Hand Hygiene as a Patient Safety Indicator

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Objectives

- Evaluate the use of hand hygiene as a patient safety indicator
- Discuss the role of public reporting and pay for performance
- Suggestions on how to interpret and use your hand hygiene data

Patient Safety Indicators

- An indicator is “a device for showing the operating condition of a system”
- A patient safety indicator is therefore “a device for showing the safety of a healthcare system”
- Quality indicators can measure outcomes or processes

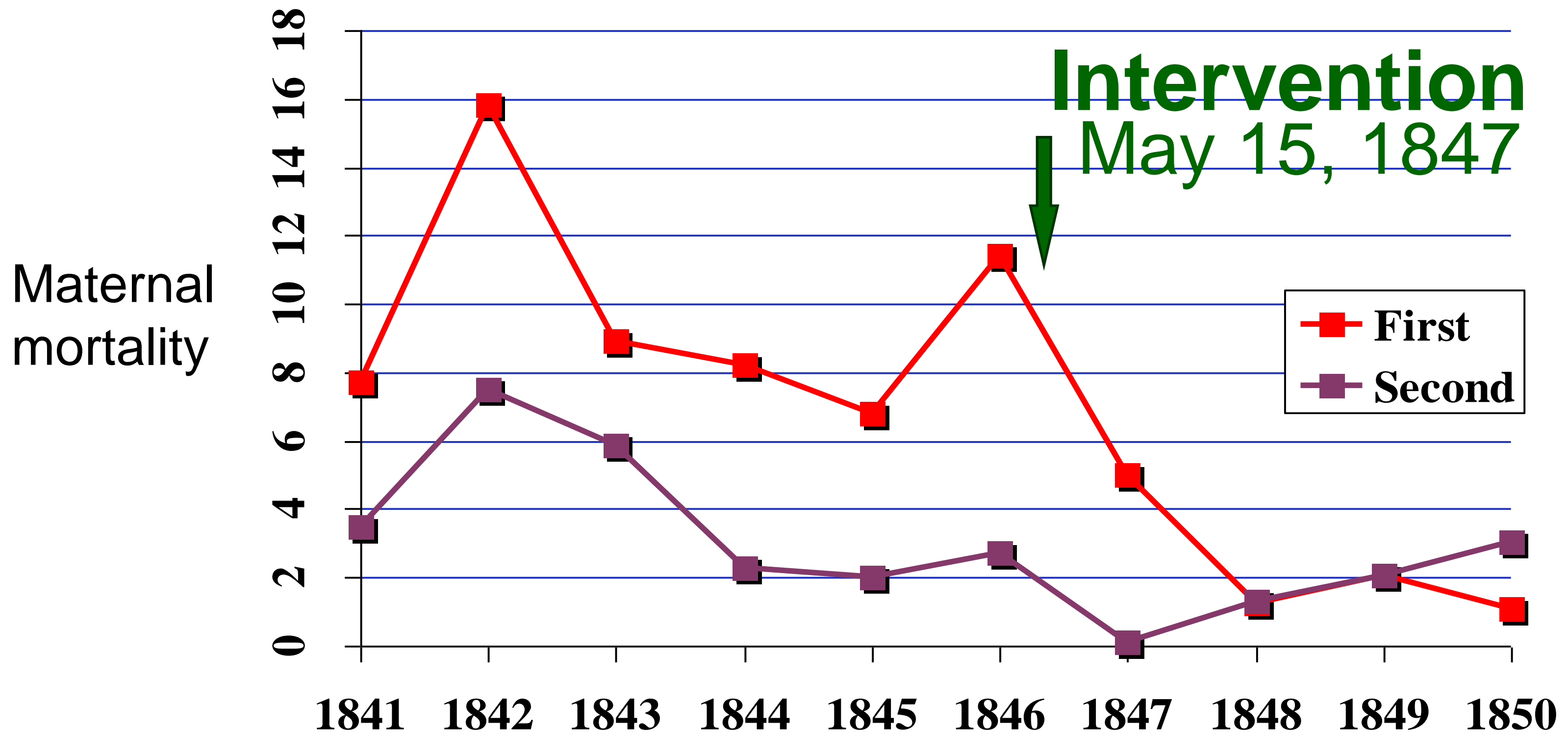
What makes a good patient safety indicator?

