

Transmission of SARS-CoV-2 to Household Members of COVID Positive Healthcare Workers (HCWs)

Background

HCWs are at increased risk of COVID-19. Yet, infection prevention and control methods to prevent HCWs from bringing the virus home are lacking.

Doctor Moves Into Tent in Garage to Protect His Family From Coronavirus

Irvine Dr. Timmy Cheng killed tens of thousand

By Jonathan Lloyd • Publii

'I tell my wife to get away.' Facing coronavirus fears, Chicago nurses and doctors try to protect their own families.

By ALISON BOWEN CHICAGO TRIBUNE | APR 02, 2020 AT 6:43 AM

Objectives

Aim 1: Describe which preemptive prevention measures HCWs were taking to mitigate SARS-CoV-2 transmission to their household members

Aim 2: Analyze if any prevention measures were associated with decreased likelihood of transmission

Aim 3: Understand the impact of HCWs stress and investigate association of stress with prevention measures during the COVID-19 pandemic

Methods

- Online survey administered through REDCap
- Disseminated through Physician/Advanced Practice Provider Facebook groups, email, listservs, and institutional websites of medical centers in highly impacted states
- Responses collected 5/19/2020 - 9/23/2020
- Inclusion Criteria:
 - ✓ COVID+ (confirmed or presumed)
 - ✓ Another person living within the same household
- Fisher's exact test was used for comparative analysis; STATA 16.1 software

