International Journal of Infection Control
www.ijic.info ISSN 1996-9783

ORIGINAL ARTICLE

WHO First Global Patient Safety Challenge: Clean Care is Safer Care Contributing to the training of health-care workers around the globe

C. Kilpatrick[1], B. Allegranzi[1], D. Pittet[2]
1. WHO Patient Safety: First Global Patient Safety Challenge, Geneva, Switzerland
2. Infection Control Programme and WHO Collaborating Centre on Patient Safety, University of Geneva Hospitals and Faculty of Medicine, Geneva, Switzerland

doi: 10.3396/ijic.V7i2.011.11

Abstract
The World Health Organisation since 2005 has worked to support reduction and prevention of health care-associated infection around the globe as part of their Patient Safety Programme, primarily through the promotion of compliance with recommended hand hygiene practices. The programme of work has been multi-factorial, with a number of achievements acknowledged as well as published over this period, including most recently a systematic review of the global burden of disease attributable to health care-associated infection. An understanding of the situations within countries has been crucial in order to inform the whole programme targeted at health-care facilities, including tools and approaches to support the training and education of health-care workers. This has in part been achieved through testing of the WHO hand hygiene toolkit that was prepared to support implementation of the WHO Guidelines on Hand Hygiene in Health Care, launched in 2009. A lot has been achieved, however, WHO continues to highlight the need to sustain the momentum to support the enhancement of patient safety.

Key words
Hand hygiene, World Health Organisation, First Global Patient Safety Challenge, Health care-associated infection, training and education, pilot testing

Corresponding author
Claire Kilpatrick, WHO Patient Safety Programme (PSP)
L Building, L323, World Health Organisation, 20, Avenue Appia, CH-1211 Geneva 27, Switzerland
+41 (0)22 791 2150 kilpatrickc@who.int

Introduction

Health care-associated infection (HAI) occurs in every health-care facility, in every country and affects hundreds of millions of patients annually worldwide, including in developing countries.[1,2] The World Health Organisation (WHO) First Global Patient Safety Challenge: Clean Care is Safer Care established in 2005, has been dedicated to raising global awareness and providing solutions to support the prevention of HAI.[3]

Following its formal launch on 13 October 2005, the period 2005-2008 was globally significant for patient safety and infection prevention and control as rapid progress was made by the First Challenge along with key partners, WHO regions and country leaders. The First Challenge's key objectives were to develop technical guidelines and tools and to provide support for implementation to undertake awareness-raising as well as to mobilise governments and stakeholders. Improvement of hand hygiene was highlighted as the first aspect of HAI to address.

In 2009, the first international, evidence-based recommendations for improvement of hand hygiene practices were issued by the Challenge in the form of the WHO Guidelines for Hand Hygiene in Health Care.[4]

Background

WHO's motivation for this work has been, and continues to be, in response to the concerns over the global burden of disease due to HAI. Available data collated by WHO highlight that while HAI surveillance systems, which are critical to understanding and addressing the problem, exist in developed countries, only 16% of developing countries report a functioning system. Conversely, HAI rates when known are markedly higher in developing countries, with up to 19% of patients estimated to acquire an HAI hospital-wide. Surgical site infections are known to be the most frequent in these countries and can occur at rates of up to 25% of all surgical procedures. For ventilator-associated pneumonia (VAP) and neonatal infections, the rates are equally as alarming. VAP occurs up to 17 times more frequently than in developed countries with an excess mortality rate as high as 27%. Neonatal infections are three to 20 times higher and are responsible for 4-56% of all causes of death in the neonatal period. The costs to health-care systems in the developed world, are also clearly documented.[2,5]

The impact of the First Challenge's work has been demonstrated thus far by 124 Ministries of Health pledging to WHO that they will address HAI, and over 40 country or area hand hygiene campaigns under way, coordinated within by a WHO network. Additionally, around 12,000 health-care facilities have so far registered for 'WHO SAVE LIVES: Clean Your Hands', which was launched in 2009 (http://www.who.int/gpsc/5may/registration_update/en/index.html). This global annual campaign was seen as a natural extension to the work of the Challenge, and with the aim of sustaining the focus on hand hygiene at the point of patient care all around the globe has already galvanised significant global action since its conception. It is also clear to WHO, through preliminary investigation, that a large number of health-care facilities have utilised the hand hygiene tools, in support of the Guideline's implementation and a growing number of scientific publications have featured detail of First Challenge recommendations.[6]

Available literature highlights that successful hand hygiene programmes inevitably contain an educational component[4] and that this is an integral part of effective health-care functioning. The First Challenge team has invested considerable energies in supporting training and education efforts related to hand hygiene around the globe.

