

Reality Check: Challenges with Reporting Data from Various Sources

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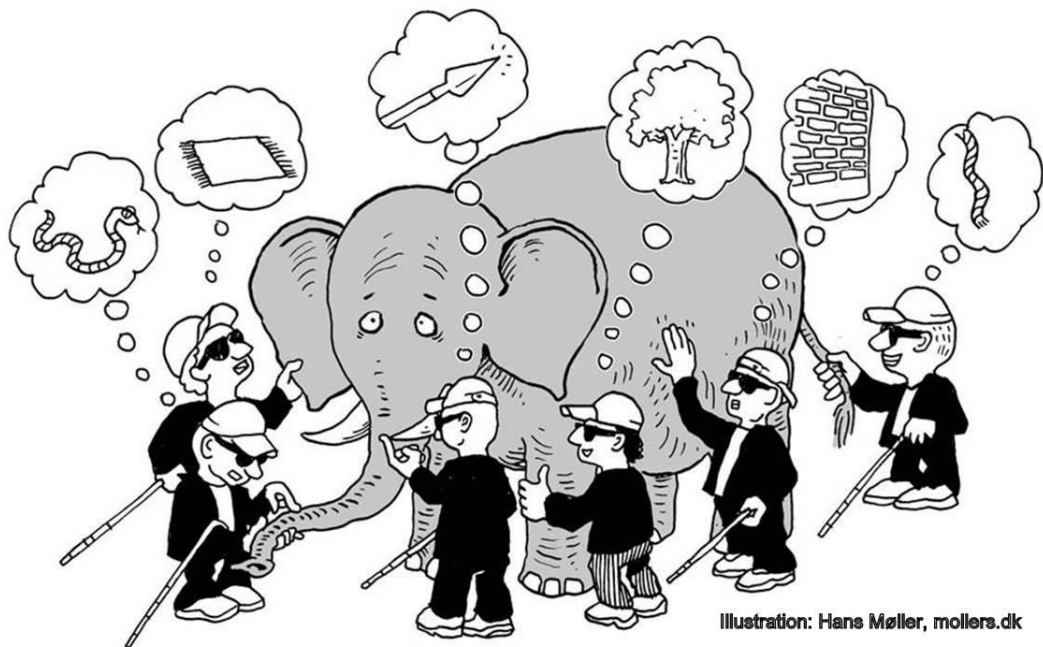
Disclosure Statement

- I have no affiliation (financial or otherwise) with a pharmaceutical, medical device or communications organization.

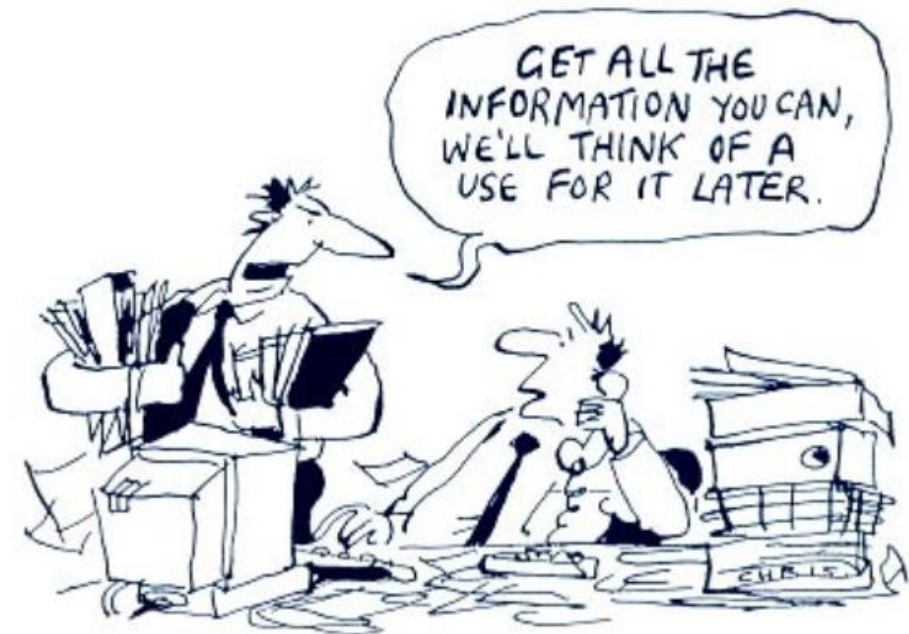
Measurement is the first step that leads to control and eventually to improvement. - H. James Harrington

Measure → understand → control → improve

But...



