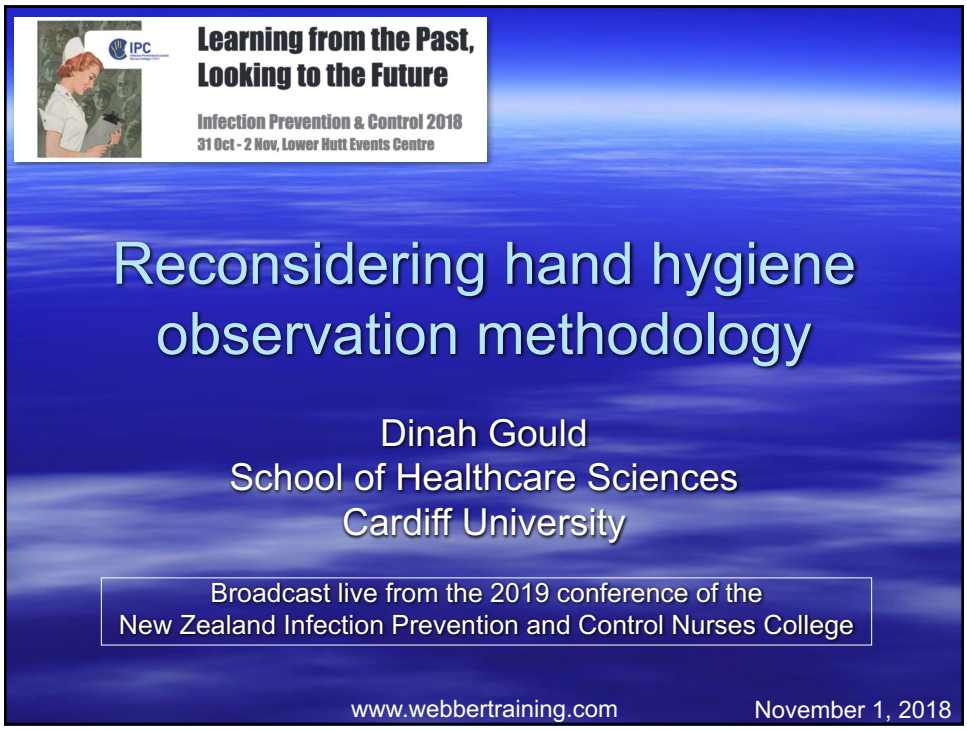


Context

- Hand hygiene breaks the chain of infection
- Essential part of any infection prevention program
- Received more attention than any other infection prevention measure
- WHO emphasises importance of audit/monitoring
- Undertaken routinely in many countries: time-consuming
- Adherence to hand hygiene often taken as key patient safety indicator
- BUT maintaining adherence is challenging

Making sense of audit/monitoring: what do the results mean?

We need:

- RELIABILITY (consistency): same results generated by all data collectors
- VALIDITY (truth): monitoring tool measures what it claims to measure

Poor reliability reduces validity

Monitoring methods

- SELF-REPORT: social desirability
- DIRECT OBSERVATION: 'gold standard', overt/covert
- VIDEO-RECORDING: vantage for data capture, patient privacy, resource-intensive
- PRODUCT CONSUMPTION: inexpensive, inaccurate, 'gaming'
- ELECTRONIC/COMPUTERISED: variable cost/sophistication
- COMBINATION OF ABOVE METHODS

What do we know about the rigour of hand hygiene audit/monitoring?

- 2007 Cochrane systematic review to evaluate effectiveness of interventions to improve hand hygiene adherence/reduce healthcare-associated infection
- Updated 2009, 2017
- Included studies must demonstrate robust designs
- Data collection methods of secondary importance
- Rigour of monitoring not mentioned/briefly mentioned in publications & not considered in review criteria
- Other reviews overlook how data were collected

Retrospective look at hand hygiene monitoring

PRE-2007: data collected by direct observation, rigour not considered

EXCEPTIONS

Gould 1994: observational study
- Detailed monitoring: 172 nurses, 2h each
- Extensive pilot studies: individual 'shadowing'
- Attempt to reduce impact of observation: 'blending in', some information about data collection withheld

Creedon 2005: intervention study
- Habituation: data collected 2h on x5 at each venue
- Discarded early data from each 2h session
- Health workers not informed when 'real' audit began

Creedon 2005: messages for validity?

