

COVID-19 Outbreak Associated with a Fitness Center — Minnesota, September–November 2020

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## **Abstract**

The Minnesota Department of Health investigated a COVID-19 outbreak at a fitness center in Olmsted County, Minnesota. Twenty-three SARS-CoV-2 infections (five employees and 18 members) were identified. An epidemiological investigation supported by whole genome sequencing demonstrated that transmission of SARS-CoV-2 occurred at the fitness center despite following recommended prevention strategies.

**Keywords:** Fitness Centers, Cluster Analysis, COVID-19, SARS-CoV-2, Whole Genome Sequencing

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## **Text**

Fitness centers and gyms are a concern for transmission of SARS-CoV-2, the virus that causes coronavirus disease 2019 (COVID-19), because of crowding, ventilation concerns, and heavy breathing while exercising (1). Epidemiological investigations in Chicago and Hawaii demonstrated SARS-CoV-2 transmission in exercise facilities (2,3). Through routine COVID-19 outbreak surveillance, 47 COVID-19 outbreaks were detected at fitness centers in Minnesota during August–November 2020. Whole genome sequencing (WGS) has been used in Minnesota to support epidemiological investigations of SARS-CoV-2 transmission in various settings (4,5) but had not been previously applied to fitness center outbreaks. WGS and case interview data were used to elucidate SARS-CoV-2 transmission at a fitness center in Olmsted County, Minnesota during September–November 2020.

### **Investigation Methods**

Minnesota Department of Health (MDH) and local public health staff routinely conduct case interviews for Minnesota residents with COVID-19 confirmed by reverse transcription-polymerase chain reaction to identify exposures in the 14 days before symptom onset or specimen collection if asymptomatic. The 14-day exposure period overlaps with the infectious period; the infectious period was estimated to begin 2 days before symptom onset or specimen collection if asymptomatic and end 10 days after symptom onset (6). Exposure assessment includes questions about travel and visiting specific settings including bars, restaurants, fitness centers, salons, healthcare facilities, places of worship, and social gatherings. Using exposure data collected from interviews, MDH conducted outbreak surveillance by reviewing case interviews to identify common exposures. A fitness center outbreak was defined a priori as seven cases from separate households who visited the same fitness center during their exposure period within one month. After each outbreak was

detected, local public health officials were notified so compliance with COVID-19 prevention guidance could be assessed.

To investigate genomic similarity among outbreak cases, positive SARS-CoV-2 specimens were requested from clinical laboratories, and WGS was conducted at the MDH Public Health Laboratory as previously described (4). Phylogenetic relationships, including distinct clustering of viral sequences, were inferred based on nucleotide differences via IQ-TREE using general time reversible substitution models as a part of the Nextstrain workflow (7,8). This activity was reviewed by CDC and conducted consistent with applicable federal law and policy (9).

#### **Assessment of Prevention Strategies**

After identifying an outbreak at the fitness center, local public health staff assessed the fitness center's compliance with Minnesota's recommended prevention strategies. The assessment concluded the fitness center was in compliance with the recommended guidance at the time. The Minnesota COVID-19 guidance for fitness centers from June - November 20, 2020 included limiting occupancy to 25% of fire code occupancy or up to 250 people (whichever was lower), with a minimum of 6 feet of distancing between equipment, staff, members, and trainers. Guidance for workers included handwashing recommendations and frequently cleaning equipment and high touch surfaces. While a statewide mask mandate was in place for all indoor businesses and public indoor spaces, members could choose to remove face coverings when exercising.

In addition to following guidance, the fitness center also implemented its own additional precaution measures. Exercise equipment was removed to allow for greater than 6 feet between exercising members. To allow for frequent cleaning of equipment and high touch surfaces, the fitness center implemented a 90-minute reservation system. At the end of every

90 minute reservation period, the fitness center would shut down for 30 minutes to allow for cleaning and sanitizing. Additionally, COVID-19 safety precaution announcements were made every 15 minutes over an intercom system throughout the facility reminding members of symptoms, masking, and distancing.

