

1 **COVID-19 burden among unaccompanied minors in United States custody**

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15 **Running title:**

16 COVID-19 burden among unaccompanied minors

1 **Abstract**

2 *Background*

3 Prior to the COVID-19 pandemic, crowded and unsanitary living conditions lacking medical expertise  
4 made U.S. detention centers hotbeds for infectious disease outbreaks. There have been 30,000 COVID-19  
5 cases, positivity rates exceeding 50%, and nine deaths in Immigration and Customs Enforcement (ICE)  
6 custody, but the extent of disease among children under the care of the Office of Refugee Resettlement  
7 (ORR) has not been well-documented. We sought to evaluate the burden of COVID-19 among  
8 unaccompanied minors under the ORR's responsibility.

9 *Methods*

10 We analyzed SARS-CoV-2 testing results of refugees and asylum seekers in facilities associated with the  
11 ORR from 02/01/2020 to 11/18/2020, courtesy of a Freedom of Information Act request.

12 *Results*

13 ORR facilities performed 7,132 SARS-CoV-2 tests from 3/13/2020 to 11/18/2020. Overall, the SARS-  
14 CoV-2 positivity rate was 13.4%. Factors associated with higher positivity rates were age group (16 to 17  
15 years old); identifying as male; undergoing testing in April, August, or September; staying in a for-profit  
16 versus a non-profit facility, and detention in certain facilities. The mean detention time with a positive test  
17 was  $14.8 \pm 3.2$  days. Greater than 10 percent of positive tests were in long-term detainees.

18 *Conclusions*

19 The high SARS-CoV-2 test positivity rate raises concerns about an inability to limit the spread of SARS-  
20 CoV-2 within detention facilities housing unaccompanied migrant children, particularly those run by for-  
21 profit companies. Mandated measures for social distancing and vaccination among detainees and  
22 detention facility employees are needed to limit the spread of the virus.

23

24 **Key words**

25 COVID-19, immigrant health, health inequities

1 **Background**

2 Prior to the onset of the COVID-19 pandemic, United States (U.S.) detention centers housing  
3 refugees and asylum seekers were hotbeds for infectious disease outbreaks.[1] Crowded living conditions,  
4 inadequate sanitation, limited capacity for isolation, and lack of medical expertise led to outbreaks of  
5 influenza, varicella, and mumps and the deaths of detainees, including several children.[2,3]

6 With the arrival of the COVID-19 pandemic, the U.S. government failed to follow the Centers for  
7 Disease Control and Prevention (CDC) infection prevention and evaluation guidelines, including not  
8 providing adequate social distancing in detainment centers or appropriate cohorting of suspected cases at  
9 the start of the COVID-19 pandemic.[4–6] Detainees were not consistently provided with access to  
10 COVID-19 testing or standard infection control supplies such as hand soap, sanitizer, or masks.[7] This  
11 lack of proper care for adult migrant detainees led to over 30,000 COVID-19 cases, positivity rates  
12 exceeding 50%, and nine deaths among detainees in Immigration and Customs Enforcement (ICE)  
13 custody.[8–11]

14 Thousands of unaccompanied minors have remained in U.S. custody during the pandemic, first  
15 under the auspices of ICE, where detainees spend up to 72 hours, and then the Office of Refugee  
16 Resettlement (ORR), in facilities run by either non-profit tax-status organizations or for-profit companies.  
17 The extent of the spread of COVID-19 in this population has not been well-documented, although the  
18 spread of COVID-19 among undocumented minors in one Chicago facility received some media  
19 attention.[12] The CDC has stated that the “processes in place...at ORR’s regular facilities afford  
20 sufficient resources and time to identify SARS-CoV-2 cases and implement environmental controls to  
21 attenuate the risk of COVID-19 infection and spread.”[13] We sought to evaluate the burden of COVID-  
22 19 among unaccompanied minors under ORR responsibility, identifying hotspot facilities with an  
23 exceptionally high disease burden or within-facility spread of COVID-19.

