

WHITE PAPER

The Impact of COVID-19 on Pediatric Mental Health

A Study of Private Healthcare Claims

A FAIR Health White Paper, March 2, 2021



Summary

The COVID-19 pandemic has had a profound impact on mental health, particularly on that of young people. Defining the pediatric population as individuals aged 0-22 years, and focusing on the age groups 13-18 years and 19-22 years, FAIR Health studied the effects of the pandemic on US pediatric mental health. To do so, FAIR Health analyzed data from its database of over 32 billion private healthcare claim records, tracking month-by-month changes from January to November 2020 compared to the same months in 2019. Aspects of pediatric mental health investigated include overall mental health, intentional self-harm, overdoses and substance use disorders, top mental health diagnoses, reasons for emergency room visits and state-by-state variations. Among the key findings:

Overall Mental Health

- In March and April 2020, mental health claim lines¹ for individuals aged 13-18, as a percentage of all medical claim lines, approximately doubled over the same months in the previous year. All medical claim lines (including mental health claim lines), however, decreased by approximately half. That pattern of increased mental health claim lines and decreased medical claim lines continued through November 2020, though to a lesser extent.
- A similar pattern was seen for individuals aged 19-22, though the changes were smaller. In general, the age group 19-22 had mental health trends similar to but less pronounced than the age group 13-18.

Intentional Self-Harm

- Claim lines for intentional self-harm as a percentage of all medical claim lines in the 13-18 age group increased 90.71 percent in March 2020 compared to March 2019. The increase was even larger when comparing April 2020 to April 2019, nearly doubling (99.83 percent).
- Comparing August 2019 to August 2020 in the Northeast, for the age group 13-18, there was a 333.93 percent increase in intentional self-harm claim lines as a percentage of all medical claim lines, a rate higher than that in any other region in any month studied for that age group.

Overdoses and Substance Use Disorders

- For the age group 13-18, claim lines for overdoses increased 94.91 percent as a percentage of all medical claim lines in March 2020 and 119.31 percent in April 2020 over the same months the year before. Claim lines for substance use disorders also increased as a percentage of all medical claim lines in March (64.64 percent) and April (62.69 percent) 2020 as compared to their corresponding months in 2019.

Mental Health Diagnoses

- For the age group 6-12, from spring to November 2020, claim lines for obsessive-compulsive disorder and tic disorders increased as a percentage of all medical claim lines from their levels in the corresponding months of 2019.
- For the age group 13-18, in April 2020, claim lines for generalized anxiety disorder increased 93.6 percent as a percentage of all medical claim lines over April 2019, while major depressive disorder claim lines increased 83.9 percent and adjustment disorder claim lines 89.7 percent.

Background

The COVID-19 pandemic has had a profound impact on mental health. Infection-related fears, bereavement, economic instability and social isolation have triggered and exacerbated mental health

¹ A claim line is an individual service or procedure listed on an insurance claim.

issues.² In a survey in March 2020, 45 percent of adults reported that worry and stress related to coronavirus had had a negative impact on their mental health.³ A study from the Centers for Disease Control and Prevention (CDC) found that the prevalence of depression reported in June 2020 was approximately four times that reported in the second quarter of 2019, and the prevalence of anxiety in June 2020 was about three times that in the second quarter of 2019.⁴ More than 42 percent of respondents surveyed by the US Census Bureau in December 2020 reported symptoms of anxiety or depression that month, a rise from 11 percent the previous year.⁵

Young people have proven especially vulnerable to mental health issues related to the COVID-19 pandemic. School closures, having to learn remotely and isolating from friends due to social distancing have been sources of stress and loneliness. A review of the international literature identified high rates of anxiety, depression and post-traumatic symptoms among children during the pandemic.⁶ A CDC report showed that, starting in April 2020, the proportion of mental health-related emergency room (ER) visits for children under 18 among all pediatric ER visits increased and stayed elevated through October.⁷ Students surveyed at seven American universities reported largely negative impacts of COVID-19 on their psychological health and lifestyle behaviors.⁸

In a series of studies, FAIR Health has examined several aspects of the COVID-19 pandemic. The first brief projected the costs to the nation of inpatient services for COVID-19 patients.⁹ The second brief analyzed the impact of COVID-19 on hospitals and health systems.¹⁰ The third brief concerned the impact of COVID-19 on healthcare professionals.¹¹ The fourth brief profiled COVID-19 patients by illuminating

² World Health Organization, “COVID-19 Disrupting Mental Health Services in Most Countries, WHO Survey,” press release, October 5, 2020, <https://www.who.int/news/item/05-10-2020-covid-19-disrupting-mental-health-services-in-most-countries-who-survey>.

³ Ashley Kirzinger et al., *KFF Health Tracking Poll—Early April 2020: The Impact of Coronavirus on Life in America*, April 2, 2020, <https://www.kff.org/health-reform/report/kff-health-tracking-poll-early-april-2020/>.

⁴ Mark É. Czeisler et al., “Mental Health, Substance Use, and Suicidal Ideation during the COVID-19 Pandemic—United States, June 24–30, 2020,” *Morbidity and Mortality Weekly Report (MMWR)* 69, no. 32 (August 14, 2020): 1049–57, <https://www.cdc.gov/mmwr/volumes/69/wr/mm6932a1.htm>.

⁵ Alison Abbott, “COVID’s Mental-Health Toll: How Scientists Are Tracking a Surge in Depression,” *Nature*, February 3, 2021, <https://www.nature.com/articles/d41586-021-00175-z>.

⁶ Debora Marques de Miranda et al., “How Is COVID-19 Pandemic Impacting Mental Health of Children and Adolescents?,” *International Journal of Disaster Risk Reduction* 51 (December 2020): 101845, <https://doi.org/10.1016/j.ijdrr.2020.101845>.

⁷ Rebecca T. Leeb et al., “Mental Health-Related Emergency Department Visits among Children Aged <18 Years during the COVID-19 Pandemic—United States, January 1–October 17, 2020,” *Morbidity and Mortality Weekly Report (MMWR)* 69, no. 45 (November 13, 2020): 1675–80, <https://www.cdc.gov/mmwr/volumes/69/wr/mm6945a3.htm>.

⁸ Matthew H. E. M. Browning et al., “Psychological Impacts from COVID-19 among University Students: Risk Factors across Seven States in the United States,” *PLOS ONE* (January 7, 2021), <https://doi.org/10.1371/journal.pone.0245327>.

⁹ FAIR Health, *COVID-19: The Projected Economic Impact of the COVID-19 Pandemic on the US Healthcare System*, A FAIR Health Brief, March 25, 2020, <https://s3.amazonaws.com/media2.fairhealth.org/brief/asset/COVID-19%20-%20The%20Projected%20Economic%20Impact%20of%20the%20COVID-19%20Pandemic%20on%20the%20US%20Healthcare%20System.pdf>.

¹⁰ FAIR Health, *Illuminating the Impact of COVID-19 on Hospitals and Health Systems: A Comparative Study of Revenue and Utilization*, A FAIR Health Brief, May 12, 2020, <https://s3.amazonaws.com/media2.fairhealth.org/brief/asset/Illuminating%20the%20Impact%20of%20COVID-19%20on%20Hospitals%20and%20Health%20Systems%20-%20A%20Comparative%20Study%20of%20Revenue%20and%20Utilization%20-%20A%20FAIR%20Health%20Brief.pdf>.

¹¹ FAIR Health, *Healthcare Professionals and the Impact of COVID-19: A Comparative Study of Revenue and Utilization*, A FAIR Health Brief, June 10, 2020, <https://s3.amazonaws.com/media2.fairhealth.org/brief/asset/Healthcare%20Professionals%20and%20the%20Impact%20of%20COVID-19%20-%20A%20Comparative%20Study%20of%20Revenue%20and%20Utilization%20-%20A%20FAIR%20Health%20Brief.pdf>.

some of their key characteristics.¹² The fifth brief examined the impact of the pandemic on dental services.¹³ A white paper analyzed risk factors for COVID-19 mortality.¹⁴

This white paper concerns the impact of the pandemic on pediatric mental health in the United States. FAIR Health herein defines the pediatric population as including individuals aged 0-22, in order to encompass not only children and adolescents but young adults. The focus of most of the study is on the age groups 13-18 (people in middle school and high school) and 19-22 (the college-age population).

To study the impact of the pandemic on these age groups, FAIR Health analyzed data from its database of over 32 billion private healthcare claim records, the nation's largest such repository, which is growing by over 2 billion claim records per year. The analysis includes month-by-month changes from January to November 2020 compared to the same months in 2019. Aspects of pediatric mental health investigated include overall mental health, intentional self-harm, overdoses and substance use disorders, top mental health diagnoses, reasons for ER visits and state-by-state variations. Among the factors considered are age group, gender, region and place of service (in particular, telehealth versus office visits).

FAIR Health is a national, independent nonprofit organization dedicated to bringing transparency to healthcare costs and health insurance information. The data in its repository of private healthcare claims are contributed by over 60 payors and third-party administrators who insure or process claims for private insurance plans. The dataset includes data on fully insured and employer self-funded plans and Medicare Advantage (Medicare Part C) enrollees, but not on uninsured individuals or those on Medicare Parts A, B and D.¹⁵ Those insured under other government programs, such as Medicaid, CHIP, and state and local government programs, are also not included.

Methodology

For this analysis, FAIR Health obtained from its database of private healthcare claims all claim lines with an ICD-10-CM diagnosis code representing mental health conditions, intentional self-harm, overdoses and substance use disorders for dates of service from January 1, 2019, to November 30, 2019, and from January 1, 2020, to November 30, 2020, for patients who were aged 0-22 years. The specific diagnoses were:

- **Mental Health Conditions:** Diagnoses from F20* to F69* and from F90* to F99, which include mood [affective] disorders (F30.10–F39); anxiety, dissociative, stress-related, somatoform and other nonpsychotic mental disorders (F40.00–F48.9); and disorders of adult personality and

¹² FAIR Health, *Key Characteristics of COVID-19 Patients: Profiles Based on Analysis of Private Healthcare Claims*, A FAIR Health Brief, July 14, 2020, <https://s3.amazonaws.com/media2.fairhealth.org/brief/asset/Key%20Characteristics%20of%20COVID-19%20Patients%20-%20Profiles%20Based%20on%20Analysis%20of%20Private%20Healthcare%20Claims%20-%20A%20FAIR%20Health%20Brief.pdf>.

¹³ FAIR Health, *Dental Services and the Impact of COVID-19: An Analysis of Private Claims*, A FAIR Health Brief, September 16, 2020, <https://s3.amazonaws.com/media2.fairhealth.org/brief/asset/Dental%20Services%20and%20the%20Impact%20of%20COVID-19%20-%20An%20Analysis%20of%20Private%20Claims%20-%20A%20FAIR%20Health%20Brief.pdf>.

¹⁴ FAIR Health, *Risk Factors for COVID-19 Mortality among Privately Insured Patients: A Claims Data Analysis*, A FAIR Health White Paper in Collaboration with the West Health Institute and Marty Makary, MD, MPH, from Johns Hopkins University School of Medicine, November 11, 2020, <https://s3.amazonaws.com/media2.fairhealth.org/whitepaper/asset/Risk%20Factors%20for%20COVID-19%20Mortality%20among%20Privately%20Insured%20Patients%20-%20A%20Claims%20Data%20Analysis%20-%20A%20FAIR%20Health%20White%20Paper.pdf>.

¹⁵ FAIR Health also receives the entire collection of claims for traditional Medicare Parts A, B and D under the Centers for Medicare & Medicaid Services (CMS) Qualified Entity Program, but those data are not a source for this report.

behavior (F60.0–F69). F01–F09 were removed as these are mental disorders due to known physiological conditions (e.g. dementia). F10–F19 were removed because these indicate substance use disorders (but were used when specifically analyzing those disorders). F70–F89 were removed because these are intellectual disabilities and pervasive and specific developmental disorders.

- **Intentional Self-Harm:** Diagnoses from X71* to X83*, which include intentional self-harm by handgun discharge (X72.XXA–X72.XXS), intentional self-harm by sharp object (X78.0XXA–X78.9XXS) and intentional self-harm by other specified means (X83.0XXA–X83.8XXS). Also used was T14.91* (suicide attempt).
- **Overdoses:** Under codes from the “Poisoning by, adverse effects of and underdosing of drugs, medicaments and biological substances” section, those codes were used that are not indicative of underdosing (as per the description, though most of the underdosing codes have a diagnosis code like T*.X6*) from T36* to T50*.
- **Substance Use Disorders:** Diagnoses from F10* to F19*, which include alcohol-related disorders (F10.10–F10.99), opioid-related disorders (F11.10–F11.99) and cocaine-related disorders (F14.10–F14.99).

Individuals were then grouped into four age groups: 0-5 (pre-school-aged), 6-12 (elementary-school-aged), 13-18 (middle- and high-school-aged) and 19-22 (college-aged).

After analysis, based on lower utilization of mental health services in the youngest age groups, individuals aged 0-5 were removed completely, and individuals aged 6-12 were not a topic of focus other than a single analysis (figure 12 in this report).

Once the data were grouped, data were stratified by month of service, gender, geographic location and place of service. To identify a telehealth service, the following methodologies were used:

- Place of service of 02.
- Procedure modifier of:
 - 95 – Synchronous telemedicine service rendered via a real-time interactive audio and video telecommunications system;
 - GT – Interactive telecommunication; and
 - GQ – Telehealth store and forward.
- Procedure code indicating that the service was rendered via telehealth:
 - CPT^{®16} 99091–CPT 99474 – Non-face-to-face services.

In the graphs that follow, the analyses of percent changes from 2019 to 2020 are based on changes in the percentage of medical claim lines rather than in the raw number of claim lines. This normalization was done to account for fluctuations in plan data (e.g., employers entering or exiting the market, thereby changing the number of plan members).

¹⁶ CPT © 2020 American Medical Association (AMA). All rights reserved.

Results

Overall Mental Health

For individuals aged 13 to 18, figure 1 shows the percent change in mental health claim lines as a percentage of all medical claim lines in January to November 2020 compared to the same months in 2019, and compares that change to the percent change in all medical claim lines (including mental health claim lines). In March and April 2020, at the height of the spring wave of the COVID-19 pandemic, mental health claim lines increased as a percentage of all medical claim lines 97.0 percent and 103.5 percent, respectively, over the same months in the previous year. Medical claim lines, however, decreased 53.3 percent in March 2020 and 53.4 percent in April 2020.

That pattern of increased mental health claim lines and decreased medical claim lines continued through November 2020, though the extent of change compared to 2019 in later months was not as great as in March and April. August 2020 had the smallest decrease in medical claim lines compared to the same month in the prior year, 9.6 percent. Mental health claim lines never fell below an increase of 19 percent over the previous year (September was 19.1 percent).

The decrease in all medical claim lines is likely due to widespread restrictions on nonemergency medical care in spring 2020 and continuing avoidance of such care even after restrictions were lifted in May. It is striking, therefore, that one component of medical care, mental healthcare, increased significantly even while overall medical care was falling. It suggests the increase in mental health issues brought on by the pandemic in the 13-18 age group.

