

## Adolescent mood disorders since 2010: A collaborative review

An ongoing open-source literature review posted and curated by [Jonathan Haidt](#) (NYU-Stern) and [Jean Twenge](#) (San Diego State U), and [Zach Rausch](#) (NYU-Stern). You can cite this document as:

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See also our companion review: [Social Media and Mental Health](#), which examines the evidence that social media use is a substantial contributor to these recent increases. Also see our reviews of trends in Australia, Canada, New Zealand, and other countries [here](#).

You can always find this doc linked from [jonathanhaidt.com/reviews](http://jonathanhaidt.com/reviews)

You can also access this doc at this link: <https://tinyurl.com/TeenMentalHealthReview>

We thank those researchers who put in the time to read this document and raise additional points and **counterpoints**, including [Chris Ferguson](#) (Stetson U), [Sally Satel](#) (AEI); Friedrich Jochenning (Neuroscience Research Center, Charité University Medicine Berlin); others to come]..... We also thank Cameron How and Chris Vaccaro for their earlier work on this document.

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*If you are a researcher and would like to notify us about other studies, or add comments or counterpoints to this document, please request commenting access to the Google Doc, or [contact Haidt](#) directly, and he will set your permissions to add comments to the Google doc, or will paste in your comments. This document is evolving based on feedback.]*

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## INTRODUCTION

Are rates of teen depression and anxiety--and their behavioral correlates such as self-harm and suicide--really rising in the US and UK? If so, for whom, and when did the rise start? Or is this another moral panic, an overreaction to small fluctuations, or to increases that are really due to changes in diagnostic criteria, rather than to real increases in suffering? Most importantly, is there a cohort effect? Is Gen Z (also known as “iGen”; those born after 1995) really different from the Millennials and previous generations? This Google doc collects studies and datasets published/released in 2015 or later (on the assumption that the rise seems to begin around 2012, so would not be clearly detectable until 2014, so could not be published until 2015.)

\*\*\*\*\*

MAIN THEORIES THAT ARE WIDELY DISCUSSED AS CAUSES OF THE RISE:

**1) The rapid adoption of smartphones and rapid spread of social media** among teens in the years 2009-2011. (This argument is highlighted in *iGen*, by Jean Twenge. See a [summary of the argument here](#).)

**2) Changes to parenting practices -- particularly the loss of autonomy and unsupervised play** beginning in the 1990s. (This argument is highlighted in *The Coddling of the American Mind*. Lukianoff and Haidt point to multiple factors, but they believe this is the largest single contributor, interacting with the spread of social media. See a [summary of the argument here](#), and then see our [other lit review, on social media and mental health](#).)

**3) Economic factors, including the global financial crisis and the rise of inequality** which has fostered more competitive parenting in countries that have high inequality. (This argument is made in *Love, Money, & Parenting*, by Doepke & Zilibotti. See a [summary of the argument here](#). See also [Hogberg 2021](#))

[Haidt assumes that all three causal processes are at work, and are complementary]

**Chris Ferguson comment:** “There are probably a great number of historical factors happening during this time frame. Left out, for instance, are everything from more wounded young parent war veterans from 2 wars, to increased political polarization to the opioid epidemic. I'm reading a fascinating book now "The Book of Woe" that suggests around this time that increased diagnosis of bipolar disorder in children may have exposed them to more pharmaceuticals including some with suicide as a risk factor. Point being, it's difficult to isolate a historical cause.” [Haidt's response: I agree with you, and I am particularly interested in learning more about new chemicals and pharmaceuticals that became common in the late 1990s, when Gen Z was in utero or early childhood, or changes in the use pharmaceuticals during the later childhood of Gen Z. It is possible that we are replaying the catastrophe of leaded gas, which I believe [was a major contributor to the American crime wave](#) that began in the late 1960s and ended, mysteriously, in the 1990s. More on that when we discuss suicide rates below.]

\* \* \* \* \*

## CAUTIONS AND CAVEATS

- 1) The numbers and patterns almost always vary by gender, so we always show data for male and female separately where available.
- 2) Young people today, known as Gen Z (born 1996 or later) are probably more willing than previous generations to admit to symptoms and to seek out and accept [diagnoses](#). This may contribute to rising trends in some datasets, particularly for depression and anxiety, without necessarily indicating a real change in underlying rates. See [this Guardian article](#) for the claim that this is all that is happening. But this factor is much less relevant for measures of behaviors, such as self-harm and suicide.
- 3) There is a risk of moral panic. The popular press loves to report on problems with “kids today,” especially if it can be linked to a new technology that kids today use, such as smartphones and social media. So we must all be cautious about believing the steady stream of reports in the American and British press about the mental health crisis. We must look at the original studies and the raw datasets, and we must invite researchers to offer conflicting interpretations.

[Chris Ferguson put the **counterpoint** this way: “As one thought, the argument that a rise in suicide could be linked to technology seems eerily reminiscent of similar arguments in the 1970s and 80s, that a rise in violent crime could be linked to the introduction of television. Then, when crime began to plummet again in the 1990s, but television violence continued to increase in popularity, those same scholars began to argue that population data wasn’t important after all. Are you willing to certify, now and forever more, that should at some point in the future, 10, 20, 30 years even, that suicide rates fall, but social media and screen use continues to remain high or increase, that this pattern would falsify your hypotheses linking screens/social media to suicide?”

Haidt’s response: “No, because crime rates and suicide rates respond to many causal factors. Such a drop would only prove that high rates of social media are not *sufficient*, on their own, to drive up suicide rates and hold them there. But you are right that many researchers saw two correlated social trends and jumped to the conclusion that one caused the other. You are right that past claims of links between technology use and bad outcomes for kids have mostly been shown to be false or inflated, so the onus is on me to show that “this time is different.”]

\*\*\*\*\*

## SECTION 1: DEPRESSION, ANXIETY, AND SUICIDAL IDEATION

### 1.1 USA: STUDIES AND DATASETS SHOWING A RISE IN RECENT YEARS IN TEEN DEPRESSION, ANXIETY, AND SUICIDAL IDEATION

**1.1.1** [Twenge, Cooper, Joiner, Duffy, & Binau \(2019\)](#). Age, period, and cohort trends in mood disorder indicators and suicide-related outcomes in a nationally representative dataset, 2005-2017. *Journal of Abnormal Psychology*.

