Severe Acute Respiratory Syndrome Coronavirus 2 Prevalence, Seroprevalence, and Exposure among Evacuees from Wuhan, China, 2020

Benjamin D. Hallowell,¹ Christina M. Carlson, Jesica R. Jacobs, Mary Pomeroy, Jonathan Steinberg, Mark W. Tenforde, Emily McDonald, Loretta Foster, Leora R. Feldstein, Melissa A. Rolfes, Amber Haynes, Glen R. Abedi, George S. Odongo, Kim Saruwatari, Errin C. Rider, Gina Douville, Neenaben Bhakta, Panagiotis Maniatis, Stephen Lindstrom, Natalie J. Thornburg, Xiaoyan Lu, Brett L. Whitaker, Shifaq Kamili, Senthilkumar K. Sakthivel, Lijuan Wang, Lakshmi Malapati, Janna R. Murray, Brian Lynch, Martin Cetron, Clive Brown, Shahrokh Roohi, Lisa Rotz, Denise Borntrager, Kenta Ishii, Kathleen Moser, Mohammad Rasheed, Brandi Freeman, Sandra Lester, Kizzmekia S. Corbett, Olubukola M. Abiona, Geoffrey B. Hutchinson, Barney S. Graham, Nicki Pesik, Barbara Mahon, Christopher Braden, Casey Barton Behravesh, Rebekah Stewart, Nancy Knight, Aron J. Hall, Marie E. Killerby

To determine prevalence of, seroprevalence of, and potential exposure to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) among a cohort of evacuees returning to the United States from Wuhan, China, in January 2020, we conducted a cross-sectional study of quarantined evacuees from 1 repatriation flight. Overall, 193 of 195 evacuees completed exposure surveys and submitted upper respiratory or serum specimens or both at arrival in the United States. Nearly all evacuees had taken preventive measures to limit potential exposure while in Wuhan, and none had detectable SARS-CoV-2 in upper respiratory tract specimens, suggesting the absence of asymptomatic respiratory shedding among this group at the time of testing. Evidence of antibodies to SARS-CoV-2 was detected in 1 evacuee, who reported experiencing no symptoms or high-risk exposures in the previous 2 months. These findings demonstrated that this group of evacuees posed a low risk of introducing SARS-CoV-2 to the United States.

Author affiliations: Centers for Disease Control and Prevention, Atlanta, Georgia, USA (B.D. Hallowell, C.M. Carlson, J.R. Jacobs, M. Pomeroy, J. Steinberg, M.W. Tenforde, E. McDonald, L. Foster, L.R. Feldstein, M.A. Rolfes, A. Haynes, G.R. Abedi, G.S. Odongo, P. Maniatis, S. Lindstrom, N.J. Thornburg, X. Lu, B.L. Whitaker, S. Kamili, S.K. Sakthivel, L. Wang, L. Malapati, J.R. Murray, B. Lynch, M. Cetron, C. Brown, S. Roohi, L. Rotz, D. Borntrager, K. Ishii, K. Moser, B. Freeman, N. Pesik, B. Mahon, C. Braden, C. Barton Behravesh, R. Stewart, N. Knight, A.J. Hall, M.E. Killerby);

On December 31, 2019, a cluster of severe pneumonia cases in Wuhan, Hubei Province, China, was reported (1). On January 7, 2020, a novel coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was isolated from samples associated with the cluster (2,3). As of May 1, 2020, a total of 3,175,207 coronavirus disease (COVID-19) cases had been confirmed and 224,172 persons had died worldwide; 84,385 cases and 4,643 deaths were in China (4). Also as of May 1, 2020, the US Centers for Disease Control and Prevention (CDC) was reporting ongoing worldwide transmission (5).

On January 20, 2020, a case of coronavirus disease (COVID-19) was confirmed in a US patient who had recently traveled to Wuhan (6). To slow the spread of the epidemic, on January 23, the government of China enacted a travel ban restricting all travel into and out of Wuhan, including air and rail travel, and

Riverside University Health System-Public Health, Riverside, California, USA (K. Saruwatari, E.C. Rider, G. Douville, N. Bhakta); Synergy America Inc., Duluth, Georgia, USA (M. Rasheed, S. Lester); National Institutes of Health, Bethesda, Maryland, USA (K.S. Corbett, O.M. Abiona, G.B. Hutchinson, B.S. Graham)

DOI: https://doi.org/10.3201/eid2609.201590

¹Current affiliation: Department of Health, Providence, Rhode Island, USA

suspending operation of buses, subways, and ferries within the city (7). As of January 23, a total of 571 confirmed COVID-19 cases had been reported in China (8).

After China enacted the travel ban, the US Department of State planned evacuation flights for US citizens and other third country nationals in Wuhan. We describe the demographic and clinical characteristics, potential exposures to SARS-CoV-2, personal protective measures implemented, and SARS-CoV-2 real-time reverse transcription PCR (rRT-PCR) and serologic test results for evacuees from 1 repatriation flight from Wuhan. These data can be used to better determine SARS-CoV-2 epidemiology, including assessing the point prevalence of past and current SARS-CoV-2 infections in this cohort and identifying factors associated with infection in this cohort. These findings can also be used to help estimate the initial risk for transmission to contacts in the United States posed by evacuees from Wuhan and are relevant to current and future implementation of public health control measures, such as isolation and quarantine.

Methods

We investigated quarantined evacuees from a January 28, 2020, repatriation flight from Wuhan to the United States. Before the flight departed Wuhan, evacuees were evaluated to ensure that they had no fever or respiratory signs/symptoms. At arrival in the United States and again at the quarantine facility, evacuees were asked to complete a US Traveler's Health Declaration form disclosing any symptoms; they were also screened for illness and fever, asked about symptoms in the past 72 hours, and asked about any high-risk exposures (including working in or visiting healthcare settings; caring for or visiting persons with fever, respiratory illness, or a confirmed COVID-19 diagnosis; or visiting any live animal markets) in Wuhan in the past 14 days. Those who reported symptoms or high-risk exposures were evaluated by a CDC Quarantine Medical Officer, who determined if they required further evaluation and isolation from the quarantined cohort.

