

# The Consequences of Abuse, Neglect and Cyber-bullying on the Wellbeing of the Young

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### **Abstract**

Using cross-sectional data files for the United States we show that difficulties experienced in childhood - so-called Adverse Child Experiences (ACE)s - are strongly and significantly associated with mental health in adulthood. Our evidence is taken from eight Behavioral Risk Factor Surveillance System (BRFSS) surveys from 2009-2023 which contain a special supplement asking respondents to recall abuse in their childhood. We find that poor mental health is on the rise in the United States, particularly among young women. This upward trend among the young is also apparent from the National Health Interview Surveys 1997-2021, the Healthy Minds surveys of 2007-2023 and the Youth Risk Behavior Surveillance System (YRBSS) for high school students. We find ACEs are strongly correlated with poor mental health among both the young and older people and the effect is additive. The impact of living with a household member with poor mental health is large relative to other ACEs and is particularly pronounced among younger people. Being bullied, including electronically, is also strongly negatively associated with the wellbeing of high school students. Time spent in front of a screen has been rising over time for the young and has an independent negative impact on their mental health over and above bullying, one which is more pronounced for young women.

JEL codes: I1; I31; J16

Key words: Adverse Childhood Experiences (ACEs); wellbeing; mental health; social media; cyber-bullying

## 1. Introduction

Existing research indicates that mental health has been deteriorating in the United States since shortly after the Great Recession, particularly among the young (Xu et al., 2024; Udupa et al., 2022, Botha et al 2023). It continued to deteriorate during COVID, which was also a huge negative economic shock. One possible reason for the deterioration is the state of the labor market. It is well known that the state of the labor market when graduating from college negatively impacts lifetime earnings (Kahn, 2010). The young were hugely impacted by unemployment which peaked in the United States at 18.4% in 2010 and didn't drop into single digits until 2017. This may also have spilled over into a 'scarring' effect on their mental health. However, as we shall show in this paper, the decline in mental health appears to have affected those who have yet to enter the labor market too, potentially explaining the poor PISA performance of high school students in the United States. PISA math test scores in 2022 were among the lowest ever measured. Compared to 2012 the proportion of age 15 high school students scoring below a baseline PISA proficiency increased by eight percentage points.<sup>1</sup>

The depth of the mental health crisis is apparent in suicide rates among those aged 15-24 which rose sharply from around 2007 and especially so for young women (Keyes et al, 2019; Spiller et al, 2019). From 2011 to 2021 suicide rates of women ages 15-24 doubled while those of young men rose by a half, although they are still around four times higher than for young females who attempt more but succeed less.<sup>2</sup>

Using three data sets Udupa et al. (2022)<sup>3</sup> confirm this decline in the mental health of young people, particularly among women, as did Twenge (2022). Speculating as to the reasons they argue COVID is not a primary cause since the trend pre-dates it by many years. They also discount a change in willingness to admit to mental health issues, given that suicide also increased among these age groups over the same time period. We extend their work using the Behavioral Risk Factor Surveillance System Surveys (BRFSS), through to 2022, and the Youth Risk Behavior Surveillance System (YRBSS) data from 1999-2021 for high school students ages 14-18. In both, we show a deterioration in mental health especially of women. We also report evidence from the National Health Interview Surveys (NHIS), 2005-2018.

In doing so we build on our earlier work in three recent papers and do further analysis on mental health of the young in the United States. First, in Xu, Blanchflower and Bryson (2024) we found that there has been a dramatic decline in the wellbeing of young people under the age of twenty-five, and especially for young women in both the US and the UK. This decline in mental health occurred from around 2011.

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<sup>1</sup> PISA 2022 Results – USA, OECD, 5<sup>th</sup> December 2023. <https://www.oecd.org/publication/pisa-2022-results/country-notes/united-states-a78ba65a/>

<sup>2</sup> Suicide rates /100000 for ages 15-24 were as follows for men with women in parentheses 2007=15.7 (3.1); 2011=17.6 (4.0); 2015=19.4 (5.3); 2017=22.7 (5.8); 2019=22.0 (5.5); 2020=22.4 (5.8); 2021=23.8 (6.1). <https://www.cdc.gov/nchs/data/databriefs/db464-tables.pdf#2>.

<sup>3</sup> The Behavioral Risk Factor Surveillance Survey (BRFSS), 1993-2020 (n=8.8 million), the National Health Interview Survey, 1997-2018 (n=657,000) and the National Health and the much smaller Nutrition Examination Survey (NHIS), 2005-2020 (n=39,467).

Second, in Blanchflower and Bryson (2023a) we used data for Europe and the United States to examine the impact of a number of ACE variables on wellbeing in later life.<sup>4</sup> Death of a parent, parental separation or divorce, financial difficulties, the prolonged absence of a parent, quarreling between parents, parental unemployment, sexual assault, experiencing long-term health problems, being bullied at school and being beaten or punched as a child all have long-term impacts on wellbeing. The evidence of ACEs impacting adult wellbeing outcomes was consistent across 50 different wellbeing measures we identify including sixteen positive affect measures (including happiness, life satisfaction and satisfaction with family and social life),<sup>5</sup> and twenty-six negative affect measures such as the GHQ6, high blood pressure, loneliness, being down and depressed and tired.<sup>6</sup> In addition, we find childhood adversity impacts views on the area where the respondent lives in eight variables, including unemployment, drugs, violence and vandalism plus democracy in their country.<sup>7</sup>

Third, in Blanchflower and Bryson (2023b) we made use of birth cohort data from the British National Child Development Study of everyone born in Great Britain in one week in March 1958. We were able to use characteristics from childhood including reports from a parent on whether the child was bullied at 7 and/or at age 11 and wellbeing data collected prospectively throughout cohort members' lives. Perhaps unsurprisingly, bullying makes adolescents at age sixteen more worried, miserable and tearful. But it has persistent effects on wellbeing across the life-course. We show bullying negatively impacts life satisfaction at ages 42, 46, 50 and 62 as well as several other wellbeing measures at ages 42, 50 and 55. It also significantly lowers the probability of having a job as an adult right through to age 62. These effects are independent of a number of other childhood experiences, such as whether the child reported that they got on well with their mother or father when they were 16, many of which also have persistent effects on outcomes in adulthood. A child who is bullied appears to carry scars for a lifetime.

In this paper we document the rise in mental ill-health among the young since 2010 using BRFSS data plus data from the NHIS, Healthy Minds and from high school students in the YRBSS. The four data sets used in this paper examine the association between Adverse Child Experiences (ACEs) and poor mental health, especially among the young. The BRFSS contains information on parental characteristics and abuse in childhood while the YRBSS contains data on screen time as well as being bullied and sexually abused. The former is by recall whereas in the latter case it is contemporaneous. Healthy Minds and the NHIS provide information on the worsening mental health of the young.

Some studies suggest that the rise in mental ill-health for the young coincided with the growth in

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<sup>4</sup> The datafiles used were the General Social Survey, 1973-2022 and the BRFSS, 2009-2023 for the United States, the Eurobarometer, 2001 and the European Social Survey, 2014.

<sup>5</sup> Happiness; life satisfaction; financial situation; life you lead; family life; social life; leisure life; income; standard of living; health status; time to do things you have to do; consideration shown by others; job satisfaction; pay satisfaction; job security satisfaction and satisfaction with democracy.

<sup>6</sup> Lost sleep; feeling unhappy; could not overcome difficulties; strain; worthless; high blood pressure; not valued; no friends; left out of my family; left out of society; not useful; some people look down on me; fear poverty; confidence; stress; pain; little pleasure in doing things; down, depressed or hopeless; felt a failure; trouble concentrating; bad mental health days; bad physical health days; depressive disorder; anxiety disorder; distress; tired or little energy.

<sup>7</sup> In relation to the local neighborhood - noise; unemployment; violence; drug abuse; vandalism; bad buildings; area you live in and a bad reputation.

smart phone usage. The iPhone was unveiled in January 2007 and sold 4.7 million phones in Q32008, and the iPad was launched in January 2010.<sup>8</sup> In q12011 Apple sold 18.6 million iPhones, while Samsung sold 17.5m. Sales of smartphones worldwide rose from 122m in 2007; 297m in 2010; 472m in 2011; 690m in 2012; 970m in 2013; 1.2 billion in 2014 and 1.5 billion a year since 2018.<sup>9</sup> Twenge (2022), for example, finds that there is a consistent relationship between mental health and social media use for a sample of those ages 13-15 using data from 2015 wave of the UK Millennium Study, a cohort born in 2000 and 2001. Twenge and Farley (2020) used the same data and showed that hours spent on social media and Internet use were more strongly associated with mental ill-health than hours spent on electronic gaming and TV watching with girls showing stronger correlations than boys. Twenge and Martin (2022) found from an analysis of YRBSS, and the UK Millennium Study that digital media time was more strongly associated with low well-being among girls than among boys, particularly for smartphone and social media use. We extend that work and show that a rise in screen time has impacted well-being especially among high school girls.