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1 **Methods**

2 We submitted a Freedom of Information Act (FOIA) request for all SARS-CoV-2 testing results  
3 from 02/01/2020 to 11/18/2020 of refugees and asylum seekers, including unaccompanied minors, in  
4 facilities with migrants placed by the ORR (including both non-profit and for-profit facilities) and also of  
5 staff of these detainment facilities. Data requested included age, sex, country of origin, the name of the  
6 holding facility, how many days into detainment did the individual test positive, and the test date.  
7 Additional data also requested included whether a provider evaluated detainees for possible COVID-19.  
8 The original request may be found in the supplementary materials. We received data from 94 out of the  
9 210 existing ORR facilities.[13,14] We used chi-squared testing for bivariate analysis of factors  
10 associated with higher SARS-CoV-2 test positivity rates, late rates, and rates of positive SARS-CoV-2  
11 results from children who tested positive despite having been detained since at least the start of COVID-  
12 19. Two-sample independent t-tests were used to compare the overall and monthly test positivity rates  
13 among for-profit detention centers and non-profit detention centers. Logistic regression testing was used  
14 to calculate adjusted odds ratios (aOR) to determine the strength of the association of bivariate analysis.  
15 We conducted all data analysis and created figures with Microsoft Excel, GraphPad Prism 8.0,  
16 CoreIDRAW 2020, and R version 4.0.2.

17 The COVID-19 test positivity rate was defined as the number of positive test results divided by  
18 the sum of positive and negative results, omitting indeterminate results, rejected specimens, pending  
19 results, or if no result was available. A positive SARS-CoV-2 result was described as occurring “early”  
20 during admission if it was positive within the first 6 days of admission to a facility, while a positive test  
21 result was “late” if it occurred on or after day 7 of admission to a facility. The “late rate” for a facility was  
22 defined as the number of “late” positive tests divided by the sum of “early” and “late” positive tests.

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## 1 **Results**

### 2 *Testing Demographics*

3           There were 7,132 SARS-CoV-2 test results performed at ORR facilities from 3/13/2020 to  
4 11/18/2020. Most children tested were teenage males and were from Central America and the Caribbean  
5 (89.8%). Minors from three countries - Guatemala, Honduras, and El Salvador - represented over 85% of  
6 SARS-CoV-2 tests (Table 1). Children who underwent SARS-CoV-2 testing were detained in 94 facilities  
7 across 16 different states. Over 90% of SARS-CoV-2 tests were performed on individuals in Texas  
8 (70.2%) or Arizona (21.1%) facilities (Supplementary Table 1). Most facilities were run by non-profit  
9 organizations (87.1%), with the remainder run by for-profit companies (Supplementary Table 1).

10

### 11 *ICD-10 coding rationale for SARS-CoV-2 testing*

12           ICD-10 coding was available for a subset of COVID-19 testing, providing insight into the  
13 underlying reason for a fraction of the tests (N=4,142 tests). The majority of COVID-19 tests were due to  
14 potential (3.9%; 161/4,142 tests) or definite (61.0%; 2,526/4,142 tests) exposure to a child with COVID-  
15 19. Additional COVID-19 testing was prompted by symptoms such as cough (9.9%; 410/4,142 tests),  
16 fever (2.8%; 117/4,142 tests), shortness of breath (8.0%; 33/4,142 tests), or bronchitis (0.2%; 7/4,142  
17 tests). For the 317 COVID-19-positive tests with accompanying ICD-10 coding, 2.5% (8/317) had  
18 bronchitis or another respiratory disorder.

19

### 20 *Characteristics of minors with a positive SARS-CoV-2 test*

21           Symptom information was only available for children with a positive SARS-CoV-2 test (N=893  
22 children). Among these children, 27.3% had symptoms, whereas 72.7% were asymptomatic. Similarly,  
23 the duration of detention at a facility on the date of testing was only documented for children with a  
24 positive test result (96.1%, N=902/936 tests; Table 2). The mean time of detention with a positive test  
25 was  $14.8 \pm 3.2$  days, with most positive tests (62.0%) within the first six days of detention to a program

1 (Figure 1A). Most tests were performed in the last three months for which data was available (Figure 1B;  
2 23.1% September 2020, 11.7% October 2020, 11.3% November 2020).