ABSTRACT: Drawing from the National Survey on Drug Use and Health (NSDUH; N = 611,880), a nationally representative survey of U.S. adolescents and adults, we assess age, period, and cohort trends in mood disorders and suicide-related outcomes since the mid-2000s. **Rates of major depressive episode in the last year increased 52% 2005–2017 (from 8.7% to 13.2%) among adolescents aged 12 to 17 and 63% 2009–2017 (from 8.1% to 13.2%) among young adults 18–25. Serious psychological distress in the last month and suicide-related outcomes (suicidal ideation, plans, attempts, and deaths by suicide) in the last year also increased among young adults 18–25 from 2008–2017 (with a 71% increase in serious psychological distress), with less consistent and weaker increases among adults ages 26 and over.** Hierarchical linear modeling analyses separating the effects of age, period, and birth cohort suggest **the trends among adults are primarily due to cohort**, with a steady rise in mood disorder and suicide-related outcomes between cohorts born from the early 1980s (Millennials) to the late 1990s (iGen). Cultural trends contributing to an increase in mood disorders and suicidal thoughts and behaviors since the mid-2000s, including the rise of electronic communication and digital media and declines in sleep duration, may have had a larger impact on younger people, creating a cohort effect.

FIGURES:

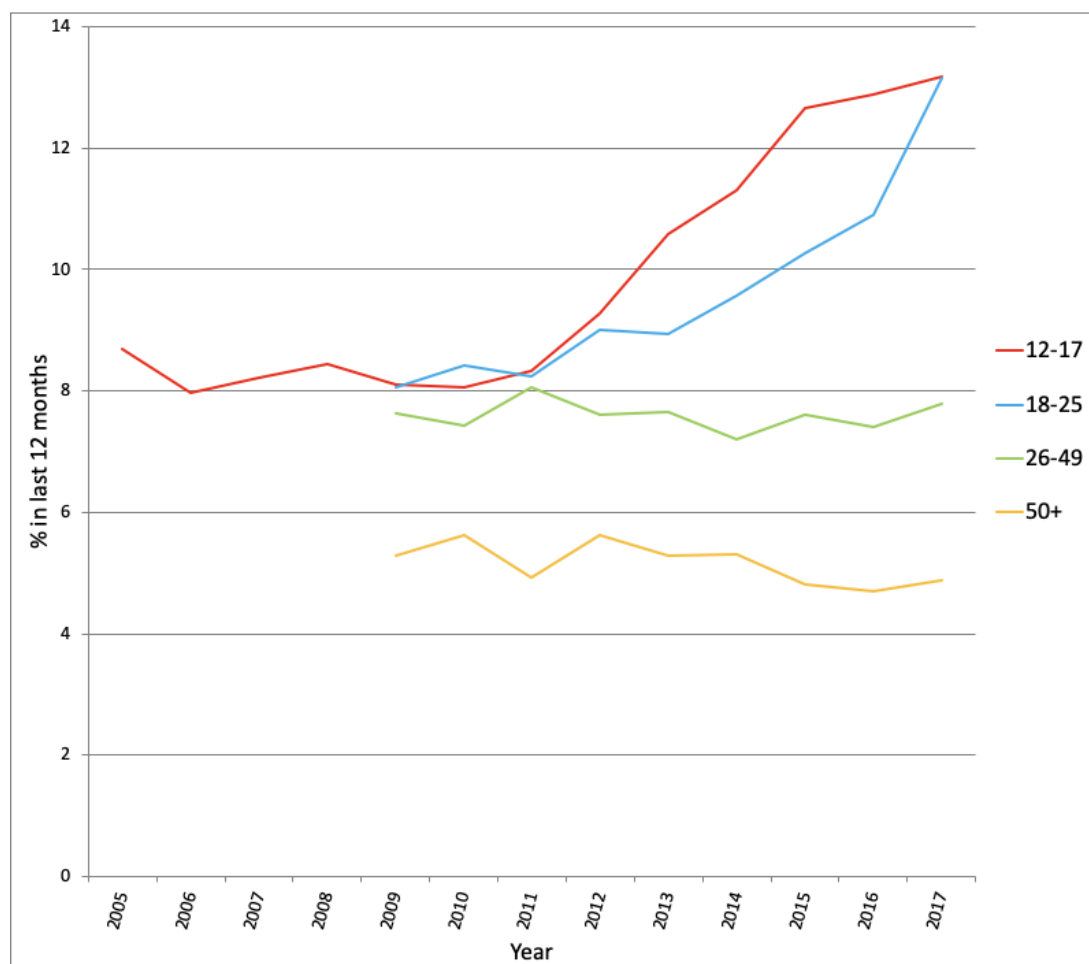


Figure 1: Major depressive episode in the last 12 months, by age group, 2005-2017, NS-DUH. [Note that the rise happens only for Gen Z and younger millennials.]

