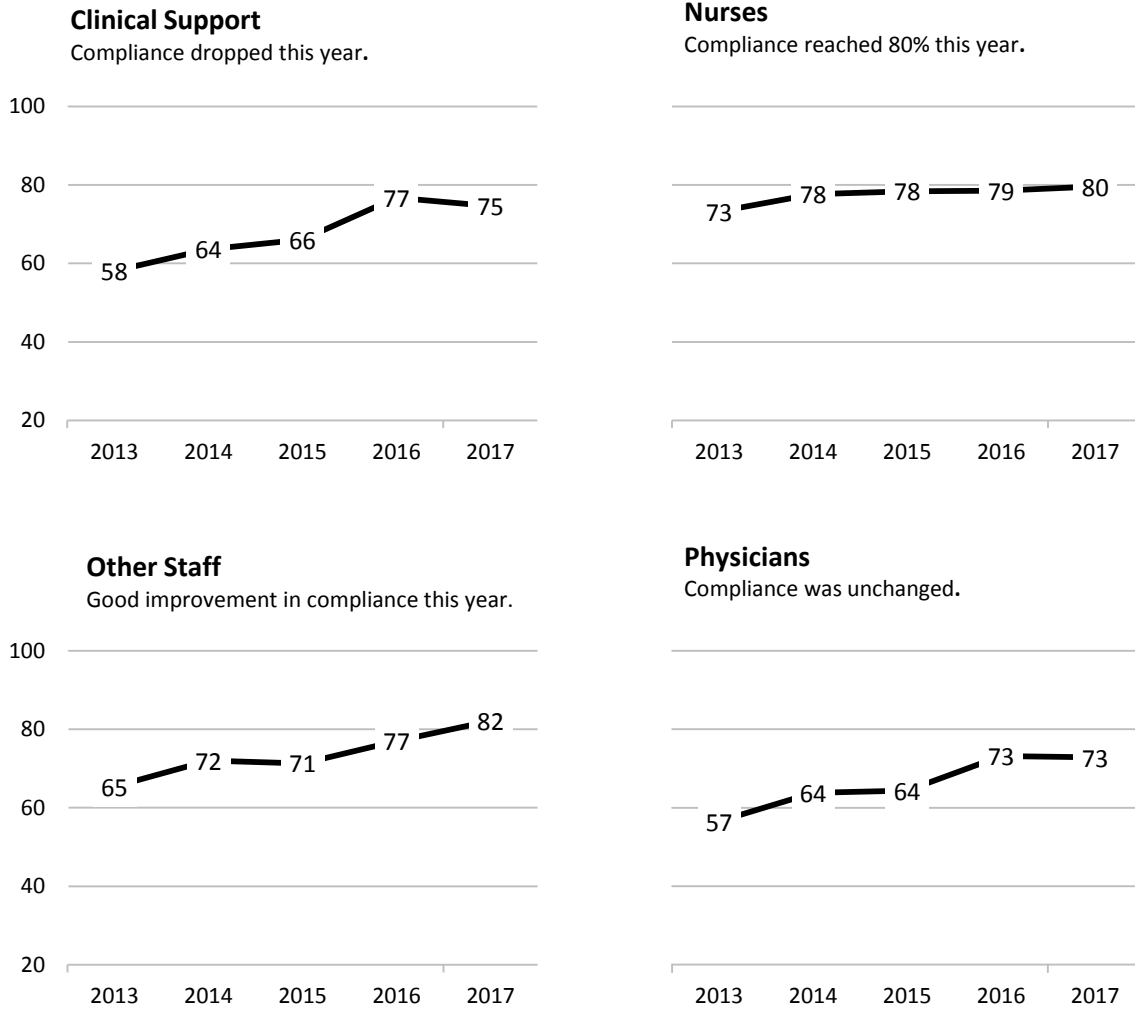
### Smaller facilities\*

Compliance improvement this year



\* 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 2013 through FY 2017**

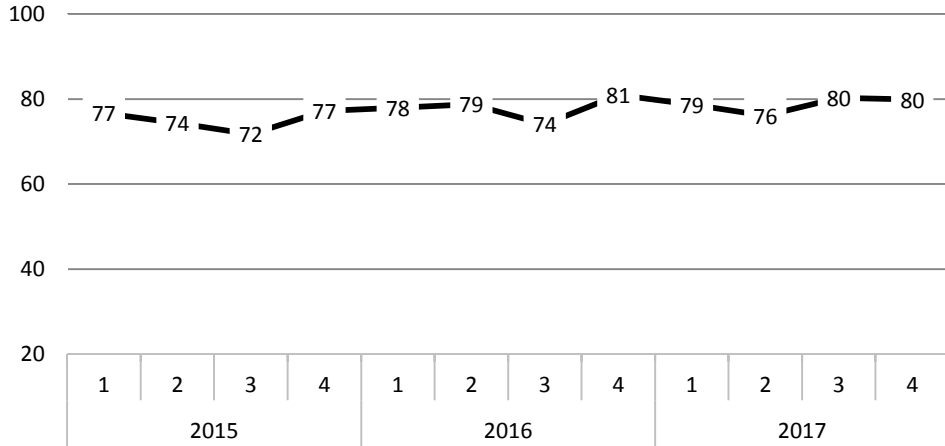


\***Clinical Support Staff:** Occupational Therapist, Physiotherapist, Respiratory Therapist, Speech Therapist, Social Work, Dietician, Psychologist, Audiologist, Porter, Pastoral Care, Radiology, Technicians (e.g. EKG, EEG, etc.), Laboratory: Phlebotomy; **Nursing:** Registered Nurse, Registered Psychiatric 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

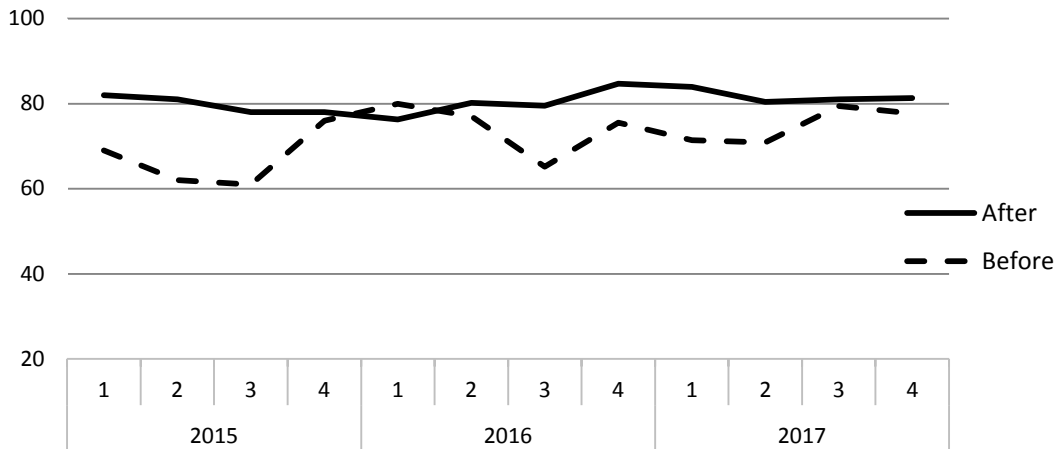


**Figure 3. HH compliance rates (%) in all IH acute care facilities by fiscal quarter**

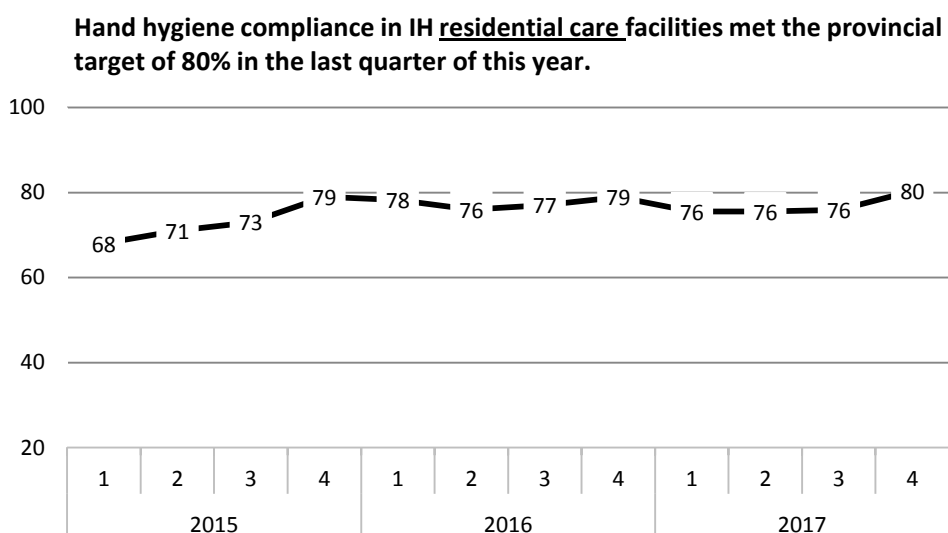
**Hand hygiene compliance in IH acute care has met or exceeded the provincial target of 80% several times in the past two years.**



**Hand hygiene compliance in IH acute care observed before and after contact with patient environment became closer this year.**



**Figure 4. HH compliance rates (%) in all IH residential care facilities by fiscal 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 was one education session for 12 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.

### 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.

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#### ACCOMPLISHMENTS/PRIORITIES MET

IPAC provides vital education to contractors and staff on infection prevention practices related to construction. Over 400 new construction and renovation permits were issued by ICPs across IH during FY 2017. Of these issued permits, construction and renovation projects ranged in size, completion time, and health risk.

Some of the more significant projects included:

- Construction of the new Patient Care Tower at Penticton Regional Hospital
- Completion of the new Clinical Services Building at Royal Inland Hospital
- Planning for the construction of the new patient tower at Royal Inland Hospital
- Completion of Intensive Care Unit renovation at Kootenay Boundary Regional Hospital
- Completion of the new Intensive Care Unit at East Kootenay Regional Hospital

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#### GOING FORWARD

A complete revision of the IPAC Construction Guidelines, including electronic permits, is currently ongoing.

#### EMERGING PATHOGENS

Since March 2014, West Africa has experienced the largest outbreak of Ebola in history, with multiple countries affected. While the probability of Ebola virus disease (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.

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#### ACCOMPLISHMENTS/PRIORITIES MET

Emerging Pathogens and Pandemic Planning Committee (EPPPC) is responsible for all aspects of Ebola preparedness in IH and has representation on provincial Ebola preparedness committees.

In January 2017, the Refresher Training for Emerging Pathogens commenced using the IH i-Learn platform, which provides reminders to HCPs of the annual training requirements and allows for ongoing tracking of participants.

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## GOING FORWARD

The ‘train the trainer’ strategy is used for Emerging Pathogens Training. The ICPs are responsible for all trainer education and then the trainers are 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.

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## ACCOMPLISHMENTS/PRIORITIES MET

- There were 11,069 visits to the IPAC InsideNet page and 1,312 visits to the IPAC HH InsideNet page.
- In addition, there were 1,203 visits to the Infection Control website and 667 visits to the IPAC Manual on the public [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.

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## 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.

A semi-automated electronic surveillance system assists ICPs to identify potential HAI cases in acute care based on predetermined case definitions. Standardized reports are available to all staff and the public.

Surveillance is conducted in IH acute care and residential care facilities.

### ACCOMPLISHMENTS/PRIORITIES MET

Changes were carried out to the IPAC acute care electronic data collection system to allow for unit-level HAI surveillance and for documentation of action plans on individual units. Unit-level surveillance will allow the program to monitor increases in CDI and ARO case numbers over time in individual units. This is in addition to the traditional facility-level surveillance in which all HAI (CDI, ARO, SSI, VAP, and CLABSI) cases are linked to facilities, allowing facility-level rates to continue to be reported.

CDI alert levels were updated to reflect more recent CDI data.