3

#### 4 *SARS-CoV-2 positivity rates*

5 Overall, there was a SARS-CoV-2 positivity rate of 13.4% (N=7,132: 6,092 negative; 939  
6 positive; 51 pending; 28 specimen rejected; 21 indeterminate; 1 no result). Detention facilities associated  
7 with higher positivity rates were located across the United States but with the highest density in Texas  
8 (Figure 2 and Supplementary Table 1). Facilities with notably high COVID-19 positivity rates included  
9 Seton Home in San Antonio, TX (57.1%); CC Houston in Houston, TX (46.2%); Heartland International  
10 Children's RC in Chicago, IL (42.2%); Nueva Esperanza Neighborhood Ministries in Phoenix, AZ  
11 (35.3%); Children's Home of Kingston in Kingston, NY (33.3%); Children's Village in Dobbs Ferry, NY  
12 (33.3%); BCFS El Paso in El Paso, TX (27.0%); Rite of Passage LTFC in Queen Creek, AZ (25.3%);  
13 BCFS Harlingen in Harlingen, TX (20.8%); and CHSI Casa Norma Linda in Los Fresnos, TX (20.7%).  
14 Factors associated with higher positivity rates included age group (16 to 17 years old); identifying as  
15 male; undergoing testing in April, August, or September; and staying in a facility in Illinois  
16 (Supplementary Table 2). The overall positivity rate was higher at for-profit versus non-profit facilities ( $P$   
17  $< 0.001$ ; Figure 3A). On a monthly basis, this difference was only statistically significant in July ( $P$   
18  $< 0.01$ ), October ( $P = 0.05$ ), and November 2020 ( $P < 0.001$ ; Figure 3B).

19

#### 20 *Positive tests in children under prolonged detention*

21 More than a quarter of positive tests occurred "late," *i.e.*, seven days or later from the start of  
22 detention (26.1%, N=235/902). The only program with a significantly higher late rate was Heartland  
23 International Children's RC in Chicago, IL (97.7%,  $P < 0.001$ ; Supplementary Figure 1A). Tax status was  
24 not associated with a higher late rate.

25 More than 10 percent (10.9%, N=89/813) of positive tests were from individuals who had been  
26 residing within a facility before the start of testing for SARS-CoV-2 at ORR facilities (March 13, 2020).

1 Facilities associated with a higher percentage of such positive SARS-CoV-2 results included Heartland  
2 International Children's RC in Chicago, IL (66.6%,  $P < 0.001$ ), Rite of Passage LTFC in Queen Creek,  
3 AZ (66.6%,  $P < 0.001$ ), and CC Houston in Houston, TX (66.6%,  $P < 0.001$ , Supplementary Figure 1B).

## 5 **Discussion**

6 This is the first analysis of SARS-CoV-2 testing results of refugees and asylum seekers who were  
7 unaccompanied minors under the responsibility of the Office of Refugee Resettlement in the COVID-19  
8 pandemic. We identified a high overall test positivity rate and a failure to contain the spread of SARS-  
9 CoV-2, leading to infections in long-term detainees throughout the study period. Facilities designated as  
10 for-profit programs had higher positivity rates than non-profit institutions.

11 Unaccompanied minors under the care of the ORR were at high risk of acquiring COVID-19, as  
12 evidenced by a 13.4% test positivity rate and 26.1% late rate. The World Health Organization has  
13 recommended that governments use a positivity rate below 5% as a marker of adequate COVID-19  
14 control measures.[15] A recent study found that ICE detention facilities had higher COVID-19 case rates  
15 than the US population or their surrounding communities early in the pandemic.[16] We identified several  
16 factors associated with higher positivity rates, including age, sex, and time of year. The highest monthly  
17 positivity rate was in April (41%), likely reflecting insufficient testing as the pandemic initially surged  
18 across the country and a failure to contain the virus in detention centers. Alarming, monthly positivity  
19 rates continued well above the five percent threshold in the second half of 2020. Such sustained high  
20 positivity rates likely indicate high COVID-19 case rates and insufficient testing and infection control at  
21 these facilities.