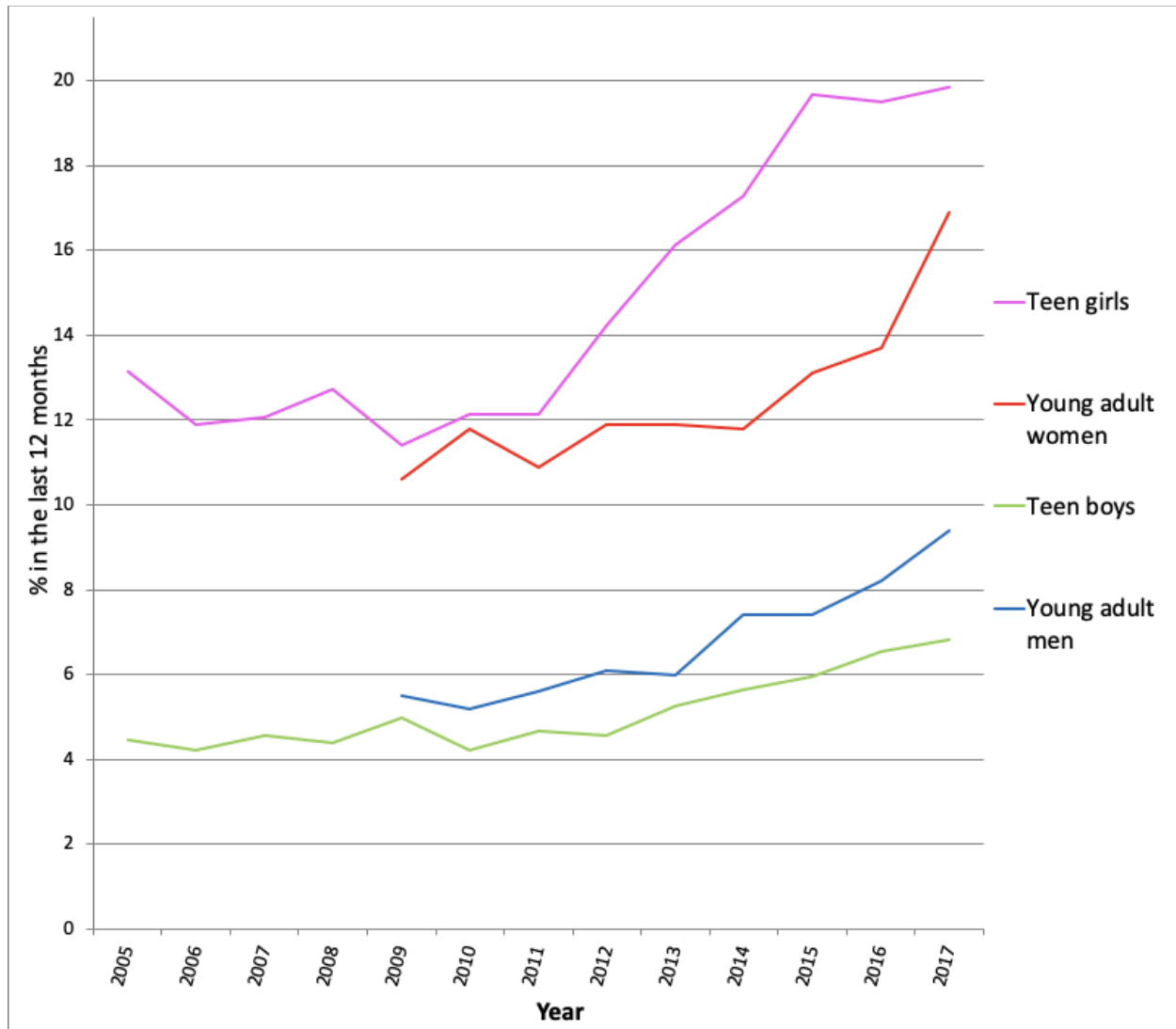


Figure 2: Major depressive episode in the last 12 months, by age group and sex, 2005-2017, NS-DUH

[Note that 2011 is the last year of normal rates. Beginning around 2012, rates begin to rise.]



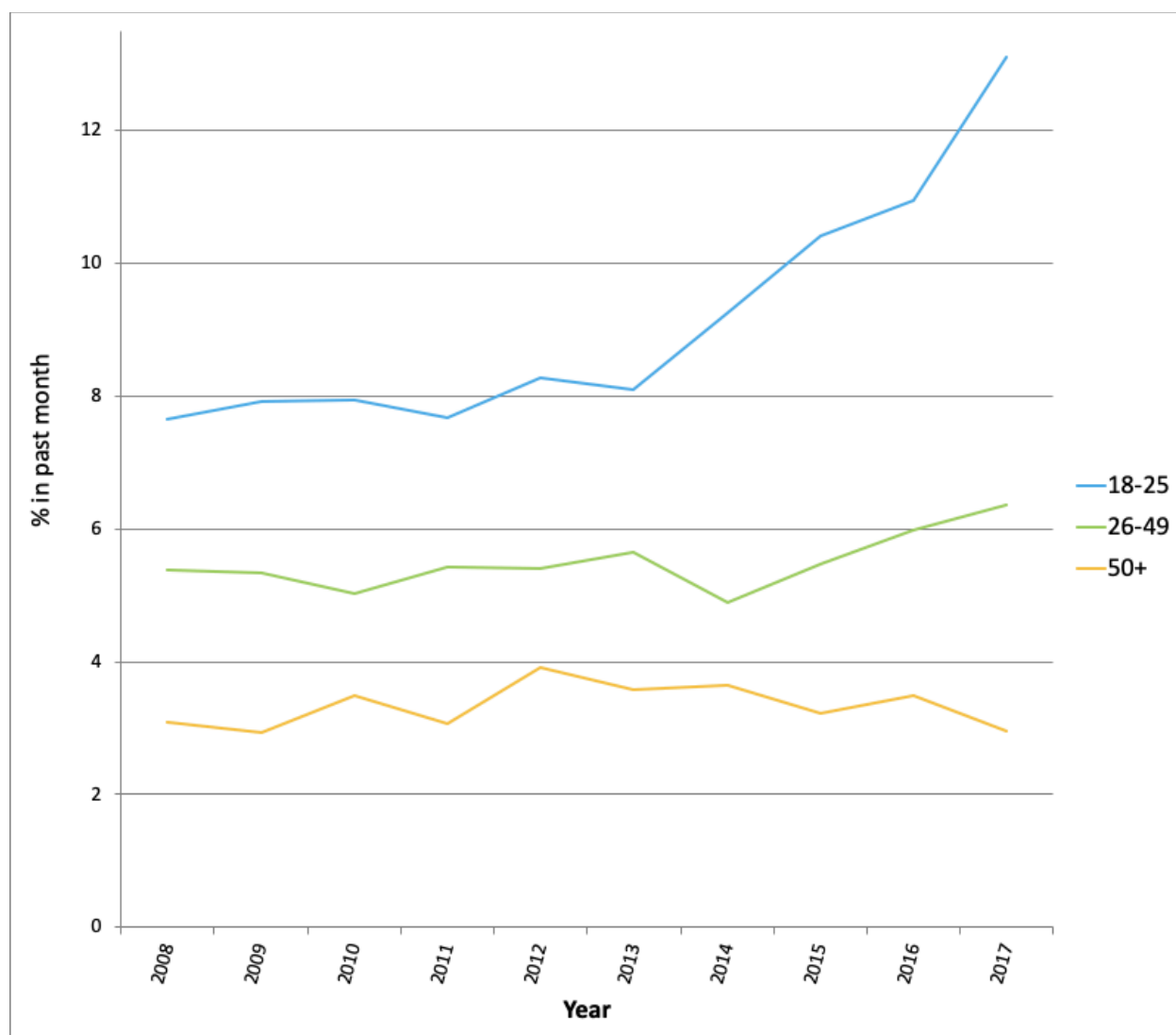


Figure 3: Serious psychological distress in the past month, by age group, 2008-2017, NS-DUH

