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Address for correspondence: Sitanshu Sekhar Kar, Jawaharlal Institute of Postgraduate Medical Education – Preventive and Social Medicine, JIPMER Campus, Puducherry, Puducherry 605006 India; email: drsitanshukar@gmail.com

SARS-CoV-2 Infection and Mitigation Efforts among Office Workers, Washington, DC, USA

Samira Sami, Nga Vuong, Halie Miller, Rachael Priestley, Matthew Payne, Garrett Licata-Portentosio, Jan Drobeniuc, Lyle R. Petersen

Author affiliations: Centers for Disease Control and Prevention, Atlanta, Georgia, USA (S. Sami, H. Miller, R. Priestley, J. Drobeniuc); Centers for Disease Control and Prevention, Fort Collins, Colorado, USA (N. Vuong, L.R. Petersen); Federal Emergency Management Agency, Washington, DC, USA (M. Payne, G. Licata-Portentosio)

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Despite mitigation efforts, 2 coronavirus disease outbreaks were identified among office workers in Washington, DC. Moderate adherence to workplace mitigation efforts was reported in a serologic survey; activities outside of the workplace were associated with infection. Adherence to safety measures are critical for returning to work during the pandemic.

On March 19, 2020, the Federal Emergency Management Agency (FEMA) activated the National Response Coordination Center in Washington, DC, USA, in response to the coronavirus disease (COVID-19) pandemic. At that time, cases were rapidly increasing in Washington, DC; ≈200 cases had been reported since March 7. Although city officials

ordered closure of nonessential businesses on March 24, FEMA remained open. To protect staff from severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, all persons entering FEMA headquarters underwent symptom and temperature screening. On April 5, after a cluster of 6 epidemiologically linked cases was identified, additional mitigation efforts were implemented, including requiring face masks at all times, requiring that a distance of 6 feet be maintained between employees, and reducing occupancy in the open office space building from a daily average of 1,300 to 400 persons.

To examine workplace and community factors associated with infection, we conducted a serologic survey of SARS-CoV-2 antibodies among staff who worked on site after the mitigation efforts had been implemented. To assess the effect of mitigation efforts in the workplace, we examined occupational case surveillance data.

Staff who worked in the FEMA building during April 1–22 were identified by using turnstile records and were invited by email to participate in a survey. Persons who had had symptoms of COVID-19 within 2 weeks of the survey were ineligible to participate. During April 23–29, consenting participants completed a self-administered, online questionnaire assessing demographics and potential community and workplace exposure to SARS-CoV-2, and blood samples were collected.

Blood samples were tested for SARS-CoV-2 IgG by using ELISA targeting the SARS-CoV-2 receptor-binding domain protein (1). Indeterminate test results or incomplete questionnaires resulted in the exclusion of 10 participants. Characteristics of seropositive and seronegative groups were compared by using the Fisher exact test, and 2-sided *p* values <0.05 were considered statistically significant. Reports of confirmed COVID-19 cases among staff who worked at FEMA headquarters during March–October 2020 were obtained from occupational health records. This activity was reviewed by the Centers for Disease Control and Prevention and deemed public health surveillance.

Of the 466 survey participants, 15 (3.2%) tested positive for SARS-CoV-2 antibodies. Seroprevalence did not vary by sex or age (Table). Of those who tested positive, 11 (73%) reported never having been tested for SARS-CoV-2 by nasal or throat swab, and 8 (53%) reported no symptoms suggestive of SARS-CoV-2 infection since January 15, 2020 (2). On average, participants had spent 20.5 (± 12.0 SD) days in the FEMA building since March 2020. We found no significant difference in workplace

Table. Characteristics and workplace and community exposure for SARS-CoV-2 infection among workers in the FEMA headquarters, by serologic testing results, Washington, DC, USA, April 2020*