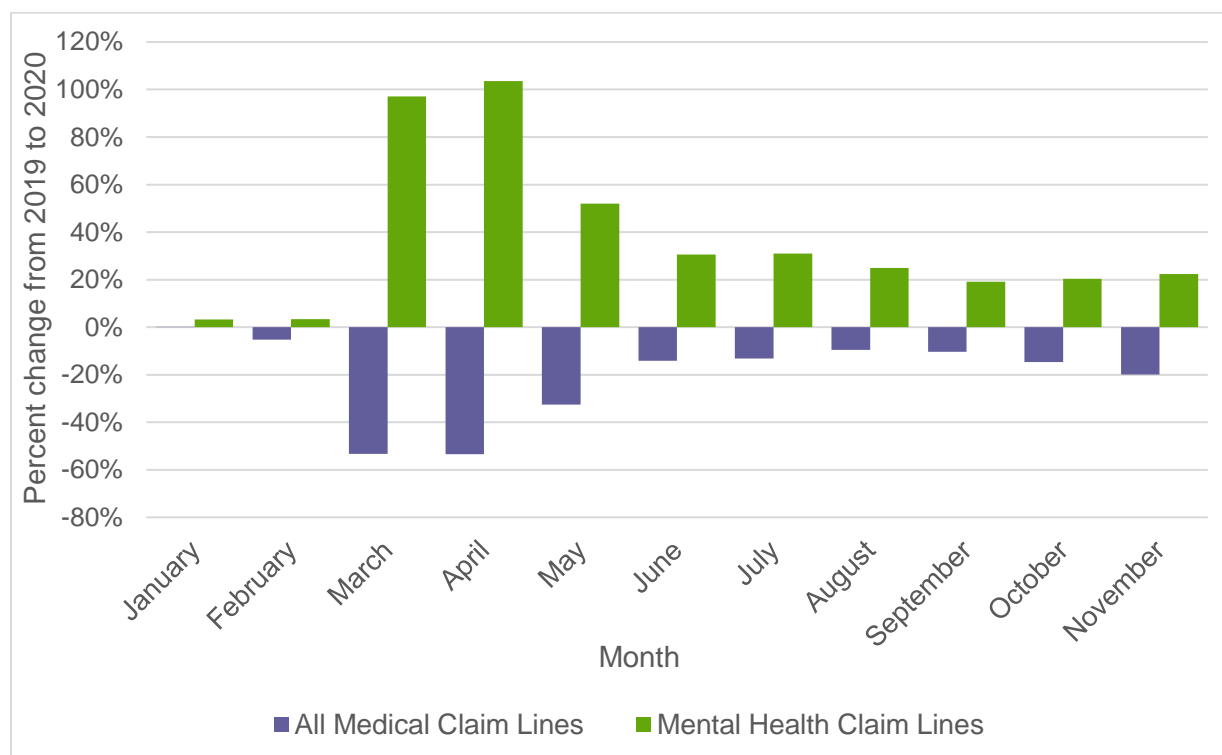


Figure 1. Percent change from January-November 2019 to January-November 2020 in mental health claim lines and all medical claim lines, age group 13-18 years

In January and February 2020, even before the pandemic began its rapid escalation in March, females accounted for 66 percent of total mental health claim lines in the 13-18 age group (figure 2). From March onward, however, the percentage of claim lines attributed to females climbed, reaching 71 percent in November, compared to 29 percent for males.

These results are generally consistent with other researchers' findings that women are nearly twice as likely as men to be diagnosed with a mental illness.¹⁷

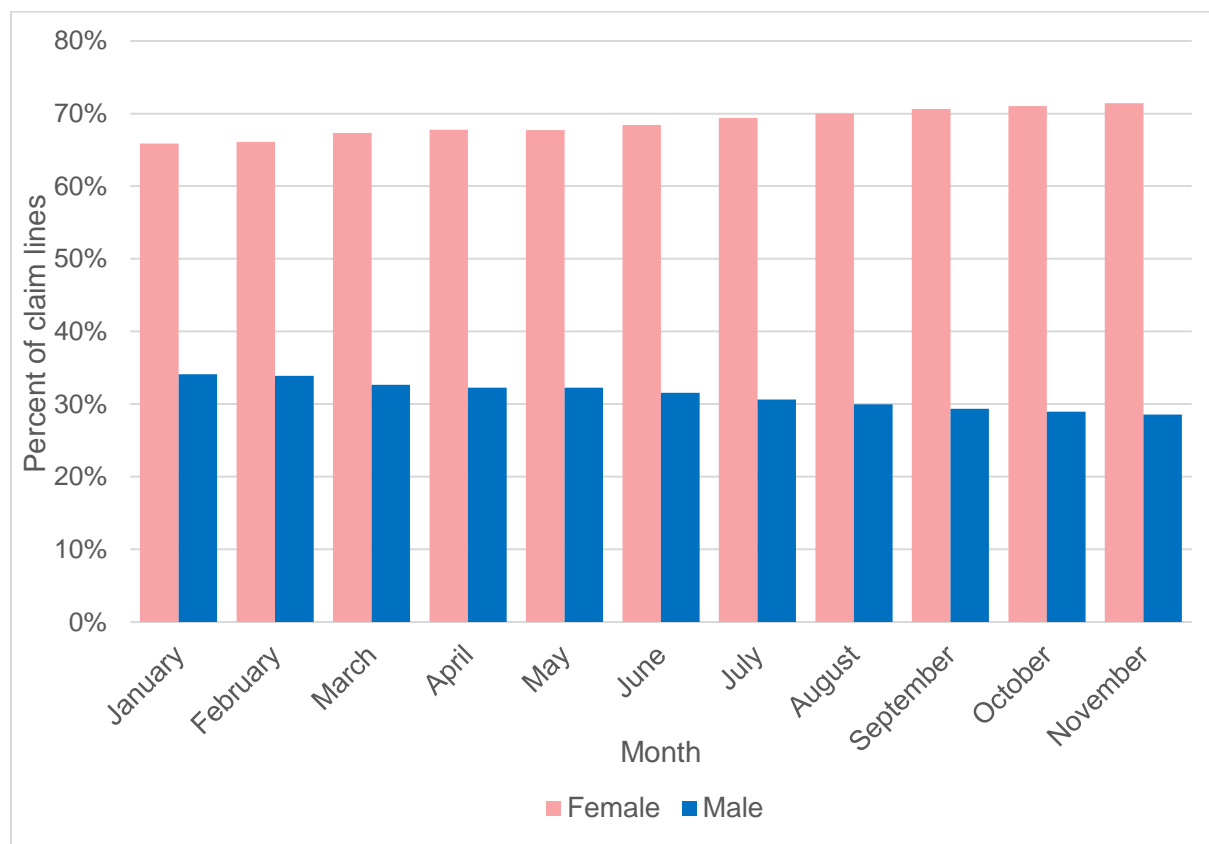


Figure 2. Distribution of mental health claim lines by gender, age group 13-18 years, January-November 2020

¹⁷ Shoukai Yu, "Uncovering the Hidden Impacts of Inequality on Mental Health: A Global Study," *Translational Psychiatry* 8 (May 18, 2018): 98, <https://doi.org/10.1038/s41398-018-0148-0>.

Similar to the pattern seen with the 13-18 age group (figure 1), there was an increase from March-November 2019 to March-November 2020 in mental health claim lines as a percentage of all medical claim lines in the 19-22 age group, along with a decrease in all medical claim lines in the same period (figure 3). In the 19-22 age group, the increase in mental health claim lines in March and April 2020 was, respectively, 67.1 percent and 74.9 percent, and the decrease in medical claim lines in those two months was, respectively, 40.1 percent and 38.1 percent. These changes were smaller than the corresponding changes in the 13-18 age group (figure 1).

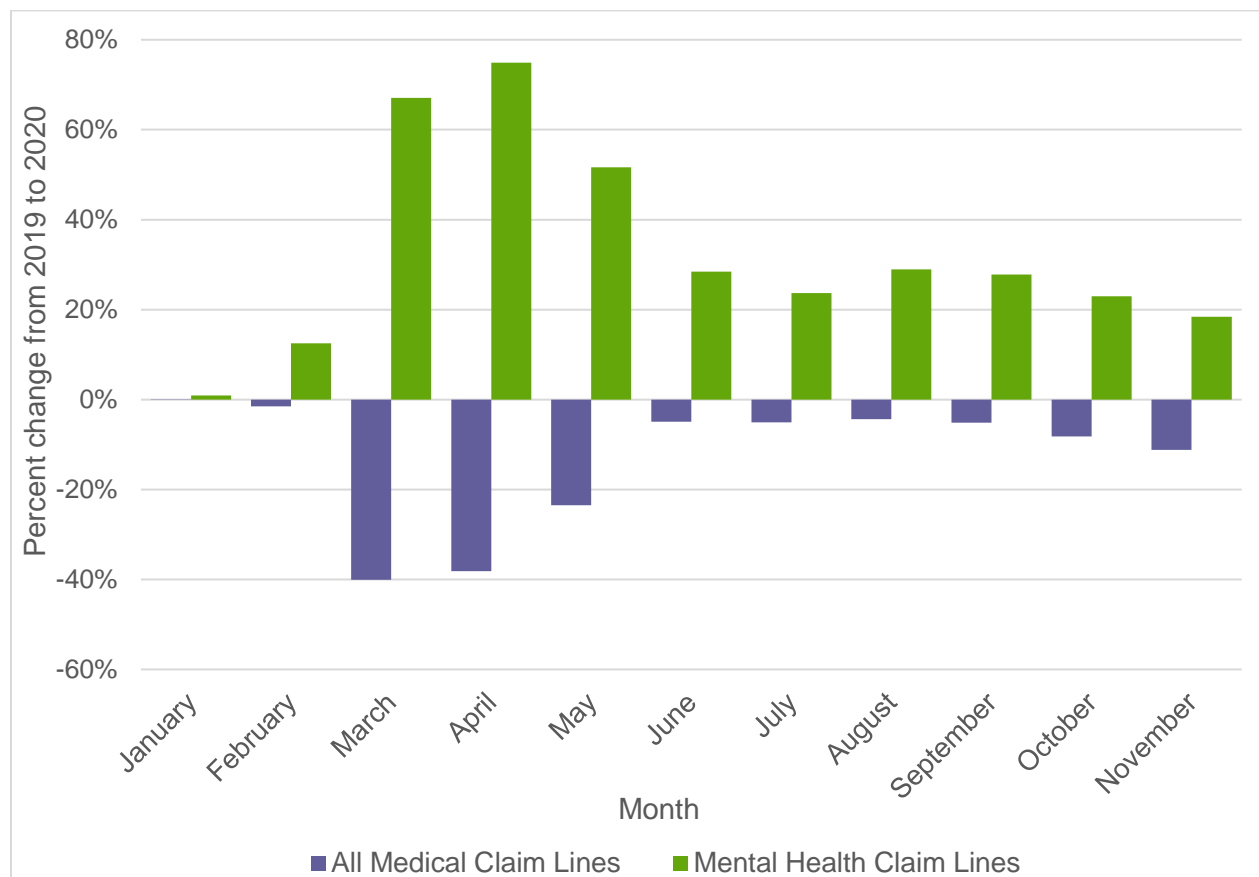


Figure 3. Percent change from January-November 2019 to January-November 2020 in mental health claim lines and all medical claim lines, age group 19-22 years

Similar to the change in gender distribution seen in the 13-18 age group (figure 2), the 19-22 age group began in January 2020 with females as 65 percent of the total distribution and ended in November with females accounting for 71 percent of the distribution (figure 4).

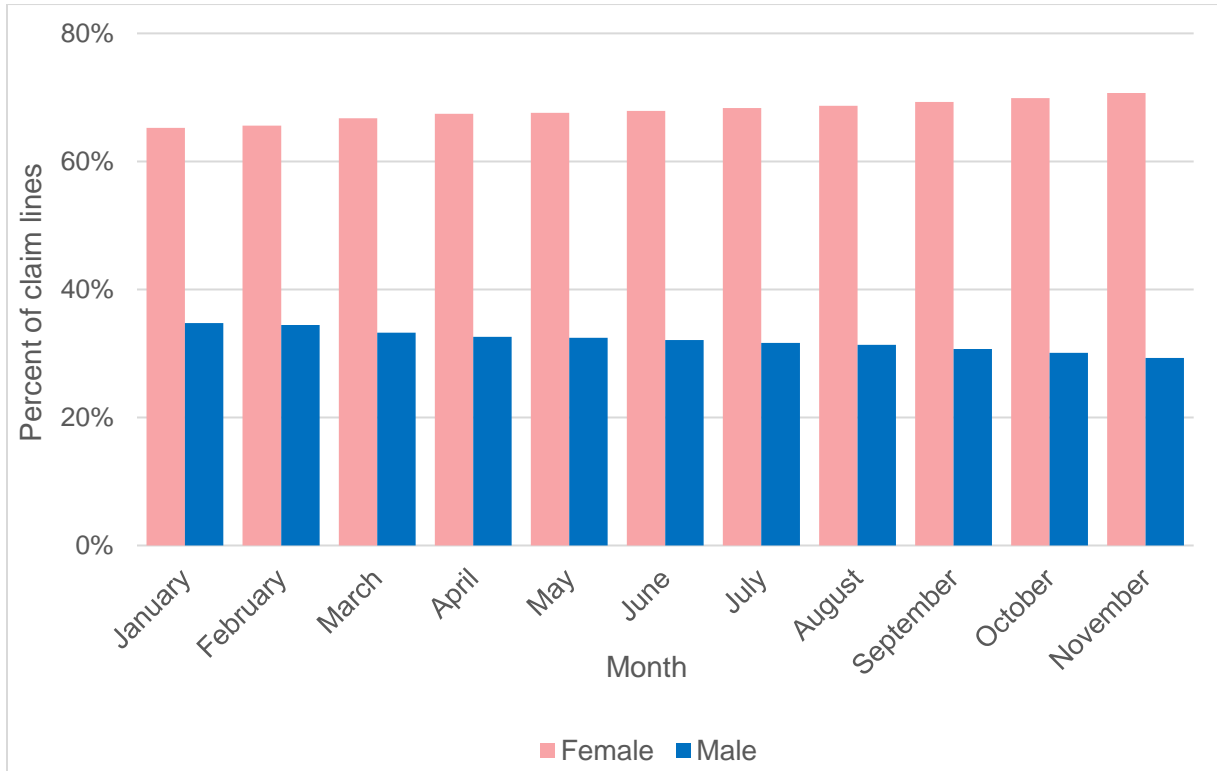


Figure 4. Distribution of mental health claim lines by gender, age group 19-22 years, January-November 2020

Intentional Self-Harm

Diagnoses of intentional self-harm increased substantially in the 13-18 age group in spring 2020 as compared to spring 2019 (figure 5). These diagnoses included intentional self-harm through such means as drowning, firearms, smoke or fire, sharp objects, blunt objects and crashing of a motor vehicle. Although typically associated with attempted suicide, intentional self-harm can include forms of self-harm without suicidal intent, such as “cutting,” intentional cutting or scratching of the skin. It has been noted that self-harm can serve as a proxy outcome to identify how the pandemic has affected mental health.¹⁸

In March 2020, claim lines for intentional self-harm as a percentage of all medical claim lines increased 90.71 percent, from 0.0130 percent of all medical claim lines in March 2019 to 0.0248 percent in the same month the following year. In April 2020, the increase was even larger, nearly doubling (99.83 percent) from 0.0137 percent of all medical claim lines in April 2019 to 0.0274 percent in April 2020. All other months for 2020 stayed above the corresponding months for 2019, with a rise of 89.64 percent in the single month from July to August 2020 (from 0.0121 percent of all medical claim lines to 0.0230 percent).

