Understanding the acceptability of different ABHR foam dose sizes with healthcare workers in the context of their hand size, frequency of use, profession and experience.

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INTRODUCTION

Effective alcohol based hand rubs (ABHRs) and healthcare worker (HCW) compliance to hand hygiene guidelines are important in the prevention of infection transmission in healthcare settings. Compliance to hand hygiene guidelines is affected by many factors including education, ABHR availability, time pressure, skin health and user acceptance of the dose size of ABHRs Earlier research[1] suggested 1.5 ml as the optimal foam dose when considering hand coverage, a 20-30 second wet time and workers' acceptance This study was designed to explore further the acceptability of doses that provide between 20-30 seconds wet time, within a hospital setting and under multiple applications.

METHOD

Objective: To assess different ABHR foam dose sizes that are within the WHO recommended drying time of between 20-30 secs 1.3 ml, 1.5 ml, 1.6 ml and 1.7 ml) with a variety of HCWs to consider how repeated use, hand size and experience might affect acceptability.

Setting: A 440 bed tertiary hospital in Toronto, Canada (Mount Sinai Hospital), currently using ABHR foam at a dose of 1 5 ml while most other hospitals in Canada use 0.75 ml.

Data: Collection A total of 197 HCWs evaluated a random combination of 3 of 4 dose sizes, in a random order, during a central location test at the hospital Each dose was rated as 'acceptable' or 'not acceptable' for use in the hospital, then scored on a 7-point visual analogue agreement scale (7 is highest) with the following statement this product is ideal for me and my patients.

Analysis: We compared the proportion of doses rated as 'acceptable' and the proportion scoring 5-7 for agreement ("top box" responses) for each dose size using the Chi Square test.

Figure 1

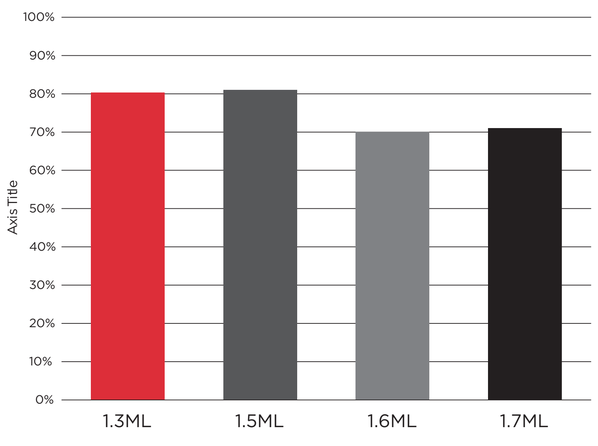


Figure 2

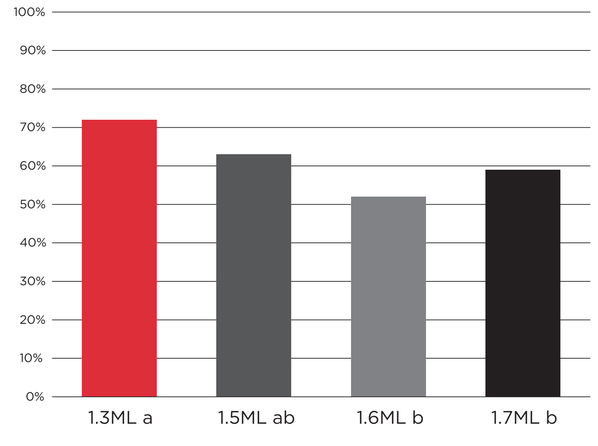
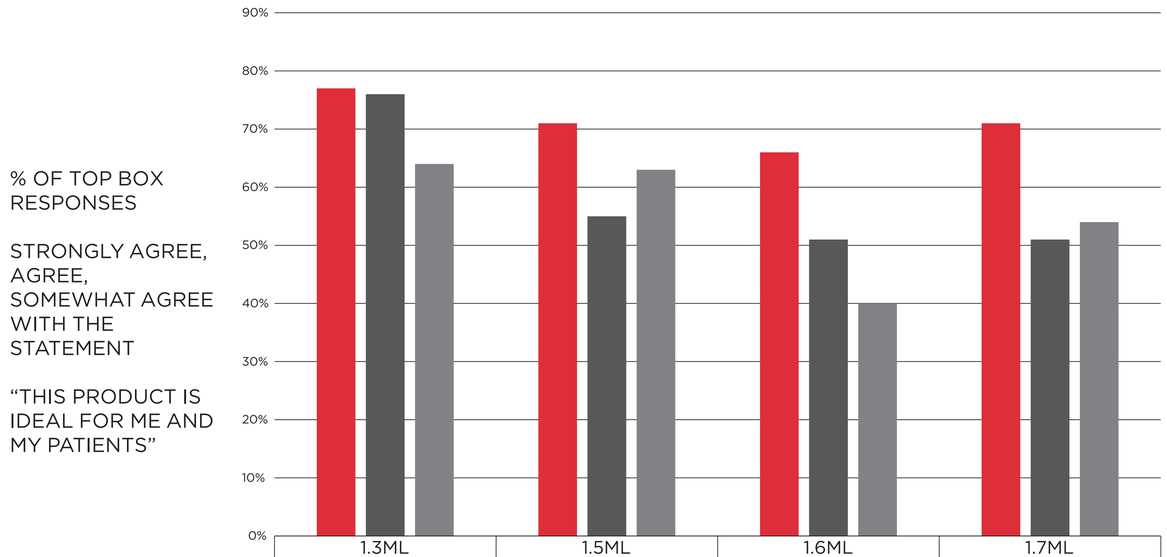


