

Pathways to clean hands: highlights of successful hand hygiene implementation strategies in Europe

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Hand hygiene is the most effective way to stop the spread of microorganisms and to prevent health-care-associated infections (HAI). The World Health Organization launched the First Global Patient Safety Challenge - Clean Care is Safer Care - in 2005 with the goal to prevent HAI globally. This year, on 5 May, the WHO's initiative SAVE LIVES: Clean Your Hands, which focuses on increasing awareness of and improving compliance with hand hygiene practices, celebrated its second global day. In this article, four Member States of the European Union describe strategies that were implemented as part of their national hand hygiene campaigns and were found to be noteworthy. The strategies were: governmental support, the use of indicators for hand hygiene benchmarking, developing national surveillance systems for auditing alcohol-based hand rub consumption, ensuring seamless coordination of processes between health regions in countries with regionalised healthcare systems, implementing the WHO's My Five Moments for Hand Hygiene, and auditing of hand hygiene compliance.

Introduction

Ignaz Semmelweis first demonstrated in 1847 that good hand disinfection was able to prevent puerperal fever [1-2] and evidence continues to show that hand hygiene is the simplest, most effective way to prevent cross-transmission of microorganisms and healthcare-associated infections (HAI) [3-5]. Despite all the data that are available supporting the benefits of performing hand hygiene, strict compliance of healthcare workers (HCW) with recommended hand hygiene practices is very difficult to achieve and even when it is achieved, it is very difficult to sustain. Factors found to be associated with poor hand hygiene practices include, among others: being an assistant physician or assistant nurse rather than a physician or a nurse, working on a week-day, having many hand hygiene opportunities per hour of patient care, performing activities with high risk

of cross-transmission of microorganisms, working in high-risk areas and wearing gloves and gowns [4,6,7].

No single intervention is adequate enough to bring about change in behaviour, and in fact, for hand hygiene practices to be changed and results to be sustainable, multimodal approaches and complex interventions have been shown to be necessary [7-9].

In 2005, the World Health Organization's (WHO) World Alliance for Patient Safety, launched the First Global Patient Safety Challenge, Clean Care is Safer Care (<http://www.who.int/gpsc/background/en/index.html>) [10], which targeted the prevention of HAI. Subsequently, in 2009, it launched the SAVE LIVES: Clean Your Hands (<http://www.who.int/gpsc/5may/en>) initiative, highlighting the importance of hand hygiene and providing guidelines and toolkits for the best implementation of hand hygiene [9,11,12]

The purpose of this article is to highlight one important aspect of the national hand hygiene campaigns from four Member States of the European Union (EU) that we felt to be noteworthy and successful in changing HCW's hand hygiene practices.

Belgium: governmental support as a key factor for success

In Belgium three multimodal, country-wide hand hygiene campaigns were organised from 2005 to 2009 [13]. The purpose of these campaigns was to raise the awareness of HCW in all hospitals and, in doing so, to increase their adherence to good hand hygiene practices. The main foci of the campaigns were to improve the use of alcohol-based hand rubs (ABHR) by HCW and to measure their compliance with hand hygiene before and after each patient intervention. In order to increase adherence, performance feedback, education, workplace reminders and patient empowerment were used.

Government support, one of the WHO's key recommendations for planning national hand hygiene campaigns, was one of the most important reasons for success of the Belgian national campaigns [9]. The Federal Public Service (FPS) for Public Health, Food Chain Safety and Environment gave a strong political commitment during all three campaigns. The Belgian Antibiotic Policy Coordination Committee (BAPCOC), together with the FPS, were the core groups supporting the campaigns. The FPS had a dual role: it funded the campaigns and was part of the national task force that was responsible for their organisation. In addition, the FPS supported the campaigns by sending a written invitation to all Belgian hospitals, requesting voluntary participation in Belgium's national hand hygiene campaigns. In order to solidify the engagement of hospitals at an institutional level, positive replies indicating the intention to participate in the national hand hygiene campaigns, had to be returned to the FPS with signatures from the hospital directors and infection control teams.

Other governmental activities included press conferences at the launch of each hand hygiene campaign by the Belgian Minister of Social Security and Public Health and campaign materials in French and Dutch, made available on the Federal platform for hospital hygiene website (www.hicplatform.be).