The role of the First Challenge in training and education on hand hygiene improvement

Given that hand hygiene is an essential element in preventing and reducing HAI and most studies have shown that compliance continues to be less than optimum,[4] a core element of the First Challenge's work on improving hand hygiene practices has been to focus on the new concept of 'My 5 moments for Hand Hygiene'. This approach was intended, and has indeed begun, to drastically change the perspective of education and practice in relation to hand hygiene in many countries[7] while simplifying the learning of key hand hygiene recommendations. It helps to address behaviours associated with hand hygiene compliance as well as bringing ownership to clinical

staff in understanding the principles of prevention of microorganism transmission for their patients.[8,9] Many of the supporting implementation tools for use in health care, provided by the First Challenge, are focussed on the 5 Moments.

Providing training on the implementation of a multimodal hand hygiene improvement strategy is crucial. The hand hygiene improvement strategy developed by WHO is comprised of five components: system change, including access by health-care workers to alcohol-based handrub at the point of patient care and to soap, clean towels and a safe, continuous supply of water; staff education; monitoring and evaluation including providing knowledge and compliance feedback; posting visual reminders in the work place, and creating a safety climate within institutions, with active and visible participation from health-care workers, managers and, when feasible, patients (Box 1).

Box 1: Key WHO tools developed to support the training and education component of the hand hygiene strategy

- MS PowerPoint slides for hand hygiene coordinators
- MS PowerPoint slides for education sessions focused on trainers, observers and health-care workers
- A hand hygiene training film and accompanying slides, with a focus on the WHO 'My 5 Moments for Hand Hygiene'
- A hand hygiene technical reference manual for supporting understanding of the implementation of the WHO 'My 5 Moments for Hand Hygiene'
- A hand hygiene why, how and when brochure
- A glove use information leaflet
- 'Your 5 Moments for Hand Hygiene' poster
- Frequently asked questions and answers
- A list of key scientific publications
- Sustaining improvement suggestions - additional activities for consideration by health-care facilities.

Table I: Training and education suggestions included in the WHO Guide to Implementation

- In the context of a hand hygiene improvement programme, the targets for training are; trainers, observers and all health care workers
  - It is recommended that the identified hand hygiene coordinator along with senior managers and/or an overseeing committee if one exists, identify individuals capable of fulfilling the roles of trainers and observers
  - Trainers should have a basic knowledge of infection control, experience in training as well as having delivered health-care at the bedside and being influential and credible in their setting
- As facilities move across the hand hygiene improvement continuum it is expected that they will establish a robust programme of education on hand hygiene and provide regular training to all health care workers, on commencement of employment and as regular updates
  - Plans for training should be made and should include how much time will be allocated to training as well as which specific clinical settings in which training and education will be provided in the first instance (e.g. according to risk for HAI)

Table I continued

- Training is expected to include, as a minimum; a background to the WHO Clean Care is Safer Care programme, definition, impact and burden of HAI, patterns of transmission of HAI with a particular focus on hand transmission, the critical role of hand hygiene in the prevention of HAI, the recommendations from the WHO Guidelines for Hand Hygiene in Health Care and the associated implementation strategy and toolkit

- Consideration should be given to checking the competence of all health-care workers who have received training. This might take the form of a practical hand hygiene demonstration workshop to confirm competence in relation to correct hand hygiene technique at the correct moments.

Key point:

- The hand hygiene observation form and the compliance calculation form provide a simple method and helpful support by which health-care workers can be educated both in training sessions and at the bed side, while discussing their own performance results and highlighting the times when it is most appropriate to cleanse hands as per the 5 Moments.

Table II: Sequential indications for conducting surveys that can inform training and education programmes using WHO tools (the time lines are approximate)

Ward infrastructure servey (baseline)	Week 1-2			
Senior executive managers perception survey (baseline)		Week 3		
Health-care workers perception survey (baseline)			Week 4-5	
Hand hygiene observations (baseline)				Week 6-8
Soap ? handrub consumption survey (baseline)				End of Step 2: then monthly or every 3-4 months
Health-care workers knowledge survey (baseline)				Last week or immediatley before education session

The Guide to Implementation of the WHO Multimodal Hand Hygiene Improvement Strategy is a key part of the WHO toolkit in that it provides comprehensive advice on how to develop an effective hand hygiene improvement action plan and includes details on how to address training and education to achieve hand hygiene standards (see Table I and Table II).

Evidence related to the importance and impact of education has been described within the WHO Guidelines on Hand Hygiene in Health Care in a chapter dedicated to 'Organizing an educational programme to promote hand hygiene'. Furthermore, this evidence is also discussed in a recent review paper on this topic authored by the First Challenge team which concludes, through a review of the evidence, that education has a positive impact on improving hand hygiene and reducing HAI. It also outlines key elements for a successful education programme, building on the information already provided by WHO, and highlights that multifaceted approaches that combine several aspects such as training, written materials, reminders and continued feedback on performance can have a better and more sustained effect on hand hygiene. Additionally, it discusses the more recent use of innovative approaches such as those that mimic contextual conditions and stimulate reflective thinking.[10]

Testing the WHO multimodal hand hygiene improvement strategy

Training for those undertaking pilot site testing of the multimodal strategy over this period has been a key activity for the Challenge team.