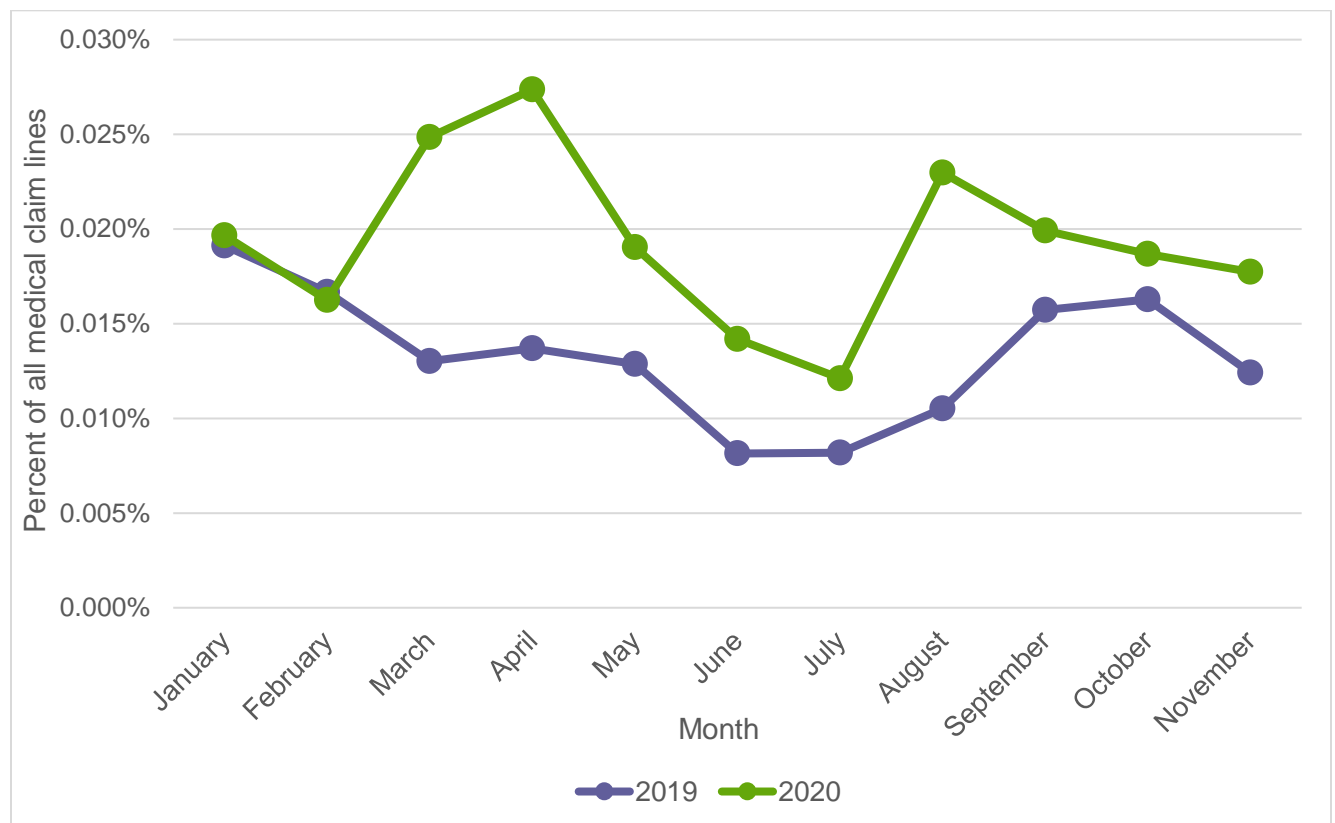


Figure 5. Intentional self-harm claim lines as percent of all medical claim lines, age group 13-18 years, January-November 2019 versus January-November 2020

¹⁸ Nav Kapur et al., “Effects of the COVID-19 Pandemic on Self-Harm,” *The Lancet Psychiatry* 8, no. 2 (February 1, 2021): E4, [https://doi.org/10.1016/S2215-0366\(20\)30528-9](https://doi.org/10.1016/S2215-0366(20)30528-9).

Reports of increases in attempted suicide and suicide risk in young people during the pandemic are widespread in the United States,^{19,20} though a British analysis found no indication that the pandemic had caused self-harm rates to rise in the United Kingdom.²¹

Month-by-month gender analysis of intentional self-harm claim lines from January to November 2020 shows that, in the 13-18 age group, females were approximately 2.5 to 5 times as likely to be treated for intentional self-harm as males (figure 6). At the height of the disparity, in August, females accounted for 84 percent of the distribution, males for 16 percent.

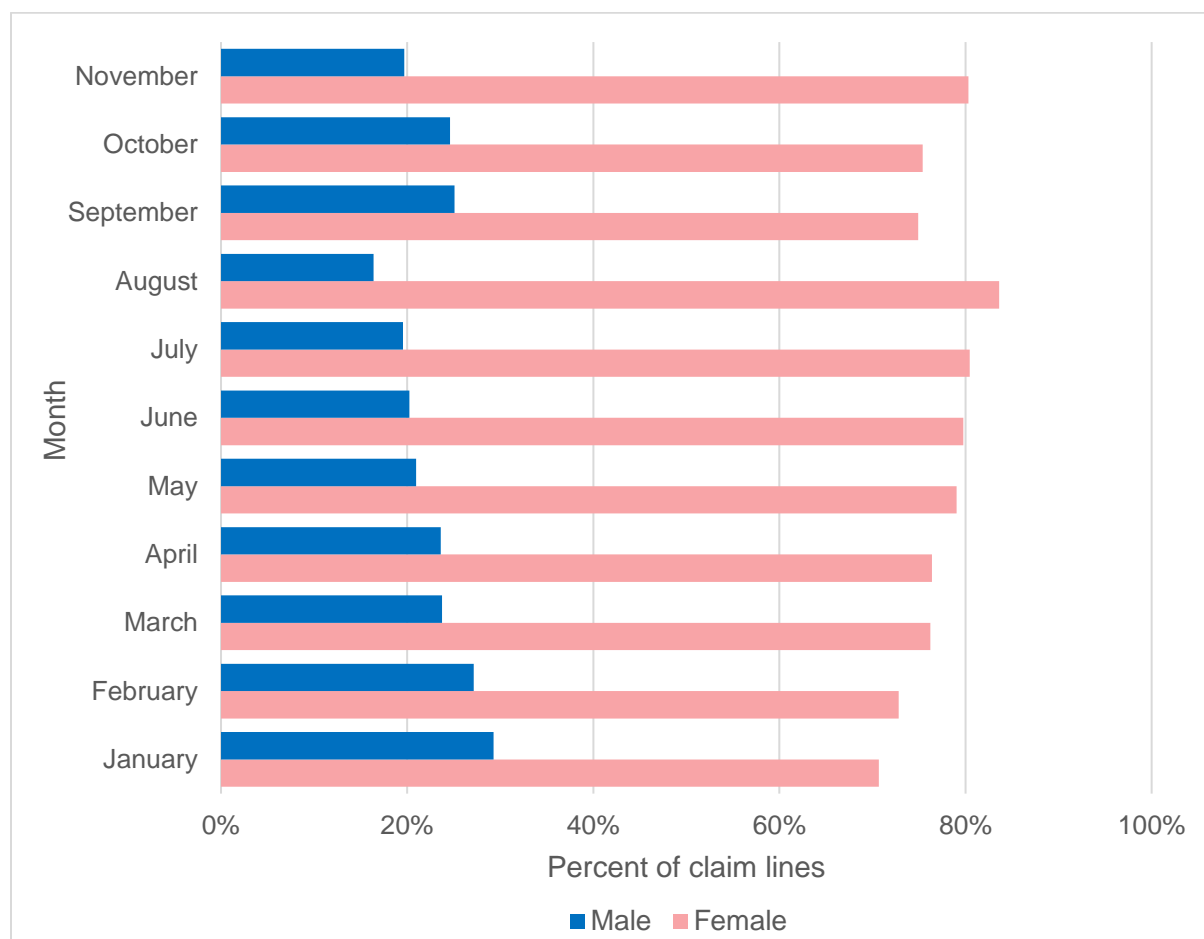


Figure 6. Distribution of intentional self-harm claim lines by gender, age group 13-18 years, January-November 2020

¹⁹ Rhitu Chatterjee, “Child Psychiatrists Warn That the Pandemic May Be Driving Up Kids’ Suicide Risk,” NPR WNYC, February 2, 2021, <https://www.npr.org/sections/health-shots/2021/02/02/962060105/child-psychiatrists-warn-that-the-pandemic-may-be-driving-up-kids-suicide-risk>.

²⁰ Ryan M. Hill et al., “Suicide Ideation and Attempts in a Pediatric Emergency Department before and during COVID-19,” *Pediatrics* 147, no. 2 (February 1, 2021): e2020029280, <https://doi.org/10.1542/peds.2020-029280>.

²¹ Kapur et al., “Effects of the COVID-19 Pandemic on Self-Harm.”

In the age group 19-22, there were some increases in intentional self-harm as a percentage of all medical claim lines in 2020 compared to 2019 (figure 7), but not the persistent rise found in the age group 13-18 (figure 5). For the 19-22 age group, the increase in March was 16.41 percent (from 0.0120 percent of all medical claim lines in 2019 to 0.0140 percent in 2020), and in April 30.14 percent (from 0.0128 percent in 2019 to 0.0166 in 2020). These were much smaller increases than in the 13-18 age group. The 2020 rate then stayed close to the previous year's rate, except for a sharp increase of 52.05 percent from 0.0110 percent of all medical claim lines in September 2020 to 0.0168 percent in October 2020.

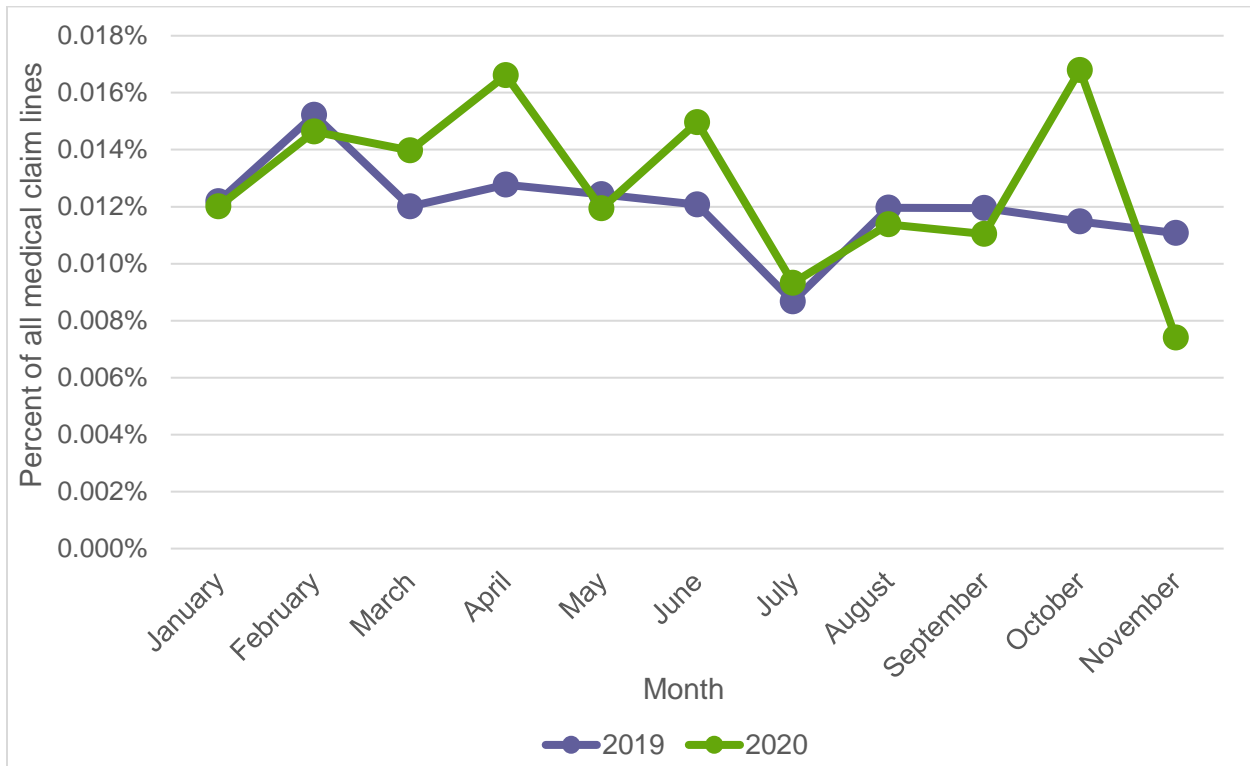


Figure 7. Intentional self-harm claim lines as percent of all medical claim lines, age group 19-22 years, January-November 2019 versus January-November 2020

As in the age group 13-18 (figure 6), the gender distribution in the age group 19-22 from January to November 2020 showed that females were more likely than males to be treated for intentional self-harm (figure 8). But the gender disparity was generally lower, with the female share of the distribution reaching between approximately 1.2 and 2.5 times that of males throughout the year. The disparity was lowest in August, when females accounted for 55 percent of the distribution compared to 45 percent for males.

Other researchers have found that intentional self-harm is associated with females more than males,²² and age-related differences similar to the FAIR Health results have also been noted. In one study, the ratio of females to males for deliberate self-harm was 3.1 to 1 in 15-19-year-olds but 1.6 to 1 in 20-24-year-olds.²³

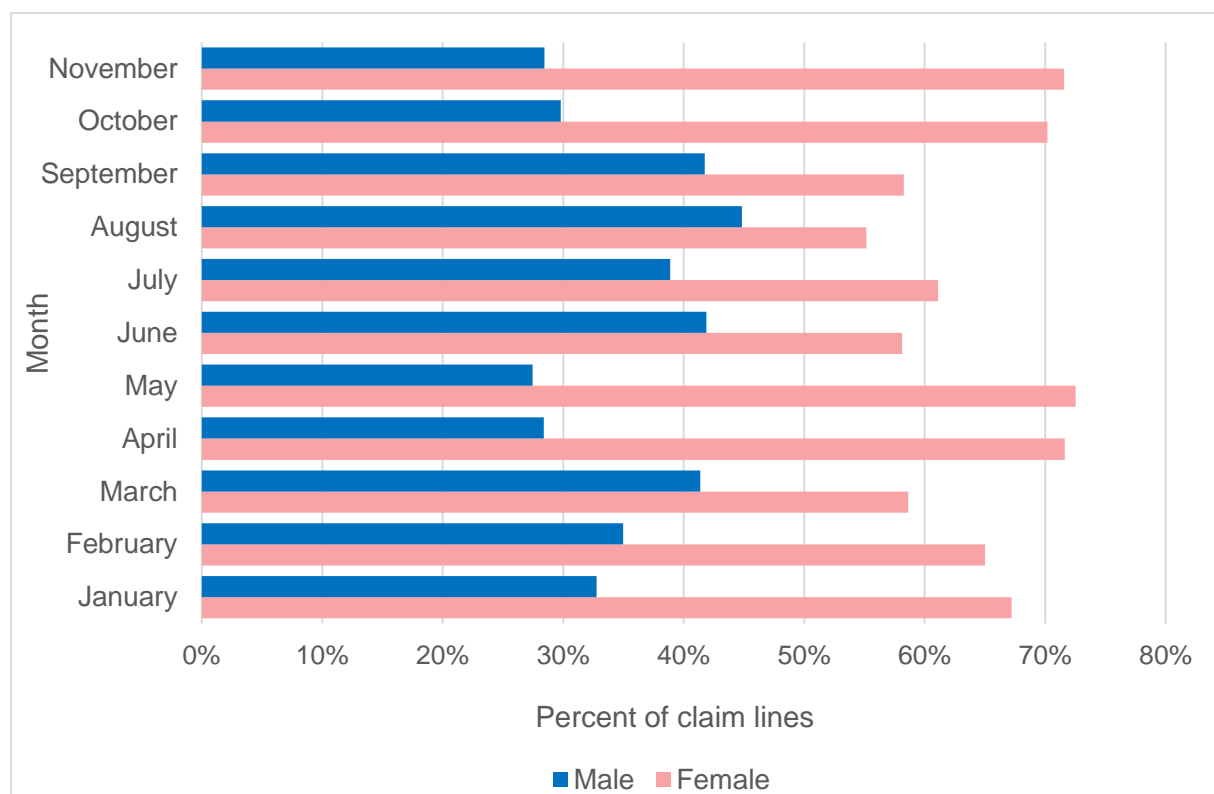


Figure 8. Distribution of intentional self-harm claim lines by gender, age group 19-22 years, January-November 2020

²² Konrad Bresin and Michelle Schoenleber, "Gender Differences in the Prevalence of Nonsuicidal Self-Injury: A Meta-Analysis," *Clinical Psychology Review* 38 (June 2015): 55-64, <https://doi.org/10.1016/j.cpr.2015.02.009>.