In the YRBSS 1999-2021 we find a big rise in sadness and hopelessness in particular for young women high school students matching the rise in despair noted above for those age 18-24. We also present dramatic supporting evidence of a rise in screen time usage of young women especially measured as hours spent in front of a TV, computer, smart phone, or other electronic device watching shows or videos, playing games, accessing the Internet, or using social media excluding schoolwork. It does appear to be a significant contributor to the rise in sadness and hopelessness. Further examination of the YRBSS showed that bullying and sexual abuse raises sadness and hopelessness dramatically.

## **2. Adverse Childhood Experiences (ACEs)**

There is a substantial literature showing that experiences in childhood can impact physical as well as emotional outcomes contemporaneously, but also in adulthood.

Petrucelli, Davis and Berman (2019) in a systematic review of the impact of ACEs found that they had a significant effect on both physical and mental outcomes. Huang et al. (2015) showed an impact on diabetes, Yu, Liu et al (2022), on sleep disorders and Exley et al., (2015) on asthma. Hardcastle et al (2018) found a relationship between adverse childhood experiences and educational and employment success in England and Wales.

Sacker, Murray, Maughan and Lacey (2023) show a relationship in the UK between poor social care in childhood and adult outcomes which is especially marked for minority children. Some studies have examined the impact of ACEs in other countries including Iceland (Ásgeirsdóttir et al, 2023), Eritrea (Kelifa et al, 2021) and China (Wu et al 2020).

Other childhood trauma also appears to have long lasting effects. Akbulut-Yuksel, Tekin and Turan (2022) examined the impact of early life exposure to warfare on long-term mental health, using data on the quantity of bombs dropped in German cities by Allied Air Forces during World War II (WWII) and German Socioeconomic Panel. They found that cohorts younger than age five at the onset of WWII or those born during the war were in significantly worse mental health later

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<sup>8</sup> <https://www.theguardian.com/technology/2012/jan/24/smartphones-timeline>

<sup>9</sup> <https://www.sellcell.com/how-many-mobile-phones-are-sold-each-year/>

in life when they are between ages late 50s and 70s. They conclude that “*children bear the invisible wounds of wars*” (2022, p.23). Other papers show the negative impact of war on adult wellbeing including Singhal (2019) on the Vietnam War and Kim (2017) on the Korean War and concluded that “*war exposure in late childhood to early teenage years has a long-run negative impact on variables related to mental health, including depression, fear, insomnia, and loneliness*” (2017, p.431). Economic factors matter also. Adhvaryu, Fenske and Nyshadham (2019) show that a rise in the cocoa price in early life in Ghana decreases the likelihood of severe mental distress in adulthood.

Persson and Rossin-Slater (2018) found that prenatal exposure to the death of a maternal relative increases take-up of ADHD medications during childhood and anti-anxiety and depression medications in adulthood. Kelly-Irving et al (2013) found in the UK that children with higher ACE scores had nearly double the risk of premature mortality through middle age fifty than children without ACE. Brown et al (2009) found that “*ACEs are associated with an increased risk of premature death*”.

A Danish study also found ACEs raised mortality (Østergaard et al (2019). Yu et al (2022) used a US birth cohort to examine 13 individual ACEs assessed between birth and age seven and at the start of the study respondents were age 12-20 in 1979 and followed them up in 2016 – more than three decades later - and observed that 3,344 had died from an overall sample of 46,129.<sup>10</sup> The authors found that “*higher ACE scores led to an increasing risk of premature mortality, with each additional adversity associated with about a 10% higher risk of premature mortality, and exposure to  $\geq 4$  ACEs associated with a 45% higher risk of premature mortality*” (p.7).

Some earlier studies have examined the ACE data in the BRFSS that we examine below. Swedo et al (2023), Merrick et al (2019) and Cole, Armstrong, Giano and Hubach (2022), for example, also examined the ACE data using the BRFSS.<sup>11</sup> Li and Penn (2023) used the 2019 and 2020 BRFSS and showed that ACEs were higher for females and did not find a significant difference in ACE scores between the White population and the Black population. They found that ACEs lowered incomes and the probability of being in work in adulthood.

Monnat and Chandler (2015) examined the impact on adult health from ACEs using data on 52,250 adults ages 18-64 using pooled 2009-2012 BRFSS data. They found that “*experiencing childhood physical, verbal, or sexual abuse, witnessing parental domestic violence, experiencing parental divorce, and living with someone who was depressed, abused drugs or alcohol, or who had been incarcerated were associated with one or more of the following health outcomes: self-rated health, functional limitations, diabetes, and heart attack*”.

Harter and Harter (2022) used the 2012 BRFSS to examine the impact of ACEs on adult financial wellbeing. They analyzed how respondents’ self-reported levels of food security and housing security are influenced by demographics and ACEs and find that, at various income levels, financial stress in adulthood is related to childhood trauma.

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<sup>10</sup> Participants were offspring (born in 1959–1966) of participants enrolled in the Collaborative Perinatal Project. <https://www.archives.gov/research/electronic-records/nih.html>

<sup>11</sup> For a discussion of their findings see Blanchflower and Bryson (2023a).

### 3. Evidence on Adverse Child Experiences in the BRFSS

#### 3.1. Data and Factor Analysis

Here we update evidence in Blanchflower and Bryson (2023a), with a pooled data file for the eight surveys of 2009-2012 and 2019-2022 from the Behavioral Risk Factor Surveillance System (BRFSS) telephone survey (<https://www.cdc.gov/brfss/index.html>) using the same module on adversity in childhood.<sup>12</sup> Each of the eight surveys contain information on eight adverse childhood experiences that respondents reported as an adult on events that occurred when they were a child.<sup>13</sup> Four events relate to their parents and four to whether they were abused, including sexually in childhood. The questions used were as follows with means in parentheses.

*“I’d like to ask you some questions about events that happened during your childhood. This information will allow us to better understand problems, that may occur early in life, and may help others in the future. This is a sensitive topic, and some people may feel uncomfortable with these questions. At the end of this section, I will give you a phone number for an organization that can provide information and referral for these issues. Please keep in mind that you can ask me to skip any question you do not want to answer. All questions refer to the time period before you were 18 years of age. Now, looking back before you were 18 years of age...*

*Q1. Did you live with anyone who was depressed, mentally ill, or suicidal? (18.5%).*

*Q2. Did you live with anyone who was a problem drinker or alcoholic? (24.1%).*

*Q3. Did you live with anyone who used illegal street drugs or who abused prescription medications? (11.8%).*

*Q4. Were your parents separated or divorced? (30.4%)*

*Q5. How often did anyone at least 5 years older than you or an adult, ever touch you sexually? (11.5%)*

*Q6. How often did anyone at least 5 years older than you or an adult, try to make you touch them sexually? (8.6%).*

*Q7. How often did anyone at least 5 years older than you or an adult, force you to have sex? (5.2%).*

*Q8. Before age 18, how often did a parent or adult in your home ever hit, beat, kick, or physically hurt you in any way? Do not include spanking. (23.3%).*

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<sup>12</sup> Thirty-eight states provided information on Adverse Childhood Experiences - Alabama; Arizona; Arkansas; Delaware; District of Columbia; Florida; Georgia; Hawaii; Idaho; Indiana; Iowa; Kentucky; Louisiana; Michigan; Minnesota; Mississippi; Missouri; Montana; Nevada; New Hampshire; New Mexico; North Carolina; North Dakota; Oklahoma; Oregon; Pennsylvania; Rhode Island; South Carolina; South Dakota; Tennessee; Texas; Utah; Vermont; Virginia; Washington; West Virginia; Wisconsin and Wyoming.

