
Peering Beyond the Five Moments of Hand Hygiene Compliance
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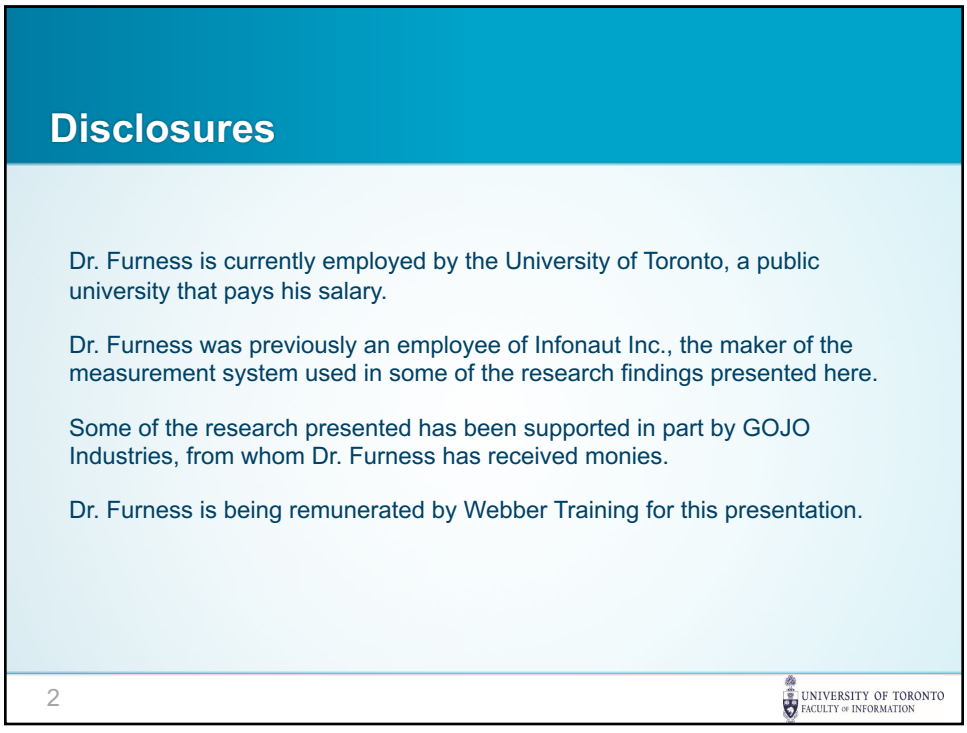
Disclosures
Dr. Furness is currently employed by the University of Toronto, a public university that pays his salary.
Dr. Furness was previously an employee of Infonaut Inc., the maker of the measurement system used in some of the research findings presented here.
Some of the research presented has been supported in part by GOJO Industries, from whom Dr. Furness has received monies.
Dr. Furness is being remunerated by Webber Training for this presentation.
2
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Learning Objectives

After this session, participants will be familiar with:

- The major measurement limitations of the WHO Five Moments
- Multiple opportunities for patient hand hygiene and non-clinical hand hygiene
- Some possibilities and limitations for implementation and measurement

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Outline

- Background: **Origins** of hand hygiene compliance
- Three problems of **bias** in measuring the WHO Five Moments
- The case for **patient** hand hygiene
- **Non-clinical** opportunities for hand hygiene
- Towards implementing **improvement**

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Origins of
hand hygiene
compliance

5

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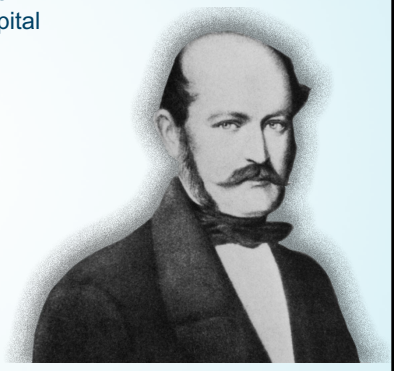
Origins of Hand Hygiene Compliance

Vienna, 1847: Dr. Ignaz Semmelweis postulates "cadaverous particles" responsible for fatal hospital infections in a maternity ward

Compelled medical residents to wash hands in chlorinated lime prior to maternity rounds

Mortality rates plummeted immediately

Subsequently ridiculed and drummed out of his profession; later died from sepsis in an asylum



6

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Origins of Hand Hygiene Compliance

Very slow uptake of Semmelweis' discovery!