### GOING FORWARD

Additions to the IPAC electronic surveillance reporting system will include:

- Facility HAI Report - rates of all HAIs in a facility during a fiscal period
- Facility Action Plan Report - all IPAC action plans in a facility during a fiscal period
- Location HAI and Action Plan Report - CDI and ARO counts and Action Plan in a unit during a fiscal period

Distribution processes for facility-specific SSI epidemiological reports will be updated to ensure the appropriate stakeholders receive these reports. Processes will be developed that will permit surgeons to view line lists of their patients in whom SSI have been identified by IPAC.

### CLOSTRIDIUM DIFFICILE INFECTION

*C. difficile* are Gram-positive spore-forming bacteria that can cause diarrheal infections in persons in acute and residential care facilities, and in the community. CDI are one of the most common HAIs among patients in Canadian hospitals<sup>1</sup>. *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 AND REPORTED?

CDI surveillance includes cases of new healthcare-associated CDI (HA-CDI), relapse CDI, and inpatient community-associated CDI (CA-CDI). 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 protocol<sup>2</sup> ([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. This year facility-specific alert levels, which trigger investigations and preventative actions to reduce transmission, were updated. Consequently, alert levels in most facilities decreased from the original alert levels set in 2014. In the past year facility-specific alert levels were exceeded at each of the facilities listed below. Quick responses by facility staff and ICPs helped to prevent new cases of CDI from emerging and avoided outbreak situations at these facilities.

- Royal Inland Hospital, April 2016
- Shuswap Lake General Hospital, June 2016
- Shuswap Lake General Hospital, October 2016
- Penticton Regional Hospital, December 2016
- Kelowna General Hospital, March 2017
- Boundary District Hospital, March 2017

<sup>1</sup> 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.

<sup>2</sup> 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 and their facilities worked on many pro-active interventions to reduce HA-CDI. Most interventions were on-going, but some were new initiatives to address specific concerns. Most interventions were applied across IH, but some were locally-driven in single facilities. Below is a list of practices that were worked on by staff in acute care facilities to control CDI.

- Identification of CDI cases with staff in inpatient units, emergency departments, and housekeeping
- Communication regarding symptomatic patients during transfer from emergency to inpatient units
- Ensuring CDI checklist is shared with staff
- Reviewing new Contact Precautions Plus sign with staff
- Providing education at Housekeeping School
- IH-wide use of low odour, chlorinated cleaning product in housekeeping (effective against *C. difficile*)
- Cleaning of patient environment, nursing areas, clean supply rooms, and medication rooms
- Commode cleaning
- Mattress cleaning and discarding, when required
- Ensuring bedside equipment is dedicated to patients, or is cleaned between patients
- Promoting CDI education pamphlet for patients and families
- Based on point-of-care risk assessment assess for additional precautions
- Use of personal protective equipment
- Daily monitoring of all CDI cases
- Antimicrobial stewardship

#### GOING FORWARD

Emphasis on CDI control will be increased. 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 2018 Strategic Plan section.

#### LIMITATIONS

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

#### RESULTS

**Table 2: Interior Health new healthcare associated CDI status, FY 2017**

<b>Incidence</b> (95% confidence interval)	<b>Five-year trend</b>	<b>FY 2017 benchmark</b>	<b>Status</b>
4.3/10,000 patient-days (3.7/10,000 – 4.9/10,000 patient-days)	Significantly decreasing	3.5/10,000 patient-days	Above benchmark

## **Current Year:**

### **Cases:**

Across IH there were 209 cases of new healthcare associated CDI (HA-CDI), 128 new cases of community-associated CDI, and 27 cases of relapse CDI. The proportion of community-associated CDI (CA-CDI, 35.2%) was somewhat lower than the proportion last year (36.6%) and similar to the proportion reported across BC in FY 2016<sup>3</sup>. Across facilities, the proportion varies (Figure 5) with KBH having the lowest proportion (18%) and VJH having the highest (60%).

### **Rates:**

The incidence of new HA-CDI in IH for FY 2017 was 4.3/10,000 patient-days (95% confidence interval, 3.7/10,000 patient-days – 4.9/10,000 patient-days, Figure 6, [Appendix E](#)). Compared to this rate, no individual facility had a significantly different HA-CDI rate ( $p > 0.05$ ). This is above the benchmark of 3.5/10,000 patient-days. RIH, VJH, and CMH had CDI rates below the IH benchmark of 3.5/10,000 patient-days.

## **Comparison to Previous Year:**

Across IH the incidence of new HA-CDI decreased from 5.0/10,000 patient-days in FY 2016 to 4.3/10,000 patient-days; however, this was not a statistically significant change ( $p > 0.05$ , Figure 6, [Appendix E](#)). Furthermore, no individual facility had a significant change in CDI rate from the previous year.

## **Long Term Trend:**

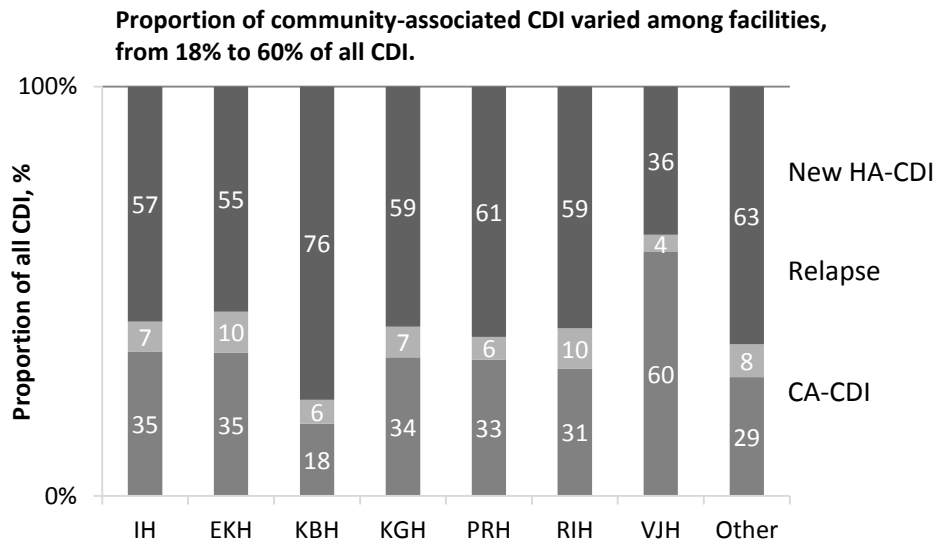
The data in the past five years have shown a statistically significant decreasing trend in new HA-CDI rate in IH ( $p < 0.01$ ; Figure 6). There have also been strongly significant decreasing trends at Royal Inland Hospital, East Kootenay Regional Hospital, and Vernon Jubilee Hospital ( $p \leq 0.01$ ).

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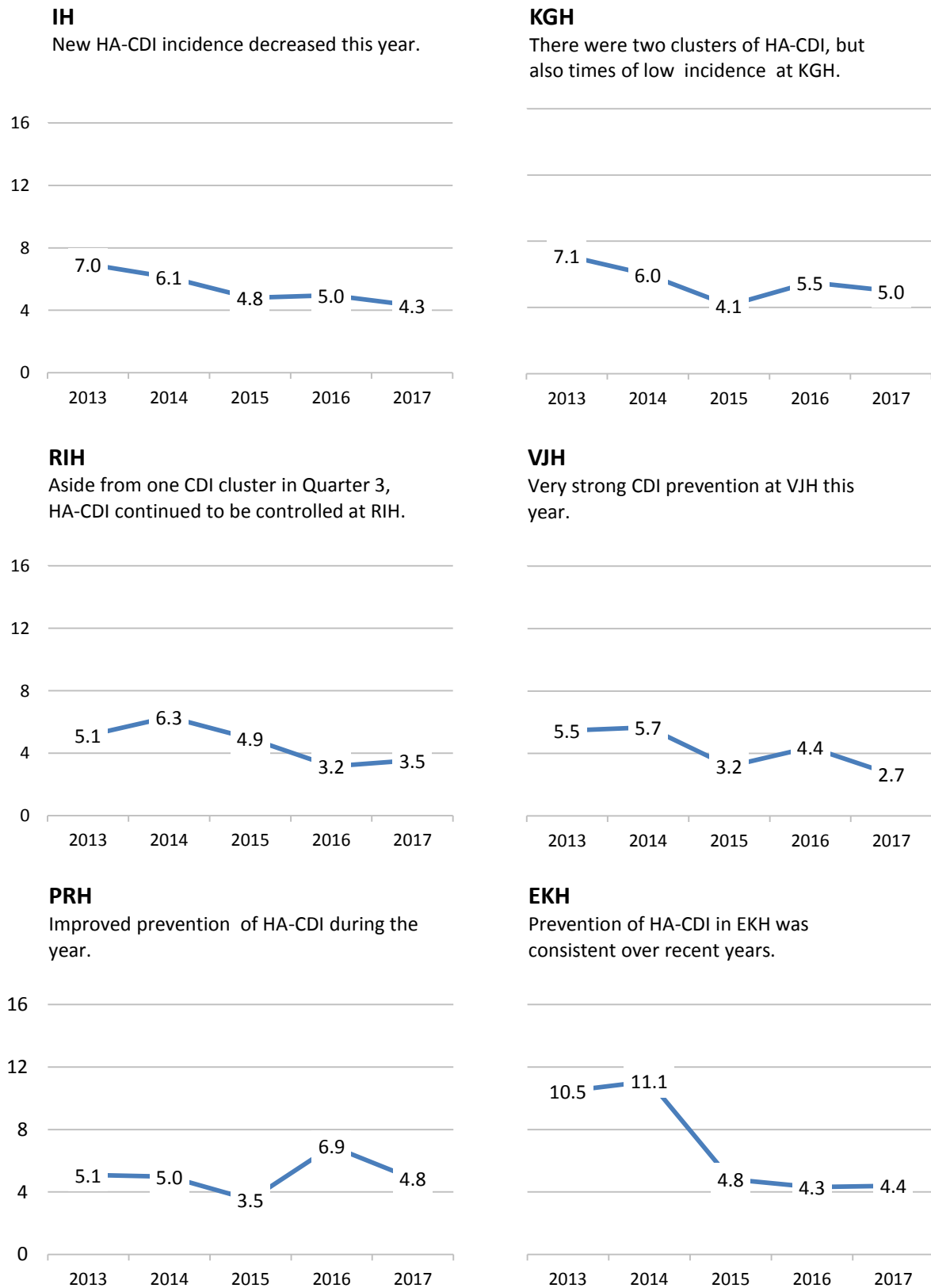
<sup>3</sup> Annual Surveillance Report of Healthcare-Associated Infections in BC Health Care Facilities, Fiscal Year 2015/16. Provincial Infection Control Network of British Columbia



**Figure 5. Distribution of CDI across classification groups (new, relapse, community) by facility, FY 2017**

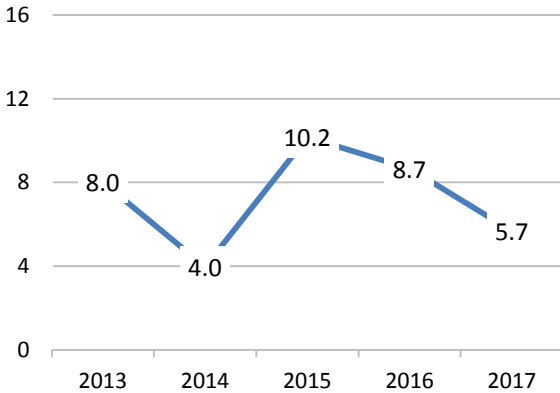


**Figure 6. New HA-CDI incidence (I/10,000 patient-days) FY 2013 through FY 2017. Order of graphs based on hospital size.**

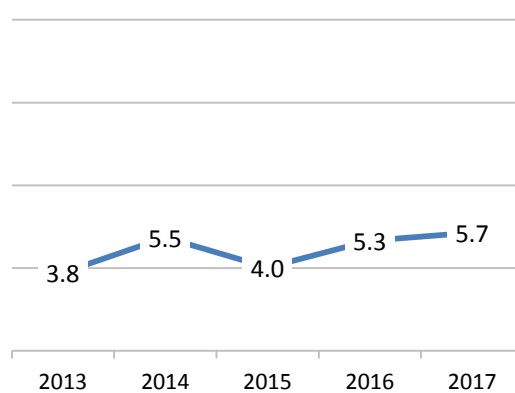


**KBH**

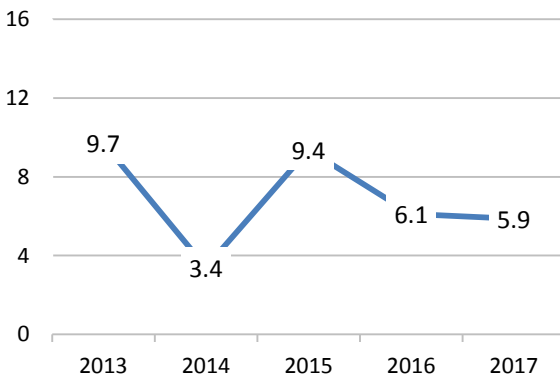
There was an improvement in prevention of new HA-CDI this year.