<sup>13</sup> There were three other questions we decided not to use as we found they had little statistical impact once the eight others were included. a) *Did you live with anyone who served time or was sentenced to serve time in prison, jail or other correctional facility? Yes/No= .093* b) *How often did your parents or adults in your home ever slap, hit, kick, punch or beat each other up? Never, once or more than once? =.174.* C) *How often did a parent or adult in your home ever swear at you, insult you or put you down? Never, once or more than once? .35.* The weighted means are based on setting the last two variables to dummy variables with once or more than once set to zero, never=0. See for example 2010 BRFSS Questionnaire (<https://www.cdc.gov/brfss/questionnaires/pdf-ques/2010brfss.pdf>)

The three variables relating to sexual abuse (Q5-Q7) allowed the possibility of responding never, once or more than once. For simplicity we recoded all of these variables as (1,0) Yes/No dummies. The correlation matrix is as follows.<sup>14</sup>

	Depress	Drink	Drugs	Divorce	Touch	Them	Hurt
Depression	1.0000						
Drink	0.4941	1.0000					
Drugs	0.6098	0.6055	1.0000				
Divorce	0.3650	0.4152	0.4668	1.0000			
Touch	0.4548	0.3852	0.4145	0.3117	1.0000		
Them	0.4490	0.3821	0.4308	0.3248	0.9318	1.0000	
Hurt	0.4494	0.4220	0.4237	0.3276	0.4500	0.4538	1.0000
Have sex	0.4495	0.4013	0.4415	0.3383	0.8886	0.8798	0.4907

All eight ACEs are highly positively correlated with each other with coefficients ranging from .36 to .93. We undertook exploratory factor analysis to establish whether the items loaded on one or more underlying factors. A single factor emerged with an eigenvalue above one (2.2) indicating that all eight ACEs are associated with a single underlying construct. The Cronbach alpha of 0.70 is an acceptable reliability score. We then proceed initially to sum the ACEs together and create a variable scored from zero to eight (n=426,195) with the weighted distribution as follows.

	Male	Female	Male <25	Female <25
0	44.9	41.9	39.3	32.5
1	26.7	24.2	26.5	23.7
2	12.9	12.4	14.9	13.0
3	7.1	8.0	8.4	10.8
4	4.2	5.4	5.8	8.0
5	2.4	3.6	3.4	5.2
6	0.8	2.2	1.1	3.5
7	0.6	1.4	0.5	2.0
8	0.3	0.8	0.3	1.3
Mean	1.14	1.43	1.33	1.86

Around four in ten of both men and women and a third of young women say they had no ACEs. One in five young woman have four or more ACEs versus one in ten of young men, leading to a much higher mean among young women (1.86 versus 1.33).

**Table 1** reports the raw weighted means where we simply calculate the number of ACEs an individual reports. Also using BRFSS Swedo et al (2023) identified 11 ACEs and found 64% of respondents reported one or more of these eleven ACEs. Looking at our smaller subset of eight ACEs, we find that 52% had one or more ACEs, while 8% had four or more.<sup>15</sup> As we show in

<sup>14</sup> We used the tetrachoric command in STATA for binary variables.

<sup>15</sup> Mean weighted rankings of the average number of ACEs by state was as follows in order: Oregon=1.70; Nevada=1.58; New Mexico=1.48; Missouri=1.41; Michigan=1.40; Utah= 1.40; Kentucky=1.39; New Hampshire=1.39; Indiana=1.38; Montana=1.38; Washington=1.37; South Carolina=1.36; Wyoming=1.36; Arkansas=1.35; Tennessee=1.35; Arizona=1.35; Idaho=1.33; Florida=1.32; Alabama=1.32; Delaware=1.29;



**Table 2**, there is evidence of a rise over time, the reasons for which are unclear. In the raw data weighted scores were higher among females, Natives and Hispanics; those age 25-34, and the jobless and the higher income earners. They were especially low among Asians, the old and retired.

### **3.2. Econometric analysis of the number of the determinants of ACEs in the BRFSS**

**Table 2** reports six OLS regressions modelling the determinants of the number of ACEs. As we move to the right, controls are added. The first column includes age, gender and race and year. The second adds education, the third adds state, the fourth adds labor force status and the final column adds income with \$75000 and over set to the maximum. There is a good deal of stability in the coefficients as controls are varied. Females have a higher number of ACEs than men,; ACEs are higher for native Americans (Blanchflower and Feir, 2022) and those out of work (not shown). The final column reports estimates, for those under age twenty-five, and has especially large female and time effects which we explore further below.

Li and Penn (2023) found no significant difference in the raw data between whites and blacks, but we find blacks have a significantly lower number of ACEs than whites in the first column which persists as controls are added. In contrast, Slopen et al. (2016) found that blacks had a higher incidence of child adversity than white children, which we do not find. They examined racial/ethnic differences in nine adversities among children (from birth to age 17 years) in the National Survey of Child Health (2011–2012) and determined how differences vary by immigration history and income (N=84,837).<sup>16</sup> Overall 49% were exposed to at least one adversity, and 23% were exposed to two or more. Among children of U.S.-born parents, exposure to ACEs was more common among black and Hispanic children than white children: mean scores for black, Hispanic, and white children were 1.27, 1.26, and 0.90, respectively.

Giano, Wheeler and Hubach (2020) examined the BRFSS and found that 57.8% of individuals experienced at least one ACE.<sup>17</sup> Females had significantly higher ACEs than males while White individuals had significantly lower mean ACE scores (1.53) than Black (1.66) or Hispanic (1.63) individuals. The 25-to-34 age group had a significantly higher mean ACE score than any other group (1.98). Generally, those with higher income/educational attainment had lower mean ACE scores than those with lower income/educational attainment. Sexual minority individuals had higher ACEs than straight individuals.

In **Table 3** we report four separate probit regressions by gender for the young (age <25) and older groups (>=25) which include a time variable set to zero in 2009 and fourteen in 2023. ACEs are

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Pennsylvania=1.28; Rhode Island=1.26; West Virginia= 1.26; Georgia= 1.24; Virginia=1.23; Mississippi=1.22; Texas=1.21; Iowa=1.19; Oklahoma= 1.18; North Dakota=1.18; DC=1.16; Wisconsin=1.14; Vermont=1.10; South Dakota=1.10; North Carolina=1.09; Hawaii=1.06; Louisiana=1.04 and Minnesota=.98.

<sup>16</sup> This inventory included 1. financial hardship; 2. parental divorce/separation; 3. parental death; 4. parental imprisonment; 5. witness to domestic violence; 6. victim or witness of neighborhood violence; 7. lived with mentally ill/suicidal person; 8. lived with someone with alcohol/drug problem; and 9. treated unfairly because of race/ethnicity. Items 2, 4, 5, 7, and 8 were based on CDC's BRFSS System ACE Module.

<sup>17</sup> Giano, Wheeler and Hubach (2020) examined the 2011-2014 BRFSS data used by Merrick et al (2018), added 11 states and updated some data but restricted the sample to a single observation per state using the latest data available for each state. They confirmed ACEs were higher for the unemployed, those unable to work as well as those with lower incomes and low educational attainment.

rising over time for all groups, but the coefficient is largest for young females. Why there should have been a rise over time remains unclear especially for those over the age of twenty-five since their childhood would have ended before the start of this time-series.

In **Table 4** we estimate probit equations for the eight ACEs for the young aged <25. Being unemployed is always significantly positive and having a college degree or more is negative and significant. For these young people the likelihood of suffering ACEs in childhood had risen over the period, apart from in the case of living with someone with a drug problem or with divorced parents. It is possible that some of this increase might have been attributable to impacts of the Great Recession or COVID, both of which may have impacted things like depression in the household.

#### 4. Declining mental health for those ages 14-24

We have data available from four datasets that consistently show declining wellbeing of the young in the years since the Great Recession.

##### 4.1. Healthy Minds, 2007-2023 (<https://healthymindsnetwork.org>)

The Healthy Minds surveys are an annual web survey in the United States examining mental health and related factors among undergraduate and graduate students. Institutions choose to participate in the surveys. Publicly available data can be downloaded on application since 2007.<sup>18</sup>

Lipson et al 2022 examined these data and reported results of changes in mental health in eight separate surveys for college students, although they did not report separate results by gender through 2021. The sample also included students aged twenty-five and older which accounted for around a quarter of students. They reported a rise in poor mental health based on a 9-item depression score and a 7-item anxiety score. Each item allowed respondents to report 0='not at all'; 1 "several days" 2= more than half the days and 3 nearly every day. The estimates they reported related to those scoring at least ten on these scales with both showing a sharp rise.

