

Improving Healthcare Staff's Hand Rubbing Skills by Digital Scanning Technology

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Agenda

- * The importance of hand hygiene in healthcare setting
- * Why do we need to conduct hand hygiene compliance/skill assessment audit
- * Traditional methods of conducting hand hygiene skill assessment
- * Performing hand hygiene skill assessment by employing digital imaging technology
- * The way forward by employing digital imaging technology
- * Summary

Healthcare-Associated Infections (HAI) in Hospitals

HAI in hospitals

- * 722,000 HAIs in U.S. acute care hospitals
- * About 75,000 patients with HAIs died during their hospitalizations
- * Hands of healthcare staff are the most common mode of transmission of pathogens in hospitals

Many HAIs are preventable with hand hygiene!

Multi-Organizational Efforts

- * Hand hygiene has been known to be able to prevent spread of infections for 150 years
- * WHO and many other authorities have promulgated hand hygiene guidelines
- * Healthcare facilities have hygiene policies and procedures
- * Lots of studies, intervention trials, observations and measurements


Still... Hand hygiene adherence in healthcare has much room for improvement

Barriers to Hand Hygiene


- * No consequences for not performing hand hygiene
- * The culture does not encourage healthcare staff to perform hand hygiene
- * The HCW perception that they do clean their hands
- * The HCW perception that the use of gloves replaces the need for hand hygiene
- * Insufficient hand hygiene facilities
- * Inconvenient hand hygiene facility locations
- * Agents cause irritation and dryness
- * Lack of understanding of germ transmission
- * Lack of understanding of hand rubbing / washing skills

Hand Hygiene Performance Evaluations


- * HH Compliance Direct Observation
- * Indirect Assessment of Product Consumption
- * Electronic HH Compliance Systems
- * Hand Hygiene Skills



Healthcare facilities should take a comprehensive, systematic approach to assessing HH performance and provide regular feedback to compliance based on established goals.



The ideal approach to monitoring HH should be free of bias, not interfere with the observation process, assess the quality of each HH episode.



As a result, staff time and other resources are intensively required, while real-time and specific feedback is necessary for improving performance.




Observer bias:

The systematic error introduced by variations in the observation method.



Bias plays a critical role in accessing compliance, and efforts should be taken to minimize its impact.



The bias can be minimized through the employment of experienced observers that conduct observations with a consistent validated approach.

Our Considerations

There are a few studies that assess the HH technique via marked HAS spreading. This is probably due to the HH guides provided by the WHO and other institutions that describe the *solutions*, their *efficiency*, and *application sequence*, but which do not provide statements about quality assessment.

