Adverse Childhood Experiences Among US Adolescents Over the Course of the COVID-19 Pandemic

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abstract

BACKGROUND AND OBJECTIVE: A national, longitudinal survey of US adolescents assessed adverse childhood experiences (ACEs) twice during the COVID-19 pandemic. Adolescents with more Wave 1 ACEs were expected to be more likely to experience additional ACEs at Wave 2.

METHODS: Adolescents aged 13 to 18 ($n = 727$, Fall 2020; $n = 569$, Spring 2021) recruited via a national, probability-based panel (survey completion rate Wave 1, 62.1%; Wave 2, 78.3%) responded to questions about household challenges, violence or neglect, and community ACE exposure at Wave 1 and Wave 2 (since Wave 1). Unweighted frequencies and 95% confidence intervals of demographic characteristics and individual ACEs were calculated by using weighted data. Odds ratios examined associations between ACEs by Wave 1 and Wave 2.

RESULTS: Among respondents of both survey waves ($n = 506$), 27.2% experienced violence or abuse, 50.9% experienced a household challenge, and 34.9% experienced a community ACE by Wave 1. By Wave 2, 17.6% experienced 1 new ACE, 6.1% experienced 2 new ACEs and 2.7% experienced 4 or more new ACEs. Those with ≥4 ACEs by Wave 1 were 2.71 times as likely as those with none to report a new ACE at Wave 2 (confidence interval: 1.18–6.24).

CONCLUSIONS: This nationwide, longitudinal study of US adolescents measured exposure to ACEs early in and during the COVID-19 pandemic. Nearly one-third of adolescents experienced a new ACE between survey waves. Prevention and trauma-informed approaches in clinical, school, and community settings may be helpful.

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Ms Hertz and Dr Verlenden conceptualized and designed the study, designed the data collection instruments, and drafted the initial manuscript; Ms Heim Viox and Ms Fordyce designed the data collection instruments, managed the data collection process, and conducted the analyses; Drs Massetti, Anderson, Bacon, and Mercado-Crespo drafted the initial manuscript; and all authors critically reviewed and revised the manuscript, approved the final manuscript as submitted, and agree to be accountable for all aspects of the work.

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

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WHAT'S KNOWN ON THIS SUBJECT: Risk factors for adverse childhood experiences (ACEs) are well documented in the literature and include many factors that increased during the coronavirus disease 2019 pandemic, such as social isolation, economic disruption, and stress.

WHAT THIS STUDY ADDS: This is a national, longitudinal study of adolescent ACE exposure during the pandemic. Between Waves 1 and 2, 28.3% of adolescents experienced a new ACE. Having ≥4 ACEs by Wave 1 increased the likelihood of new ACEs at Wave 2.

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The coronavirus disease 2019 (COVID-19) pandemic resulted in stay-at-home orders and school closures across the United States,[1] increasing the time families spent together and, for some, increasing economic, physical, and mental health stress.[2] By winter 2021, there was substantial concern about potential increases in adverse childhood experiences (ACEs) during the pandemic.[3] ACEs are preventable, potentially traumatic events occurring in childhood (0–17 years), generally categorized as direct experiences of violence (physical, sexual, or emotional) or neglect, and as household challenges (eg, witnessing violence or substance use in the home, parental incarceration, or mental illness).[4] ACE exposure has a dose-response association with negative adult health outcomes, with a greater number of ACEs associated with an increased likelihood of adult substance use, poor mental and physical health, suicide attempts, and an increased risk of early mortality.[4]

In addition to long-term impacts, ACEs exposure also has immediate effects. The association between ACEs and poor academic outcomes, including chronic absenteeism, nonengagement in school, and grade retention has been documented elsewhere.[5] Students experiencing even 1 ACE are more likely to demonstrate externalizing behaviors (ie, aggression, rule-breaking) necessitating professional attention,[6] are twice as likely to report depression or anxiety, and are 5 times more likely to have a substance use disorder, compared with those without ACEs.[7] The Centers for Disease Control (CDC)-Kaiser ACE Study[8] and national surveillance surveys ask adults to retrospectively report on experiences with ACEs before age 19[9] or ask parents to report on their child's experience with ACEs.[10] However, recently, there have been efforts to assess current ACEs by directly surveying adolescents.[11–13]

Despite concerns about the impact of the pandemic on ACEs, there has been limited investigation of the occurrence of and changes in ACEs among adolescents during this period. The purpose of this study was to assess, through an online, national longitudinal survey, (1) the occurrence of ACEs from birth through the early stages of the pandemic (Wave 1 in Fall 2020; hereafter, previous ACEs), (2) the occurrence of new ACEs occurring between Wave 1 and Spring 2021 (Wave 2, hereafter, new ACEs), and (3) individual and community demographic characteristics associated with ACEs among study participants at both waves. Understanding the occurrence of ACEs, how they manifested during the COVID-19 pandemic, and how earlier experiences with ACEs may influence ACE changes during the pandemic, is critical to ensuring appropriate supports are provided to youth to mitigate risk for poor health and education outcomes and promote resilience.