- Relevance
  - Measures an important outcome or a process that is clearly linked to an important outcome
  - Measures an outcome that is relevant to the end user
- Measurement
  - Accurate and reproducible measurement available
  - Measurement is easy and inexpensive
- Modifiable

Hand Hygiene – a good indicator?

- Hand hygiene
  - The use of soap/water or alcohol-based hand rinse to remove pathogens from the hands
- Hand hygiene compliance
  - The proportion of times hand hygiene is performed relative to the number of times that hand hygiene is indicated

A controlled trial of hand hygiene from 1847



Semmelweis IP, 1861

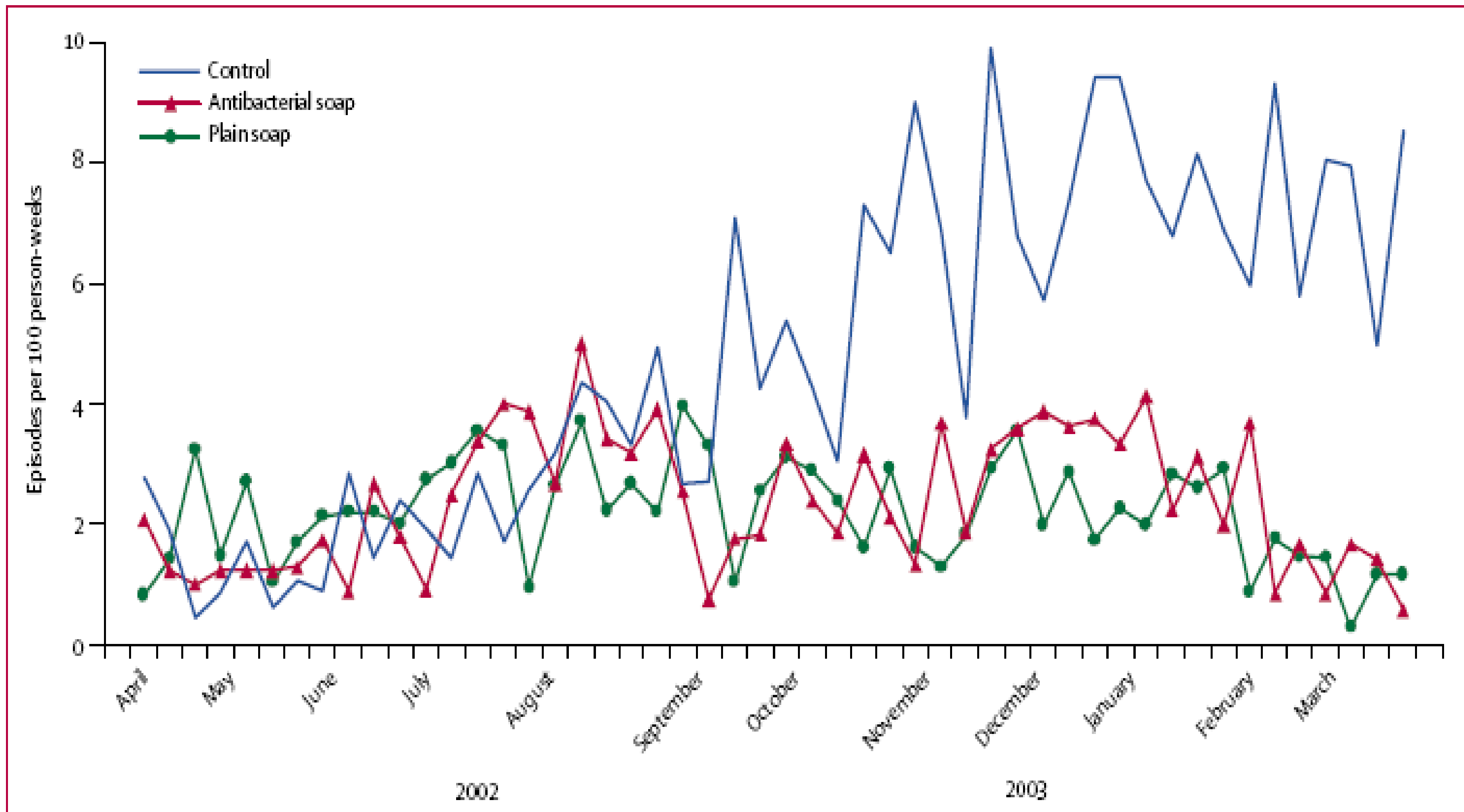
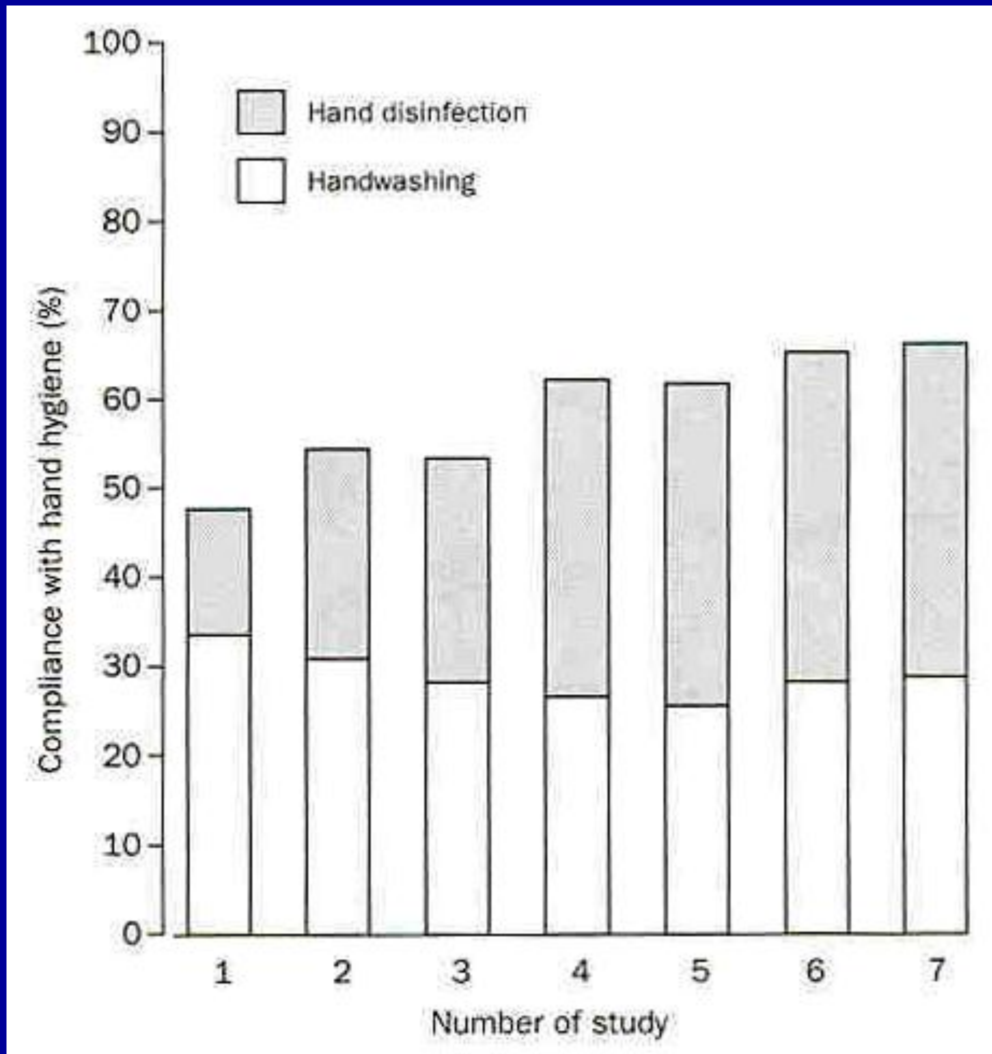


