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## SARS-CoV-2 Transmission Dynamics in a Sleep-Away Camp

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### Abstract

**Objective:** In late June 2020, a large outbreak of COVID-19 occurred at a sleep-away youth camp in Georgia affecting primarily persons < 21 years. We conducted a retrospective cohort study among campers and staff (attendees) to determine the extent of the outbreak and assess factors contributing to transmission.

**Methods:** Attendees were interviewed to ascertain demographic characteristics, known exposures to cases and community exposures, and mitigation measures before, during, and after attending

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camp. COVID-19 case status was determined for all camp attendees based on SARS-CoV-2 test results and reported symptoms. We calculated attack rates and instantaneous reproduction numbers, and sequenced SARS-CoV-2 viral genomes from the outbreak.

**Results:** Among 627 attendees, median age was 15 years (interquartile range: 12–16 years); 56% (351/627) were female. The attack rate was 56% (351/627) among all attendees. Based on date of illness onset or first positive specimen collected, 12 cases were infected before arriving at camp, and 339 cases were camp-associated. Among 288 cases with available symptom information, 45 (16%) were asymptomatic. Despite cohorting, 50% of attendees reported direct contact with people outside their cabin cohort. On the first day of camp session, the instantaneous reproduction number was 10. Viral genomic diversity was low.

**Conclusions:** Few introductions of SARS-CoV-2 into a youth congregate setting resulted in a large outbreak. Testing strategies should be combined with pre-arrival quarantine, routine symptom monitoring with appropriate isolation and quarantine, cohorting, social distancing, mask wearing, and enhanced disinfection and hand hygiene. Promotion of mitigation measures among younger populations is needed.

### Table of Contents Summary:

A cohort study of attendees at a youth sleep-away camp with a COVID-19 outbreak highlights transmission dynamics of SARS-CoV-2 in youth congregate settings.

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## Introduction

Evidence for SARS-CoV-2 susceptibility and transmission dynamics among children is conflicting.<sup>1-5</sup> School closures and stay-at-home orders early in the pandemic reduced contact among children, thereby limiting opportunities for transmission.<sup>6,7</sup> Additionally, children more frequently experience asymptomatic and mild disease compared to adults<sup>8</sup>, which may result in less testing,<sup>9</sup> further obscuring their role in transmission. A better understanding of transmission dynamics among children is needed to inform mitigation measures in youth-congregated settings.<sup>3,10</sup>

In June 2020, a large outbreak of COVID-19 occurred at a sleep-away youth camp in Georgia (eIntroduction),<sup>11</sup> affecting primarily persons <21 years, despite the requirement of a negative SARS-CoV-2 nucleic acid amplification or antigen test (viral test) within 12 days of arrival. We conducted a retrospective cohort study and performed genetic sequencing of residual samples to determine the extent of the SARS-CoV-2 outbreak and assess factors contributing to transmission. We estimated effective case and instantaneous reproduction numbers.

## Methods

### Epidemiologic Investigation

All attendees of the camp during June 10–July 1, 2020 were eligible for inclusion in the retrospective cohort study. We categorized persons who attended staff orientation during June 17–20 as trainees if they only attended orientation, and as staff members if they also worked during the only camp session, held June 21–27. Campers only attended the

camp session. The camp provided attendee contact information, age, sex, attendee type (trainee, staff, camper), and cabin. Based on contact information, we categorized attendees as residents of counties included in the metro Atlanta area, counties in Georgia not part of the metro Atlanta area, or out-of-state. During July 17-August 25, we contacted camp attendees for a phone interview; those we did not successfully reach after three attempts over different times of day, including evenings, and days of the week, including weekends, were considered non-respondents. We used a structured questionnaire to collect demographics, clinical characteristics, SARS-CoV-2 testing history, activities during camp, and known exposures to cases and community exposures 14 days before and 14 days after attending camp, mask use during camp attendance, and dates of arrival and departure from camp. We also reviewed pre-arrival laboratory results that were provided to the camp per Georgia executive order.<sup>12</sup> We conducted a detailed interview with a senior staff member to assess mitigation measures adopted by the camp. For attendees who were Georgia residents, we obtained post-camp laboratory results by manually matching name and age, address, or phone number of attendees to known cases in the Georgia Department of Public Health (DPH) State Electronic Notifiable Disease Surveillance System (SENDSS) and collected symptom status and testing histories from state case investigations conducted during June–July. For out-of-state attendees, we contacted respective state health departments to obtain available information. In cases of discordant laboratory results or symptom reports between interviews and state case investigations, a positive test result or the presence of symptoms from either source superseded a negative test result or the absence of symptoms.

