On January 13, 2021, this report was posted as an MMWR Early Release on the MMWR website (https://www.cdc.gov/mmwr).

Coronavirus disease 2019 (COVID-19) case and electronic laboratory data reported to CDC were analyzed to describe demographic characteristics, underlying health conditions, and clinical outcomes, as well as trends in laboratory-confirmed COVID-19 incidence and testing volume among U.S. children, adolescents, and young adults (persons aged 0–24 years). This analysis provides a critical update and expansion of previously published data, to include trends after fall school reopenings, and adds preschool-aged children (0–4 years) and college-aged young adults (18–24 years) to the analysis. Among children, adolescents, and young adults, weekly incidence (cases per 100,000 persons) increased with age and was highest during the final week of the review period (the week of December 6) among all age groups. Time trends in weekly reported incidence for children and adolescents aged 0–17 years tracked consistently with trends observed among adults since June, with both incidence and positive test results tending to increase since September after summer declines. Reported incidence and positive test results among children aged 0–10 years were consistently lower than those in older age groups. To reduce community transmission, which will support schools in operating more safely for in-person learning, communities and schools should fully implement and strictly adhere to recommended mitigation strategies, especially universal and proper masking, to reduce COVID-19 incidence.

Children, adolescents, and young adults were stratified into five age groups: 0–4, 5–10, 11–13, 14–17, and 18–24 years to align with educational groupings (i.e., pre-, elementary, middle, and high schools, and institutions of higher education), and trends in these groups were compared with those in adults aged ≥25 years. Confirmed COVID-19 cases, defined as positive real-time reverse transcription–polymerase chain reaction (RT-PCR) test results for SARS-CoV-2, the virus that causes COVID-19, were identified from individual-level case reports submitted by state and territorial health departments during March 1–December 12, 2020.† COVID-19 case data for all confirmed cases were analyzed to examine demographic characteristics, underlying health conditions,† and outcomes. Trends in COVID-19 incidence were analyzed using a daily 7-day moving average, aggregated by week,§ and expressed as cases per 100,000 persons.¶

Trends in laboratory testing volume and percentage of positive test results were assessed using COVID-19 electronic laboratory reporting data. SARS-CoV-2 RT-PCR test results for May 31–December 12, 2020 were obtained from electronic laboratory reporting data submitted to CDC by health departments from 44 states, the District of Columbia, two territories, and one freely associated state; when information was unavailable in state-submitted data, records submitted directly by public health, commercial, and reference laboratories were used.** Data represent test results, not number of persons receiving tests; test result date was used for analyses. The weekly percentage of positive SARS-CoV-2 RT-PCR test results was calculated as the number of positive test results divided by the sum of positive and negative test results. Because some data elements are incomplete for more than 47% of cases, percentages were calculated only from among those with available information. This project was deemed nonresearch public health practice by the CDC and conducted consistent with applicable federal law and CDC policy.†† Analyses were conducted using R software (version 4.0.2; The R Foundation).

† Underlying health conditions were defined based on the categories included in the COVID-19 Case Report Form. https://www.cdc.gov/coronavirus/2019-ncov/downloads/pui-form.pdf.
§ Weekly incidence date based on the earliest symptom onset date reported for each COVID-19 case. If symptom onset date was missing, earliest onset date was populated with the earliest date in a series of variables submitted by the jurisdiction, including symptom resolution date, positive specimen date, diagnosis date, specimen collection date (for spumus, nasopharyngeal, oropharyngeal, or other specimen type), hospital or ICU admission or discharge date, date of death, or the date of case reporting to CDC.
¶ Population estimates used in calculating incidence were obtained from the Kids Count Data Center. https://datacenter.kidscount.org/data.
** COVID-19 Electronic Laboratory Reporting data submitted by state health departments from all laboratories performing SARS-CoV-2 RT-PCR testing were used for 44 states, the District of Columbia, Guam, Marshall Islands, and Northern Mariana Islands. SARS-CoV-2 RT-PCR testing data from a subset of public health, commercial, and reference laboratories were used for six states for which data were not directly submitted by state health departments (Maine, Missouri, Ohio, Oklahoma, Washington, and Wyoming), Puerto Rico, and the U.S. Virgin Islands. The data might not include results from all testing sites within a jurisdiction and therefore might reflect the majority of, but not all, SARS-CoV-2 RT-PCR tests in the United States. The data represent laboratory test totals, not individual persons tested, and exclude antibody and antigen tests.
†† 45 C.F.R. part 46, 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.
During March 1–December 12, 2020, a total of 2,871,828 laboratory-confirmed cases of COVID-19 in children, adolescents, and young adults aged 0–24 years were reported in the United States. Among these cases, the majority (57.4%) occurred among young adults aged 18–24 years; children and adolescents aged 14–17 years accounted for 16.3% of cases, those 11–13 years for 7.9%, those 5–10 years for 10.9%, and those 0–4 years for 7.4% (Table). Overall, 51.8% of cases occurred in females. Among the 1,504,165 (52.4%) children, adolescents, and young adults with COVID-19 with complete information on race/ethnicity, 50.2% were non-Hispanic White, 27.4% were Hispanic/Latino (Hispanic), and 11.7% were non-Hispanic Black. The proportion of cases among Hispanic persons decreased with increasing age from 34.4% among those aged 0–4 years to 24.6% among those aged 18–24 years.  