22 These findings raise concern for COVID-19 spread within facilities under the federal  
23 government's responsibility. Most infections (74%) occurred early in admission (within seven days of  
24 arrival to ORR facilities). Given the mean incubation period of 5 days for COVID-19,[17] these cases  
25 were likely the result of virus acquisition prior to admission to migrant centers, potentially before being  
26 taken into custody. However, before transfer to ORR facilities, unaccompanied minors are typically

1 detained for up to 72 hours in ICE facilities, which have had significant spread of COVID-19.[13,16,18]  
2 Unaccompanied minors are not supposed to spend more than 72 hours in ICE facilities, but this is not  
3 always the case. In fact, there have been several notable deaths of children in extended ICE custody.[3]  
4 Given the incubation period of SARS-CoV-2, unaccompanied minors testing positive for COVID-19  
5 within the first seven days of ORR detention could have contracted COVID-19 at the ICE facility where  
6 they were previously held. In addition, importantly, we also identified a significant proportion of positive  
7 tests (10.9%) in long-term residents of detention centers, indicating an inability to limit the spread of  
8 SARS-CoV-2 and protect vulnerable children within ORR facilities.

9 Infection control practices at ORR detention facilities must be reviewed and harmonized across  
10 different facilities, given the wide disparities in facility positivity rates. Our results raise serious concerns  
11 about the ability to adequately protect the health of unaccompanied minors at ORR facilities. We found  
12 that test positivity rates differed widely among programs, with nine programs having test positivity rates  
13 ranging from 21% to 57%. One of these facilities, Heartland International Children's RC in Chicago, IL,  
14 has previously received attention due to an outbreak of COVID-19 cases among both children and  
15 staff.[12] For-profit programs had higher COVID-19 positivity rates than non-profit institutions,  
16 particularly in the months of October and November 2020, when the COVID-19 burden was at its highest  
17 during the study period. This suggests that infection control practices at for-profit facilities deserve  
18 additional scrutiny and that mechanisms guaranteeing uniform infection control practices across ORR  
19 facilities are not in place. Additional oversight by the ORR or independent agencies at for-profit facilities  
20 may be necessary to ensure the health and safety of detained minors. Timely, periodic publicly reported  
21 data on COVID-19 infection rates and compliance with mitigation strategies across all ORR facilities  
22 could be particularly helpful to support uniformity of infection control practices.

23 There have been several reports of COVID-19 infections among staff members at detention  
24 centers for unaccompanied children and ICE facilities, raising concern that some unaccompanied minors  
25 may have been infected by ORR staff.[12,19] Unfortunately, the ORR did not provide data on COVID-19  
26 testing and cases among staff members of ORR facilities. A recent study found that detention workers



1 may be at increased risk of COVID-19 than the general population due to their occupational  
2 exposure.[20] The ORR should provide explicit, publicly available guidelines to protect ORR facility  
3 staff from COVID-19, including provision for personal protective equipment and social distancing.

4 The CDC has reported that as of July 2021, there were over eight thousand COVID-19 cases  
5 among unaccompanied minors in ORR facilities, suggesting that potentially more than seven thousand  
6 additional cases occurred from the end of our data collection in November 2020 through July 2021, an  
7 increase in case count of more than eightfold.[13] This indicates that COVID-19 remains a significant  
8 challenge in ORR facilities. Our findings suggest that this high case burden is not surprising, as test  
9 positivity rates differed dramatically across ORR facilities, likely reflecting differences in test availability  
10 and infection control practices.[21,22] The federal government is responsible for the health of  
11 unaccompanied minors within detention centers. The ORR must be more proactive in mandating adequate  
12 infection control practices, guaranteeing social distancing in its facilities, and vaccinating eligible children  
13 and staff members.[11,19,23] Crowded detention conditions are associated with increased rates of  
14 COVID-19.[24] Steps must be taken to more rapidly place unaccompanied minors outside of ORR  
15 facilities, given the significant risk of contracting COVID-19 within these facilities.[25] Importantly, the  
16 CDC should reconsider its position that ORR facilities effectively contain the spread of COVID-19.[26]

17 Our study had several limitations. First, the ORR provided data but did not provide all of the  
18 requested information. Given the nature of the dataset, it is impossible to identify whether a positive test  
19 result represents the first or subsequent time that an individual tested positive for SARS-CoV-2.