²³ Keith Hawton and Louise Harriss, "The Changing Gender Ratio in Occurrence of Deliberate Self-Harm across the Lifecycle," *Crisis* 29, no. 1 (2008): 4-10, <https://doi.org/10.1027/0227-5910.29.1.4>.

Changes in the extent of intentional self-harm during the pandemic varied by region,²⁴ as can be seen by comparing January-November 2019 to January-November 2020 for the age group 13-18 (figure 9). Most notably, in August 2020 in the Northeast, there was a 333.93 percent increase in intentional self-harm claim lines as a percentage of all medical claim lines from 2019 to 2020, a rate higher than that in any other region in any month studied for that age group. The Northeast also had high increases in April (127.47 percent) and November (108.13 percent).

The West had its highest increase in June (172.32 percent) and the South had its highest in April and May (168.46 percent and 162.94 percent, respectively). The Midwest had its highest increase in March (161.61 percent) and another relatively high mark in August (101.19 percent).

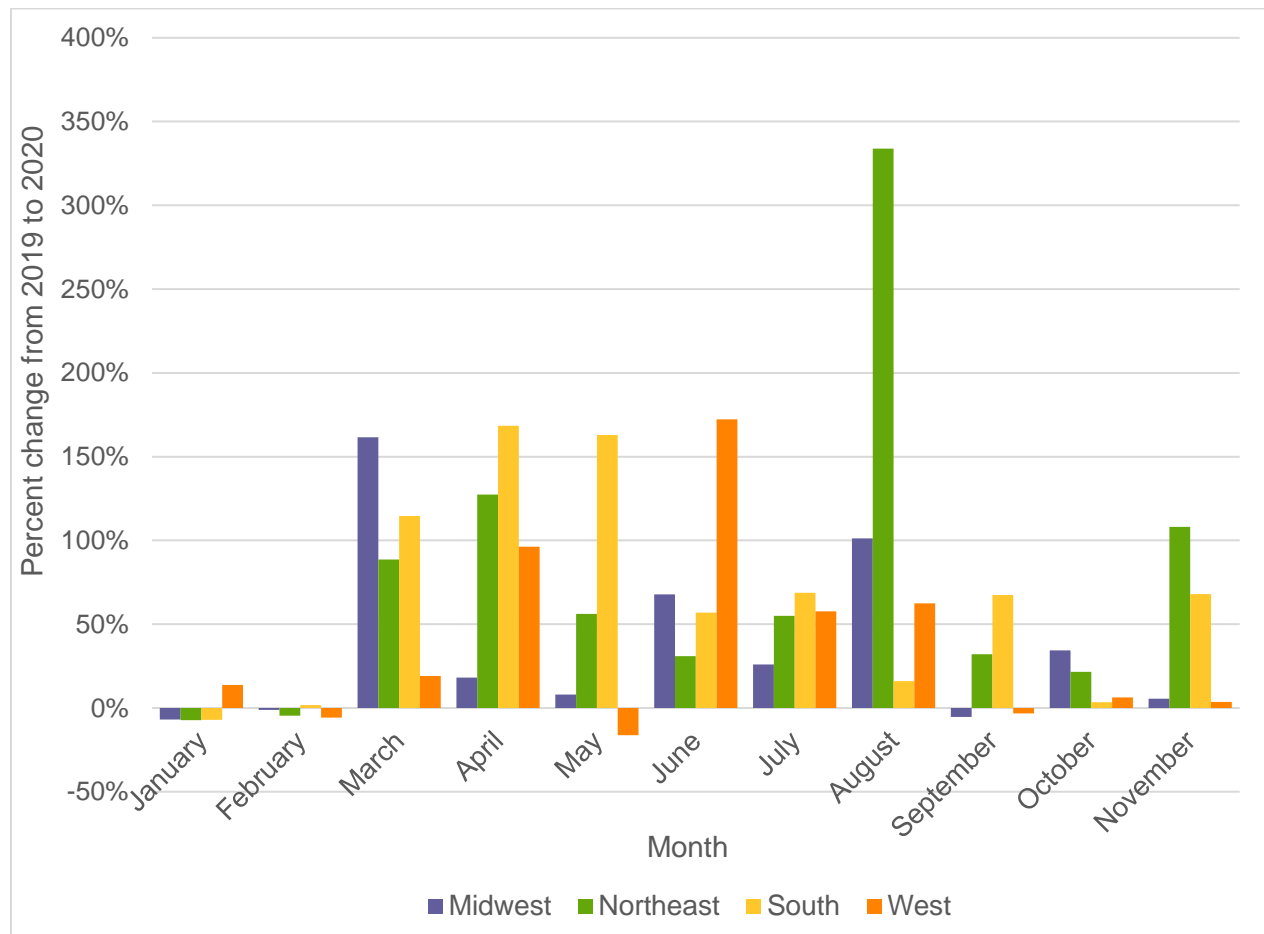


Figure 9. Percent change from January-November 2019 to January-November 2020 in intentional self-harm claim lines, age group 13-18 years, by region

²⁴ The states in the US census regions are:

- **Midwest:** Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin;
- **Northeast:** Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont;
- **South:** Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia; and
- **West:** Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.

Overdoses and Substance Use Disorders

Although the focus of this report is not substance use disorders, a broad view of overdoses and substance use disorders in January-November 2020 as compared to the same months in 2019 in the age group 13-18 is informative (figure 10). Claim lines for overdoses, which encompass drugs and other substances, including alcohol, and which may include suicide attempts and fatalities, increased 94.91 percent as a percentage of all medical claim lines in March 2020 and 119.31 percent in April 2020 over the same months the year before. April was the peak month, but overdose claim lines continued above 2019 levels throughout the remaining months to November.

Claim lines for substance use disorders also increased in March (64.64 percent) and April (62.69 percent) 2020, but not as much as for overdoses. In later months, substance use disorder claim lines declined, falling below 2019 levels from September to November.

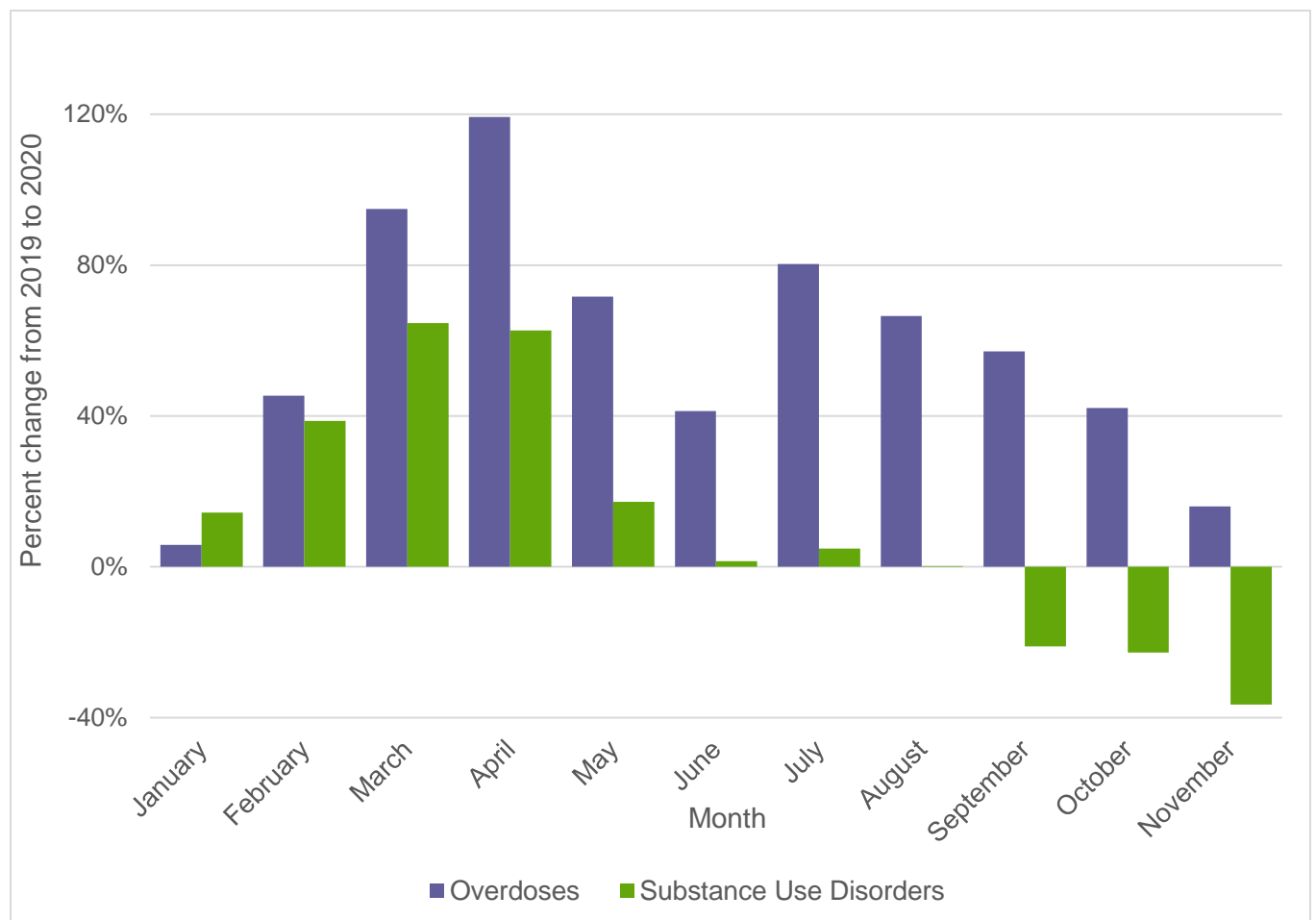


Figure 10. Percent change from January-November 2019 to January-November 2020 in overdose claim lines and substance use disorder claim lines, age group 13-18 years

The results regarding overdoses and substance use disorders are similar for individuals aged 19-22 (figure 11) as for those aged 13-18 (figure 10). In the 19-22 age group, claim lines for overdoses peaked in the spring, as they did for the younger population, but in this case the greatest increase was in May 2020, when overdose claim lines as a percentage of all medical claim lines rose 64.83 percent over May 2019. That peak was lower than the peak in the 13-18 age group, 119.31 percent in April 2020. Afterward, in the 19-22 age group, overdose claim lines remained above 2019 levels for all but two months, September and November.

In the 19-22 age group, claim lines for substance use disorders rose in March (24.25 percent) and April (26.86 percent) 2020 as a percentage of all medical claim lines, but not as much as they did in the younger age group. Substance use disorder claim lines fell below 2019 levels beginning in June for this age group, while this decrease did not occur until September for the 13-18 age group.

Overdose trends identified by FAIR Health are consistent with CDC findings regarding overdose deaths. The CDC reported the highest number of US overdose deaths ever recorded in a 12-month period (over 81,000) for the 12 months ending in May 2020.²⁵ Although deaths were already increasing before the onset of COVID-19, the rate accelerated during the pandemic.

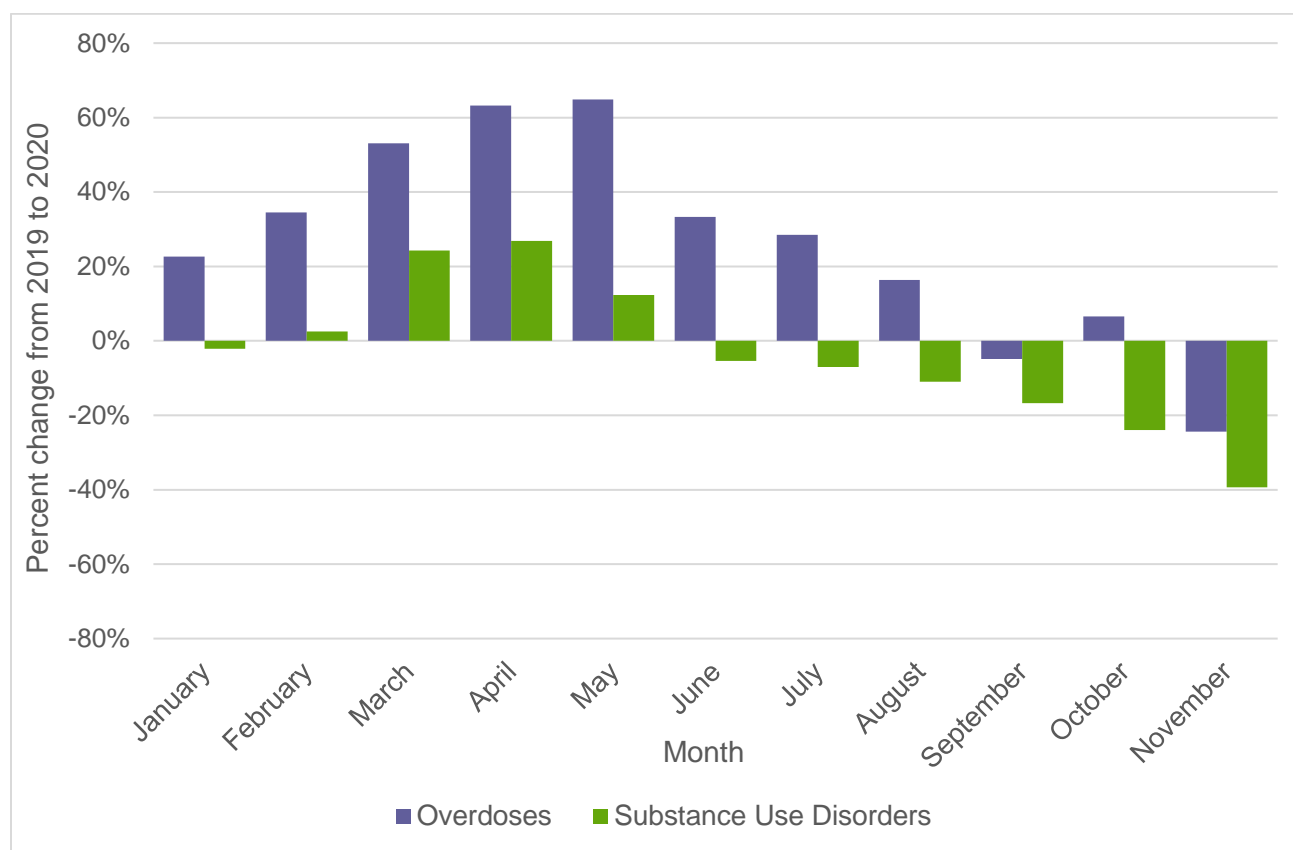


Figure 11. Percent change from January-November 2019 to January-November 2020 in overdose claim lines and substance use disorder claim lines, age group 19-22 years

²⁵ Centers for Disease Control and Prevention, “Overdose Deaths Accelerating during COVID-19,” press release, December 17, 2020, <https://www.cdc.gov/media/releases/2020/p1218-overdose-deaths-covid-19.html>.