## Main Outcomes

We classified camp attendees as COVID-19 cases, non-cases, or having an unknown case status using the Council of State and Territorial Epidemiologists (CSTE) definitions approved on August 5, 2020.<sup>13</sup> Cases were defined as attendees who had a state- or self-reported positive viral test or met the CSTE clinical criteria without test information. Non-cases were defined as attendees who had a state- or self-reported negative viral test or had not been tested and did not meet the CSTE clinical criteria. Case status was unknown for attendees who we did not interview and were not identified in state case investigations. We defined the date of first positive specimen as the earliest specimen collection date, if available in the laboratory reports, or the earliest specimen collection date reported during the interview. We categorized cases as either community-associated or camp-associated. Cases with symptom onset or first positive specimen collection date, whichever was earliest, 10 days before until 2 days of arrival at camp were community-associated, and 3 days of arrival until 14 days after leaving camp were camp-associated.

## Whole Genome Sequencing

For attendees who were Georgia residents, one commercial laboratory provided available residual specimens to the U.S. Centers for Disease Control and Prevention (CDC) for whole genome sequencing (WGS). Twenty-two specimens with cycle threshold values <32 by real-time reverse transcription polymerase chain reaction were selected for sequencing extraction. The nucleic acid was extracted and subjected to Illumina MiSeq sequencing following previously published protocols,<sup>14</sup> and consensus sequences were generated with Minimap 2.17 and Samtools 1.9. We downloaded representative full-genome sequences on

September 28, 2020, from GISAID and inferred phylogenetic relations using approximate maximum likelihood analyses implemented in TreeTime<sup>15</sup> using the Nextstrain pipeline.<sup>16</sup>

## Statistical Analyses

We tabulated demographic characteristics and exposures by case status and by attendee type. We calculated attack rates (AR) using two methods: 1) the proportion of attendees with COVID-19 among all attendees and 2) the proportion of attendees with COVID-19 among attendees excluding those with unknown case status. To estimate effective case and instantaneous reproduction numbers, we performed a probabilistic reconstruction of transmission chains, based on a serial interval distribution of illness onset among cases and time present at camp (eMethods). The effective case reproduction number is the average number of secondary cases per infectious case under observed conditions.<sup>17,18</sup> The instantaneous reproduction number is the average number of secondary cases that each infectious case at time,  $t$ , would infect, if the conditions remained as they were at time,  $t$  (reflecting mitigation measures in place).<sup>19</sup>

For attendees aged 6–21 years with non-missing values for covariates of interest, we used unconditional generalized estimating equations to calculate unadjusted and adjusted risk ratios (RRs and aRRs) with 95% confidence intervals (CIs) for characteristics and exposures related to camp-associated case status. We conducted statistical analyses in SAS version 9.4 (SAS Institute) and R (version 4.0.2).

## Ethical Considerations

This activity was reviewed by human subjects research advisors at CDC and DPH and was determined to not be human subjects research. For interviews with attendees younger than 18 years, we obtained parental or guardian permission and verbal assent from attendees.

## Results

### Camp Cohort

During June 10–July 1, 2020, 627 persons attended the camp, including 137 trainees, 127 staff, and 363 campers (Table 1). Trainee median age was 16 years (range = 14–20 years), and 61% (83/137) were female. Staff member median age was 17 years (range = 14–59 years), and 59% (75/127) were female. Camper median age was 12 years (range = 6–16 years), and 53% (193/363) were female. Most attendees were white (94%), non-Hispanic (96%), and metro Atlanta area residents (77%). Attendees spent a median of 6 days (range = 2–21 days) at camp. As part of the mitigation measures implemented by the camp (eResults), attendees were cohorted by cabin. During orientation, 137 trainees and 124 staff members stayed in 28 cabins with a median occupancy of 11 (range = 1–23 occupants). During the camp session, 127 staff and 363 campers stayed in 31 cabins with a median occupancy of 24 (range = 1–26 occupants); 98% of staff members stayed in the same cabin as during orientation.

Among 627 attendees, 598 (95%) provided negative pre-arrival laboratory results to the camp and 29 (5%) attendees (8 [6%] trainees, 11 [9%] staff members, and 10 [3%] campers)

did not have record of pre-arrival tests. A total of 476 (80%) attendees had an available specimen collection date, with a mean time from specimen collection to arrival at camp of 6 days (range = 0–13 days).