	Depression	Anxiety
2013	17	17
2014-2015	20	20
2015-2016	26	21
2016-2017	31	26
2017-2018	37	32
2018-2019	37	32
2020-2021	41	35

We have access to two more recent surveys, 2021-2022 and 2022-2023 plus surveys from 2007-2012 and decided to examine changes over time by gender in one of the component variables which asked the following:

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<sup>18</sup> A comprehensive list of publications using these data is available here <https://healthymindsnetwork.org/publications/>

*Q9. Over the last two weeks how often have you been bothered by any of the following problems? Feeling down, depressed or hopeless? – not at all (=1), several days (=2), more than half the days (=3), nearly every day (=4).*

We further restricted the sample to those under the age of twenty-five. **Table 5** reports weighted distributions by gender as well as a mean score using the scoring 1-4 for twelve-year groupings. We grouped years together for the earlier years due to smaller sample sizes. The main finding is the increase over time especially for young women. For example, 28% of females in 2022-2023 reported more than half the days or nearly every day versus 14% in 2012-2013. For males 20% said this up from 13% in 2012-2013. It is also notable that females have higher mean depression scores than men. They are also more likely to report higher frequencies of experiencing depression. The mental health of the young and especially young women appears to have deteriorated in the last dozen years or so. We replicate that result in other datasets examined below.

#### **4.2. National Health Interview Surveys 1997-2021 (NHIS)**

We have data available from the US National Health Interview Survey, which is a national survey conducted by the U.S. Census Bureau on behalf of the National Center for Health Statistics (<https://www.cdc.gov/nchs/nhis/index.htm>). The National Health Interview Survey (NHIS) is the principal source of information on the health of the civilian noninstitutionalized population of the United States and is one of the major data collection programs of the National Center for Health Statistics (NCHS), which is part of the U.S. Centers for Disease Control and Prevention (CDC). We downloaded these data from the IPUMS data service (<https://nhis.ipums.org/nhis/>).

We examine the NHIS through to 2020, extending work previously undertaken by Udupa et al (2022) who showed declining mental health from 1997-2018. Udupa et al (2020) used the 6-item Kessler scale which is based on the six items below where participants were asked:

*Q10. “During the past 30 days, how often did you feel ... 1) so sad that nothing could cheer you up, 2) nervous, 3) restless or fidgety, 4) hopeless, 5) that everything was an effort, 6) worthless. Response choices were recoded as: “all of the time” = 4, “most of the time” = 3, “some of the time” = 2, “little of the time” = 1, and “none of the time” = 0.*

The six items are added together to get the Kessler score which ranges between 0 and 24 where a higher score denotes poorer mental health. Mean scores on each item are all less than one with the majority of respondents answering, ‘none of the time’.<sup>19</sup>

**Chart 1** plots these data over time using sample weights for those age 25 and over along with those under 25 by gender (n=685,640). We extend the analysis through 2020 using more recent data. The incidence of poor mental health, on this measure, has been trending up a little for those aged 25 and over and for males aged under-25 but it has risen dramatically for young women aged under-25 since around 2011.

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<sup>19</sup> Weighted means with percent saying none of the time in parentheses were as follows – Sadness=.39 (76%); Hopeless=.22 (88%); Everything an effort=.48 (75%); Nervous=.59 (64%); Worthless=.17 (90%) and Restless=.61 (66). Kessler mean=2.45 (48%).

### 4.3. Behavioral Risk Factor Surveillance Surveys, 1993-2023

The Behavioral Risk Factor Surveillance System (BRFSS) is the nation's premier system of health-related telephone surveys that collect state data about U.S. residents regarding their health-related risk behaviors, chronic health conditions, and use of preventive services. Established in 1984 with 15 states, BRFSS now collects data in all 50 states as well as the District of Columbia and three U.S. territories. BRFSS completes more than 400,000 adult interviews each year, making it the largest continuously conducted health survey system in the world. Annual data files are publicly available here ([https://www.cdc.gov/brfss/annual\\_data/annual\\_data.htm](https://www.cdc.gov/brfss/annual_data/annual_data.htm)).

We have data in the BRFSS from 1993-2023 on the number of bad mental health days in the last thirty. The exact question asked is:

*Q11. Now thinking about your mental health, which includes stress, depression and problems with emotions, for how many of the past 30 days was your mental health not good?*

The question has been asked in the BRFSS since 1993. Blanchflower and Oswald (2021) and Blanchflower and Feir (2022) construct a mental distress (1,0) dummy variable where the respondent reports all 30 days are bad mental health days. They examined BRFSS surveys through 2018 and 2019 respectively. We extend that to the 2022 survey that also includes some observations for 2023. Xu, Blanchflower and Bryson (2024) examined the same BRFSS data for the young. The number of bad mental health days and the mental distress variable are plotted in **Chart 2**. Both mental health days and distress rose steadily over time though the rate of decline in mental health appears to have increased in the last decade.

Included in the BRFSS data files is also an equivalent question that relates to bad physical health days. The question is:

*Q12. "Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?"*

We use that variable to construct a measure of physical distress which is where the respondent reports all thirty days were bad physical health days, zero otherwise.

The weighted distribution of the two variables is as reported in **Table 6** for those ages 25 and over and for men and women under 25 in 2011 and 2022. These years are chosen because 2011 appears to be the date when the rise in mental ill-health of the young is most commonly observed and 2022 is the most recent survey available. A few things stand out. First there is a big decline for young women in the percent saying zero bad mental health days and a more than doubling in the proportion saying every day. The rise over the two years is considerably smaller for young men and the older group. Second, bad mental health days are highest for young females. Third young females in both years have higher mean bad physical and mental health days compared to the other two groups. Finally mean bad physical health days does rise over this period for all three groups but less so than bad mental health days.

**Chart 3** plots both the average number of physical health days and the incidence of physical distress. The number of bad physical health days and distress rose through 2010 but in contrast to mental health then remained broadly steady before declining in 2020 during COVID and then picking up subsequently.

The mean number of bad physical health days in 2022 was 4.09 compared with 4.93 for bad mental health days and .068 for physical distress and .070 for mental distress. In the case of young people there was a much more marked difference between physical and mental health incidence. The mean number of bad physical health days for those under 25 in 2022 was 2.72 compared with 7.58 for bad mental health days and .026 for physical distress and .090 for mental distress.

**Chart 4** restricts the BRFSS trend analysis to under-25s. It includes both physical and mental health days and the two despair variables defined as 30 of 30 days in the month being ‘bad’. Bad physical health days and physical despair are broadly flat, with both showing dips in COVID in 2020. In contrast both bad physical health days and mental despair rise steadily from around 2011 before dropping in 2023.

**Chart 5** focuses on physical and mental distress for young men and women separately. Physical distress is flat for males and females, but mental distress rises for both and is consistently higher for women than men. For example, in 2022 10.8% of young women suffered mental distress compared to 7.3% of young men while physical distress affected 2.7% and 2.5% respectively.

Whereas mental distress is more evident than physical distress among the young it is the other way round for 25s and over where the physical lines are above the mental lines until the end of the period (**Chart 6**). Physical despair is always above mental despair. All trend up slightly over time. In 2011 mental despair for young females had a mean of .051 but by 2022 it had reached .11 while among prime age less educated the rates were .10 and 0.11 respectively so the gap between the two series disappeared over these dozen years.

In part a) of **Table 7** we report the number of ACEs and the proportion who report despair by gender and age. So, for example 44% of the young females with eight ACEs report being in despair, compared to only 3% with no ACEs. Part b) of **Table 7** reports the incidence of ACEs for those in despair and those who are not in BRFSS pooled data for 1993-2022. The columns present these data for three groups: young females, young males and all those aged 25 and over. Despair is much higher among those who say they had ACEs and especially so for young females. For example, 65% of young females in despair report that as a child they lived with someone who was depressed compared with 33% of those not in despair. The mean number of ACEs for young females in despair was 3.5 versus 1.7 for those not in despair. Analogously for the other two groups the probability of having a particular ACE was higher for those in despair than those who were not.

To estimate the partial correlation between ACEs and mental and physical despair we run probit estimates in **Table 8** and, below them, estimates for the number of bad mental and physical health days. We do so for men and women, young and old. Models contain controls for age and its square, income, education, race, labor force status, and state dummies. The linear time trend shows an upward trend in mental despair for all groups which is also apparent for bad mental health days. However, there are no trends in physical despair and the number of bad physical days.