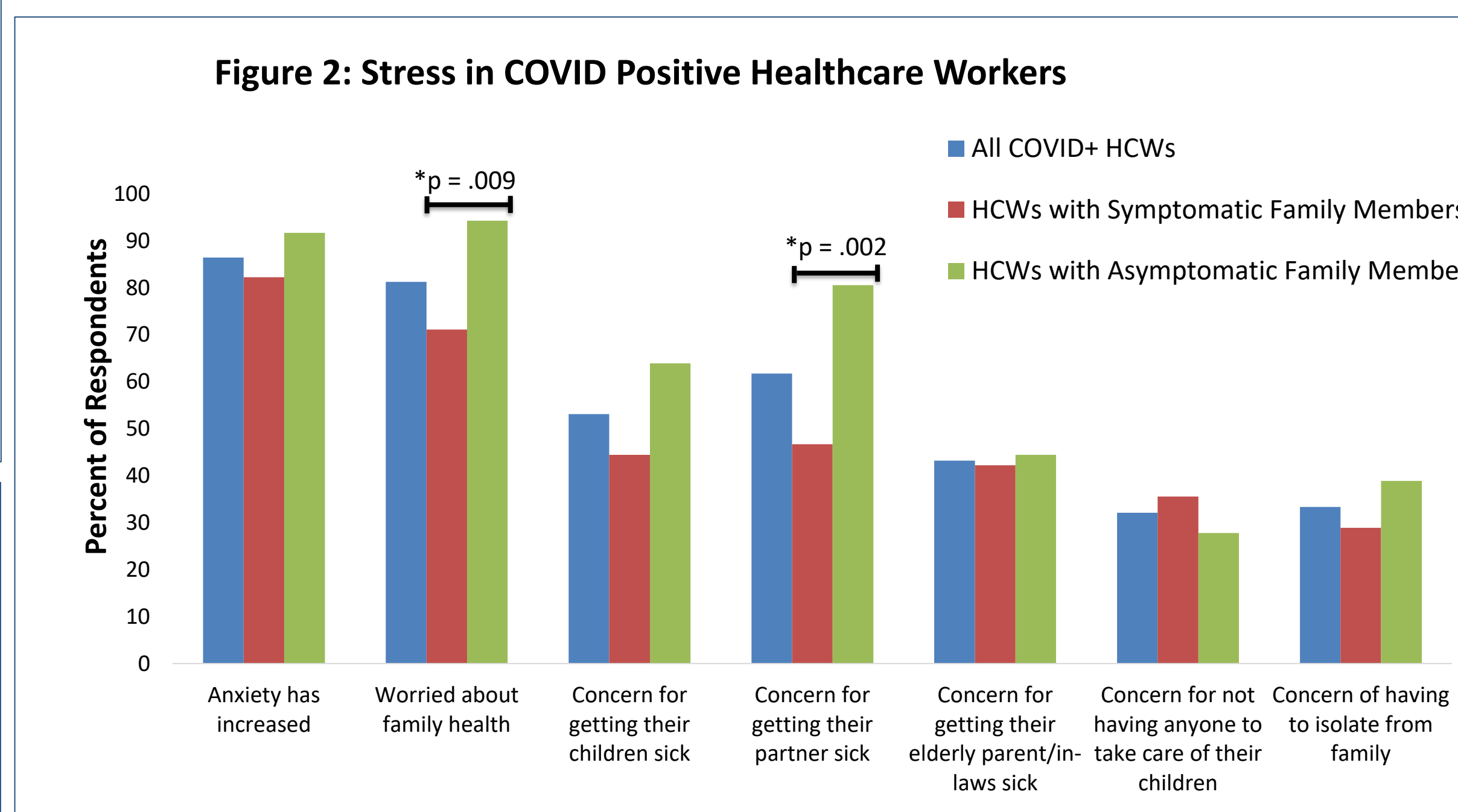
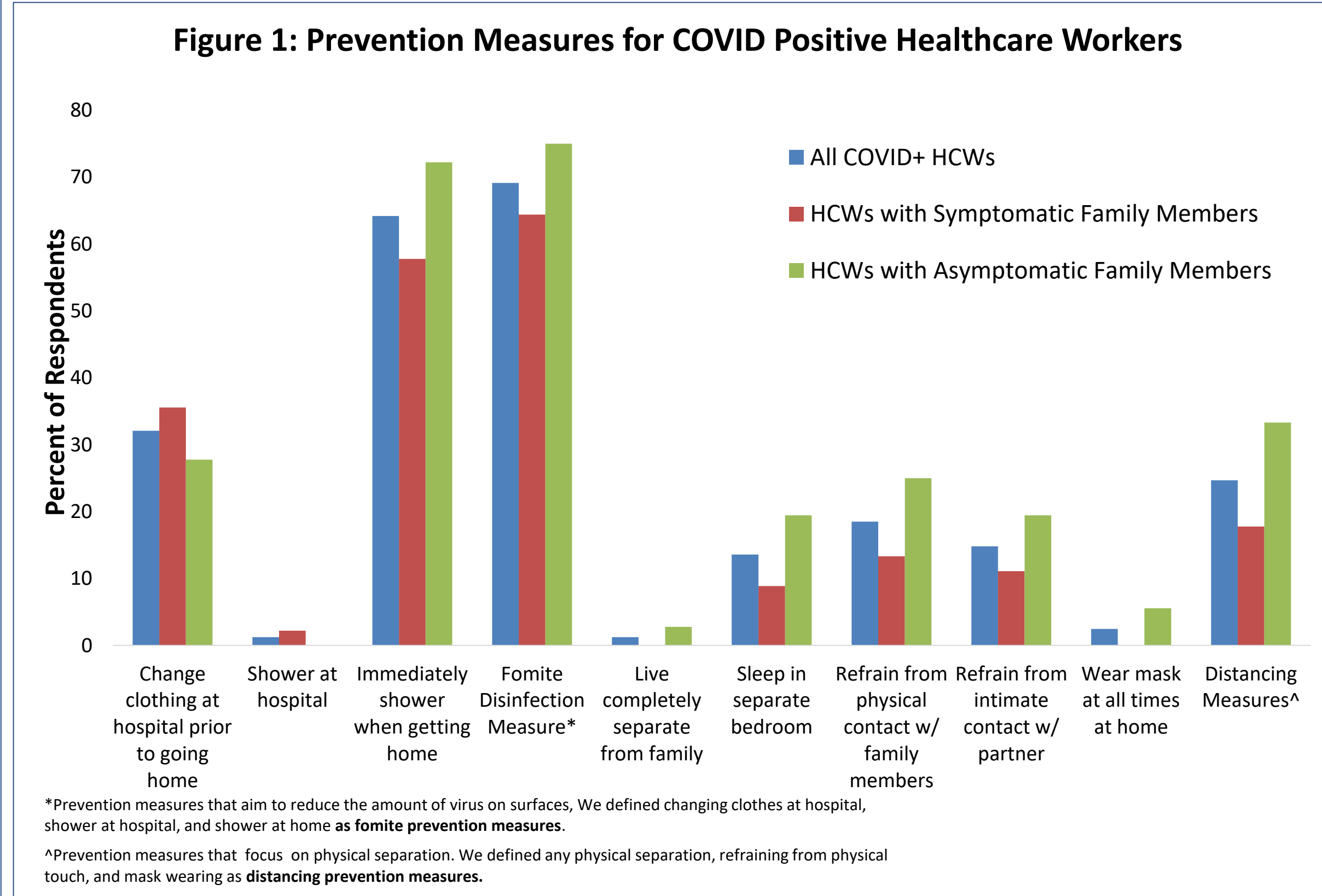
Results