20 Additionally, we could not analyze the amount of asymptomatic versus symptomatic COVID-19 cases  
21 due to limited symptom information (only a subset of cases had ICD-10 codes) and an inability to match  
22 ICD-10 codes with test results provided in separate, deidentified data sets. Finally, the number of days  
23 between admission to a facility and testing was only reported for positive tests and not provided for  
24 negative tests, which may skew results.

25 Future work should include an analysis of testing results since November 2020, including the  
26 over seven thousand cases in ORR facilities since the end of our study analysis period. Now that children

1 over five years of age qualify for vaccination, future studies should also evaluate the uptake of vaccines  
2 among unaccompanied minors and the impact of immunization on test positivity rates.

3

#### 4 **Conclusion**

5 This is the first analysis of SARS-CoV-2 testing results among unaccompanied minors at  
6 facilities placed by the Office of Refugee Resettlement early in the COVID-19 pandemic. An overall high  
7 positivity rate raises concerns about an inability to limit the spread of SARS-CoV-2 within these  
8 facilities, particularly those run by for-profit companies. Mandated measures for social distancing and  
9 vaccination among detainees and detention facility employees may be necessary to limit the spread of the  
10 virus.

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1 **NOTES**

2 **Acknowledgments**

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4

5 **Contributions**

6 All authors contributed substantially to the writing and editing of the manuscript. We received no medical  
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12

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14 The authors declare that they have no commercial or other associations that might pose a conflict of  
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ACCEPTED MANUSCRIPT

1 **Table 1. Demographic information of ORR detainees.** Demographic information, including age, sex  
2 and region of origin of detainees in ORR facilities tested during the study period (3/13/2020 to  
3 11/18/2020).

4

<b>Age</b>	<b>N</b>	<b>%</b>
0 to 5	203	2.9
6 to 10	530	7.4
11 to 15	2201	30.9
16 to 17	4154	58.2
18 and older	43	0.6

<b>Sex</b>		
Female	2261	31.7
Male	4871	68.3

<b>Region of origin</b>		
Africa	42	0.6
Asia	77	1.1
Central America & Caribbean	6403	89.8
Europe	6	0.1
North America	197	2.8
South America	405	5.7

5



1 **Table 2. SARS-CoV-2 test characteristics.** Characteristics of SARS-CoV-2 test, including results,  
 2 presence of symptoms, duration of detention and month at the time of a positive test.

<b>Test result</b>	<b>N</b>	<b>%</b>
Indeterminate	21	0.3
Negative	6092	85.4
No result	1	0.0
Pending	51	0.7
Positive	939	13.2
Specimen rejected	28	0.4
<b>Symptoms</b>		
Asymptomatic	649	72.7
Symptomatic	244	27.3
<b>Duration of detention</b>		
Before admission	22	2.3
On date of admission	86	8.8
Days 1-6 after admission	557	57.3
Days 7-13 after admission	154	15.8
Days 14-90 after admission	95	9.8
>90 days after admission	58	6.0
<b>Month of testing</b>		
March	25	0.4
April	175	2.5
May	87	1.2
June	116	1.6
July	244	3.4
August	399	5.6
September	1650	23.1
October	2519	35.3
November	1917	26.9

3

1 **FIGURE LEGENDS**

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3 **Figure 1. Positive SARS-CoV-2 tests over time.** **A)** Bee swarm plot of the duration of time (days) from  
4 admission to the detention center before children tested positive for SARS-CoV-2 in each month. **B)** Bar  
5 graph representing the number of positive SARS-CoV-2 tests per testing day and grouped by month. The  
6 number of testing dates increased in later months.

7

8 **Figure 2. Locations and characteristics of ORR detention facilities.** Map of the United States  
9 depicting the location of ORR detention facilities and characteristics of the facilities, including SARS-  
10 CoV-2 test positivity rate (symbol color), number of SARS-CoV-2 tests performed (symbol size), and  
11 type of facility (symbol shape).