**Table 9** examines the correlates of mental despair in more detail. The first column, with a sample size of nearly ten million, takes the full BRFSS sample from 1993-2023 and estimates a probit with state controls (not reported) along with year, age and its square, education, race, and labor

force status. Of note is the big rise in the year dummies noted in the charts above and in Xi, Blanchflower and Bryson (2024), especially from 2014/15. Column 2 confines the analysis to those aged under-25. The rise in incidence since 2014/15 is especially notable. Column 3 now adds the eight ACE variables to the analysis in column 1 for all, and column 4 does so for those under twenty-five. Because these ACE variables are only available for a subset of years our sample size falls. All ACE variables are positive and statistically significant in column 3 for all. Among the young, only four of the ACEs – living with someone with depression, living with someone who drinks, being forced to have sex, and being hurt by parents – significantly adversely impacted mental health as a young adult.

We now move onto another data set for high schoolers which has data on sadness, bullying and internet and smart phone screen usage.

#### **4.4. Youth Risk Behavior Surveillance System, 1999-2021 for high school students**

We also have data on the mental wellbeing of high school students ages 14-18 in 9<sup>th</sup> through 12<sup>th</sup> grades, in the Youth Risk Behavior Surveillance System (YRBSS) also conducted by the CDC.<sup>20</sup> The data are publicly available for download. The survey, which reports data every odd year, contains data on mental well-being.<sup>21</sup> It first asked a question on sadness and hopelessness in 1999 that is not dissimilar to the distress and despair variable used earlier from the BRFSS.

*Q13. During the past 12 months did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities? Yes/No*

Part 1 of **Table 10** shows that, just as with despair, sadness and hopelessness has trended up alarmingly, especially for high school women, from 36% in 1999 to 57% in 2021. This is consistent with data from the NHIS on sadness which is one of the six components of the Kessler score reported above. The mean score rose from 2011 as follows: 2011=.39; 2012=.42; 2013=.46; 2014=.45; 2015=.44; 2016=.46; 2017=.46; 2018=.48; 2021=.55. It should be noted that Udupa et al (2022) pointed out that the smallest rise over time in the six components they observed through 2018 was in sadness.

#### **5. Internet usage, bullying and sexual abuse in the YRBSS**

Twenge, Martin and Campbell (2018), examined data from the YRBSS 8th, 10th, and 12th graders 1991–2016 in the US and found that teens who spent more time on electronic communication and screens and less time on non-screen activities, had lower psychological well-being. Twenge and Martin (2022) extended that work and examined smart phone use with the YRBSS for the years 2009-2015. First, they found in their Table 1 that electronic device usage was higher for males (2.07 hours) than for females (1.72 hours). They also looked at the sadness variable in YRBSS and found “*digital media time was more strongly associated with low well-being among girls than among boys, particularly for smartphone and social media use*”.

We extend that work through 2021 as screen usage pushes upwards and especially so in 2019 and

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<sup>20</sup> <https://www.cdc.gov/healthyyouth/data/yrbs/index.htm>

<sup>21</sup> See various reports from the CDC on the YRBSS including also Brener et al (2004); Eaton et al (2008); Kann et al (2016), Merrick et al (2019), Ivey-Stephenson et al (2020); Johns et al (2020); Underwood et al (2020) Dittus et al (2021), Swedo et al (2023) and Mpofu et al (2023).

2021. There are three different questions asked over time, with slightly different wording covering a) 2021 b) 2007-2019 and c) 2021. The middle grouping covering seven surveys asks as follows.

*Q14. On an average school day, how many hours do you play video or computer games or use a computer for something that is not schoolwork? (Count time spent playing games, watching videos, texting, or using social media on your smartphone, computer, Xbox, PlayStation, iPad, or other tablet.)*

The 2003-2005 surveys ask:

*Q15. On an average school day, how many hours do you play video or computer games or use a computer for something that is not schoolwork?*

While the 2021 survey asks a broader question including watching TV:

*Q16. On an average school day, how many hours do you spend in front of a TV, computer, smart phone, or other electronic device watching shows or videos, playing games, accessing the Internet, or using social media (also called "screen time")? (Do not count time spent doing schoolwork.)*

They all have six responses of <1 hour; 1 hour; 2 hours, 3 hours, 4 hours and 5 or more hours. There is also a code in 2021 survey which says, “I do not play video or computer games or use a computer for something that is not schoolwork”. The weighted distribution by year for girls and boys is reported in the second part of **Table 10** with zero percent in that first category in 2021. It is clear, that the proportion reporting at least four hours a day rose sharply from 2011 and especially so for women. The proportion in the top two categories is especially high in 2021, presumably in part as it broadened the question to include watching tv. It is crucial in what follows to include a 2021, year dummy to control for this difference, which is always highly significant.

Columns 1-4 of **Table 11** report OLS regressions for the sadness and hopelessness variable for the years 2003-2019 in column 1 and 2003-2019 in columns 2-4 and 2011-2021 in column 5. As our measure of screen time, we simply use two dummies to identify high usage (4 hours per day) and very high usage (5+ hours per day). In column 1 we exclude the 2021 data and then include it in columns 2-5. The 2021 dummy is always highly significant and positive in all specifications.

Column 1 indicates that sadness and hopelessness rose markedly in 2019 for which we have no explanation. This is apparent across all model specifications, and columns 2-5 show it stayed high in 2021. But columns 3 and 4 suggest the trend in sadness began rising in 2015 for both men and women.

Screen time is associated with greater sadness and hopelessness, and the effect rises markedly with time spent in front of a screen as indicated by the doubling of the coefficient on 5+ hours versus 4 hours a day. Women are more prone to sadness and hopelessness than men but this is compounded by time in front of a screen, as indicated by the female interactions with screen time.

The YRBSS also contains some data on ACEs, this time whether the student was bullied or cyber bullied or was forced to have sex.

Q17. During the last twelve months, have you ever been bullied on school property? Yes/No

Q18. During the past 12 months, have you ever been electronically bullied (count being bullied through texting, Instagram, Facebook, or other social media)? Yes/No?

Q19. Have you been physically forced to have sexual intercourse when you did not want to? Yes/No

The bullying questions are only available from 2011 whereas the forced to have sex variable is available from 1999. Bullying is another example of an ACE that we specifically examined in Blanchflower and Bryson (2023b) for the UK using a birth cohort and was also examined as an ACE in Blanchflower and Bryson (2023a) using the 2001 Eurobarometer #56.1.<sup>22</sup> Bullying in childhood lowers health and wellbeing, variously measured in adults. It also lowers life expectancy.

A recent IPSOS survey (n=1607) for Pew Research found that nearly half (46%) of US teens ages 13-17 in 2022 had been bullied or harassed online, with older teens especially likely to be targeted. Offensive name calling was most commonly reported (32%) followed by false rumors (22%). In total, 28% of teens in the survey experienced multiple types of cyberbullying.<sup>23</sup>

As noted by CDC (2023) surprisingly given the rise we have seen in screen time usage in the same data file, there has not been evidence of a *rise* in most of these three variables since 2008. The exception is the rise in being forced to have sex for females. Their estimates that we replicate are below.<sup>24</sup>

	Males		Females	
	2011	2021	2011	2021
Bullied	18	13	22	17
Electronically bullied	11	11	22	20
Forced to have sex	4	4	12	14

The decline of bullying is interesting as is the lack of change in the electronic bullying variables over time, but it seems that it is the usage that matters. Of note here is that in 2021 approximately 14% of high school girls said they had been forced to have intercourse against their will. This contrasts in the BRFSS with 8% of females and 3% of males ages 18-24 who said they had been forced to have sex in the period 2020-2023.

The final column of **Table 11** estimates an overall sadness and hopelessness equation for 2011-2021 that includes controls for bullying and sexual abuse (n=76284). All are significantly positive. Their inclusion has little impact on the sign or significance of the screen time variables, the female

<sup>22</sup> Blanchflower and Bryson (2023a) examined other ACEs including being beaten or punched by a parent in the General Social Survey, a parent dying, financial strains on the family and so on.

<sup>23</sup> <https://www.pewresearch.org/internet/2022/12/15/teens-and-cyberbullying-2022/>

<sup>24</sup> We have a longer time run for being forced to have sex since 1999 for males with female (weighted) estimates in parentheses 1999=.052 (.12); 2000=.051 (.10); 2003=.061 (.12); 2005=.042 (.11); 2007=.045 (.11); 2009=.045 (.10); 2011=.045 (.12); 2013=.042 (.10); 2015=.031 (.10); 2017=.035 (.11); 2019=.034 (.11); 2021=.036 (.14).



interactions or the female variable itself, with the coefficient falling from .17 to .13. The obvious time series rise remains. It seems that rising screen usage is playing a major part in explaining the rise of mental ill-being among young men and especially young women.

