Anatomy of a successful multimodal hand hygiene campaign

Andrew Stewardson,[1] Didier Pittet[1,2]

In 2005, in the far northeastern corner of the USA, Kirkland *et al*,[1] found themselves in a situation painfully familiar to many infection control professionals worldwide, including our institution in the early 1990s.[2] Hand hygiene compliance amongst healthcare workers in their hospital was poor, healthcare workers were unenthusiastic about the importance of hand hygiene, and quality improvement interventions were 'not consistently supported by organisational leaders'.[1] In response, they undertook a comprehensive hand hygiene promotion programme, which evolved over the course of 2 years, that resulted in an institutional culture change, a dramatic increase in hand hygiene compliance from 41% to 87%, and most importantly, a significant reduction in healthcare-associated infections from 4.8 to 3.3 per 1000 inpatient days. These changes were sustained during a 1-year postintervention follow-up. So how did they do it and what can we learn from them?

First, Kirkland *et al* used well-established strategies with local interpretation and adaptation. Their intervention included each of the five components of WHO multimodal hand hygiene improvement strategy (table 1),[3] and each of these components was implemented with careful attention to the local landscape and available resources, similar to the earlier 'Geneva hand hygiene promotion model'.[2] System change involved carefully considered installation of alcohol-based hand-rub dispensers in locations designed to suit staff workflow as assessed by a workgroup comprised of senior biomedical engineering and clinical staff.[1] Education and training of healthcare workers was facilitated by development of an electronic learning module. This was complemented by a voluntary—and well received—hand hygiene competency certification programme. The measurement and feedback component of this initiative is particularly impressive, with hand hygiene compliance and healthcare-associated infection rates published monthly by unit on the hospital intranet. Implicit in this seemingly straightforward action is a broad range of challenges, including the significant burden of monthly hand hygiene observation sessions in each hospital ward to collect information regarding a sufficient number of hand hygiene opportunities to provide meaningful feedback.[4]

Monitoring hand hygiene compliance by direct observation is a resource intensive task, but it yields rich rewards to the infection control professionals. This team has previously reported how they used these data to provide a dynamic insight into hand hygiene behaviour in their facility, thereby facilitating targeted interventions.[5] But perhaps even more importantly, hand hygiene observations facilitate performance feedback to the healthcare workers themselves. By our own evaluation, we tend to overestimate our own hand hygiene performance.[6] And compared with other patient safety issues—such as wrong side surgery or medication errors—healthcare workers are rarely aware of adverse outcomes resulting from their own hand hygiene behaviour. Consider a hypothetical healthcare worker who fails to clean hands before patient contact, and whose contaminated hand transmits methicillin-resistant *Staphylococcus aureus* (MRSA) to a patient, leading to patient colonisation and, several weeks or months later, infection. Such an outcome is not only multifactorial, but will never be linked to the specific patient–healthcare worker interaction when transmission occurred.[7] One important aim of performance feedback is to fill this gap, completing the feedback loop between action and its effect.[8] While evidence regarding the best way of doing this in the field of infection control is limited, it seems reasonable to believe that increasing the frequency and narrowing the range (eg, ward rather than hospital-wide feedback) would be most effective.

Perhaps another key to success for this team[1] was a simultaneous statewide campaign; the 'High Five for a Healthy NH' campaign.[9] One facet of this regional campaign was the signing of a leadership commitment memorandum, where hospital leaders agree that their organisation 'will implement or improve upon the five identified best practices for achieving 100% compliance with proper hand hygiene'. These best practices involved the standard elements of multimodal promotion and included a 'focus on accountability'.[9] This public commitment to hand hygiene and patient safety may have been of particular importance to galvanise support in an institutional context where healthcare workers were sceptical about hand hygiene. But while the support from institutional leadership is key in creating an

[1]Infection Control Programme, University of Geneva Hospitals and Faculty of Medicine, Geneva, Switzerland, and designated as the World Health Organization Collaborating Centre on Patient Safety; [2]External advisor, Clean Care is Safer Care, World Health Organization Patient Safety Programme, Geneva, Switzerland

Correspondence to Professor Didier Pittet, Infection Control Programme, University of Geneva Hospitals, 4 Rue Gabrielle Perret-Gentil, 1211 Geneva 14, Switzerland; didier.pittet@hcuge.ch