METHODS

Participants

The nationwide COVID Experiences Survey (CovEx) was administered to adolescents aged 13 to 19 years online or via telephone from October 16 to December 2, 2020 (Wave 1) and March 31 to May 7, 2021 (Wave 2) to examine the impact of the COVID-19 pandemic on youth. Adolescents were recruited by using the National Opinion Research Center (NORC) at the University of Chicago's AmeriSpeak Panel, a national, probability-based panel of ~40 000 US households recruited using random sampling from an address-based sample with mail, e-mail, internet, telephone, and in-person follow-up.

Adolescent participants were recruited from (1) AmeriSpeak Panel members (aged 18–19), (2) AmeriSpeak Teen Panel members (aged 13–17), and (3) adolescents aged 13 to 17 residing with an adult AmeriSpeak Panel member but not a current AmeriSpeak Teen Panel member. AmeriSpeak invited a single adolescent, randomly selected among all eligible adolescents within the household, to participate. For respondents aged <18, parent consent and adolescent assent were obtained. Among adult panelists qualified to go through the nomination/consent process for a teen, the consent survey completion rate was 69.2%, with 874 teens giving consent to be invited to the CovEx Adolescent Survey and 605 adolescents continuing to complete the survey. Adolescents who had reached the age of majority (18) did not need parental consent and provided informed consent. Interview completion rate among 18- to 19-year-old adolescents at Wave 1 was 41.1%. In total, 727 adolescents were surveyed at Wave 1; of these, 569 (78.3%) also participated at Wave 2. Respondents aged 19 at Wave 1 were excluded from this analysis because only events occurring before age 18 are considered ACEs, and the exact timing of ACEs exposure relative to age was not collected. Respondents reporting ≥18 new ACEs at Wave 2 ($n = 2$) or who did not complete the ACEs items at Wave 1 or Wave 2 ($n = 10$) were also excluded. The final, cross-wave analytic sample consisted of 506 adolescents. Adolescents received the cash equivalent of $20 for each completed survey. This study was reviewed and approved by NORC's Institutional Review Board and was conducted consistently with applicable federal law and CDC policy.

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Survey Content

Surveys captured information on adolescents' experiences amid the pandemic to better understand the impact of COVID-19 on their health and well-being.

ACE exposure was assessed by using the Kaiser-CDC ACEs scale,[4] with the addition of 4 items measuring community-level traumatic events, informed by items on the National Survey of Children's Health.[14] The final CovEx ACEs scale used for analysis contained 18 items: 7 measuring household challenges, 7 assessing direct experiences with abuse, neglect, and violence victimization, and 4 measuring challenges experienced in one's community (see Table 1).

At Wave 1, adolescents were asked, "Please read the statements below and mark all that you experienced at any point since you were born." At Wave 2, the same 18 ACEs questions were included, and adolescents were directed to, "Please read the statements below and mark all that you experienced at any point since [prepopulated with the month the respondent completed Wave 1]." ACEs sum scores were calculated for each wave. Wave 2 ACEs sum scores comprised only newly reported ACEs ("new ACEs") since the last survey administration (ie, any ACEs that were reported "yes" at Wave 2, but "no" at Wave 1). A lifetime ACEs score was also constructed and included the total number of ACEs reported at Wave 1 plus newly reported ACEs at Wave 2.

Unweighted frequencies, weighted percentages, and 95% confidence intervals (CIs) of demographic characteristics and individual ACEs were calculated, as were mean increases in categories of ACEs (ie, household challenges, abuse, neglect, and violence victimization, and community challenges) from Wave 1 to Wave 2 and mean increases in categories of ACEs by demographic characteristics, including sex, age, race/ethnicity, and poverty level based on previous research suggesting differences by these demographics.[9] Odds ratios were calculated to examine the relationship between ACEs reported at Wave 1 and newly reported ACEs at Wave 2. A paired *t* test compared the sum of ACEs at Wave 1 to the sum of lifetime ACEs through Wave 2, using the described constructed variable. Findings were considered statistically significant if $P < .05$. All analyses were conducted by using SAS Studio 3.81 Enterprise Edition (SAS Institute Inc, Cary, NC) with survey weighting procedures.