## 6. Discussion

Mental ill-health, on a variety of measures and across several data sets is on the rise in the United States and elsewhere. Of particular concern is the dramatic increase since 2011 in mental ill-being among those under the age of twenty-five. By 2022 more than one in ten young women say that every day of their lives is a bad mental health day, up from 4.8% in 2010 and 3.2% in 1993 (Blanchflower and Bryson, 2023a).

This is quite different from the upward trend in both the morbidity and mortality of white prime age less educated that led to a rise in deaths of despair, due to opioid overdoses, suicides and alcohol poisonings. [Chart 7](#) compares the trends in mental despair for young women with that of white prime age non-college men. It reports despair first reported in Figure 2 of Blanchflower and Oswald (2020) for 1993-2019 for prime age less educated whites (35-54) and extends it through 2022. Also included on the graph are the data from our [Chart 4](#) for females age <25. Despair, measured as 30 of the last 30 days being bad mental health days, for young females has picked up sharply especially since 2011 and now despair in 2022 is approximately the same for both (10.8% for young females and 10.6% for prime age less educated whites). In past decades the United States had a youth unemployment problem (Freeman and Wise 1982, Blanchflower and Freeman, 2000). Now it has a burgeoning youth mental health crisis.

Traumatic experiences in childhood appear to be having a continuing impact on the young and their deteriorating mental health. Here we find that eight ACEs relating to parental circumstances and being abused in childhood raise the probability of poor mental well-being, whether measured as bad mental health days or distress or sadness and hopelessness. Of course, youngsters under age twenty-five experienced these childhood events most recently and could still be experiencing them, for example if a parent was depressed, drinking or if they were divorced. They have an impact also on physical health but to a lesser degree.

Although we show the more ACEs reported by people, the poorer their mental health, our BRFSS data are not sufficient to estimate whether ACEs have contributed directly to the rise in poor mental health. They may have done so if the number of ACEs reported has risen over time or if sensitivity to having had one or more ACEs (captured in coefficients over time in mental health equations) has risen. Unfortunately, the BRFSS isn't well suited to that given the way the data are collected as there is not a long run of years – we only have data for 2009-2012 and 2019-2022.

Young women are especially likely to report ACEs. The impact of being under the age of eighteen and living in a household where someone is depressed seems especially important. Of those young females who said they were in despair in the years 2020-2022 four out of five of them reported having one or more ACEs: 35% had 3 or more. Of those who did not report being in despair two out of ten had one or more ACEs and 12% had 3 or more.

We also found using data on high school students ages 14-18 that there has been a marked rise in screen time which appears to be an important determinant of rising mental ill-being over and

above being bullied, cyberbullied or sexually abused at school. Being bullied and abused and spending long hours on the internet all appear to lower wellbeing especially for young women.

The broad impact of these ACE variables at all ages on numerous outcomes is perhaps surprising. The issue is whether these variables fundamentally alter the life course in a bad way. Alternatively, they are simply identifying a series of characteristics that predict poor adult outcomes. The question is why and what is the mechanism? Are these ACE variables simply picking up some susceptibility in childhood to subsequent bad youth outcomes or are they having direct adverse effects? Of course, both things could be happening.

The other issue is how accurate is the respondent's recall? One possibility is that there is a deep endogeneity going on. People experiencing bad times may well want to blame them on their childhood experiences. Perhaps the memories are false, and this is not the case, but we are unable to disentangle such a possibility.

Finally, in a recent paper (Xu et al., 2024) we speculated what might lie behind the growth in poor mental health among the young in the last decade or so. One of our hypotheses was the growth in exposure to social media linked to increased screen time usage. In this paper using recent data on high school students, we have confirmed that this is one of the contributory factors since screen time, and especially lengthy screen time exposure, has been rising and is significantly correlated with poor mental health. The effect is particularly pronounced for young women where the growth in poor mental health has been most dramatic. This is an issue that requires urgent attention both by academics and policymakers.

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Table 1. Mean weighted aggregates ACE scores

Male	1.14	Employee	1.35	<\$10k	1.80
Female	1.43	Self-employed	1.30	\$10k and <\$15k	1.64
White non-Hispanic	1.27	Unemployed >=1yr	1.86	\$15k and <\$20k	1.58
Black	1.33	Unemployed<1yr	1.84	\$20k and <\$25k	1.49
Asian	0.65	Homemaker	1.29	\$25k and <\$35k	1.43
Native	1.89	Student	1.31	\$35k and <\$50k	1.33
Hispanic	1.36	Retired	0.80	\$50k and <\$75k	1.27
Other	1.88	Unable to work	1.91	\$75k and over	1.14
Never attended school	1.04	Age <25	1.58	\$75k and <\$100k	1.34
Grades 1 through 8	1.13	Age 25-34	1.66	\$100k and <\$150k	1.31
Grades 9 through 11	1.66	Age 35-44	1.53	\$150k and <\$200k	1.26
Grade 12 or GED	1.34	Age 45-54	1.38	\$200k and over	1.08
Some college	1.40	Age 55-64	1.17	All	1.28
College graduate	1.02	Age 65+	0.76		

Source: BRFSS



Table 2. Determinants of Adverse Childhood Experiences Aggregate OLS

	(1)	(2)	(3)	(4)	(5)	(6) Age <25
Female	.2942 (63.07)	.2914 (62.70)	.2917 (63.00)	.2974 (63.33)	.2893 (61.38)	.5193 (21.74)
Time	.0206 (37.20)	.0219 (39.60)	.0261 (28.15)	.0256 (27.76)	.0291 (31.60)	.0400 (7.79)
25-34	.0376 (2.96)	.1003 (7.89)	.0951 (7.51)	.0434 (6.69)	.0145 (1.08)	
35-44	-.0844 (6.92)	-.0133 (1.09)	.0201 (1.65)	-.0878 (6.69)	-.0975 (7.41)	
45-54	-.2357 (19.98)	-.1696 (14.36)	-.1797 (15.27)	-.2813 (21.90)	-.2830 (22.00)	
55-64	-.4637 (40.53)	-.4098 (35.82)	-.4223 (37.00)	-.5526 (43.55)	-.5584 (44.00)	
65+	-.8905 (81.30)	-.8441 (77.05)	-.8583 (78.44)	-.9021 (67.76)	-.9122 (68.68)	
Black	-.0202 (2.39)	-.0606 (7.15)	-.0399 (4.47)	-.0951 (10.69)	-.1372 (15.40)	-.1962 (4.49)
Asian	-.6233 (37.91)	-.5792 (33.35)	-.6712 (37.43)	-.6555 (36.82)	-.6588 (37.13)	-.5716 (9.45)
Native	.4852 (29.15)	.4272 (25.72)	.4510 (26.78)	.3933 (23.52)	.3496 (20.94)	.4177 (5.40)
Hispanic	.0365 (3.49)	-.0163 (1.52)	-.0900 (8.14)	-.0807 (7.35)	-.1126 (10.27)	-.1355 (3.71)
Other	.4780 (30.95)	.4564 (29.67)	.3966 (25.42)	.3623 (23.42)	.3524 (22.80)	.4052 (6.88)
Education	No	Yes	Yes	Yes	Yes	Yes
State	No	No	Yes	Yes	Yes	Yes
Labor force status	No	No	No	Yes	Yes	Yes
Income	No	No	No	No	Yes	Yes
Constant	1.2537	1.1308	1.6033	1.0096	1.2902	1.7338
Pseudo R <sup>2</sup>	.0685	.0769	.0848	.1004	.1069	.0968
N	425,733	425,724	425,724	425,724	425,655	21,856

Notes: Excluded age <25; whites. T-statistics in parentheses.

Source: BRFSS

Table 3. Determinants of Adverse Childhood Experiences Aggregate Probits

	Age<25		Age >=25	
	Male (1)	Female (2)	Male (3)	Female (4)
Time	.0337 (5.33)	.0487 (5.95)	.0248 (19.34)	.0315 (23.98)
Black	-.1103 (1.89)	-.2631 (4.02)	-.0076 (0.57)	-.2209 (17.89)
Asian	-.4867 (6.72)	-.6879 (6.82)	-.5710 (23.32)	-.7248 (26.54)
Native	.3377 (3.53)	.4996 (4.03)	.3943 (17.08)	.2994 (12.29)
Hispanic	-.1281 (2.88)	-.1415 (2.38)	-.0570 (3.71)	-.1668 (9.91)
Other	.4945 (6.84)	.3101 (3.26)	.3306 (16.06)	.3400 (14.20)
Constant	2.1561	1.7700	1.0500	1.7432
Pseudo R <sup>2</sup>	.0784	.0976	.0843	.1153
N	11,761	10,133	175,217	228,582

Notes: all equations also include state and income dummies, education and labor force status. 4 age dummies are in columns 3 and 4. T-statistics in parentheses.