Nasopharyngeal and oropharyngeal swab samples and serum specimens were obtained from participating evacuees when they arrived at the quarantine station in the United States. As part of quarantine procedures, evacuees were actively monitored for fever and respiratory signs/symptoms for 14 days after departure from Wuhan; any evacuee in whom either fever or respiratory signs/symptoms developed during this time was evaluated for COVID-19 (9), and additional nasopharyngeal and oropharyngeal specimens were collected (10,11). All specimens

were collected, processed, and shipped to CDC for testing (10,11). Presence of SARS-CoV-2 in nasopharyngeal and oropharyngeal swab samples was confirmed by rRT-PCR detection of viral RNA in respiratory specimens (12). Serum specimens were initially tested for SARS-CoV-2 antibodies by SARS-CoV-2 ELISA (Appendix 1, https://wwwnc.cdc.gov/EID/article/26/9/20-1590-App1.pdf).

We asked evacuees to complete a detailed, selfadministered survey during the flight from Wuhan (Appendix 2, https://wwwnc.cdc.gov/EID/ article/26/9/20-1590-App2.pdf). The survey captured information on demographics, clinical signs/ symptoms, travel outside of Hubei Province, face mask use, limitation of time spent in public, and past high-risk exposures (including contact with confirmed COVID-19 case-patients; persons with fever, acute respiratory illness, or both; healthcare and laboratory facilities; and animals and live animal markets). We assessed high-risk exposures over the past 2 weeks and the past 2 months. We compared high-risk exposures over the past 2 weeks with rRT-PCR results for persons who provided an upper respiratory specimen (because 14 days was the upper end of the estimated incubation period for COVID-19 [13,14]). We also compared high-risk exposures over the past 2 months with the serologic test results for evacuees who provided a serum sample (because SARS-CoV-2 had probably been circulating for the 2 months before their departure [15]).

We entered survey responses into REDCap electronic data capture tools hosted at CDC (16), and all entries were verified by a second reviewer for accuracy and completeness. Data were analyzed by using SAS software version 9.4 (SAS Institute, Inc., https://www.sas.com).

CDC determined that this investigation was public health surveillance (US Department of Health and Human Services, Title 45 Code of Federal Regulations 46, Protection of Human Subjects). Evacuees' participation in the collection of biological specimens and the survey was voluntary.

Results

At the time of arrival in the United States, no evacuee had a measured fever or reported any signs or symptoms that required further evaluation. Of the 195 evacuees, 193 completed surveys; 99% (191/193) of respondents provided a nasopharyngeal sample, an oropharyngeal sample, or 1 of each for SARS-CoV-2 rRT-PCR testing, and 96% (186/193) provided a serum sample for testing. The median age of all 193 evacuees was 42 (range 0-74) years, and 53% (100/189) were

male (Table 1). Most were either Asian (49%, 94/192) or White (35%, 68/192).

One evacuee reported having had close contact with a person with laboratory-confirmed CO-VID-19 in the previous 2 weeks. Specifically, reported exposures included direct physical contact, being within 6 feet of the person while that person was coughing or sneezing, taking an object handed from or handled by the person, and traveling in the same vehicle as the person (Table 2). No other evacuees reported exposure to a person with laboratory-confirmed COVID-19 in the previous 2 months. However, 6% (12/191) reported having had close contact with a person with fever, acute respiratory illness, or both in the previous 2 weeks and 16% (30/186) in the previous 2 months (Table 2). One evacuee had visited a live animal market in the previous 2 weeks and 5% (9/186) in the previous 2 months. Three percent (6/191) of evacuees had visited settings with nondomesticated live animals in the previous 2 weeks and 5% (10/186) in the previous 2 months. One percent (2/191) of evacuees had had direct physical contact with a nondomesticated

Table 1. Demographic characteristics of 193 evacuees on a repatriation flight from Wuhan, China, to the United States, January 2020

January 2020	
	No./total no.
Characteristic	(%)*
Age group, y	_
<18	32/193 (17)
18–44	68/193 (35)
45–64	83/193 (43)
<u>></u> 65	10/193 (5)
Sex	
M	100/189 (53)
F	89/189 (47)
Race/ethnicity	
White	68/192 (35)
Black	6/192 (3)
Asian	94/192 (49)
Multiracial	13/192 (7)
Hispanic	11/192 (6)
Underlying medical condition	
Chronic lung disease	1/191 (1)
Asthma/reactive airway disease	7/191 (4)
Diabetes mellitus type 1	2/187 (1)
Diabetes mellitus type 2	4/191 (2)
Hypertension	14/192 (7)
Chronic heart or cardiovascular disease	0/191 (0)
Chronic kidney disease	1/191 (1)
Liver disease	1/191 (1)
Noncancer immunosuppressive condition	1/189 (1)
Neurologic/neurodevelopmental disorder	1/191 (1)
Other chronic disease	11/191 (6)
Specimen submitted	
Nasopharyngeal and/or oropharyngeal swab	191/193 (99)
sample	
Serum	186/193 (96)

^{*}Data for persons for whom responses were missing were excluded from the numerator and denominator.

live animal (both instances with stray dogs) in the previous 2 weeks. No additional evacuees had had direct physical contact with a nondomesticated live animal in the previous 2 months.

During the previous month, after hearing about COVID-19 cases in Wuhan, 95% (178/188) of evacuees reported having limited their time in public in Wuhan, including avoiding public gatherings (87%), public transportation (84%), and all public settings (e.g., grocery stores or restaurants; 70%) (Table 3). In addition, in the previous month, after hearing about COVID-19 cases in Wuhan, 76% of evacuees reported having worn a face mask while in public spaces. This finding represented a significant increase from the 34% of evacuees who reported having worn a face mask while in public spaces in the previous 2 months (McNemar test statistic 74.05; p<0.0001).

Five percent (9/193) of evacuees reported having experienced signs or symptoms associated with COVID-19 (measured or subjective fever, cough, shortness of breath) in the previous 2 weeks, and 12% (24/193) reported signs/symptoms associated with COVID-19 in the previous 2 months. One evacuee who reported signs/symptoms associated with COVID-19 in the previous 2 weeks sought medical care, and no evacuee required hospitalization while in Wuhan (Table 4).

SARS-CoV-2 was not detected by rRT-PCR in any of the 190 nasopharyngeal or 190 oropharyngeal swab specimens collected from 191 unique evacuees (189 provided nasopharyngeal and oropharyngeal samples, 1 nasopharyngeal sample only, and 1 oropharyngeal sample only). During the 14-day quarantine period, fever developed in 2 evacuees; additional nasopharyngeal and oropharyngeal swab specimens were collected and tested, and SARS-CoV-2 was not detected in either specimen type.