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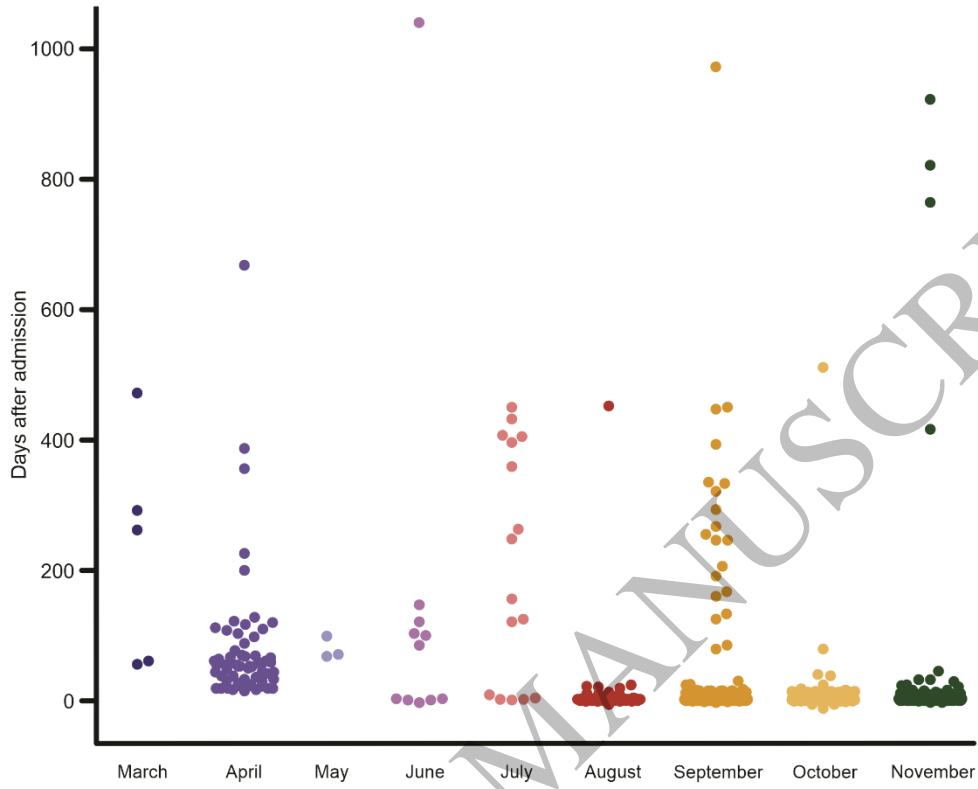
13 **Figure 3. SARS-CoV-2 test positivity rate by tax status.** **A)** Overall test positivity rate differed among  
14 for-profit detention centers compared to non-profit detention centers ( $P < 0.001$ ; two-sample independent  
15 t-test). **B)** Test positivity rate among for-profit versus non-profit detention centers by month in 2020. Of  
16 note, for-profit facilities in March did not have any positive tests. Monthly comparisons made by two-  
17 sample independent t-test. \*  $P = 0.05$ , \*\*  $P < 0.01$  and \*\*\*  $P < 0.001$ .