Characteristic	SARS-CoV-2 result, no. (%)		p value†
	Positive (n = 15)	Negative (n = 451)	
Sex			
F	4 (26.7)	167 (37.0)	0.588
M	11 (73.3)	284 (63.0)	
Age group, y (n = 464)			
18–34	5 (33.3)	112 (24.9)	0.503
35–49	3 (20.0)	187 (41.5)	
50–64	7 (46.7)	139 (31.0)	
≥65	0 (0.0)	11 (2.4)	
Mitigation activities in the workplace			
Wear a face cover (most or all the time)	9 (60.0)	273 (60.5)	0.298
Maintain a distance ≥6 feet from others (most or all the time)	12 (80.0)	344 (76.3)	1.000
Wash your hands or use hand sanitizer (>5 times daily)	13 (86.7)	411 (91.1)	0.147
Exposure to someone who tested positive for SARS-CoV-2 in the FEMA building			
Any face-to-face contact	2 (13.3)	51 (11.4)	0.224
>10 min within 6 feet	2 (13.3)	46 (10.2)	0.061
Shared workspace	2 (13.3)	44 (9.8)	0.062
Shared breakroom	1 (6.7)	30 (6.7)	0.286
Within 6 feet while coughing or sneezing	1 (6.7)	10 (2.2)	0.325
Exposure to household member with confirmed COVID-19	2 (13.3)	3 (0.7)	0.001
Community exposure during January 15–March 11			
Traveled by bus, train, or subway	8 (53.3)	318 (70.5)	0.161
Traveled by taxi or rideshare	9 (60.0)	290 (64.3)	0.787
Attended social gatherings of >50 persons	12 (80.0)	254 (56.3)	0.109
Visited a healthcare facility	8 (53.3)	150 (33.3)	0.162
Community exposure during March 12 through date of blood draw			
Traveled by bus, train, or subway	5 (33.3)	204 (45.2)	0.436
Traveled by taxi or rideshare	9 (60.0)	147 (32.6)	0.047
Attended social gatherings of >50 persons	2 (13.3)	55 (12.2)	0.704
Visited a healthcare facility	2 (13.3)	64 (14.2)	1.000

*COVID-19, coronavirus disease; FEMA, Federal Emergency Management Agency; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

†Fisher exact test for categorical variables.

mitigation activities between seropositive and seronegative participants: 60.0% seropositive versus 60.5% seronegative participants used a face covering most of the time or always, 80.0% versus 76.3% maintained a distance of ≥6 feet from others most of the time or always, and 86.7% versus 91.1% washed their hands or used hand sanitizer ≥5 times per day. However, a higher, although not statistically significant, percentage of participants who shared a workspace were seropositive (13.3%) than seronegative (9.8%). The same was true for persons who spent >10 minutes ≤6 feet from someone who tested positive for SARS-CoV-2 in the FEMA building; 13.3% were seropositive and 10.2% were seronegative. A significantly higher percentage of seropositive participants lived with someone who had a confirmed positive test result for SARS-CoV-2 (13.3%) than those who were seronegative (0.7%). After the cancellation of nonessential gatherings on March 11, 60.0% of seropositive participants traveled by taxi or rideshare compared with 32.3% of seronegative participants who did not ($p = 0.047$).

By October 30, after mitigation efforts were implemented, 2 clusters of epidemiologically linked COVID-19 cases were identified: 4 cases among staff

in cluster B and 5 cases in cluster D (Figure). We identified an additional 6 nonlinked cases among staff who worked in the FEMA building. Overall, 15 (71%) cases were linked to a cluster.

To our knowledge, evaluations of workplace SARS-CoV-2 mitigation strategies in office buildings have not been published. This study identified 2 factors outside of the workplace that are potentially associated with SARS-CoV-2 infection and transmission in the workplace (despite limited knowledge of whether infection occurred before or after potential exposure): residing with a household member with COVID-19 and using shared transportation. Although seroprevalence for SARS-CoV-2 antibodies was low among office workers, preventing workplace exposures to COVID-19 during March–April 2020 remained challenging. More than half of seropositive participants remained asymptomatic or were never tested for SARS-CoV-2, and 20%–40% of participants did not adhere to masking or physical distancing guidelines. This finding highlights the difficulties of adhering to mitigation efforts in the workplace and the importance of ensuring prevention efforts as persons return to work, such as engineering controls to reduce occupancy levels and modifying areas to