TABLE 1 ACE Variables by Category From the National CovEx Survey of Adolescents

Category	Variable
Household challenges	Your parents or primary caregivers were separated or divorced.
	You lived with a household member who served time in jail or prison.
	You lived with a household member who was depressed, mentally ill, or attempted suicide.
	You saw or heard household members hurt or threaten to hurt each other.
	You lived with someone who had a problem with drinking or using drugs.
	You have lived with a parent or primary caregiver who died.
	You have been separated from your primary caregiver through deportation or immigration.
Abuse, neglect, and violence victimization	A household member swore at, insulted, humiliated, or put you down in a way that scared you OR a household member acted in a way that made you afraid that you might be physically hurt (emotional abuse).
	Someone touched your private parts or asked you to touch their private parts in a sexual way that was unwanted, against your will, or made you feel uncomfortable (sexual violence).
	Someone pushed, grabbed, slapped, or threw something at you OR you were hit so hard that you were injured or had marks (physical violence).
	You have been detained, arrested, or incarcerated.
	You have experienced verbal or physical abuse or threats from a romantic partner (ie, boyfriend or girlfriend) (teen dating violence).
	More than once, you went without food, clothing, a place to live, or had no one to protect you (physical neglect).
	You often felt unsupported, unloved, and/or unprotected (emotional neglect).
Community challenges	You have been in foster care.
	You have experienced harassment or bullying at school.
	You have often seen or heard violence in the neighborhood or in your school neighborhood (community violence).
	You have often been treated badly because of your race, ethnicity, gender, sexual orientation, place of birth, disability, or religion (discrimination).

RESULTS

The final, cross-wave analytic sample included 506 adolescents aged 13 to 18 distributed across age, sex, and race/ethnicity. Of the cross-sectional sample, 28.0% had a parent/guardian (or self-report for teens aged 18) reported household income at or below the federal poverty limit (Table 2).

At Wave 1, 63.7% of the sample reported having experienced ≥1 ACEs. The most common ACEs category (Table 3) was household challenges (50.9%), followed by community challenges (34.9%), and abuse, neglect, or other violence victimization (27.2%). Parental separation or divorce (28.5%) and living with a household member who had a mental health problem (26.0%) were the most common ACEs reported at Wave 1. Of the types of abuse, neglect, or other violence victimization, having a household member swear at, insult, humiliate, or put you down in a way

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TABLE 2 Demographic Characteristics of Analytic Sample: COVID-19 Experiences Survey of Adolescents,[a] United States, October 2020 (Wave 1) and May 2021 (Wave 2)

	Waves 1 and 2	
Characteristics	*n*	Weighted % (95% CI)
Total	506	
Age at Wave 1		
13–15 y	261	49.8 (45.4–54.2)
16–18 y	245	50.2 (45.8–54.6)
Gender[b]		
Male	227	47.9 (42.1–53.7)
Female	262	48.8 (43.0–54.6)
Transgender/another identity	16	3.3 (1.2–5.5)
Race/ethnicity		
Black, non-Hispanic	62	13.6 (9.0–18.3)
Hispanic	106	25.8 (18.8–32.9)
Other, non-Hispanic[c]	61	9.6 (7.2–12.1)
White, non-Hispanic	277	50.9 (42.6–59.2)
Poverty level[d]		
At or below poverty	118	28.0 (20.7–35.4)
Above poverty	388	72.0 (64.6–79.3)
Mode of school attendance, Wave 1[e]		
In-person full-time	88	16.6 (13.0–20.1)
Hybrid: in-person part-time and virtual part-time	127	25.1 (19.7–30.5)
Virtual full-time	248	54.6 (47.6–61.6)
Homeschool	15	2.2 (0.9–3.5)
Other	7	1.5 (0.2–2.8)
Mode of school attendance, Wave 2[e]		
In-person full-time	140	24.9 (19.0–30.9)
Hybrid: in-person part-time and virtual part-time	110	20.9 (16.3–25.4)
Virtual full-time	203	48.2 (40.6–55.8)
Homeschool	20	3.9 (2.2–5.7)
Other	13	2.0 (1.1–3.0)

Table shows unweighted numbers and weighted overall percentages with 95% CIs.

[a] See technical overview of the AmeriSpeak Panel: NORC's Probability-Based Household Panel retrieved from https://amerispeak.norc.org/Documents/Research/AmeriSpeak%20Technical%20Overview%202019%2002%2018.pdf.

[b] Totals may not sum to the full sample due to nonresponse.

[c] Other race category includes other non-Hispanic races and non-Hispanic multiracial individuals.

