

**Review Article**

# HAND WASHING WITH SOAP: THE MOST EFFECTIVE 'DO-IT-YOURSELF' VACCINE?

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## ABSTRACT

Hand washing is one of the most effective means of preventing diseases and have a major impact on public health in any country. It is known to significantly reduce the two leading causes of mortality - diarrheal diseases and acute respiratory infections, including the recent outbreak of pandemic influenza. Because hand washing with soap can prevent the transmission of a variety of pathogens, it may be more effective than any single vaccine or hygiene behaviour. Promoted broadly enough, hand washing with soap can be viewed as an essential do-it-yourself vaccine.

"Good hand hygiene is the first line of defense against spread of many illnesses". Therefore public should be provided with adequate knowledge and tools to enable them to protect themselves and their families from infection and illness by practicing proper hand hygiene through support of key stakeholders, Government, industry, and donors who can offer unique resources which are necessary to ensure the success of a large-scale program. Conducting a situation assessment and, where needed, making the case for hand washing on topics ranging from cost effectiveness to health impact will give the hand washing program a solid foundation.

This is the important time to re-look at our hand hygiene habits, for hands are the key carrier of germs that spread infections, and good hand hygiene is the one tool within easy reach of everyone, that can reduce the risk of infection. If the millennium development targets for reduction in child mortality are to be met, hand washing habits must be improved.

**Keywords:** Hand washing, Vaccine, Millennium development targets

## INTRODUCTION

Hand washing is one of the most effective means of preventing diseases and have a major impact on public health in any country. It is known to significantly reduce the two leading causes of mortality - diarrheal diseases and acute respiratory infections, including the recent outbreak of pandemic influenza. Because hand

washing with soap can prevent the transmission of a variety of pathogens, it may be more effective than any single vaccine or hygiene behaviour. Promoted broadly enough, hand washing with soap can be viewed as an essential do-it-yourself vaccine<sup>1</sup>.

## HISTORICAL ORIGIN

As early as 1840's, Dr. Ignaz Semmelweis, an assistant in the maternity wards of a Vienna hospital, observed that the mortality rate in a delivery room staffed by medical students was up to three times higher than in a second delivery room staffed by midwives. In fact, women were terrified of the room staffed by the medical students. Dr Semmelweis observed that the students were coming straight from their lessons in the autopsy room to the delivery room. He postulated that the students might be carrying infection from their dissections to birthing mothers. He ordered doctors and medical students to wash their hands with a chlorinated solution before examining women in labour. The mortality rate in his maternity wards eventually dropped to less than one percent. In the late 1843, Dr. Oliver Wendell Holmes advocated hand-washing to prevent childbed fever.

### IMPACT OF HANDWASHING

Hand washing interrupts the transmission of disease agents and so can significantly reduce diarrhoea and respiratory infections, as well as skin infections and trachoma. A recent review by Curtis and Cairncross<sup>2</sup> suggests that hand washing with soap, particularly after contact with faeces (post-defecation and after handling a child's stool), can reduce diarrheal incidence by 42-47 percent, while work by Rabie et al. suggests a 16 percent reduction in respiratory infections is possible through handwashing<sup>3</sup>. Every year, more than 3.5 million Children<sup>4</sup> do not live to celebrate their fifth birthday because of diarrhoea and pneumonia. Yet, despite its lifesaving potential, hand washing with soap is seldom practiced and not always easy to promote. Turning hand washing with soap after using a bathroom (private or public), after changing a diaper, before feeding a child, before eating and before preparing food or handling raw meat, fish, or poultry, or any other situation leading to potential contamination into an ingrained habit could save more lives than and single vaccine or medical intervention, cutting deaths from diarrhoea by almost half and deaths from acute respiratory infections by one-quarter<sup>5,6</sup>. To reduce the spread of germs, it is also better to wash the hands and/or use a hand antiseptic before and after tending to a sick person. If your hands are not visibly dirty or soiled, washing one's hands with a good hand antiseptic is the most effective overall way to

prevent the spread of infectious disease. If hands are dirty or soiled, washing your hands with soap and water followed by a good hand antiseptic is the most effective overall way to prevent the spread of infectious disease. The Centers for Disease Control and Prevention (CDC) has stated: "It is well-documented that one of the most important measures for preventing the spread of pathogens is effective hand washing."

### TECHNIQUE

The application of water alone is inefficient for cleaning skin because water is often unable to remove fats, oils, and proteins, which are components of organic soil. Therefore, removal of microorganisms from skin requires the addition of soaps or detergents to water.

Solid soap, because of its reusable nature, may hold bacteria acquired from previous uses, so it's important to wash the soap itself before and after use<sup>7</sup>. Antibacterial soaps have been heavily promoted to a health-conscious public. A comprehensive analysis from the University Of Oregon School Of Public Health indicated that plain soaps are as effective as consumer-grade anti-bacterial soaps containing triclosan in preventing illness and removing bacteria from the hands.