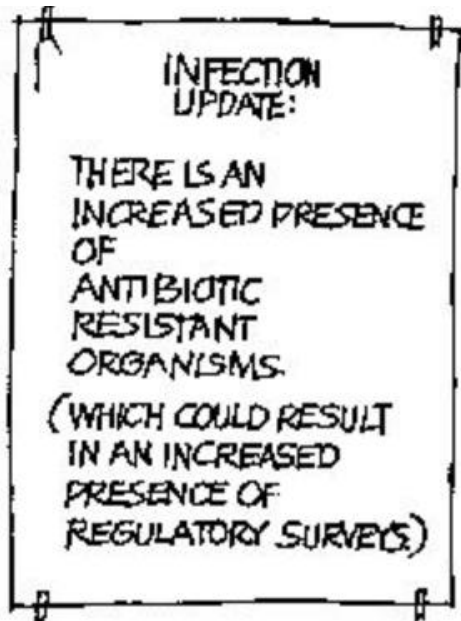
Individuals may perceive and therefore measure healthcare-associated infections differently



Pressure on a program to measure inaccurately so the problem remains poorly understood

And...

HAI data under scrutiny by public payer as quality metrics
(Reimbursement in the US)



Critical to follow standard definitions and ensure consistency

- Ascertainment of infection
- Attribution to healthcare setting
- Reporting internally and externally

Objectives

- Review process and outcome measures in surveillance of healthcare-associated infections
- Review impact of reportable HAI surveillance indicators
- Highlight pitfalls in accurately reporting data from various sources

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Value of surveillance

- Systematic, ongoing collection and analysis of data during a defined period of time using standardized definitions
 - May also involve laboratory confirmation and chart review
- Timely dissemination of information to those who require it in order to take action = improve patient safety
- Why?
 - Provides measure of burden of illness
 - Establishes benchmark rates for internal and external comparison
 - May motivate hospitals to adhere more closely to best practices in infection prevention
 - Identifies potential risk factors
 - Allows for assessment of specific interventions

HAI surveillance indicators: outcomes

- Communicable diseases and events
- Body site-specific
 - Central line-associated bloodstream infections
 - Surgical site infections
 - Infection-related ventilator-associated events
 - Catheter-associated urinary tract infections
- Organism-specific healthcare-associated infections
 - Methicillin-resistant *Staphylococcus aureus*
 - Vancomycin-resistant Enterococci
 - Carbapenemase-producing organisms
 - *C.difficile*

HAI surveillance indicators: processes

- Central line-associated bloodstream infections
 - Hand hygiene prior to accessing central line
 - Bundle adherence (5-7 elements)
- Surgical site infections
 - Adherence to pre-operative MRSA screening protocol
 - Appropriateness of surgical antimicrobial prophylaxis
- Infection-related ventilator-associated events
 - Adherence to practices that reduce infection risk associated with ventilator use
- Catheter-associated urinary tract infections
 - Adherence to practices to limit urinary catheter use

Hand hygiene!

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- **Review impact of reportable HAI surveillance indicators**
- Highlight pitfalls in accurately reporting data from various sources



Impact of hospital-wide surveillance on hospital-acquired infections in an acute-care hospital in The Netherlands

A. J. Mintjes-de Groot*, C. A. N. van Hassel†, J. A. Kaan†, R. P. Verkooyen‡ and H. A. Verbrugh‡

“hospital-wide surveillance of hospital-acquired infections provides appropriate targets for interventions tailored to the specific needs of the hospital”



Effectiveness of a nationwide nosocomial infection surveillance system for reducing nosocomial infections