One evacuee showed serologic evidence of a past SARS-CoV-2 infection. Serum from that person had antibodies against SARS-CoV-2 at titers of 400 determined by ELISA and 320 determined by microneutralization test. This person was male, was in the 19-44-year age group, was traveling without any family members, and reported no signs/symptoms associated with COVID-19 in the past 2 months. He reported no high-risk exposures (including exposure to or contact with live animals, live animal markets, persons known to be ill with COVID-19, or persons with fever or acute respiratory signs/symptoms). He reported that since early January he had spent limited time out in public, including avoiding public transport, avoiding public gatherings, and not attending

Table 2. Potential exposures to severe acute respiratory syndrome coronavirus 2 by 193 evacuees returning from Wuhan, China, to the United States, January 2020*

the United States, January 2020*	
Exposure risk factors	No./total no. (%)†
Relevant exposures for serology results‡	
Animal contact	
Visited the Huanan Seafood Market in past 2 mo	1/186 (1)
Visited any live animal market in past 2 mo	9/186 (5)
Visited any settings with domesticated animals in past 2 mo	39/186 (21)
Visited any settings with nondomesticated animals in past 2 mo	8/186 (4)
Had direct contact with any animals in past 2 mo	52/186 (28)
Human contact	
Had close contact with laboratory-confirmed COVID-19 case-patient in past 2 mo	1/186 (1)
Had close contact with person with fever and/or acute respiratory illness in past 2 mo	30/186 (16)
High-risk settings	
Visited a healthcare setting (not in United States) in past 2 mo	8/186 (4)
Worked in a healthcare setting in Wuhan in past 2 mo	0/186 (0)
Worked in a laboratory setting in Wuhan in past 2 mo	0/186 (0)
Travel	
Did not travel outside of Hubei Province, China, in past 2 mo	62/186 (33)
Relevant exposures for PCR results§	
Animal contact	
Visited any live animal market in past 2 wk	1/191 (1)
Visited any settings with domesticated animals in past 2 wk	15/191 (8)
Visited any settings with nondomesticated animals in past 2 wk	6/191 (3)
Had direct physical contact with live domestic animals in past 2 wk	36/191 (19)
Had direct physical contact with live nondomestic animals in past 2 wk	2/191 (1)
Human contact	
Had close contact with laboratory-confirmed COVID-19 case-patient in past 2 wk	1/191 (1)
Had close contact with person with fever and/or acute respiratory illness in past 2 wk	12/191 (6)
High-risk settings	
Visited a healthcare setting (not in United States) in past 2 wk	7/191 (4)
*COVID 40	

^{*}COVID-19, coronavirus disease.

school/university. ELISA results for the remaining 185 serum specimens measured SARS-CoV-2 antibody titers at <400, and the samples were therefore considered seronegative.

Discussion

Our report on SARS-CoV-2 prevalence, seroprevalence, and potential exposures among evacuees returning from Wuhan is part of the public health response enacted to slow transmission of SARS-CoV-2 in the United States. Although this population of evacuees is probably not representative of all Wuhan residents in terms of risk of acquiring SARS-CoV-2 infection, our results indicate limited exposure to SARS-CoV-2 among this group of early evacuees from Wuhan.

Compared with previously reported COVID-19 case-patients in Wuhan, our population was younger (median 42 vs. 59 years of age) and their reported frequency of potential SARS-CoV-2 exposures was lower, including exposure to persons with respiratory signs/symptoms, work-associated healthcare exposures, and exposure to live animal markets (15). Of note, although our questionnaire covered exposure to animals and animal markets, most transmission

within Wuhan during the evacuees' relevant exposure period before the repatriation flight to the United States was probably human-to-human (15,17). Our study population, which consisted predominantly of US expatriates, probably had other factors that reduced their risk for exposure and were not documented as part of our investigation. For example, it is possible that the expatriates' households in Wuhan were smaller than other households in Wuhan, which has been associated with a lower risk for transmission (18–21); however, because we did not document household size in our investigation, we cannot show such an association. Nearly all evacuees took preventive measures to limit potential exposure to SARS-CoV-2 while in Wuhan. However, 16% of evacuees did have direct contact with persons who had fever or acute respiratory illness.

Previous investigations among evacuees traveling from Wuhan to Germany and Japan detected SARS-CoV-2 RNA in 7 asymptomatic persons (22,23), suggesting that symptom-based screening alone may not be effective for detecting SARS-CoV-2 infection. Evacuees in our study underwent intensive screening such that no evacuee had signs/symptoms at the time of evacuation and none had detectable SARS-CoV-2

[†]Data for persons for whom responses were missing were excluded from the denominator.

[‡]Limited to exposures within the past 2 mo and to persons who submitted serum sample.

^{\$}Limited to exposures within the past 2 wk and to persons who submitted a nasopharyngeal and/or oropharyngeal swab specimen

in upper respiratory tract specimens, suggesting the absence of asymptomatic respiratory shedding among this group at the time of testing. In addition, no SARS-CoV-2 was detected in respiratory specimens from the 2 evacuees in whom fever developed during quarantine. The lack of SARS-CoV-2 detection in asymptomatic travelers at the time of testing and in the 2 travelers in whom fever developed could result from a lower risk for exposure among this group compared with Wuhan residents or other reported evacuees (22,23).

The ELISA and microneutralization tests used in this investigation have produced robust responses to serum from confirmed SARS-CoV-2 patients (B. Freeman et al., unpub data, https://www.biorxiv. org/content/10.1101/2020.04.24.057323v2 28). Although 24 evacuees reported signs/symptoms associated with COVID-19 (subjective fever, cough, or shortness of breath) in the previous 2 months, none were seropositive for SARS-CoV-2. In contrast, an antibody response was detected in 1 person who did not report illness in the previous 2 months, indicating past SARS-CoV-2 infection, suggestive of past asymptomatic or mildly symptomatic infection. The overall seroprevalence of 1% suggests a low level of exposure to SARS-CoV-2 over the preceding 2 months in Wuhan. However, a lack of antibody response may not mean an absence of past infection; serologic responses were not always found in persons with mild Middle East respiratory syndrome coronavirus illness and positive rRT-PCR results for that virus (24). Future serologic testing among CO-VID-19 case-patients may be useful for determining whether persons with asymptomatic or mild COV-ID-19 disease become seropositive.