Figure 2: Incidence of pneumonia in children younger than 5 years

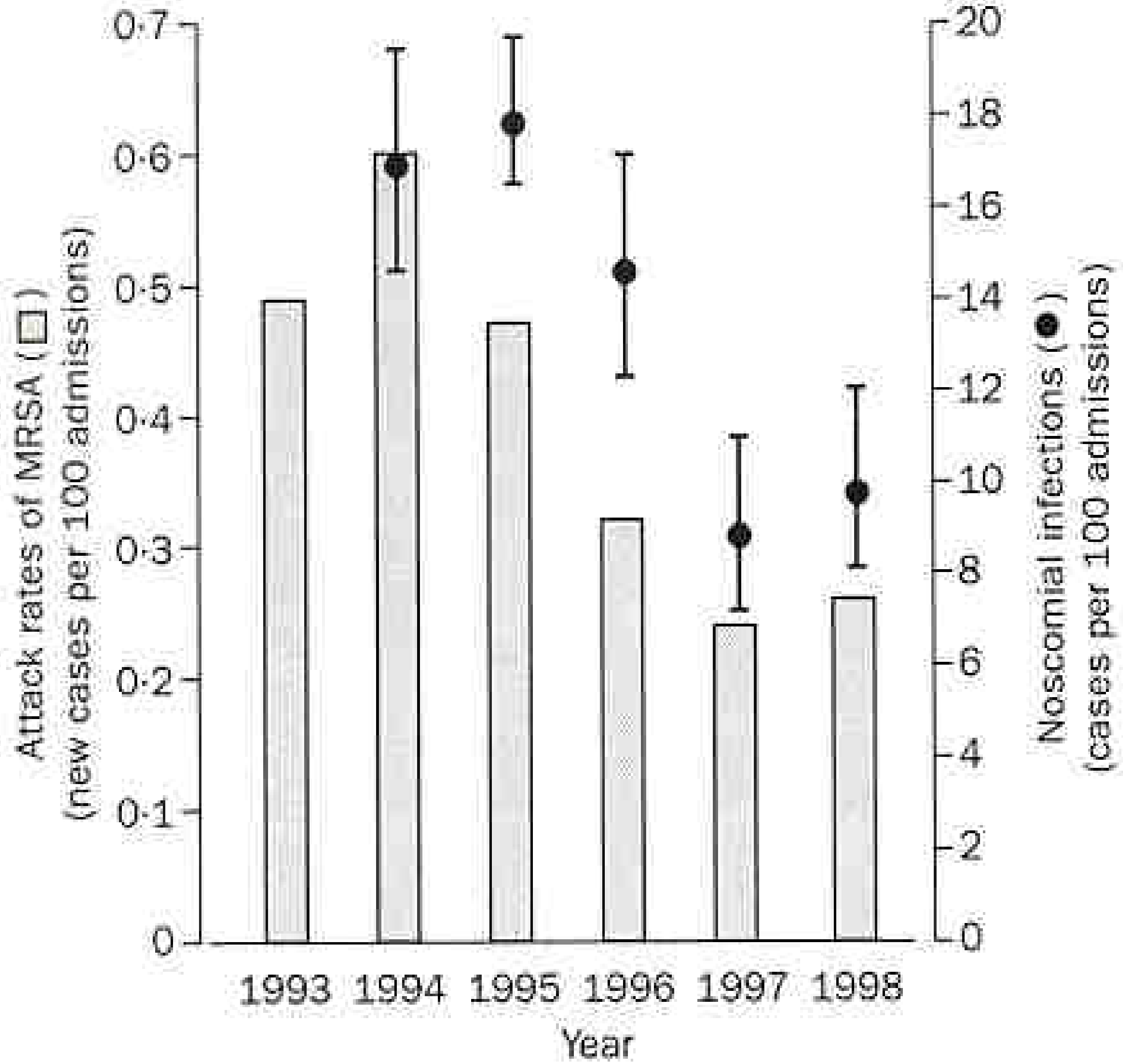
Luby SP. Lancet 2005

Does hand hygiene prevent HAI?