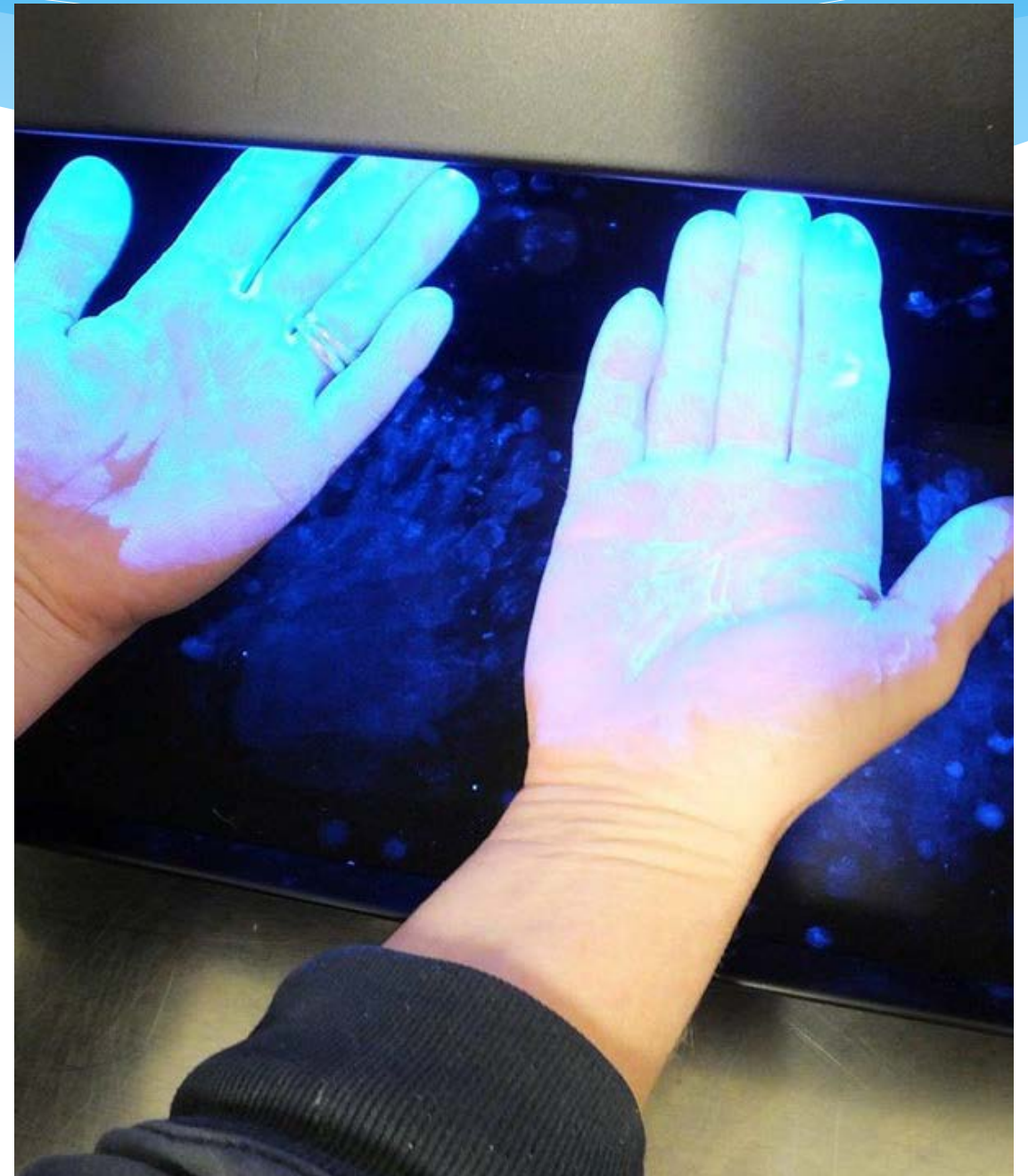
Our goals

- * Provide a moment for the staff to rethink and refresh their hand hygiene matters including quality issues.
- * Assess healthcare staff's (> 1,000 staff) hand rubbing techniques with a less biased way within 3 months.
- * Develop an improvement plan based on the collected data.

Conventional Method by Visual Inspection

Fluorescent marker and ultra-violet (UV) light is commonly used to assess the hand rubbing skill and techniques

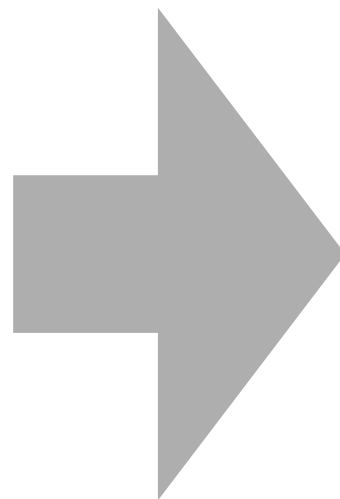
- * Observer experience and bias
- * Timely to complete the assessment and calculation
- * Data and record keeping
- * Difficult to handle a large number of assessees within limited time and human resources