Among persons aged 0–24 years, weekly incidence was higher in each successively increasing age group; weekly incidence among adults aged 25–64 years and ≥65 years exceeded that among children and adolescents aged 0–13 years throughout the review period (Figure 1). Weekly incidence was highest during the final week of the review period (the week of December 6) in all age groups: 99.9 per 100,000 (0–4 years), 131.4 (5–10 years), 180.6 (11–13 years), 255.6 (14–17 years), and 379.3 (18–24 years). Trends in weekly incidence for all age groups aged 0–17 years paralleled those observed among adults since June. The trend in incidence among young adults aged 18–24 years had a distinct and more prominent peak during the week of September 6. 

Weekly SARS-CoV-2 laboratory testing among children, adolescents, and young adults increased 423.3% from 435,434 tests during the week beginning May 31 to 2,278,688 tests during the week beginning December 6 (Figure 2). At their peak during the week of November 15, tests conducted among children and adolescents aged 0–17 years represented 9.5% of all tests performed, and tests among young adults aged 18–24 years represented 15.3% (Supplementary Figure 1, URL https://stacks.cdc.gov/view/cdc/100246). As observed in trends in incidence, weekly percentage of positive test results among children and adolescents paralleled those of adults, declining between July and September, and then increasing through December (Supplementary Figure 2, URL https://stacks.cdc.gov/view/cdc/100246). Percentage of positive test results among young adults aged 18–24 years peaked earlier in June and increased slightly in late August; this was not observed among other age groups. In contrast to incidence, percentage of positive test results among children and adolescents aged 11–17 years exceeded that among younger children for all weeks and that of all age groups since the week beginning September 6; test volumes over time were lowest among children and adolescents aged 11–13 years, suggesting incidence among these age groups might be underestimated. Among cases reviewed, data were available for 41.9%, 8.9%, and 49.1% of cases for hospitalizations, intensive care unit (ICU) admissions, and deaths, respectively. Among children, adolescents, and young adults with available data for these outcomes, 30,229 (2.5%) were hospitalized, 1,973 (0.8%) required ICU admission, and 654 (<0.1%) died (Table), compared with 16.6%, 8.6%, and 5.0% among adults aged ≥25 years, respectively. Among children, adolescents, and young adults, the largest percentage of hospitalizations (4.6%) and ICU admissions (1.8%) occurred among children aged 0–4 years. Among 379,247 (13.2%) children, adolescents, and young adults with COVID-19 and available data on underlying conditions, at least one underlying condition or underlying health condition was reported for 114,934 (30.3%), compared with 836,774 (60.4%) among adults aged ≥25 years. 

**Discussion**

Reported weekly incidence of COVID-19 and percentage of positive test results among children, adolescents, and young adults increased during the review period, with spikes in early summer, followed by a decline and then steeply increased in October through December. In general, trends in incidence and percentage of positive test results among preschool-aged children (0–4 years) and school-aged children and adolescents (5–17 years) paralleled those among adults throughout the summer and fall, including during the months that some schools were reopening or open for in-person education. In addition, reported incidence among children, adolescents, and young adults increased with age; among children aged 0–10 years, incidence and percentage of positive test results were consistently lower than they were among older age groups. Case data do not indicate that increases in incidence or percentage of positive test results among adults were preceded by increases among preschool- and school-aged children and adolescents. In contrast, incidence among young adults (aged 18–24 years) was higher than that in other age groups throughout the summer and fall, with peaks in mid-July and early September that preceded increases among other age groups, suggesting that young adults might contribute more to community transmission than do younger children. Findings from national case and laboratory surveillance data complement available evidence regarding risk for transmission in school settings. As of December 7, nearly two thirds
TABLE. Demographic characteristics and underlying conditions among persons aged 0–24 years with positive test results for SARS-CoV-2 — United States, March 1–December 12, 2020