- NO comparison of data before/after habituation period
- NO way of assessing effectiveness of habituation
- CLEAR MESSAGE for future methodological research

Gould 1994: the dataset

- Generated very detailed data: frequency, sequence of care, technique for 172 nurses
- Intra-patient care episodes (behind screens)
- Two auditors: high inter-rater reliability
- Impact of clinical workload on performance
- Documented 2hr long sequences of care: impact of emergencies

Gould 1994: findings

- Very low adherence: 28.7%
- 2 nurses failed to cleanse hands over 2h despite need
- Technique: better than in contemporary studies & stable for same nurse over time
- Nurses often forgot they were being observed
- ASTONISHING behaviour documented!

Conclusion: presence of observer did NOT have much impact

Contemporary studies

- Everybody knows they need to cleanse hands
- Presence of observers now identified as major validity threat
- Recognised in WHO 2009 guidelines
- Covert observation not encouraged
- Value of other methods debated: no solution offered
- Greatest challenge: impact of observation on behaviour 'Hawthorne Effect'

Hawthorne effect: challenges of interpretation

- Origin: Hawthorne Electrical Plant, US 1930s
- Observation resulted in Î productivity
- Applied to hand hygiene: Î frequency, better technique
- BUT modern behavioural science requires us to measure variables that could influence study outcomes e.g. being busy
- NOT DONE in original Hawthorne experiments: now criticised & not well replicated
- Contemporary interpretation: observation can disrupt behaviour in complex, unpredictable ways, often idiosyncratic
- Terms Hawthorne/observer effect used interchangeably: ongoing confusion over terminology → not used accurately

Reflections on 1994 data: marked observer effect

DELAYING TACTICS
- Complex, intricate procedures under-represented in the dataset
- 'Difficult' situations under-represented

AVOIDANCE
- 'Hiding' in administration, errands

MANAGERIAL CONTROL
- Sent to 'best' wards: Hospital B
- Sent to 'bad' wards: Hospital A

RESULT
Incomplete/inaccurate picture of hand hygiene in relation to practice & across the organisation

Audit: implications of poor validity for practice

AUDIT = overview: 'quick & dirty'

- Today clinicians are sophisticated: dissatisfaction if method does not appear fit for purpose, infection control 'fatigue'
- Consequences of low adherence → negative feedback → poor morale →poor staff retention→ high workload for remainers → vicious circle
- Patient concern
- Poor institutional reputation
- BUT 100% adherence is not credible
- Artificial inflation → complacency → no impetus for continuous quality improvement

Research: implications of poor validity

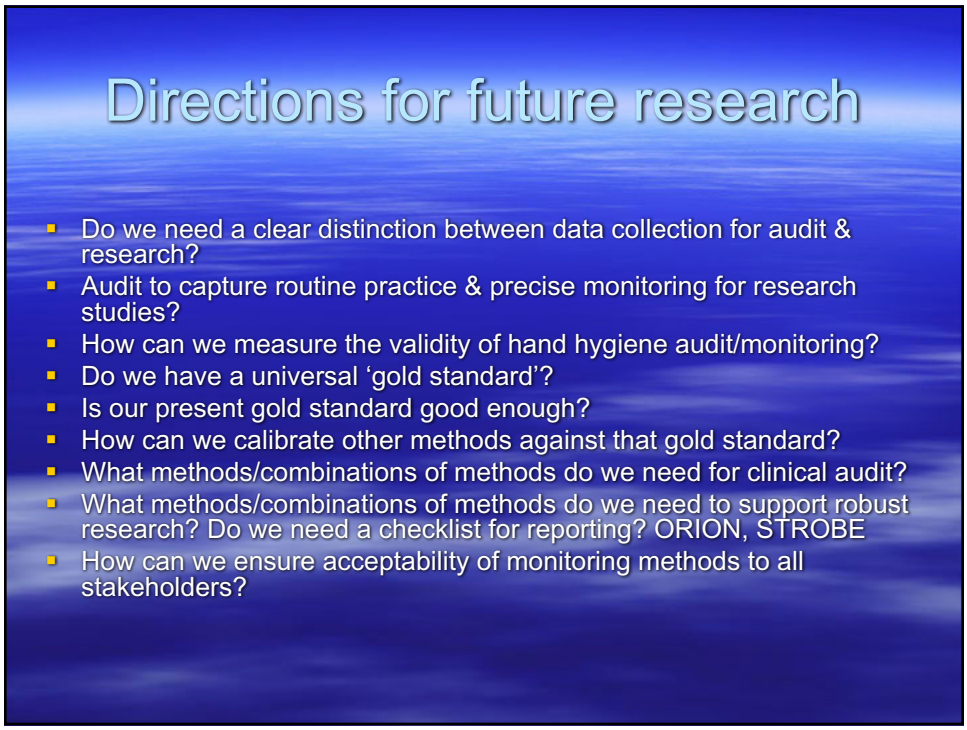
- RESEARCH = precision, truth
- Purpose = guide hand hygiene policy & practice locally, nationally, globally
- Wrong conclusions → misleads scientific & clinical community→ could harm patients/services, could lead to miss-use of resources