**SLH**

Another small increase in HA-CDI incidence this year.

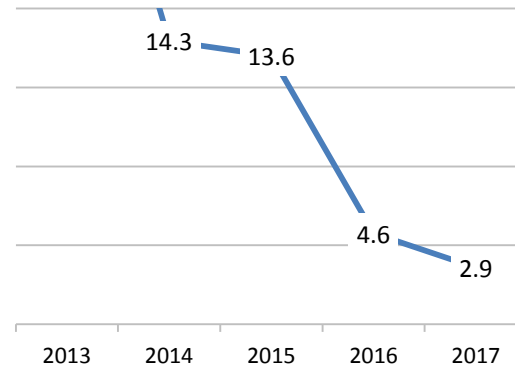
**KLH**

HA-CDI incidence at KLH was consistent with the previous year.

**CMH**

Strong improvement in prevention of new HA-CDI continued.

FY2013 incidence = 31.9



## 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 AND REPORTED?

MRSA surveillance includes the number of new cases of MRSA acquired by patients, divided by the total number of inpatient days over a specified time frame, expressed as a ratio per 10,000 patient-days. The population under MRSA surveillance are inpatients admitted to IH acute care facilities<sup>4</sup> ([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 ARO Screening* tool is completed as part of the initial patient admission history and assessment. Audits of ARO screening compliance were performed three times through the year. 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.

- Extensive collaboration with management and staff on KGH unit with MRSA cluster
- Facilitating the development of processes for bedside equipment cleaning
- Conducting audits of the completion of the ARO screening tool across eight sites and reporting results to acute care leadership
- Promoting initiation of the screening process in emergency departments for admitted patients to ensure that community-associated MRSA are identified

## 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 2017**

<b>Incidence (95% confidence interval)</b>	<b>Five-year trend</b>	<b>FY 2017 benchmark</b>	<b>Status</b>
3.1/10,000 patient-days (2.7/10,000 – 3.6/10,000 patient-days)	Significantly decreasing	4.0/10,000 patient-days	Below benchmark

<sup>4</sup> 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 244 cases of MRSA reported in acute care in IH during FY 2017. A large majority of these were healthcare-associated MRSA (165 HA-MRSA, Figure 7), with smaller contributions from pre-existing (23 pre-existing) and community-associated MRSA (56 CA-MRSA). Community cases contributed less to the MRSA total at smaller (Other) hospitals than they did at larger hospitals (Figure 7).

Of all HA-MRSA 47% were infections, which is greater than the proportion in previous years (35% in FY 2016, 31% in FY 2015; Figure 9).

### Rates:

Across IH, the incidence of new HA-MRSA (colonization and infection) was 3.1/10,000 patient-days (95% confidence interval, 2.7/10,000 patient-days – 3.6/10,000 patient-days, Figure 8). The only facility with a HA-MRSA rate that was significantly different than the IH rate was Shuswap Lake General Hospital (rate given in [Appendix E](#),  $p < 0.001$ ).

The incidence of new HA-MRSA *infection* within IH was 1.5/10,000 patient-days (95% confidence interval, 1.2/10,000 patient-days – 1.8/10,000 patient-days).

The MRSA cluster investigation that started in FY 2016 in one unit at Kelowna General Hospital was closed this year. Enhanced surveillance identified all MRSA cases with a previous admission to the unit within 12 months. Data from before, during, and after the cluster demonstrated that the incidence of MRSA cases associated with the unit had decreased from 27% at the peak of the investigation to 5% at the end, which was less than ½ of the level before the cluster.

Successful HA-MRSA control was demonstrated at Cariboo Memorial Hospital, where vigilance in housekeeping has likely played some role in eliminating HA-MRSA this year (Figure 9).

Challenges in preventing HA-MRSA continued at 100 Mile House Hospital (Appendix E). This is a small hospital where single cases can strongly impact the rate. The frequency of cases over the past years has raised some concerns regarding extended length of stay for inpatients which increases the risk of acquisition of HA-MRSA.

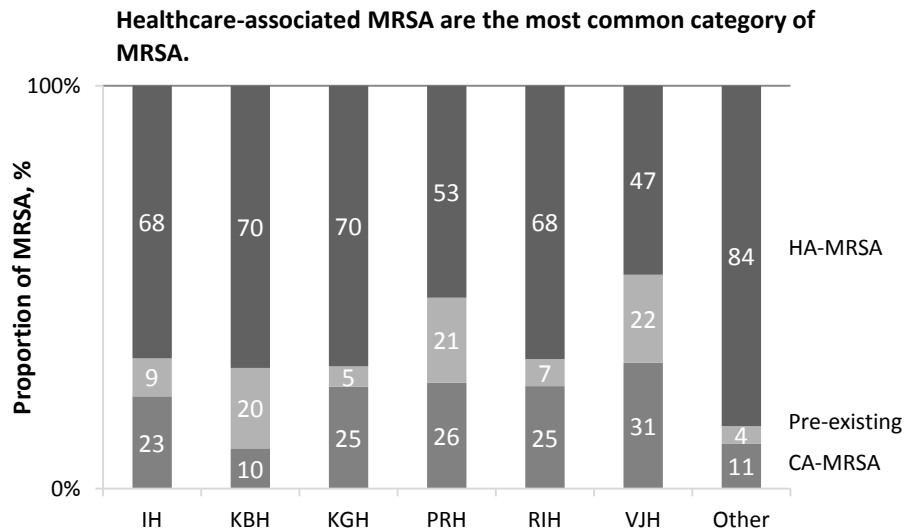
### **Comparison to 2016:**

This year's HA-MRSA rate in IH was not significantly different compared to last year. No individual facility had a significant change in HA-MRSA rate. Similarly, there was no significant change in MRSA infection rate across IH.

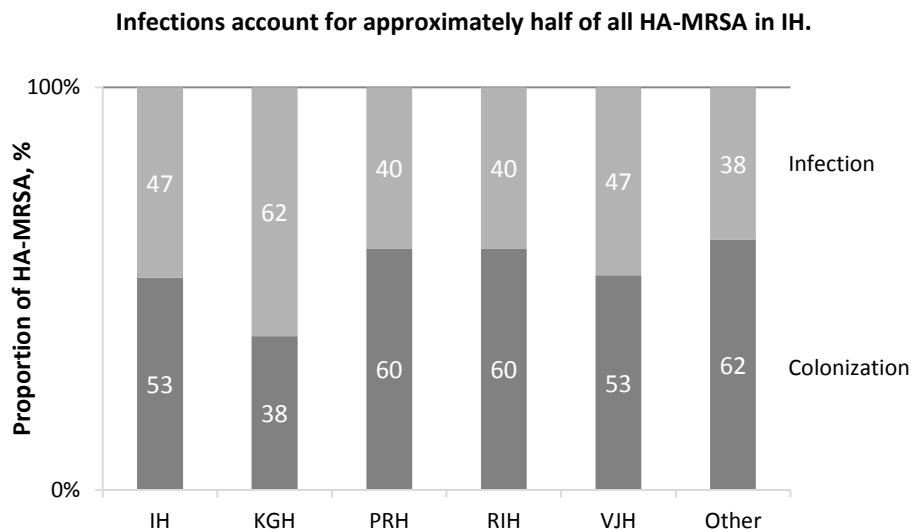
**Long Term Trend:**

Across IH over the past five years, there was a statistically significant trend in HA-MRSA rate. Period end rates have decreased at a slow but consistent manner ( $p < 0.001$ ). A strong decreasing trend continued at Royal Inland Hospital ( $p < 0.001$ ).

**Figure 7. Distribution of MRSA across classification groups by facility, FY 2017 (individual facilities with >10 cases)**



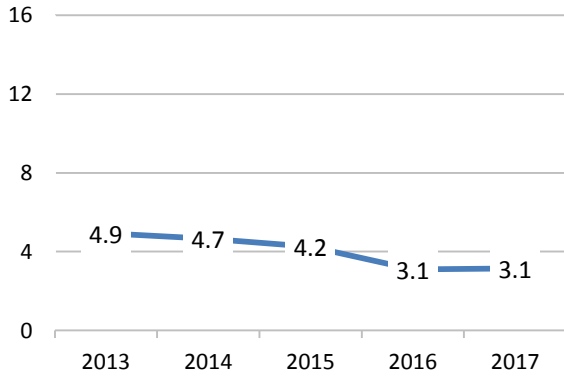
**Figure 8. Distribution of new healthcare-associated MRSA between colonization and infection by facility, FY 2017 (individual facilities with >10 cases)**



**Figure 9. Long-term incidence of HA-MRSA (1/10,000 patient-days), FY 2013 through 2017. Order of graphs based on hospital size.**

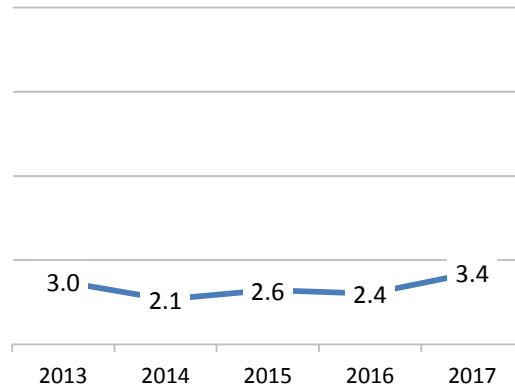
**IH**

HA-MRSA rate leveled off this year.



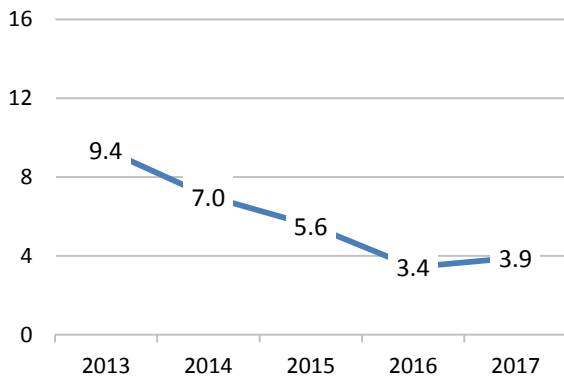
**KGH**

HA-MRSA rate increased this year in KGH.



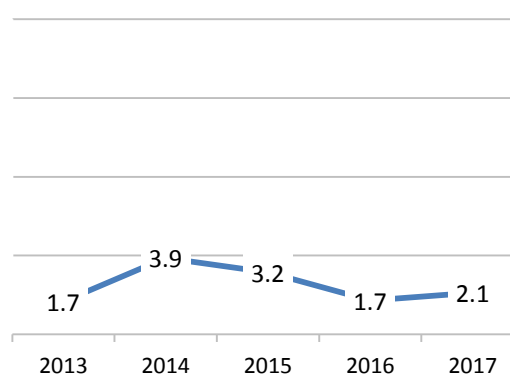
**RIH**

HA-MRSA rate increased at RIH.