P. Gastmeier^{a,*}, C. Geffers^b, C. Brandt^b, I. Zuschneid^b, D. Sohr^b, F. Schwab^b, M. Behnke^b, F. Daschner^c, H. Rüden^b

Surveillance associated with 30% decrease in rate of pneumonias and SSI, 20% decrease in BSI



Burden of Healthcare-Associated Viral Respiratory Infections in Children's Hospitals

Caroline Quach,^{1,2,3,4} Rita Shah,⁵ and Lorry G. Rubin^{5,6}

¹Montreal Children's Hospital, McGill University Health Centre, Quebec, Canada; ²Departments of Pediatrics and Epidemiology, Biostatistics and Occupational Health, McGill University, Montreal, Quebec, Canada; ³Infection Prevention & Control Unit, CHU Sainte-Justine, Quebec, Canada; ⁴Department of Microbiology, Infectious Disease and Immunology, University of Montreal, Quebec, Canada; ⁵Steven and Alexandra Cohen Children's Medical Center of New York of Northwell Health, New Hyde Park, New York; and ⁶Hofstra Northwell School of Medicine, Hempstead, New York

Prospective surveillance for HA-VRI found higher incidence rates compared to hospital-associated bloodstream infections

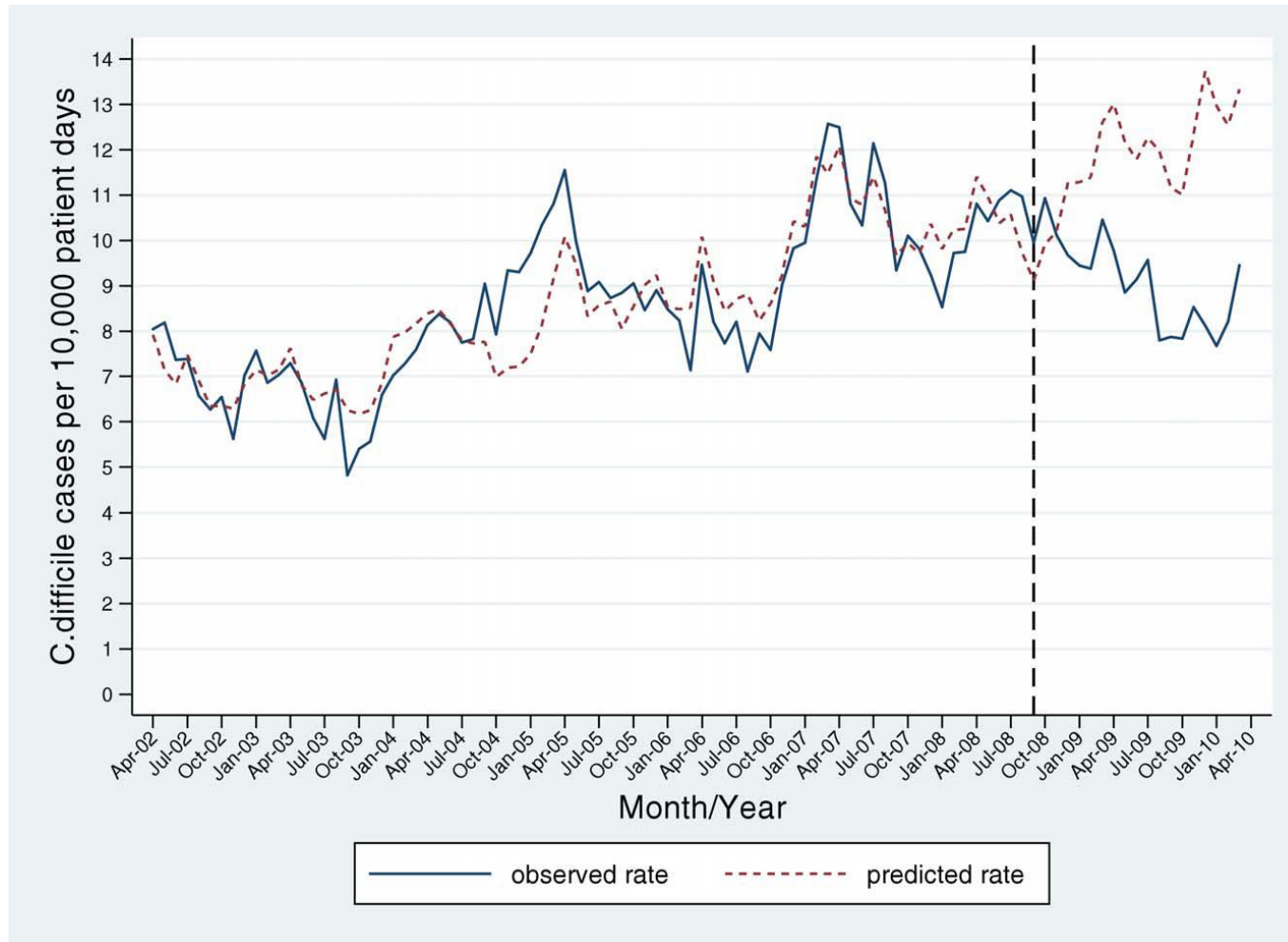
THE EFFICACY OF INFECTION SURVEILLANCE AND CONTROL PROGRAMS IN PREVENTING NOSOCOMIAL INFECTIONS IN US HOSPITALS