- 1961 US Department of Health training film
- 1975 US healthcare worker hand hygiene guidelines issued
- 1985 First revision of US guidelines
- 1995 Second revision of US guidelines
- 1997 Commercialization of hand sanitizer
- 2001 Wall-mounted hand sanitizer dispensers in US hospitals
- 2002 World Health Organization (WHO) guidelines[1]

7 [1] Boyce & Pittet (2002)

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Origins of Hand Hygiene Compliance

W.H.O. "5 moments" of bedside hand hygiene

- Before patient contact
- Before aseptic procedure
- After body fluid exposure risk
- After patient contact
- After contact with patient surroundings

courtesy of the W.H.O.

Compliance: the proportion of "opportunities" where hand hygiene actually occurs

- Two challenges: counting opportunities & counting hand hygiene events
- Monitoring can be done manually or electronically

8

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3 problems of bias

Problems of Bias

A population-level retrospective analysis[2] of publicly reported hand hygiene compliance and hospital-acquired infection rates across 230 hospitals in Ontario over a 5-year period was conducted….

No correlation whatsoever was found between compliance and infections!

[2] DiDiodato (2013)

Problems of Bias

But Semmelweis *wasn't* wrong,
so can we find catastrophic bias?

Bias in the numerator?

$$\text{compliance} = \frac{\left[\text{hand hygiene events}\right] \times 100}{\text{hand hygiene opportunities}}$$

Bias in the denominator?

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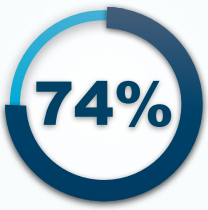
#1: Observer Bias

Observer bias – *who* observes affects compliance ratings[3]

Compliance rated by:

– unit HH ambassadors



– IPAC staff

– medical students

12 [3] Pan et al. (2013) UNIVERSITY OF TORONTO FACULTY OF INFORMATION

#2: Hawthorne Effect

Hawthorne Effect – the phenomenon that people alter their behavior when they know they are being observed, was measured in a study[4]

- A tag was attached to an auditor, and changes in hand hygiene raw rates was recorded around the auditor
- The observed jump in rates was compared to before / after (minutes, hours, days, weeks), to reveal a remarkably consistent increase of **300%**

13 [4] Srigley, Furness & Gardam (2014a)

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#2: Hawthorne Effect

A 300% jump when the auditor is present implies:

- 60% reported rate = **20%**
- 75% reported rate = **25%**
- 90% reported rate = **30%**

How can you get traction for a campaign to improve hand hygiene compliance when it is being reported at 90%?

14

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#3: Sampling Bias

Trained observers are not able to adequately capture hand hygiene opportunities of events, owing to **sampling bias:**

- Observers never intrude behind curtains drawn during procedures
- Observers may rarely enter or even look into patient rooms
  - A sample of observer records in a Toronto hospital indicated that 96% of observations were in the hallway
- Selection bias in sampling – usually limited to busy weekday periods

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#3: Sampling Bias

Consider that the 5 Moments themselves could be a form of sampling bias!

- Clinicians' hands are not the only hands that pathogenic bacteria can use as a vehicle for transmission

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The case for

Patient Hand Hygiene

17

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Patient Hand Hygiene

First electronic patient hand hygiene study[5]

- Organ transplant patients volunteered to wear tags, told only that their location was being tracked
- Tags also affixed to all soap and hand sanitizer dispensers
- Measured hand cleaning behavior Bathroom visits
  - Prior to meals
  - In and out of room
  - In and out of patient kitchen area

18 [5] Srigley, Furness & Gardam (2014b)

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Patient Hand Hygiene

Observed:

- 13,000 Visits to the bathroom
- 6,000 patient meals
- 11,500 room entries and exits

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Patient Hand Hygiene

Patient hand hygiene rates[5]:

- After bathroom use: **30%**
- Before breakfast: **20%**
- Before lunch: **35%**
- Before dinner: **45%**

Patients were given hand hygiene "credit" if they used the bathroom prior to a meal and **cleaned their hands.**

- Upon re-entry to patient room: **3%**
- Upon entry to patient kitchens: **3%**

20 [5] Srigley, Furness & Gardam (2014b) UNIVERSITY OF TORONTO FACULTY OF INFORMATION