[d] Poverty level was approximated by using the midpoint of a categorical income variable and household size, inclusive of family and nonfamily household members. Based on 2020 poverty guidelines https://aspe.hhs.gov/2020-poverty-guidelines.

[e] Mode of school attendance was asked as "In the past 14 days, how did you attend school?" at both waves of respondents who reported being currently enrolled in school.

that scared you or act in a way that made you afraid that you might be physically hurt (emotional abuse; 16.0%) was most common, followed by having often felt unsupported, unloved, and/or unprotected (emotional neglect; 13.0%). The community challenge ACEs reported most at Wave 1 were harassment or bullying at school (26.7%) and seeing or hearing violence in the neighborhood or in your school community (community violence; 17.4%).

At Wave 2, during the 6 months since Wave 1, 28.3% of adolescents reported experiencing ≥1 new ACEs (data not shown). Specifically, 15.9% of adolescents experienced at least 1 new household challenge ACE between survey waves, 13.4% experienced a new abuse, neglect, or other violence victimization ACE, and 10.0% experienced a new community challenge ACE. The most common new household challenge ACEs were hearing household members hurt or threaten to hurt each other (5.0%) and living with a household member who had a mental health problem (4.3%). The most common new abuse, neglect, or other violence victimization ACEs were emotional abuse (6.4%), followed by having been detained, arrested, or incarcerated (3.6%). The most common new community challenge ACEs were having often been treated badly because of your race, ethnicity, gender, sexual orientation, place of birth, disability, or religion (discrimination; 5.2%) and witnessing community violence (4.1%).

Adolescents who had experienced 4 or more ACEs by Wave 1 were 2.71 times as likely as those with 0 ACEs to report a new type of ACE by Wave 2 (CI: 1.18–6.24, $P = .017$). In addition, 17.6% of adolescents experienced a new type of ACE during the 6-month period between Wave 1 and Wave 2 (ie, Fall 2020 to Winter 2021), 6.1% experienced 2 new types of ACEs, 2.0% experienced 3 new types of ACEs, and 2.7% experienced 4 or more new types of ACEs (Table 4) from Wave 1 to Wave 2.

In Table 5, mean ACEs are provided by category, demographic characteristics, and across time from Wave 1 to Wave 2. Overall, we found significant ($P < .05$) mean unit increases (M^{Δ}) in community challenge ACEs ($M^{\Delta} = 0.12$, 95% CI = 0.06–0.18), household challenge ACEs ($M^{\Delta} = 0.18$, 95% CI = 0.13–0.23), and abuse, neglect, and violence victimization ACEs ($M^{\Delta} = 0.20$, 95% CI = 0.10–0.29). Significant mean unit increases were found across demographic characteristics. Nonoverlapping confidence intervals also indicate differences by demographic characteristics in newly reported abuse, neglect, and violence victimization ACEs. Compared with males ($M^{\Delta} = 0.07$, CI = 0.03–0.11), females ($M^{\Delta} = 0.32$, CI = 0.15–0.50) reported a greater increase in abuse, neglect, and violence victimization ACEs at Wave 2. Additionally, adolescents who identify as Black ($M^{\Delta} = 0.36$, 95% CI = 0.19–0.53), Hispanic ($M^{\Delta} = 0.38$, 95% CI = 0.22–0.54), and other, non-Hispanic

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TABLE 3 Adverse Childhood Experiences Across Time as a Percentage of the Sample,[a] CovEx Survey,[b] United States, $n = 506$