### Camp Attendee Cases and Clinical Characteristics

We identified 351 (56%) cases among camp attendees of which 340 (97%) had a positive viral test result and the remaining 11 (3%) reported no testing but had symptoms consistent with COVID-19. Among 211 (34%) attendees categorized as non-cases, 159 (75%) had a negative viral post-camp test result, and 52 (25%) reported no testing and no symptoms consistent with COVID-19. Case status was unknown for 65 (10%) attendees who were neither interviewed nor found in state reports.

Of all 351 cases, 288 (82%) had symptom information available; 243 (84%) reported having symptoms, and 45 (16%) reported no symptoms. Most (74%) symptomatic cases reported developing symptoms by the last day of the camp session on June 27 (Figure 1). The most common symptoms included subjective or documented fever (56%), headache (52%), and fatigue (49%). Among cases with available information, 6% (16/258) had an underlying medical condition, 5% (12/259) sought medical care due to COVID-19 illness, and none were hospitalized.

### Case Classification

Among 351 cases, 12 (3%) were categorized as community-associated cases. Negative pre-arrival laboratory test results were available for 11 community-associated cases; 1 was missing. Five cases (2 asymptomatic; 3 with missing symptom information) had a positive specimen collected a median of 7 days (range = 6–8 days) before arriving at camp but retested with a negative result a median of 3 days (range = 0–5 days) after their positive test (eFigure 1). Only negative results were supplied to the camp. Six cases with symptoms had symptom onset from 6 days prior to 2 days of arriving and had a positive specimen collected within 5–11 days of arriving at camp. One additional symptomatic community-associated case had a positive specimen collected within 2 days of arrival but symptom onset was missing.

There were 339 camp-associated cases; 328 (97%) had a positive viral test, and 11 (3%) were not tested but met the CSTE clinical case definition. Among the 279 camp-associated cases with available symptom information, 236 (85%) were symptomatic; 132 (56%) reported symptom onset date during camp and 104 (44%) after leaving camp. The median number of days from camp arrival to symptom onset was 7 days (range = 3–21).

### Whole Genome Sequencing

Among 338 Georgia cases, 32 (9%) had available residual specimens. Full genome sequencing was successful in 22 (7%) isolates; all were clustered within 0–2 single nucleotide polymorphisms (SNPs) of another case isolate and were at least 6 SNPs from any other sequenced isolate available in the public database (eFigure 1). These findings indicate low viral genomic diversity, although cases with available sequences were from

10 different cabins, 2 were community-associated, and 20 camp-associated (eTable 1), with symptom onset dates between June 19–30 (n = 17).

### Attack Rates

The overall AR was 56% (351/627) among all attendees; AR was 62% (351/562) excluding the 65 attendees with unknown case status. Across age groups, ARs ranged from 44% (4/9) among attendees aged 22–59 years to 62% (123/197) among those aged 11–14 years (Table 1). AR increased with increasing days spent at camp, up to 75% among attendees who spent 7 days at camp. Staff members had the highest attack rate (73%). Median cabin attack rate was 50% (interquartile range (IQR) = 35–59%) during orientation, and 67% (IQR = 54–72%) during the camp session; 94% (29/31) of cabins had 1 case (Figure 2 and eVideo 1).

### Reproduction Numbers

The mean effective case reproduction number ranged from 3.2 to 4.0 for cases with illness onset during orientation (June 17–20) and 0.1 to 3.5 for those during the camp session (June 21–28) (Figure 3a). For community-associated cases, the mean effective reproduction number was 2.0, and for camp-associated cases, it ranged from 0.8 among trainees to 1.3 among staff members. The instantaneous reproduction number was highest (10.1) on June 21 (Figure 3b), indicating a high probability of transmission from infectious cases at the beginning of the camp session when campers arrived.