Using a standardized methodology and a protocol, support was given for eight pilot sites to implement the WHO multimodal hand hygiene improvement strategy from 2006-2008. These sites were in Bangladesh, Costa Rica, Hong Kong Special Administrative Region, Italy, Mali, Pakistan and Saudi Arabia,

Summary results from pilot sites

The results from the pilot sites demonstrate that there was a significant increase in compliance with hand hygiene in each setting that took part. Improvement in health-care workers' perceptions on HAI and the role of hands in microorganism transmission was seen. Substantial system change was also achieved in these settings, including the production of the WHO alcohol-based handrub formulation being possible in 11 sites. This production has been demonstrated to be feasible and both clinically and cost effective.[4] Additional benefits of this phase of work included infection control programmes being established in settings where they did not previously exist.

In telephone interviews, two years following pilot testing, additional key findings have been collated. Indicators of long-term sustainability within pilot sites include:

- Extension of programmes hospital-wide
- Renewed and/or mandatory educational activities
- Poster refreshment (with poster competitions in 2 sites)
- Continuation of hand hygiene compliance monitoring in at least some wards (6/8 sites) or alcohol-based handrub consumption monitoring
- National scale-up (5/5 sites; three sites were in countries with existing national campaigns).

The experience in Pakistan

Training on the 5 Moments in Pakistan

Health-care workers' knowledge about health care-associated infection and hand hygiene showed significant improvement following training.

On follow up, although education activities have been renewed both in the pilot intensive care units as well as other units, the measurement of hand hygiene compliance and handrub consumption monitoring were not affordable after the end of pilot testing. A promising achievement of this project is that the federal ministry of health has expressed an interest to train 100,000 health visitors throughout Pakistan and distribute alcohol-based handrub.

The experience in one site in Saudi Arabia

Stations for hand hygiene learning - Saudi Arabia

Knowledge about hand hygiene did not significantly improve initially.

On follow up, one "champion", committed to hand hygiene promotion was selected in each ward and trained to become a role model and deliver on-site education.

In 2009, the average hand hygiene compliance reached levels very close to the objective of 90% hospital-wide and in most clinical areas. Overall, as a consequence, awareness and education has improved.

A full description of the work programme in Mali was published recently.[11] The aim, as in other pilot sites, was to assess the feasibility and effectiveness of the multimodal improvement strategy. The study was implemented using the five implementation steps recommended by WHO; preparedness, baseline evaluation, intervention, follow-up and long-term planning and sustainment.[12] Specific indicators were evaluated, namely; compliance with hand hygiene, health-care workers' knowledge of microorganism transmission and hand hygiene practices, health-care workers' perception of HAI and the importance of hand hygiene and effectiveness of each multimodal component, as well as evaluating the availability of an infrastructure to allow for hand hygiene.

The testing protocol was discussed and adapted for local implementation in collaboration with hospital leads and administrators as well as WHO partners at country and regional level. At the outset, severe deficiencies in the infrastructure were recorded with no availability of soap, disposable towels and alcohol-based handrub. However, local production of alcohol-based recommended WHO formulation was initiated and proved to be satisfactory in meeting the standards.[4,11] At the follow up, it was found that use of this product for hand hygiene became quasi-exclusive and compliance had increased significantly from 8.0% at baseline, to 21.8% at follow-up ($p < 0.001$), with improvement being observed across all professional categories. Intensive education of all staff in pilot wards was undertaken by local trainers with the support of the WHO tools. Following training, knowledge improved across all four main professional

categories with significant increase of the median score as examined through a knowledge questionnaire.[11]

During 2006-2008, feedback was also gathered by the Challenge team, using an on-line questionnaire and semi-structured interviews, from "complementary test sites" who registered to use the pilot hand hygiene implementation toolkit. The majority (230/329 respondents) concurred that knowledge, perception and practice improved through the use of the WHO implementation tools.[4]

Due to the results described throughout the period of testing and information gathering, it has been concluded that the multimodal improvement strategy is feasible and effective, even in a low income setting, given the right support and dedication.

Sustaining the momentum

Education and training can take on many forms. WHO's First Global Patient Safety Challenge has had the privilege and opportunity not only to be involved in their own training exercises but to take advantage of their key partners around the globe in empowering them to embed WHO hand hygiene recommendations into their own documentation and training programmes, e.g. by writing chapters in text books and informing multi-professional curricula.

Undertaking workshops such as those held at International Federation of Infection Control conferences is crucial to the ongoing cascade of information in the long term. The First Challenge is moving to a new phase of work where it will be even more important that others assume the responsibilities highlighted in these first five years, including those who have a focus on education and training.