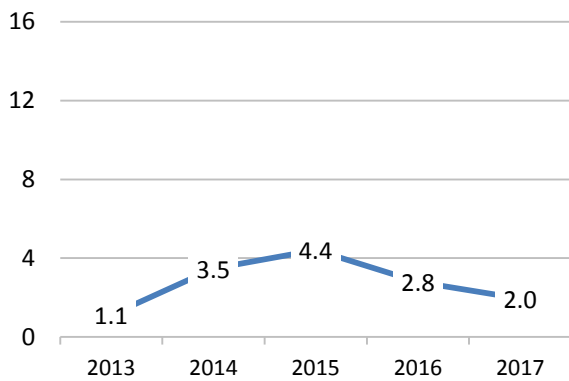
**VJH**

HA-MRSA increased slightly but still good control level.



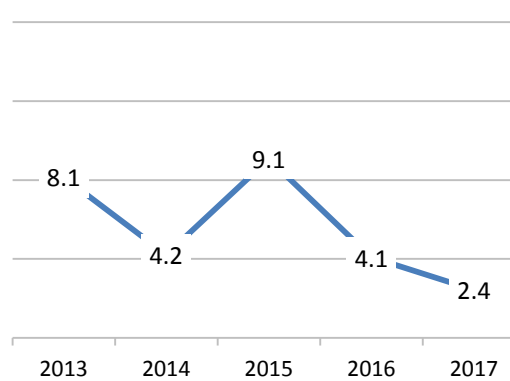
**PRH**

Progress continued this year HA-MRSA with one of the lowest rates in IH.



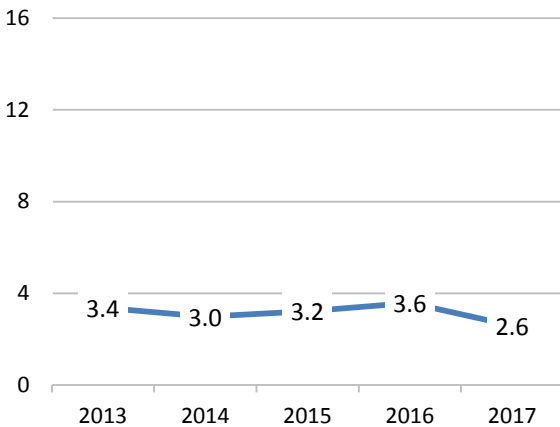
**EKH**

Compared to the previous year, HA-MRSA prevention improved.

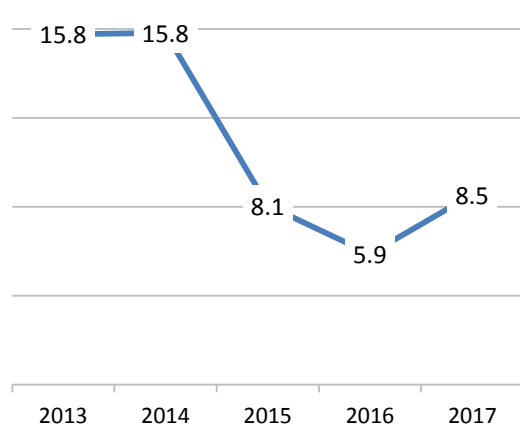


**KBH**

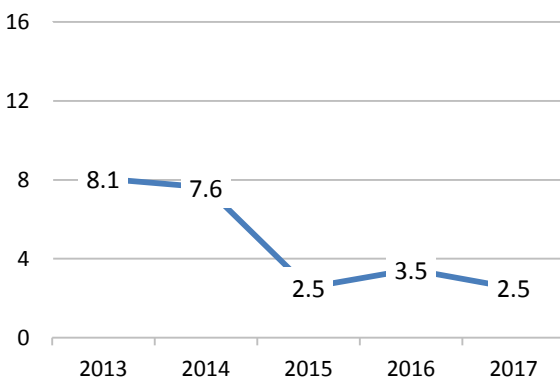
Good improvement in HA-MRSA this year.

**SLH**

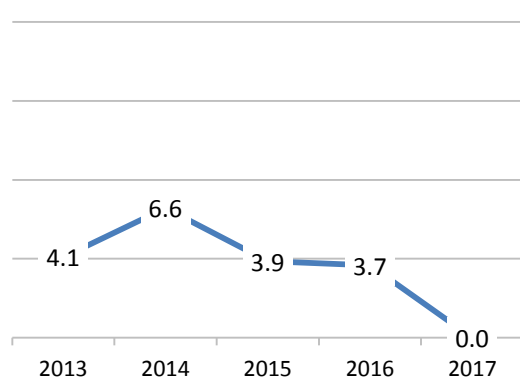
HA-MRSA rate increased this year.

**KLH**

HA-MRSA rate continued to be low this year.

**CMH**

Excellent prevention of HA-MRSA at CMH.



## 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 AND REPORTED?

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 32 cases of VRE reported in IH. Of these, 65.6% were cases of infection and 34.4% were cases of colonization. The rate of healthcare-associated VRE (HA-VRE) was 0.6/10,000 patient-days (95% CI: 0.4/10,000 patient-days – 0.8/10,000 patient-days).

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## 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.

In December 2016 CPOs became a reportable communicable disease in BC.

---

## WHAT IS BEING MEASURED AND REPORTED?

CPO cases are identified from inpatient clinical specimens and from inpatient risk-based 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.

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## ACTIONS IMPLEMENTED

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

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## GOING FORWARD

Screening for new CPO cases will continue.

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## RESULTS

There were two CPO cases identified in IH.

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## 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 AND REPORTED?

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

- Collaboration with Surgical Services to revise the patient discharge information to include wound care instructions
- Investigation of Obstetric SSI cluster at Penticton Regional Hospital
- Reporting of IPAC-related practice concerns observed during Cardiac surgeries at Kelowna General Hospital
- A working group of IMPACT started discussions regarding appropriate SSI surveillance reporting and methods of communication
- IPAC Medical Director made site visits to discuss SSI surveillance with surgeons

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## GOING FORWARD

Cardiac Surgery will continue to monitor SSI cases in collaboration with Kelowna General Hospital ICP and biannual reports. Obstetric SSI risks at Penticton Regional Hospital will be investigated. Development of new online self-serve methods of providing surgeon-specific SSI line lists will be pursued.

## 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.

Data were collected 90 days after the end of FY 2017, so all SSI from procedures done in this year are captured in the analysis below. SSI surveillance data from 10 acute care facilities are included in the IH-wide data, but graphics below are only provided for the largest six facilities.

## RESULTS

Table 4: IH SSI status, FY 2017

Rate (95% CI)	Five-year trend	FY 2017 benchmark	Status
Clean 1.0% (0.9% - 1.2%)	No trend	1.0%	At or above benchmark
Clean-contaminated 1.3% (1.1% - 1.4%)	No trend		

### Clean Surgery SSI:

#### Current Year:

There were 235 clean SSIs in IH. Less than half of cases were superficial incisional (Figure 10). The rate of SSI in clean surgeries was 1.0% (95% CI: 0.9% – 1.2%; Figure 10; [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 American society of Anaesthesiologists (ASA) score and duration of surgery ( $p < 0.05$ ). (ASA score is a measure of patient's general health assessed prior to surgery.) Conversely, the rate at Royal Inland Hospital was significantly lower than other facilities ( $p < 0.001$ ).

#### Comparison to 2016:

Within IH and in individual facilities, there was no statistically significant change in the 2017 clean surgery SSI rate for IH compared to the previous year (Figure 11; [Appendix E](#)).

#### Longer term trend:

Among the facilities with sufficient data there were significant downward trends over the past five years in clean SSI rates at East Kootenay Regional Hospital, Kelowna General Hospital, and Royal Inland Hospital ( $p < 0.05$ ; Figure 11).

### Clean-Contaminated Surgery SSI:

#### Current Year:

There were 175 clean-contaminated SSIs in IH and the rate was 1.3% and the majority of cases were superficial incisional (95% CI: 1.1 – 1.4; Figure 10; [Appendix E](#)). Kelowna General Hospital had a significantly higher rate compared to other facilities after adjusting for ASA score and duration of surgery ( $p < 0.05$ ), while Royal Inland Hospital's rate was significantly lower than others ( $p < 0.001$ ).

**Comparison to 2016:**

Similar to clean surgeries, there was no change from 2016 to 2017 in the SSI rate among clean-contaminated surgeries in IH, or in any facility (Figure 12; [Appendix E](#)).

**Long term trend:**

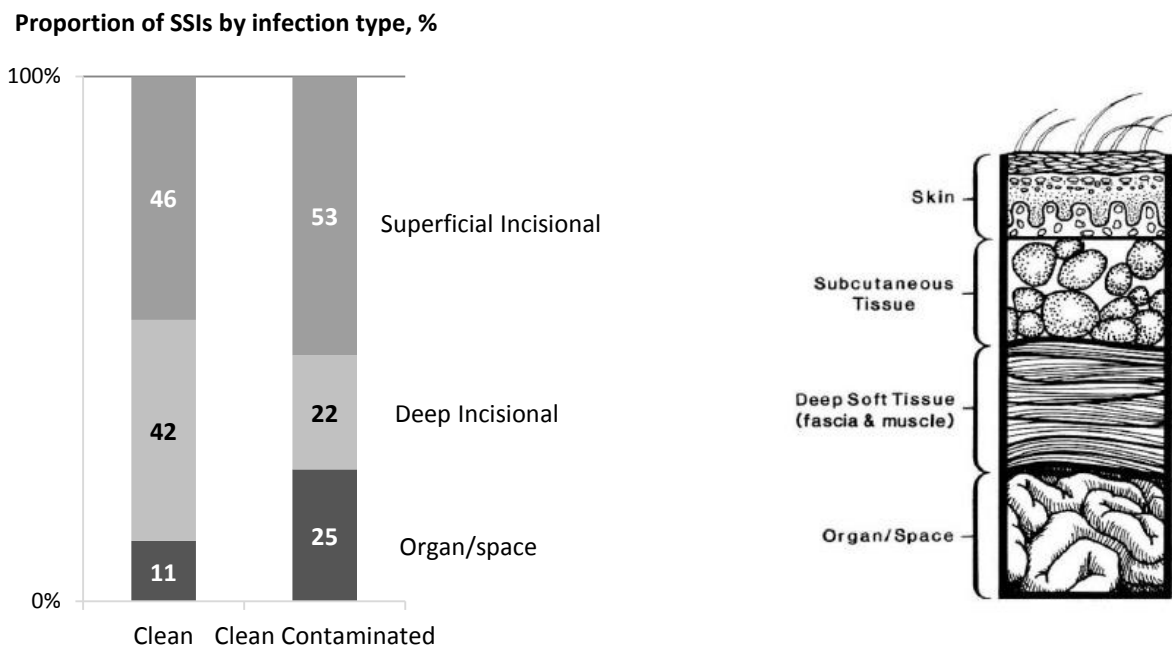
Over the past five years, there has been a significant increasing trend at Penticton Regional Hospital ( $p < 0.001$ ; Figure 12).

**SSI by Procedure Category:**

Among procedure categories with >1000 surgeries per year across all IH, the category with the highest SSI rate was Plastic Surgery (Figure 13). Relative to the other categories shown in Figure 13, this category has the smallest number of surgeries per year and its rates over the years have demonstrated considerable fluctuation. Other categories with higher volume (examples: Orthopedic Surgery, General Surgery) have more consistent rates over the years. The IH-wide SSI rate for Orthopedic Surgery has gradually decreased over the past years (Figure 13).