	Lifetime Reported ACEs at Wave 1		Newly Reported ACEs at Wave 2	
	n	Weighted % (95% CI)	*n*	Weighted % (95% CI)
Household challenges	251	50.9 (46.1–55.7)	78	15.9 (11.5–20.2)
Your parents or primary caregivers were separated or divorced.	142	28.5 (23.9–33.1)	14	2.8 (1.3–4.3)
You lived with a household member who served time in jail or prison.	57	12.0 (8.4–15.7)	11	1.8 (0.6–3.0)
You lived with a household member who was depressed, mentally ill, or attempted suicide.	108	26.0 (20.5–31.6)	23	4.3 (2.5–6.0)
You saw or heard household members hurt or threaten to hurt each other.	70	14.2 (10.6–17.7)	20	5.0 (2.1–8.0)
You lived with someone who had a problem with drinking or using drugs.	65	15.0 (10.8–19.2)	17	2.3 (1.0–3.7)
You have lived with a parent or primary caregiver who died.	19	3.3 (1.5–5.1)	—	—
You have been separated from your primary caregiver through deportation or immigration.	—	—	6	1.7 (0–3.6)
Abuse, neglect, and violence victimization	140	27.2 (22.5–31.8)	54	13.4 (7.4–19.4)
A household member swore at, insulted, humiliated, or put you down in a way that scared you OR a household member acted in a way that made you afraid that you might be physically hurt.	85	16.0 (12.5–19.6)	22	6.4 (2.7–10.1)
Someone touched your private parts or asked you to touch their private parts in a sexual way that was unwanted, against your will, or made you feel uncomfortable.	14	3.3 (1.6–5.0)	6	1.1 (0.1–2.0)
Someone pushed, grabbed, slapped, or threw something at you OR you were hit so hard that you were injured or had marks.	48	8.5 (6.2–10.9)	13	2.8 (0.7–4.9)
You have been detained, arrested, or incarcerated.	7	1.7 (0.3–3.1)	6	3.6 (0–7.9)
You have experienced verbal or physical abuse or threats from a romantic partner.	23	4.4 (2.2–6.7)	7	1.8 (0–3.7)
More than once, you went without food, clothing, a place to live, or had no one to protect you.	13	2.9 (1.2–4.7)	—	—
You often felt unsupported, unloved, and/or unprotected.	58	13.0 (8.3–17.6)	16	3.4 (1.2-5.5)
Community challenges	186	34.9 (30.0–39.8)	53	10.0 (6.9–13.1)
You have often seen or heard violence in the neighborhood or in your school neighborhood.	90	17.4 (14.0–20.9)	20	4.1 (1.8–6.4)
You have been in foster care.	6	0.7 (0.1–1.3)	—	—
You have experienced harassment or bullying at school.	127	26.7 (21.6–31.8)	15	3.4 (1.1–5.7)
You have often been treated badly because of your race, ethnicity, gender, sexual orientation, place of birth, disability, or religion.	47	9.4 (7.1–11.6)	23	5.2 (2.3–8.2)

—, Results were suppressed because of small cell size.

[a] Table shows unweighted numbers and weighted overall percentages, limited to respondents who participated in both waves.

[b] See technical overview of the AmeriSpeak Panel: NORC's Probability-Based Household Panel retrieved from https://amerispeak.norc.org/Documents/Research/AmeriSpeak%20Technical%20Overview%202019%2002%2018.pdf.

($M^{\Delta} = 0.17$, 95% CI = 0.11–0.24) race/ethnicity reported a greater increase in abuse, neglect, and violence victimization ACEs at Wave 2 compared with white, non-Hispanic adolescents ($M^{\Delta} = 0.06$, 95% CI = 0.03–0.10).

DISCUSSION

This is a national, longitudinal, US study describing how ACEs among adolescents may have changed during the COVID-19 pandemic. By Wave 1, 63.7% of adolescents had experienced at least 1 ACE, and 19.4% had experienced ≥4 ACEs. Between the fall of 2020 and the spring of 2021, nearly one-quarter of adolescents (28.3%) reported experiencing at least 1 new ACE. As hypothesized, those who experienced ≥4 ACEs by Wave 1 were more vulnerable and were nearly 3 times as likely to experience new ACEs by Wave 2 compared with their peers with no previous ACEs (Table 4). Although sample size prevented an analysis of ACE score by category for transgender youth, mean ACEs within each category were higher compared with male adolescents. This highlights the vulnerabilities of ACE-exposed youth. Although the COVID-19 pandemic was associated with social and economic stressors that impacted all groups, some youth experienced elevated risk for the social and economic impacts and their secondary effects.

The findings also reflect a shift in the type of ACEs experienced. At Wave 1, the most prevalent categories of ACEs were household challenges, followed by community ACEs, with abuse, neglect, or

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TABLE 4 Odds of Reporting New ACE at Wave 2 Based on Number of ACEs at Wave 1,[a] CoVex Survey,[b] United States October 2020 to May 2021

	Percent Reporting ACEs at Wave 1		Percent Reporting New ACEs at Wave 2		Odds of New ACE at Wave 2
	n	Weighted %	*n*	Weighted %	OR (95% CI)
0 ACEs	175	36.3	364	71.6	—
1–2 ACEs	176	32.7	122	23.6	1.22 (0.66–2.28)
3 ACEs	51	11.6	11	2.0	1.79 (0.53–6.06)
4+ ACEs	104	19.4	9	2.7	2.71 (1.18–6.24)

—. Totals may not sum to full sample because of nonresponse; OR, odds ratio.

[a] Table shows unweighted numbers and weighted overall percentages with 95% confidence intervals.