Efforts by this cohort to limit their exposure by limiting their time in public may have helped prevent infection, even in a city with extensive ongoing community transmission. Because SARS-CoV-2 seems to be transmitted primarily through respiratory droplets, limiting time in public may have helped prevent infection because proximity to infected persons is needed for virus transmission (25). Before the evacuees in our study departed Wuhan, China was implementing measures to control SARS-CoV-2 by suspending public transport and vehicle traffic and canceling Lunar New Year gatherings (7). CDC currently recommends that all persons wear cloth face coverings in public; the purpose is to help protect others from potential droplet exposure, not to protect the persons wearing the face coverings (26). Thus, although 76% of evacuees reported mask use after hearing about COVID-19 in Wuhan, individual mask use probably had minimal effect on their individual risk of acquiring infection.

Information about virus prevalence, seroprevalence, and possible SARS-CoV-2 exposures in this population of evacuees has the potential to inform current and future quarantine and isolation policies. In this population, who underwent intensive screening and monitoring, we detected no evidence of current infection with SARS-CoV-2 and very limited evidence of past infection. Other than the 193 evacuees included in our study, 3 cases of COVID-19 were detected in the United States during quarantine of later cohorts of evacuees after signs/symptoms developed and the evacuees underwent testing, demonstrating the value of quarantine and active monitoring of evacuees to detect COVID-19 cases (27).

No /total no /0/ \+

Table 3. Precautions taken to prevent infection with severe acute respiratory syndrome coronavirus 2 by 193 evacuees while in Wuhan, China*

		No./total no. (%)†	
		Submitted NP or OP	Submitted serum
Precaution	Total, n = 193	sample,‡ n = 191	sample,§ n = 186
Face mask use			_
Usually wore a face mask in past 2 mo while in public	63/185 (34)	63/184 (34)	63/178 (35)
Usually wore a face mask in past 1 mo while in public after hearing about	143/188 (76)	143/187 (76)	138/181 (76)
COVID-19			
Limited time in public			
In past 1 mo after hearing about COVID-19	178/188 (95)	176/186 (95)	171/181 (94)
By taking the following precautions			
Avoided public transport	150/178 (84)	148/176 (84)	144/171 (84)
Avoided public gatherings	154/178 (87)	153/176 (87)	148/171 (87)
Did not attend work¶	53/123 (43)	53/121 (44)	53/123 (43)
Did not attend school/university#	19/30 (63)	19/30 (63)	15/25 (60)
Avoided all public settings (e.g., grocery stores, restaurants)	125/178 (70)	124/176 (70)	119/171 (70)

^{*}COVID-19, coronavirus disease; NP, nasopharyngeal swab; OP, oropharyngeal swab.

[†]Data for persons for whom responses were missing were excluded from the denominator.

[‡]Limited to persons who submitted an NP and/or OP specimen.

^{\$}Limited to persons who submitted serum specimen.

[¶]Limited to persons who reported an occupation (other than student, stay-at-home parent, or retired).

[#]Limited to persons 2-18 years of age and those reporting student as occupation.

Table 4. Signs/symptoms, clinical course, and past medical history for evacuees reporting illness who were on a repatriation flight from Wuhan, China, to the United States in early 2020*

	No./total no. (%)†			
	Self-reported illness in past	Self-reported illness in past		
Characteristic	2 mo, n = 39	2 wk, n = 13		
Sign/symptom				
Measured fever	5/36 (14)	3/12 (25)		
Subjective fever	16/37 (43)	2/13 (15)		
Cough	15/36 (42)	6/12 (50)		
Sore throat	21/38 (55)	9/13 (69)		
Muscle aches	10/37 (27)	2/11 (18)		
Headache	12/37 (32)	1/12 (8)		
Shortness of breath	2/34 (6)	1/12 (8)		
Vomiting	3/33 (9)	1/11 (9)		
Diarrhea	7/36 (19)	1/12 (8)		
Fatigue	16/37 (43)	3/12 (25)		
Other	10/30 (33)	6/10 (60)		
Any coronavirus sign/symptom‡	24/39 (62)	9/13 (69)		
Identified as a person under investigation for COVID-19 signs/symptoms§	10/39 (26)	2/13 (15)		
Sought medical care for illness in past 2 wk	1/39 (3)	0/13 (0)		

^{*}All persons who self-reported illness submitted serum and a nasopharyngeal or oropharyngeal swab specimen. COVID-19, coronavirus disease.

Our investigation has limitations. First, the survey was self-administered and based on self-report; therefore, questions were open to interpretation and subject to reporting bias. Because respiratory specimens from asymptomatic persons were collected at a single point in time, we are unable to show whether asymptomatic shedding might have occurred later during quarantine. Also, rRT-PCR assays and serologic tests are inherently limited by their individual sensitivity and specificity; however, we believe that the limitations of test specificity and sensitivity across this population of evacuees were minimal. In addition, because only 1 serum specimen was taken at the time of US arrival, we were unable to detect antibodies that may have developed later.

As of May 1, a total of 1,062,446 COVID-19 cases had been confirmed in the United States, including 39 in repatriated persons (3 cases in 808 returned evacuees across 5 flights from Hubei Province and 36 cases from the Diamond Princess cruise ship) (28). Initial efforts to slow introduction of SARS-CoV-2 to the United States began in January 2020 and included quarantine of persons with high-risk exposures, screening of travelers at airports, and isolation and contact tracing of confirmed case-patients (28). Our investigation demonstrated that this group of evacuees posed a low risk of introducing SARS-CoV-2 to the United States, and their exposure to SARS-CoV-2 in Wuhan was probably limited. These results should help inform public health guidance on quarantine and isolation measures for travelers arriving from high-risk areas and further characterize the epidemiology of this emerging virus.

Acknowledgments

We thank the following members of the Riverside University System: Josephine Cortez, Anthony Martinez, Brianna Anderson, Hanh Nguyen, Kim Clifton, Vanessa Arreola, Jarrett Herbst, Jide Adeyeye, Stephanie Loe, Geoffrey Leung, Mike Mesisca, Gregory Harriman. We also thank the CDC COVID-19 Patient Under Investigation Team.

About the Author

At the time of the study, Dr. Hallowell was an Epidemic Intelligence Service Officer in the Division of Viral Diseases, National Center for Immunization and Respiratory Diseases, CDC. His research interests include epidemiology of infectious diseases, vaccines, and public health.

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[†]Persons for whom responses were missing were excluded from the numerator and denominator. ‡Measured fever OR subjective fever, cough, or shortness of breath.