Each of the three national hand hygiene campaigns resulted in a significant increase in hand hygiene compliance in HCW and also a higher consumption of ABHR [14-16]. Compliance with hand hygiene, measured by direct observation, increased significantly from 49% to 69% during the first campaign, from 53% to 69% during the second campaign and from 58% to 69% during the third campaign. Hospital participation and commitment, which was voluntary, was 95% for acute care hospitals, 65% for long-term care hospitals and 60% for psychiatric hospitals, for all campaigns.

High hospital participation rate and the improvement of hand hygiene compliance in all types of HCW are indications that behaviour is changing. In view of these positive outcomes, hand hygiene campaigns have now become a priority for the Belgian government, and a separate budget for a new campaign will be allocated

every two years. The next campaign will be held in November, 2010.

France: indicators and governmental involvement as key elements for the successful implementation of hand hygiene

Infection control in France began when infection control committees were created in public and private hospitals in 1988 and 1999, respectively, following a ministerial decree from the Ministry of Health in 1988 [17,18].

The first phase of the French national programme for infection control, was created in 1993 and has been responsible for strengthening infection control practices locally and nationally, for the creation of surveillance networks to monitor and prevent HAI, and preventing the emergence and spread of antimicrobial resistance in micro-organisms [19,20]. The French Institute for Public Health Surveillance (Institut de Veille Sanitaire (InVS)) has developed the Réseau d'alerte, d'investigation et de surveillance des infections nosocomiales (RAISIN) (<http://www.invs.sante.fr/surveillance/raisin/>), which is an early warning surveillance system [19,21].

The second phase of the French national infection control programme, from 2005 to 2008, promoted the implementation of five national quality indicators which are used to benchmark hospital performance in infection control. These indicators were a breakthrough in the field of infection control practices, and through benchmarking and public reporting, 89% of healthcare facilities in France attained the highest rates of performance. The indicators can be found on the website of the Ministry of Health [20] and are listed below:

- Global indicator of infection control (ICALIN) (<http://www.icalin.sante.gouv.fr/>);
- Surgical site infection surveillance indicator (SURVISO) (<http://www.sante-sports.gouv.fr/surviso-indicateur-de-realisation-d-une-surveillance-des-infections-du-site-operatoire-iso.html>);
- Alcohol-based hand rub consumption indicator (ICSHA) (<http://www.sante-sports.gouv.fr/l-indicateur-icsha.html>);

TABLE

Use of alcohol-based hand rubs from 4,076 hospital units in 2008 in Germany

Type of unit	Number of hospitals	Number of units	Patient days	L/year	mL/PD				
					P10 ^a	P25 ^b	Median	P75 ^c	P90 ^d
ICU	303	556	1,223,229	94,744	33	53	73	95	126
Non-ICU	343	3,520	28,065,590	496,824	8	13	14	23	33

ICU: intensive care unit; PD: patient days.

^a10% Percentile.

^b25% Percentile.

^c75% Percentile.

^d90% Percentile.

- Incidence of meticillin-resistant *Staphylococcus aureus* (MRSA) indicator (SARM) (<http://www.sante-sports.gouv.fr/sarm-staphylococcus-aureus-resistant-a-la-meticilline-dans-les-prelevements-a-visee-diagnostique-en-2005-et-2006-pour-1000-journees-d-hospitalisation.html>), measuring incidence of MRSA infections per 1,000 patient-days;
- Antibiotic stewardship and consumption indicator (ICATB) (<http://www.sante-sports.gouv.fr/icatb-indice-composite-de-bon-usage-des-antibiotiques.html>).

In 2008, France organised a national hand hygiene campaign, available on a dedicated space on the Ministry of Health's website *Mission mains propres* (<http://www.sante-sports.gouv.fr/mission-mains-propres.html>) (*Mission clean hands*) [13], for which there was strong governmental support, mostly by providing finances for auditing of hand hygiene compliance.

Germany: the key to success: standardising the audit of ABHR as part of the national surveillance system

The German national hand hygiene campaign *AKTION Saubere Hände* (<http://www.praxis-page.de/ash/index2.htm>) was launched in January 2008 and is supported by the German Ministry of Health. The basic premise of this campaign is the implementation of multimodal interventions to improve hand hygiene compliance. The five key intervention tools it uses are: mandatory educational lectures for HCW, increased availability of ABHR in hospitals, administrative support of the hand hygiene campaign, implementation of the WHO's My Five Moments of Hand Hygiene and the evaluation of compliance by measuring ABHR consumption.