Compliance from 48% to 68%

Pittet D. Lancet 2000



Attack rates of MRSA (□)
(new cases per 100 admissions)
0·7
0·6
0·5
0·4
0·3
0·2
0·1
0
Noscomial infections (●)
(cases per 100 admissions)
20
18
16
14
12
10
8
6
4
2
0
1993
1994
1995
1996
1997
1998
Year

Mertz, D. ICHE 2010

- Cluster RCT
- 15 units = hand hygiene intervention
- 15 units = control
- Compliance 47% vs. 42%
- No difference in MRSA transmission

Relevance

- Strong evidence from historic trials and from the outpatient setting demonstrate that hand hygiene can prevent infection
- Quantitative data from the modern hospital are not available – to what degree improvements in hand hygiene will reduce common healthcare associated infections are not known
- "there is a lack of rigorous evidence linking specific hand hygiene interventions with the prevention of HAI".

– Backman C, AJIC 2008

Measuring Hand Hygiene

- Correct hand hygiene requires
  - The correct indication for hand hygiene
  - The correct product
  - The correct method of application
  - The correct duration of application
- Hand hygiene compliance
  - The number of times hand hygiene was (?correctly) performed over the number of times hand hygiene was indicated

Table III.1.1

Advantages and disadvantages of various hand hygiene monitoring approaches

Monitoring approach	Advantages	Disadvantages
Direct observations by expert observers	• Only way to reliably capture all hand hygiene opportunities • Details can be observed • Unforeseen qualitative issues can be detected while observing hand hygiene	• Time-consuming • Skilled and validated observers required • Prone to observation, observer, and selection bias
Self-report by health-care workers	• Inexpensive	• Overestimates true compliance • Not reliable
Direct observations by patients	• Inexpensive	• Potential negative impact on patient–HCW relationship • Reliability and validity required and remains to be demonstrated
Consumption of hygiene products such as towels, soap, and alcohol-based handrub	• Inexpensive • Reflects overall hand hygiene activity (no selection bias) • Validity may be improved by surrogate denominators for the need for hand hygiene (patient-days, workload measures, etc.)	• Does not reliably measure the need for hand hygiene (denominator) • No information about the appropriate timing of hand hygiene actions • Prolonged stocking of products at ward level complicates and might jeopardize the validity • Validity threatened by increased patient and visitor usage • No possibility to discriminate between individuals or professional groups
Automated monitoring systems	• Absence of observer may reduce observation bias • May potentially produce valuable detailed information about hand hygiene behaviour and infectious risks	• Scarce real world experience so far • Potential ethical issues with tracking of individual activity • Unknown impact on staff and patient behaviour • Systems may be costly and failure-prone

WHO Hand Hygiene Guidelines, 2009

Limitations of Direct Observation of Hand Hygiene Compliance

- Time consuming (and **expensive**)
- Skilled and **validated** observers required
- Prone to biases
  - the **observer** sees what they want to see
  - the **situation** is selected to obtain the desired result
  - the act of **observation** changes the outcome

Bias in hand hygiene observation

- Compliance is higher if healthcare workers are aware of observation
- Hawthorne effect stronger on units with higher hand hygiene
- Observed compliance grossly overestimates consumption of product
  - Eckmanns
  - Kohli, ICHE 2009
  - Scheithauer et al., AJIC 2009

Hand Hygiene Compliance

- Compliance measurement is subjective and biased
- Compliance measures only whether hand hygiene was performed at the ‘right time’ but not whether hand hygiene was performed ‘correctly’