ROBERT W. HALEY,^{1,2} DAVID H. CULVER,¹ JOHN W. WHITE,¹ W. MEADE MORGAN,¹ T. GRACE EMORI,¹ VAN P. MUNN¹ AND THOMAS M. HOOTON^{1,3}

Organized, intensive surveillance and control activities associated with 32% decrease in HAI

Reduction in *Clostridium difficile* Infection Rates after Mandatory Hospital Public Reporting: Findings from a Longitudinal Cohort Study in Canada

Nick Daneman^{1,2*}, Therese A. Stukel^{1,3}, Xiaomu Ma¹, Marian Vermeulen¹, Astrid Guttman^{1,3,4,5}

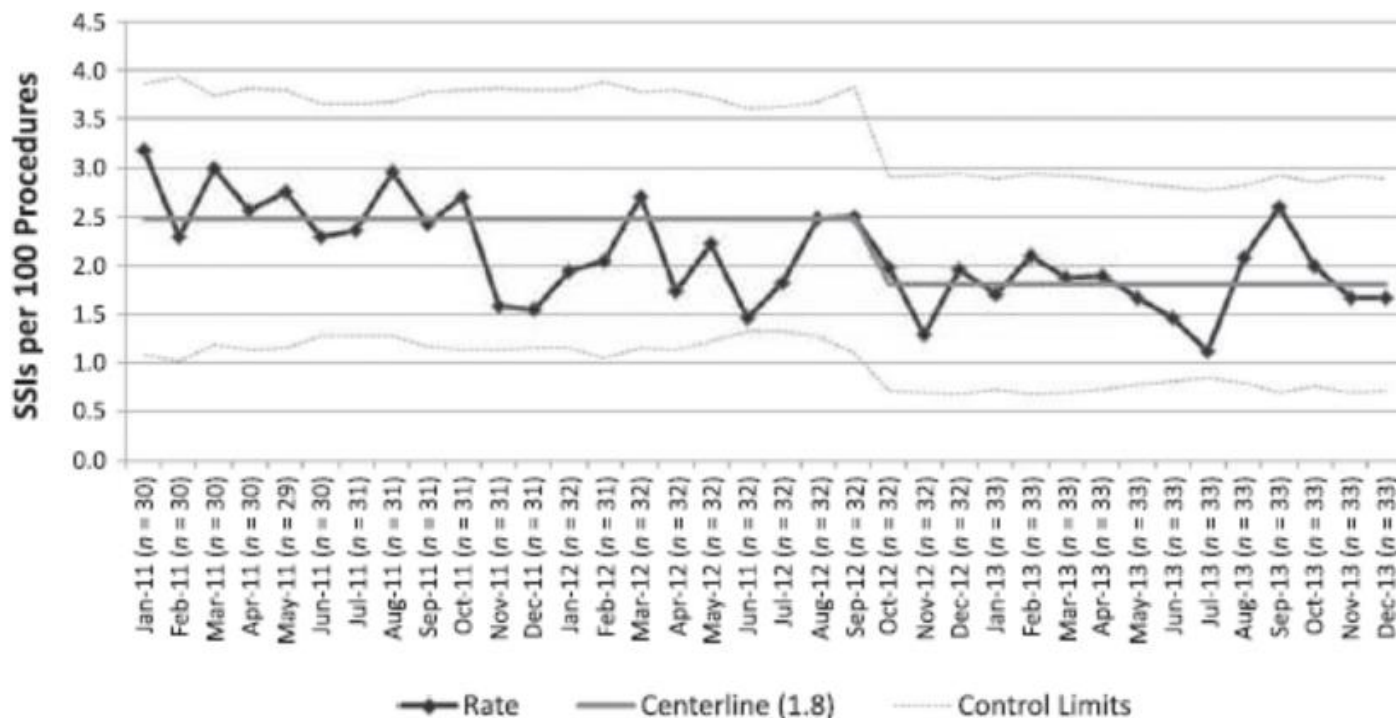