### Exposures and Activities Before, During, and After Camp

We interviewed 450 (70%) attendees to ascertain exposures and activities before, during, and after camp (eTable 2). Time spent at camp varied by attendee type as follows: 99% of trainees stayed 4 days onsite, 96% of staff stayed 7 days, and 81% of campers stayed 5–6 days at camp (Table 2). At the beginning of orientation, there were 5 community-associated cases in 5 separate cabins; 2 were symptomatic. At the beginning of the camp session, there were 10 cases across 7 cabins: 5 symptomatic community-associated cases, 3 asymptomatic community-associated cases, and 2 symptomatic camp-associated cases in staff members who stayed for the camp session. A total of 31 (23%) trainees, 23 (18%) staff members, and 100 (28%) campers stayed in a cabin with 1 case on the day they arrived at camp (Figure 2 and eVideo 1). The proportion of attendees who reported direct contact, such as hugging or kissing, or close contact, such as playing indoor sports or traveling in vehicles, with people outside their cabins was 88%. Approximately 15% of trainees and staff members reported always wearing a mask during camp, compared to 5% of campers. While singing and cheering were not individually assessed in interviews, a senior staff member described daily vigorous singing and cheering during the camp session. Community activities that could increase the risk for a SARS-CoV-2 exposure before camp, such as eating indoors at restaurants or attending gatherings with non-household members, were commonly reported (58% among staff members and 54% among campers), and 3 attendees reported a known exposure to a person who tested positive for SARS-CoV-2 before camp. While potential community exposures after camp were less commonly reported (2%), the proportion reporting known exposures, including exposures to other attendees who became sick with COVID-19, increased after camp (12% among staff and 6% among campers).

## Multivariable Model

Among the 404 attendees aged 6–21 years with non-missing values for covariates of interest, staff members were 4.5 times as likely to become a camp-associated case compared to trainees (95% CI = 2.7–7.5), adjusting for age group, length of stay, staying in a cabin with a case when arriving at camp, and contact with people outside their cabin (eTable 3). Campers were 3.8 times as likely to become a camp-associated case compared to trainees (95% CI = 2.6–5.5), adjusting for the same covariates.

## Discussion

This investigation demonstrates rapid, widespread SARS-CoV-2 transmission in a congregate setting with children, adolescents, and young adults. Relatively few community-associated cases were identified, but attack rates were as high as 73% among staff members in this sleep-away camp. In this cohort, which included >600 persons 6–21 years, a majority of whom were tested following a well-defined period of exposure, most cases were characterized by mild or asymptomatic illness, similar to previous, smaller studies characterizing SARS-CoV-2 infection among younger populations.<sup>8,20,21</sup> Nearly half of symptomatic camp-associated cases reported symptoms that started after leaving camp, suggesting transmission from presymptomatic individuals contributed to this outbreak.<sup>22</sup> Assuming cases with available sequences were representative of all cases, WGS results support the findings that few introductions resulted in widespread transmission.

In this outbreak, estimates of case reproduction number varied day to day and were as high as 4.0, demonstrating efficient transmission among children, adolescents, and young adults. The instantaneous case reproduction number peaked at 10.1 on June 21 (the first day of camp with an influx of susceptible individuals), indicating that the contact rate and intensity on that day, if sustained, would have resulted in 10 secondary cases per case among attendees. In the multivariable analysis, we found a higher risk of SARS-CoV-2 infection among staff and campers compared to trainees. During the camp session, when cabin occupancy increased, there were also more cases, either asymptomatic or presymptomatic, among attendees. Daily singing and cheering, which has contributed to previous outbreaks,<sup>23</sup> might have increased transmission within cabin cohorts. Most attendees reported having direct or close contact with others outside their cabin, and only 9% reported wearing masks at all times, which likely led to increased transmission between different cabin cohorts. These findings underscore the importance of implementing layered mitigation strategies in settings where younger populations congregate.<sup>24,25</sup>

This investigation is subject to at least four limitations. First, the interviews were performed between 2–9 weeks after attendees' last day at camp, subjecting responses to recall bias. Second, misclassification of case status and community- vs. camp-associated cases was possible because not all attendees were tested, and among those tested, there could be false-positive or false-negative results; a 56% attack rate among all attendees is likely an underestimate. Third, the effect of mask use could not be assessed; few campers reported wearing masks which were not required. Finally, the types of activities and intensity of contact among and within groups, mainly due to the sleeping arrangements in the camp setting, cannot be extrapolated to all settings that include children, adolescents, and young

adults, although some similarities exist (e.g., high school students may participate in large-group indoor school activities, college students may interact with the surrounding community, including as counselors for young children in after-school programs).

Other youth-centric settings have also used pre-arrival testing to reduce transmission.<sup>26</sup> In this outbreak, we found that testing within 12 days of arrival, without a mandatory 14-day quarantine was insufficient to prevent infected attendees from arriving at camp and infecting others. Most attendees were residents of the metro Atlanta area, which had a high incidence of COVID-19 in June 2020.<sup>27</sup> Many attendees reported engaging in community activities before arriving at camp that could have increased their risk of exposure. These findings underscore the challenges of preventing outbreaks in areas with substantial community transmission.