Hand Rubbing Skills Assessment by Digital Scanning Technology

Assessment Methodology

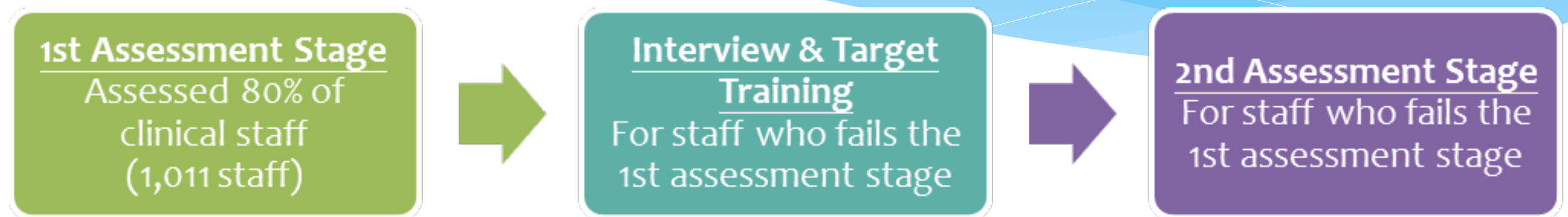


Data Consolidation and Reporting

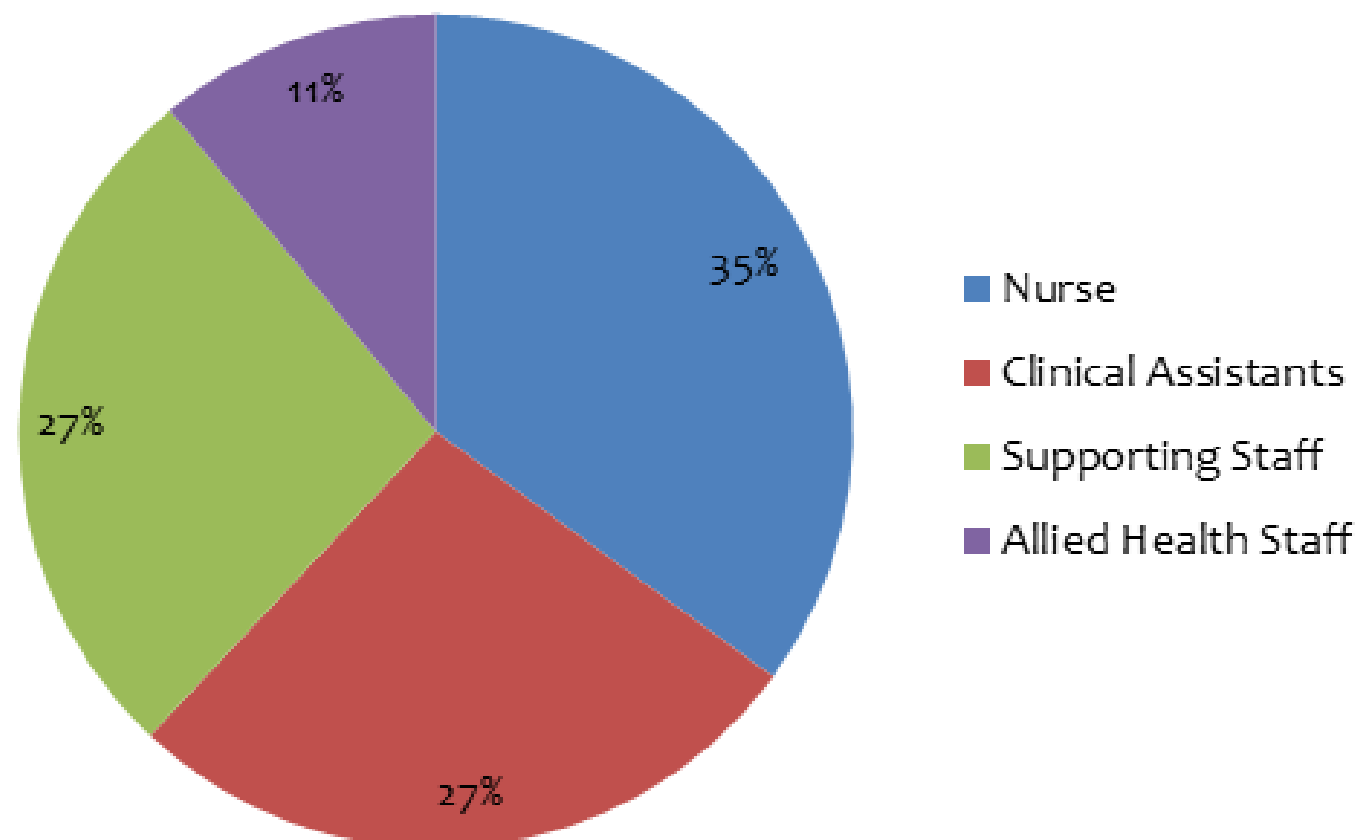


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* Assessment Flow



* Composition of 1,011 Participants by Occupation



Hand Rubbing Skills Assessment by Digital Scanning Technology

* Result Summary of 2 Assessment Stages

	1 st Stage	2 nd Stage (for participants failed in the 1 st stage)
No. of Participants	1,011	38
Overall Participant Passing Rate	95.9% (n=970)	100.0% (n=38)
Average Hand Rub Coverage of “Passed” Participants	98.1% (n=970)	99.7% (n=38)
Average Hand Rub Coverage of “Failed” Participants	56.3% (n=41)	--