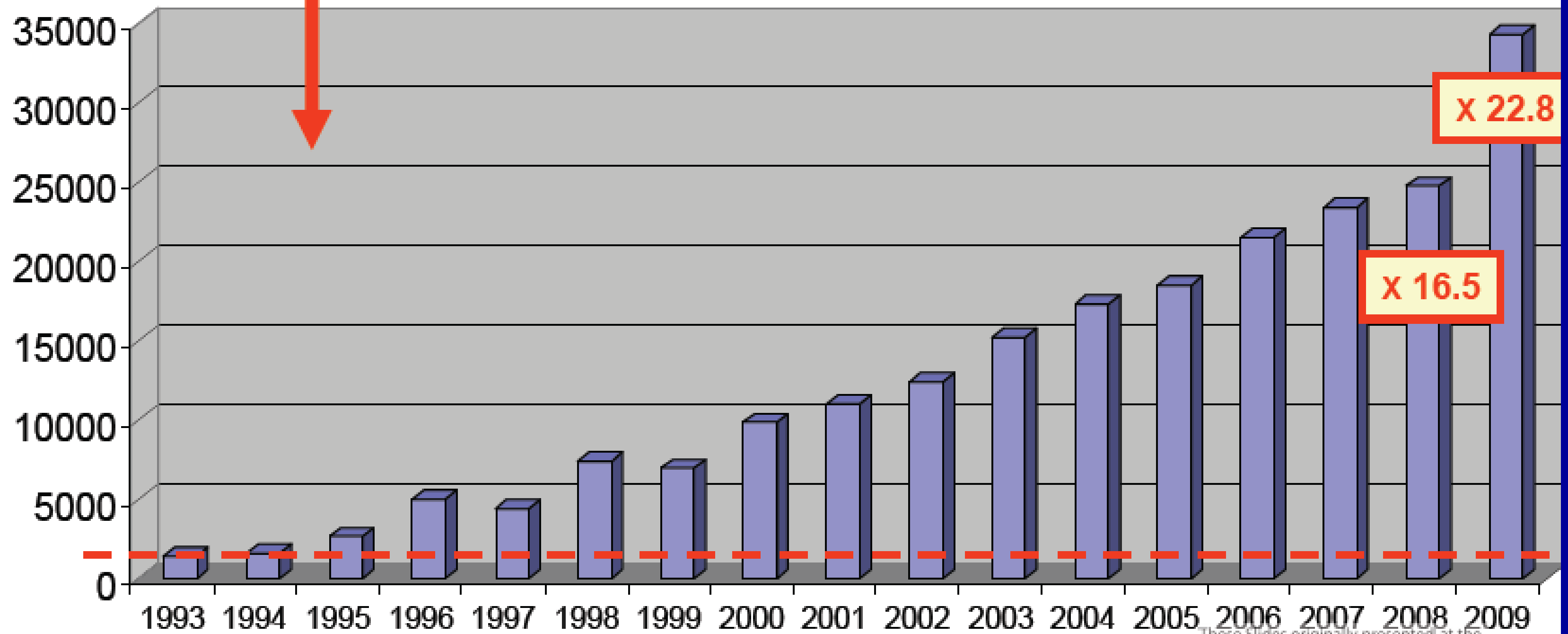
Modifiable?

- Systematic review of 21 studies by Naikoba (J Hosp Infect 2001)
  - Multimodal strategies may be effective
- Systematic review of 49 studies by Gould (Cochrane library 2011) identified only 4 high quality studies
  - the quality of intervention studies intended to increase hand hygiene compliance remains disappointing
  - Although multifaceted campaigns with social marketing or staff involvement appear to have an effect, there is insufficient evidence to draw a firm conclusion.

Use of alcohol-based hand rub HOPIRUB^{R} (liters)
University of Geneva Hospitals, Switzerland

Hand rub use (liters)

15 year hand rub promotion using the "Geneva model"



Year

Compliance	48 %

74 %

These Slides originally presented at the
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Hand Hygiene as an Indicator

- Simple, reproducible strategies to improve hand hygiene compliance do not exist
- Multimodal strategies work but are not ‘cookie-cutter solutions’
- Hard work, dedication, administrative support, strategies tailored to the local culture and a charismatic leader all help – but are hard to find or reproduce

Summary

- Relevance
  - Measures a process that is clearly linked to an important outcome [MAYBE]
  - Measures an outcome that is relevant to the end user [YES]
- Measurement
  - Accurate and reproducible measurement available [NO]
  - Measurement is easy and inexpensive [NO]
- Modifiable [With Effort]

Should hand hygiene compliance be publicly reportable?

Should CEO salaries be tied to hand hygiene compliance?