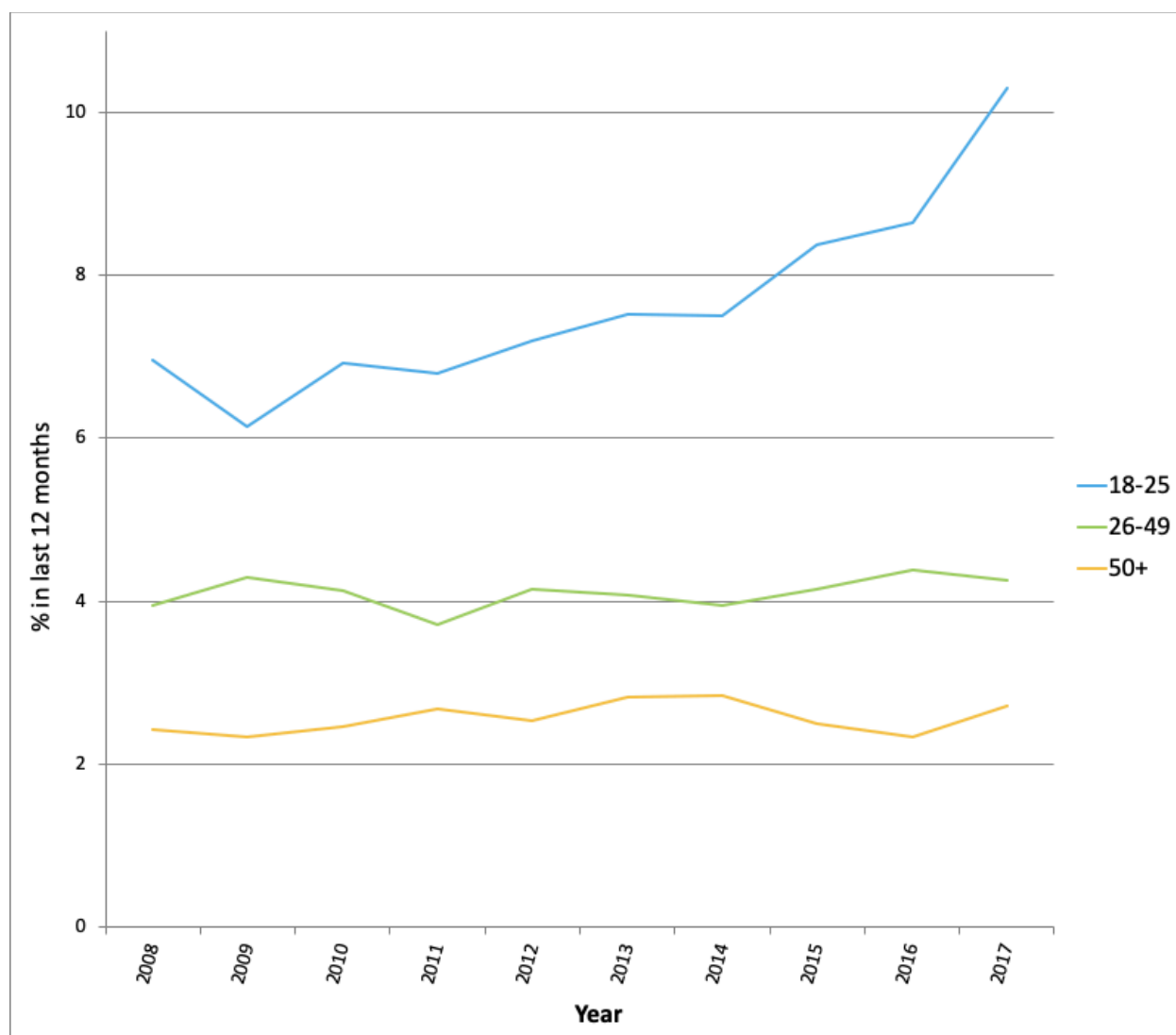


Figure 4: Suicidal thoughts in the last 12 months, by age group, 2008-2017, NS-DUH

NOTES: 1. Teen depression was essentially unchanged before, during, and immediately after the Great Recession (which officially lasted 2007-2009, with unemployment peaking in 2010). Depression among teens began to rise around 2012. The rise came a little later for young adults, around 2014 (see Figure 1).

2. Serious psychological distress in the last month and suicidal thoughts in the last 12 months also rose among young adults (only measured in those 18+; see Figures 3 and 4).

3. The increases were confined to teens and young adults and were weaker or non-existent among those ages 26 and over (see Figures 1, 3, and 4). HLM-based APC analysis confirmed that most of the increase was due to birth cohort (generation) rather than to time period.

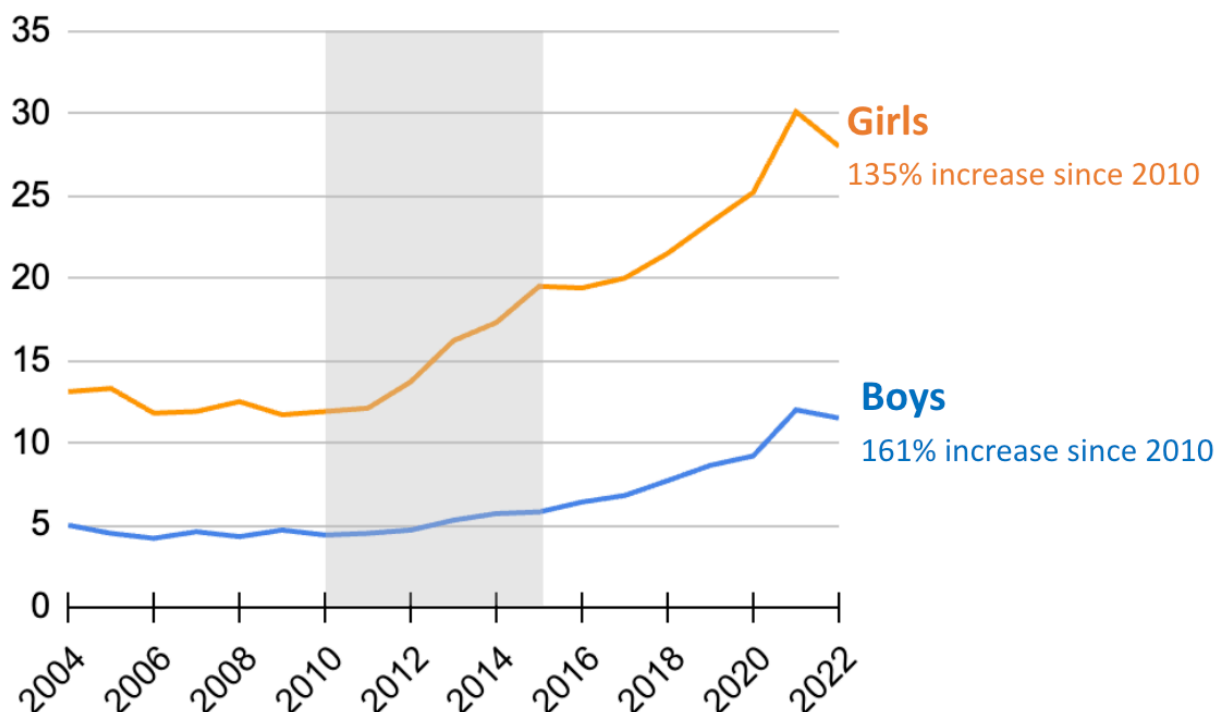


% of U.S. teens (12-17 years) experiencing a major depressive episode in the last 12 months. Source: NS-DUH

Thus: The number of teens with depression doubled between 2011 and 2019. More than 23% of girls ages 12-17 experienced a major depressive episode during 2019.