[§]Measured or subjective fever AND shortness of breath or cough.

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Address for correspondence: Marie E. Killerby, Centers for Disease Control and Prevention, 2500 Century Ctr, MailstopV25-1, Atlanta, GA 30345, USA; email: lxo9@cdc.gov

Severe Acute Respiratory Syndrome Coronavirus 2 Prevalence, Seroprevalence, and Exposure Among Evacuees from Wuhan, China, 2020

Appendix 1

Supplemental Methods

Serum specimens were initially tested for anti–SARS-CoV-2 antibodies by SARS-CoV-2 ELISA using recombinantly expressed viral spike protein S1/S2 (*I*). Briefly, plates were coated overnight at 4°C with a concentration of 150 ng/ml of S1/S2. All serum specimens from evacuees were then added to plates in serial 4-fold dilutions from 1:100 to 1:6,400 and washed, followed by the addition of horseradish peroxidase (HRP-conjugated anti human IgM/IgA/IgG (SeraCare Life Sciences, Milford, MA) with 2,2'-azino-di (3- ethylbenzthiazoline- 6-sulfonate; ABTS) peroxidase substrate system to detect binding and to determine endpoint antibody titers (SeraCareLife Sciences, Milford, MA). Absorbance was read at 405 nm and 490 nm as background correction. The highest dilution with a background correction optical density >0.4 was the endpoint titer. Any specimens with titers ≥400 were considered positive by ELISA. Serum samples that were positive by ELISA were confirmed by microneutralization test using live SARS-CoV-2 USA_WA1_2020 in a Biosafety Level 3 laboratory, using the MERS-CoV microneutralization workflow (2).

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Article DOI: https://doi.org/10.3201/eid2609.201590

Severe Acute Respiratory Syndrome Coronavirus 2 Prevalence, Seroprevalence, and Exposure Among Evacuees from Wuhan, China, 2020

Appendix 2

Evacuee Survey

The following pages contain the self-administered survey given to 95 evacuees to be completed during a repatriation flight from Wuhan, China, to the United States on January 28, 2020. Of the 95 evacuees, 93 completed the survey.

Form Approved: OMB: 0920-1011 Exp. 4/23/2020



2019-nCoV Wuhan Exposure Questionnaire

Specimen ID (for CDC use only)

CDC ID (CDC use only):	1		
Please complete this form for each person traveling	⊒ ag in your group.		
Today's date:// (MM/DD/YYYY			
Demographic Information			
1. Age (years): Age in mode. 2. Ethnicity: Hispanic/Latino 3. Race: (check all that apply) White		☐ American Indian/Alasl	ka Native 🔲 Black
6. County of Destination:	JS resident		
Symptoms and healthcare			
 7. Have you been sick in the past 2 months? If yes, what date did the symptoms associated 8. During this illness, did you experience any of 	l with this illness start?/ the following symptoms?	_/(MM/DD/YY	
Symptom Measured Fever	Symptom Present?	Symptom	Symptom Present?
Measured Fever (highest temp °F) Subjective fever (felt feverish) Cough Sore Throat Muscle aches Headache Shortness of breath Other symptoms:	Yes No Unknown Yes No Unknown	Vomiting Diarrhea Eye infection/redness Rash Fatigue Seizures Other, specify below:	Yes No Unknown Yes No Unknown
9. Are you feeling back to normal? Yes If yes, when did you feel back to normal? 10. Did you receive any medical care for the illne Yes No (skip to Q.15) 11. Where and on which date did you seek care for the illne Quipatient Date: // // Pate: // // // // // // // // // // // // //		all that apply)? rgency room Date: th department Date: er Date: Unknown (skip of hospital discharge? nown	_//(MM/DD/YYYY) _//(MM/DD/YYYY) to Q.21)/(MM/DD/YYYY)
Person completing this form. First name:	Last ı	name:	
If this form is being completed for someone else, p	- -	()	Specimen ID for CDC use only)
First name:		i	
CDC ID (CDC use only):	1		

Public reporting burden of this collection of information is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information including suggestions for reducing this burden to CDC/ATSDR Reports Clearance Officer; 1600 Clifton Road NE, MS D-74 Atlanta, Georgia 30333; ATTN: PRA (0920-1011)



Past Medical History

-5.	Do you have any of the following chronic		
	Condition	Response	If YES, specify
	Chronic lung diseases	Yes No Unknow	
	Asthma/reactive airway disease	Yes No Unknow	
	Other chronic lung disease	Yes No Unknow	n
	Diabetes Mellitus		
	Diabetes Mellitus Type 1	Yes No Unknow	n
	Diabetes Mellitus Type 2	☐Yes ☐No ☐Unknow	n
	Hypertension	Yes No Unknow	n
	Chronic heart or cardiovascular disease	Yes No Unknow	n
	Chronic kidney disease	Yes No Unknow	n
	Liver disease	☐Yes ☐No ☐Unknow	
	Non-cancer immunosuppressive condit		
	or therapy	ion Tes Enkilow	
	Cancer chemotherapy in past 12 month	s Yes No Unknow	m
	Neurologic/neurodevelopmental disord		
	-		
	Other chronic diseases	Yes No Unknow	n
6.	(Female only) Are you pregnant?		
~•	Yes (weeks pregnant)	☐ No ☐ Unknown	
7	Do you currently smoke?		
٠.	Yes No Unknown		
	a. If yes, how many packs per day	ŋ	
	b. For how many years?		
0			
8.	Do you currently vape or use e-cigarettes	!	
	Yes No Unknown		
	rel history In the last 2 months did you travel outside	e of Wuhan, Hubei Province, China	?
	Yes No Unknown		
0.	Where did you travel in the last 2 months	(list ALL locations, including over	night transits)?
	Trip 1: Departure date:	//(MM/DD/YYYY)	Departure city/country:
	Arrival date:	//(MM/DD/YYYY)	Arrival city/country:
	Trip 2: Departure date:	//(MM/DD/YYYY)	Departure city/country:
	Arrival date:	//(MM/DD/YYYY)	Arrival city/country:
	Trip 3: Departure date:	//(MM/DD/YYYY)	Departure city/country:
	Arrival date:	//(MM/DD/YYYY)	Arrival city/country:
f e	extra travel dates describe in comments sec	· · · · · · · · · · · · · · · · · · ·	
	e in Wuhan		
	The following questions all refer to exp months, and some ask about the last 2 v		n, China. Please know that some questions ask about the la
1	In the last 2 months , did you visit Huana	a Saafood Market? Vas	☐ No ☐ Unknown
	· · · · · · · · · · · · · · · · · · ·		-
	In the last 2 months , did you visit any oth		☐ No ☐ Unknown
	If visited in the last 2 weeks , dates: MM/E		
4	In the last 2 months , did you purchase an		
	If so, list:		
5.	In the last 2 months , did you visit any oth pets, or wildlife? Yes No	ner settings whether at home or awa	
5. 6.	In the last 2 months , did you visit any oth pets, or wildlife? Yes No	ner settings whether at home or awa	y from home where live animals were present, including lives