The German Krankenhaus-Infektions-Surveillance-System (KISS) (<http://www.nrz-hygiene.de/>) is a surveillance system of HAI. Within this surveillance system, KISS established a new module named *HAND-KISS* (<http://www.nrz-hygiene.de/surveillance/hand.htm>), a surveillance system that measures the ABHR usage as a surrogate measure of compliance with hand hygiene.

To date, 660 healthcare institutions, such as hospitals, senior care centres, rehabilitation centres, ambulatory dialysis centres and emergency services, feed their ABHR consumption data on a mandatory basis into *HAND-KISS*. These data are reported annually in millilitre (mL), by number of annual patient days (PD) per hospital unit type (intensive care unit or not), and by hospital. *HAND-KISS* calculates the ABHR in mL per PD for each unit and provides reference data, stratified according to each unit's speciality.

The *HAND-KISS* consecutive data from 2007 and 2008 and ABHR consumption data from hospitals participating in the *AKTION Saubere Hände* are presented in

the Table. From 2007 to 2008, there was a statistically significant increase of 13% in ABHR consumption in all hospital units participating in *HAND-KISS* and *AKTION Saubere Hände*.

Measuring consumption of ABHR is a good way to assess compliance with hand hygiene, as it is difficult to obtain precise data on compliance by auditing the number of hand hygiene observations. Satisfactory inter-rater reliability is hard to achieve when measuring hand hygiene observations and in fact, inter-rater reliability ranged between 30% and 60% when it was assessed during the German national hand hygiene campaign (Reichardt, unpublished data). Due to this variability, hand hygiene compliance rates cannot be used to accurately allow a comparison of rates between hospitals, and quantitative interpretation of data should be done with caution. Measurement of ABHR consumption provides a practical and potentially more reliable system to assess quantitative changes in hand hygiene behaviour and provides a benchmarking system to compare between hospitals. *HAND-KISS* is the first surveillance system to provide crude data of the distribution of ABHR for benchmarking between hospitals.

United Kingdom - England: My Five Moments for Hand Hygiene and beyond

From 2009 to 2010, the *cleanyourhands* (<http://www.npsa.nhs.uk/cleanyourhands>) campaign in England and Wales embraced the WHO's My Five Moments for Hand Hygiene aiming to integrate hand hygiene into every aspect of patient care and to emphasise to HCW that the point of patient care is the critical moment to stop cross-transmission of micro-organisms and thus preventing HAI.

Although My Five Moments for Hand Hygiene was initially developed for the inpatient hospital setting by the University of Geneva Hospitals [12], *cleanyourhands* has attempted to expand this approach in England and Wales across all types of National Health System (NHS) trust, from the acute inpatient setting to ambulances and mental health institutions.

In order to implement the elements of My Five Moments for Hand Hygiene, educational material and practical tools for training were developed for infection control practitioners to use, but also to train and educate other staff. A key resource that was developed was a film based on one patient's journey through the NHS, from ambulance to hospital and back home, illustrating the multitude of opportunities that were available for hand hygiene and how the Five Moments for Hand Hygiene can be applied in different care settings.

Other activities included a series of regional one-day workshops introducing My Five Moments for Hand Hygiene for infection control staff and those responsible for infection control training in England and Wales. Feedback from the workshops has been

overwhelmingly positive with 95% of respondents considering them good or excellent. Subsequently, the **cleanyourhands** campaign also facilitated a dedicated workshop for infection control and training representatives from the ambulance service.

To further highlight the Five Moments for Hand Hygiene, an online game called **Wi Five?** (<http://www.npsa.nhs.uk/cleanyourhands/resource-area/wi-five-game>) was created and launched for the WHO's Save Lives: Clean Your Hands initiative on 5 May 2009, as a tool for infection control teams to educate and engage staff in this WHO initiative. In the approximately four months following its launch, the **Wi Five?** game was played 37,362 times. Work is now underway to develop the game further, adding other scenarios to represent more care settings.

