

## EXECUTIVE SUMMARY

Human hands are one of the chief vehicles of transmission of faecal-related disease, especially the hands of mothers and other caregivers. The 2000 Global Water Supply and Sanitation Assessment Report listed handwashing with soap (or ash or other aid) as one of the three most important hygiene behaviour which could significantly benefit human health. Good hand hygiene thus, plays a significant role in preventing and minimising sanitation-related diseases.

The microbial population of the human hands are divided into two categories: transient flora and resident flora. Resident flora is found in the deeper layers of the skin and is relatively difficult to remove. Transient flora colonizes the surface layers of skin and if the skin is healthy, approximately 10% of the skin which is shed will contain viable bacteria. Hand hygiene, a general term for the correct action of hand cleansing, is a process of removing transient flora from human hand to reduce an individual's exposure to faecal-hand transmitted diseases.

Internationally and nationally, there were a number of interventions that focussed on improving hand hygiene behaviours, including:

1. Implementation of hygiene education, awareness and promotion programmes to target improvements in hygiene knowledge, specifically improving hand hygiene knowledge, i.e. washing hand at critical times;
2. Provision of hygiene technologies includes provision of handwashing devices, soap and a water supply;
3. Hygiene education, awareness and promotion programmes that target improved hand hygiene technique such as the correct way to wash hands.

However, information related to the impacts of the different approaches to hygiene improvement interventions in South Africa was limited. Scientific information of the impacts of hand hygiene interventions on changing hand hygiene behaviours were even more limited. As a result, little was known regarding the most appropriate hygiene promotion interventions for different contexts in South Africa and the effectiveness of the health and hygiene (h&h) promotion initiatives were not well understood. Research was therefore required to better inform present and future investments in hand hygiene interventions in the country.

This report emanated from the WRC project called *The Effectiveness of Handwashing*, which had the aim to assess, through developing a scientifically suitable method, the handwashing and hand hygiene behaviours in South Africa. This report describes the literature and information which was used to development a Framework for hand hygiene assessment. A framework was defined as the *theoretical models used to explain, predict and change human hand hygiene behaviour*. Literature had shown that theoretical frameworks used in this manner have evolved from those which determined behaviour using the environment and events, to those which used cognitive factors and reasoning as determining variable of hygiene behaviour, to more recent frameworks which took a broader approach of combining environment, trigger, barriers, emotions and other factors as determining variables of hygiene behaviours. Determining variables, as referred to in this report, were those variables which determine hand hygiene behaviours. The theory underlying the hand hygiene assessment Framework was that to change hand hygiene behaviours, a change one or more determining variables of hand hygiene were necessary

The Framework was thus designed to capture data from a suite of hand hygiene determining variables which international literature in this report showed measured the effectiveness of hand hygiene and hand hygiene interventions. The Framework thus assumed that a change in one or more of the variables would show a resultant change in an individual's hand hygiene. The three component of the hand hygiene assessment Framework were developed to address one of the research hypotheses' of the assessment. These were:

1. That the manner in which individuals washed their hands (Hand Hygiene Technique) during a hand hygiene demonstration would be influenced by 6 indices, namely: Cultural Influence, Media Exposure, Household Socio-economic Status, Service Environment, Hygiene Knowledge and Social Profile of the Individual. Each index in-turn would be determined by one or more indicators of hand hygiene behaviours.
2. The 'cleanliness' of an individual's hands (i.e. the bacterial counts on a individuals hands) would be determined by the manner in which the individuals washed their hands and the bacterial counts in the water which was used to practice hand hygiene during the hand hygiene demonstration.
3. From international literature, there would be a number of indicators which would determine hand hygiene and thus hand 'cleanliness' of individuals.

The Framework was focused exclusively on hand hygiene and provided a structure for the capturing and analysis of data collected during the assessment. Two 'benchmarks' of hand hygiene were used in the Framework, against which the hand hygiene variables (indicators, indices and determinants) were assessed

- the microbiological assessed **levels of bacterial counts on interviewee hands** (referred to in the report as Hand Bacterial Counts or hand 'cleanliness'), measured as colony-forming units (cfu/hand). It was that an acceptable bacterial count on a 'cleaned' post-washed human hand was below log 5.7 cfu/hand

- the **observed Hand Hygiene Technique of an individual** (referred to in this report as Hand Hygiene Technique), measured as an average score for an individual out of 10. This score was determined by scoring, out of 10, whether an individual washed their hands with water, soap, both hands, rub hands together at least 3 times and dried their hands on disposal paper towel during a hand hygiene demonstration. Incorrect or other hand hygiene options used during the demonstration were provided with a zero or lesser score.

Data collected to populate the variables in the Framework was collected using a triangulation approach, combining qualitative, quantitative and microbiological information to determine these variables of hand hygiene. Triangulation allowed for the collection of information through a multitude of methods to ensure a comprehensive picture of the reality and at the same time, validation of the information being collected. In-field data to populate the variables in the Framework were collected using two data collection tools, namely a hand hygiene *observation* and a hand hygiene *interview*. Each question or observation on these two tools was a **measure** of an individual's hand hygiene behaviour. The Framework was applied in-field from the bottom up, with data collection tools (questionnaire and observations) designed to collect data for specific measures, measured scores were combined and averaged to give a score for each indicator in the Framework. Similarly indicator scores were combined and averaged for their related index. Various statistical methods were used to analyse the data for the variables within the Framework.

The Framework was tested using data from three study sites in the Tshwane metro, namely an urban, peri-urban and rural study setting. The sites were selected based on the perceived economic status and service levels to reflect a diversity of individuals. This would ensure that the Framework was not limited to capturing hand hygiene behaviours of a single sector and group in the country.

The testing of the Framework clearly demonstrated that the Framework and underlying process and tools provide details of which hand hygiene variable determine hand hygiene in the sample sites. The testing of the Framework also showed that measuring the effectiveness of hand hygiene interventions in South Africa may be more difficult than initially anticipated and may rely on a number of variables, which were not yet clear at this point in time. What was clear was that hand hygiene in South Africa showed significant difference with what had been found in international literature, with many gaps in the local and international understanding of hand hygiene.

The hand hygiene assessment Framework has the potential to:

- Provide information which could guide future hand hygiene intervention to ensure the most effective and efficient issues, technologies and messages to ensure sustainable behaviour change, i.e. which issues, technologies and messages;
- Provide a structured manner of collecting hand hygiene baseline data against which the effectiveness of hand hygiene interventions can be assessed;
- Provide a scientific manner of assessing hand hygiene behaviours and interventions using standardized methods, tools and data analysis processes.
- Provide information which can inform future sanitation-related and development policy and strategic intervention.
- Standardize hand hygiene assessment; if practitioners continue to use and refine the Framework, it has the potential to become the standard hygiene assessment Framework in the country.