Following introduction of public reporting, *C. difficile* infections declined by 26% across Ontario = >1,900 cases averted per year

Surgical Site Infection Reduction by the Solutions for Patient Safety Hospital Engagement Network

Joshua K. Schaffzin, MD, PhD^a, Lory Harte, PharmD, CPHQ^b, Scott Marquette, MHSA^c, Karen Zieker, MS^d, Sharyl Wooton, MS^d, Kathleen Walsh, MD, MSc^d, Jason G. Newland, MD, Med^b

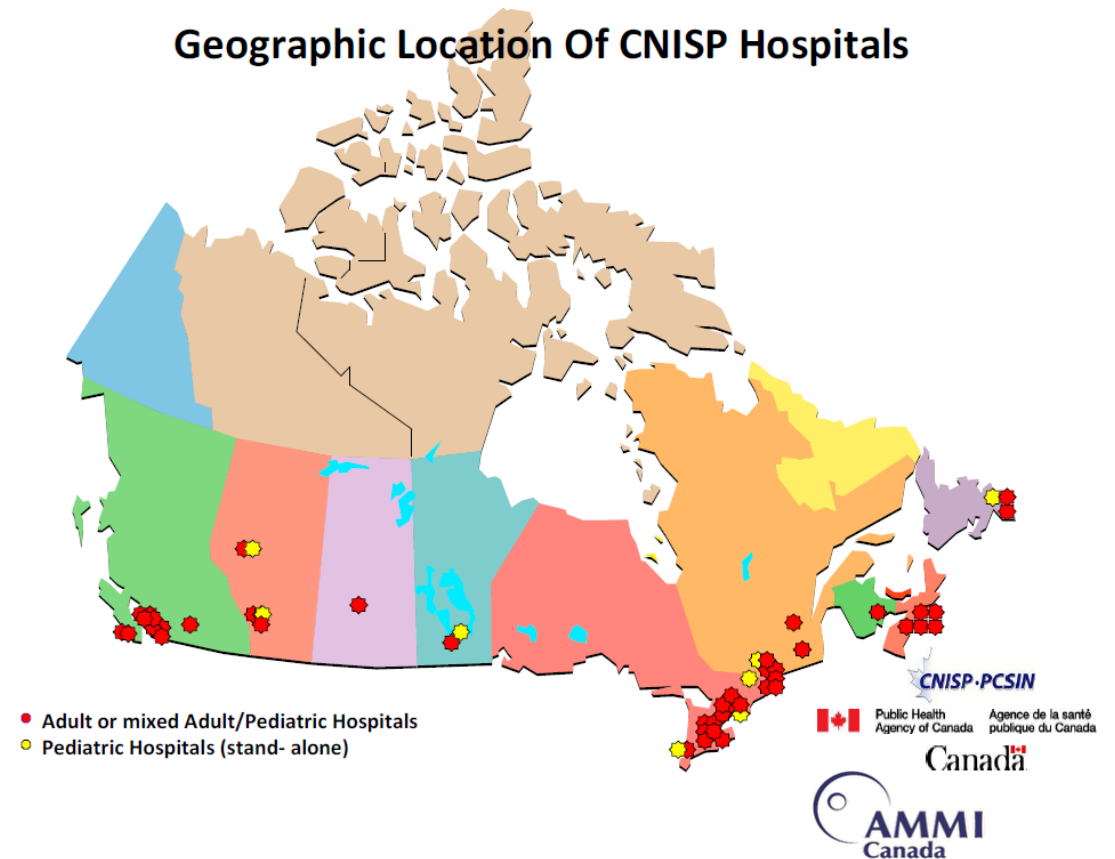
Surgical Site Infections Rate
Cardiothoracic, Neurosurgical Shunt, and Spinal Fusion Procedures
SPS National Network
January 2011 to December 2013