The increase among Obstetrics in 2017 was primarily associated with one facility where SSI cases among caesarean sections were much more frequent than normal.

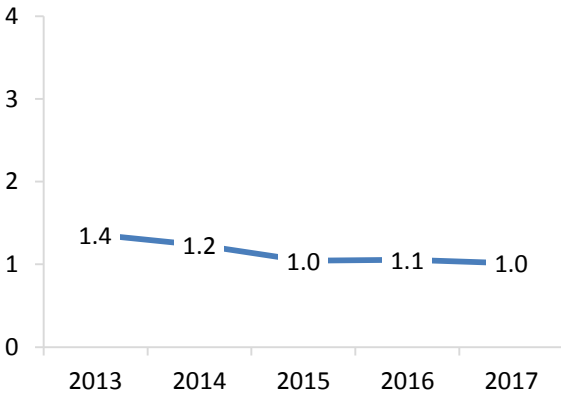
**Figure 10. Surgical site infection types, IH, FY 2017**



**Figure 11. Long-term incidence of SSIs among clean surgeries, FY 2013 through 2017**

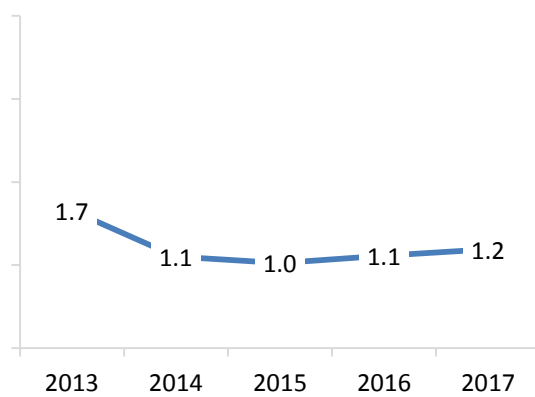
**IH**

SSI rates in clean surgeries have very slowly decreasing over the past 5 years.



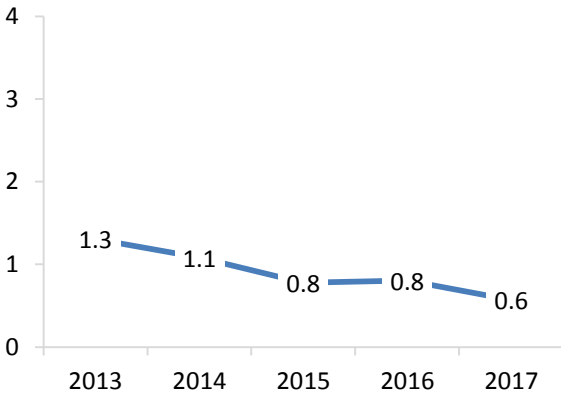
**KGH**

Clean SSI rate remained slightly above benchmark this year.



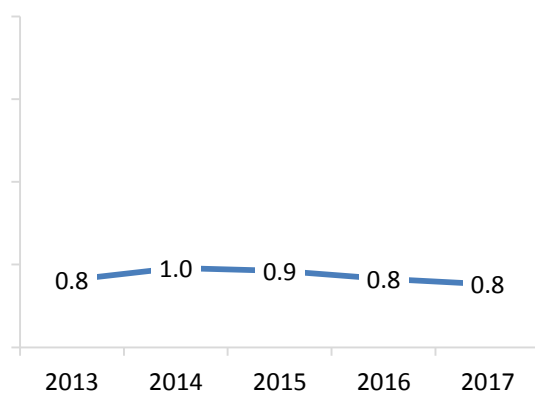
**RIH**

Clean SSI rate continued the decline shown over the past years.



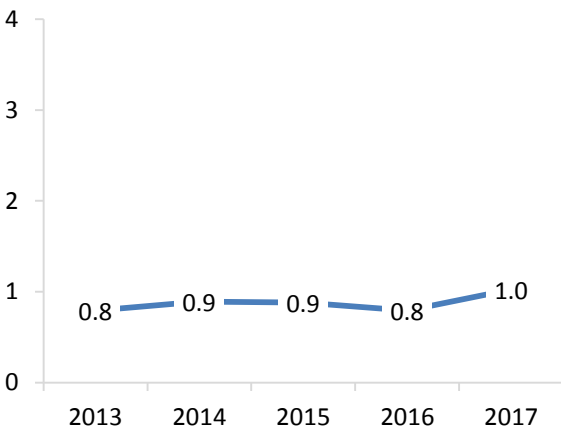
**VJH**

Steady control of SSIs in clean surgery continued.



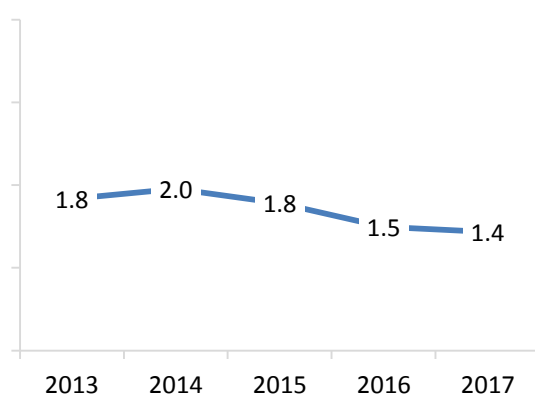
**PRH**

Slight increase in clean SSI this year..



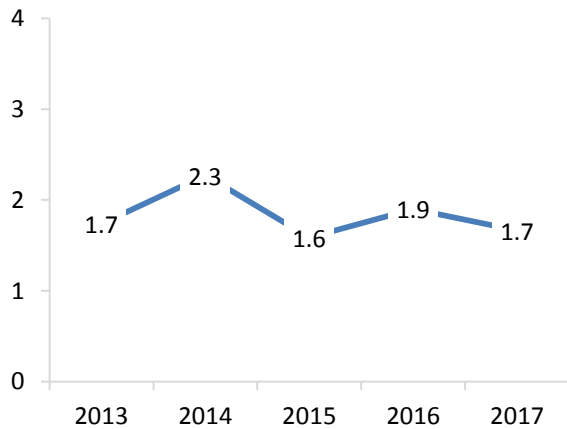
**EKH**

Gradual decrease in rate continued the overall downward trend.



**KBH**

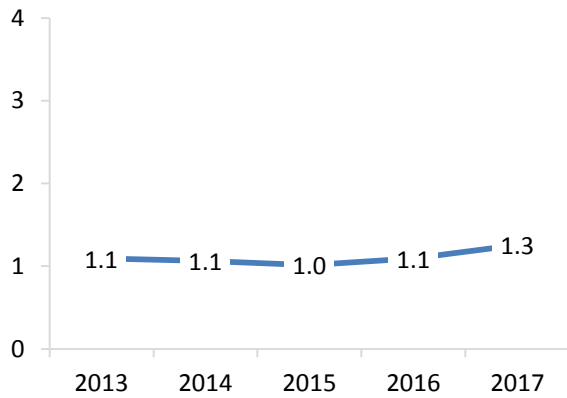
Clean SSI rate decreased slightly this year.



**Figure 12. Long-term incidence of SSIs among clean-contaminated surgeries, FY 2013 through 2017**

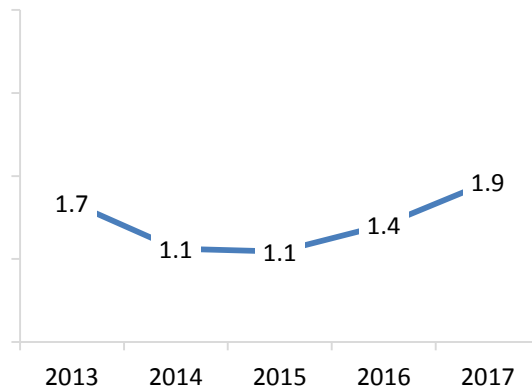
**IH**

Clean-contaminated SSI rate increased after years of consistent performance.



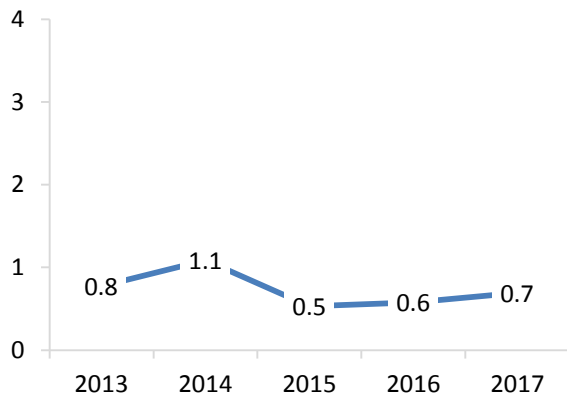
**KGH**

Clean-contaminated SSI rate continued to climb.



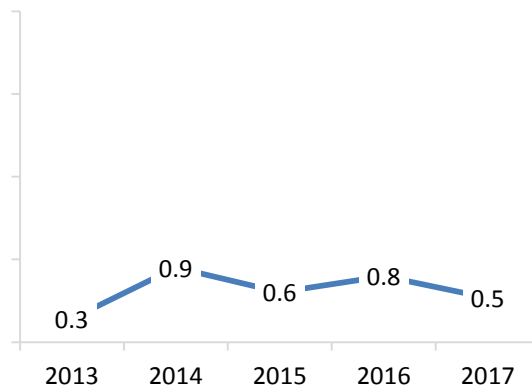
**RIH**

Clean-contaminated rate remained below benchmark.



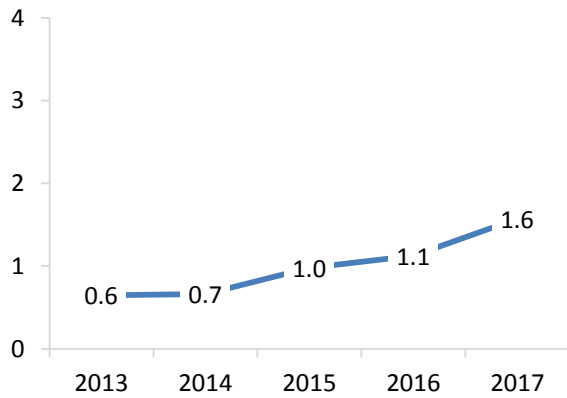
**VJH**

Good control over clean-contaminated rate.



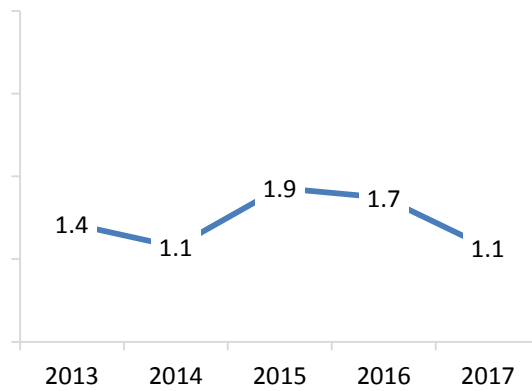
**PRH**

Clean-contaminated SSI rate continued to increase this year.



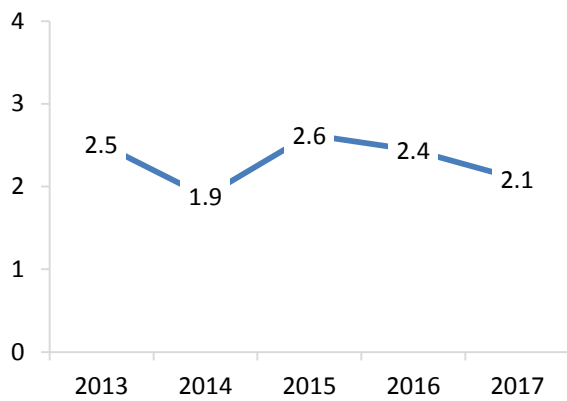
**EKH**

More improvement observed in clean-contaminated SSI rate.

