COVID-19 Drive-through Testing Survey: Measuring the Burden on Healthcare Workers

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BACKGROUND

- Severe acute respiratory syndrome coronavirus 2 (Sars-CoV-2) is the causative agent of coronavirus disease 2019 (COVID-19), first described in Wuhan, China in December 2019. As of September 28th, 2020, there have been nearly 33 million confirmed cases and 1 million deaths worldwide, and Connecticut has seen over 50,000 total confirmed cases[1]. As the prevalence of COVID-19 rises, healthcare workers (HCWs) are at a heightened risk of exposure. It has been estimated that HCWs comprised up to 19% of all COVID-19 cases in the US[2].
- Epidemiological and demographic information on HCWs who test positive for COVID-19 is essential for informing policies to protect those who are most vulnerable and ensure adequate sick leave and recovery time following infection, yet the current literature is lacking.

Objective:

- To survey individuals who tested positive for Sars-CoV-2 at one of four Trinity Health of New England (THONE) drive-through testing centers to assess the demographic information, hospitalization rate, pre-existing conditions, possible routes of exposures, duration of symptoms, and subsequent household infections of HCWs when compared to non-HCWs.

METHODS

Data Collection

- Drive-through COVID-19 testing by provider order occurred at four THONE sites.
- From March 16th and April 21st, 2020, 1,607 individuals received a positive test.
- Positive individuals were called until 100 surveys had been conducted.

Survey Design

- A standardized script was used for all surveys by uniformly trained callers.
- The study classified participants as HCWs or non-HCWs based on self-identification only.

Statistical and Qualitative Analysis

- To test the bivariate relationship between risk factors and HCW status, the Fisher's exact test was utilized to compare all categorical variables, while an independent samples T-test was used for the continuous variables.
- A model of HCW-status was made using a binary logistic regression analysis. A backward stepwise elimination approach was used to remove non-significant variables. Both analyses were conducted using SPSS v26.
- The methods used in this study, including the survey script, were approved by the Institutional Review Board (IRB) committee at THONE.

REFERENCES

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RESULTS

Table 1. Bivariate Analysis: Demographics and Comorbidities

Characteristics		Total	HCW	non-HCW	p-value
		100	46 (46.0%)	54 (54.0%)	-
Mean Age (years)		50.85 (±13.85)	48.98 (±12.42)	52.33 (±14.83)	0.347
Sex	Male	31 (31.0%)	5 (10.9%)	26 (48.1%)	<0.001**
	Female	69 (69.0%)	41 (89.1%)	28 (51.9%)	
Race	White	54 (54.0%)	22 (47.8%)	32 (59.3%)	0.066
	Black or African American	43 (43.0%)	21 (45.7%)	22 (40.7%)	
	Other	3 (3.0%)	3 (6.5%)	0 (0.0%)	
Ethnicity	Not Hispanic or Latino	89 (89.0%)	39 (84.8%)	50 (92.6%)	0.064
	Hispanic or Latino	11 (11.0%)	7 (15.2%)	4 (7.4%)	
Route of Exposure	Work	52 (52.0%)	37 (80.4%)	15 (27.8%)	<0.001**
	Home	25 (25.0%)	8 (17.4%)	17 (31.5%)	
	Other	23 (23.0%)	1 (2.2%)	22 (40.7%)	
Comorbidities	Hypertension	44 (44.0%)	23 (50.0%)	21 (38.9%)	0.314
	Hyperlipidemia	27 (27.0%)	9 (19.6%)	18 (33.3%)	0.175
	Asthma	24 (24.0%)	10 (21.7%)	14 (25.9%)	0.647
	COPD	1 (1.0%)	0 (0.0%)	1 (1.9%)	1.000
	Heart Disease	6 (6.0%)	2 (4.3%)	4 (7.4%)	0.684
	Diabetes	16 (16.0%)	6 (13.0%)	10 (18.5%)	0.587
	Kidney Disease	4 (4.0%)	2 (4.3%)	2 (3.7%)	1.000
	Autoimmune Disease	5 (5.0%)	0 (0.0%)	5 (5.0%)	0.051
Days Symptomatic		15.26 (±9.77)	17.39 (±9.21)	13.44 (±9.94)	0.043*
Hospitalized		4 (4.0%)	1 (2.2%)	3 (5.6%)	0.622
Other Household Members		2.24 (±1.61)	2.56 (±1.90)	1.98 (±1.28)	0.206
Subsequent Household Infections (persons)		0.44 (±0.61)	0.33 (±0.47)	0.54 (±0.69)	0.024*

