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Adolescent health brief

Severe Acute Respiratory Syndrome Coronavirus 2 Testing Trends Among Persons Aged <18 Years in an Outpatient Pediatric Practice — Metropolitan Atlanta, Georgia, May–December 2020

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A B S T R A C T

Purpose: The purpose of this study was to analyze trends in severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) testing and test positivity among persons aged <18 years in a three-site outpatient pediatric practice in Atlanta, Georgia, serving approximately 35,000 pediatric patients.

Methods: Using electronic medical records, weekly trends in SARS-CoV-2 tests performed and the 14-day moving average of test positivity were examined, overall and by age group, during May 24–December 5, 2020.

Results: Among 4,995 patients who received at least 1 SARS-CoV-2 test, 6,813 total tests were completed. Overall test positivity was 5.4% and was higher among older pediatric patients (<5 years: 3.3%; 5–11 years: 4.1%; 12–17 years: 8.6%). The number of tests and test positivity increased after holidays and school breaks.

Conclusions: Families might benefit from communication focused on reducing SARS-CoV-2 transmission during holidays. In addition, given higher test positivity in children aged 12–17 years, tailoring public health messaging to older adolescents could help limit SARS-CoV-2 transmission risk in this population.

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IMPLICATIONS AND CONTRIBUTION

In light of the higher SARS-CoV-2 test positivity and increasing autonomy in older children, families might benefit from communication focused on reducing SARS-CoV-2 transmission during holidays and special occasions. COVID-19 communication tailored to adolescents might be a useful component of public health.

In 2020, more than 2.5 million children in the United States tested positive for the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus, which causes COVID-19 [1]. Children account for 1%–3% of all hospitalizations and up to 1% of all COVID-19–related deaths [1]. Transmission potential among children may be similar to that among adults [2]; however, nearly one-third of children infected with SARS-CoV-2 are
asymptomatic [3]. COVID-19 incidence data in children are incomplete, and testing is more frequently carried out by persons who feel sick or suspect they may have been exposed to the virus. We sought to add to the knowledge of COVID-19 incidence in children by evaluating electronic medical records from Pediatric Medical Group A (practice A), a large pediatric clinic with three locations in metropolitan Atlanta, Georgia, that serves approximately 35,000 active outpatients aged < 18 years.

**Methods**

Using electronic medical records from practice A, weekly trends in SARS-CoV-2 tests performed and percentage of persons who tested positive (test positivity) were examined during May 24–December 5, 2020. Practice A conducted SARS-CoV-2 testing with Bako RT-PCR as a send-out test from May to mid-June 2020 and with Sofia SARS Antigen Fluorescent Immunoassay/Quidel as a point-of-care test from mid-June 2020 onwards. For patients aged 0–17 years who had ≥ 1 clinical encounter during May 24–December 5, 2020 that included SARS-CoV-2 testing, demographic information, date of encounter, and test results were abstracted from the electronic medical records. Encounters were excluded if no test was performed, test results were not recorded, or only SARS-CoV-2 antibody test (without antigen or polymerase chain reaction [PCR] testing) was performed.

Among children who had encounters during the analysis period, overall number of tests and SARS-CoV-2 test positivity were examined at the person level and encounter level. For the person-level analysis, age was assigned using first date of positive SARS-CoV-2 test or first test date for all others. Mantel-Haenszel chi-square tests or Fisher’s exact test was used (without antigen or polymerase chain reaction [PCR] testing) was performed. 

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Patterns in SARS-CoV-2 testing and test positivity, overall and by age, sex, and racial and ethnic groups—Pediatric Medical Group A, metropolitan Atlanta, Georgia, May 24–December 5, 2020

| Number of children tested | Number of SARS-CoV-2 tests |
|---------------------------|-----------------------------|
| For SARS-CoV-2            |                             |
|                           |                             |
| Number of children tested |                             |
| N (column %)              | N (row %)                   | P*                           |
| Children tested           |                             |                              |
| Overall                   | 4,995 (100%)                | 269 (5.4%)                   | .001                           |
| Age group                 |                             |                              |                                |
| <5 years                  | 1,576 (31.6%)               | 52 (3.3%)                    | 2175 (31.9%)                  | .55 (2.5%)                    |
| 5–11 years                | 1,680 (33.8%)               | 69 (4.1%)                    | 2184 (32.1%)                  | 70 (3.2%)                     |
| 12–17 years               | 1,730 (34.6%)               | 148 (8.6%)                   | 2454 (36.0%)                  | 158 (6.4%)                    |
| Sex                       |                             |                              |                                | .2245                         |
| Male                      | 2,599 (52.0%)               | 152 (5.9%)                   | 3539 (51.9%)                  | 157 (4.4%)                    |
| Female                    | 2,396 (48.0%)               | 117 (4.9%)                   | 3274 (48.1%)                  | 126 (3.9%)                    |
| Race/Ethnicity            |                             |                              |                                | .6038                         |
| Hispanic                  | 310 (6.2%)                  | 13 (4.2%)                    | 429 (6.3%)                    | 13 (3.0%)                     |
| Asian, non-Hispanic       | 383 (7.7%)                  | 13 (3.4%)                    | 504 (7.4%)                    | 13 (2.6%)                     |
| Black, non-Hispanic       | 282 (5.7%)                  | 20 (7.1%)                    | 375 (5.5%)                    | 21 (5.6%)                     |
| White, non-Hispanic       | 3608 (72.2%)                | 202 (5.6%)                   | 4942 (72.5%)                  | 212 (4.3%)                    |
| Other/unknown             | 412 (8.3%)                  | 21 (5.1%)                    | 563 (8.3%)                    | 24 (4.3%)                     |

SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2.