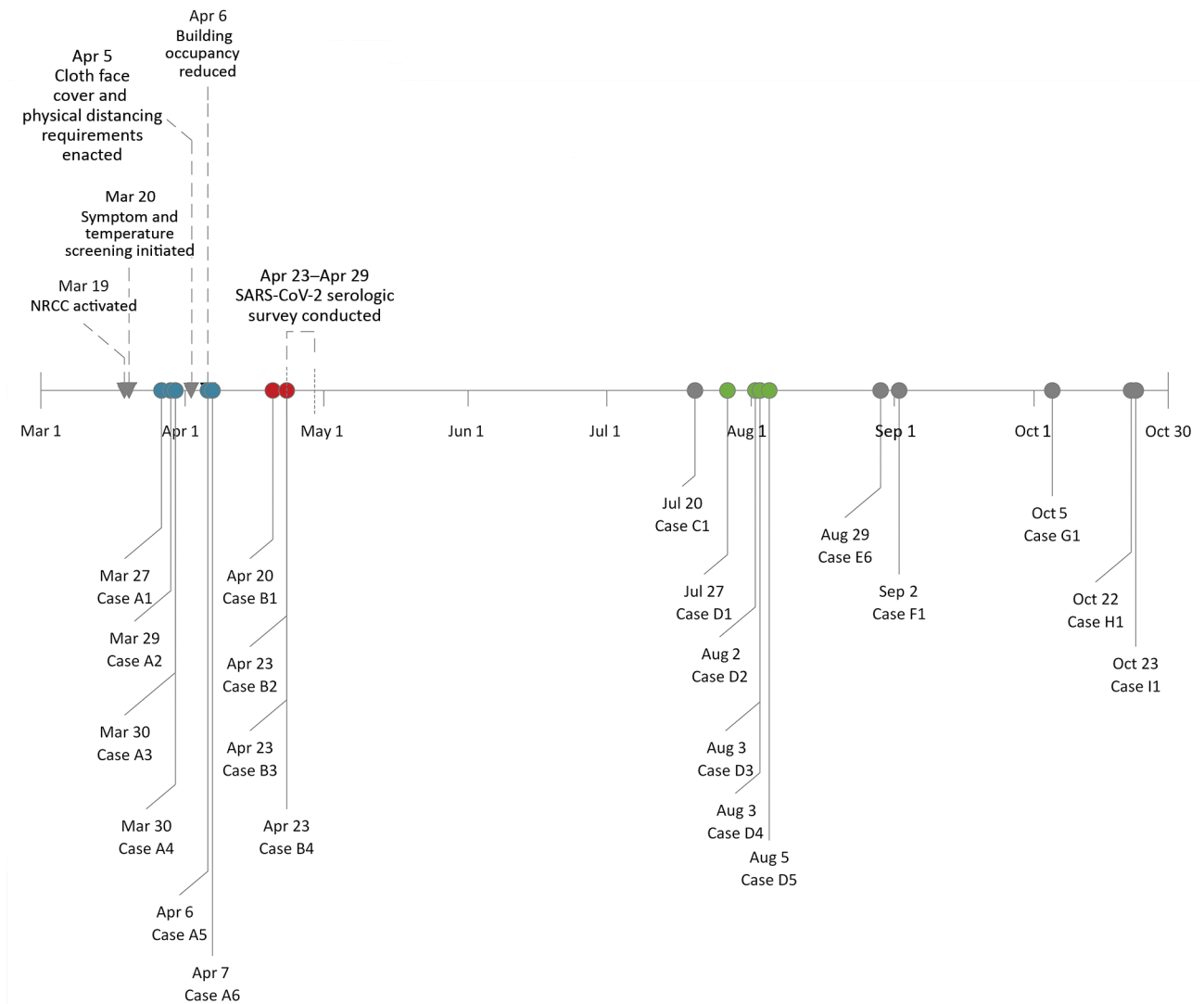


Figure. Coronavirus disease cases among workers in the Federal Emergency Management Agency, by case reporting date, and critical events, Washington, DC, USA, March–October 2020. Associated colors and A, B, and D indicate infection clusters. NRCC, National Response Coordination Center; SARS-CoV-2, severe acute respiratory syndrome coronavirus 2.

maintain a distance of 6 feet between employees (3). Despite hazard controls implemented in the workplace, activities outside of work and noncompliance with mitigation efforts probably contributed to cases and small clusters of COVID-19 among office workers. However, seroprevalence remained at the same level as the overall 3.2% seroprevalence estimate for Washington, DC residents (4).