Top Mental Health Diagnoses

Although the focus of this report is on people aged 13-22, the COVID-19 pandemic has brought about some changes in the age group 6-12 that are worth noting. In this age group, the top mental health diagnosis from January to November 2020 was attention-deficit hyperactivity disorder. Claim lines for that diagnosis, however, decreased as a percentage of all medical claim lines throughout that period from their levels in the corresponding months of 2019 (figure 12). One possible reason for the decline was that many children were learning remotely, and teachers observing children in the classroom are typically the first to suggest a diagnosis of attention-deficit hyperactivity disorder.²⁶ At the same time, claim lines for two less common diagnoses, obsessive-compulsive disorder and tic disorders (which ranked, respectively, at numbers 10 and 11 in January 2020 among mental health diagnoses for this age group), increased from 2019 levels as a percentage of all medical claim lines. The increase in obsessive-compulsive disorder claim lines began in March (26.8 percent) and persisted through November (6.7 percent) 2020. Tic disorder claim lines fell in March (27.2 percent), but then stayed above 2019 levels through November (28.7 percent).

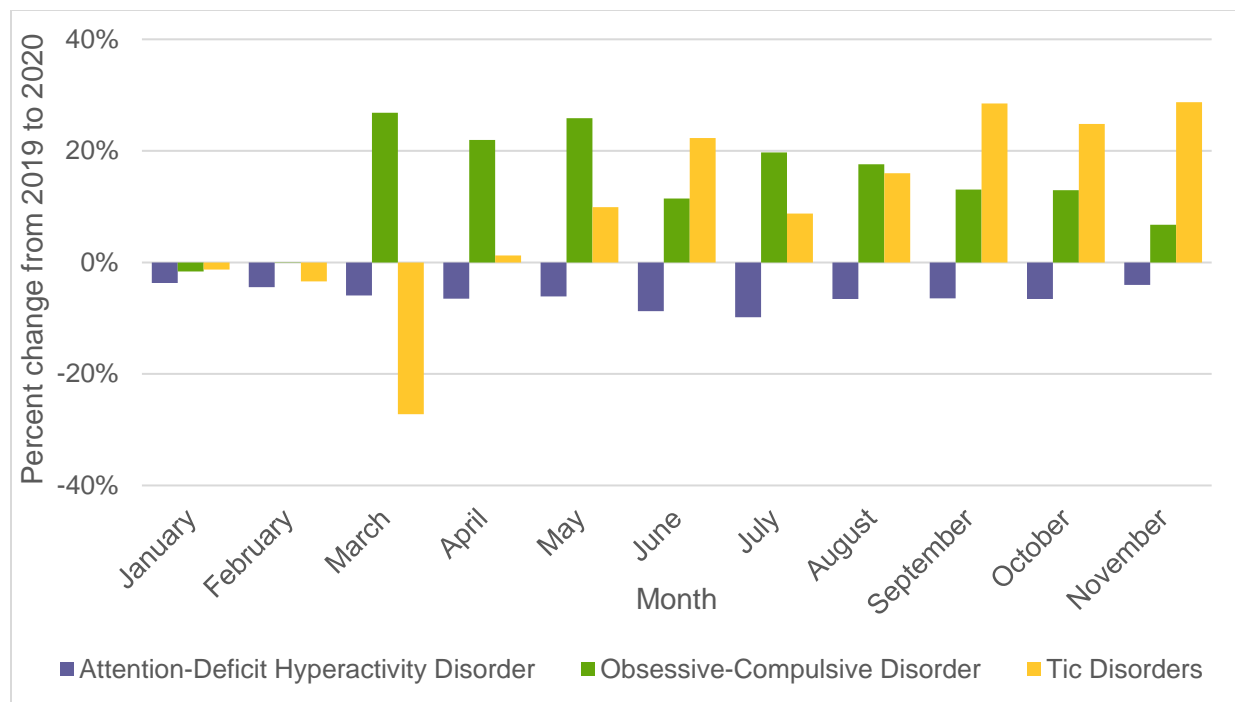


Figure 12. Percent change from January-November 2019 to January-November 2020 in claim lines for attention-deficit hyperactivity disorder, obsessive-compulsive disorder and tic disorders, age group 6-12 years

²⁶ Leonard Sax and Kathleen J. Kautz, "Who First Suggests the Diagnosis of Attention-Deficit/Hyperactivity Disorder?," *Annals of Family Medicine* 1, no. 3 (September 2003): 171-74, <https://doi.org/10.1370/afm.3>.

A Danish study found that children and adolescents (aged 7-21) showed a worsening of obsessive-compulsive disorder symptoms, as well as anxiety and depressive symptoms, during the COVID-19 pandemic.²⁷ An Italian study found a worsening of symptoms, including tics, in children and adolescents with Tourette syndrome during the pandemic.²⁸

²⁷ J. B. Nissen, D. R. M. A. Højgaard and P. H. Thomsen, "The Immediate Effect of COVID-19 Pandemic on Children and Adolescents with Obsessive Compulsive Disorder," *BMC Psychiatry* 20 (October 20, 2020): 511, <https://doi.org/10.1186/s12888-020-02905-5>.

²⁸ Giulia Conte et al., "Adverse Mental Health Impact of the COVID-19 Lockdown in Individuals with Tourette Syndrome in Italy: An Online Survey," *Frontiers in Psychiatry* (November 30, 2020), <https://doi.org/10.3389/fpsy.2020.583744>.

Among individuals aged 13-18, the top three mental health conditions from January to November 2020 were consistently, in order from most to least common, major depressive disorder, generalized anxiety disorder and adjustment disorders. Certain other diagnoses in the top 10 mental health conditions, however, shifted position. For example, eating disorders moved from number 6 to number 5 in August 2020 and stayed there through November. Post-traumatic stress disorder moved from number 8 to number 7 in the months of March to July, dropped down again to number 8 from August to October, and returned to number 7 in November.

Even though the top three conditions remained the same from January to November 2020, claim lines for those conditions as a percentage of all medical claim lines increased from their 2019 levels (figure 13). The most dramatic increases occurred in March and April. In April 2020, generalized anxiety disorder increased 93.6 percent over April 2019, while major depressive disorder increased 83.9 percent and adjustment disorders 89.7 percent. The increases diminished in subsequent months but remained at more than 10 percent. The smallest increases happened in September: for generalized anxiety disorder, 11.3 percent; major depressive disorder, 13.8 percent; and adjustment disorders, 10.6 percent. Schools started to reopen in August and September, in many cases in person,²⁹ which may have allayed some of students' fears.

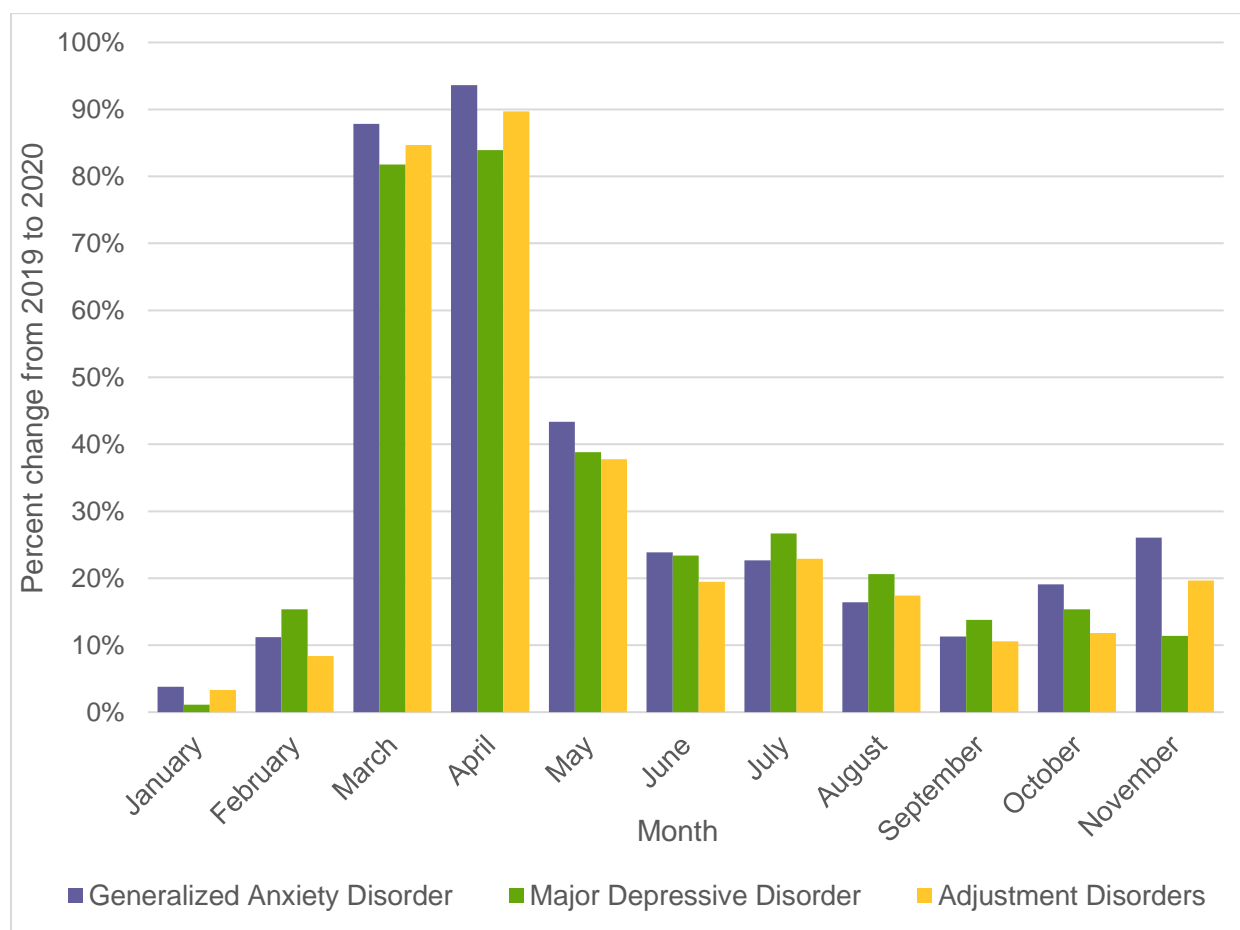


Figure 13. Percent change from January-November 2019 to January-November 2020 in claim lines for top three mental health conditions, age group 13-18 years

²⁹ "Where Schools Are Reopening in the US," CNN, updated February 22, 2021, <https://www.cnn.com/interactive/2020/health/coronavirus-schools-reopening/>.

In January and February 2020, prior to the spring wave of the pandemic, mental health services for patients aged 13-18 were overwhelmingly rendered in an office setting (figure 14). In January, for example, 97.4 percent of mental health services for this age group occurred in offices, and only 1.6 percent via telehealth. But in March and April, when states banned nonemergency medical visits and patients avoided in-person care for fear of infection with COVID-19, telehealth surged as a venue of care for mental health conditions. In April, telehealth surpassed the office as the preferred setting for mental health treatment in this age group, accounting for 69.3 percent of mental health services compared to 30.0 percent for offices. Telehealth remained in first place through November, when it accounted for 69.5 percent of mental health services, compared to 29.8 percent for offices.

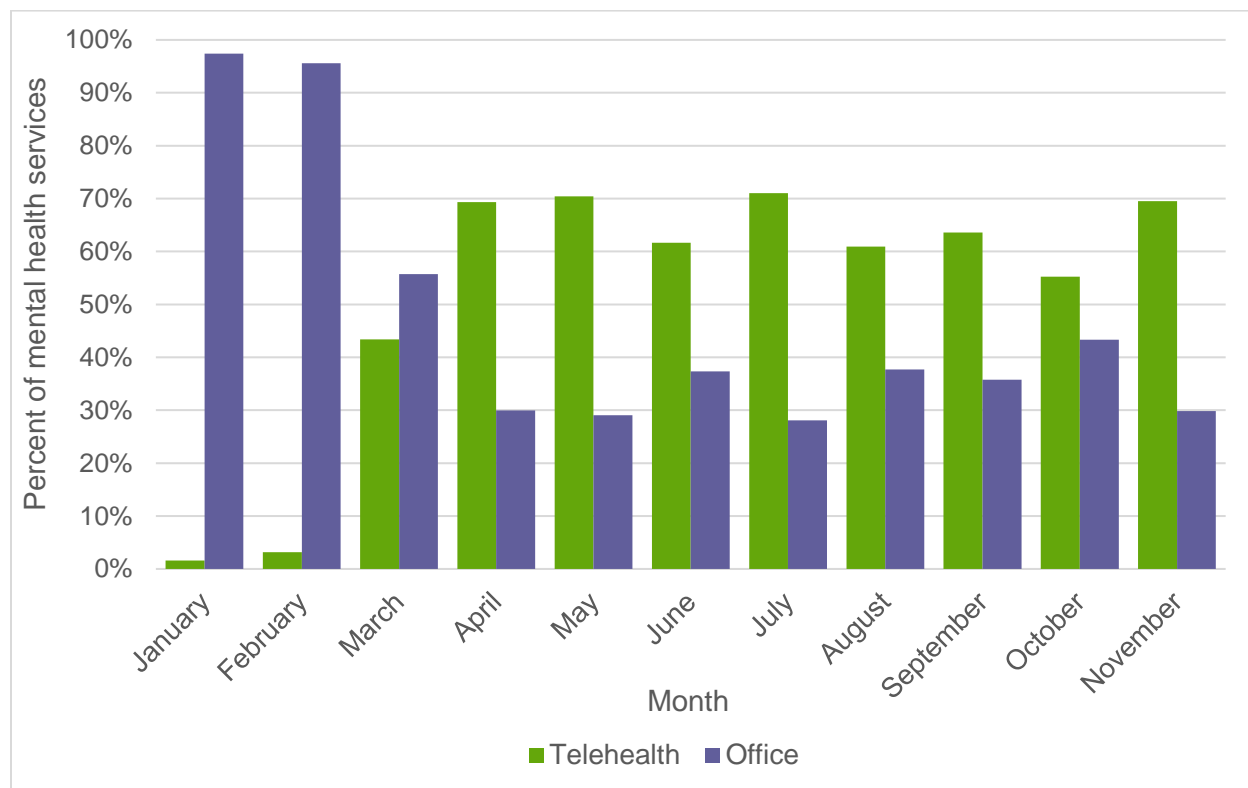


Figure 14. Telehealth versus the office as percent of mental health services, age group 13-18 years, January-November 2020³⁰

³⁰ Percentages for telehealth and the office in figures 14 and 16 do not add up to 100 percent because services were also rendered in other places of service not shown here, such as ERs and inpatient and outpatient facilities.

As in the case of individuals aged 13-18, the top three mental health conditions for individuals aged 19-22 from January to June 2020 were, in order from most to least common, major depressive disorder, generalized anxiety disorder and adjustment disorders. But unlike in the younger age group, in the age group 19-22 a change happened in the summer: From July to November, generalized anxiety disorder rose to become the number 1 mental health condition and major depressive disorder dropped to number 2. Adjustment disorders stayed at number 3 throughout the period.

As in the 13-18 age group, in the 19-22 age group post-traumatic stress disorder rose from number 8 to number 7 during certain months—in this case, April-May and July-November.

