

Hand Hygiene Infrastructure and Practices Among Healthcare Staff in Belize During the COVID-19 Pandemic

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BACKGROUND

- Healthcare workers are among the most vulnerable populations during the COVID-19 pandemic.¹
- Hand hygiene is one of the most effective public health measures to prevent the spread of diseases, including COVID-19.²

1 in 4 health facilities do not have basic water services.¹ **1 in 3** health facilities do not have hand hygiene facilities at point of care.¹

PURPOSE

Assess hand hygiene infrastructure and practices before and after patient contact among health care staff.

METHODS

- Conducted evaluation at 11 public healthcare facilities in Belize in July 2021.
- The evaluation included:

Facility Assessment

- Room type
- Handwashing station, soap, drying materials
- Alcohol-based hand rub (ABHR) and dispensers

Hand Hygiene Observation

- Hand hygiene activities of staff before and after patient contact

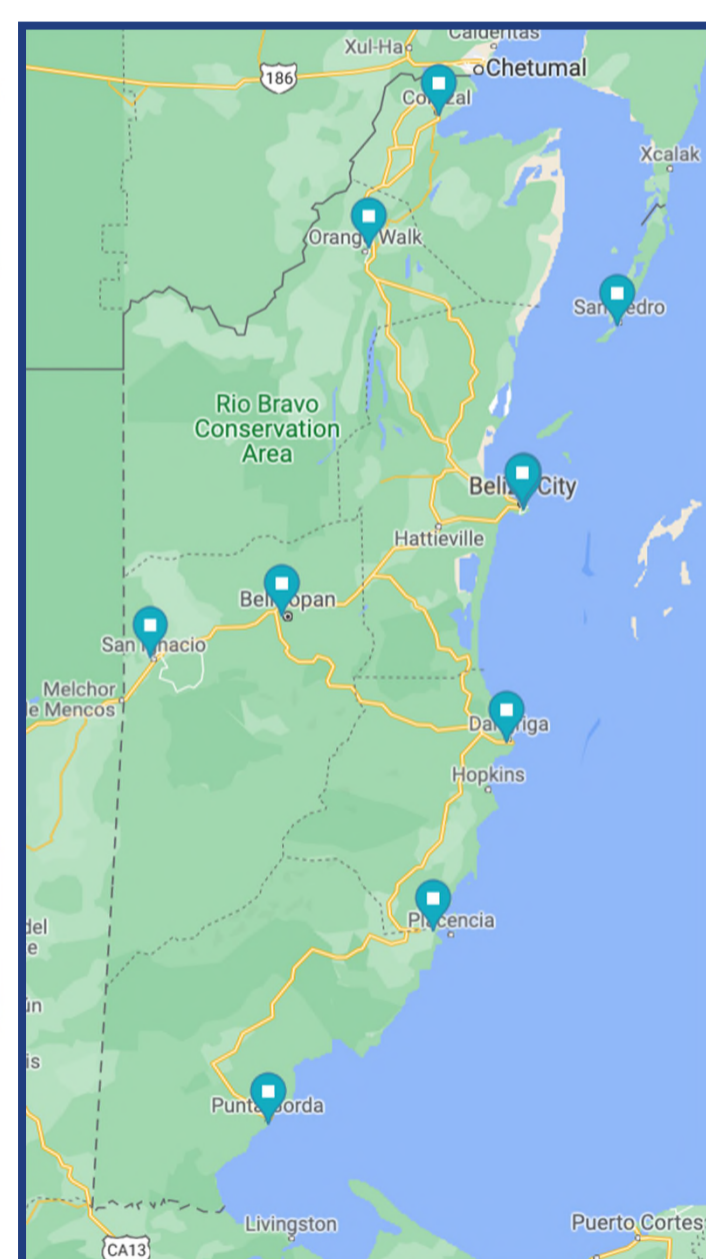


Figure 1: Participating clinical sites in Belize

RESULTS



209 (67%) of 313 patient care rooms had a functional handwashing station with soap



Of these 209 rooms, 174 (83%) had hand drying materials



148 (41%) of patient care rooms had a functional ABHR dispenser



ABHR concentration following the ABHR formula ranged from 60% to 95%.

Table 1: Simple and multivariable logistic regression evaluating functional dispensers in 363 total rooms assessed. Functional ABHR dispenser means mechanically operating with ABHR present.