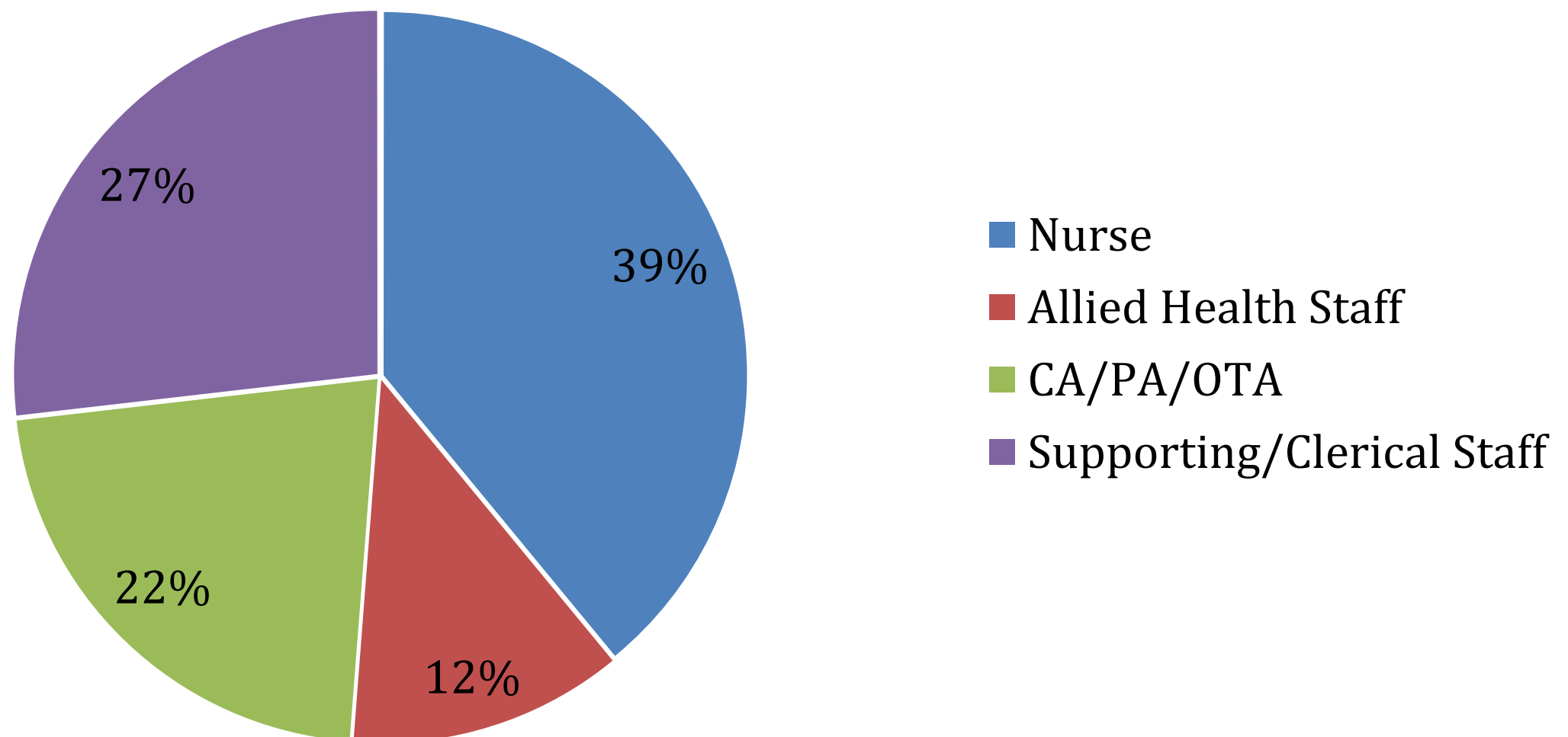


PASS:
Hand Rub Coverage $\geq 80\%$

Hand Rubbing Skills Assessment by Digital Scanning Technology