* Calculating severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) laboratory test percent positivity: CDC methods and considerations for comparisons and interpretation. We defined test positivity for the person-level analysis using the “people-over-people” method (number of new people with positive tests divided by the sum of the number of people with positive tests and the number of people with negative tests). We defined test positivity for the encounter-level analysis using the “test-over-test” method (number of positive tests divided by the sum of the number of positive and negative tests).

Results

Of all patients with ≥ 1 encounter with an associated SARS-CoV-2 test during the analysis period (n = 4,995), 31.6% were aged < 5 years, 33.8% were aged 5–11 years, and 34.6% were aged 12–17 years (Table 1). Just more than half
of the patients (52.0%) were men. Most patients identified as non-Hispanic white (72.2%). The majority of patients (93.6%) were privately insured. The SARS-CoV-2 test positivity increased significantly ($p < .05$) with increasing age ($<5$ years: 3.3%; 5–11 years: 4.1%; 12–17 years: 8.6%) but did not vary significantly by sex or racial/ethnic group. Percentage of positive tests at the encounter level ($n = 6,813$ tests) showed similar findings (Table 1). Tests performed increased from <50 total tests per week in May to >350 tests per week in early July (Figure 1A). Total tests performed decreased during August, peaked in November to >400 tests per week, and spiked after key events, including a COVID-19 outbreak associated with a Georgia camp [4], reopening of metropolitan Atlanta schools, Fall Break, Halloween, and Thanksgiving. After May 31, the overall percentage of positive SARS-CoV-2 tests increased, peaking in July (Figure 1B). Throughout the analysis period, percent positivity was most frequently highest among persons aged 12–17 years.

**Discussion**

In this outpatient pediatric practice, total tests performed and test positivity rose in the summer months, declined in the early
fall, and peaked in the late fall. Although testing volume was similar by the age group, SARS-CoV-2 test positivity was highest among adolescents aged 12–17 years. Test positivity increased after key events, including Halloween and Thanksgiving [1]. Reflecting test positivity patterns seen in state-level COVID-19 surveillance data [5] and national claims data [6]. In another U.S. region, Hobbs et al. [7] found that children who attended activities without consistent risk mitigation had higher test positivity, highlighting how much remains unknown about how pediatric practitioners used evolving knowledge of infection risk by the age group to inform test ordering.

Practice A used CDC and AAP guidance [8,9] and empirical experience to develop and implement its testing strategy. Many Atlanta area institutions including schools [10] and day care centers required testing before participation. Reentry guidance changed over time, necessitating a flexible testing strategy. Pediatric practitioners worked with local public health personnel to accommodate local considerations, including proactivity screening, exposure status, and symptoms [11,12].

These findings are subject to several limitations. First, available billing data did not provide testing indication (e.g., screening, symptoms, exposure), which might have influenced test positivity. Second, the population of practice A was primarily white, non-Hispanic, and urban. Our findings therefore might not be generalizable to other pediatric populations, and our finding that there were no differences in test positivity by racial or ethnic group had low power. Testing of 16,554 children at Texas Children’s Hospital in Houston, a city where 46% of individuals identify as Hispanic or Latino, during this time period found 66% of Hispanic children (42% of all children) had positive tests [13,14]. Third, testing volume and positivity trends might have been influenced by time of year and activity entry requirements. Although the intent of the analysis was to provide descriptive trend data by the age group, future studies should consider how trend analysis methods, including accounting for covariates other than time, might affect the observed patterns. Fourth, practice A did not perform follow-up testing after antigen tests were performed; recent guidance recommends follow-up testing with polymerase chain reaction in certain circumstances to minimize false-positive and false-negative results [15]. Finally, factors not discussed in this report, including local transmission patterns and use of mitigation strategies, may have impacted testing trends and test positivity.

In this practice, SARS-CoV-2 test positivity was highest among the 12- to 17-year age group and increased after holidays and school breaks. This cohort represents about 15% of practice A outpatients (4.5% aged <5 years, 4.8% aged 5–11 years, 4.9% aged 12–17 years), so these findings should be interpreted cautiously, though national trend analyses from this study period also showed higher case incidence in adolescents than in younger children [16]. As communities reopen, and children and adolescents continue to interact through school, recreational activities, and other social gatherings, the COVID-19 pandemic presents unique challenges in navigating and prioritizing social interactions, particularly among adolescents who often exercise independent decision-making [17–19]. Families might benefit from communication focused on reducing SARS-CoV-2 transmission during holidays. In addition to public health messages aimed at adults and caregivers, adolescents might benefit from tailored messaging and outreach strategies that address their developmental stage and social behaviors [20].

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