whether at home or away ☐ Yes ☐ No	r from home? (list A Unknown	LL animal	exposures in	cluding po	ets)?		
9. If you contacted animals City/Country contact(s)	in the last 2 weeks , Type of animal con-	-		ata ranga	of contact	Contact setting(s) (chec	dr all that annly)
•	(livestock, pets, wil-		(in the pas	_		Contact setting(s) (chec	K an that apply)
occurred	(IIVestock, pets, wil	diric,)	-		M/DD/YYYY)		
			(,	Home Work	Farm Animal
			/	_/	//	_ Market ☐ Zoo ☐ C	
						☐ Home ☐ Work ☐	Farm Animal
			/	_/	//	— Market ☐ Zoo ☐ Othe	
						Home Work	Farm Animal
			/	_/	//	— Market ☐ Zoo ☐ Other	er
						Home Work	
			/	_/	/	Market ☐ Zoo ☐ Othe	
			,	,	, ,	Home Work	
TC 11'4' 1 1		1.			//	— Market ☐ Zoo ☐ Other	er
If additional exposures, plea	se include in the app	penaix					
. When you were exposed	to the person diagno	Exposi	ure to Confir		erson was sic -nCoV patien	t	
		Date / Da				Estimated frequency (e.g.	Estimated Duration
	DV DV-	(MM/DI	D/YYYY - M	M/DD/Y	YYY)	daily, 2x daily)	(e.g. minutes, hours
Have face to face contact?	☐Yes ☐No ☐Unknown	/	/ -	/	/		
Have direct physical							
contact? (e.g. hug, shake	☐Yes ☐No						
hands, etc.)	Unknown	/_	/	/	/		
Physically within 6 feet of	□Yes □No						
the case?	Unknown	/_	/	/	/		
In close proximity (within 6							
feet) while the case was	☐Yes ☐No ☐Unknown	,	,	,	1		
coughing or sneezing? Take an object handed from		/		/			
or handheld by the case?	☐Yes ☐No						
or nanuncia by the case!	□ I Inlemesses	/_		/	/		
(e.g. pen, paper, fork, etc.)	Unknown						
(e.g. pen, paper, fork, etc.) In the same room as the	☐Yes ☐No	,	,	,	,		
(e.g. pen, paper, fork, etc.) In the same room as the case?		/_	/	/	/		
(e.g. pen, paper, fork, etc.) In the same room as the case? Travel in the same vehicle	☐Yes ☐No ☐Unknown	/_			/		
(e.g. pen, paper, fork, etc.) In the same room as the case? Travel in the same vehicle (car, bus, airplane), sitting	☐Yes ☐No		/	/			
(e.g. pen, paper, fork, etc.) In the same room as the case? Travel in the same vehicle (car, bus, airplane), sitting within 6 feet of the case?	☐ Yes ☐ No ☐ Unknown ☐ Yes ☐ No ☐ Unknown	/_	/	//			
(e.g. pen, paper, fork, etc.) In the same room as the case? Travel in the same vehicle (car, bus, airplane), sitting within 6 feet of the case? Live in the same house or	☐ Yes ☐ No ☐ Unknown ☐ Yes ☐ No ☐ Unknown ☐ Yes ☐ No				/		
(e.g. pen, paper, fork, etc.) In the same room as the case? Travel in the same vehicle (car, bus, airplane), sitting within 6 feet of the case? Live in the same house or	☐ Yes ☐ No ☐ Unknown ☐ Yes ☐ No ☐ Unknown	/_			/		
(e.g. pen, paper, fork, etc.) In the same room as the case? Travel in the same vehicle (car, bus, airplane), sitting within 6 feet of the case? Live in the same house or apartment as a case	□Yes □No □Unknown □Yes □No □Unknown □Yes □No □Unknown	/		//	/	respiratory illness?	
(e.g. pen, paper, fork, etc.) In the same room as the case? Travel in the same vehicle (car, bus, airplane), sitting within 6 feet of the case? Live in the same house or apartment as a case	☐ Yes ☐ No ☐ Unknown you have close cont	/	/	//_ad a fever	/	respiratory illness?	
(e.g. pen, paper, fork, etc.) In the same room as the case? Travel in the same vehicle (car, bus, airplane), sitting within 6 feet of the case? Live in the same house or apartment as a case 2. In the last 2 months, did Yes No Un If contact was in the last	☐ Yes ☐ No ☐ Unknown ☐ Yes ☐ No ☐ Unknown ☐ Yes ☐ No ☐ Unknown ☐ Unknown you have close contains known			/ / / ad a fever	/	respiratory illness?	