Source: BRFSS

Table 4. Age <25 Determinants of Adverse Childhood Experiences Probits

	Depressed	Drink	Drugs	Touch sexually	Touch them	Forced sex	Hit or kicked	Divorced
Female	.3277 (18.36)	.2187 (11.82)	.1915 (9.60)	.7313 (29.14)	.6340 (23.47)	.6524 (20.33)	.1046 (5.52)	.1309 (7.43)
Time	.0320 (8.18)	.0144 (3.59)	<b>.0001 (0.04)</b>	.0290 (5.34)	.0252 (4.26)	.0254 (3.65)	.0307 (7.33)	<b>.0041 (1.09)</b>
Black	-.5211 (15.39)	-.3100 (8.95)	-.2218 (6.07)	.1056 (2.61)	.1223 (2.86)	.1066 (2.14)	-.0010 (0.03)	.3565 (11.21)
Asian	-.6802 (12.56)	-.5155 (9.04)	-.6286 (9.03)	-.1905 (2.57)	-.2267 (2.73)	-.1263 (1.31)	<b>.1143 (2.33)</b>	-.4822 (9.60)
Native	.0270 (0.48)	.2874 (5.13)	.4149 (7.23)	.2119 (2.94)	.1701 (2.14)	.2301 (2.63)	.1523 (2.57)	.2402 (4.29)
Hispanic	<b>-.2610 (9.48)</b>	-.0360 (1.29)	-.1766 (5.76)	.1056 (3.00)	.0987 (2.61)	.1178 (2.70)	.1497 (5.37)	-.0160 (0.60)
Other	.0406 (1.21)	.1358 (3.15)	.2113 (4.69)	.2930 (5.76)	.2473 (4.38)	.3373 (541)	.2617 (6.02)	.2940 (6.88)
Constant	-.7003	-.8896	-.1,2719	-1.6806	-1.6128	-1.5027	-.7565	-.1444
Pseudo R <sup>2</sup>	.0426	.0316	.0390	.0886	.0767	.0768	.0292	.0510
N	23,489	23,572	23,484	23,124	23,037	23,259	23,319	22,863
Mean	.30	.25	.18	.17	.11	.05	.19	.42

Notes: all equations also include education, labor force status and state dummies. T-statistics in parentheses. Excluded white

Source: BRFSS

Table 5. *Over the last two weeks how often have you been bothered by any of the following problems? Feeling down, depressed or hopeless?*

	Not at all	Several days	More than half the days	Nearly every day	Average score.	Unweighted N
<b>Males %</b>						
2022-2023	38	42	11	9	1.91	14,015
2021-2022	34	42	14	10	2.00	17,219
2020-2021	36	41	14	9	1.96	24,772
2019-2020	37	42	12	9	1.93	20,074
2018-2019	39	39	13	9	1.93	11,414
2017-2018	37	40	13	10	1.95	12,062
2016-2017	43	39	11	7	1.81	9,945
2015-2016	46	40	9	5	1.73	8,182
2014-2015	48	38	9	5	1.71	7,080
2012-2013	48	38	9	4	1.69	14,618
2010-2011	45	42	9	5	1.73	11,326
2007-2009	47	41	8	4	1.68	4,924
<b>Females %</b>						
2022-2023	27	45	17	11	2.12	3,885
2021-2022	25	45	18	13	2.18	44,085
2020-2021	26	44	17	13	2.17	64,009
2019-2020	29	46	16	10	2.06	43,501
2018-2019	30	44	16	10	2.06	23,371
2017-2018	30	45	16	10	2.05	26,349
2016-2017	34	45	14	7	1.94	21,614
2015-2016	38	46	11	6	1.85	15,770
2014-2015	42	42	11	6	1.81	8,713
2012-2013	44	42	10	4	1.75	27,089
2010-2011	40	45	10	4	1.78	20,598
2007-2009	39	47	9	5	1.79	8,961

Notes; 1=not at all, 2= several days 3=more than half the days, 4=nearly every day.

Source: Healthy Minds, 2007-2023

Table 6. Distribution of bad mental and physical health days 2011 and 2022, BRFSS

	Age $\geq$ 25		Female <25		Male <25	
	2011	2022	2011	2022	2011	2022
a) Mental health days						
0	66	60	49	29	58	45
1-5	17	18	26	24	25	24
6-15	6	7	12	18	8	13
16-29	3	4	4	10	3	6
30	6	7	5	11	4	7
Mean	3.81	4.58	4.92	9.06	3.52	6.19
b) Physical health days						
0	63	63	61	58	68	66
1-5	18	18	26	26	23	24
6-15	6	7	8	10	5	5
16-29	3	3	4	2	1	1
30.0	7	7	2	3	2	3
Mean	2.30	2.70	2.54	3.09	2.04	2.38

Table 7. Despair and ACEs by Gender and Age (weighted) Source: BRFSS

a) Number of ACEs and the proportion who report despair by gender and age.

	Males <25	Females <25	Males $\geq$ 25	Females $\geq$ 25
0	.021	.032	.030	.037
1	.035	.052	.045	.055
2	.061	.095	.066	.076
3	.099	.142	.094	.102
4	.134	.156	.112	.137
5	.145	.208	.161	.157
6	.221	.252	.147	.188
7	.401	.265	.242	.262
8	.311	.438	.225	.266
All	.053	.094	.052	.068
Mean ACE	1.33	1.86	1.11	1.38

b) Distribution of ACEs by despair

	Females <25		Males <25		Age $\geq$ 25	
	Despair	Not despair	Despair.	Not despair	Despair	Not despair
Aggregate score	3.46	1.69	2.72	1.26	2.36	1.18
Live with anyone depressed	.65	.33	.54	.25	.37	.16
Live with a problem drinker	.47	.26	.44	.20	.40	.23
Live with anyone uses illegal drugs	.42	.18	.39	.15	.24	.10
Did anyone touch you sexually	.35	.15	.15	.05	.26	.11
Anyone make you touch sexually	.27	.11	.13	.04	.21	.11
Anyone force you to have sex	.20	.07	.06	.02	.15	.04
Parents divorced/separated	.61	.43	.60	.39	.42	.28
Parent hurt you	.52	.23	.48	.23	.40	.22

Table 8. Mental Distress and Adverse Child Experiences, 1993-2023 probits

	Age<25		Age >=25	
	Male (1)	Female (2)	Male (3)	Female (4)
<b>a) Mental Despair Probit</b>				
Aggregate score	.2020 (17.64)	.1540 (17.39)	.1360 (39.00)	.1157 (48.30)
Time	.0200 (1.92)	.0326 (3.60)	.0079 (3.30)	.0096 (5.12)
Pseudo R <sup>2</sup>	.1082	.0990	.1144	.1079
N	11,560	9,920	172,414	224,557
<b>b) Physical Despair Probit</b>				
Aggregate score	.0947 (5.56)	.0700 (4.69)	.0806 (23.51)	.0767 (31.07)
Time	-.0158 (1.16)	-.0060 (0.42)	-.0014 (0.70)	-.0029 (1.74)
Pseudo R <sup>2</sup>	.0793	.0778	.1455	.1302
N	11,314	9,709	171,946	223,395
<b>c) Bad Mental Health Days OLS</b>				
Aggregate score	1.5295 (32.21)	1.4321 (30.76)	.9329 (74.02)	.9640 (93.46)
Time	.1968 (6.20)	.3413 (3.48)	.0632 (9.36)	.1008 (15.60)
Adjusted R <sup>2</sup>	.0793	.0955	.1152	.1359
N	11,296	9,934	172,414	224,557
<b>d) Physical Health Days</b>				
Aggregate score	.3706 (12.59)	.3998 (14.30)	.4988 (33.96)	.5526 (49.85)
Time	-.0045 (0.22)	.0165 (0.52)	.0120 (1.52)	-.0072 (1.04)
Adjusted R <sup>2</sup>	.0324	.0431	.1591	.1632
N	11,594	9,933	171,931	223,375

Notes: all equations also include state, age and its square and income dummies, education, race and labor force status dummies. Time=year-2009. T-statistics in parentheses.

