

# Cultural context and accessibility of sanitization pumps affect hand hygiene practices in a Ugandan neurosurgery ward



Kampala, Uganda

Meggie Lund, Kelsey Graywill,  
Akash Patel, Sam Sadler

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## PROJECT SUMMARY

Although the complexity and number of neurosurgical procedures has increased at Mulago National Referral Hospital in Kampala, Uganda, post-operative infection rates have hindered positive patient outcomes.<sup>1,2</sup> MNRH's neurosurgery ward has only one, inconveniently-located sink in the nurses' station for about 30 patient beds, greatly hindering the feasibility of sanitizing between every patient. Hand sanitization gel provides a transportable, low-cost solution to this problem and is equally effective as hand washing at killing disease-spreading bacteria.<sup>3,4,5</sup> We aimed to facilitate and promote proper hand hygiene in a Ugandan neurosurgical ward through the installation of hand sanitization gel pumps by implementing two intervention types. We analyzed the relationship between pump location and usage, as well as changes in mass usage with each intervention type to evaluate the most effective methods for improving hand hygiene compliance.

## PROJECT OBJECTIVE

To improve the hand hygiene practices of medical staff and non-staff members at Mulago National Referral Hospital (MNRH), we installed hand sanitization pumps throughout the neurosurgical ward and addressed **accessibility, education, and visibility**.

## METHODOLOGY

We installed **seventeen Purell hand sanitizer pumps** at patient bedsides and at points of transition throughout the neurosurgical ward, and collected:

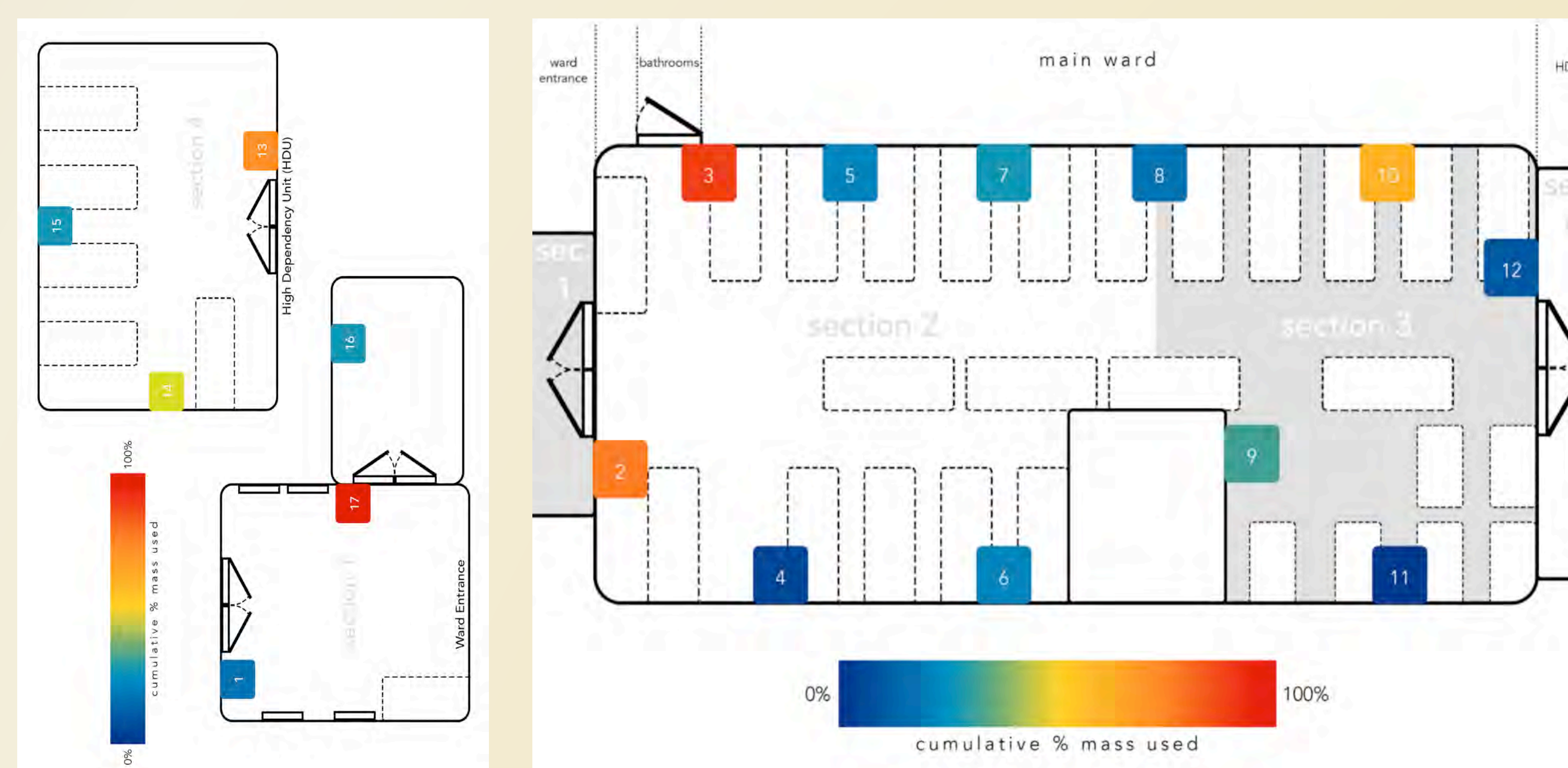
- Daily **mass of gel used**
- Twenty-three hours of **observational data** over the course of four days detailing the following interactions between staff/non-staff and patients:

- positive interactions (i.e., successful use of the gel after patient interaction)
- negative interactions (i.e., failure to use the gel after patient interaction)

Following installation, we implemented **two pilot interventions**:

- a staff-only educational seminar (Intervention 1) on Day 12
- placement of informational posters (Intervention 2) on Day 14

## Heat Maps: Visualizing Sanitization Usage Spatially



	Mass (g)		Positive Interactions	
	Daily Average	Total	Non-Staff, n (%)	Staff, n (%)
Section 1	26.10	417.58	1.50/1.50 (100)	2.50/4.50 (56)
Pump 1	8.35	133.65		
Pump 16	11.93	190.90		
Pump 17	58.01	928.20		
Section 2	15.51	248.23	1.35/5.44 (25)	0.96/1.92 (50)
Pump 2	28.21	451.38		
Pump 3	32.57	521.18		
Pump 4	3.17	50.78		
Pump 5	8.97	143.55		
Pump 6	8.23	131.68		
Pump 7	11.93	190.80		
Section 3	10.67	170.71	0.57/3.67 (16)	0.67/1.00 (67)
Pump 8	7.38	118.15		
Pump 9	13.63	218.15		
Pump 10	23.21	371.90		
Pump 11	1.34	21.50		
Pump 12	7.78	124.47		
Section 4	16.62	265.87	0.57/2.86 (20)	2.00/3.29 (61)
Pump 13	24.50	391.97		
Pump 14	16.40	262.43		
Pump 15	8.95	143.22		
Total	16.15	258.43		

	Pre-Intervention	Post-Intervention 1		Post-Intervention 2	
	Average	Average	P Value with Pre-Int	Average	P Value with P Value with Pre-Int Post-Int 1
Section 1	36.2	30.0	0.08	74.6	0.28
Pump 1	13.4	4.6		25.7	
Pump 16	19.3	12.1		31.7	
Pump 17	76.0	73.5		166.5	
Section 2	21.4	23.7	0.51	37.4	<0.01
Pump 2	42.2	37.9		61.7	
Pump 3	42.0	59.7		71.4	
Pump 4	3.9	2.2		12.7	
Pump 5	11.6	10.7		27.8	
Pump 6	9.8	10.7		25.8	
Pump 7	18.7	20.8		25.1	
Section 3	16.1	13.5	0.20	25.8	0.01
Pump 8	11.7	8.4		17.6	
Pump 9	23.3	15.1		33.0	
Pump 10	35.3	37.3		47.8	
Pump 11	1.1	1.1		5.0	
Pump 12	9.1	5.4		25.5	
Section 4	22.1	28.9	0.63	36.2	0.28
Pump 13	41.9	26.9		46.1	
Pump 14	13.4	40.1		47.0	
Pump 15	11.0	19.8		15.7	
Total	22.6	22.7	0.96	40.3	<0.01

## RESULTS & CONCLUSIONS

Installation of hand sanitization pumps throughout the neurosurgical ward resulted in improved hand hygiene practices.

- **Relative accessibility** directly affected individual pump usage, demonstrated by the low usage of bedside pumps.
- **Pilot interventions:** A staff-only educational seminar proved *less influential* on pump usage than informational posters targeting both staff and non-staff. This supports the necessity of incorporating non-staff in proper hand hygiene practices in an LMIC context, particularly considering the culture specific family involvement.
- **Future studies** should aim to augment staff access to pumps and increase non-staff involvement in hand hygiene practices.

## REFERENCES

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