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About the Author

Dr. Sami is an epidemiologist in the Influenza Division, the National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, Atlanta, Georgia, USA. She and her colleagues have undertaken this research while deployed in support of the federal coronavirus disease response.

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Address for correspondence: Samira Sami, Centers for Disease Control and Prevention, 1600 Clifton Rd NE, Atlanta, GA 30329, USA; email: ssami@cdc.gov

Potential Association between Zika Infection and Microcephaly during 2007 Fever Outbreak, Gabon

Claudine A. Kombila Koumavor, Eric Elguero, Eric M. Leroy

Author affiliations: University of Health Sciences, Libreville, Gabon (C.A. Kombila Koumavor); Institute for Sustainable Development, IRD-CNRS-University of Montpellier Unit, Montpellier, France (E. Elguero, E. Leroy)

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Although Zika virus (ZIKV) circulates in sub-Saharan Africa, no case of ZIKV-associated microcephaly has thus far been reported. Here, we report evidence of a possible association between a 2007 outbreak of febrile illness and an increase in microcephaly and possibly ZIKV infection in Gabon.

Since its 1947 discovery in Uganda, Zika virus (ZIKV) was restricted to sporadic human infections in Africa and Asia until 2007, when a large outbreak occurred in Micronesia, followed by another in

French Polynesia 6 years later. This second outbreak spread to Brazil and throughout Central and South America, resulting in hundreds of thousands of cases (1). ZIKV infection leads to an asymptomatic or mildly symptomatic nonspecific disease in 80% of cases, but the outbreak in the Americas and French Polynesia coincided with a steep increase in the birth of babies with congenital microcephaly (2–4). However, no case of ZIKV-associated microcephaly has been recorded in sub-Saharan regions of Africa, where ZIKV also circulates.

During April–August 2007, Gabon's capital, Libreville, experienced simultaneous outbreaks of chikungunya and dengue (5). A retrospective study of 4,312 serum samples collected during this time found 5 ZIKV-positive cases (6). In addition, 2/137 (1.46%) pooled samples from *Aedes albopictus* mosquitoes tested positive for ZIKV, a proportion similar to that observed for dengue virus. Given that 80% of ZIKV infections are asymptomatic or subclinical, these findings suggest that an undetected ZIKV outbreak may have occurred in Gabon in 2007.

To determine if the incidence of microcephaly increased during this suspected ZIKV outbreak, we examined birth registers at the 2 main hospitals of Libreville: the Libreville Hospital Centre and the Regional Hospital of Melen in Estuaire Province. We recorded all births and cases of microcephaly occurring during January 2006–December 2008 (Figure). Most births in Libreville and its suburbs occur in these 2 hospitals; in addition, the hospitals receive newborns with malformations observed at birth who have been transferred from smaller healthcare facilities that lack neonatal departments. We collected most of the 4,312 samples from patients who visited these hospitals, so the 5 ZIKV case-patients likely lived in the 2 hospitals' coverage area.

In 2017, we searched birth registers for cases of microcephaly, identified when the head circumference was 2 SDs below the average, according to World Health Organization standards, depending on the age and sex of the neonate. For male-born infants, microcephaly corresponded to a cranial circumference of <31.9 cm, and for female-born infants, a cranial circumference of <31.5 cm, measured ≤48 hours after birth. We recorded only data from physical examination of newborns.

We collected details of 34,409 births and grouped them by 2-month periods from January–February 2006 through November–December 2008. Children were considered exposed if they were born during May 2007–June 2008 to mothers pregnant during April 2007–August 2007, as described elsewhere (7).