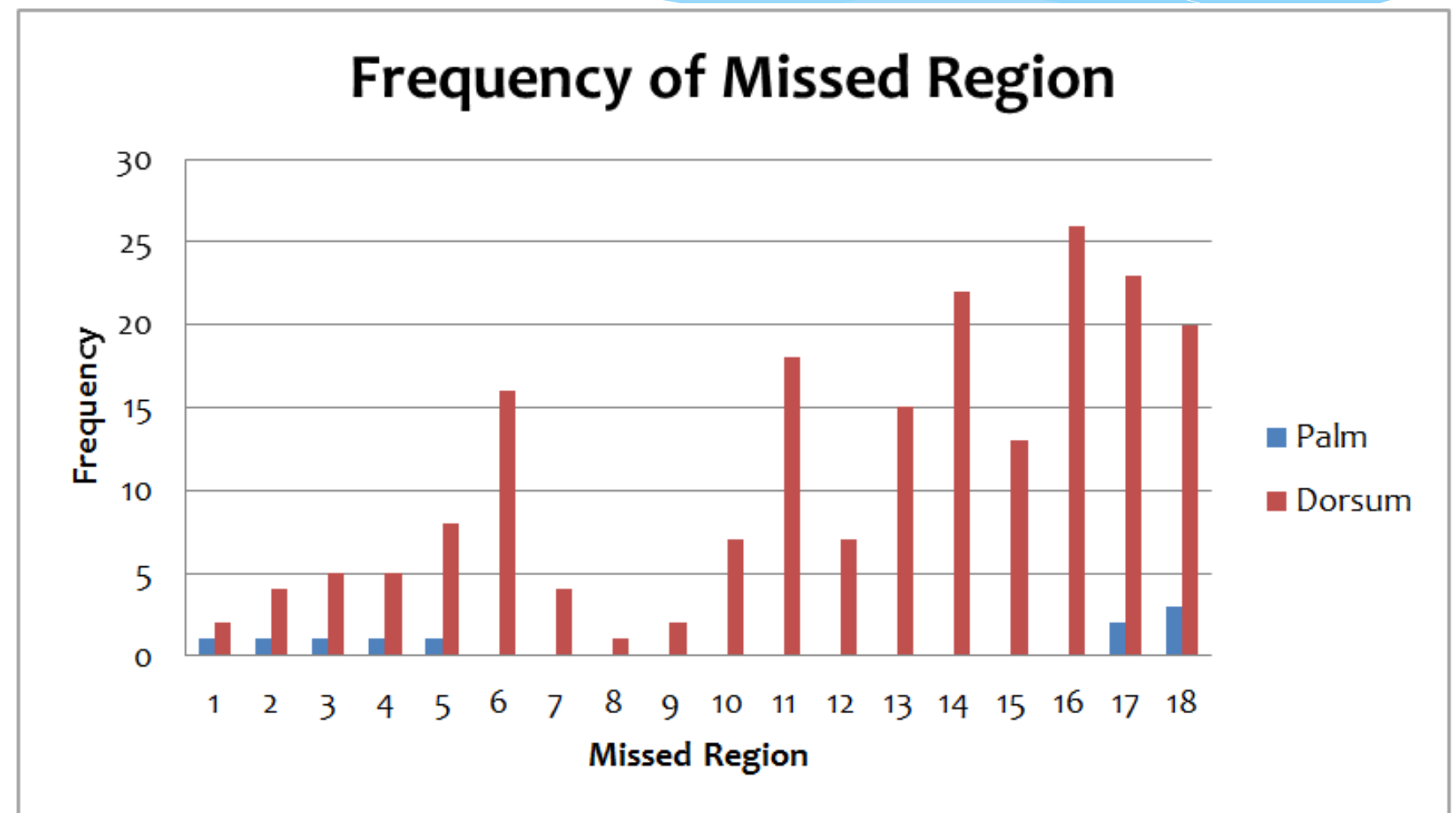
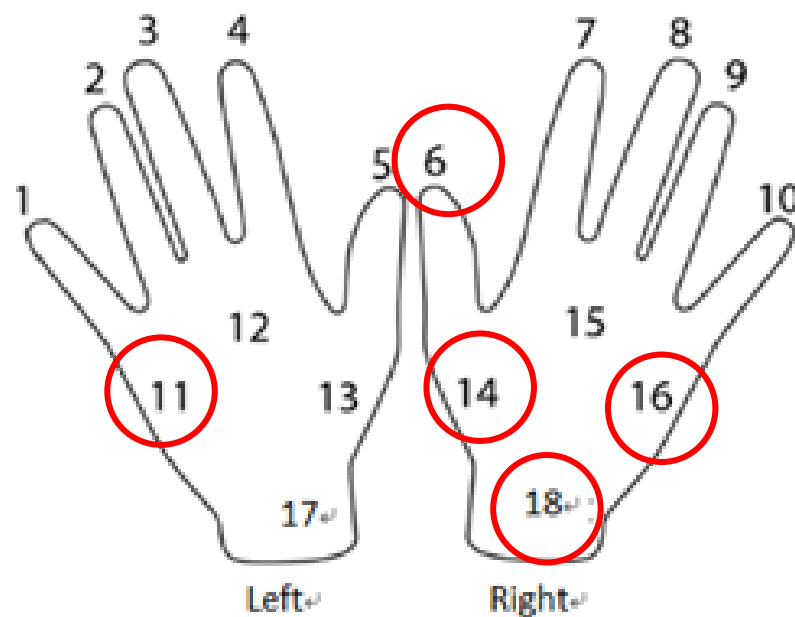
* Composition of Failed Participant Group by Staff Rank