When compared to 2019 levels, 2020 levels of claim lines as a percentage of all medical claim lines for the top three mental health conditions for the age group 19-22 (figure 15) show a similar pattern to those for the age group 13-18 (figure 13): large increases in March and April 2020, followed generally by smaller but persistent increases. But in the 19-22 cohort, generalized anxiety disorder and adjustment disorders had consistently greater increases than major depressive disorder. In April 2020, for example, generalized anxiety disorder increased over the same month in 2019 by 67.5 percent, major depressive disorder by 49.6 percent and adjustment disorders by 66.8 percent. Generalized anxiety disorder and adjustment disorders continued to have higher increases than major depressive disorder through October. In November, major depressive disorder dropped 0.2 percent below the November 2019 level, while generalized anxiety disorder was 19.7 percent above and anxiety disorders were 24.5 percent above.

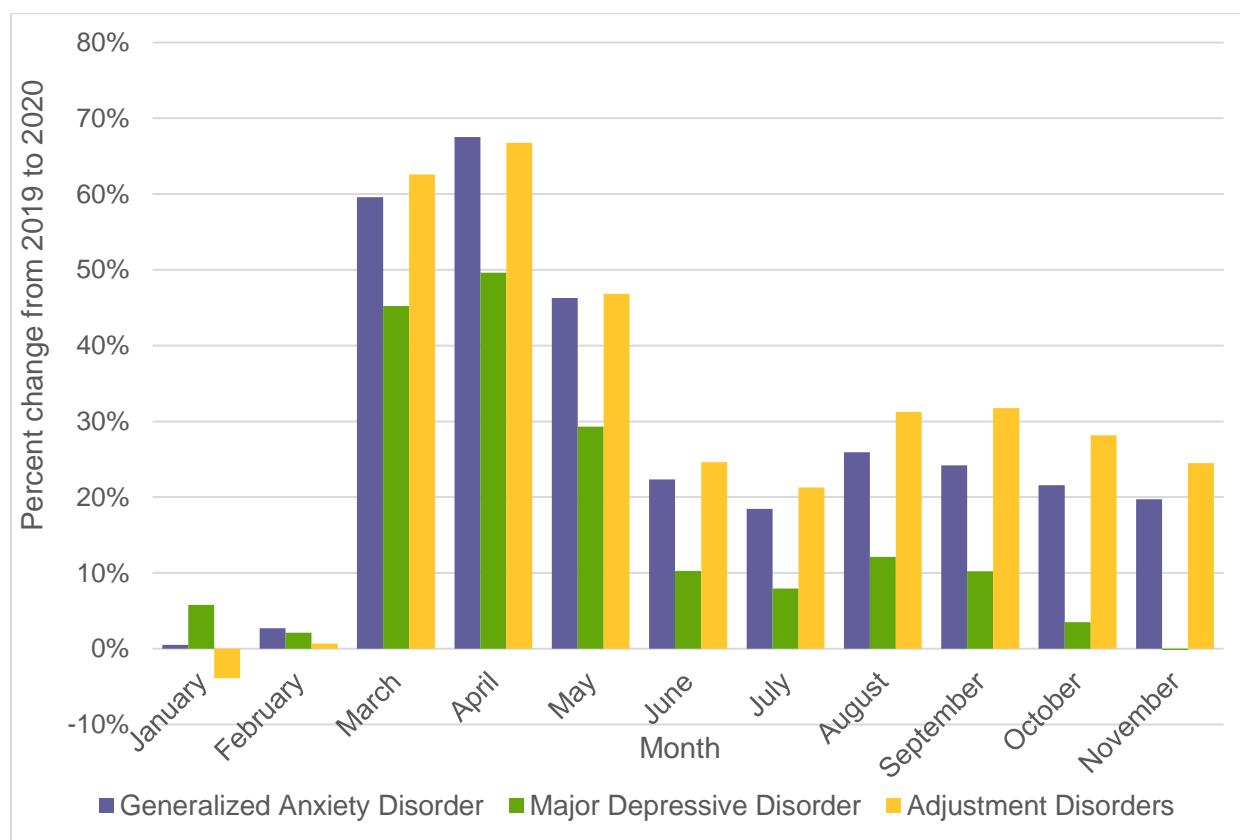


Figure 15. Percent change from January–November 2019 to January–November 2020 in claim lines for top three mental health conditions, age group 19-22 years

Just as for patients aged 13-18 (figure 14), the office setting predominated for delivery of mental health services to patients aged 19-22 in January and February 2020, before telehealth became predominant (figure 16). In the 19-22 age group, however, telehealth first surpassed the office for mental health services in March rather than April 2020. Additionally, in the 19-22 age group, the change was not only sustained but fairly stable, with telehealth steadily capturing between about 61 and 66 percent of mental health services from April to October. In November, telehealth climbed even higher, to 71.71 percent.

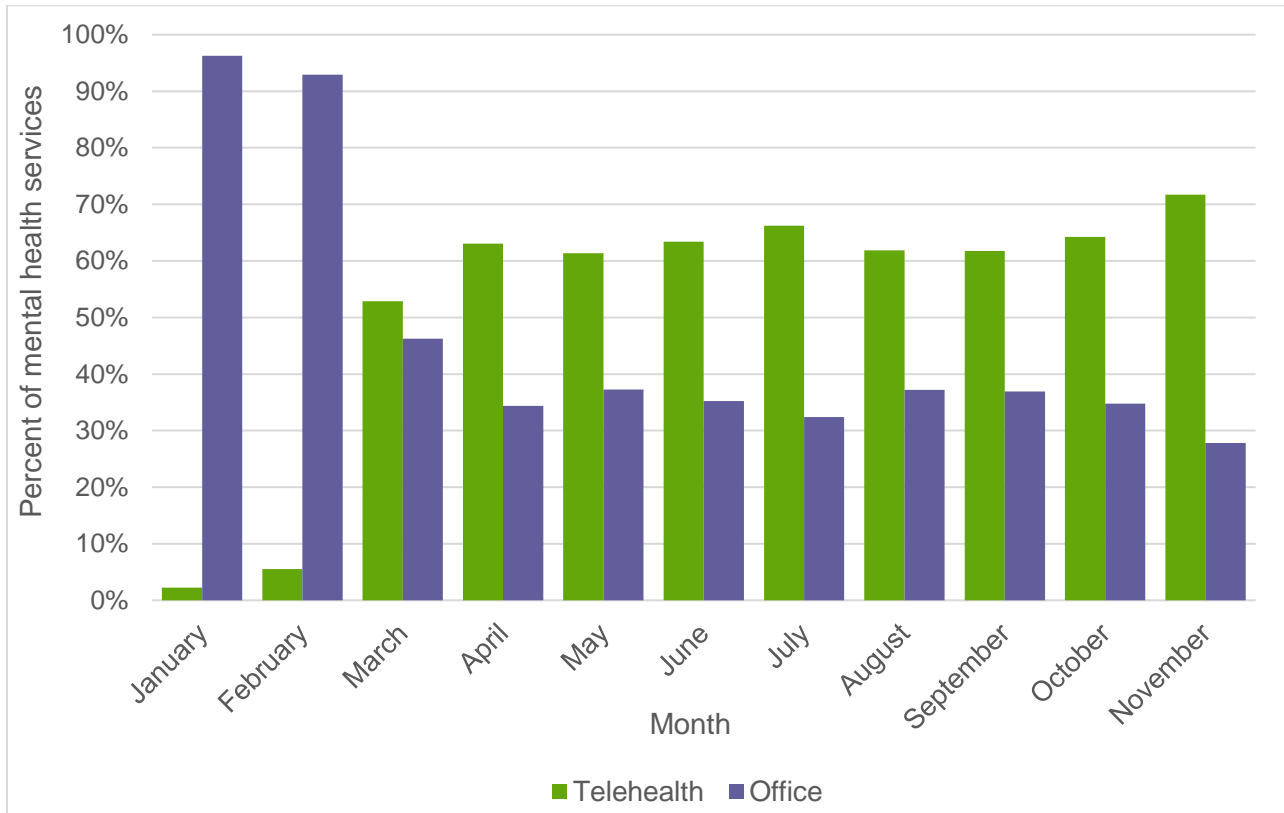


Figure 16. Telehealth versus the office as percent of mental health services, age group 19-22 years, January-November 2020

Emergency Room Visits

In the 13-18 age group, mental health conditions were the seventh most common reason for ER visits in 2019 and the sixth most common in 2020. When claim lines for the six most common conditions from March to November 2020 are compared to their 2019 levels, it is clear that claim lines for most of the conditions aside from mental health decreased (figure 17). In March 2020, injury to body; sprains, strains, breaks and fractures; abdominal and pelvic pain and tenderness; head injury; and general signs and symptoms all fell below the level of March 2019, while mental health conditions increased 8.3 percent. In subsequent months, conditions such as injury to body and abdominal and pelvic pain and tenderness showed some increases, but mental health conditions had the most consistent growth, reaching a peak of 22.8 percent in September.

These findings are consistent with a CDC report showing that, from April to October 2020, compared with 2019, the proportion of mental health-related ER visits for patients aged 5-11 and 12-17 increased approximately 24 percent and 31 percent, respectively.³¹

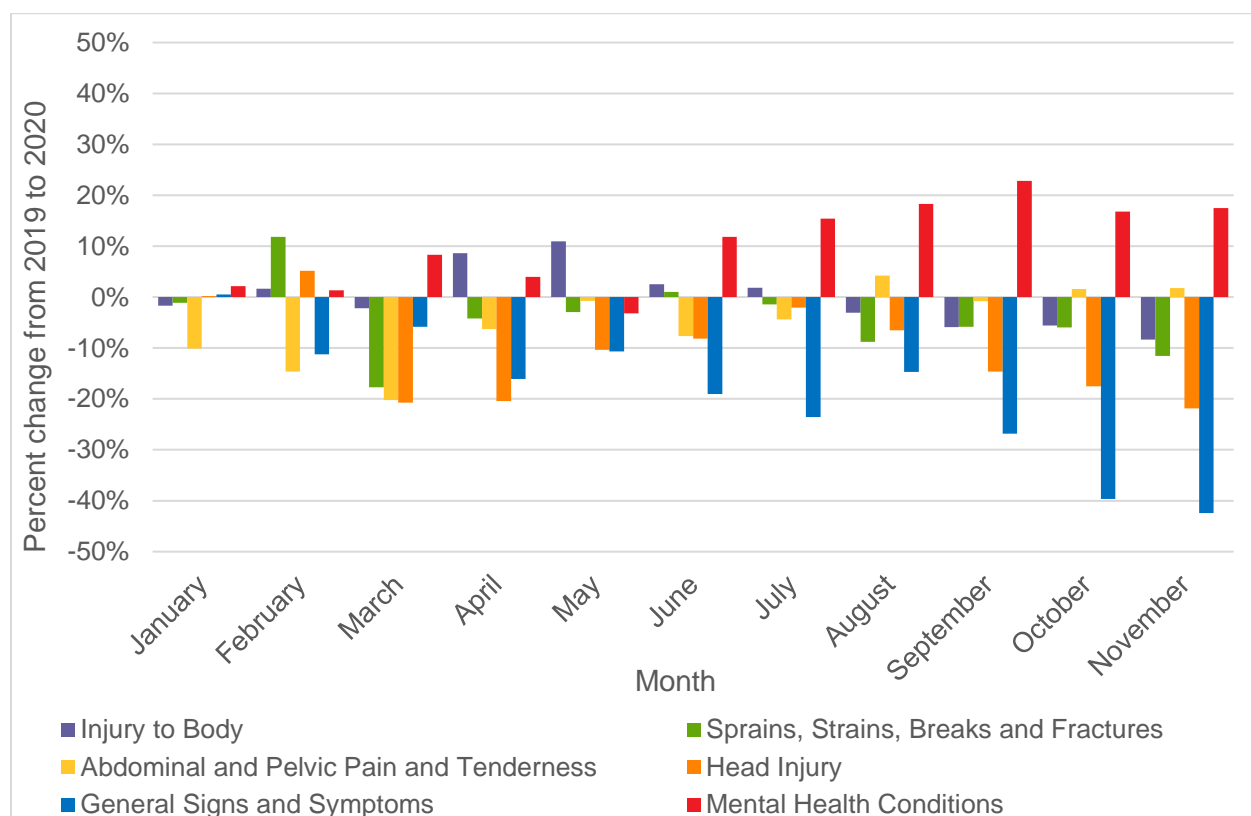


Figure 17. Percent change from January-November 2019 to January-November 2020 in top reasons for emergency room visits, age group 13-18 years

³¹ Leeb et al., "Mental Health-Related Emergency Department Visits among Children Aged <18 Years during the COVID-19 Pandemic."

Of the mental health conditions commonly seen in ERs in the 13-18 age group, major depressive disorder and generalized anxiety disorder were at the top. By comparison with 2019, 2020 levels of major depressive disorder increased in March and throughout the period June-November, with the peak increase 28.89 percent in September (figure 18). Generalized anxiety disorder increased over 2019 levels every month from March to November 2020, with its peak increase 30.14 percent in November.

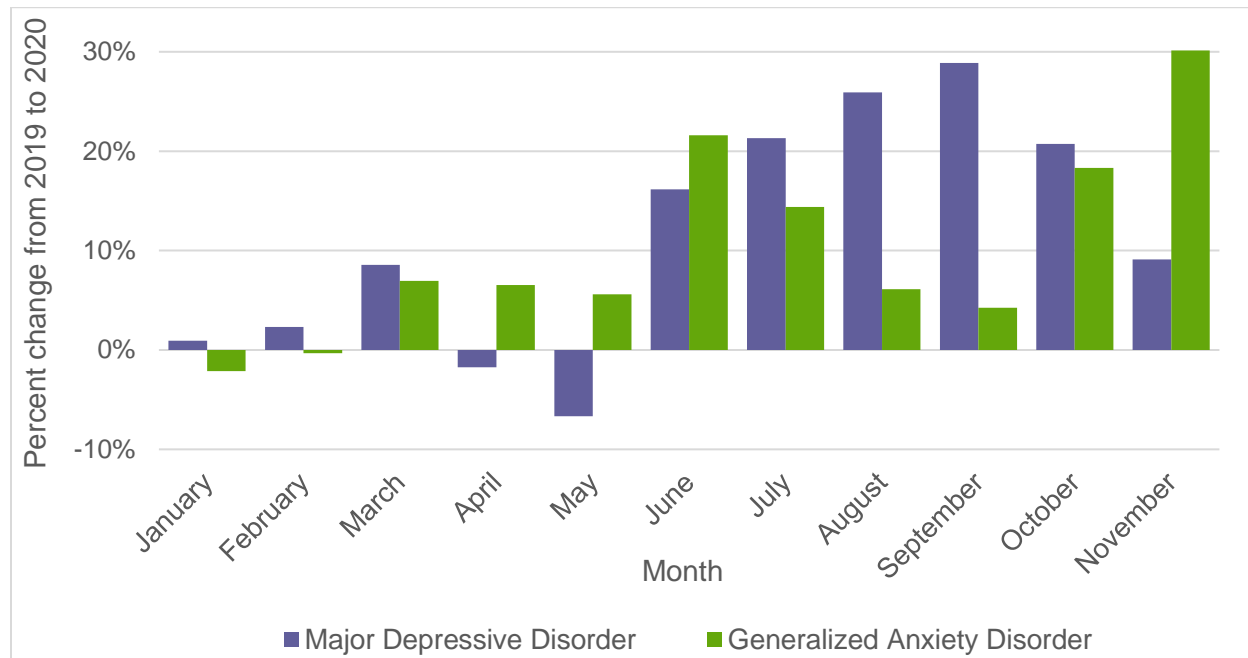


Figure 18. Percent change from January-November 2019 to January-November 2020 in emergency room claim lines related to major depressive disorder and generalized anxiety disorder, age group 13-18 years

For the 19-22 age group, the top reasons in 2020 for ER visits (figure 19) were similar but not identical to those for the 13-18 cohort (figure 17): abdominal and pelvic pain and tenderness, injury to body, chest pain, general signs and symptoms, head injury, and (at number 11) mental health conditions. When compared to 2019 levels, the 2020 levels of mental health conditions for individuals aged 19-22 increased in most months from April to the fall, but not as prominently or steadily as for individuals aged 13-18. The peak increase was in May, 19.28 percent; in November, there was a decrease of 9.12 percent. Other conditions, such as injury to body, abdominal and pelvic pain and tenderness, and chest pain, had scattered increases throughout the April to November period.