		Date / Date (MM/DD/		<u>MM</u> /.	DD/YY	YYY)		ncy (e.g. 2x daily)		ated Duration
Have face to face contact?	☐Yes ☐No	,	,		,	,				
Have direct physical	Unknown	/	/		/	/	_			
contact? (e.g. hug, shake	□Yes □No									
hands, etc.)	Unknown	/_	/		_/	_/	_			
,										
Physically within 6 feet of	☐Yes ☐No									
the case?	Unknown	/_	/		/	/	_			
In close proximity (within 6										
feet) while the case was coughing or sneezing?	☐Yes ☐No ☐Unknown	,	,		,	/				
Take an object handed from	Ulikilowii		/		/	/	_			
or handheld by the case?	□Yes □No									
(e.g. pen, paper, fork, etc.)	Unknown	/	/	_	/	/				
In the same room as the	☐Yes ☐No									
case?	Unknown	/_	/	<u>-</u>	/	/	_			
Travel in the same vehicle										
(car, bus, airplane), sitting within 6 feet of the case?	☐Yes ☐No ☐Unknown	,	,		,	/				
within 6 feet of the case?	Ulikilowii		/		/	/	_			
Live in the same house or	□Yes □No									
		/	/	_	/	/				
apartment as a case n the last 2 months , did you v	isit a healthcare se	tting? \(\text{Yes}	s No	<u> </u>	Unkno	wn				
f yes, in the last 2 weeks give in the last 2 months, did you ca	care for a lab-confir									
Yes No Unknown		YYY)								
f yes, in the last 2 weeks give	dates: (MM/DD/Y									
	dates: (MM/DD/Y								V natient	
f yes, in the last 2 weeks give When you were caring for a lab	dates: (MM/DD/Y b-confirmed 2019-	nCoV patient	t(s):				_ab-confirme	d 2019-nCo	V patient	
f yes, in the last 2 weeks give	dates: (MM/DD/Y b-confirmed 2019-	nCoV patient	t(s):						V patient	Unkno
f yes, in the last 2 weeks give When you were caring for a lab Were you within 6 feet of a co	dates: (MM/DD/Y b-confirmed 2019-a confirmed case arou	nCoV patient	t(s):				_ab-confirme _ Yes _ Yes	d 2019-nCo	V patient	Unkno
f yes, in the last 2 weeks give When you were caring for a lab Were you within 6 feet of a conformation for than 10 minutes? Which of the following PPE of	dates: (MM/DD/Y b-confirmed 2019-a confirmed case arou	nCoV patient	t(s):				_ab-confirme Yes	d 2019-nCo		Unkno
f yes, in the last 2 weeks give When you were caring for a lab Were you within 6 feet of a co For more than 10 minutes?	dates: (MM/DD/Y b-confirmed 2019-a confirmed case arou	nCoV patient	t(s):			I [[_ab-confirme _ Yes _ Yes _ Never	d 2019-nCo		Unkno
f yes, in the last 2 weeks give When you were caring for a lab Were you within 6 feet of a conformation for than 10 minutes? Which of the following PPE of	dates: (MM/DD/Y b-confirmed 2019-a confirmed case arou	nCoV patient	t(s):			I [[_ab-confirme _ Yes _ Yes	d 2019-nCo	etimes	Unkno
f yes, in the last 2 weeks give When you were caring for a lab Were you within 6 feet of a coronic for more than 10 minutes? Which of the following PPE of Gloves	dates: (MM/DD/Y b-confirmed 2019-a confirmed case arou	nCoV patient	t(s):				_ab-confirmeYesYesNeverNever	d 2019-nCo	etimes	Unkno
f yes, in the last 2 weeks give When you were caring for a lab Were you within 6 feet of a coronic for more than 10 minutes? Which of the following PPE of Gloves	dates: (MM/DD/Y b-confirmed 2019-a confirmed case arou	nCoV patient	t(s):				_ab-confirme _ Yes _ Yes _ Never	d 2019-nCo	etimes	Unkno
f yes, in the last 2 weeks give When you were caring for a lab Were you within 6 feet of a cr For more than 10 minutes? Which of the following PPE of Gloves Gown Surgical Mask	dates: (MM/DD/Y b-confirmed 2019-a confirmed case arou	nCoV patient	t(s):				Ab-confirmeYesYesNeverNeverNever	d 2019-nCo	etimes	Unkno
f yes, in the last 2 weeks give When you were caring for a lab Were you within 6 feet of a cor For more than 10 minutes? Which of the following PPE of Gloves Gown	dates: (MM/DD/Y b-confirmed 2019-a confirmed case arou	nCoV patient	t(s):				_ab-confirmeYesYesNeverNever	d 2019-nCo	etimes etimes	Unkno
f yes, in the last 2 weeks give When you were caring for a lab Were you within 6 feet of a cr For more than 10 minutes? Which of the following PPE of Gloves Gown Surgical Mask	dates: (MM/DD/Y b-confirmed 2019-a confirmed case arou	nCoV patient	t(s):				Ab-confirmeYesYesNeverNeverNever	d 2019-nCo No No Some	etimes etimes etimes	☐ Unkno ☐ Unkno ☐ Always ☐ Always ☐ Always
f yes, in the last 2 weeks give When you were caring for a lab Were you within 6 feet of a cc For more than 10 minutes? Which of the following PPE cc Gloves Gown Surgical Mask N95 mask or PAPR Faceshield or goggles	dates: (MM/DD/Y b-confirmed 2019- confirmed case arou did you use while o	nCoV patient and the time t caring for the	t(s): they were patient?	positi	ive?		_ab-confirmeYesYesNeverNeverNeverNever	d 2019-nCo	etimes etimes etimes	Unkno
f yes, in the last 2 weeks give When you were caring for a lab Were you within 6 feet of a cr For more than 10 minutes? Which of the following PPE of Gloves Gown Surgical Mask N95 mask or PAPR	dates: (MM/DD/Y b-confirmed 2019-i confirmed case arou did you use while o during aerosolizing ode/CPR, open suc	nCoV patient and the time t caring for the procedures (tioning of air	t(s): they were patient? including ways, spu	g intub	ation,	I	_ab-confirme _ Yes _ Yes _ Never _ Never _ Never _ Never _ Never _ Yes	Some	etimes etimes etimes	☐ Unkno ☐ Unkno ☐ Always ☐ Always ☐ Always