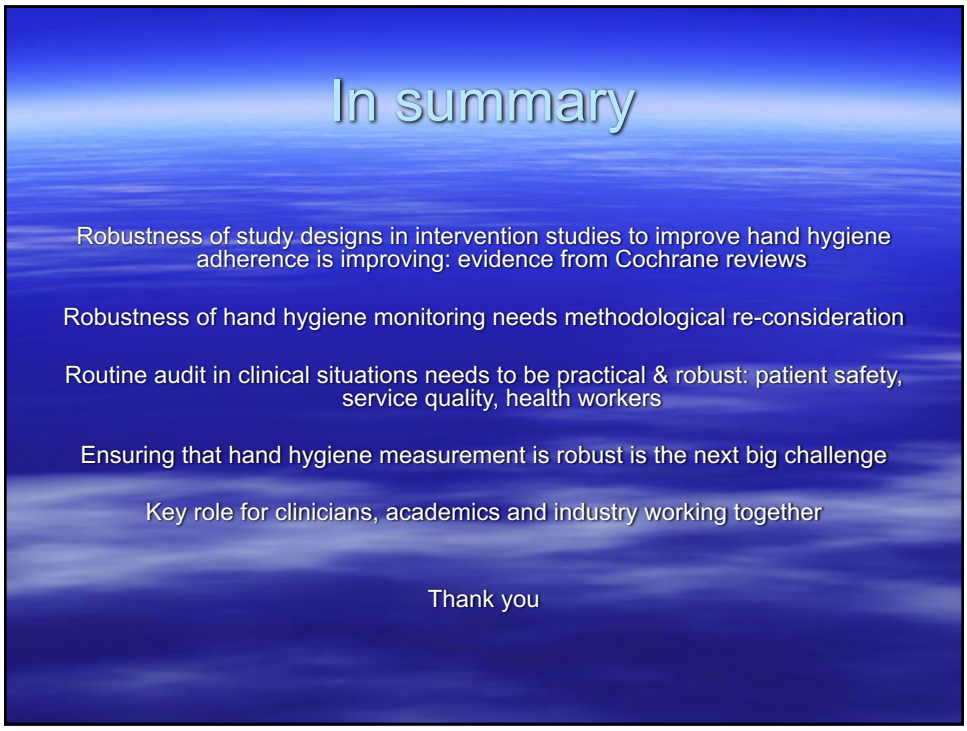
Blurred boundaries

- Distinction between audit & research is ill-defined: methodologists argue
- ESPECIALLY challenging for hand hygiene
- 'Research' is often not *a-priori*
- Hand hygiene interventions – success assessed with big datasets collected routinely over years
- BUT hand hygiene monitoring is not rigorous
- Likely to 'drift' over years of data collection especially without rigorous auditor training, revalidation & quality control
- Poor monitoring has major consequences for what we can conclude from 'research'

Choosing a method fit for purpose: key decisions

- How will the data be used – now/in future? Audit or research?
- Who will use the data? Infection prevention personnel, managers or clinical staff?
- Acceptability: health workers, patients, managers
- Cost: purchase, installing & maintaining equipment
- Priority: depends on country, health service
- Resources: time for analysis – computer/video footage requires detailed analysis
- Where will the data be collected? One method may not be appropriate in all clinical settings
- How much detail is wanted?: Outside screens or intra-patient care episodes?
- How will we deal with issues of privacy, ethics?
- How will we deal with poor performance if 'quick & dirty' audit is used?
- How will monitoring inform training/education?
- Combining methods: troubleshooting vs. precision


Directions for future research
Do we need a clear distinction between data collection for audit & research?
Audit to capture routine practice & precise monitoring for research studies?
How can we measure the validity of hand hygiene audit/monitoring?
Do we have a universal 'gold standard'?
Is our present gold standard good enough?
How can we calibrate other methods against that gold standard?
What methods/combinations of methods do we need for clinical audit?
What methods/combinations of methods do we need to support robust research? Do we need a checklist for reporting? ORION, STROBE
How can we ensure acceptability of monitoring methods to all stakeholders?


In summary
Robustness of study designs in intervention studies to improve hand hygiene adherence is improving: evidence from Cochrane reviews
Robustness of hand hygiene monitoring needs methodological re-consideration
Routine audit in clinical situations needs to be practical & robust: patient safety, service quality, health workers
Ensuring that hand hygiene measurement is robust is the next big challenge
Key role for clinicians, academics and industry working together
Thank you

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