### **Results**

On October 27, 2020, MDH identified eight cases from six different households who reported attending a 260,000 square foot fitness center in Olmsted County, Minnesota in October 2020 during their 14-day exposure period. On November 2, this cluster met the outbreak definition. A total of 23 cases from 20 households were identified, including five (22%) employees and 18 (78%) members. Four of five (80%) employees reported working while infectious (one was symptomatic), and six of 18 members (33%) reported attending while infectious (one was symptomatic). Overall, 21 cases (91%) had COVID-19 symptoms, and none were hospitalized or died. The median age was 31 years (range 6-60 years), and 13 (56%) were female. Fitness center visit dates were during September 28–November 2, and symptom onset (or testing) dates were during October 7–November 2 (Figure 1). Six (33%) member-cases reported attending more than seven times during their exposure period. Six (33%) members reported working in healthcare, five of whom reported working while infectious.

### **Whole Genome Sequencing**

Thirteen specimens were obtained for WGS: ten from members and three from employees. Two genetic subclusters were identified, differing from each other by 22-24 single nucleotide polymorphisms (SNPs), and four specimens did not cluster with each other or the other two subclusters. Using the Pango lineage system, subcluster 1 sequences were identified as lineage B.1.564, and subcluster 2 sequences were identified as lineage B.1.2 (10).

Subcluster 1 included specimens from seven cases from four households that differed by zero to two SNPs. Two cases were fitness center employees from the same household, and five were members. All cases were symptomatic with onset dates from October 20 - October 31. The two employees worked while infectious. Members reported visiting the fitness center from October 12 - October 23; some reported multiple attendance dates, and some did not specify dates.

Subcluster 2 included specimens from two persons (one employee, one member) from separate households that differed by one SNP. The employee reported a symptom onset date of October 14 and worked while infectious on October 12 and 14. The member reported a symptom onset date of October 29 and reported visiting the fitness center on October 27 (and possibly other dates). The only common exposure reported for each subcluster among cases from different households was visiting the fitness center.

### **Discussion**

The identification of two genetically distinct subclusters and four distinct sequences suggests multiple introductions of SARS-CoV-2 at the fitness center during the outbreak.

Identification of two subclusters indicate two distinct chains of transmission of SARS-CoV-2 occurred at the fitness center, despite existing COVID-19 prevention strategies.

Multiple studies have demonstrated SARS-CoV-2 transmission in fitness centers (2-3,11).

Fitness centers present unique challenges that suggest the need for enhanced COVID-19 prevention strategies. Many people visit fitness centers repeatedly, creating the opportunity for frequent exposures. Our investigation findings support mandatory mask use, increased ventilation, and maintaining at least 6 feet of separation from others as strategies to minimize the spread of COVID-19 in this setting.

All cases in this outbreak were <65 years old, and none were hospitalized. However, several cases were healthcare workers, highlighting that transmission at fitness centers and other community settings can impact health care through staff shortages and increased risk of transmission in this setting. Even with COVID-19 prevention guidance, fitness centers are settings that facilitate the spread of SARS-CoV-2 to members and employees, resulting in possible community transmission. These findings further highlight the importance of case and cluster investigation to identify transmission risks in various settings.

These findings have several limitations, all of which may underestimate the magnitude of the outbreak and create an incomplete understanding of transmission in this outbreak. First, asymptomatic or mildly symptomatic persons who worked at or visited the fitness center may not have been tested for SARS-CoV-2. Second, COVID-19 case interviews were voluntary and based on case recall; cases could choose not to respond to questions, such as fitness center attendance or close contacts. Third, assessment of secondary transmission was not conducted. Furthermore, MDH did not re-interview cases to obtain additional information such as mask use at the fitness center and did not request a member roster or attendance data from the fitness center to identify additional cases. Finally, specimens for only 13 of 23 confirmed COVID-19 outbreak cases were available for WGS due to specimen storage limitations at testing laboratories.