| Characteristic | 0–24 | 0–17 | 0–4 | 5–10 | 11–13 | 14–17 | 18–24 |
|---------------|------|------|-----|------|------|------|------|
| Age group, yrs, no. (%) | | | | | | | |
| **Total** | 2,871,828 (100) | 1,222,023 (42.6) | 212,879 (7.4) | 313,913 (10.9) | 227,238 (7.9) | 467,993 (16.3) | 1,649,805 (57.4) |
| **Sex** | | | | | | | |
| Female | 1,469,744 (51.8) | 603,948 (50.0) | 100,935 (48.2) | 152,494 (49.1) | 111,683 (49.7) | 238,836 (51.6) | 865,796 (53.1) |
| Male | 1,367,083 (48.2) | 603,029 (50.0) | 108,457 (51.8) | 157,769 (50.8) | 112,930 (50.3) | 232,873 (48.4) | 764,242 (46.9) |
| **Race/Ethnicity** | | | | | | | |
| Missing/Unknown* | 34,760 (N/A) | 15,028 (N/A) | 3,485 (N/A) | 3,647 (N/A) | 2,623 (N/A) | 5,273 (N/A) | 19,732 (N/A) |
| **Symptom Status** | | | | | | | |
| No | 77,899 (5.9) | 46,166 (8.1) | 9,281 (9.6) | 15,720 (11.1) | 8,736 (8.2) | 12,429 (5.5) | 31,733 (4.2) |
| Yes | 1,247,552 (94.1) | 524,390 (91.9) | 87,646 (90.4) | 126,010 (88.9) | 97,831 (91.8) | 212,903 (94.5) | 723,162 (95.8) |
| **Symptom Status** | | | | | | | |
| Current/Former smoker | 15,362 (3.6) | 798 (0.5) | 37 (0.1) | 42 (0.1) | 39 (0.1) | 680 (1.0) | 14,564 (6.0) |
| **Underlying condition** | | | | | | | |
| Any | 114,930 (30.3) | 43,388 (27.6) | 6,334 (23.7) | 10,203 (26.4) | 8,206 (28.8) | 18,243 (29.5) | 71,546 (32.2) |
| None | 264,313 (69.7) | 103,612 (72.4) | 20,426 (76.3) | 28,386 (73.6) | 20,280 (71.2) | 44,529 (70.5) | 150,692 (67.8) |
| Missing/Unknown* | 2,492,581 (N/A) | 1,065,014 (N/A) | 186,119 (N/A) | 275,324 (N/A) | 198,752 (N/A) | 404,819 (N/A) | 1,427,567 (N/A) |
| **Surviving condition** | | | | | | | |
| Chronic lung disease | 26,937 (6.4) | 10,521 (6.0) | 786 (2.6) | 2,495 (5.7) | 2,316 (7.2) | 4,924 (7.0) | 16,416 (6.7) |
| Diabetes mellitus | 4,030 (1.0) | 1,104 (0.6) | 63 (0.2) | 133 (0.3) | 237 (0.7) | 671 (0.9) | 2,982 (1.2) |
| Psychosocial | 3,055 (0.7) | 1,176 (0.7) | 23 (0.1) | 153 (0.3) | 231 (0.7) | 769 (1.1) | 1,879 (0.8) |
| Cardiovascular disease | 3,103 (0.7) | 1,133 (0.6) | 266 (0.9) | 239 (0.5) | 163 (0.5) | 465 (0.7) | 1,970 (0.8) |
| Current/Former smoker | 15,362 (3.6) | 798 (0.5) | 37 (0.1) | 42 (0.1) | 39 (0.1) | 680 (1.0) | 14,564 (6.0) |
| Chronic kidney disease | 796 (0.2) | 336 (0.2) | 80 (0.3) | 77 (0.2) | 44 (0.1) | 135 (0.2) | 614 (0.3) |
| Substance abuse/use | 345 (0.1) | 120 (0.1) | 1 (0.0) | 1 (0.0) | 6 (0.1) | 64 (0.1) | 283 (0.1) |
| Other | 10,100 (2.4) | 3,511 (2.0) | 665 (2.2) | 725 (1.7) | 581 (1.8) | 1,540 (2.2) | 6,589 (2.7) |

See table footnotes on the next page.