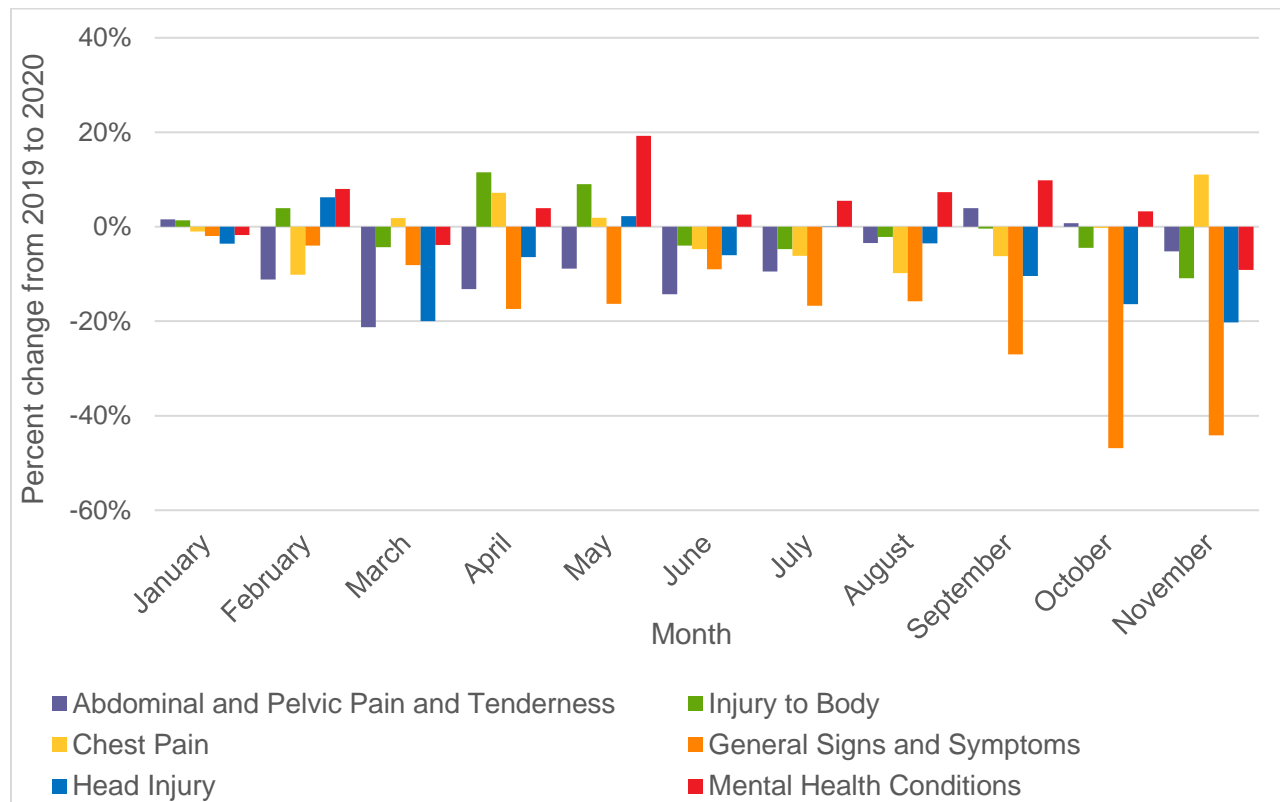


Figure 19. Percent change from January-November 2019 to January-November 2020 in reasons for emergency room visits (including top five and mental health conditions), age group 19-22 years

Schizophrenia was one mental health condition that increased markedly from 2019 levels as a reason for ER visits in 2020 for the age group 19-22 (figure 20). From April 2019 to April 2020, schizophrenia claim lines increased 61.29 percent as a percentage of all ER claim lines; the increase from May 2019 to May 2020 was similar (58.59 percent). Afterward, schizophrenia had a lower but sustained increase over 2019 levels. For example, the increase in July was 24.14 percent; in September, 32.14 percent; and, in October, 14.71 percent.

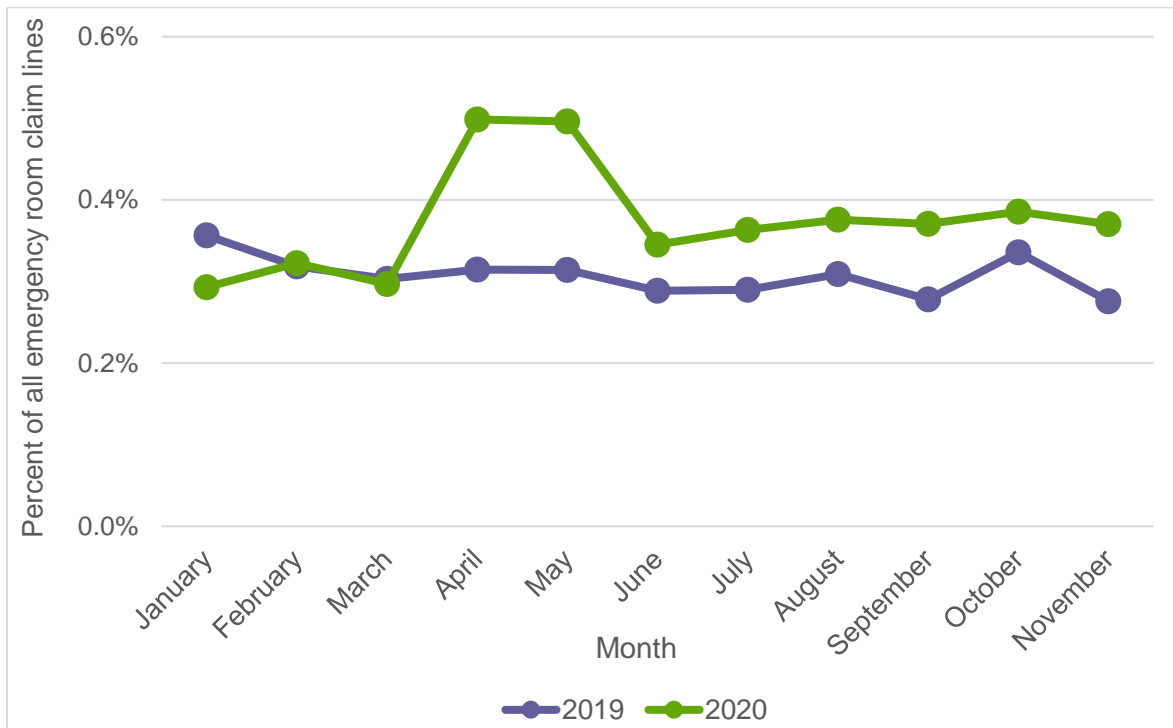


Figure 20. Schizophrenia claim lines as percent of all emergency room claim lines, age group 19-22 years, January-November 2019 versus January-November 2020

Panic disorders also showed an increase in 2020 from 2019 levels as a reason for ER visits for patients aged 19-22 (figure 21). In May 2020, claim lines for panic disorders rose 43.75 percent over the May 2019 level as a percentage of all ER claim lines, then, in August 2020, increased 47.37 percent over the August 2019 level. Afterward, panic disorder claim lines through November 2020 remained above their corresponding 2019 levels.

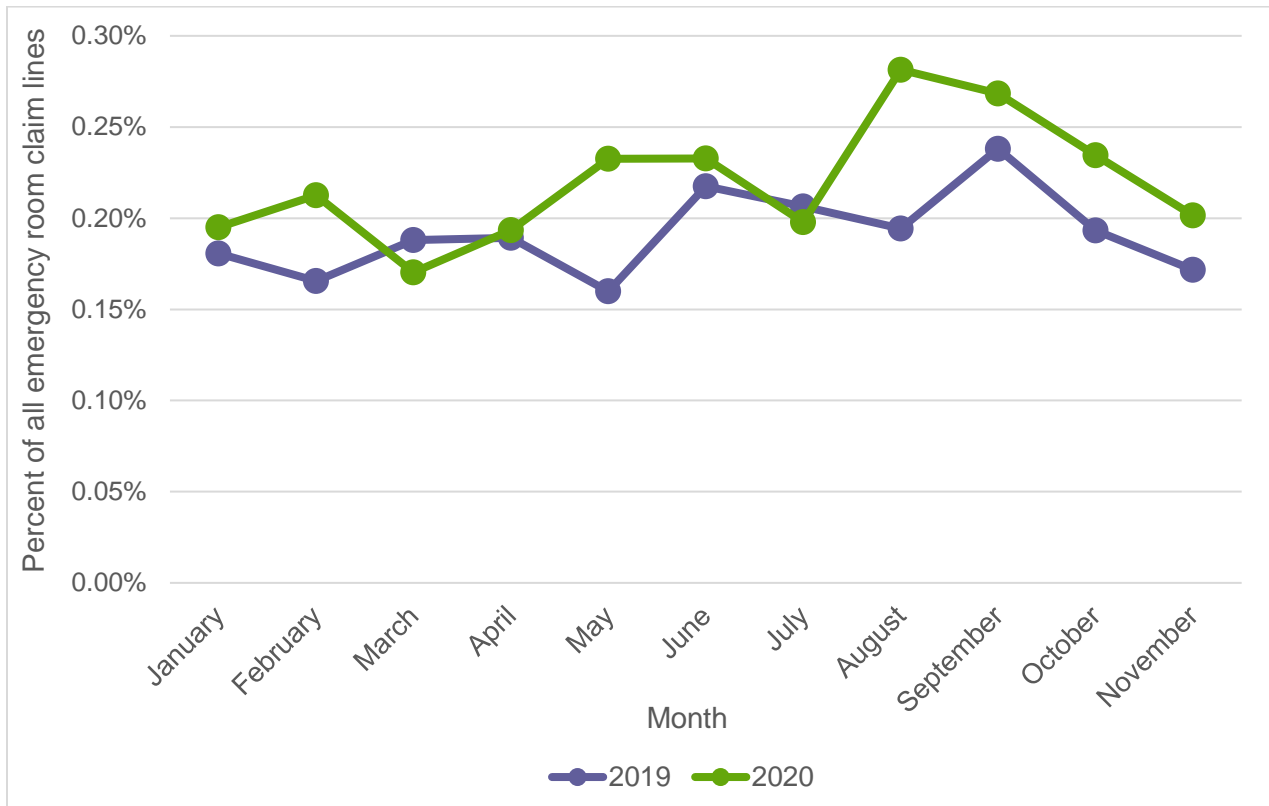


Figure 21. Claim lines for panic disorders as percent of all emergency room claim lines, age group 19-22 years, January-November 2019 versus January-November 2020

Bipolar disorder also increased notably from 2019 to 2020 as a reason for ER visits for the age group 19-22 (figure 22). Bipolar disorder claim lines as a percentage of all ER claim lines increased 63.16 percent in May 2020 over May 2019 and remained above 2019 levels through November. In November 2020, the increase by comparison to November 2019 was 112.50 percent.

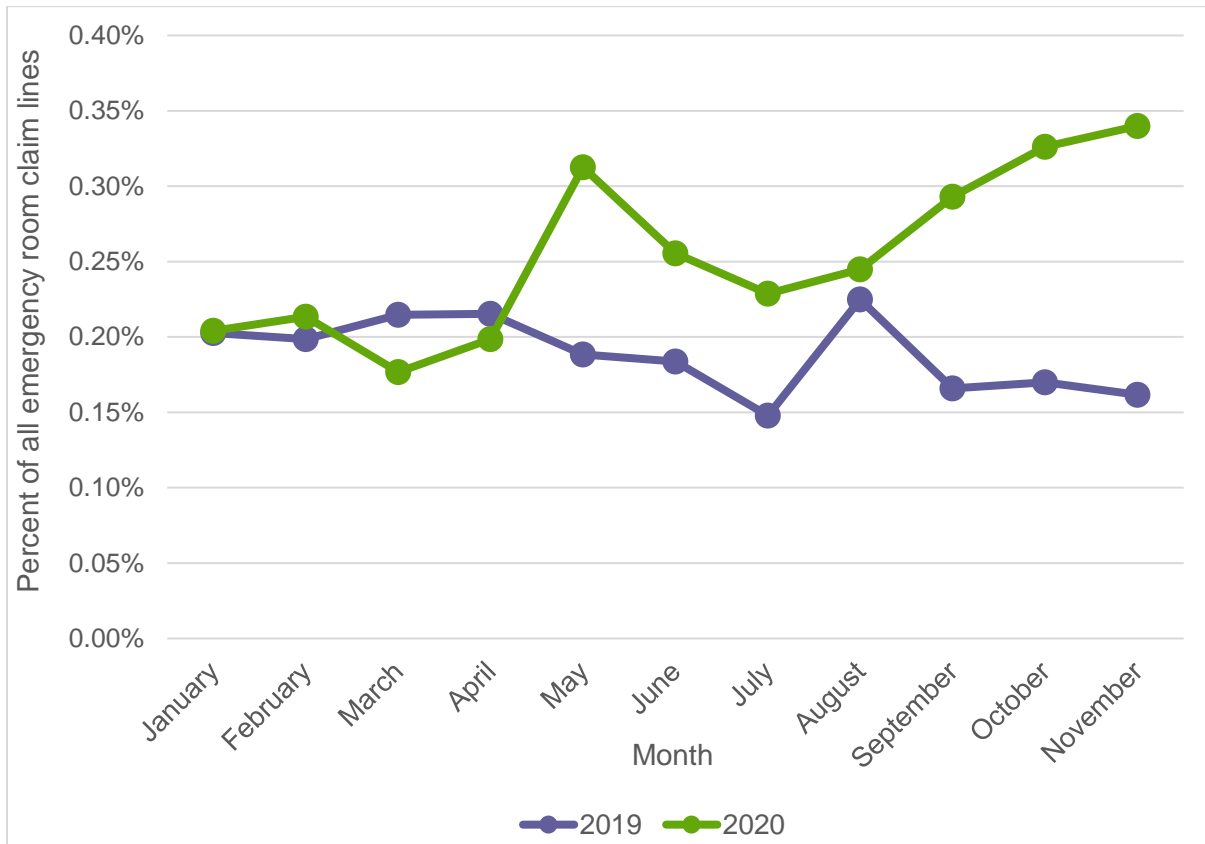


Figure 22. Bipolar disorder claim lines as percent of all emergency room claim lines, age group 19-22 years, January-November 2019 versus January-November 2020

State-by-State Variations

In the heat maps that follow, states toward the red end of the spectrum are those in which claim lines associated with the noted diagnoses were a larger percentage of all medical claim lines for individuals aged 6-22. States toward the green end are those in which the claim lines for those diagnoses were a smaller percentage of all medical claim lines for that age range.

Mental Health

In 2019, the top states associated with claim lines for mental health diagnoses for individuals aged 6-22 were, from highest to lowest: Vermont, Montana, Minnesota, Oregon and New Hampshire (figure 23). The bottom five states were, from lowest to highest: Alabama, Tennessee, Nevada, Texas and North Carolina.