Figure 3



	1.3ML		1.5ML		1.6ML		1.7ML	
1ST PRODUCT	77%	a	71%	a	66%	a	71%	a
2ND PRODUCT	76%	a	55%	b	51%	b	51%	b
3RD PRODUCT	64%	a	63%	a	40%	a	54%	a

RESULTS

Overall, 80 of HCWs who assessed doses of 1.3ml and 1.5ml rated them as acceptable in contrast to only 70 of HCWs who assessed 1.6ml and 1.7ml .(See Figure 1 Filtering the data further showed that 47 of HCWs felt all 3 of their dose sizes were acceptable Figure 2 shows the percentage of HCWs who scored each of the dose sizes between 5 and 7 (top boxes) on the 7 point agreement scale (somewhat agree, agree, strongly agree), in accordance with the statement, "this product is ideal for me and my patients" At 95 confidence, 1.3ml scored significantly higher than 1 6 ml and 1 7 ml, but with no significant differences to 1.5ml Further analysis of participant demographics and order effects assisted in explaining the differences observed between dose sizes.

Repeated

Use Affects HCW Acceptance of Dose Size. Figure 3 shows the percentage of top box agreement scores for each dose size when the dose was presented first as if each dose was tested in isolation by a separate group of HCWs, and when the dose was presented 2nd and 3rd. The letters in the table on Figure 3 indicate the significant differences in agreement scores identified between dose sizes, at 95 confidence. When the first dose is tested in isolation, there are no significant differences in top box responses. Considering the second dose tested only, 1.3ml scores significantly higher on top box responses than 1.5ml, 1.6ml and 1.7ml No significant differences at 95 confidence were observed between doses of the third product tested, however at 90 confidence 1.3ml and 1.5ml scored significantly higher than 1.6ml. This suggests that repeated use, in rapid succession, is a discriminating factor in HCW acceptance of dose size.

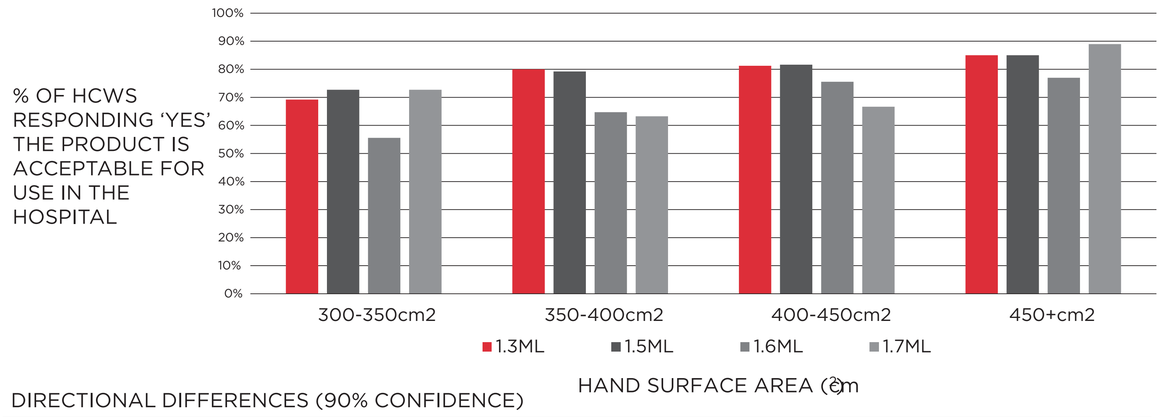
Hand Size Affects Dose Size Acceptability