N = 41



Hand Rubbing Skills Assessment by Digital Scanning Technology

* Frequency of Missed Region



Hand Rubbing Skills Assessment by Digital Scanning Technology

* Result Analysis by Gender Differences

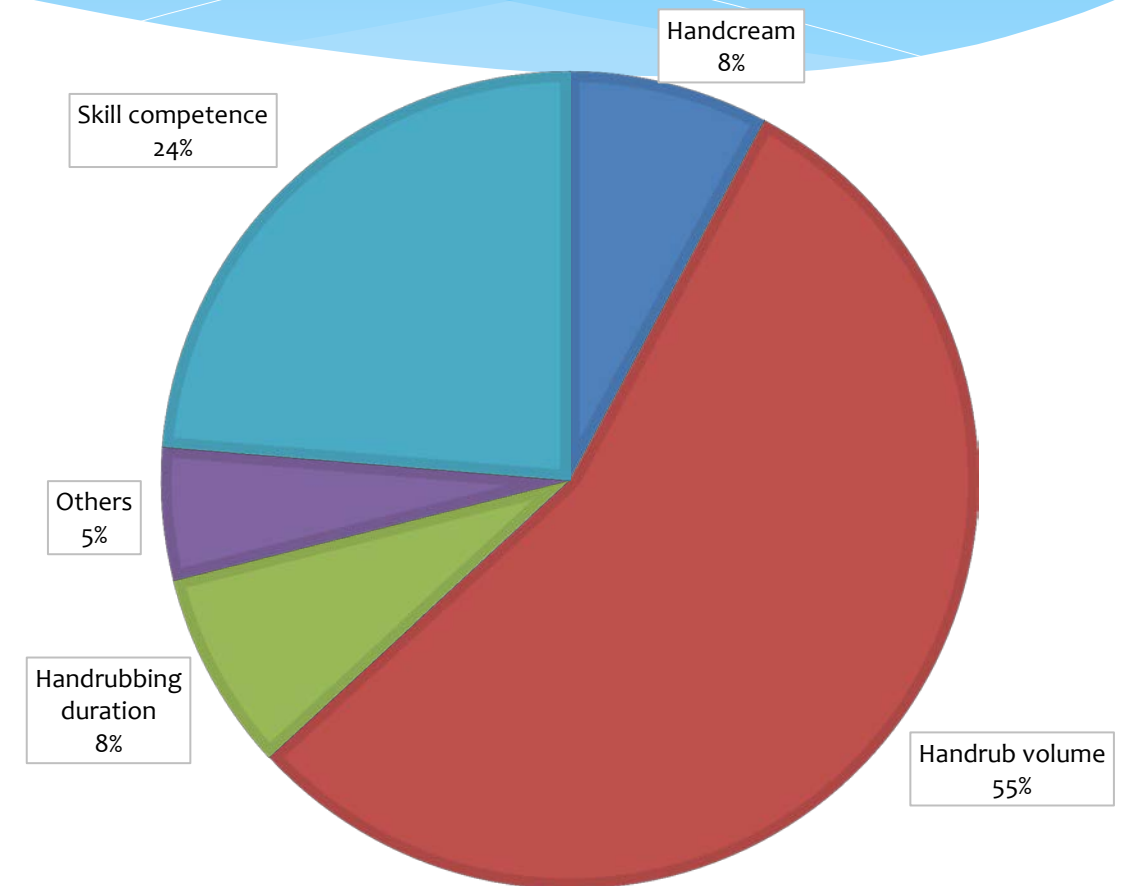
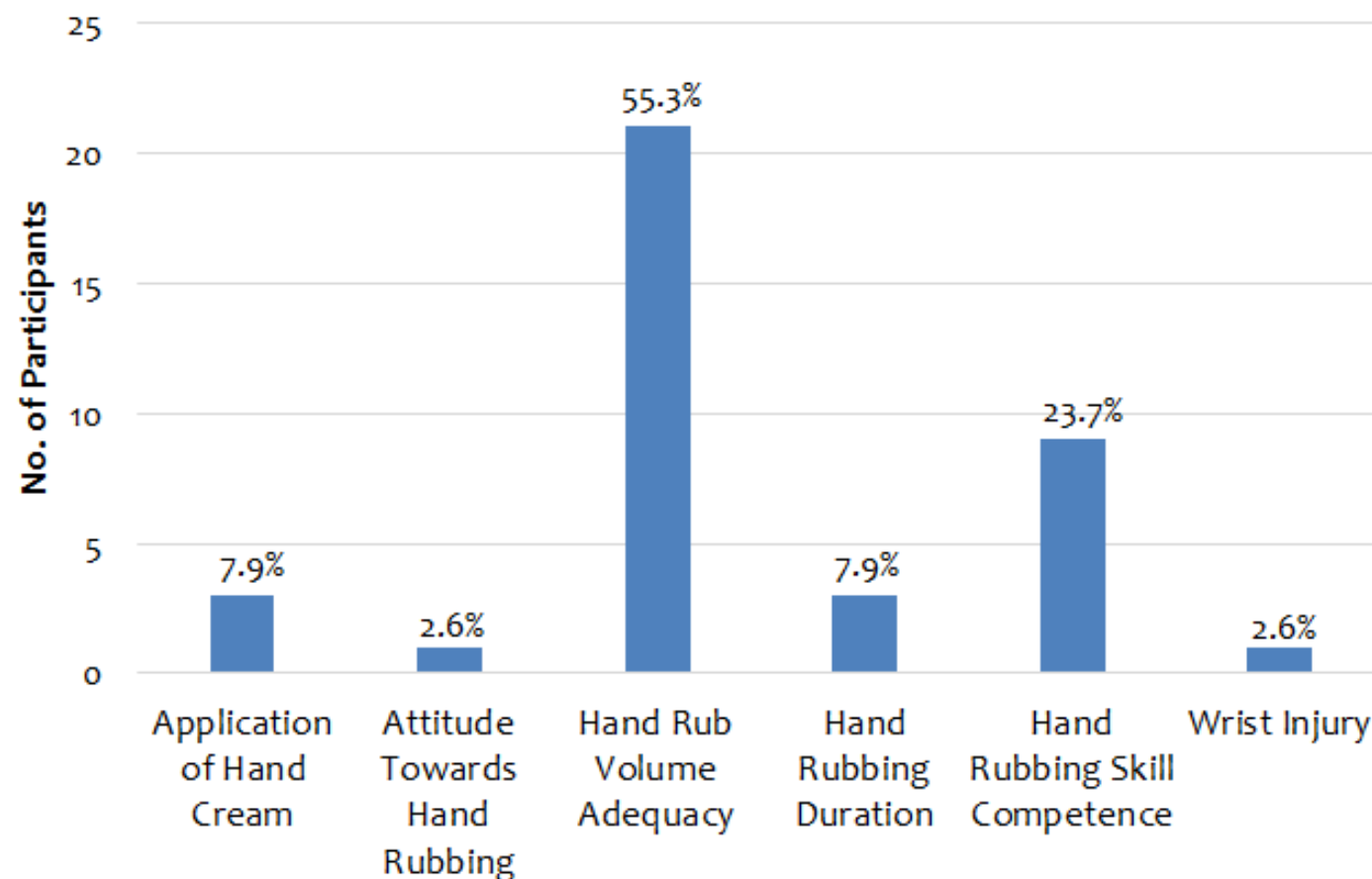
Composition of failed participant group	Frequency	N*	%	Male > Female
Total no. of failed participants	41	1,011	4.1%	
• Female participants	35	899	3.9%	
• Male participants	6	112	5.4%	
Percentage of regions missed out of all regions assessed	Frequency	N*#	%	
Total no. of missed regions (41 participants)	208	1,476	14.1%	
• No. of missed regions of female participants (35 participants)	173	1,260	13.7%	
• No. of missed regions of male participants (6 participants)	35	216	16.2%	

*N= no. of opportunities observed

36 regions were assessed per participant (18 regions x 2 sides [palm & dorsum])

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Failure Reasons Reflected by Failed Participants