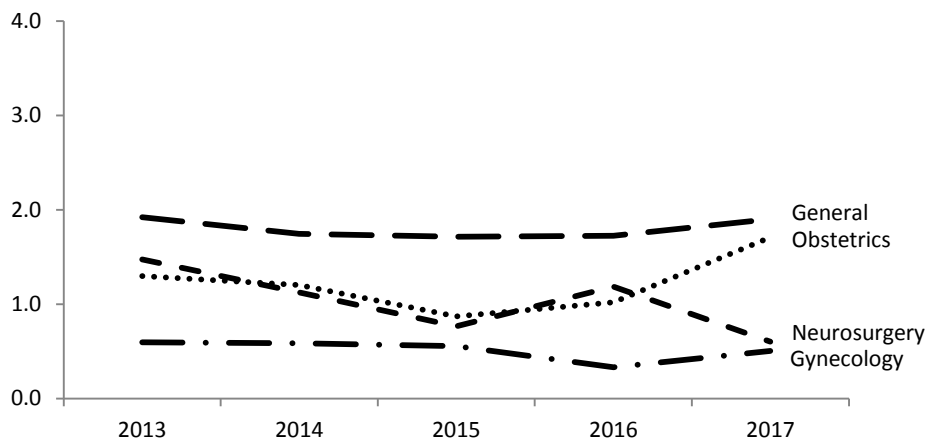


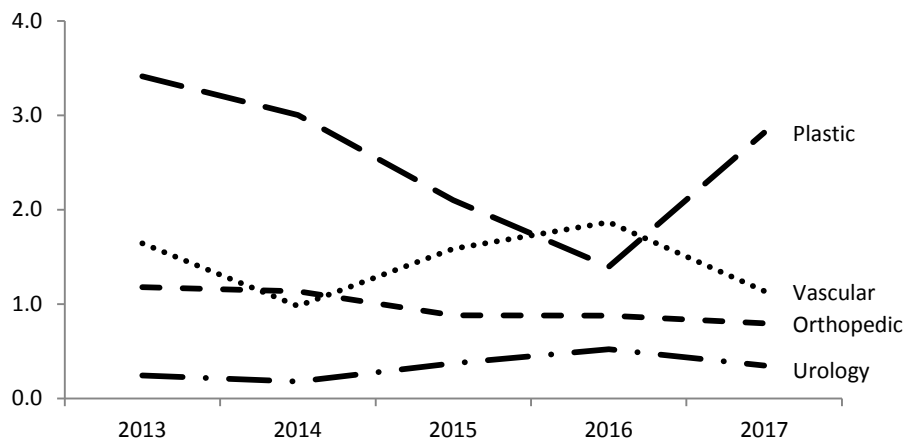
**KBH**

Clean-contaminated SSI rate continued to decrease this year.



**Figure 13. Surgical site infection rate (%) by procedure category, FY 2017 (Categories shown had sufficient data each year)**





## 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 AND REPORTED?

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 1,000 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 1,000 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.



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## RESULTS

There were no VAPs in IH this year.

There were two CLABSI identified at different facilities and three months apart.

## RESIDENTIAL CARE FACILITIES

IPAC supports staff in IH residential care facilities through regular site visits, phone consultations, and following up with laboratory-identified cases of infection as needed. In addition, regular surveillance of HAIs is carried out through prevalence surveys.

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## WHAT IS BEING MEASURED AND REPORTED?

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.

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## ACTIONS IMPLEMENTED

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 criteria<sup>5</sup>. The criteria are based on any signs and symptoms documented in resident nursing charts. Four rounds of surveys were conducted (June, September, December, and March).

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## GOING FORWARD

Prevalence surveys will be done six times per year and monitoring of LRI rates will be an area of focus, given that the rate has been increasing during the year.

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## 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.

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<sup>5</sup> 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

## RESULTS

Prevalence surveys suggested that LRI, LRI with pneumonia, and CAUTI were not common among residents in IH facilities (Table 5). SSTI were more common, as they have been in the past. Larger facilities were surveyed more often than smaller facilities and this allowed some ability to compare rates. Among sites with statistically reliable data, the LRI rate was highest at Cottonwoods Care Centre (3.8%; n = 160) and SSTI rates were highest at Gillis House (4.2%; n = 118), Ponderosa Lodge (4.0%; n = 149), and Gateby Care Facility (3.4%; n = 116).

**Table 5: Residential care HAI prevalence survey results, FY 2017**

	<b>June 2016</b>	<b>September 2016</b>	<b>December 2016</b>	<b>March 2017</b>	<b>FY 2017</b>
<b>Number of residential care facilities surveyed</b>	15	16	15	19	65
<b>Number of residents surveyed</b>	581	582	543	683	2,398
<b>Lower respiratory infection (LRI), %</b>	0.7	0.9	1.1	1.5	1.0
<b>LRI with pneumonia, %</b>	0.3	0.2	0.0	0.3	0.2
<b>Skin and soft tissue infection, %</b>	1.7	2.1	2.4	3.1	2.3
<b>Catheter-associate urinary tract infection, %</b>	0.0	0.2	0.6	0.1	0.2

## OUTBREAK SURVEILLANCE AND MANAGEMENT

Outbreaks can occur at any time during the year however, the majority usually happen during the winter season due to common circulating viruses, including influenza and norvirus. The IH IPAC program collaborates with the CD Unit in managing outbreaks in residential care facilities with the goal being to recognize, report, and react in a timely manner.

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

A total of 431 HCPs were educated on outbreak management.

Working in collaboration with the CD Unit, IPAC updated the RI outbreak guideline, an education session was provided to stakeholders 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. IPAC will review the roles and responsibilities in the management of RI and GI outbreaks in acute care.

### RESULTS

There were four outbreaks of gastrointestinal illness (GI) in acute care settings. Norovirus was identified in three. Patient attack rates ranged from 21% to 67%, and duration ranged from 6 to 11 days. Three occurred in January and one was in March. One outbreak of respiratory illness (RI) occurred in an acute care facility. This was the only RI outbreak in any IH acute care facility reported in IH outbreak databases (FY 2010). It was 7 days long and the patient attack rate was 46%.

There were 23 GI outbreaks in IH residential care facilities and 25 RI outbreaks (Table 6). Norovirus was identified in 11 GI outbreaks in residential care, but the majority of outbreaks had no pathogen identified. This year RI outbreaks were predominantly caused by Influenza A/H3 (13 of 25). There was a strong increase in influenza outbreaks in IH residential compared to the previous year, when there were four influenza outbreaks (Influenza B and A/H1).

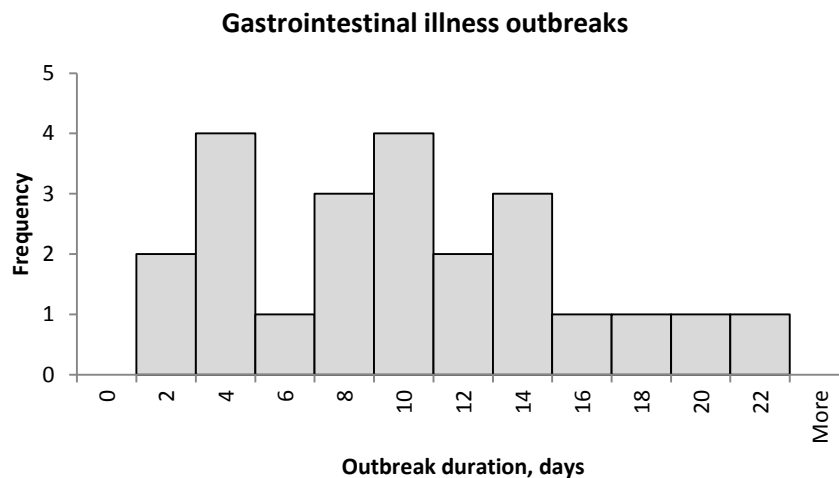
Compared to the FY 2016, the impact of GI outbreaks was lower this year. While the number of RI outbreaks did not change, the attack rates did increase. Histograms of outbreak duration (Figure 14) demonstrate that the average durations in Table 6 are skewed, in particular, RI outbreaks in which a few were unusually long. Similarly, the distributions of outbreak resident attack rates show the bulk of outbreaks had low attack rates, but some outbreaks were exceptionally challenging (Figure 15).

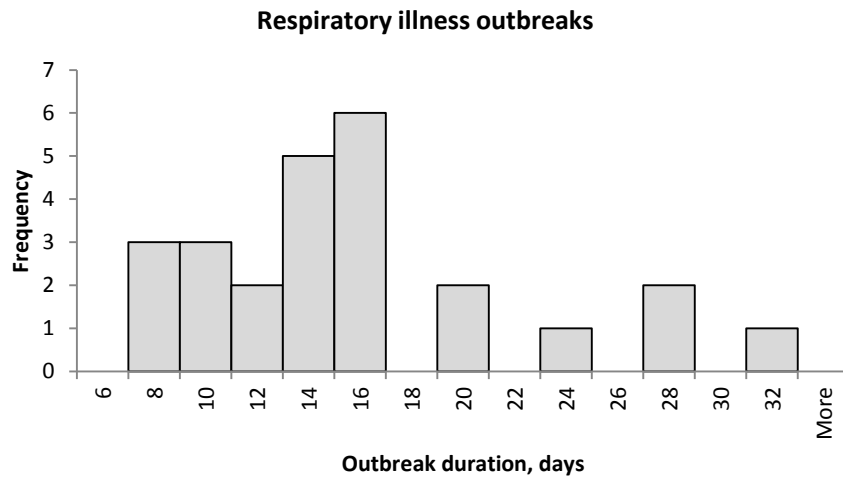
It should be noted that the RI outbreak with the highest resident attack rate has no staff ill and the GI outbreak with the highest resident attack rate had the second-highest staff attack rate. Resident and staff attack rates were highly correlated among GI outbreaks ( $p < 0.001$ ), but were not correlated among RI outbreaks.

**Table 6: IH residential care outbreak summary, FY 2016**

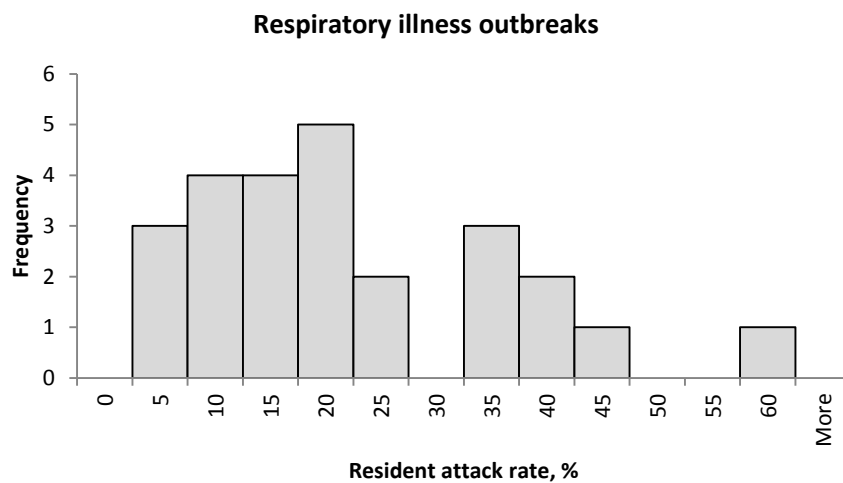
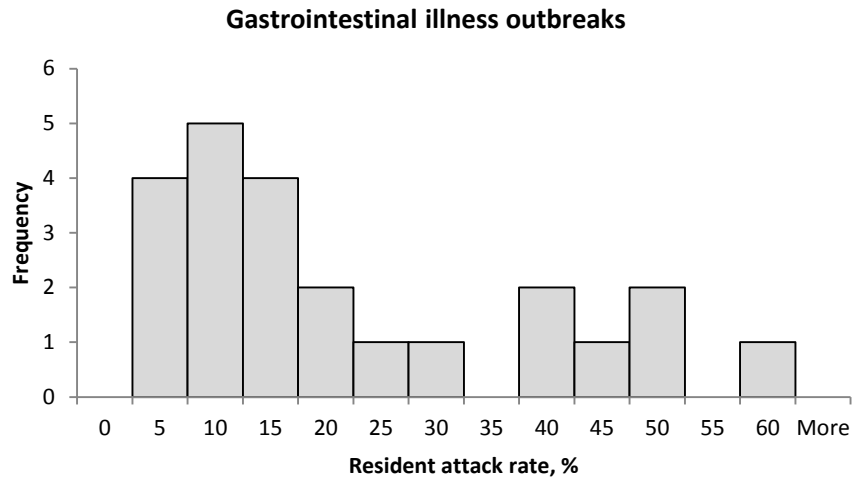
	<b>GI outbreaks</b>		<b>RI outbreaks</b>	
	FY 2017	Change from FY 2016	FY 2017	Change from FY 2016
<b>Count</b>	23	-8	25	0
<b>Average duration, days</b>	9.6	-1.5	15.4	+1.3
<b>Average resident attack rate, %</b>	20.0	-5.0	19.8	+4.8
<b>Average staff attack rate, %</b>	15.4	-4.6	10.9	+6.9

