Home Sick with Coronavirus Symptoms: a National Study, April–May 2020

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INTRODUCTION

Reports from hospitals and locales[1] have highlighted racial/ethnic disparities in COVID-19 outcomes. However, few national studies in the USA have examined disparities among persons with symptoms suggestive of COVID-19. We analyzed a unique, nationally representative survey to assess demographic characteristics and social vulnerabilities among those with symptoms attributed to the coronavirus.

METHODS

We analyzed data on adults age 18–64 in weeks 1 (April 23–May 5) and 4 (May 21–26) of the Census Bureau's Household Pulse Survey (HPS), which collects data on pandemic-related health and financial problems.[2] Individuals reporting not working the preceding week were asked why; one of 12 response options was "… because I am/was sick with coronavirus symptoms." (Previous research demonstrated that 83.0% of Americans correctly identify fever, cough, and dyspnea as the three leading COVID-19 symptoms).[3] We compared the demographic characteristics, health insurance status, food insecurity, and prevalence of COVID-19 in their state of residence[4] (divided into quartiles), of those selecting this response to two other groups: (1) those working and (2) persons out-of-work because of a non-coronavirus-related illness/disability.

We performed univariate logistic regressions to evaluate the association of each factor with being out-sick due to coronavirus symptoms relative to each comparator group. We generated nationally representative estimates (and standard errors) using HPS' sample weights (and replicate weights) and Stata/SE 16.1.

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RESULTS

Our sample included 89,490 adults working the past week, 457 out-sick with coronavirus symptoms, and 3503 out-of-work because of a non-coronavirus illness/disability.

During May 21–26, 1.3 million workers nationally were out-sick because of coronavirus symptoms. Table 1 presents characteristics of that group and the comparator groups. Relative to both other groups, those out-sick with coronavirus symptoms were younger and more likely to be people of color: 24.2% were Black (vs. 11.5% of those working and 18.2% of those not-working due to a non-coronavirus illness/disability), 11.7% were Asian (vs. 5.6% and 2.0%), and 26.5% were Hispanic (vs. 17.2% and 12.7%).

Those out-sick with coronavirus symptoms were less-educated and had lower incomes than those working; their education levels and incomes were more similar to those not working due to a non-coronavirus illness/disability. They had larger household size: 42.4% lived in a household with 5+ members, vs. less than a quarter in each comparison group.

29.2% of those out-sick with coronavirus symptoms were uninsured, vs. 8% in each comparison group; 36.2% were food insecure, vs. 7.5% among those working and 20.8% among those out-sick for non-coronavirus symptoms/disability.

Finally, we observed an association between states' prevalence of coronavirus and being out-sick with coronavirus symptoms: 45.1% of Americans out-sick with coronavirus symptoms resided in a state in the top quartile of coronavirus prevalence, while only 15.2% lived in a bottom-quartile state. In contrast, individuals in the two comparison groups were divided roughly equally among the four state quartiles.

DISCUSSION

Minority race/ethnicity, low income, and residence in a state with high COVID prevalence were associated with work absence because of coronavirus symptoms in April–May 2020. This national-level evidence of the disparate impact of COVID-19 bolsters reports based on diagnoses from regions and hospital systems,[1] as well as our previous findings of an increase in illness-related work absence in April that disproportionately affected minorities.[5]

We also identified social vulnerabilities—uninsurance and food insecurity—among many out-sick with coronavirus

Table 1 Characteristics of Non-elderly Adults in April–May 2020 by Employment Status ($n = 93,450$)

	Working % ($n = 89,490$)	Not working w/ non-coronavirus illness/disability % ($N = 3503$)	Out-sick w/ coronavirus symptoms % ($N = 457$)	Odds ratio: out-sick w/ coronavirus symptoms vs. working*	95% confidence interval		*P* value	Odds ratio: out-sick w/ coronavirus symptoms vs. not working w/ non-coronavirus illness/ disability*	95% confidence interval		*P* value
Age											
18–29	20.8	7.9	33.2	Reference				Reference			
30–39	26.0	14.4	20.8	0.50	0.28	0.90	0.022	0.35	0.17	0.71	0.004
40–49	22.6	19.9	15.8	0.44	0.25	0.76	0.003	0.19	0.10	0.38	< 0.001
50–59	22.0	38.2	24.2	0.69	0.43	1.12	0.131	0.15	0.08	0.29	< 0.001
60–69	8.6	19.6	6.0	0.44	0.27	0.71	0.001	0.07	0.04	0.14	< 0.001
Sex											
Male	51.9	42.8	49.1	Reference				Reference			
Female	48.1	57.2	51.0	1.12	0.78	1.62	0.537	0.78	0.51	1.18	0.239
Race†											
White	61.9	59.6	35.3	Reference				Reference			
Black	11.5	18.2	24.2	3.71	2.27	6.08	< 0.001	2.25	1.31	3.85	0.003
Asian	5.6	2.0	11.7	3.66	1.77	7.59	< 0.001	9.85	3.75	25.92	< 0.001
Other	3.9	7.5	2.3	1.03	0.52	2.03	0.933	0.52	0.24	1.11	0.090
Hispanic	17.2	12.7	26.5	2.71	1.66	4.42	< 0.001	3.53	2.03	6.13	< 0.001
Education											
< HS	5.7	12.3	15.4	Reference				Reference			
HS	25.6	40.9	37.8	0.55	0.27	1.13	0.103	0.74	0.36	1.52	0.413
College	68.7	46.8	46.8	0.25	0.13	0.49	< 0.001	0.80	0.40	1.61	0.532
Income‡											
< $25K	9.0	50.6	35.5	19.47	11.35	33.39	< 0.001	0.55	0.31	0.98	0.042
$25–49K	20.2	25.2	28.9	7.04	3.74	13.26	< 0.001	0.90	0.46	1.76	0.767
$50–$99K	33.3	18.2	27.9	4.10	2.25	7.49	< 0.001	1.20	0.61	2.37	0.592
$100K+	37.6	6.0	7.7	Reference				Reference			
Insurance status§											
Insured	91.9	92.2	70.8	Reference				Reference			
Uninsured	8.1	7.8	29.2	4.70	3.01	7.34	< 0.001	4.88	2.88	8.26	< 0.001
Household size‖											
1	6.2	13.1	4.5	Reference				Reference			
2	25.9	29.8	17.0	0.92	0.40	2.10	0.847	1.68	0.69	4.08	0.252
3	21.9	18.0	20.4	1.31	0.55	3.09	0.540	3.34	1.34	8.32	0.010
4	22.6	16.3	15.8	0.98	0.45	2.10	0.950	2.84	1.27	6.37	0.011
5	12.1	11.1	20.3	2.35	1.00	5.53	0.050	5.40	2.17	13.47	< 0.001
6	5.5	4.1	8.4	2.15	0.66	6.95	0.203	6.04	1.76	20.71	0.004
7	5.8	7.7	13.7	3.34	0.97	11.51	0.057	5.23	1.42	19.28	0.013
Food insecurity¶											
No	92.5	79.2	63.8	Reference				Reference			
Yes	7.5	20.8	36.2	7.02	4.50	10.95	< 0.001	2.17	1.32	3.54	0.002