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1st Assessment Stage

Assessed 80% of clinical staff



Interview & Target Training

For staff who fails the 1st assessment stage



2nd Assessment Stage

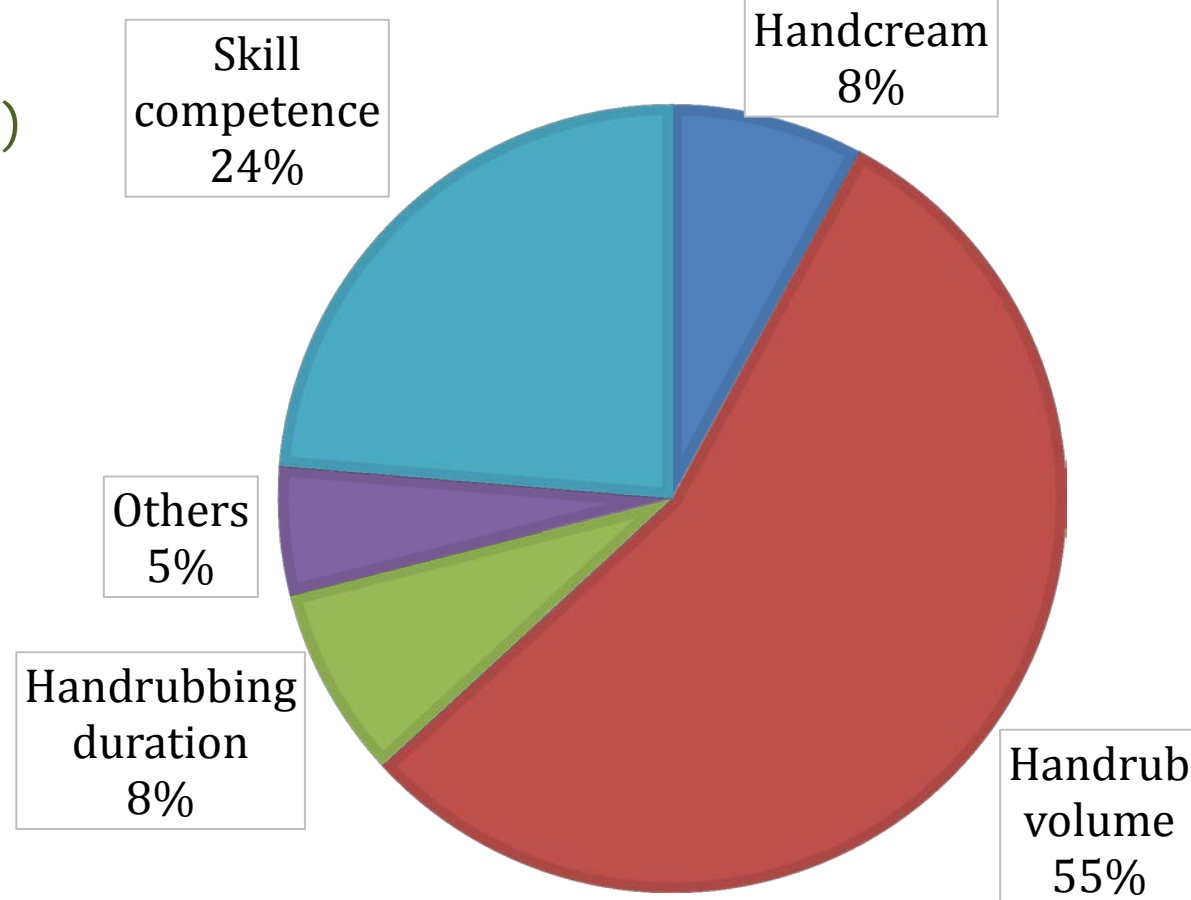
For staff who fails the 1st assessment stage

No. of Participants: 1,011

Passing Rate: 95.9%
(≥80% of hand rub coverage)