**Figure 14. Histograms of GI and RI outbreak duration, IH residential care facilities, FY 2017**





**Figure 15. Histograms of GI and RI outbreak resident attack rates, IH residential care facilities, FY 2017**



STRATEGY	STAKEHOLDERS	PERFORMANCE MEASURES	SHORT-TERM GOALS (WITHIN 1 YEAR)
CDI	PICNet, Pharmacy, Housekeeping, Site/Unit Managers, HCPs, Antimicrobial Stewardship Committee	Ongoing surveillance	All facilities below benchmark
		Number of HCPs educated	Targeted education to units over benchmark
		Number of times alert levels exceeded	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 Review facility alert levels
			Zero outbreaks
Community Programs (In Alignment with IH5 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	Working group(s) created	Create working group(s) and deliverables as required
		Completed needs assessment	Develop and implement a work plan based on the results of the Working Group
		Roles and responsibilities defined	Create roles and responsibilities of IPAC in the Community setting
		Implementation plan developed	Determine ICP contact for each geographical area 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	Quarterly observation quotas met for acute and residential	Engage acute, residential and community leadership teams to promote HH at all levels Provide annual HH education session (eg. skills fair)
		Number of HCPs educated	
		Two education modules yearly	Develop and implement education modules
		Completion of infrastructure audits every three years	Evaluate outcome of infrastructure audits and make recommendations to senior leadership
		Number of documented iLearn education sessions	Request annual completion (%) of iLearn sessions Promote HH iLearn module
		Quarterly HH compliance rates	Consistent 80% compliance rate for all facilities
		Number of feedback tools completed	Completion of feedback tool for HH rates below 69% (including iLearn module)
		Number of in-the-moment feedback opportunities	Initiating in-the-moment feedback in the HH observation process
		Quarterly reporting to PICNet, Public & HCPs	Completion and submission as required
		Number of periods above benchmark	Create and implement action plans for patient care areas of concern
HAI Surveillance	PICNet, Physicians, Housekeeping, Site/Unit Managers, HCPs, Patients, Residents, SET, Relevant Committees	Number of HCPs educated	All facilities below benchmark
		Daily Surveillance	Implement revised surveillance indicators and reporting process
		Implementation of revised indicators and process	Develop a plan for unit specific surveillance
		Reporting of unit specific HAI rates	
Education/ Accreditation	ICPs, HCPs, Quality & Patient Safety	Number of materials revised/updated	Revised/updated all education materials (standardize content across IH)
		Number of new materials developed	Investigate other methods of providing IPAC education (eg. videos)
		Number of HCPs that have completed routine practice iLearn module annually	Develop and implement routine practices iLearn module
		Monthly accreditation discussion at IPAC meetings	Standing accreditation item on the monthly IPAC meeting agenda. Monthly rotating ICP presentations. Develop and implement action plans to address gaps in best practices
			Revised/updated all Outbreak Management education materials and outbreak guidelines to reflect change of ICPs as key stakeholders in IH owned facilities. (standardize content with CDU)
Outbreak Management (IH owned facilities)	ICPs, HCPs, Communicable Disease Unit, Quality & Patient Safety, Access and Flow, Acute and Residential Care, Support Services, Physicians, Patients, Residents	Decrease in the number of IH facility outbreaks	Develop. New outbreak management algorithms and place on Inside Net
		Number of HCPs that have completed the Provincial iLearn modules annually	Promote Provincial Infection Control Routinized additional practices iLearn modules
		Decrease in the Duration of Outbreaks in IH Facilities.	Education to residential and acute care leaders regarding new outbreak management with ICPs for IH facilities
		Monthly Outbreak discussions at IPAC meetings	Develop strong working relationships with CDU to create a complimentary team for outbreak management Develop and implement action plans to address gaps in outbreak management

# APPENDICES

## APPENDIX A: STRATEGIC PLAN FISCAL YEAR 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	
		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	Zero transmission of CDI
		Number of times alert levels exceeded	Review facility alert levels Zero outbreaks	Implementation of unit specific alert levels Zero outbreaks	
Community Programs (In Alignment with IH 5 Key Strategies)	Community Teams, P3 Residential, CD Unit, IH Clinics, Contracted Services (Housekeeping), HCPs, Clients, Mental Health, Senior Care, Primary Health Care, Rural & Aboriginal Health	Working group created	Create a working group and deliverables	Develop educational materials	Provide basic IPAC education and consultation for Community HCPs
		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	
		Roles and responsibilities defined	Create roles and responsibilities of IPAC in the Community setting		
		Implementation plan developed	Determine ICP contact for each geographical area		
		Quarterly observation quotas met for acute and residential	Each geographical area will have a needs assessment completed by ICPs	Complete practice assessments in wound care and outreach clinics	
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 Provide annual HH education session (eg. skills fair)		100% HH compliance rate for all HCPs
		Two education modules yearly	Develop and implement education modules		
		Completion of infrastructure audits every three years	Evaluate outcome of infrastructure audits and make recommendations to senior leadership		
		Number of documented Learn education sessions	Request annual completion (%) of Learn sessions Promote HH Learn module	All IH staff complete Learn each year	
		Quarterly HH compliance rates	Consistent 80% compliance rate for all facilities	Consistent 85% compliance rate for all acute facilities	
		Number of feedback tools completed	Completion of feedback tool for HH rates below 69% (including Learn module)	Continue completion of feedback tool for HH rates below 74% (including Learn module)	
		Quarterly reporting to PICNet, Public & HCPs			
HAI Surveillance	PICNet, Physicians, Housekeeping, Site/Unit Managers, HCPs, Patients, Residents, SET, Relevant Committees	Number of periods above benchmark	Create and implement action plans for patient care areas of concern	Continue targeted education on units above benchmark	Zero HAIs
		Number of HCPs educated	All facilities below benchmark	Use lessons learned from previous action plans to continue to improve practices and reduce HAIs	
		Daily Surveillance	Implement revised surveillance indicators and reporting process	Reduce benchmarks	
		Implementation of revised indicators and process	Develop a plan for unit specific surveillance	Implementation of unit specific surveillance	
		Reporting of unit specific HAI rates			
Education/Accreditation	ICPs, HCPs, Quality & Patient Safety	Number of materials revised/updated	Revise/ update all education materials (standardize content across H)	Reassess annually	All HCPs receive standardized IPAC educational information Program is prepared for accreditation in 2019
		Number of new materials developed	Investigate other methods of providing IPAC education (eg. videos)		
		Number of HCPs that have completed routine practices Learn module annually	Develop and implement routine practices Learn module	Develop and implement Learn module for Additional Precautions	
		Monthly accreditation discussion at IPAC meetings	Standing accreditation item on the monthly IPAC meeting agenda; Monthly rotating ICP observations.	Standing accreditation item on the monthly IPAC meeting agenda; Monthly rotating ICP observations.	
			Develop and implement action plans to address gaps in best practices	Review, develop and implement action plans to address gaps in best practices	

## 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...	<b>Infection reflections newsletter</b> To share the latest information about Infection Control issues and the IPAC team members, inaugural Christmas edition.	January 15, 2017	Content: Andrea Neil Distribution: Communications
Public Community All IH staff Physicians	Public Website In the Loop	<b>Hand Hygiene Compliance results</b> To provide the public, the community, staff and physicians with an update on Hand Hygiene compliance results within IH.	January 15, 2017	Content: Julie Mori Distribution: Communications
Public Community All IH staff Physicians	Public Website In the Loop	<b>Healthcare Acquired Infections (HAI) results</b> To provide the public, the community, staff and physicians with an update on HAI results within IH.	January 15, 2017	Content: Julie Mori Distribution: Communications
All IH staff	IPAC web page In the Loop...	<b>Infection reflections newsletter</b> To share the latest information about Infection Control issues and the IPAC team members.	April 15, 2017	Content: Andrea Neil Distribution: Communications
Public Community All IH staff Physicians	Public Website In the Loop	<b>Hand Hygiene Compliance results</b> To provide the public, the community, staff and physicians with an update on Hand Hygiene compliance results within IH.	April 15, 2017	Content: Julie Mori Distribution: Communications
Public Community All IH staff Physicians	Public Website In the Loop	<b>Healthcare Acquired Infections (HAI) results</b> To provide the public, the community, staff and physicians with an update on HAI results within IH.	April 15, 2017	Content: Julie Mori Distribution: Communications
All IH staff	Facebook "share" In the Loop	<b>WHO "Save Lives: Clean Your Hands"</b> To support awareness of the WHO campaign to wash your hands.	May 5, 2017	Content: Andrea Neil Distribution: Communications
All IH staff	IPAC web page In the Loop	<b>Infection reflections newsletter</b> To share the latest information about Infection Control issues and the IPAC team members.	July 15, 2017	Content: Andrea Neil Distribution: Communications
Public Community All IH staff Physicians	Public Website In the Loop	<b>Hand Hygiene Compliance results</b> To provide the public, the community, staff and physicians with an update on Hand Hygiene compliance results within IH.	July 15, 2017	Content: Julie Mori Distribution: Communications
Public Community All IH staff Physicians	InsideNet In the Loop IPAC web page	<b>Healthcare Acquired Infections (HAI) results</b> To provide the public, the community, staff and physicians with an update on HAI results within IH.	July 15, 2017	Content: Julie Mori Distribution: Communications



All IH staff, members of public	InsideNet Rotating ad Facebook posting (with pictures after the fact)	<b>Infection Control week</b> International focus on Infection prevention and control Will have a specific theme (not aware what this is yet)	October 15 – 21, 2017	Content: Nicki Gill Distribution: Communications
All IH staff, members of public	Facebook “share”	<b>Global handwashing day</b> To support awareness of Global handwashing day” and tie it into Infection Control week.	October 15, 2017	Content: Andrea Neil Distribution: Communications
Public Community All IH staff Physicians	InsideNet In the Loop IPAC web page	<b>Hand Hygiene Compliance results</b> To provide the public, the community, staff and physicians with an update on Hand Hygiene compliance results within IH.	October 15, 2017	Content: Julie Mori Distribution: Communications
Public Community All IH staff Physicians	InsideNet In the Loop IPAC web page	<b>Healthcare Acquired Infections (HAI) results</b> To provide the public, the community, staff and physicians with an update on HAI results within IH.	October 15, 2017	Content: Julie Mori Distribution: Communications
All IH staff	IPAC web page In the Loop...	<b>Infection reflections newsletter</b> To share the latest information about Infection Control issues and the IPAC team members	Dec 15, 2017	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 four weeks before hospitalization AND symptom onset less than four 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 four 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 four 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 two 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  $\leq$  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*<sup>6</sup>. Clean wounds are uninfected operative wounds 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.