Here is the [same data](#) from NSDUH, updated to include up to 2022 data and with a neater format from Zach and Jon:

## Major Depression Among Teens



NOTE: There were methodology changes beginning in 2020: Researchers incorporated web-based interviewing (instead of ONLY in-person interviews), which may have impacted scores, although on these variables we see no sign of a sharp discontinuity. For more on the method change, see [here](#).

**1.1.2** [Mojtabai, R., Olfson, M., & Han, B. \(2016\)](#). National trends in the prevalence and treatment of depression in adolescents and young adults. *Pediatrics*.

**ABSTRACT: OBJECTIVES:** This study examined national trends in 12-month prevalence of major depressive episodes (MDEs) in adolescents and young adults overall and in different sociodemographic groups, as well as trends in depression treatment between 2005 and 2014.

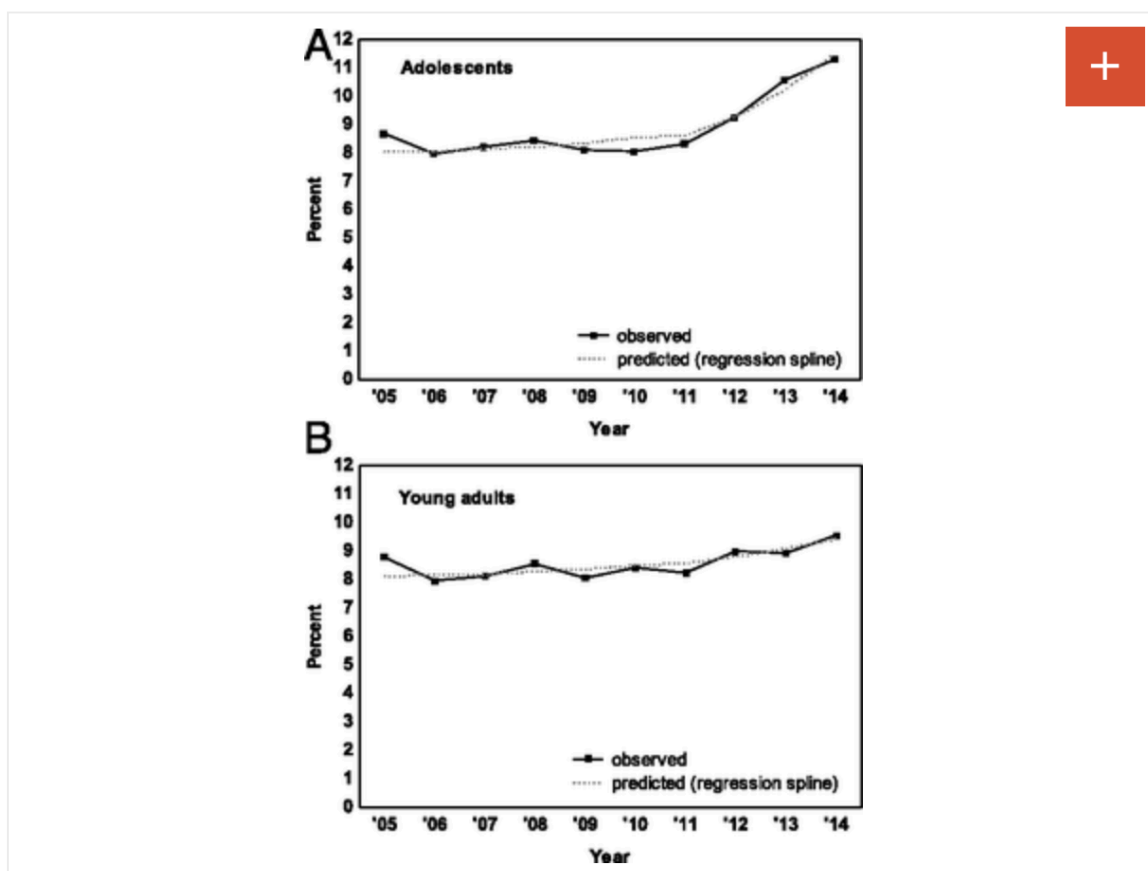
**METHODS:** Data were drawn from the National Surveys on Drug Use and Health for 2005 to 2014, which are annual cross-sectional surveys of the US general population. Participants included 172 495 adolescents aged 12 to 17 and 178 755 adults aged 18 to 25. Time trends in 12-month prevalence of MDEs were examined overall and in different subgroups, as were time trends in the use of treatment services.

**RESULTS:** The 12-month prevalence of MDEs increased from 8.7% in 2005 to 11.3% in 2014 in adolescents and from 8.8% to 9.6% in young adults (both  $P <$

.001). The increase was larger and statistically significant only in the age range of 12 to 20 years. The trends remained significant after adjustment for substance use disorders and sociodemographic factors. Mental health care contacts overall did not change over time; however, the use of specialty mental health providers increased in adolescents and young adults, and the use of prescription medications and inpatient hospitalizations increased in adolescents.

CONCLUSIONS: The prevalence of depression in adolescents and young adults has increased in recent years. In the context of little change in mental health treatments, trends in prevalence translate into a growing number of young people with untreated depression. The findings call for renewed efforts to expand service capacity to best meet the mental health care needs of this age group.

FIGURE:



**FIGURE 1**

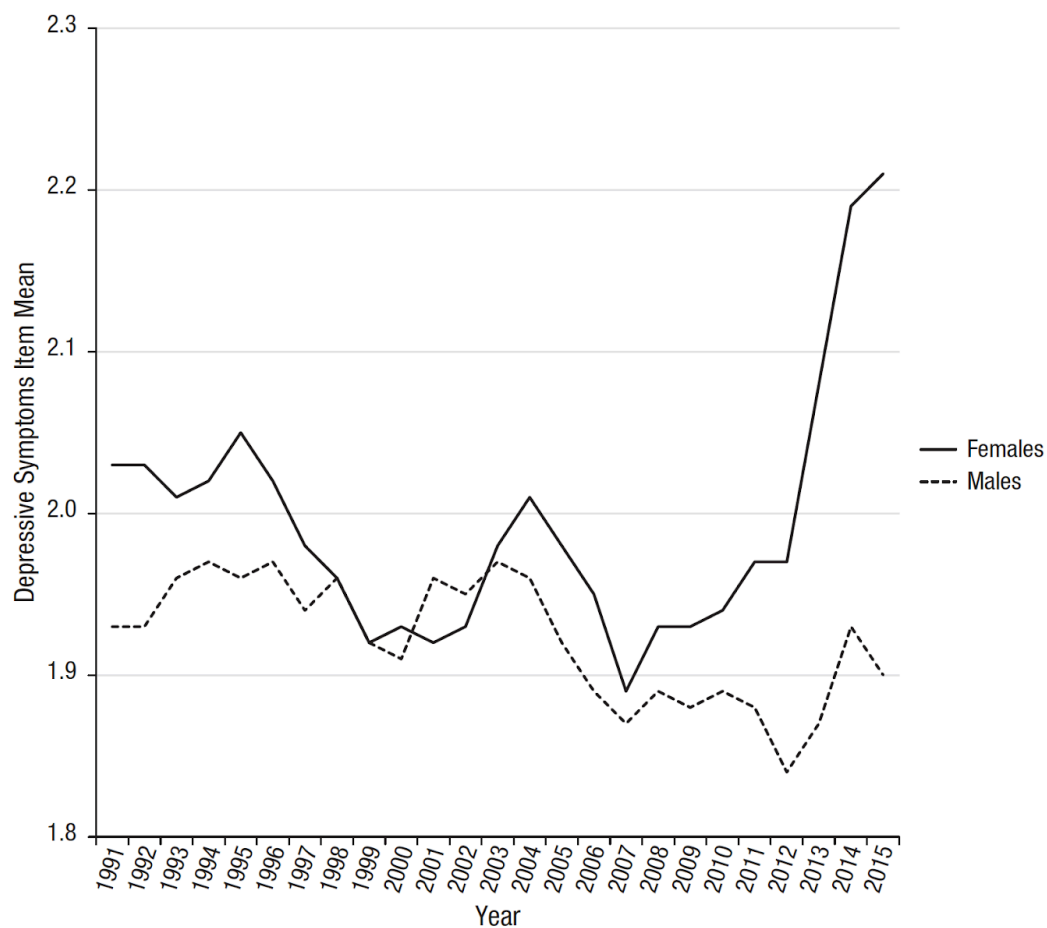
[Download figure](#) | [Open in new tab](#) | [Download powerpoint](#)

Prevalence of 12-month MDEs in adolescents (A) and young adults (B) in the United States based on the 2005 to 2014 NSDUH. The predicted value lines are based on regression spline (see text and [Supplemental Information](#) for detail).

**1.1.3 [Twenge, Joiner, Rogers, & Martin \(2018\)](#).** Increases in depressive symptoms, suicide-related outcomes, and suicide rates among U.S. adolescents after 2010 and links to increased new media screen time. *Clinical Psychological Science*.

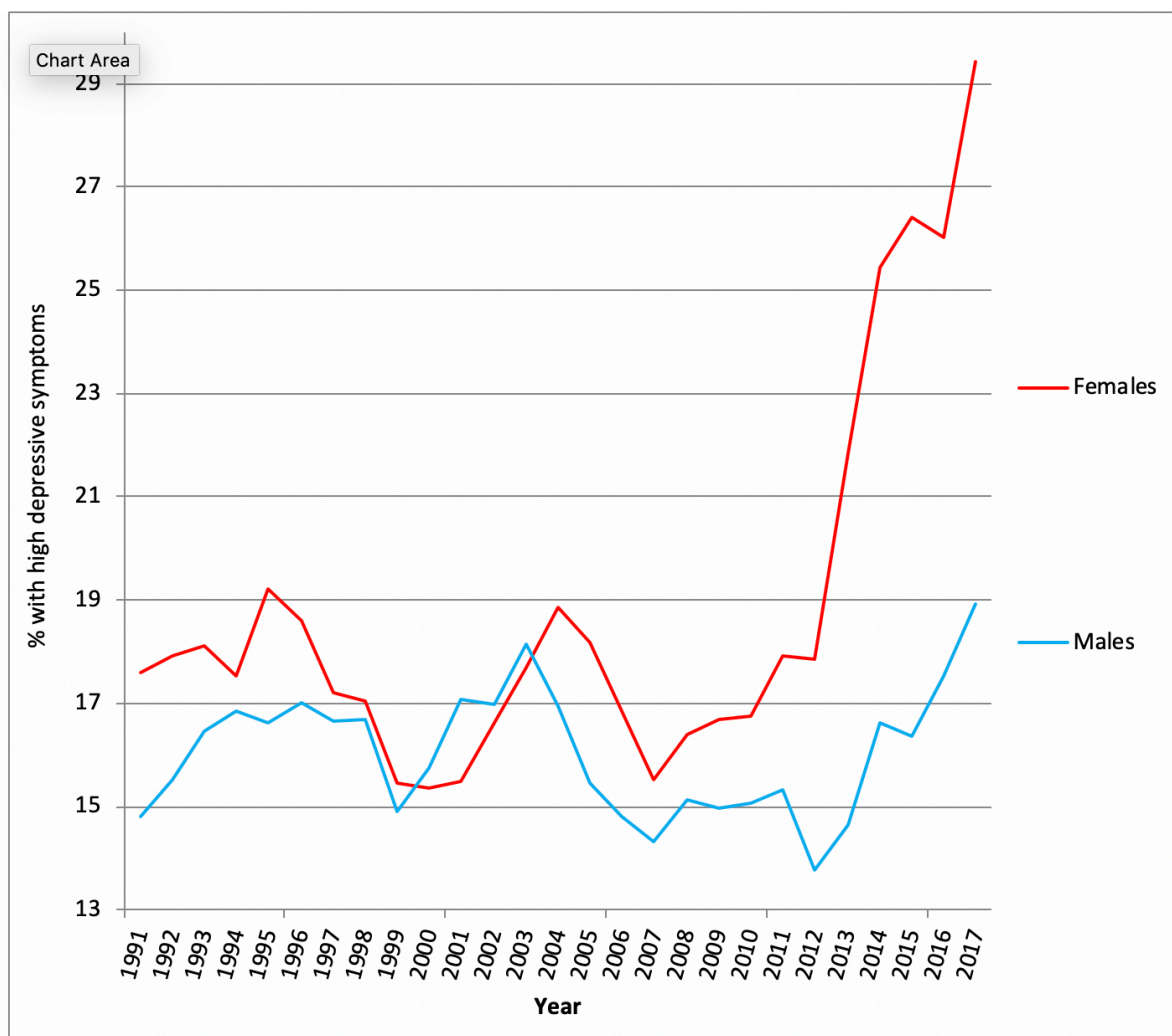
ABSTRACT: In two nationally representative surveys of U.S. adolescents in grades 8 through 12 ( $N = 506,820$ ) and national statistics on suicide deaths for those ages 13 to 18, **adolescents' depressive symptoms, suicide-related outcomes, and suicide rates increased between 2010 and 2015, especially among females. Adolescents who spent more time on new media (including social media and electronic devices such as smartphones) were more likely to report mental health issues, and adolescents who spent more time on nonscreen activities (in-person social interaction, sports/exercise, homework, print media, and attending religious services) were less likely.** Since 2010, iGen adolescents have spent more time on new media screen activities and less time on nonscreen activities, which may account for the increases in depression and suicide. In contrast, cyclical economic factors such as unemployment and the Dow Jones Index were not linked to depressive symptoms or suicide rates when matched by year.