## Conclusion

Despite mitigation measures, including pre-arrival testing, relatively few introductions of SARS-CoV-2 into this congregate setting resulted in a large outbreak affecting >50% of attendees. Testing should not be used as the sole mitigation measure;<sup>28</sup> instead, it should be used as one component of a layered mitigation approach combined with adherence to pre-arrival quarantine, routine symptom monitoring with appropriate isolation and quarantine, cohorting, social distancing, mask wearing, enhanced disinfection, and proper hand hygiene.<sup>25</sup> Furthermore, it is important to emphasize appropriate isolation education and compliance for persons who test positive even in the absence of symptoms,<sup>29</sup> particularly among younger adults who have been reported to have lower engagement in social mitigation behaviors.<sup>30,31</sup> Targeted communication strategies about behavioral expectations for younger populations may be necessary to emphasize mitigation measures that should be adopted to avoid contracting and spreading COVID-19 to others in youth congregate settings.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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**Disclaimer:**

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the U.S. Centers for Disease Control and Prevention.

**Abbreviations:**

<b>COVID-19</b>	Coronavirus Disease 2019
<b>SENDSS</b>	State Electronic Notifiable Disease Surveillance System
<b>CSTE</b>	Council of State and Territorial Epidemiologists
<b>CDC</b>	U.S. Centers for Disease Control and Prevention
<b>WGS</b>	whole genome sequencing
<b>AR</b>	attack rates
<b>RRs</b>	unadjusted risk ratios
<b>aRRs</b>	adjusted risk ratios
<b>CI</b>	confidence intervals
<b>SNPs</b>	single nucleotide polymorphisms

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**What's Known on This Subject**

COVID-19 outbreaks in adult congregate settings have fueled much of the pandemic, however the transmission dynamics of outbreaks in youth congregate settings are less understood.

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**What This Study Adds**

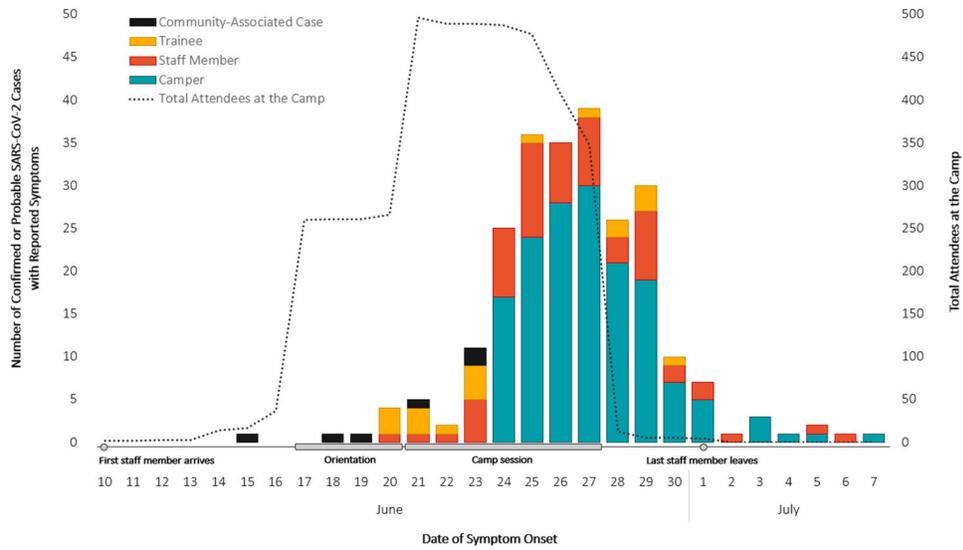
Few introductions of SARS-CoV-2 into a youth congregate setting, with substantial mixing of cohorts, combined with presymptomatic and asymptomatic transmission, resulted in a large outbreak with a 56% attack rate.