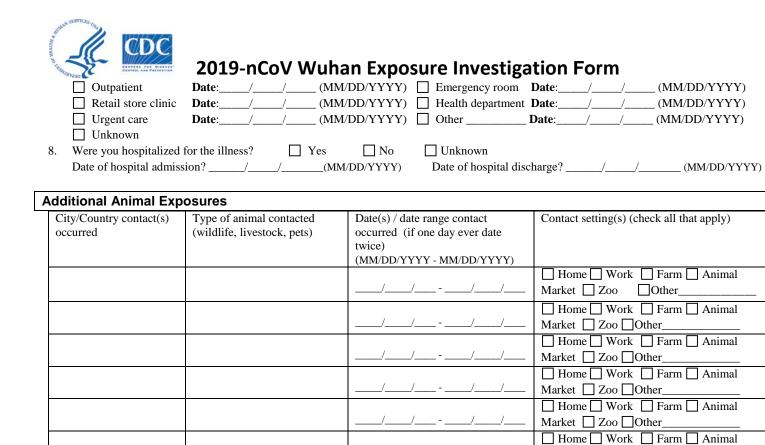


THE OF WEALTH & HIGH	2019-nCoV Wuhan Exposure Invest	igation F	orm	
	***************************************		ver and/or acute res	piratory illness
	Were you within 6 feet of the patient around the time they were sick?	Yes	☐ No	Unknown
	For more than 10 minutes?	Yes	☐ No	Unknown
	Which of the following PPE did you use while caring for the patient?			
	Gloves	□Never	Sometimes	Always
	Gown	□Never	Sometimes	Always
	Surgical Mask	□Never	Sometimes	Always
	N95 mask or PAPR	□Never	Sometimes	Always
	Faceshield or goggles	□Never	Sometimes	Always
	Were you in the same room during aerosolizing procedures (including intubation, extubation, bronchoscopy, Code/CPR, open suctioning of airways, sputum induction)?	Yes	□No	Unknown
38.	In the last 2 months , did you work in a laboratory setting handling blood, blood products, Yes No Unknown	tissues or sample	es, or viral or bacteri	al samples?
	If yes, in the last 2 weeks give dates: (MM/DD/YYYY)			
	If yes, specify location and materials:			
39.	In the last 2 months , did you usually wear a face-mask while out in public?	No Unknow	vn	
40.	In the last 1 mon, after hearing about 2019-nCoV, did you usually wear a face-mask while	out in public?		
	Yes No Unknown			
41.	In the last 1 month, after hearing about 2019-nCoV, did you limit time out in public? $\ \square$	Yes No	Unknown	
	During what dates did you limit time out in public/(MM/DD/YYYY)	to/	/ (MM/DI	D/YYYY)
42.	If yes, how did you limit time out in public (check all that apply):			
	☐ Avoid public transport ☐ Avoid public gatherings ☐ Not attend work ☐ Not attend	end school/unive	rsity	
	Avoiding all public settings including grocery stores, restaurants etc.			

Revised 1/28/2020 5



If yes, when did you feel back to normal?/(MM/DD/YYYY) Did you receive any medical care for the illness? YesNoUnknown Where and on what date did you seek care first after this illness started (check all that apply)?					
Symptom Symp					
Symptom Symp					
Symptom Symp					
Symptom Subjective fever (highest temp °F) Yes No Unknown Diarrhea Yes No Unknown Subjective fever (felt feverish) Yes No Unknown Eye infection/redness Yes No Unknown Sore Throat Yes No Unknown Rash Yes No Unknown Muscle aches Yes No Unknown Fatigue Yes No Unknown Headache Yes No Unknown Seizures Yes No Unknown Shortness of breath Yes No Unknown Other, specify below: Yes No Unknown Other symptoms: Are you feeling back to normal? Yes No Unknown Other, specify below: Yes No Unknown Other symptoms: Yes No Unknown Other, specify and you feel back to normal? Yes No Unknown Shortness No Unknown Shortness No Unknown Shortness No Unknown Shortness Symptoms					
Symptom Symp					
Symptom Subjective fever (highest temp °F) Yes No Unknown Diarrhea Yes No Unknown Subjective fever (felt feverish) Yes No Unknown Eye infection/redness Yes No Unknown Sore Throat Yes No Unknown Rash Yes No Unknown Muscle aches Yes No Unknown Fatigue Yes No Unknown Headache Yes No Unknown Seizures Yes No Unknown Shortness of breath Yes No Unknown Other, specify below: Yes No Unknown Other symptoms: Are you feeling back to normal? Yes No Unknown Other, specify below: Yes No Unknown Other symptoms: Yes No Unknown Other, specify and you feel back to normal? Yes No Unknown Shortness No Unknown Shortness No Unknown Shortness No Unknown Shortness Symptoms					
Symptom Symp					
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Symptom Symp	anandiy				
Have you been sick a second time the past 2 months?	•				
If yes, complete the questions below. What date did the symptoms associated with this illness start?					
What date did the symptoms associated with this illness start?		months? Yes No Unk	nown		
During this illness, did you experience any of the following symptoms? Symptom		d: 'H			
Symptom Symptom Present? Symptom Symptom Present? Measured Fever (highest temp °F) Yes No Unknown Vomiting Yes No Unknown Subjective fever (felt feverish) Yes No Unknown Diarrhea Yes No Unknown Cough Yes No Unknown Eye infection/redness Yes No Unknown Sore Throat Yes No Unknown Rash Yes No Unknown Muscle aches Yes No Unknown Fatigue Yes No Unknown Headache Yes No Unknown Seizures Yes No Unknown Shortness of breath Yes No Unknown Other, specify below: Yes No Unknown Other symptoms:			(MM/DD/YYYY)		
Measured Fever (highest temp			l a		49
Subjective fever (felt feverish)					
Cough					
Sore Throat					
Muscle aches					
Shortness of breath					
Other symptoms: Are you feeling back to normal? Yes No (Note, if still experiencing symptoms, report as PUI) If yes, when did you feel back to normal? (MM/DD/YYYY) Did you receive any medical care for the illness? Yes No Unknown Where and on what date did you seek care first after this illness started (check all that apply)?					
Are you feeling back to normal? Yes No (Note, if still experiencing symptoms, report as PUI) If yes, when did you feel back to normal? (MM/DD/YYYY) Did you receive any medical care for the illness? Yes No Unknown Where and on what date did you seek care first after this illness started (check all that apply)?	Shortness of breath	Yes No Unknown	Other, specify below:	Yes No	o 🗌 Unknown
If yes, when did you feel back to normal?/(MM/DD/YYYY) Did you receive any medical care for the illness? YesNoUnknown Where and on what date did you seek care first after this illness started (check all that apply)?	Other symptoms:				
If yes, when did you feel back to normal?/(MM/DD/YYYY) Did you receive any medical care for the illness? YesNoUnknown Where and on what date did you seek care first after this illness started (check all that apply)?					
Did you receive any medical care for the illness? Yes No Unknown Where and on what date did you seek care first after this illness started (check all that apply)?	• • • —	-		I)	
☐ Yes ☐ No ☐ Unknown Where and on what date did you seek care first after this illness started (check all that apply)?			<u>(</u>)		
Where and on what date did you seek care first after this illness started (check all that apply)?		ess?			
			ll that apply)?		



Market Zoo Other_

Market Zoo Other_

Market Zoo Other_

Market Zoo Other___

☐ Home ☐ Work ☐ Farm ☐ Animal

☐ Home ☐ Work ☐ Farm ☐ Animal

☐ Home ☐ Work ☐ Farm ☐ Animal