[b] See technical overview of the AmeriSpeak Panel: NORC's Probability-Based Household Panel retrieved from https://amerispeak.norc.org/Documents/Research/AmeriSpeak%20Technical%20Overview%202019%2002%2018.pdf.

violence victimization the least-common category of ACE experienced. At Wave 2, during the spring of 2021, although household challenge ACEs remained the most common, there was a shift, with abuse, neglect, or violence victimization ACEs becoming the second most common type of ACE, and community challenges the least common. There were also changes within each of these categories. Among household challenge ACEs, witnessing household violence, the fourth most common at Wave 1, was the most common household challenge ACE reported at Wave 2. Within abuse, neglect, and violence victimization ACEs, having been arrested or detained was the least common of all 7 types of ACEs in this category at Wave 1 but was the second most reported at Wave 2. Finally, when examining community challenge ACEs, at Wave 1, discrimination was the third (of 4) most often reported in this category but was the most reported at Wave 2. A variety of factors may have contributed to this increase. For example, there were increases in some types of crimes, including motor vehicle thefts and homicide during 2020 and 2021.[15] The social justice protests that occurred in the United States during 2020 and 2021 may have also contributed to the increase in being arrested or detained, as well as the increase in reported discrimination. These findings indicate a need for trauma-informed strategies across adolescent-serving entities including health care, community organizations, and schools to prevent increases in poor health outcomes associated with ACE exposure and to prevent additional ACEs from occurring.[16]

Although there are no comparable national data sets on ACEs exposure collected from adolescents prepandemic, population-based data collected among young adults aged 18 to 24 years between 2015 and 2017 provides some context.[17] Approximately 7 in 10 young adults report exposure to at least 1 ACE during their childhood, with 1 in 5 reporting exposure to 4 or more ACEs. Although findings from our analysis for 4 or more ACEs are slightly lower, this is not unexpected given the younger age of the sample; estimates may also differ from previously published work because of differences in study methodology and the number of ACEs included.[17] Despite the relative similarity in the cumulative burden of ACEs in our analysis and previous literature, our estimates are generally lower than those published previously for exposure to specific types of ACEs. For example, 40.5% of young adults aged 18 to 24 from 2015 to 2017 reported experiencing emotional abuse before age 18.[9] In a recent nationally representative survey of adolescents, 55.1% of adolescents during the COVID-19 pandemic[18] reported experiencing emotional abuse; however, only 16.0% of adolescents in our sample reported experiencing emotional abuse. These differences could be due to differences in how the questions were asked. This study's CovEx question asked if, "A household member swore at, insulted, humiliated, or put you down in a way that scared you OR a household member acted in a way that made you afraid that you might be physically hurt." However, the previously cited research used questions that did not specify the actions that made the respondent feel scared or afraid for their physical safety. It is possible that these additional qualifiers limited the survey capture to only specific forms of emotional abuse, particularly those related to physical safety concerns. Previous research also reveals that 29.1% of young adults aged 18 to 24[17] reported living with a parent who had misused substances before the age of 18, compared with 15.0% in our analysis. Differences here may be due to the survey data collection method, question wording, age of respondent, and time of data collection. Nonetheless, our longitudinal findings indicate that a substantial proportion of adolescents experienced new ACEs in the 6 months between data collection during the COVID-19 pandemic.

The findings have critical implications for understanding the increasing burden of ACEs during the COVID-19 pandemic and the importance of ensuring families and adolescents have access to safe, stable, and nurturing environments. A key component of safe and supportive environments is access to culturally appropriate, trauma-informed intervention supports to mitigate the impact of ACEs and prevent further victimization. The

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TABLE 5 Mean Reported ACEs by Category, Demographic Characteristics, and Across Time Among Adolescents Aged 13 to 18, CovEx Survey, United States, October 2020 (Wave 1) to May 2021 (Wave 2)