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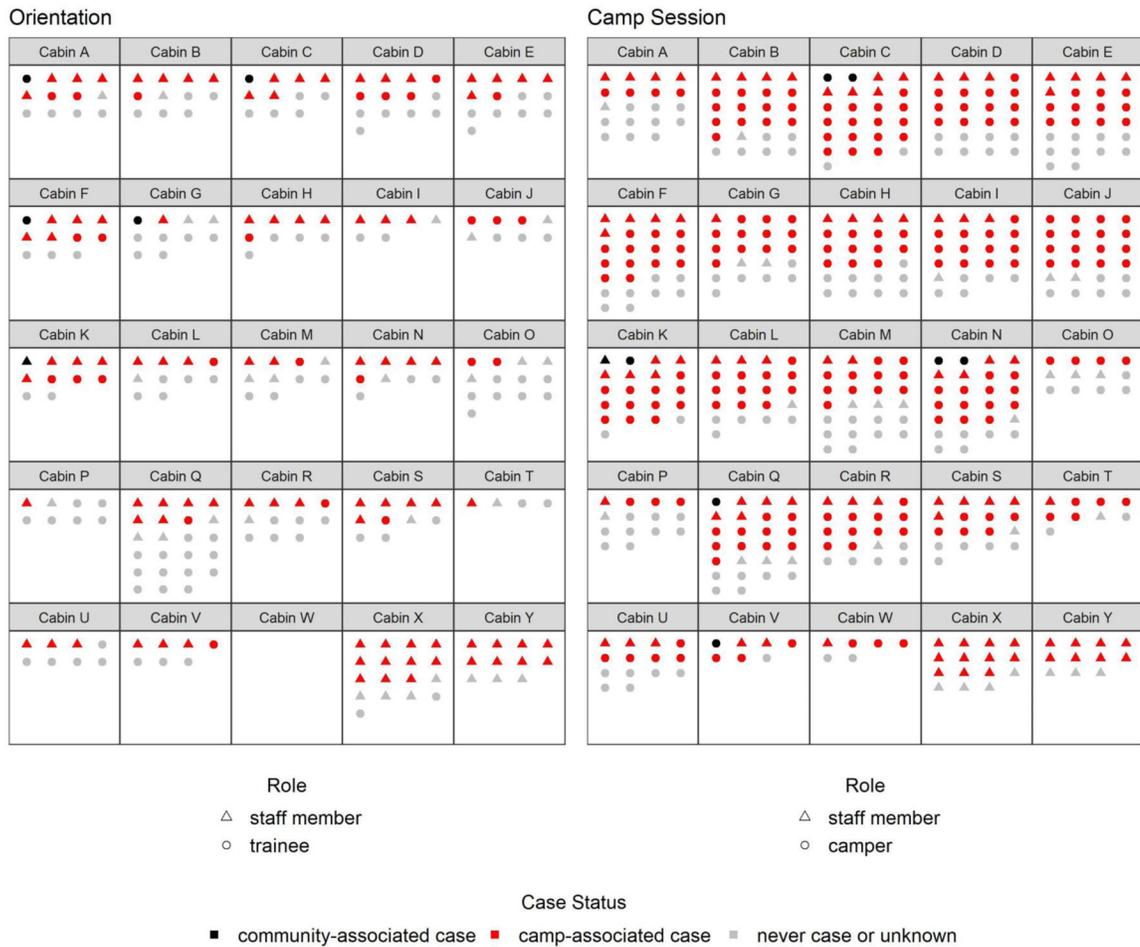
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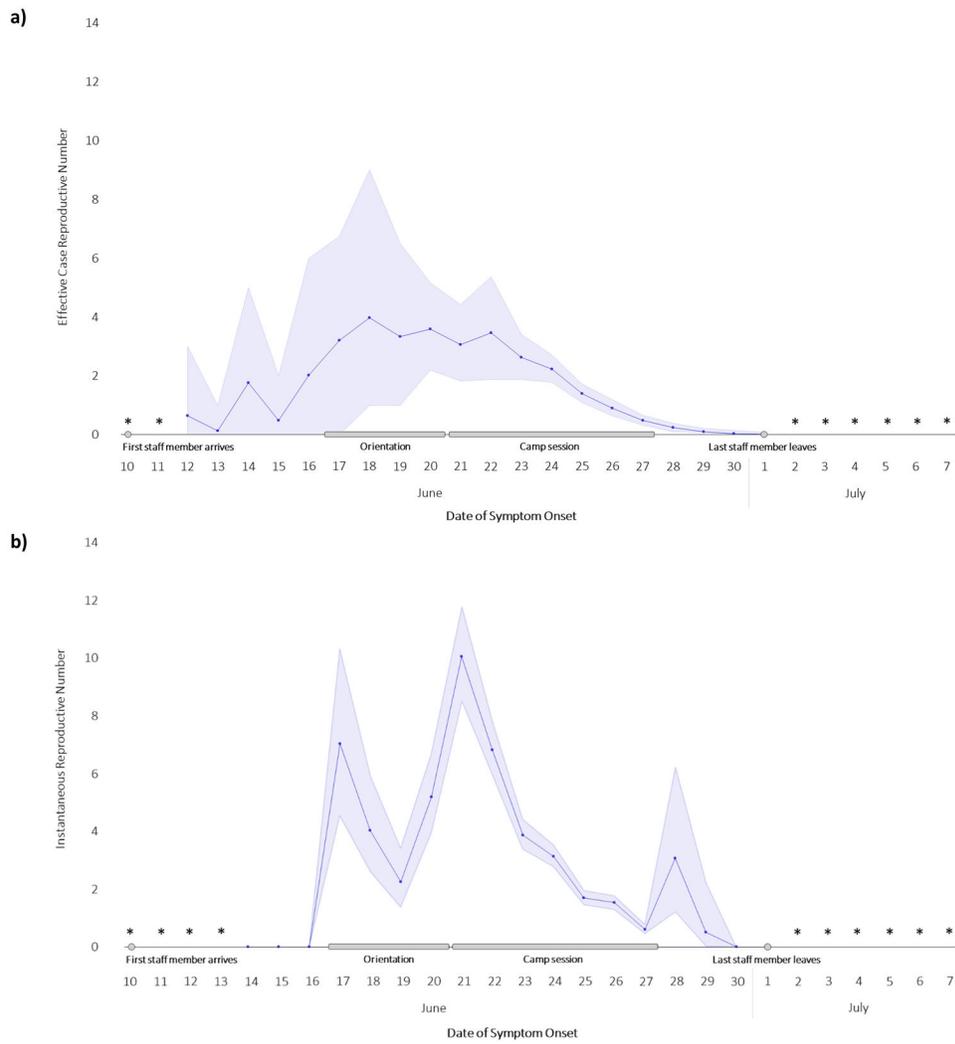
**Figure 1.** Epidemic Curve of Symptomatic Cases (n=242<sup>a</sup>) by Attendee Type, Number of Attendees at the Camp Over Time<sup>b</sup>, and Key Events