FIGURE:



**Fig. 1.** Depressive symptoms (item mean), 8th, 10th, and 12th graders, by sex, MtF, 1991–2015.

Below, with data updated to 2017, and instead showing the percentage with high depressive symptoms (item mean of 3 or over):



Source: Monitoring the Future, 8th, 10th, and 12th graders combined, by sex, 1991-2017

[Note that 2012 is the last year of normal data. Surge begins in 2013, for girls only.]

**1.1.4** [Keyes, K. M., Gary, D., O'Malley, P. M., Hamilton, A., & Schulenberg, J. \(2019\).](#)

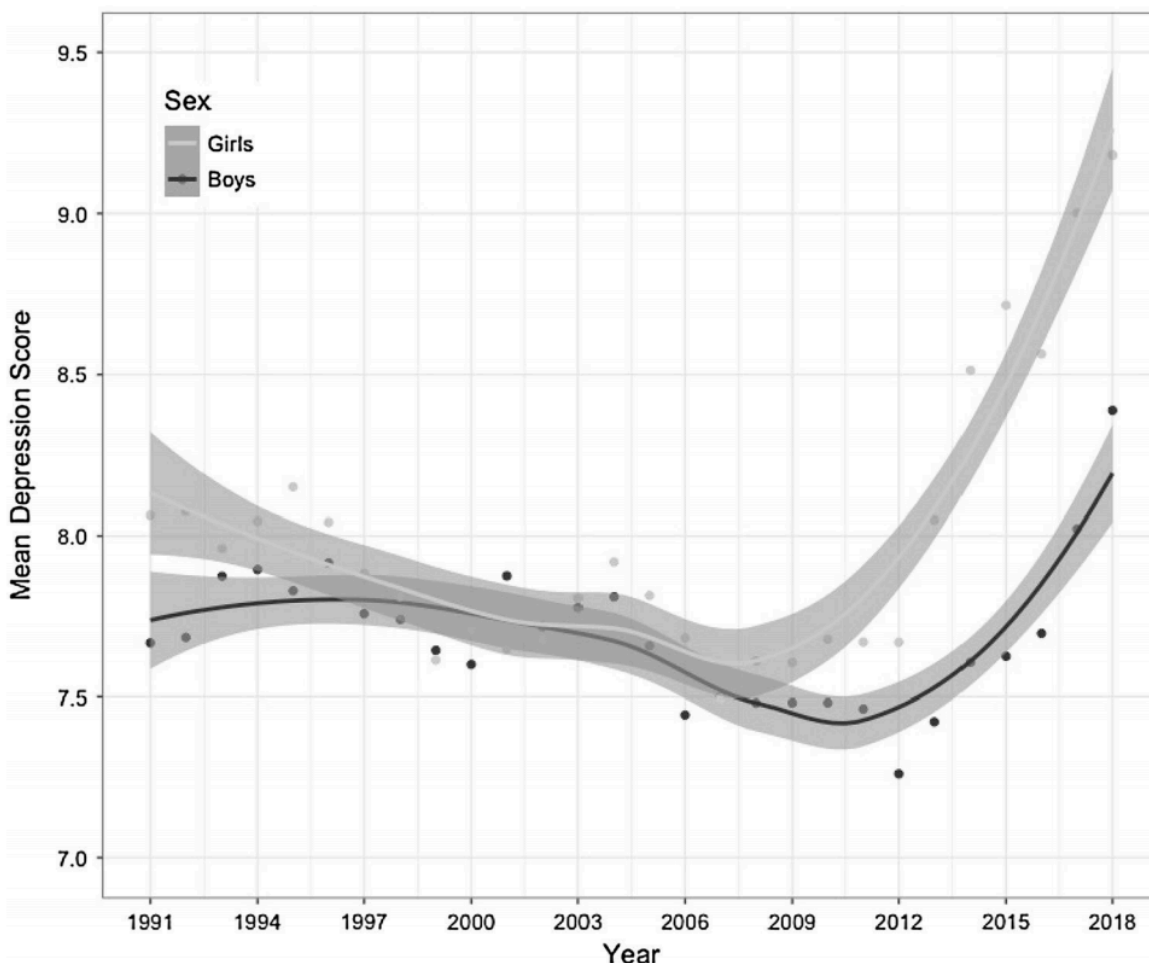
Recent increases in depressive symptoms among US adolescents: Trends from 1991 to 2018. *Social Psychiatry and Psychiatric Epidemiology*.

**ABSTRACT:** Mental health problems and mental health related mortality have increased among adolescents, particularly girls. These trends have implications for etiology and prevention and suggest new and emerging risk factors in need of attention. The present study estimated age, period, and cohort effects in depressive symptoms among US nationally representative samples of school attending adolescents from 1991 to 2018.



Data are drawn from 1991 to 2018 Monitoring the Future yearly cross-sectional surveys of 8th, 10th, and 12th grade students ( $N = 1,260,159$ ). Depressive symptoms measured with four questions that had consistent wording and data collection procedures across all 28 years. Age–period–cohort effects estimated using the hierarchical age–period–cohort models. **Among girls, depressive symptoms decreased from 1991 to 2011, then reversed course, peaking in 2018; these increases reflected primarily period effects, which compared to the mean of all periods showed a gradual increase starting in 2012 and peaked in 2018 (estimate = 1.15,  $p < 0.01$ ). Cohort effects were minimal, indicating that increases are observed across all age groups. Among boys, trends were similar although the extent of the increase is less marked compared to girls;** there was a declining cohort effect among recently born cohorts, suggesting that increases in depressive symptoms among boys are slower for younger boys compared to older boys in recent years. Trends were generally similar by race/ethnicity and parental education, with a positive cohort effect for Hispanic girls born 1999–2004. Depressive symptoms are increasing among teens, especially among girls, consistent with increases in depression and suicide. Population variation in psychiatric disorder symptoms highlight the importance of current environmental determinants of psychiatric disorder risk, and provide evidence of emerging risk factors that may be shaping a new and concerning trend in adolescent mental health.