United Kingdom – Scotland: auditing as a key factor for successful implementation of hand hygiene campaigns

In 2005, the Scottish Minister for Health and Community Care participated in the First Global Patient Safety Challenge, Clean Care is Safer Care [22,23] and pledged to develop and fund a national hand hygiene campaign in Scotland. Consequently, in January 2007, Scotland's campaign **Germs. Wash your hands of them** (<http://www.washyourhandsofthem.com/>) was launched by Health Protection Scotland (HPS). The campaign is funded until March 2011 and includes both professional and public elements. Campaign activities include educational posters for staff and visitors in acute and community healthcare settings, public media campaigns, information for children, leaflets for the public and for healthcare staff, credit card-sized fliers depicting My Five Moments for Hand Hygiene [12], research activities, presentation of national hand hygiene compliance data, a dedicated enquiry service (including telephone and email inbox enquiry service) and a campaign website.

Auditing hand hygiene compliance is a key method to monitor hand hygiene compliance in the Scottish hand hygiene campaign and is in accordance with the recommendations in the WHO's My Five Moments for Hand Hygiene. An audit tool and a supporting protocol were developed by HPS to ensure a standard methodology for data collection [24] and were adopted in Scotland for use in acute healthcare settings. The Scottish hand hygiene compliance data that are collected are published by HPS [25].

Local campaign activities at each National Health Service (NHS) board in Scotland are implemented by the Local Health Board Coordinators for hand hygiene (LHBCs). The LHBCs are employed to perform audits of hand hygiene compliance, to promote hand hygiene practice among HCW and to raise awareness of campaign materials. Initial training for the LHBCs in the use of the audit protocol is provided by HPS and training updates are offered regularly. These are necessary

because auditors can report different hand hygiene rates depending on their training [26] and any observation method will be susceptible to an inherent observer bias [27]. For this reason, a quality assurance exercise for LHBCs was undertaken and results indicated good inter-rater reliability for observed hand hygiene behaviour.

Local Health Board Coordinators for hand hygiene perform audits in acute healthcare settings during mandatory national audit periods. They measure compliance of HCWs by observing 20 opportunities for hand hygiene during the course of one working day. Fifteen one-day audits are conducted during each mandatory audit period, which equates to 300 opportunities per NHS board. After every audit period, the data are submitted to HPS for quality assurance and analysis.

The campaign has helped the NHS boards to meet, and even exceed, the hand hygiene compliance target of 90% set by the Scottish Government for November 2008. In February 2007, the first audit period, hand hygiene compliance across NHS Scotland for acute healthcare settings was 68%, and in the latest report published in January 2010, national hand hygiene compliance was 94% [25]. In fact, national hand hygiene compliance has remained above 90% since August 2008. The next phase of the campaign will focus on sustainability of hand hygiene improvements as well as extension into the non-NHS healthcare sector.

Conclusions and perspectives

Adherence of HCW to good hand hygiene practices is necessary during all aspects of patient care. Despite all the evidence supporting the benefits of hand hygiene, compliance with hand hygiene among HCW is low, and there is still much room for improvement to ensure that patients remain free from HAI. Only complex, multimodal interventions have been shown to change HCW behaviour and to achieve high rates of compliance and sustainability.

Although compliance with good hand hygiene practices represents an important part of infection control and prevention of HAI, other important practices, for instance the prudent use of antibiotics, must be strongly reinforced and used in parallel with hand hygiene. Preventing healthcare-associated infections, such as catheter-associated blood-stream infections and *Clostridium difficile* colitis, also require multimodal strategies, examples of which are education, feedback and guidance for HCW.

Hand hygiene campaigns in the EU Member States can range from local hospital-based hand hygiene activities to national campaigns [13]. Important factors in the support and success of national campaigns include governmental support, use of indicators for benchmarking, national surveillance systems for auditing AHBR consumption, coordination of processes between health regions, implementation of hand hygiene

toolkits and guidelines, and auditing and feedback of hand hygiene compliance.

In accordance with the Council Recommendation of the European Commission of 9 June 2009 on patient safety [28], which includes the prevention and control of HAI, the implementation of best practices and infection prevention and control programmes are important issues for the EU Member States. The benefits of complying with good practices of hand hygiene in the EU are now being recognised and many Member States are making hand hygiene a priority, frequently within the framework of patient safety, and are developing strategies or adapting or adopting those already used by others.

In order to further highlight the importance of hand hygiene and to increase the awareness and communication between the EU Member States, Belgium, as part of the Belgian EU Presidency celebration, will organise a conference in November 2010, during which a hand hygiene workshop will be held. This will be arranged in collaboration with the WHO and the European Centre for Disease Prevention and Control (ECDC), to provide a further platform and tools for raising awareness and implementing best hand hygiene practice in Europe.

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