Average Hand rub Coverage of Passed Participants: 98.1%

Possible Failure Reason

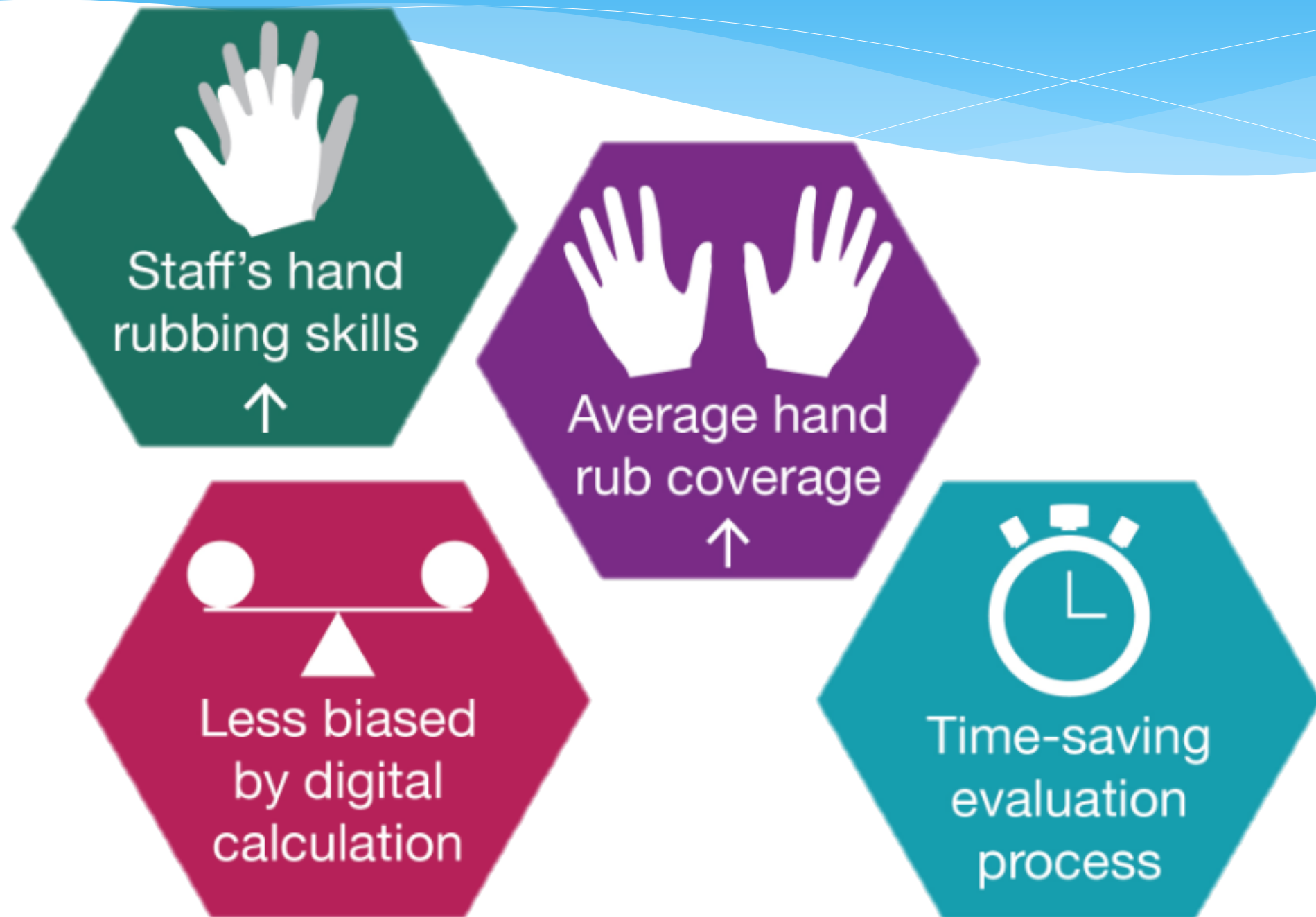


No. of Participants: 38

Passing Rate: 100%
(≥80% of hand rub coverage)


Average Hand rub Coverage of Participants:
56.6% (1st stage) →
99.7% (2nd stage)

Hand Rubbing Skills Assessment by Digital Scanning Technology



Summary

- * Proper education and training in proper HH technique performance and regular launching of campaigns and workshops remains a priority.
- * Effectiveness of HH also depends on quality of technique.
- * Regular practicum and assessment using this immediate feedback method could provide a simple, quick tool with large effect in healthcare providers.
- * HH technique quality at an individual level is important in quality improvement apart from WHO 5 moments compliances.



*Give our staff the necessary skills
and knowledge, as well as
awareness and better adherence of
pursuing HH improvement*



Way Forward



Patient involvement in promotion: Hand Hygiene by Using Digital Scanning Technology

Patient Involvement in Hand Hygiene Promotion

- * Before involving patients in asking healthcare professionals about hand hygiene, it is important to adequately prepare patients (McGuckin, Storr, Longtin, Allergranzi, & Pittet, 2011)
- * To take into consideration of patients' knowledge (Kim et al., 2015)
- * Patient health conditions, beliefs and experiences (Vaismoradi et al., 2015)
- * Interventions such as video and leaflets are effective to encourage patient involvement in safety-related behaviours including hand hygiene (Davis, Sevdails, Pinto, Darzi & Vincent 2013)



Let patients and visitors have a
hands-on experience about the
proper hand hygiene technique

The digital image scanning technology and hand hygiene skill training



- * Visitors and patients do not typically have relevant background.
- * Intuitive visual feedback on hand hygiene is essential powerful education tool.

Reference

- * Davis, R.E., Sevdalis, N., Pinto, A., & Vicent, C.A. (2013). Patient's attitudes towards patient involvement in safety intervention: Results of two exploratory studies. *Health expectations*, 16, e164-e176. <https://doi.org/10.1111/j.1369-7625.2011.00725.x>
- * Kim, M.K Nam, E.Y., Na. S.H., M.J., Lee, H.S., N,H.. Park, W.B (2015). Discrepancy in perceptions regarding patient participation in hand hygiene between patients and health care workers. *American Journal of Infection Control*, 43, 510-515. <http://doi.org/10.1016/j.ajic.2015.01.018>
- * McGuckin, M., Storr, J., Longtin, Y., Allegranzi, B., & Pittet, D (2011), Patient empowerment and multimodal hand hygiene promotion: A win-win strategy. *American Journal of Medical Quality*, 26, 10-27. <https://doi.org/10.1177/1062860610373138>
- * Vaismoradi, M., Jordan, S., & Kangasniemi, M. (2015). Patient participation in patient safety and nursing input - A systematic review. *Journal of clinical nursing*. 24, 627-639. <https://doi.org/10.1111/John.12664>

The image features a solid blue rectangular header at the top. Below the header, the background consists of several overlapping, wavy, light blue shapes that create a sense of depth and movement. The text "Thank you!" is centered in the lower half of the image.

Thank you!