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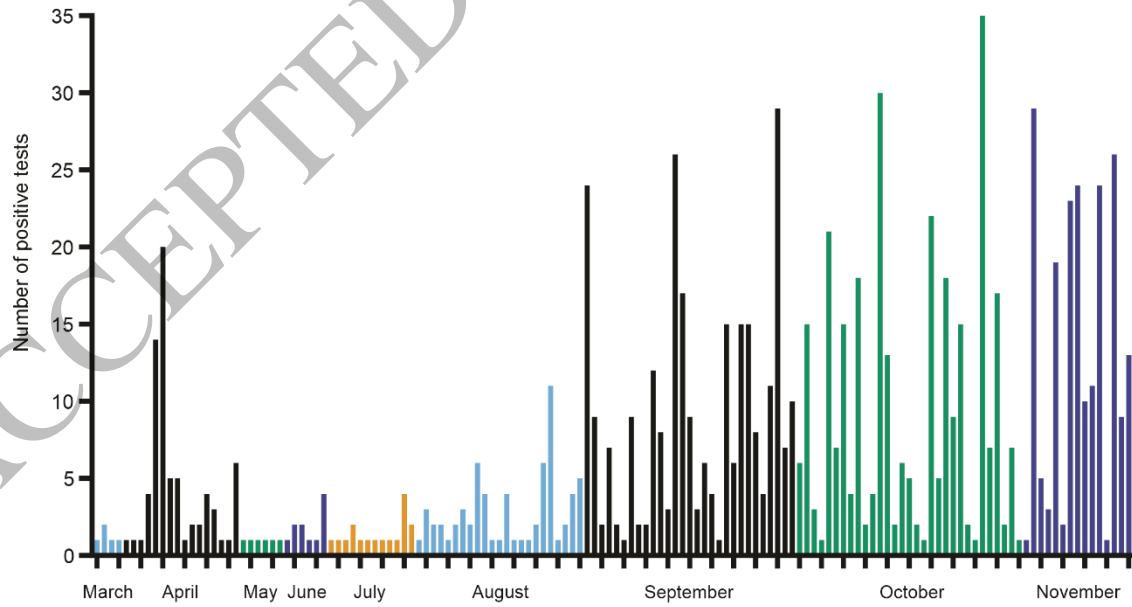
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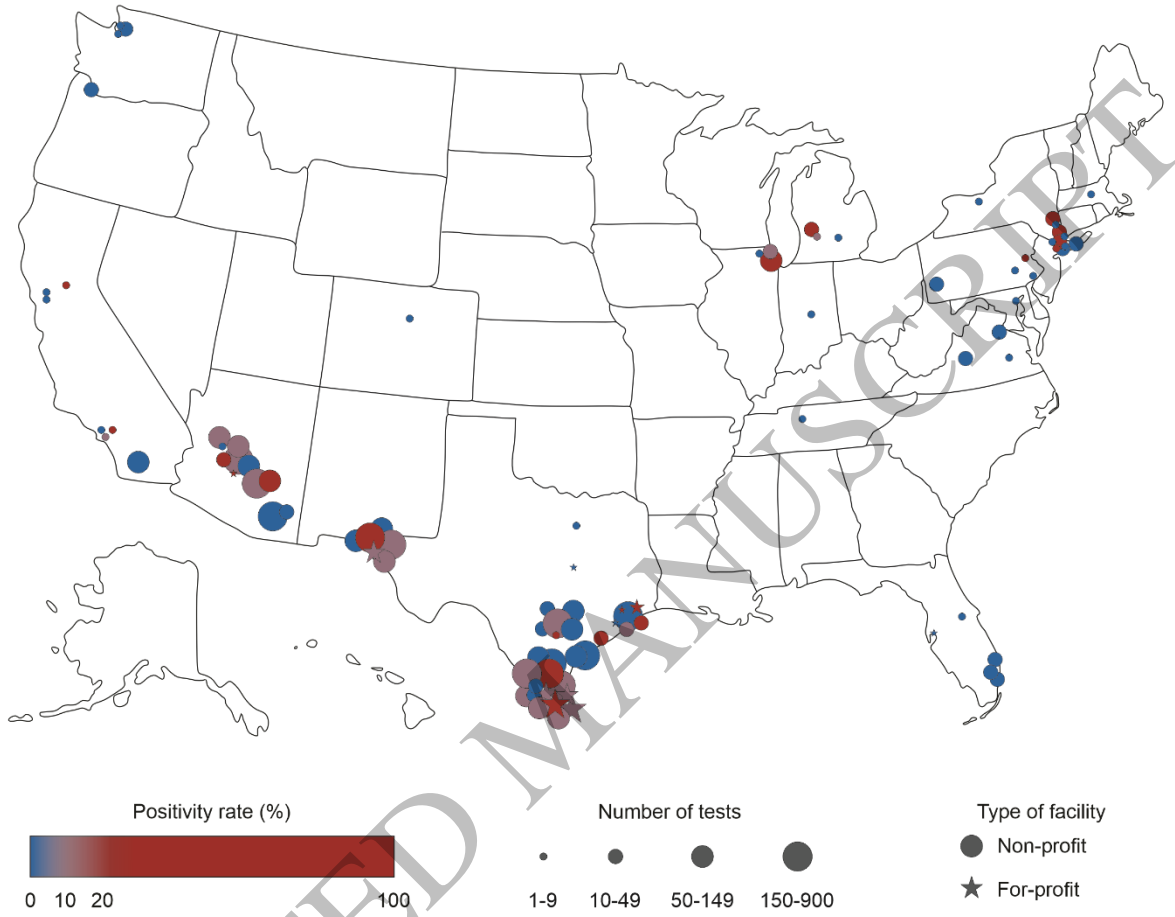
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Figure 1  
165x211 mm (3.9 x DPI)