	Household Challenge			Abuse, Neglect, and Violence Victimization			Community Challenges		
	Mean at Wave 1 (CI)	Mean at Wave 2 (CI)	Mean Newly Reported ACEs at Wave 2[a] (CI)	Mean at Wave 1 (CI)	Mean at Wave 2 (CI)	Mean Newly Reported ACEs at Wave 2[b] (CI)	Mean at Wave 1 (CI)	Mean at Wave 2 (CI)	Mean Newly Reported ACEs at Wave 2[a] (CI)
Overall	0.99 (0.86–1.13)	1.21 (1.05–1.36)	0.18 (0.13–0.23)[c]	0.50 (0.40–0.61)	0.73 (0.57–0.89)	0.20 (0.10–0.29)[c]	0.54 (0.47–0.61)	0.67 (0.59–0.75)	0.12 (0.06–0.18)[c]
Gender									
Male	0.82 (0.65–0.98)	0.98 (0.81–1.15)	0.13 (0.08–0.18)[c]	0.31 (0.21–0.42)	0.41 (0.29–0.52)	0.07 (0.03–0.11)[c]	0.46 (0.29–0.62)	0.54 (0.38–0.70)	0.08 (0.04–0.12)[c]
Female	1.11 (0.85–1.37)	1.38 (1.07–1.70)	0.25 (0.16–0.33)[c]	0.62 (0.44–0.81)	0.97 (0.68–1.26)	0.32 (0.15–0.50)[c]	0.58 (0.44–0.72)	0.76 (0.62–0.91)	0.17 (0.06–0.28)[c]
Transgender/ another identity	1.85 (1.53–2.17)	1.85 (1.53–2.17)	—	1.55 (0.77–2.33)	1.98 (0.81–3.14)	—	1.18 (0.73–1.63)	1.23 (0.12–2.34)	—
Age at Wave 1									
13–15	0.88 (0.72–1.05)	1.10 (0.93–1.26)	0.18 (0.12–0.24)[c]	0.44 (0.33–0.55)	0.58 (0.44–0.72)	0.09 (0.05–0.13)[c]	0.51 (0.37–0.64)	0.65 (0.51–0.78)	0.13 (0.08–0.18)[c]
16–18	1.10 (0.84–1.37)	1.32 (1.02–1.61)	0.18 (0.12–0.24)[c]	0.57 (0.41–0.73)	0.88 (0.61–1.15)	0.30 (0.13–0.48)[c]	0.57 (0.45–0.70)	0.69 (0.54–0.85)	0.11 (0–0.23)
Race/ethnicity									
White, non-Hispanic	0.93 (0.78–1.08)	1.11 (0.96–1.25)	0.15 (0.11–0.19)[c]	0.50 (0.37–0.64)	0.60 (0.45–0.75)	0.06 (0.03–0.10)[c]	0.47 (0.37–0.57)	0.55 (0.45–0.65)	0.08 (0.05–0.12)[c]
Black, non-Hispanic	1.16 (0.89–1.43)	1.45 (1.12–1.79)	0.26 (0.17–0.35)[c]	0.62 (0.32–0.92)	1.00 (0.59–1.40)	0.36 (0.19–0.53)[c]	0.94 (0.64–1.24)	1.08 (0.78–1.37)	0.12 (0.05–0.20)[c]
Hispanic	1.15 (0.98–1.32)	1.40 (1.16–1.64)	0.21 (0.12–0.31)[c]	0.48 (0.29–0.67)	0.90 (0.64–1.15)	0.38 (0.22–0.54)[c]	0.45 (0.32–0.59)	0.66 (0.50–0.83)	0.20 (0.15–0.26)[c]
Other, non-Hispanic[b]	0.71 (0.54–0.89)	0.87 (0.68–1.07)	0.16 (0.11–0.21)[c]	0.42 (0.28–0.57)	0.61 (0.42–0.80)	0.17 (0.11–0.24)[c]	0.60 (0.33–0.86)	0.73 (0.47–0.98)	0.13 (0.08–0.18)[c]
Poverty level[d]									
At or below poverty	1.12 (0.78–1.45)	1.34 (0.94–1.75)	0.20 (0.08–0.32)[c]	0.42 (0.12–0.71)	0.74 (0.29–1.20)	0.28 (0.07–0.50)[c]	0.74 (0.55–0.93)	0.83 (0.65–1.01)	0.08 (0.03–0.13)[c]
Above poverty	0.95 (0.78–1.11)	1.15 (0.97–1.34)	0.17 (0.12–0.22)[c]	0.54 (0.41–0.67)	0.73 (0.56–0.22)	0.16 (0.07–0.25)[c]	0.46 (0.38–0.54)	0.61 (0.51–0.71)	0.14 (0.06–0.22)[c]

—, Indicates *t* test not conducted due to small cell size.

[a] Due to nonresponse, the mean newly reported ACEs may not equal the difference between Wave 1 and Wave 2. Newly reported ACEs are limited to records in which respondent answered an individual ACE item at both Wave 1 and Wave 2.

[b] Other race category includes other non-Hispanic races and non-Hispanic multiracial individuals.

[c] Indicates significant increase ($P < .05$) in mean adverse childhood experiences from Wave 1 to Wave 2 based on *t* test on difference from null hypothesis of zero (no increase).