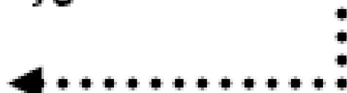
Perverse incentives

- Given finite resources, individuals will seek to obtain the incentive with the minimum expenditure of energy
- In Hanoi under French rule a bounty was given for rat pelts with the goal of reducing the rat population (and infection)
- 19th century paleontologists offered Chinese peasants a reward for dinosaur fossil fragments

Does not work consistently or yields slow improvement

Low Hand Hygiene Compliance

Works rapidly with minimal resource requirements; can be deliberate or inadvertent



Pressure to improve hand hygiene in a sustainable manner

Pressure to rapidly increase compliance to exceptional levels

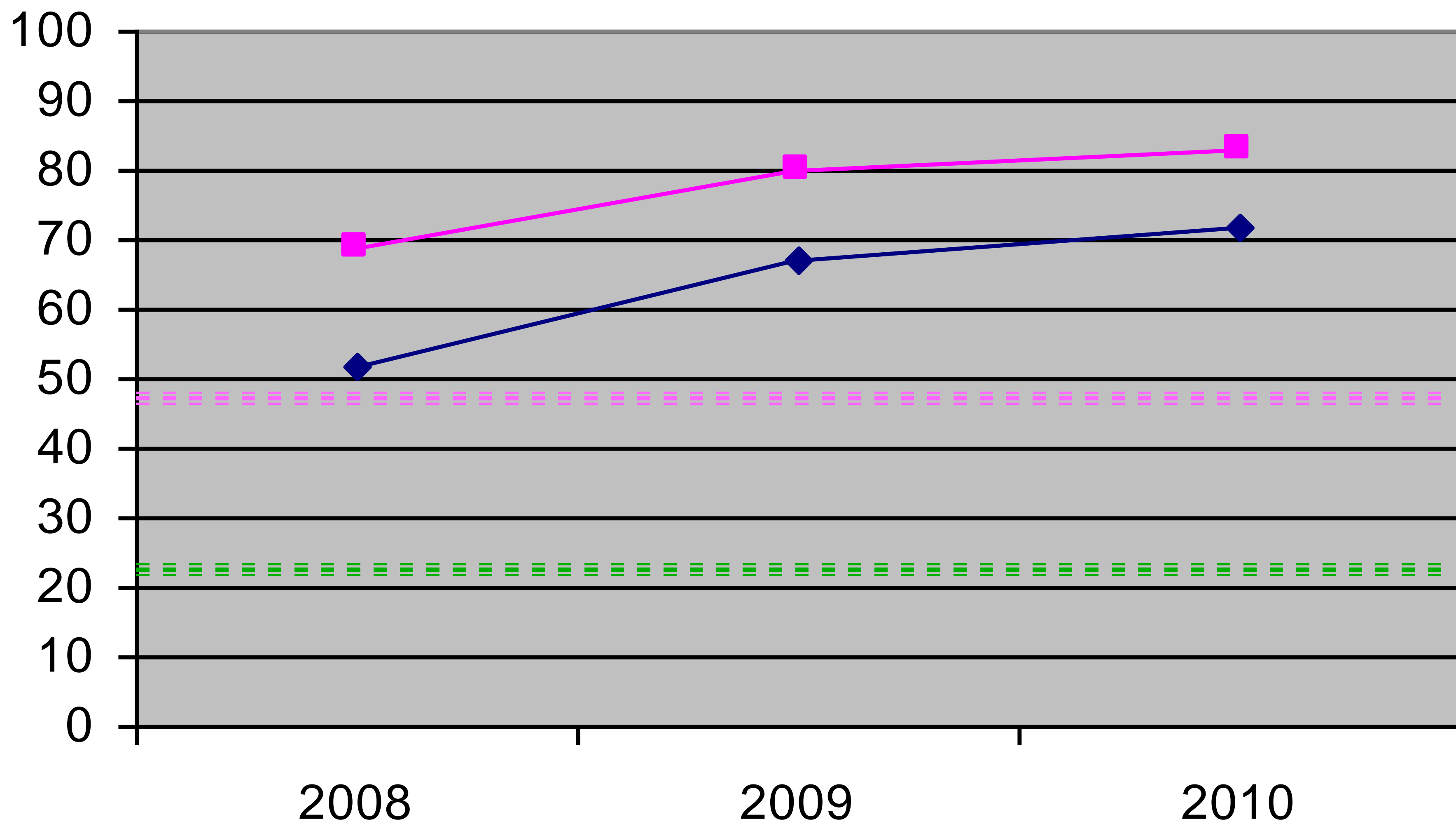
Evidence-based improvement strategies*
- Point of care alcohol-based hand rinse
- Education
- Audit with feedback
- Awareness campaigns
- Culture change