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Figure 2  
165x134 mm (3.9 x DPI)

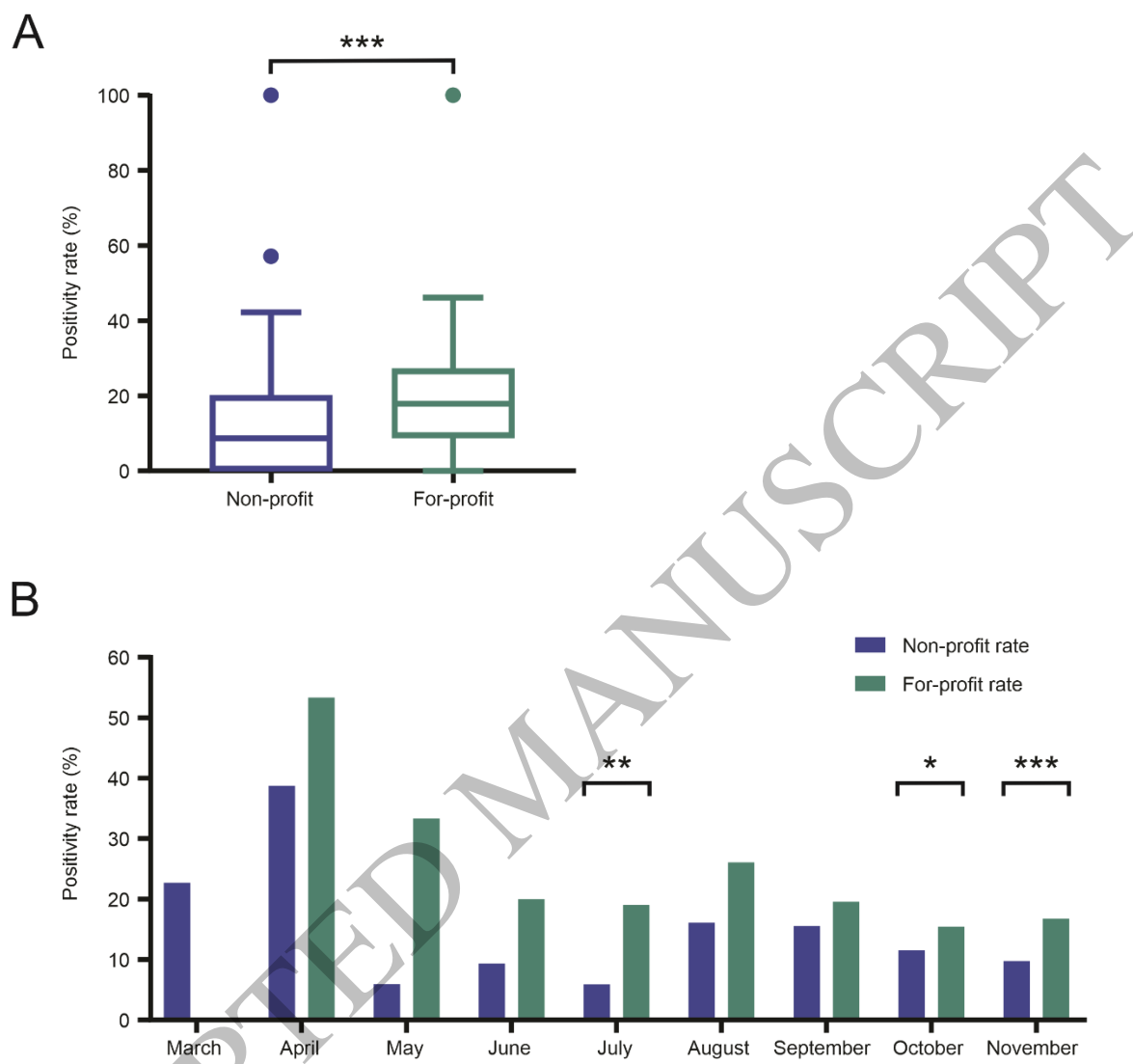


Figure 3  
165x156 mm (3.9 x DPI)

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