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<sup>6</sup> Interior Health Surgical Services Practices: Operative Wound Classification Reference Guide (May 2011)

## **VAP**

Minimum time on the Ventilator  $\geq$  three 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 two or more days:

- Increase FIO<sub>2</sub> of  $\geq 20$  or PEEP  $\geq 3$ cm for  $\geq$  two days
- Changes in temperature OR white blood cell count AND a new antimicrobial agent started for  $\geq$  four 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  $>$  two 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 two or more blood cultures, drawn on separate occasions
  - AND criterion elements occurred within a timeframe that does not exceed a gap of one calendar day
- Elements required for patient  $<$  one 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 BY FACILITY

<b>Acute Care Facility Hand Hygiene Compliance</b>				
<b>Facility</b>	<b>Compliance Rate, %</b>	<b>95% Confidence Interval, %</b>	<b>Observations</b>	<b>Change from FY 2016, %</b>
<b>IH</b>	79	78 - 79	31,356	1
<b>Arrow Lakes Hospital</b>	72	56 - 87	32	-13
<b>Boundary Hospital</b>	76	71 - 80	344	0
<b>Cariboo Memorial Hospital</b>	83	79 - 86	373	8
<b>Creston Valley Hospital</b>	78	73 - 83	302	3
<b>Dr. Helmcken Memorial Hospital</b>	79	71 - 87	95	-4
<b>East Kootenay Regional Hospital</b>	76	74 - 78	1880	5
<b>Elk Valley Hospital</b>	72	61 - 77	420	4
<b>Golden and District General Hospital</b>	75	66 - 84	92	-9
<b>Invermere and District Hospital</b>	80	71 - 88	83	-6
<b>Kootenay Boundary Regional Hospital</b>	80	78 - 82	1962	-1
<b>Kelowna General Hospital</b>	76	75 - 77	8955	-3
<b>Kootenay Lake Hospital</b>	83	80 - 85	946	1
<b>Lillooet Hospital and Health Centre</b>	NA	NA	32	NA
<b>Nicola Valley Health Centre</b>	77	70 - 83	176	14
<b>100 Mile District General Hospital</b>	82	78 - 86	357	12
<b>Princeton General Hospital</b>	89	83 - 95	108	1
<b>Penticton Regional Hospital</b>	76	75 - 78	3447	2
<b>Queen Victoria Hospital</b>	83	75 - 90	93	-8
<b>Royal Inland Hospital</b>	81	80 - 82	5392	1
<b>Shuswap Lake General Hospital</b>	87	86 - 88	2188	3
<b>South Okanagan General Hospital</b>	80	76 - 84	406	4
<b>Vernon Jubilee Hospital</b>	79	78 - 81	3614	3

N/A indicates rate not reportable

<b>Residential Care Facility Hand Hygiene Compliance</b>			
<b>Facility</b>	<b>Compliance Rate, %</b>	<b>95% Confidence Interval, %</b>	<b>Observations</b>
<b>IH</b>	77	76 - 78	9950
<b>Arrow Lakes Hospital (Minto)</b>	100	100 - 100	20
<b>Ashcroft Hospital</b>	73	63 - 83	81
<b>Bastion Place</b>	79	74 - 83	327
<b>Brookhaven</b>	74	68 - 80	177
<b>Columbia House</b>	78	70 - 85	107
<b>Columbia View Lodge</b>	74	69 - 78	325
<b>Cottonwoods</b>	72	69 - 75	919
<b>David Lloyd Jones</b>	71	65 - 77	236

<b>Deni House Residential Services</b>	89	82 – 96	72
<b>Dr. F.W. Green Home</b>	75	70 – 79	355
<b>Fischer Place/Mill Site Lodge</b>	77	72 – 82	270
<b>Forestview (Dr. Helmcken)</b>	88	81 – 95	83
<b>Gillis House</b>	74	69 – 79	328
<b>Hardy View Lodge</b>	82	78 – 86	365
<b>Henry Durand Manor</b>	88	81 – 94	97
<b>Kimberley Special Care Home</b>	73	68 – 77	342
<b>McKinney Place</b>	76	71 – 81	307
<b>Mountainview Lodge</b>	88	77 – 98	40
<b>Mt Cartier Court</b>	86	80 – 93	108
<b>Nelson Jubilee Manor</b>	85	79 – 91	136
<b>Noric House</b>	82	77 – 86	325
<b>Orchard Haven (SSHC)</b>	90	83 – 97	80
<b>Overlander RC</b>	78	75 – 81	720
<b>Parkview Place</b>	83	76 – 89	122
<b>Pleasant Valley Manor</b>	77	72 – 81	348
<b>Polson Residential Care</b>	79	74 – 84	289
<b>Ponderosa Lodge</b>	86	82 – 89	366
<b>Poplar Ridge</b>	74	68 – 79	227
<b>Ridgewood Lodge</b>	78	71 – 84	148
<b>Slocan Community Health Centre</b>	77	64 – 90	39
<b>Summerland Extended Care (Dr Andrew Pavilion)</b>	84	79 – 89	204
<b>Sunnybank Care Home</b>	76	71 - 82	203
<b>Swan Valley Lodge</b>	81	77 – 85	370
<b>Talarico Place</b>	74	69 – 80	242
<b>The Gateby</b>	72	67 – 77	311
<b>Three Links Manor</b>	73	69 – 78	337
<b>Trinity Care Centre</b>	74	69 – 79	295
<b>Victorian Hospital</b>	NA	NA	30
<b>Westview Extended Care</b>	70	65 – 74	407

N/A indicates rate not reportable

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 <sup>1</sup>	95% CI <sup>1</sup>	Difference in rate from FY 2016 <sup>2</sup>
All	IH	209	483,907	4.3	3.7 – 4.9	-0.6
Tertiary hospital	KGH	71	142,376	5.0	3.8 – 6.2	-0.5
	RIH	36	101,502	3.5	2.4 – 4.7	0.4
Service area hospital	EKH	11	25,066	4.4	1.8 – 7.0	0.1
	KBH	13	22,864	5.7	2.6 – 8.8	-3.0
	PRH	22	45,370	4.8	2.8 – 6.9	-2.1
	VJH	17	63,844	2.7	1.4 – 3.9	-1.7
Community level hospital	ALH	1	1029	NA	NA	9.7
	BDH	4	4372	9.1	0.2 – 18.1	4.0
	CMH	3	10,441	NA	NA	-1.7
	CVH	1	5563	NA	NA	0.0
	DHH	0	1893	NA	NA	-6.5
	EVH	4	3907	10.2	0.2 – 20.3	1.5
	GDH	2	2148	NA	NA	-0.8
	IDH	2	1968	NA	NA	6.0
	KLH	7	11,921	5.9	1.5 – 10.2	-0.2
	LIH	0	1269	0.0	0.0 – 0.0	-7.1
	NVH	1	2747	NA	NA	3.6
	OMH	0	7366	0.0	0.0 – 0.0	-1.6
	PGH	1	1838	NA	NA	0.4
	QVH	0	2908	0.0	0.0 – 0.0	-2.6
SLH	10	17,519	5.7	2.2 – 9.2	0.4	
SOG	3	5996	NA	NA	2.0	

<sup>1</sup> NA: Not available due to lack of insufficient data

<sup>2</sup> \* Indicates statistical significance,  $p < 0.05$ . Differences without \* are not statistically significant.

Healthcare-associated Methicillin-resistant <i>Staphylococcus aureus</i>							
Facility type	Facility	Count	Patient-days	Rate, 1/10,000 patient-days <sup>1</sup>	95% CI <sup>1</sup>	Difference in rate from 2015 FY <sup>2</sup>	Infection rate, 1/10,000 patient-days
All	IH	165	525,574	3.1	2.7 – 3.6	0.0	1.5
Tertiary hospital	KGH	55	161,769	3.4	2.6 – 4.4	1.0	2.1
	RIH	40	102,522	3.9	2.7 – 5.1	0.5	1.6
Service area hospital	EKH	7	28,804	2.4	0.6 – 4.2	-1.7	0.7
	KBH	7	27,043	2.6	0.7 – 4.5	-1.0	0.7
	PRH	10	51,257	2.0	0.7 – 3.2	-0.8	0.8
	VJH	15	71,070	2.1	0.9 – 3.0	0.4	1.0
Community level hospital	ALH	0	1029	0.0	0.0 – 0.0	0.0	0.0
	BDH	2	4372	NA	NA	-0.5	NA
	CMH	0	10,525	0.0	0.0 – 0.0	-3.7	NA
	CVH	1	5583	NA	NA	-1.7	0.0
	DHH	1	1893	NA	NA	5.3	0.0
	EVH	7	28,804	2.4	0.6 – 4.2	-1.7	0.7
	GDH	0	2153	0.0	0.0 – 0.0	0.0	0.0
	IDH	0	1974	0.0	0.0 – 0.0	-4.2	0.0
	KLH	3	11,963	NA	NA	-0.9	NA
	LIH	0	1272	0.0	0.0 – 0.0	0.0	0.0
	NVH	0	2747	0.0	0.0 – 0.0	-3.8	0.0
	OMH	5	7373	6.8	0.8 – 12.7	-9.3	4.1
	PGH	0	1838	0.0	0.0 – 0.0	0.0	0.0
	QVH	0	2918	0.0	0.0 – 0.0	-7.5	0.0
	SLH	15	17,544	8.5	4.2 – 12.9	2.7	2.3
SOG	3	5996	NA	NA	5.0	NA	

<sup>1</sup> NA: Not available due to lack of insufficient data

<sup>2</sup> \* indicates statistically significant difference,  $p < 0.05$

Surgical Site Infection, Clean Surgeries						
Facility type	Facility	Count	Surgeries	Rate <sup>1</sup> , %	95% CI <sup>1</sup>	Difference in rate from 2016 FY <sup>2</sup>
All	IH	235	23,131	1.0	0.9 – 1.2	-0.1
Tertiary hospital	KGH	98	8229	1.2	1.0 – 1.4	0.1
	RIH	27	4737	0.6	0.4 – 0.8	-0.2
Service area hospital	EKH	24	1676	1.4	0.9 – 2.0	-0.1
	KBH	34	2041	1.7	1.1 – 2.2	-0.2
	PRH	22	2148	1.0	0.6 – 1.5	0.2
	VJH	22	2884	0.8	0.5 – 1.1	-0.1
Community hospital	CMH	1	412	NA	NA	0.0
	KLH	2	145	NA	NA	0.7
	QVH	2	121	NA	NA	0.9



	SLH	3	738	NA	NA	-0.3
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<sup>1</sup> NA: Not available due to lack of sufficient data

<sup>2</sup> \* indicates statistical significance,  $p < 0.05$

Surgical Site Infection, Clean-contaminated Surgeries						
Facility type	Facility	Count	Surgeries	Rate <sup>1</sup> , %	95% confidence interval of rate <sup>1</sup>	Difference in rate from 2015 FY <sup>2</sup>
All	IH	175	13,894	1.3	1.1 – 1.4	0.2
Tertiary hospital	KGH	78	4046	1.9	1.5 – 2.4	0.5
	RIH	22	3170	0.7	0.4 – 1.0	0.1
Service area hospital	EKH	13	1141	1.1	0.5 – 1.8	-0.6
	KBH	16	764	2.1	1.1 – 3.1	-0.3
	PRH	22	1399	1.6	0.9 – 2.2	0.4
	VJH	10	1868	0.5	0.2 – 0.9	-0.3
Community hospital	CMH	10	961	1.0	0.4 – 1.7	0.8
	KLH	1	222	NA	NA	0.0
	QVH	0	22	0.0	0.0 – 0.0	0.0
	SLH	3	301	NA	NA	0.4

<sup>1</sup> NA: Not available due to lack of sufficient data

<sup>2</sup> \* indicates statistical significance,  $p < 0.05$