Another factor which could influence the acceptability of dose size is hand size. The hand surface area of each participant was estimated using their hand circumference and hand length 2 measured prior to starting the test. The top box agreement scores were compared for hand sizes above and below the average observed in the study 411cm^2. At 95 confidence, agreement scores for hand sizes below average followed the trend of the full data set with 1.3ml scoring significantly higher than 1.6ml and 1.7ml, but with no significant differences to 1.5ml. There were no significant differences in top box agreement scores for hand sizes above average. Figure 4 shows the differences in percentage of respondents who said 'this product is acceptable for use in the hospital' for various hand sizes. All doses combined, at 90 confidence the number of people who deemed the products acceptable was significantly higher for hand sizes 450cm^2 compared to hand sizes 300-350cm^2 and 350-400cm^2. Considering the two highest doses, 1.6ml and 1.7ml, at 90 confidence the number of people who deemed the doses acceptable was significantly higher for hand sizes 450cm^2 compared to hand sizes 350-400cm^2 These trends could have been significant at 95 confidence if a larger sample size had been tested.

Number of Years Working at Mount Sinai Hospital Affected Dose Size Acceptability

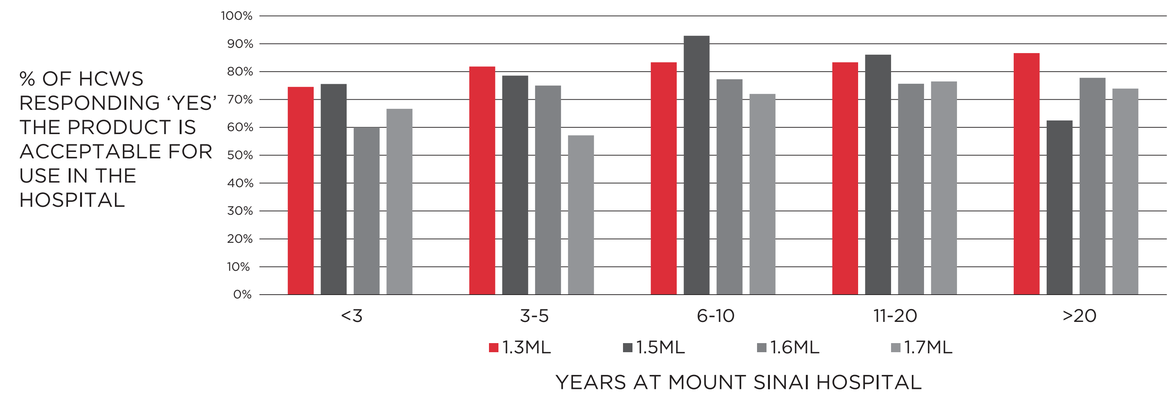
Figure 5 demonstrates the effect of the number of years working at Mount Sinai hospital, on dose size acceptability The number of HCWs who considered the product acceptable for use in the hospital, across all dose sizes, was significantly lower for those employed by Mount Sinai for less than 3 years opposed to those working at the hospital for 6 10 years and 11 20 years, at 95 confidence No significant differences in dose size acceptability were identified when considering the number of years working in healthcare generally.

Figure 4



DIRECTIONAL DIFFERENCES (90% CONFIDENCE)				
ALL DOSE SIZES COMBINED	a	a	ab	b
1.6ML&1.7ML ONLY	ab	a	ab	b

Figure 5



CONCLUSION

When defining acceptability of doses to HCWs, multi use testing may be needed to reflect effects of repeated use hand size also affects acceptability ratings. In this hospital, currently using 1.5ml of foam routinely, there was a decline in acceptability of dose with volumes greater than 1.5ml lower volumes may therefore increase hand hygiene compliance. However, the differences in acceptability with experience at this hospital versus any healthcare suggests that education and acculturation may also affect the acceptability of different doses of ABHR.

CONFLICT OF INTEREST

All materials for this study were funded by SC Johnson Professional.
Kevin Ormandy and Georgia Oxley are employed by SC Johnson Professional.
Research lead by Mount Sinai Hospital.

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