(*continued on next page*)

Table 1. (continued)

	Working % ($n = 89,490$)	Not working w/ non-coronavirus illness/disability % ($N = 3503$)	Out-sick w/ coronavirus symptoms % ($N = 457$)	Odds ratio: out-sick w/ coronavirus symptoms vs. working*	95% confidence interval		P value	Odds ratio: out-sick w/ coronavirus symptoms vs. not working w/ non-coronavirus illness/ disability*	95% confidence interval		P value
State coronavirus infection rate quartile**											
1	25.7	27.3	15.2	Reference				Reference			
2	25.2	25.4	17.4	1.17	0.66	2.08	0.594	1.23	0.68	2.24	0.498
3	25.1	24.6	22.4	1.51	0.91	2.52	0.111	1.64	0.99	2.69	0.053
4	24.0	22.7	45.1	3.19	1.85	5.51	< 0.001	3.58	2.06	6.21	< 0.0011

*Univariate logistic regressions. The dependent variable is employment status (out-sick with coronavirus symptoms versus working, or out-sick with coronavirus symptoms versus not working due to non-coronavirus illness/disability) and the independent variable is the indicated characteristic (e.g., age category, sex)

†White, Black, Asian, and other are non-Hispanic Whites, non-Hispanic Blacks, non-Hispanic Asians, and non-Hispanic others. Hispanic individuals may be of any race

‡10,759 individuals had missing data on income (11.5% of $n = 93,450$ sample)

§Insurance status is defined similar to the approach used by the American Community Survey. We considered individuals insured if they report private insurance (through an employer), private insurance (individually obtained), TRICARE, Medicare, Medicaid, or Veterans Health Administration coverage; those who report not having each of these insurance types (including those who only report Indian Health Service or "other" insurance) are considered uninsured. Others ($n = 8677$ in our sample) were treated as missing (9.2% of $n = 93,450$ sample)

‖We top-coded the categorical household size variable at 7

¶This is based on a four-category variable that we re-categorized as a binary variable: not insecure (either enough food or enough but not the types wanted) vs. insecure (sometimes not enough food or often not enough food). $N = 1203$ with missing data on current food security (1.3% of $n = 93,450$ sample)

**Data on state-level per 100,000 population coronavirus infections was downloaded from the CDC on June 12, 2020[4]; data is current as of June 9, 2020. The total survey population was divided into quartiles based on the coronavirus infection rate in their state (using sample weights)

symptoms, which likely intensifies their risk of health and financial harms.

Our study has strengths and limitations. The Census Bureau recruited respondents via email and text messages to generate almost-real-time data;[6] the trade-off was poorer response rates,[2] which, despite weighting designed to account for non-response, may compromise generalizability. Additionally, the survey did not involve performance of diagnostic testing; some of those with "coronavirus symptoms" no doubt had other illnesses. However, the correlation between the state-level COVID-19 infection rate and the proportion out-sick with coronavirus symptoms is reassuring, as is the consistency of findings across the two comparison groups. The high rate of uninsurance among those with "coronavirus symptoms" that we observed could, of course, obstruct medical evaluation and other care even among those with other illnesses.

During the COVID-19 pandemic, poor and minority Americans have been doubly disadvantaged: they are more often infected, but have fewer household resources and inferior health protection. Protecting the health and welfare of these patients must be a policy priority.

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Compliance with Ethical Standards:

Conflict of Interest: *The authors report no financial conflicts of interest. Adam Gaffney, David Himmelstein, Steffie Woolhandler, and Danny McCormick serve as leaders of Physicians for a National Health Program (PNHP), a non-profit organization that favors coverage expansion through a single-payer program; however, none of them received any compensation from that group, although some of Dr. Gaffney's travel on behalf of the organization is reimbursed by it. David Bor is a member of PNHP.*

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