Table 1 Components of WHO multimodal hand hygiene improvement strategy

Component	Description
1. System change	Ensuring that the necessary infrastructure is in place to allow healthcare workers to practice hand hygiene. This includes two essential elements: • access to a safe, continuous water supply as well as to soap and towels • readily accessible alcohol-based hand-rub at the point of care
2. Training and education	Providing regular training on the importance of hand hygiene based on the 'My 5 Moments for Hand Hygiene' approach, and the correct procedures for hand-rubbing and hand-washing, to all healthcare workers
3. Evaluation and feedback	Monitoring hand hygiene practices and infrastructure, along with related perceptions and knowledge among healthcare workers, while providing performance and results feedback to staff
4. Reminders in the workplace	Prompting and reminding healthcare workers about the importance of hand hygiene, and about the appropriate indications and procedures for performing it
5. Institutional safety climate	Creating an environment and the perceptions that facilitate awareness-raising about patient safety issues, while guaranteeing consideration of hand hygiene improvement as a high priority at all levels, including: • active participation at both the institutional and individual levels • awareness of individual and institutional capacity to change and improve (self-efficacy) • partnership with patients and patient organisations

Adapted from ref. 3.

institutional safety climate,[10] one size may not necessary fit all. A commitment to achieve '100% hand hygiene compliance' undoubtedly sends a strong message to healthcare workers, but one may also argue that such an ambitious target could equally prove counter-productive in other circumstances. Could healthcare workers be alienated by such a move, polarising negative opinions and fostering a perception that hospital leadership have unrealistic expectations and are too far removed from 'front-line' clinical practice?

While perhaps not contributing directly to their own local success, Kirkland *et al* make an interesting contribution to the generally increasing quality of study design and analysis in hand hygiene literature.[6] They employed process control charts in order to facilitate prospective surveillance of outcome measure and to monitor the impact of the stepwise introduction of various interventions. They used infections attributed to the operating room as a 'tracer condition'. The fact that this indicator—presumed to be less sensitive to hand hygiene compliance—rose while other healthcare-associated infections fell is presented as evidence in support of the role of hand hygiene in infection prevention. As the authors mention, infection control, and specifically hand hygiene, is a field criticised for weak study designs—notably before and after studies.[11] However, recent years have seen utilisation of a range of higher-quality study designs and statistical approaches. The cluster-randomised studies have recently been performed in both[12] inpatient and ambulatory care settings.[13 14] When a control group is impractical, as is frequently the case with safety and quality interventions, other techniques can be employed.[12] For example, the impact of the *Cleanyourhands* campaign in England and Wales was recently reported using an interrupted time series approach with predefined study phases and analysis with mixed-effect regression techniques.[15] The programme was associated with a sustained increase in alcohol-based hand-rub and soap procurement and a reduction in MRSA bacteriaemia rates. Previously, Vernaz *et al*[16] used time-series analysis to take into account autocorrelation when demonstrating that a multimodal hand hygiene campaign was associated with increased alcohol-based hand-rub usage and reduced MRSA incidence. Based on recently published study protocols and conference presentations, we can look forward to the reporting of several large multicentre cluster-randomised studies in the near future.

As with any programme, there is room for improvement. For example, while direct observations were performed in a 'covert' fashion, the observers were not blinded to the interventions in place and observer training and interobserver reliability is not described.[12 17] Furthermore, a hand hygiene opportunity was defined as before and after contact with patients or their immediate surroundings, thereby missing hand hygiene opportunities during each single patient care episode.[18] This definition was reasonable at the time of initiation of this project, but has since been superseded by the WHO 'My 5 moments for hand hygiene' model.[19]

Multimodal hand hygiene promotion is not novel. But what Kirkland *et al* provide us with is an excellent

example of a locally adapted, successful and sustainable programme that adds to evidence regarding the impact of improved hand hygiene compliance on healthcare-associated infection. Overall, we are left with the impression that they were able to shift the momentum towards an institutional climate of patient safety. So do not despair if you find yourself in the same position as this group was in 2005: use the many guidelines and tools that are now freely available to introduce culture change into your institution,[3] consider joining a regional or nationwide hand hygiene campaign,[20] and create links with other clinical and non-clinical institutional colleagues. In particular, the WHO Hand Hygiene Self-Assessment Framework can provide a status report of hand hygiene infrastructure and promotion in your institution.[21] It can be used to set targets and to identify key resources and tools useful for achieving them, thereby helping with the crucial process of local adaptation and implementation of multimodal hand hygiene campaigns. So do not hesitate—make a start.

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