<sup>a</sup>One additional community-associated case was missing a symptom onset date and was excluded.

<sup>b</sup>Some trainees and staff (n=37) arrived at camp prior to orientation during June 10–16. Three staff arrived at camp on June 21 and did not attend orientation, and five campers and staff left during June 29–July 1.



**Figure 2.** Attack Rates<sup>a</sup> by Cabin<sup>b</sup> During Orientation and Camp Session  
<sup>a</sup>The final case status is shown for each attendee. Staff members attended both orientation and the camp session, and their final case status is shown in both periods.  
<sup>b</sup>Six cabins with three persons or less were not shown in this figure. Two of these cabins did not house any cases.



**Figure 3.** Case and Instantaneous Reproductive Numbers During Orientation and Camp Session  
 \*Effective or instantaneous reproductive number could not be estimated for these dates.

**Table 1.**

## Characteristics of Camp Attendees Overall and by Case Status

	Overall, No. (col %)	Known Case Status <sup>a</sup> , No. (row %) <sup>b</sup>	
	(n = 627)	Case (n = 351)	Not a case (n=211)
Age group (years)			
6–10	96 (15)	54 (56)	30 (31)
11–14	197 (31)	123 (62)	60 (30)
15–17	250 (40)	127 (51)	95 (38)
18–21	75 (12)	43 (57)	23 (31)
22–59	9 (1)	4 (44)	3 (33)
Sex			
Male	276 (44)	164 (59)	81 (29)
Female	351 (56)	187 (53)	130 (37)
Race <sup>c</sup>			
White	465 (94)	292 (63)	173 (37)
Black	0	0	0
Other or Multiracial	31 (6)	27 (87)	4 (13)
Ethnicity <sup>d</sup>			
Hispanic or Latino	20 (5)	13 (65)	7 (35)
Not Hispanic or Latino	430 (96)	266 (62)	164 (38)
Residence			
Metro Atlanta <sup>e</sup>	482 (77)	274 (57)	163 (34)
Non-Metro Atlanta, Georgia	118 (19)	64 (54)	39 (33)
Out-of-state	27 (4)	13 (48)	9 (33)
Attendee Type			
Trainee	137 (22)	30 (22)	83 (61)
Staff member <sup>f</sup>	127 (20)	93 (73)	23 (18)
Camper	363 (58)	228 (63)	105 (29)
Length of stay (days)			
4	201 (32)	73 (36)	104 (52)
5–6	299 (48)	183 (61)	85 (28)
7	127 (20)	95 (75)	22 (17)

<sup>a</sup>An additional 65 attendees with an unknown case status are not shown.