Table 1: Demographics for COVID Positive Healthcare Workers (HCWs)

	All COVID+ HCWs (n=81) N (%)	HCWs with Symptomatic Family Members (n = 45) N (%)	HCWs with Asymptomatic Family Members (n = 36) N (%)
Mean Age	41.6 (std. 8.8)	42.6 (std. 8.9)	40.3 (std. 8.6)
Female	70 (86.4)	39 (86.7)	31 (86.1)
Outpatient Care	47 (58.0)	25 (55.6)	22 (61.1)
Median Number of people in household (IQR)	3 (IQR 2)	3 (IQR 2)	3 (IQR 2)
COVID Test (PCR or Serology)	70 (86.4)	35 (77.8)	35 (97.2)*
Symptoms			
Cough	51 (63.0)	32 (71.1)	19 (52.8)
Difficulty Breathing	33 (40.7)	20 (44.4)	13 (36.1)
Fever	50 (61.7)	31 (68.9)	19 (52.8)
Abdominal pain	14 (17.3)	10 (22.2)	4 (11.1)
Vomiting or diarrhea	31 (38.3)	17 (37.8)	14 (38.9)
Rash	4 (5.0)	3 (6.7)	1 (2.8)
Anosmia	40 (49.4)	22 (48.9)	18 (50.0)
Malaise	64 (79.0)	38 (84.4)	26 (72.2)
Age of household members			
< 1 years old	4 (5.0)	1 (2.2)	3 (8.3)
1-9 years old	47 (58.0)	29 (64.4)	18 (50.0)
10-17 years old	26 (32.1)	15 (33.3)	11 (30.6)
18-64 years old	77 (95.1)	43 (95.6)	34 (94.4)
65+ years old	9 (11.1)	5 (11.1)	4 (11.1)
Age of household members with COVID symptoms			
< 1 years old		1 (2.2)	
1-9 years old		18 (30.0)	
10-17 years old		6 (13.3)	
18-64 years old		40 (88.9)	
65+ years old		3 (6.8)	
Relationship of household members with COVID Symptoms			
Partner		38 (84.4)	
Children		25 (55.6)	
Parent		1 (2.2)	
Grandparent		0 (0.0)	
Other family - Same age		2 (4.4)	
Other family - Younger		2 (4.4)	
Other family - Older		0 (0.0)	

*p = 0.019

- 26% worked in inpatient units, 6% worked in the ER, and 7% in the ICU
- 62% reported mild disease and 37% reported moderate disease severity - Only 1 respondent required hospitalization
- 22% of HCWs did not take any household prevention measure
- 83% of HCWs reported either moderate or significant worsening of their mental health
- HCWs responded that their single greatest source of stress was either health/safety concerns (25%) or impact on family (25%)
- HCWs that had symptomatic household members implemented more fomite disinfection measures (mean = .96) than distancing measures (mean = 0.33, two-sided t-test p < .001)



Conclusions

- HCWs are implementing a variety of prevention measures within their household.
- There are no clear prevention measures that significantly differ between HCWs with transmission events and those without.
- There is significantly increased stress and worsening mental health among HCWs during this pandemic.
- HCWs who were stressed about transmission to their family or partner were less likely to have a transmission event within their household.

Future Directions

- More research is needed to better understand how prevention measures of HCWs impact transmission of novel infectious pathogens, such as SARS-CoV-2, in the household.
- Future work should also seek to understand the impact of stress on transmission dynamics within households, paying attention to distinct types of stressors in HCWs lives.

References

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- Bowen A. 'I tell my wife to get away.' Facing coronavirus fears, Chicago nurses and doctors try to protect their own families. *Chicago Tribune* 2020.