FIGURE:



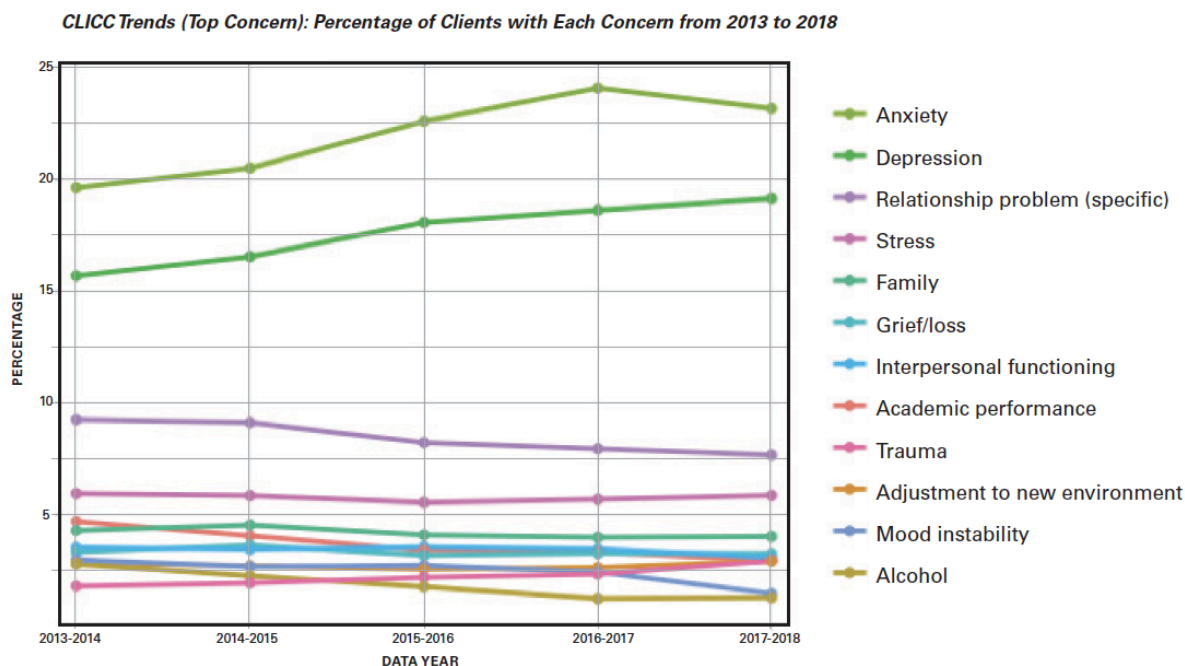
NOTES: This paper uses the same dataset (Monitoring the Future) used in 1.1.3, replicating the rise in depressive symptoms among teens since 2012 with a slightly different scale (using 4 items instead of 6) and including data up to 2018. Increases in depressive symptoms begin after 2012 and are largest for girls, though increases for boys became more pronounced after 2016. **Increases for girls are  $d = .50$  2012-2018 and  $d = .33$  for boys 2012-2018.** This paper also adds an age-period-cohort analysis, which finds that depressive symptoms showed a similar increase across age groups (13 to 18 year olds), suggesting a **period effect** among teens. [This means that the pattern suggests that something happened to all teens, as they entered a new period of time, rather than it being a cohort -- such as Gen Z -- entering the dataset gradually. But since all high school students in the study during the sharp rise after 2013 ARE Gen Z, this “period effect” could explain when and why Gen Z became so depressed and anxious. We would want to see if the same thing happened to young adults in their 20s at the same time -- the millennial generation.]

### 1.1.5 [Center for Collegiate Mental Health \(2018\)](#) Penn State University

ABSTRACT: [None. This is not a representative survey of American college students. It is a compilation of data provided by 152 college and university counseling centers, about 1.3 million appointments made by 179,964 college students, showing the changing nature of student concerns that motivate an increasing number of students to come in for help. The increases here probably reflect, in part, the increasing willingness of Gen Z to self-diagnose. [Sally Satel adds: It may also reflect the increased willingness of universities in recent years to accept students with a history of mental illness] I (Jon Haidt) am including this study here for two reasons: 1) It confirms the commonly stated concern of mental health counselors on campus that volume is increasing during the years in which Gen Z replaced the Millennials, and 2) it shows us that the increase is entirely localized in mood disorders, it is not an across-the-board increase in Gen Z's willingness to self-diagnose in other categories.]

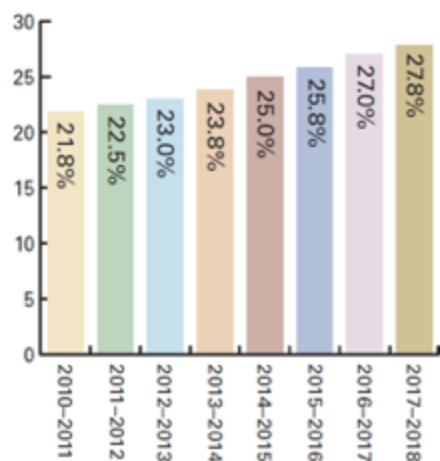
[Note: the [2021 report is here](#)]

#### FIGURES:

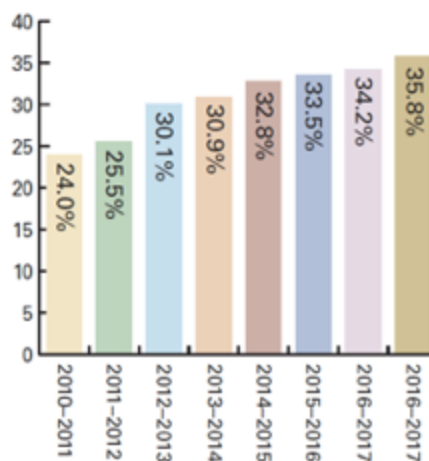


[The same study shows a rise in self-harm and in suicidal ideation, and in self-reports of having ever made a suicide attempt, as a percentage of all those who come to the counseling center.]

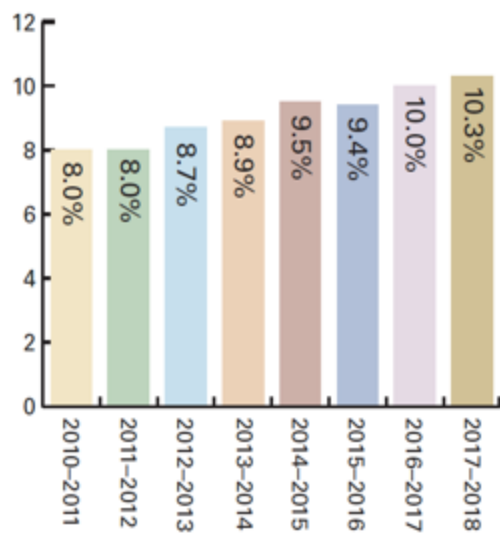
***Purposely injured yourself without suicidal intent (e.g., cutting, hitting, burning, hair pulling, etc.)***



***Seriously considered attempting suicide***



***Made a suicide attempt***



**2022 Figures:**