Conventionally, the use of soap and warm running water and the washing of all surfaces thoroughly, including under fingernails is seen as necessary. One should rub wet, soapy hands together outside the stream of running water for at least 20 seconds, before rinsing thoroughly and then drying with a clean or disposable towel. It has been shown that the use of a towel is a necessary part of effective contaminant removal, since the washing action separates the contaminants from the skin but does not completely flush them from the skin - removing the excess water (with the towel) also removes the suspended contaminants. After drying, a dry paper towel should be used to turn off the water (and open the exit door if one is in a restroom or other separate room). Moisturizing lotion is often recommended to keep the hands from drying out, should one's hands require washing more than a few times per day.

Effective drying of the hands is an essential part of the hand hygiene process, but there is some debate over the most effective form of drying in washrooms. In 2008, a study conducted by the

University of Westminster, London revealed that after washing and drying hands with the warm air dryer, the total number of bacteria was found to increase on average on the finger pads by 194% and on the palms by 254% and after washing and drying hands with a paper towel, the total number of bacteria was reduced on average on the finger pads by up to 76% and on the palms by up to 77%<sup>8</sup>.

Medical hand washing is for a minimum of 15 seconds using generous amounts of soap and water or gel to lather and rub each part of the hands<sup>9</sup>. Hands should be rubbed together with digits interlocking. If there is debris under fingernails, a bristle brush may be used to remove it. Since germs may remain in the water on the hands it is important to rinse well and wipe dry with a clean towel. After drying, the paper towel should be used to turn off the water (and open any exit door if necessary). This avoids re-contaminating the hands from those surfaces. The purpose of hand washing in the health care setting is to remove pathogenic microorganisms ("germs") and avoid transmitting them. The New England Journal of Medicine reports that lack of hand washing remains at unacceptable levels in most medical environments, with large numbers of doctors and nurses routinely forgetting to wash their hands before touching patients<sup>10</sup>. One study showed that proper hand washing and other simple procedures can decrease the rate of catheter-related bloodstream infections by 66 percent.<sup>11</sup> The World Health Organization has published a sheet demonstrating standard hand washing and hand rubbing in health care sectors.

To 'scrub' one's hands for a surgical operation, a tap that can be turned on and off without touching with the hands, some chlorhexidine or iodine wash, sterile towels for drying the hands after washing, and a sterile brush for scrubbing and another sterile instrument for cleaning under the fingernails are required. All jewellery should be removed. This procedure requires washing the hands and forearms up to the elbow, usually 2-6 minutes. Long scrub times (10 minutes) are not necessary. When rinsing, one must prevent water to run back from the elbow to the hand. After hand washing is completed, the hands are dried with a sterile cloth and a surgical gown is donned.

In order to foster and support a global and local culture of hand washing with soap, shine a spotlight on the state of hand washing in each country and raise awareness about the benefits of hand washing with soap, the first-ever Global Hand washing Day was observed on October 15, 2008. The UN General Assembly had designated 2008 the 'International Year of Sanitation', and Global Hand washing Day reinforced its call for improved hygiene practices. Global Hand washing Day was the centerpiece of a week of activities that mobilized millions of people in more than 20 countries across five continents to wash their hands with soap<sup>12</sup>. WHO's 'Clean Care is Safer Care' programme is concerned with improving hand hygiene everywhere in the world where health care is delivered.

As the world and India deals with trying to minimize the impact of the recent Swine Flu pandemic, there is a need to adoption of good hand hygiene practices which is the most important non-pharmacological intervention, to protect from flu and viral infections. Global Hygiene Council advises simple and effective guidelines on hand-washing that would help the public protect their families against flu and virus. Steps as simple as washing hands frequently with soap and water for a minimum of 20 seconds, coughing or sneezing into your elbows, washing your hands thoroughly after contact with an ill person, are the most effective and powerful tools against many infections. These simple, easy practices are adaptable by every individual and are exercisable both inside and when outside the home.

Recent study conducted in 2009 by the Global Hygiene Council reveals startling results on poor levels of hand-hygiene amongst Indians, with only 42% of Indians feeling that hand washing is an effective way to prevent the spread of flu and viruses, 29% of people in India not washing their hands properly after coughing or sneezing and 70% of Indian's not wash hands their hands for the recommended duration (at least 20 seconds). Further, nearly 3 in 5 (59%) parents admitted that their children may not wash their hands properly in between meal snacking<sup>13</sup>.

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## PROMOTION OF HANDWASHING

themselves and their families from infection and illness by practicing proper hand hygiene”.

To be successful, hand washing programs must be set up to address a recognized health need and have the support of key stakeholders, Government, industry, and donors who can offer unique resources which are necessary to ensure the success of a large-scale program. Conducting a situation assessment and, where needed, making the case for handwashing on topics ranging from cost effectiveness to health impact will give the handwashing program a solid foundation.

## CONCLUSION

This is the important time to re-look at our hand hygiene habits, for hands are the key carrier of germs that spread infections, and good hand hygiene is the one tool within easy reach of everyone, that can reduce the risk of infection. If the millennium development targets for reduction in child mortality are to be met, hand washing habits must be improved.

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