[d] Poverty level was approximated by using the midpoint of a categorical income variable and household size, inclusive of family and nonfamily household members. Based on 2020 poverty guidelines https://aspe.hhs.gov/2020-poverty-guidelines. See technical overview of the AmeriSpeak Panel: NORC's Probability-Based Household Panel retrieved from https://amerispeak.norc.org/Documents/Research/AmeriSpeak%20Technical%200verview%202019%2002%2018.pdf.

authors of the CDC's *Preventing Adverse Childhood Experiences (ACEs): Leveraging the Best Available Evidence*[16] summarize effective strategies to prevent and respond to ACEs, including strengthening economic supports for families, promoting social norms that protect against violence and adversity, ensuring a strong start for children (ie, early childhood home visitation programs, high-quality child care, preschool enrichment with family engagement), teaching youth and parents skills to handle stress, resolve conflicts, and manage their emotions and behaviors, connecting youth to caring adults and activities, and intervening to lessen immediate and long-term harms.

From an educational perspective, a large body of research indicates that ACEs create toxic stress, which can, over the course of a young person's growth, alter the physical structure of the brain, negatively impacting the ability to focus, increasing impulsivity, and overall, impairing learning.[19,20] Consequently, ACEs exposure, particularly for those with an accumulation of ACEs, is associated with >4 times the odds of having an adverse education-related outcome (no plans to graduate, skipping school, or below average grades).[21]

To mitigate the impact of ACEs exposure, schools can implement trauma-informed policies, programs, and practices to foster student-school connectedness. These trauma-informed supports foster academic engagement, positive peer relations, feelings of school belonging, school safety, and school staff support. Schools can also implement activities within the broader community environment to promote parent and family connectedness to the school.[22] These strategies can be complemented by restorative justice approaches (ie, circles, peer

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mediation) to improve relationships between students, and between students and teachers, and promote a positive, inclusive school and community culture.[23,24]

School-based strategies are most likely to be effective when they are embedded in a broader context of community-based, multisectoral strategies that include strengthening policies and programs most likely to result in safe, stable, and nurturing families, schools, and communities. For example, feeling connected to family members or the community can moderate negative mental health outcomes, such as depression and anxiety.[25] As the findings of this analysis reveal, postpandemic recovery will require leveraging these comprehensive approaches to support resiliency among youth, their families, and their communities.

The present findings are subject to several limitations. First, information collected at Wave 1 is dependent on respondent recall. Second, ACEs are generally reported as lifetime experiences; thus, there is no prepandemic prevalence data on ACEs occurring during a 6-month time to permit comparison, nor was this information collected at Wave 1. Relatedly, Wave 1 assessed ACEs that occurred from birth to Wave 1 and did not assess ACEs that may have occurred in the 6 months between the pandemic beginning and Wave 1 of data collection. This was an intentional design decision because 6-month ACE prevalence was likely to yield small cell sizes and may have prohibited any analysis or comparison with a subsequent, longer time period. However, as a result, it was not possible to determine the true prevalence of ACEs before the pandemic. Third, it is possible that some increases may be attributed to greater exposure time as a child ages; however, this explanation seems less likely. As noted in Table 5, given the overlap in confidence intervals between 13- to 15-year-olds and 16- to 18-year-olds, it seems unlikely that differences were due to the aging of respondents. In addition, although we do not have comparison data to understand the 6-month incidence of new ACEs (ie, how many ACEs may accumulate as children age), this analysis indicates that the experience of new adversities is differential between children who had experienced ACEs previously versus those without ACEs, suggesting that the increase in ACEs between waves is not solely due to age. Fourth, the data reflect a national sample but the relatively novel methodology of using panel survey data does not allow generalization to nationally representative prevalence. Fifth, the sensitive subject matter may cause respondents to underreport their experiences, leading to the underestimation of ACEs at either or both waves. Sixth, sample size prevented an analysis of ACEs by special needs category.

CONCLUSIONS

ACE exposure before and during the COVID-19 pandemic among US adolescents was a common occurrence. This study's findings highlight the occurrence of new ACEs among vulnerable adolescents who had multiple ACEs before or early in the pandemic. The occurrence of ACEs may reflect social and structural determinants of health in environments in which adolescents live, work, go to school, and socialize. The burden of ACEs and their associated impacts on health necessitates the implementation and scale-up of prevention and intervention strategies across school, home, and community settings to mitigate negative health and academic impacts and promote resilience.

ABBREVIATIONS

ACE: adverse childhood experience
CDC: Centers for Disease Control and Prevention
CI: confidence interval
CovEx: COVID Experiences Survey
COVID-19: coronavirus disease 2019
M^{Δ}: mean unit increases
NORC: National Opinion Research Center

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