Non-Clinical
Hand Hygiene Opportunities
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Non-Clinical Opportunities
Unpublished research project: bathroom hand hygiene in an ICU **visitor** lounge
– Door swings and soap dispenses were counted to gauge visitor hand hygiene
Bathroom A: prominent location, door opens directly to seating area (higher social presence?)
Bathroom B: relatively secluded location, door opens into alcove (lower social presence?)
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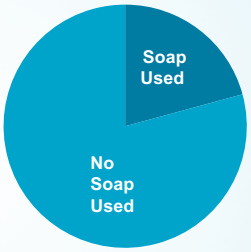
Non-Clinical Opportunities

Visitor Bathroom A

29 visits per day
Overall compliance: 37.4%

Visitor Bathroom B



19 visits per day
Overall compliance: 19.2%

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Non-Clinical Opportunities

An accidental study: testing a bathroom believed to be unused, for the means to measure bathroom hand hygiene based on counting door swings and soap dispenses

- Collected unexpected data outside of test times, and learned later that staff use this bathroom
- Data was immediately deleted, but observations indicated staff bathroom hand hygiene is similar to that of patients and visitors (~30%)

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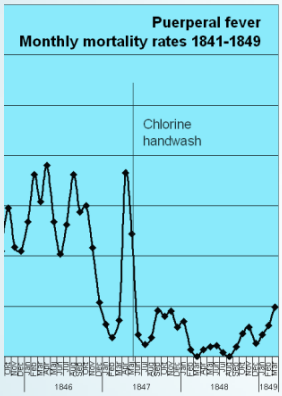
Towards Implementing

Improvement

Towards Implementing Improvement



We can all be a *bit* like Semmelweis

- Take a **critical** look at what is going on
- Try out simple interventions
- Measure the outcomes

Towards Implementing Improvement

We can all be a bit *unlike* Semmelweis

- Fighting against the status quo (5 Moments) is usually a bad idea
- You can go *under the radar*, adding additional measures on to the existing measurement and reporting regime

27

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Towards Implementing Improvement

Electronic monitoring of hand hygiene behaviour is an **effective way** to improve measurement

- Eliminates Hawthorne Effect and observer bias
- Can limit sampling bias

Can also be **appropriated** for non-WHO measurement (patients, visitors, staff bathrooms …)

Can be expensive … use the 5 Moments as the basis of your business case

28

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Towards Implementing Improvement

Patients are not usually **told** that their own hands pose a danger to themselves

Patient and visitor education through **signage** may help

Patient empowerment through **bedside** hand hygiene materials may help

Fear has a short half-life as a motivator, but may be adequate for typical hospital length of stay

29

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Towards Implementing Improvement

Like restaurant staff, hospital staff evidently need to be told to wash hands when using the bathroom

There is room for creativity!

- "Contamination testing" of staff break room with hazard labels revolutionized behaviour in one hospital

Just be sure to measure outcomes

30

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Conclusion

Semmelweis proved that hand hygiene matters.

W.H.O. Moments of Compliance moved the needle substantially.

However, the Moments have also stopped that needle due to bias.

No need to *fight* the W.H.O. – frontline interventions can be done as adjunct projects to usual hand hygiene, for patient, staff, and visitor hands.

Measure outcomes to your creative interventions, so that you will discover what truly works.

31

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32

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Thank You!

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33

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www.webbertraining.com/schedulep1.php	
March 21, 2019	INFLUENZA AND VIRAL PNEUMONIA Speaker: **Prof. Rodrigo Cavallazzi**, University of Louisville
March 26, 2019	*(European Teleclass)* TAMING THE BUGS: CONTAMINATION AND INNOVATIVE APPROACHES TO STETHOSCOPE DISINFECTION Speaker: **Prof. Gabriele Messina**, University of Siena, Italy
April 3, 2019	*(South Pacific Teleclass)* HEALTHCARE ASSOCIATED INFECTION SURVEILLANCE IN THE ERA OF ELECTRONIC HEALTH DATA Speaker: **Prof. Phil Russo**, Deakin University, Australia
April 9, 2019	*(FREE European Teleclass … Denver Russell Memorial Teleclass Lecture)* MODERN TOOLS FOR BACTERIAL IDENTIFICATION AND ANTIBIOTIC SUSCEPTIBILITY TESTING Speaker: **Prof. Vincent Cattoir**, Université de Caen Basse-Normandie, France
April 18, 2019	INFECTION CONTROL ISSUES IN HEALTHCARE CONSTRUCTION, PART 1 - RENOVATION Speaker: **Andrew Streifel**, University of Minnesota
May 2, 2019	*(FREE Teleclass)* MEAT, MONKEYS, AND MOSQUITOES: A ONE HEALTH PERSPECTIVE ON EMERGING DISEASES

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