## **Conclusion**

Twenty-three COVID-19 cases reported attending a fitness center during October–November 2020. Based on genetic analysis of the specimens from outbreak cases, two distinct genetic subclusters were identified, indicating SARS-CoV-2 transmission among fitness center members and employees. At a minimum, this suggests a need for enhanced prevention strategies such as maintaining a distance of at least 6 feet from others, well-fitting mask use at all times, increasing ventilation, frequently wiping highly touched surfaces, and hand washing to prevent SARS-CoV-2 transmission at gyms and fitness centers (12). As gyms are risky environments for SARS-CoV-2 transmission, more stringent mitigation strategies may be needed.

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## **Notes**

## **Acknowledgments**

N/A

## **Disclaimers**

The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

## **Funding**

This work was supported in part by U.S. Centers for Disease Control and Prevention Epidemiology and Laboratory Capacity for Infectious Diseases Program (U50/CK000371); the work was also supported by The Centers for Disease Control and Prevention Epidemiology and Laboratory Capacity for Prevention and Control of Emerging Infectious Diseases (ELC) grant, paid to the Minnesota Department of Health. AL reports receiving a fellowship stipend, including travel support, paid by Association of Public Health Laboratories (APHL).

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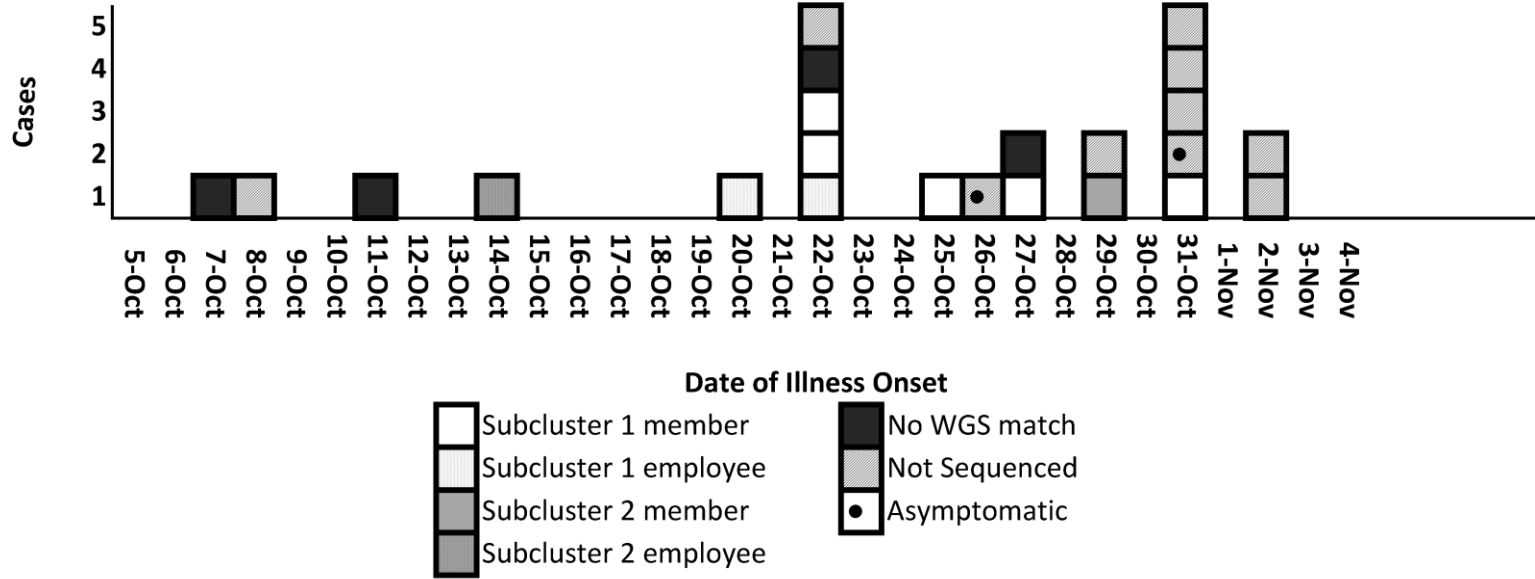
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## Figure Legend

**Figure 1.** Symptom onset or specimen collection dates for COVID-19 cases associated with an outbreak at a fitness center, Olmsted County, Minnesota, September 2020-November 2020

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Figure 1



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