Indicator-based improvement strategies*
- Announce audit in advance and specify date
- Use auditors known to the clinical service
- Instruct auditors to inform all healthcare workers that their compliance is being monitored
- Avoid conducting audits at night
- Collect audits more frequently on top performing units

*Evidence-based improvement strategies are associated with a reduction in healthcare associated infection; improvement due to Indicator-based improvement strategies would not be expected to reduce infection rates

Muller MP, Detsky AS. JAMA 2010

Publicly Reported Hand Hygiene Compliance, Ontario 2008 to 2010 [blue=moment I, pink=moment IV]



Interpretation of results

- Systematic review of the literature suggests a median compliance of 40% at most healthcare institutions
  - Erasmus, ICHE 2010
- It took Pittet 15 years to get from 48% to 74% compliance
- How did Ontario do this in 1 year across all hospitals and with minimal additional resources provided?

Unintended Consequences

- Pressure to improve without a simple blueprint for evidence-based improvement leads to indicator-based improvement
- Teaching to the test – less emphasis on how (or how long) to wash hands
- Worsening of non-targeted care – diversion of resources away from other IPAC activities

Unintended Consequences

- How do you motivate healthcare workers or administrators to start QI projects when compliance is >90%?
- What do you say to the hand hygiene skeptics when they point out that infection rates have not fallen?
- Hospitals with low or slowly improving compliance will be pressured to seek ‘a quick fix’
- QI initiatives that are resulting in slow improvement may be abandoned

Public Reporting

- Public reporting likely increased interest and awareness of hand hygiene and perhaps diversion of resources to this area
- However, most of these resources likely went to measurement (not improvement) efforts
- Comparison between hospitals is not appropriate

How to collect your own hand hygiene data

- Use the MOHLTC methods
- Develop a consistent approach
- Monitor your auditors and measure Inter-observer agreement
- Try not to change your approach once it is working and is consistent
- Use another method (e.g. consumption of product, electronic counters) as a ‘double check’

Using the data

- Leverage your results – send them out to senior management, clinical leaders, unit leaders, physician groups, frontline staff and anyone else you can think of
- This will generate positive and negative interest in hand hygiene but remember that "all publicity is good publicity"

Using the data
low compliance unit / hospital

- Use data showing that your unit/hospital has low compliance to motivate change and improvement efforts
- Seek administrative support, identify role models, improve patient safety culture
- Implement multimodal strategies including
  - Education
  - Awareness
  - Audit with feedback
  - Appropriate location of alcohol-based hand rinse
  - Hand care program
- Foster unit based QI initiatives for hand hygiene

Using the data

Average compliance unit / hospital

- Use the data to demonstrate that compliance is still not good enough
- Seek administrative support, identify role models, improve patient safety culture
- Implement or improve on existing multimodal strategies
- Expand successful unit based initiatives to other units

Using the data

high compliance unit / hospital

- Review auditing process to minimize bias
- Strive to reduce measured compliance to allow room for improvement – the goal is not 100% compliance but 0% HAI!
- Continue to improve on your multimodal campaign
- If your high compliance is ‘real’ expand your focus to look at other important aspects of hand hygiene (e.g. duration, technique, timing)

Conclusions

- Hand hygiene prevents infection, is expected by patients, and is a required practice
- Hand hygiene compliance is difficult to measure accurately and difficult to compare between institutions
- Strive to measure compliance in a reproducible way that minimizes bias
- Use your data – whether high or low – to improve