*HCW = healthcare; *meets 0.05 p-value level, **meets <0.001 p-value level*

LIMITATIONS

- HCW overrepresentation in the data: HCWs, particularly within the THONE system, may have had better knowledge of, or access to, testing services compared with the general population. Also, HCWs were defined based on self-identification, some of whom had administrative or other non-patient facing roles.
- There is the possibility of recall bias, given that participants were asked to recall details of their illness that had occurred prior to the date of the survey.

RESULTS

- Of the study population of the 1,607 individuals who tested positive between March 16th and April 21st, 2020, 462 (28.7%) people were called. 100 (21.6%) answered and completed the survey.
- Of those interviewed, 46 (46%) of respondents were HCWs, while 54 (54%) were non-HCWs. 54 (54%) of participants were white and non-Hispanic. Of the HCWs, certified nursing assistants and medical assistants constituted the largest single group (41.3%), followed by registered nurses (30.4%). Compared to non-HCWs, HCW respondents were more likely to be female (n=41; 89.1%; p<0.001), report work as their route of exposure (n=37; 80.4%; p<0.001), have fewer household infections after their testing date (0.3 vs 0.5 infections; p=0.024), and have a longer duration of symptoms (17.4 vs 13.4 days; p=0.043).
- The binary regression analysis yielded work exposure (OR=10.5; 95% CI=3.8-29.1; p<0.001) and number of days symptomatic (OR=1.1; 95% CI=1.0-1.1; p=0.018) as significant predictors of HCW-status.

DISCUSSION

- Of the 100 surveyed individuals, almost half identified as HCWs. Similarly, 42.1% of the 5,611 individuals who tested positive between March 1st and June 17th were HCWs. HCWs were estimated to account for 19% of cases in the US, so this data may be an overrepresentation[2]. Regardless, these numbers suggest a disproportionate burden on HCWs.
- In this study, 80.4% of HCWs self-reported work to be their route of exposure. Frontline HCWs have a 12-fold increase in risk of testing positive when compared with the general community, possibly attributed to misuse of or inadequate PPE[3]. Moreover, psychological burden may lead to immunosuppression and an increased likelihood of contracting the disease[4].
- HCWs had a longer duration of symptoms than non-HCWs, which was also longer than the CDC's minimum return-to-work criteria: HCWs must wait at least 10 days after symptoms first appeared, be afebrile without antipyretics for 24 hours, and have improving symptoms before returning to work. Given that HCWs were symptomatic for an average of 17.4 days, the minimum time off work may need to be extended to ease the physical health burden of the pandemic on HCWs.
- Despite HCWs reporting a longer duration of symptoms and a higher number of household members, HCWs infected fewer people in their household after receiving their positive result than non-HCWs. This might be explained by HCWs' increased medical literacy and understanding of COVID-19, leading to better adherence to standard precautions and self-quarantine.

Conclusion:

- Overall, results suggest that HCWs faced an increased risk of testing positive for COVID-19 compared to the general public and the self-reported duration of symptoms may be longer than what the current guidelines anticipate. Guaranteeing adequate PPE and adequate time off work to reduce the spread of infection in healthcare settings could help alleviate the disproportionate burden faced by HCWs.