Collaboration in surveillance + bundle implementation = 21% reduction in SSI rate of pediatric cardiothoracic, neurosurgical ventricular shunt, and spinal fusion surgeries

Canadian Nosocomial Infection Surveillance Program

- Established in 1994
- Epidemiology and molecular characteristics of healthcare-associated infections in Canadian hospitals
- Partnerships: PHAC, NML, AMMI
- 73 sentinel hospitals in 10 provinces
 - 9 freestanding pediatric hospitals
 - ~ 78% of Canadian population lives within 100km of CNISP site



CNISP

- Provides Canadian hospitals with “benchmark” data
 - Standardized HAI surveillance case definitions - reviewed annually
 - National, regional and site-specific HAI rates, strain types and antimicrobial resistance and utilization data
- Provides evidence-based data:
 - Antimicrobial surveillance program (CARSS)
 - Canadian infection prevention and control guideline preparation (National Advisory Committee for Infection Prevention and Control)
- Raises public awareness of important infection control issues relating to AROs and HAIs

<https://www.canada.ca/en/public-health/services/infectious-diseases/nosocomial-occupational-infections.html>

<https://ipac-canada.org/cnisp-publications.php>

Objectives

- Review process and outcome measures in infection prevention and control
- Review impact of reportable HAI surveillance indicators
- Highlight pitfalls in accurately reporting data from various sources
 - Case study

Variability in reporting

- What: clinical diagnosis vs standard definition
- Who: infection control professional, coders, clinicians in admin roles
- When: continuously or periodically
- Where: internal and external reporting authorities
- How are data reported: numerators and denominators

What is reported

- Sources of surveillance data:
 - Patient chart/records (e.g. pharmacy, medical imaging)
 - Laboratory reports
 - Safety reports
 - Clinical rounds
 - Communication with caregivers
 - Decision Support (coders)
 - Surveillance-specific forms (e.g. NICU patients with central lines by weight category)
 - Surgical Information System
 - Critical Care Information System

What is reported

- Clinical diagnosis vs surveillance definitions
- Critically important to have uniform application of standardized and validated case definitions
 - For both outcome and process measures
- Unique challenges to pediatric surveillance:
 - Surgical site infection
 - ICD-10 codes do not have specific codes for pediatric procedures e.g. Tetralogy of Fallot
 - Contentious diagnosis (“purulent drainage” vs “incision clean and dry” by MDs)
 - *C.difficile* infection

Case: *Clostridium difficile* reporting

- Colonization is common in children under 2 yo
 - Higher rates of colonization, lower rates of complications compared to adults
 - Benchmarked against adult teaching and community hospitals in provincial reporting
 - IDSA “strongly discourages” public reporting of cases in children <2 yo
 - CNISP and most provincial ministries of health report rates among 1-18 yo
 - Alberta moving to 2-18 yo
- = What gets measured as a quality metric?
- Case definition for CNISP reporting:
 - 3 x loose, watery stools or fever, abdominal pain and/or ileus
 - “without reasonable evidence of another cause of diarrhea”
 - >70% cases found to have alternate pathogen present
- = Requires individual chart review + lab confirmation

When are HAI data reported?

- Continuously or concurrently
- Periodically (retrospective)
- Challenges
 - Human resources for case finding and review
 - Different case definitions among reporting bodies
 - May not be able to determine “truth” when retrospectively reviewing data due to numerous sources

Who does the reporting?