<sup>b</sup>Row percent was calculated using the overall number in each category as the denominator.

<sup>c</sup>An additional 131 attendees with unknown race are not shown.

<sup>d</sup>An additional 177 attendees with unknown ethnicity are not shown.

<sup>e</sup>Metro-Atlanta defined as Fulton, DeKalb, Cobb, Douglas, Gwinnett, Clayton, Paulding, and Cherokee counties

<sup>f</sup>Three staff members did not attend orientation.

**Table 2.**

## Characteristics, Exposures, and Behaviors Overall and by Camp Attendee Type

	Overall <sup>a</sup> , No. (col %)	Camp Attendee Type, No. (col %)		
	(n = 627)	Trainee (n = 137)	Staff Member (n = 127)	Camper (n = 363)
Age group (years)				
6–10	96 (15)	0	0	96 (26)
11–14	197 (31)	1 (1)	1 (1)	195 (54)
15–17	250 (40)	115 (84)	63 (50)	72 (20)
18–21	75 (12)	21 (15)	54 (43)	0
22–59	9 (1)	0	9 (7)	0
Sex				
Male	276 (44)	54 (39)	52 (41)	170 (47)
Female	351 (56)	83 (61)	75 (59)	193 (53)
Length of stay (days)				
4	201 (32)	135 (99)	1 (1)	65 (18)
5–6	299 (48)	2 (1)	4 (3)	293 (81)
7	127 (20)	0	122 (96)	5 (1)
Stayed in cabin with a case upon arrival <sup>b</sup>				
Yes	154 (25)	31 (23)	23 (18)	100 (28)
No	473 (75)	106 (77)	104 (82)	263 (72)
Contact with people outside cabin <sup>c</sup>				
None	37 (9)	8 (9)	3 (4)	26 (10)
Outdoor sports only	14 (3)	2 (2)	2 (3)	10 (4)
Close contact <sup>d</sup>	155 (38)	22 (25)	24 (32)	109 (44)
Direct contact <sup>e</sup>	204 (50)	55 (63)	45 (61)	104 (42)
Mask use frequency <sup>f</sup>				
Never	133 (32)	0	1 (1)	132 (53)
Sometimes	243 (59)	75 (85)	65 (86)	103 (42)
Always	36 (9)	13 (15)	10 (13)	13 (5)
Exposures before attending camp <sup>g</sup>				
None	195 (44)	40 (43)	33 (41)	122 (45)
Community exposure <sup>h</sup>	247 (56)	53 (57)	47 (58)	147 (54)
Known exposure <sup>i</sup>	3 (1)	0	1 (1)	2 (1)
Exposures after attending camp <sup>g</sup>				
None	404 (91)	80 (86)	71 (88)	253 (93)
Community exposure <sup>h</sup>	7 (2)	5 (5)	0	2 (1)
Known exposure <sup>i</sup>	34 (8)	8 (9)	10 (12)	16 (6)

<sup>a</sup> Among attendees aged 6–21 years who provided exposure and behavior information during attendance at camp in interviews.

<sup>b</sup> Defined as staying in a cabin with a community-associated case or a symptomatic camp-associated case on the day of arrival to camp.

<sup>c</sup> An additional 217 attendees with unknown contact status with people not staying in the same cabin are not shown.

<sup>d</sup> Defined as playing indoor sports or activities, traveling in vehicles, spending more than 15 minutes within 6 feet, having face-to-face contact within two feet, or spending any time within 6 feet while the other person was coughing or sneezing.

<sup>e</sup> Defined as hugging or kissing the other person.

<sup>f</sup> An additional 5 attendees with unknown mask use are not shown.

<sup>g</sup> An additional 182 attendees with unknown exposure status before and after camp are not shown.

<sup>h</sup> Defined as visiting, working, or volunteering in a healthcare setting, eating indoors at a restaurant, attending a gathering of any size with non-household members, using public transportation, or attending or working at a school or daycare.

<sup>i</sup> Defined as close contact (within 6 feet for 15 minutes) with a person who tested positive for SARS-CoV-2, including other camp attendees

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