	Functional Dispenser N = 244 n (%)	Non-Functional Dispensers N = 62 n (%)	Bivariate		Multivariable	
			OR (95% CI)	P-Value	AOR (95% CI)	P-Value
Facility type						
Polyclinic	28 (60%)	19 (40%)	Ref		Ref	
Hospital	216 (83%)	43 (17%)	2.82 (1.13, 7.05)	0.027	6.00 (1.87, 19.24)	0.003
Health region						
Central	33 (66%)	17 (34%)	0.28 (0.10, 0.81)	0.018	1.80 (0.49, 6.60)	0.377
Northern	21 (66%)	11 (34%)	0.27 (0.08, 0.87)	0.028	0.28 (0.11, 0.73)	0.009
Western	120 (88%)	17 (12%)	Ref			
Southern	70 (80%)	17 (20%)	0.53 (0.18, 1.56)	0.251	0.66 (0.30, 1.45)	0.299
Type of room						
No hand hygiene needed	41 (93%)	3 (7%)	Ref		Ref	
Hand hygiene needed	203 (77%)	59 (23%)	0.55 (0.23, 1.31)	0.177	0.21 (0.06, 0.79)	0.020
Clinical area						
Outpatient	48 (83%)	10 (17%)	Ref			
Emergency and operating	34 (77%)	10 (23%)	0.45 (0.18, 1.14)	0.093		
Flu and isolation	13 (87%)	2 (13%)	0.97 (0.23, 4.18)	0.970		
Other patient care areas	36 (65%)	19 (35%)	0.35 (0.15, 0.83)	0.017		
Laboratory	20 (83%)	4 (17%)	0.62 (0.20, 1.89)	0.400		
Pharmacy	17 (81%)	4 (19%)	0.67 (0.21, 2.20)	0.513		
Triage	8 (67%)	4 (33%)	0.41 (0.11, 1.56)	0.190		
Waiting area and hallway	32 (86%)	5 (14%)	0.69 (0.25, 1.88)	0.469		
Administrative and staff	36 (90%)	4 (10%)	0.71 (0.26, 1.96)	0.513		
Type of dispenser						
Spray bottle	96 (93%)	7 (7%)	Ref		Ref	
Pump top bottle	45 (80%)	11 (20%)	0.45 (0.18, 1.16)	0.097	0.45 (0.15, 1.29)	0.139
Push-style	73 (68%)	35 (32%)	0.20 (0.09, 0.45)	<0.001	0.12 (0.05, 0.31)	<0.001
Automatic	16 (70%)	7 (30%)	0.28 (0.07, 1.12)	0.073	0.40 (0.09, 1.73)	0.219
Other	14 (88%)	2 (13%)	0.49 (0.12, 2.02)	0.321	0.25 (0.04, 1.63)	0.149

Table 2: Simple and multivariable logistic regression evaluating hand hygiene adherence before and after patient contact. Hand hygiene adherence is defined as handwashing with soap and water or using ABHR on the hands.

	Hand Hygiene Adherence (N = 363) n (%)	No Hand Hygiene (N = 379) n (%)	Bivariate		Multivariable	
			OR (95% CI)	P-value	AOR (95% CI)	P-value
Facility type						
Polyclinic	58 (37%)	100 (63%)	Ref			
Hospital	305 (52%)	279 (48%)	1.95 (0.97, 3.94)	0.062		
Health region						
Central	76 (32%)	158 (68%)	Ref		Ref	
Northern	80 (60%)	54 (40%)	2.97 (1.71, 5.15)	<0.001	3.93 (2.28, 6.77)	<0.001
Western	88 (56%)	70 (44%)	2.56 (1.51, 4.35)	<0.001	2.79 (1.69, 4.59)	<0.001
Southern	119 (55%)	97 (45%)	2.52 (1.56, 4.09)	<0.001	2.60 (1.65, 4.10)	<0.001
Health care worker role						
Physicians	130 (58%)	94 (42%)	Ref		Ref	
Nursing staff	200 (48%)	214 (52%)	0.75 (0.54, 1.04)	0.083	0.72 (0.51, 1.03)	0.071
Lab technicians	21 (33%)	43 (67%)	0.36 (0.20, 0.65)	0.001	0.22 (0.11, 0.42)	<0.001
Patient care assistant	3 (11%)	25 (89%)	0.09 (0.03, 0.32)	<0.001	0.07 (0.02, 0.26)	<0.001
Pharmacist	9 (75%)	3 (25%)	1.52 (0.46, 5.06)	0.495	1.83 (0.47, 7.20)	0.387
Procedure type						
Invasive	149 (52%)	139 (48%)	Ref		Ref	
Non-invasive	214 (47%)	240 (53%)	0.75 (0.56, 1.02)	0.064	0.57 (0.40, 0.81)	0.001
Clinical area						
Outpatient	78 (58%)	56 (42%)	Ref			
Flu clinic	49 (51%)	47 (49%)	0.76 (0.45, 1.29)	0.315		
Accident and emergency	46 (51%)	44 (49%)	0.64 (0.37, 1.10)	0.107		
emergency						
Dressing	9 (56%)	7 (44%)	1.17 (0.40, 3.39)	0.779		
Laboratory	21 (40%)	31 (60%)	0.47 (0.24, 0.91)	0.025		
Pharmacy	10 (71%)	4 (29%)	1.20 (0.39, 3.68)	0.752		
Triage	25 (35%)	47 (65%)	0.47 (0.26, 0.84)	0.011		
Other medical wards	99 (43%)	133 (57%)	0.58 (0.34, 0.97)	0.039		
Time						
Before patient contact	144 (39%)	227 (61%)	Ref		Ref	
After patient contact	219 (59%)	152 (41%)	2.27 (1.71, 3.02)	<0.001	2.52 (2.52, 1.84)	<0.001

INTERVENTION



Increase access to ABHR dispensers in patient care areas



Improve hand hygiene knowledge among all healthcare staff through online training



Centralize and standardize national production of ABHR

NEXT STEPS

- Monitor progress of online training
- Evaluate effectiveness and sustainability of intervention on hand hygiene material access and hygiene adherence during patient contact
- Continued assessment and intervention in other community settings

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REFERENCES

- Global progress report on water, sanitation and hygiene in health care facilities: fundamentals first. (2020). Retrieved 18 March 2022, from <https://washdata.org/sites/default/files/2020-12/WHO-UNICEF-2020-wash-in-hcf.pdf>
- Handwashing an effective tool to prevent COVID-19, other diseases. (2020). Retrieved 18 March 2022, from <https://www.who.int/southeastasia/news/detail/15-10-2020-handwashing-an-effective-tool-to-prevent-covid-19-other-diseases>
- Poverty Study 2018-2019. (2021). Retrieved 18 March 2022, from <http://sib.org.bz/wp-content/uploads/PovertyStudy2018.pdf>