(62.0%) of U.S. kindergarten through grade 12 (K–12) school districts offered either full or partial (hybrid with virtual) in-person learning.*** Despite this level of in-person learning, reports to CDC of outbreaks within K–12 schools have been limited,††† and as of the week beginning December 6, aggregate COVID-19 incidence among the general population in counties where K–12 schools offer in-person education (401.2 per 100,000) was similar to that in counties offering only virtual/online education (418.2 per 100,000).§§§ Several U.S. school districts with routine surveillance of in-school cases report lower incidence among students than in the

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**See table footnotes on the next page.**

*** In addition to routine case surveillance reports, CDC receives regular updates from state, local, and tribal health departments, as well as various school districts. School-based outbreaks have been periodically reported to CDC at the time jurisdictions request technical assistance. In the context of childcare and K–12 schools, requests for assistance have more frequently been in response to a single case or small clusters of cases. Reports of large outbreaks in these settings have been rare.

§§§ Data presented are for the week beginning December 6, 2020. Aggregate case incidence is the rate derived after summing the case and population values for counties that currently have that K–12 teaching plans. Among the 2,717 counties having school districts with currently known teaching plans, 1,696 had school districts with differing methods. For these counties, case incidence and positive test result data are proportionately allocated into a specific plan based on the ratio of total enrollment for school districts that currently have that plan type to the total enrollment for all school districts in that county. Population estimates were obtained from the Vintage 2019 Bridged-Race Postcensal Population Estimates for Calculating Vital Rates (https://www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm). County-level case counts were obtained from CDC County Aggregate figures (extracted December 28, 2020). School enrollment data and school reopening plans were obtained from MCH Strategic Data (https://www.mchdata.com/covid19/schoolclosings, extracted December 28, 2020). Data were extracted and analyzed by the Johns Hopkins University Applied Physics Laboratory.
**TABLE. (Continued) Demographic characteristics and underlying conditions among persons aged 0–24 years with positive test results for SARS-CoV-2 — United States, March 1–December 12, 2020**

| Characteristic     | Age group, yrs, no. (%) |
|--------------------|-------------------------|
| **Outcome**        |                         |
| Hospitalized       |                         |
| Yes                | 30,229 (2.5)            |
|                    | 11,882 (2.3)            |
|                    | 4,294 (4.6)             |
|                    | 1,983 (1.5)             |
|                    | 1,598 (1.6)             |
|                    | 4,007 (2.0)             |
|                    | 18,347 (2.7)            |
| No                 | 1,172,310 (97.5)        |
| ICU admission      |                         |
| Yes                | 1,973 (0.8)             |
|                    | 866 (0.8)               |
|                    | 288 (1.8)               |
|                    | 168 (0.6)               |
|                    | 131 (0.6)               |
|                    | 279 (0.6)               |
|                    | 1,107 (0.8)             |
| No                 | 252,961 (99.2)          |
| Missing/Unknown*   | 1,111,923 (N/A)         |
|                    | 196,500 (N/A)           |
|                    | 287,777 (N/A)           |
|                    | 206,533 (N/A)           |
|                    | 421,113 (N/A)           |
|                    | 1,504,971 (N/A)         |
| Died               |                         |
| Yes                | 654 (<0.1)              |
|                    | 178 (<0.1)              |
|                    | 52 (<0.1)               |
|                    | 30 (<0.1)               |
|                    | 27 (<0.1)               |
|                    | 69 (<0.1)               |
|                    | 476 (0.1)               |
| No                 | 1,409,626 (100)         |
| Missing/Unknown*   | 620,989 (100)           |
|                    | 111,437 (100)           |
|                    | 162,971 (100)           |
|                    | 115,624 (100)           |
|                    | 230,917 (100)           |
|                    | 788,637 (100)           |
| **Abbreviations:** |                         |
| ICU = intensive care unit; N/A = not available. |
positive test results was generally higher among children and adolescents (particularly those aged 11–17 years) than that among adults, and testing frequently prioritized persons with symptoms; asymptomatic infection in children and adolescents occurs frequently (9). Second, data on race/ethnicity, symptom status, underlying conditions, and outcomes are incomplete, and completeness varied by jurisdiction; therefore, results for these variables might be subject to reporting biases and should be interpreted with caution. Future reporting would be enhanced by prioritizing completeness of these indicators for all case surveillance efforts. Third, the reporting of laboratory data differs by jurisdiction and might underestimate the actual volume of laboratory tests performed; as well, reporting of laboratory and case data are not uniform.**** Finally, the presented analysis explores case surveillance data for children, adolescents, and young adults; trends in cases among teachers and school staff members are not available because cases are not routinely reported nationally by occupations other than health care workers.