The Challenge team have held four international workshops of their own with more than 80 country representatives, issued over 60 scientific publications and undertaken invited lectures in over 20 national and international conferences each year; all with the aim of promoting 'cascade training' and message spread to health-care workers all around the globe. The year 2010 also saw the launch of the inaugural infection control webinar series by WHO Patient Safety with monthly free, live online sessions supported by infection prevention and control experts from around the globe.

Many challenges as well as solutions have been recognized since the launch of WHO's First Global Patient Safety Challenge. WHO patient safety programmes are relatively new in the field of health care, and have been fortunate to have had access to many countries and organizations to explore the elements that constitute successful global patient safety initiatives. Another part of WHO Patient Safety work has been to prepare a medical, and subsequently a multi-professional, patient safety curriculum which includes a chapter on infection prevention and control and which is being rolled out to a wide range of academic and other settings globally.

Education and training as part of a multimodal strategy can lead to significant results, however, gaps remain. In 2010 WHO released a Hand Hygiene Self-Assessment Framework to additionally help facilities to assess their situations and target initiatives. WHO challenges all health-care partners to continue with their activities and to develop novel approaches to achieving sustainability with hand hygiene practices and reductions in HAI, including long-term culture change in health care, and to test and share these approaches with colleagues around the globe. WHO SAVE LIVES: Clean Your Hand annual global campaign on 5 May every year is a medium by which facilities, organizations and countries can continue to demonstrate their commitment to the world.

Acknowledgements

The authors thank all current and previous members of WHO First Global Patient Safety Challenge, members of the Infection Control Programme University Hospitals of Geneva, all participating pilot test sites, those participating in the WHO infection control webinar series and the International Federation of Infection Control for collaborative opportunities.

References

1. Pittet D, Donaldson L. Clean care is safer care: a worldwide priority. *Lancet* 2005; **366:** 1246-1247.
2. Allegranzi B, Bagheri Nejad S, Combescure C, *et al*. Burden of endemic healthcare-associated infection in developing countries: a systematic review and meta-analysis. *Lancet* 2010; **377:** 228 – 241.
3. World Health Organization. The Global Patient Safety Challenge 2005-2006 "Clean Care is Safer Care." Geneva: World Health Organization, 2005. http://www.who.int/patientsafety/events/05/GPSC_Launch_ENGLISH_FINAL.pdf. (Accessed September 22, 2010)
4. World Health Organization. WHO guidelines on hand hygiene in health care. Geneva: World Health Organization, 2009.
5. World Health Organization. The burden of health care-associated infection worldwide: a summary. Geneva: World Health Organization, 2010. http://www.who.int/gpsc/country_work/summary_20100430_en.pdf (Accessed September 22, 2010)
6. Graafmans W, Kilpatrick C, Mathai E, Allegranzi, Bagheri Nejad S, Pittet D. Trends in scientific publications as an indicator for hand hygiene awareness. 50th Annual Interscience Confrence on Antimicrobial Agents and Chemotherapy, Boston, USA, 12-15 September 2010.
7. Sax H, Allegranzi B, Uçkay I, Larson E, Boyce J, Pittet D. "My five moments for hand hygiene" – a user-centred design approach to understand, train, monitor and report hand hygiene. *J Hosp Infect* 2007; **67:** 9-21.
8. Storr J. Five moments for hand hygiene, a focused targeted approach to patient safety. *Int J Infect Control* 2009; **5(2):** doi: 10.3396/ijic.V5i2.019.09.
9. Pittet D, Allegranzi B, Sax H, *et al*. WHO Global Patient Safety Challenge, World Alliance for Patient Safety. Evidence-based model for hand transmission during patient care and the role of improved practices. *Lancet Infect Dis* 2006; **6:** 641-652.
10. Mathai E, Allegranzi B, Seto WH, *et al*. Educating healthcare workers to optimal hand hygiene; addressing the need. *Infection* 2010; **38(5):** 349-356.
11. Allegranzi B, Sax H, Bengaly L, et al. Successful implementation of the World Health Organization hand hygiene improvement strategy in a referral hospital in Mali, Africa. *Infect Control Hosp Epidemiol* 2010; **31:** 133-141.
12. World Health Organization. A guide to the implementation of the WHO hand hygiene improvement strategy. Geneva: World Health Organization, 2009. http://whqlibdoc.who.int/hq/2009/WHO_IER_PSP_2009.02_eng.pdf (Accessed September 22, 2010)

Additional web links:

- WHO First Global Patient Safety Challenge http://www.who.int/gpsc
- WHO Hand Hygiene Tools http://www.who.int/gpsc/5may/tools/en/index.html
- WHO Infection Control Webinar Series http://www.who.int/gpsc/5may/news/webinars/en/index.html