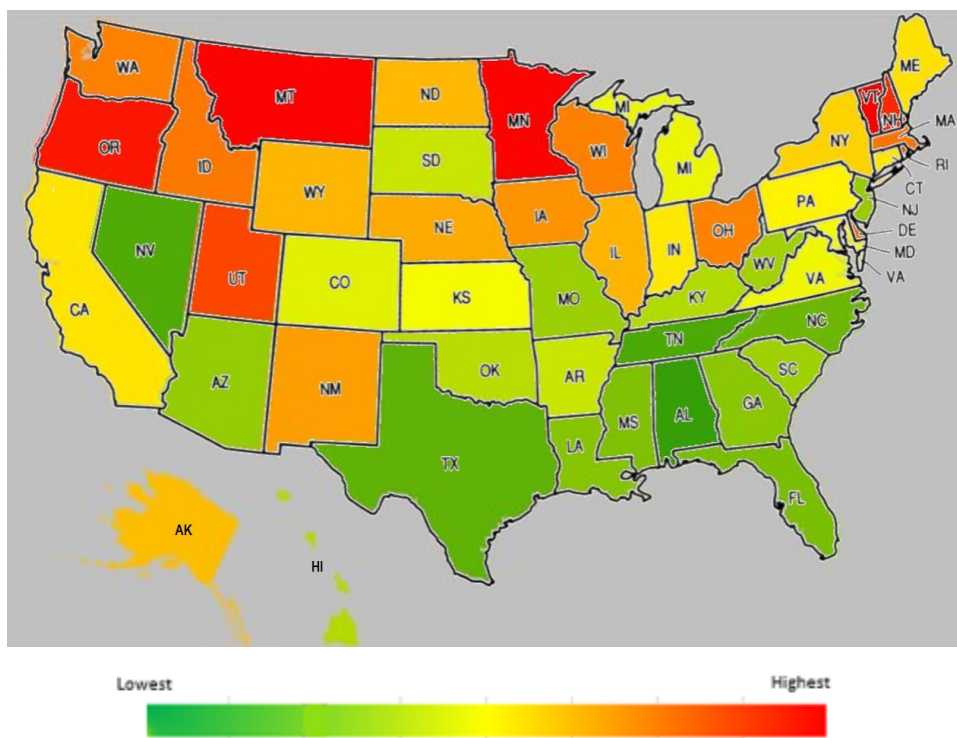


Figure 23. Mental health claim lines as a percentage of all medical claim lines for individuals aged 6-22 years by state, 2019

In 2020 (figure 24), the top five states for mental health claim lines for the age range 6-22 were similar to those in 2019 (figure 23). The top four in 2020 were Vermont, Minnesota, Oregon and Montana, all of which were in the top four in 2019; in addition, in 2020, Massachusetts entered the top five in fifth place, with New Hampshire becoming number 6. The bottom five states for mental health claim lines for the age range 6-22 were also similar in both years. In 2020, the bottom five were Alabama, Tennessee, Mississippi, Nevada and Texas. Mississippi joined the bottom five in 2020 and North Carolina dropped off the list.

More of the country was in the orange and red part of the spectrum in 2020 than in 2019, indicating that mental health claim lines composed a greater share of all medical claim lines for this age range. New York and California, for example, were both yellow in 2019 but orange in 2020.

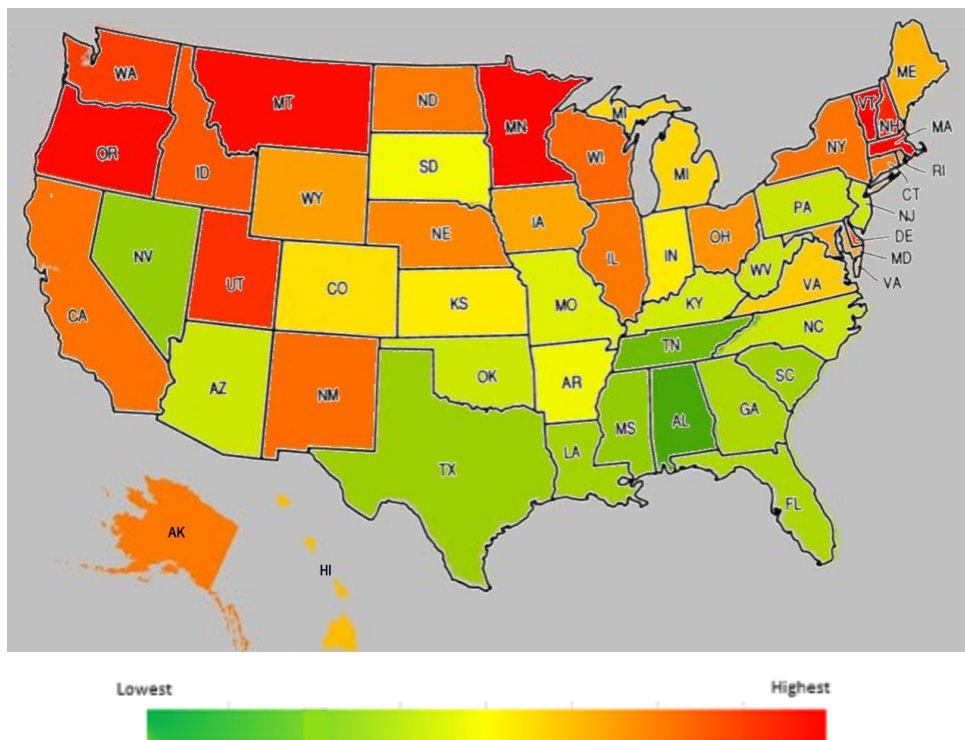


Figure 24. Mental health claim lines as a percentage of all medical claim lines for individuals aged 6-22 years by state, 2020

Intentional Self Harm

In 2019, the top five states for intentional self-harm claim lines as a percentage of all medical claim lines for the age range 6-22 were: Wyoming, Ohio, Utah, Oregon and Colorado (figure 25). The bottom five were: Vermont, Connecticut, Montana, Rhode Island and Maryland.

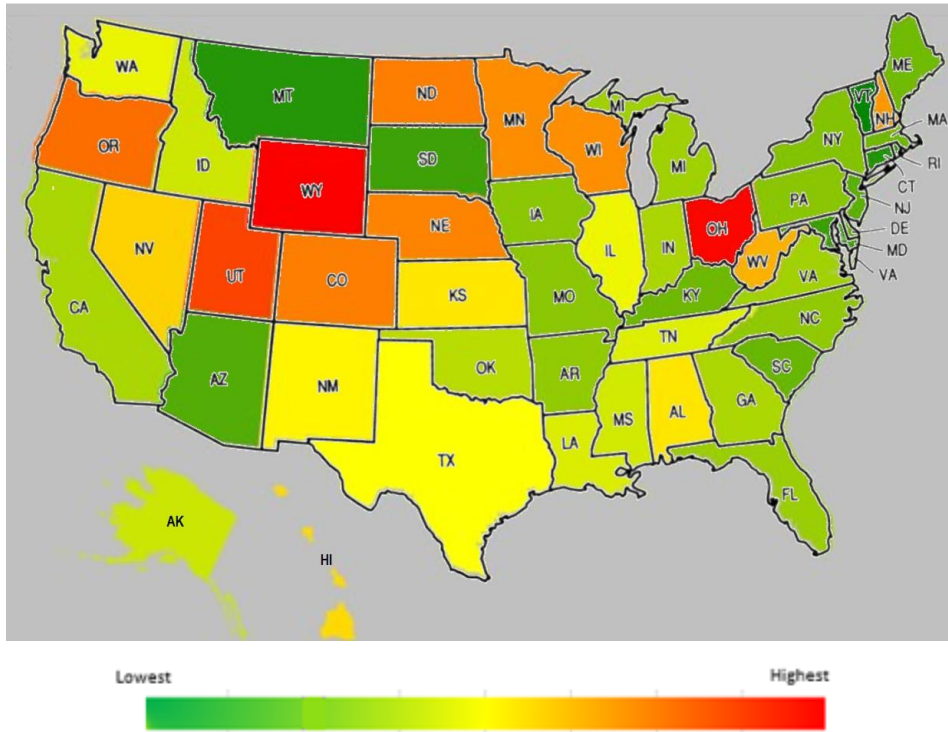


Figure 25. Intentional self-harm claim lines as a percentage of all medical claim lines for individuals aged 6-22 years by state, 2019

In 2020 (figure 26), many more states were red and orange than in 2019 (figure 25), indicating that intentional self-harm claim lines were a greater percentage of all medical claim lines for individuals aged 6-22. Even the South, which had relatively few mental health claim lines in 2019 and 2020 and relatively few intentional self-harm claim lines in 2019, showed an increase in intentional self-harm in 2020. The top five states for intentional self-harm claim lines in 2020 for this age range were: Indiana, Oregon, Wisconsin, Texas and Idaho; only Oregon repeated from the 2019 list. The bottom five states in 2020 were: South Dakota, Rhode Island, Vermont, Maine and Maryland. Vermont, Rhode Island and Maryland repeated from the 2019 list.

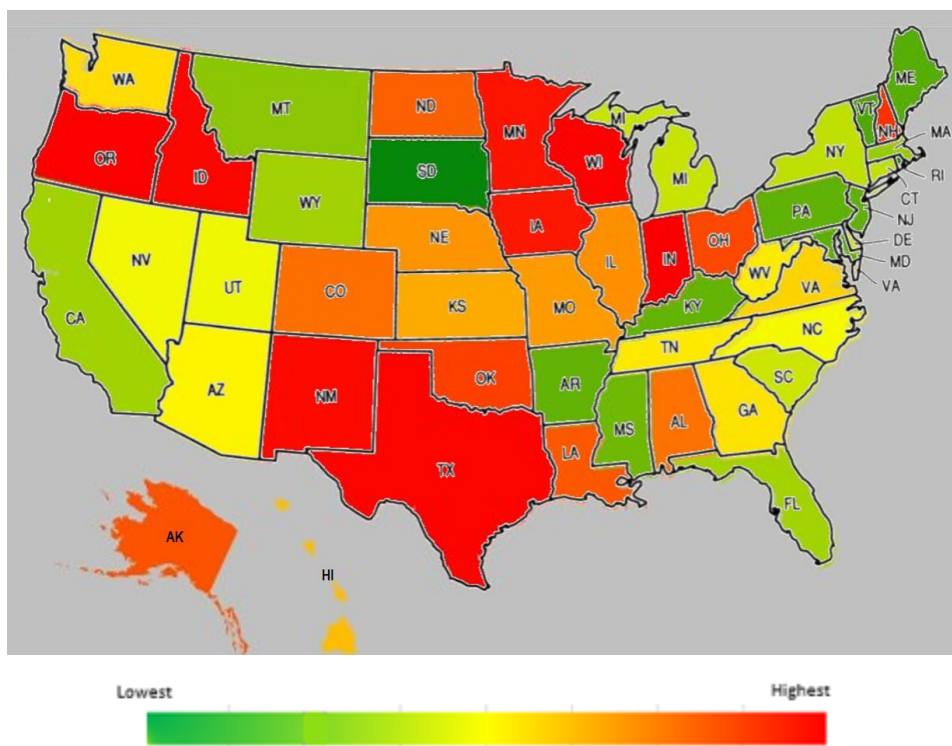


Figure 26. Intentional self-harm claim lines as a percentage of all medical claim lines for individuals aged 6-22 years by state, 2020

Conclusion

This study sheds light on the toll that the COVID-19 pandemic has taken on the mental health of the nation’s youth. In March and April 2020, mental health claim lines for young people aged 13-18 approximately doubled as a percentage of all medical claim lines by comparison to the same months in 2019, while medical claim lines decreased by approximately half. The pattern of increased mental health claim lines and decreased medical claim lines continued through November 2020, though not to as great an extent. A similar pattern was seen for individuals aged 19-22, though the changes were smaller. In general, the age group 19-22 had mental health trends similar to but less pronounced than the age group 13-18.

The increased burden of mental health issues is evident at the level of specific diagnoses. In spring 2020, by comparison to spring 2019, claim lines for intentional self-harm, generalized anxiety disorder, major depressive disorder, adjustment disorders, overdoses and substance use disorders all increased as a

percentage of all medical claim lines for the 13-18 age group, as they did for the 19-22 age group, though less sharply.

Children aged 6-12 were not the focus of this study, but changes were apparent in that age group too. Throughout January-November 2020, in the 6-12 age group, claim lines for attention-deficit hyperactivity disorder as a percentage of all medical claim lines decreased from their 2019 levels. From spring to November 2020, claim lines for two diagnoses less common in that age group, obsessive-compulsive disorder and tic disorders, increased.

Gender differences were noted. More females than males were associated with mental health claim lines throughout the age range 13-22, and that disparity increased from January to November 2020. The disparity was especially evident with respect to intentional self-harm in the 13-18 age group. At the height of the disparity, in August 2020, females accounted for 84 percent of the distribution in this age group, males for 16 percent.

Changes occurred in places of service for mental health treatment. In spring 2020, telehealth surpassed the office as the chosen setting for mental healthcare across the age range 13-22. For the same age range, the five most common reasons for ER visits declined in most of the months from March to November 2020 as compared to 2019 levels, but ER claim lines for mental health conditions increased in most of those months. Schizophrenia, panic disorders and bipolar disorder all increased from 2019 levels as reasons for ER visits in 2020 for the age group 19-22.

Changes varied by region. From August 2019 to August 2020 in the Northeast, for example, for the age group 13-18, intentional self-harm claim lines as a percentage of all medical claim lines increased by more than 300 percent, a rate higher than that in any other region in any month studied for that age group. Changes varied by state as well, but a broad pattern was clear. For the age range 6-22, more states in 2020 than in 2019 exhibited mental health claim lines and intentional self-harm claim lines as a relatively large percentage of all medical claim lines.

The findings in this report have implications for all those responsible for the care of young people, including providers, parents, educators, policy makers and payors. FAIR Health hopes that these findings will also be starting points for further research in the field of pediatric mental health during the COVID-19 pandemic.

About FAIR Health

FAIR Health is a national, independent nonprofit organization dedicated to bringing transparency to healthcare costs and health insurance information through data products, consumer resources and health systems research support. FAIR Health qualifies as a public charity under section 501(c)(3) of the federal tax code. FAIR Health possesses the nation's largest collection of private healthcare claims data, which includes over 32 billion claim records and is growing at a rate of over 2 billion claim records a year. FAIR Health licenses its privately billed data and data products—including benchmark modules, data visualizations, custom analytics and market indices—to commercial insurers and self-insurers, employers, providers, hospitals and healthcare systems, government agencies, researchers and others. Certified by the Centers for Medicare & Medicaid Services (CMS) as a national Qualified Entity, FAIR Health also receives data representing the experience of all individuals enrolled in traditional Medicare Parts A, B and D; FAIR Health includes among the private claims data in its database, data on Medicare Advantage enrollees. FAIR Health can produce insightful analytic reports and data products based on combined Medicare and commercial claims data for government, providers, payors and other authorized users. FAIR Health's free, award-winning, national consumer websites are [fairhealthconsumer.org](https://www.fairhealthconsumer.org) and [fairhealthconsumidor.org](https://www.fairhealthconsumidor.org). For more information on FAIR Health, visit [fairhealth.org](https://www.fairhealth.org).

FAIR Health, Inc.
530 Fifth Avenue, 18th Floor
New York, NY 10036
212-370-0704
[fairhealth.org](https://www.fairhealth.org)
[fairhealthconsumer.org](https://www.fairhealthconsumer.org)
[fairhealthconsumidor.org](https://www.fairhealthconsumidor.org)

Copyright 2021, FAIR Health, Inc. All rights reserved.