Lower incidence among younger children and evidence from available studies (2–8) suggest that the risk for COVID-19 introduction and transmission among children associated with reopening child care centers and elementary schools might be lower than that for reopening high schools and institutions of higher education. However, for schools to operate safely to accommodate in-person learning, communities should fully implement and strictly adhere to multiple mitigation strategies, especially universal and proper masking, to reduce COVID-19 incidence within the community as well as within schools to protect students, teachers, and staff members. CDC recommends that K–12 schools be the last settings to close after all other mitigation measures have been employed and the first to reopen when they can do so safely (10). CDC offers tools†††† to help child care programs, schools, colleges and universities, parents, and caregivers plan, prepare, and respond to

### Abbreviation
COVID-19 = coronavirus disease 2019.

* The 7-day moving average of new cases (current day + 6 preceding days/7) was calculated to smooth expected variation in daily case counts.

† Incidence was calculated per 100,000 population using 2019 U.S. Census population estimates obtained from Kids Count Data Center (https://datacenter.kidscount.org/data).

§ Data included through December 12, 2020, so that each week has a full 7 days of data.

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* The 7-day moving average of new cases (current day + 6 preceding days/7) was calculated to smooth expected variation in daily case counts.

† Incidence was calculated per 100,000 population using 2019 U.S. Census population estimates obtained from Kids Count Data Center (https://datacenter.kidscount.org/data).

§ Data included through December 12, 2020, so that each week has a full 7 days of data.
COVID-19, thereby helping to protect students, teachers, and staff members and slowing community spread of COVID-19.

Corresponding author: Erin K. Sauber-Schatz, ige7@cdc.gov.

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References

1. Leeb RT, Price S, Sliwa S, et al. COVID-19 trends among school-aged children—United States, March 1–September 19, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1410–5. PMID:33001869 https://doi.org/10.15585/mmwr.mm6939e2

2. Fricchione MJ, Seo JY, Arwady MA. Data-driven reopening of urban public education through Chicago's tracking of COVID-19 school transmission. J Public Health Manag Pract 2020;Epub December 20, 2020. PMID:33394643 https://doi.org/10.1097/PHH.0000000000001334

3. Harris DN, Ziedan E, Flisig S. The effects of school reopenings on COVID-19 hospitalizations. New Orleans, LA: National Center for Research on Education Access and Choice; 2021. https://www.reachcentered.org/publications/the-effects-of-school-reopenings-on-covid-19-hospitalizations

4. Leidner AJ, Barry V, Bowen VB, et al. Opening of large institutions of higher education and county-level COVID-19 incidence—United States, July 6–September 17, 2020. MMWR Morb Mortal Wkly Rep 2021;70:14–9. PMID:33411699 https://doi.org/10.15585/mmwr.mm7001a4

5. Ismail SA, Saliba V, Lopez Bernal J, Ramsay ME, Ladhani SN. SARS-CoV-2 infection and transmission in educational settings: a prospective, cross-sectional analysis of infection clusters and outbreaks in England. Lancet Infect Dis 2020. Epub December 8, 2020. PMID:33306981

6. Macartney K, Quinn HE, Pillsbury AJ, et al.; NSW COVID-19 Schools Study Team. Transmission of SARS-CoV-2 in Australian educational settings: a prospective cohort study. Lancet Child Adolesc Health 2020;4:807–16. PMID:32758454 https://doi.org/10.1016/S2352-4642(20)30251-0

7. Hobbs CV, Martin LM, Kim SS, et al.; CDC COVID-19 Response Team. Factors associated with positive SARS-CoV-2 test results in outpatient health facilities and emergency departments among children and adolescents aged <18 years—Mississippi, September–November 2020. MMWR Morb Mortal Wkly Rep 2021;69:1925–9. PMID:33332298 https://doi.org/10.15585/mmwr.mm6950e3

8. Zimmerman KO, Akinboyo IC, Brookhart MA, et al.; ABC Science Collaborative. Incidence and secondary transmission of SARS-CoV-2 infections in schools. Pediatrics 2021;e2020048090. PMID:33419869 https://doi.org/10.1542/peds.2020-048090
9. Poline J, Gaschignard J, Leblanc C, et al. Systematic severe acute respiratory syndrome coronavirus 2 screening at hospital admission in children: a French prospective multicenter study. Clin Infect Dis 2020;ciaa1044. PMID:32710743 https://doi.org/10.1093/cid/ciaa1044

10. Honein MA, Christie A, Rose DA, et al.; CDC COVID-19 Response Team. Summary of guidance for public health strategies to address high levels of community transmission of SARS-CoV-2 and related deaths, December 2020. MMWR Morb Mortal Wkly Rep 2020;69:1860–7. PMID:33301434 https://doi.org/10.15585/mmwr.mm6949e2December 2020.