- Infection control professional
- Coder from Decision Support
- Clinical team: notifies IPAC to review if clinical suspicion of HAI
- Clinical nurse: temporary administrative role to support QI initiative

Where do HAI data go?

- Internal committee: IPAC, Quality and Safety; Executive, Board
- Provincial mandatory reporting
- Quality improvement / surveillance programs
 - Solutions for Patient Safety (US and Canadian network of pediatric hospitals)
 - National Surgical Quality Improvement Program
 - Canadian Nosocomial Infection Surveillance Program

How are HAI reported?

- Numerators:
 - Based on case definition; can differ between surveillance programs
 - e.g.: CSF shunt infection for CNISP = up to 1 year post-op
 - SPS = up to 90 days post-op
 - We can create workflow process, but **which rate to report internally?**
- Denominators:
 - Not consistent between surveillance programs

Denominator	NSQIP	SPS	CNISP
Cardiovascular surgery surveillance	No	Yes	Yes
General surgery surveillance	Yes	No	No
Pericardial window procedures	No	Yes	No

Case Study:

- Hospital IPAC program prospectively identifies HAIs
 - Submits data to CNISP, Ministry of Health, Critical Care Services Ontario
- 2016: Hospital joined 2 surveillance networks:
 - Solutions for Patient Safety to reduce risk of CLABSI, SSI
 - CV surgery requiring bypass, spinal fusion, neurosurgical shunt infections
 - IPAC program central to surveillance strategy and development of process audits
 - National Surgical Quality Improvement Program-Pediatrics network
 - Data abstractor hired by NSQIP team to prospectively collect preoperative, intraoperative and postoperative data, with outcomes at 30 days after index surgery
 - Surveillance every 8 days x 35 cases, no dental or CV surgery
 - Data submitted directly to NSQIP and anonymized in network publications
 - Hospital benchmarked against similar institutions, info sent to hospital leadership

Case Study:

- 2017: CIHI approached hospital in advance of launching “In-hospital infections indicators”
 - 2 publicly reportable indicators: MRSA, *C.difficile*
 - Meant to complement Patient Safety indicators (e.g. in-hospital sepsis) with site-specific data
 - Infection data to be collected by coders
 - Coders review clinical chart and code for HAI if documented in physician’s note

Case study: Current state

- CNISP
 - ICP collects data
 - Most of CNISP data reported to Solutions for Patient Safety, MOH
- NSQIP:
 - Reported directly to NSQIP and internally by clinical administrator
 - ICP may receive data to validate, with short turnaround time
- Solutions for Patient Safety
 - ICP collects data, sends to clinical administrator to report internally and to SPS
- CIHI
 - No published HAI indicator

Challenges = human resource-intensive; various denominators for same measure
Which one reflects the truth? Which one to follow in quality improvement?

Major Article

Assessment of the accuracy and consistency in the application of standardized surveillance definitions: A summary of the *American Journal of Infection Control* and National Healthcare Safety Network case studies, 2010-2016

Marc-Oliver Wright MT(ASCP), MS, CIC, FAPIC ^{a,*},
Katherine Allen-Bridson MScPH, BSN, RN, CIC ^b, Joan N. Hebden MS, RN, CIC ^c

- Case studies published in AJIC with link to online survey
 - Multiple-choice questions based on standard surveillance criteria and protocols
- Assessed accuracy and consistency in applying standardized surveillance definitions
- 62.5% responses correct
 - ICPs responded correctly (62%) significantly more often than physicians (55%)
- Highlights need for **continuing education, competency development, auditing**

How to overcome challenges in data quality?

- One source of information internally and externally
 - All data collected by IPAC
 - Workload? Opportunity costs?
 - All data reviewed by IPAC
 - Forum (if no IPAC Committee)? Frequency? Responsibility if inaccurate data collection?
- HAI case finding and reporting
 - How to assess competency in applying case definitions within the organization?
 - How to measure accuracy of reporting

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- Pat Bedard, RN, CIC
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