Table 9. Mental Despair and Adverse Child Experiences, 1993-2023 probits

	All 1993-2023	Age <25 1993-2023	All 2009-2023	Age <25 2009-2023
ACE Depression			.3212 (35.90)	.4342 (13.42)
ACE Drink			.0914 (10.96)	.1380 (4.01)
ACE Drugs			.0858 (7.68)	.0583 (1.55)
ACE Parents divorced			.0443 (5.46)	.0502 (1.61)
ACE Touched sexually			.0971 (6.94)	.0991 (1.67)
ACE Touched them			.0929 (5.90)	.1207 (1.80)
ACE Have sex			.1560 (9.71)	.1493 (2.29)
ACE Parents hurt			.1684 (20.41)	.2601 (7.95)
Age	.0138 (52.85)		.0077 (5.87)	
Age <sup>2</sup> *100	-.0202 (78.02)		-.0122 (9.44)	
Age 19		.1241 (10.51)		.1991 (3.58)
Age 20		.1638 (13.82)		.2470 (4.39)
Age 21		.1772 (15.21)		.2165 (3.82)
Age 22		.1956 (16.53)		.2173 (3.71)
Age 23		.2315 (19.66)		.1481 (2.46)
Age 24		.2253 (19.01)		.2229 (3.74)
Female	.1409 (94.48)	.2340 (10.51)		.1973 (6.61)
1994	.0436 (4.20)	.0771 (13.82)		
1995	.0913 (9.05)	.0827 (15.21)		
1996	.0868 (8.77)	.0725 (16.53)		
1997	.0875 (9.01)	.0891 (19.66)		
1998	.1156 (12.20)	.1402 (19.01)		
1999	.1125 (12.02)	.1153 (38.94)		
2000	.1159 (12.68)	.1718 (2.23)		
2001	.1469 (16.52)	.1903 (2.39)		
2002	.1144 (11.02)	.1941 (2.13)		
2003	.1333 (15.39)	.1890 (2.67)		
2004	.1455 (17.09)	.2042 (4.36)		
2005	.1280 (15.23)	.1713 (3.63)		
2006	.1422 (16.93)	.2142 (5.59)		
2007	.1310 (15.84)	.2073 (6.33)		
2008	.1389 (16.75)	.1781 (5.40)		
2009	.1323 (16.00)	.1773 (6.29)		
2010	.1439 (17.47)	.1940 (6.85)	.0674 (1.34)	.0571 (0.19)
2011	.1373 (16.81)	.1690 (5.69)	.1404 (2.70)	-.0681 (0.22)
2012	.1444 (17.65)	.2169 (6.98)	.0788 (1.56)	.1144 (0.39)
2013	.1150 (14.04)	.2077 (6.79)	.0403 (0.45)	.0363 (0.08)
2014	.1216 (14.75)	.2021 (5.66)		
2015	.1345 (16.25)	.2509 (5.56)		
2016	.1539 (18.79)	.2851 (6.05)		
2017	.1782 (21.74)	.3730 (5.73)		
2018	.1920 (23.27)	.4325 (7.48)		
2019	.2140 (25.92)	.4509 (7.21)	.1138 (2.45)	.2601 (0.92)
2020	.2036 (24.59)	.3983 (6.90)	.1151 (2.49)	.2289 (0.81)

2021	.2350 (28.51)	.5238 (8.61)	.1205 (2.65)	.2579 (0.91)
2022	.2831 (34.54)	.5632 (9.97)	.1417 (3.12)	.3236 (1.15)
2023	.2768 (18.21)	.5584 (13.19)	.2032 (2.80)	.4257 (1.26)
Black	-.0883 (33.13)	-.0783 (15.29)	-.0391 (3.08)	-.0455 (0.84)
Asian	-.1871 (30.40)	-.1566 (15.93)	-.0902 (2.87)	-.0852 (0.95)
Native	.0959 (13.56)	-.0102 (14.05)	.0822 (3.46)	.1927 (2.08)
Hispanic	-.0317 (9.28)	-.0957 (18.66)	-.0535 (3.38)	-.0404 (0.92)
Other	.1740 (42.56)	.1240 (20.20)	.1123 (6.12)	.0325 (0.52)
Grades 1-8	.0435(2.89)	.2024 (10.48)	.2039 (1.88)	.0332 (0.07)
Grades 9-11	.0275(1.85)	.3061 (7.60)	.1565 (1.45)	.3183 (0.74)
Grade 12 HSG	-.1075 (7.28)	.1272 (9.01)	.0993 (0.93)	.1524 (0.36)
1-3 yr college	-.1242 (8.40)	.0206 (0.36)	.0746 (0.70)	.0752 (0.18)
4yr college+	-.3448 (23.28)	-.2756 (8.76)	-.1210 (1.13)	-.1710 (0.40)
Self-employed	.0422 (14.76)	.0903 (8.76)	.0262 (1.90)	.0547 (0.80)
Unemployed $\geq$ 1yr	.6123 (163.22)	.2179 (2.48)	.5683 (29.95)	.2119 (2.72)
Unemployed<1yr	.4750 (126.31)	.2080 (3.89)	.4249 (23.22)	.1802 (3.33)
Homemaker	.0781 (25.66)	-.0271 (1.62)	.1148 (6.79)	-.0787 (0.78)
Student	.0615 (12.65)	-.1189 (0.26)	.0634 (2.62)	-.0619 (1.71)
Retired	.1847 (72.50)	.2886 (3.50)	.1752 (14.58)	-.0759 (0.17)
Unable to work	.9752 (423.69)	.5997 (6.33)	.8129 (71.32)	.3284 (3.65)
Constant	-1.9355	-2.1718	-2.0476	-2.3477
Pseudo R <sup>2</sup>	.0851	.0430	.1091	.1142
	9,634,087	549,007	419289	21,358

Contains state dummies. Excluded whites, employee and 1993 in columns 1 and 2 and 2009 in columns 3 and 4.

Table 10. Sadness and screen time – Youth Risk Behavior Surveillance System Surveys, 1999-2021

a) % Sad or Hopeless almost every day for two weeks

	Male	Female
1999	.21	.36
2001	.22	.35
2003	.22	.35
2005	.20	.37
2007	.21	.36
2009	.19	.34
2011	.21	.36
2013	.21	.39
2015	.20	.40
2017	.21	.41
2019	.27	.47
2021	.29	.57

b) Screen time by year (%)

	Female	0 hours	<1 hour	1 hour	2 hours.	3 hours	4 hours	5+ hours
2003		28	26	14	15	8	4	4
2005		32	26	14	13	8	4	3
2007		24	24	16	15	9	5	7
2009		22	25	17	16	10	5	6
2011		15	23	18	18	11	6	10
2013		17	15	13	15	12	8	21
2015		22	11	10	14	13	9	21
2017		25	10	9	13	12	8	22
2019		23	10	9	14	14	10	21
2021		0	4	4	13	18	18	43
Male								
2003		13	23	18	20	12	6	10
2005		13	24	18	19	12	6	9
2007		13	22	17	19	13	6	10
2009		13	23	18	18	12	6	10
2011		11	18	17	19	14	8	14
2013		12	16	13	16	14	9	19
2015		14	17	11	18	14	9	18
2017		14	14	12	17	14	9	20
2019		12	11	11	18	17	11	20
2021		0	8	5	14	21	17	36



Table 11. Sadness and hopelessness OLS regressions, 2003-2021

	All 2003-2019	All 2003-2021	Male 2003-2021	Female 2003-2021	All 2011-2021
Screen time 4 hour per day	.0547 (7.93)	.0505 (8.17)	.0572 (10.02)	.0739 (10.28)	.0381 (5.18)
Screen time 5+ hours per day	.1079 (20.54)	.1065 (22.58)	.1140 (25.97)	.1404 (26.43)	.0862 (15.51)
Female	.1647 (56.46)	.1699 (60.04)			.1343 (34.76)
Female*4 hrs/day	.0348 (3.41)	.0342 (3.80)			.0356 (3.37)
Female*5+hrs/day	.0288 (3.87)	.0467 (7.10)			.0417 (5.46)
Forced to have sex					.2320 (38.08)
Bullied at school					.1647 (35.44)
Electronic bullied					.1904 (37.47)
10 <sup>th</sup> grade	.0083 (2.27)	.0133 (3.89)	.0162 (3.60)	.0105 (2.04)	.0245 (5.58)
11 <sup>th</sup> grade	.0137 (3.76)	.0184 (5.36)	.0276 (6.14)	.0097 (1.89)	.0394 (8.95)
12 <sup>th</sup> grade	.0060 (1.64)	.0113 (3.26)	.0379 (8.37)	-.0149 (2.86)	.0336 (7.54)
Asian	-.0351 (2.78)	-.0339 (2.80)	.0079 (0.53)	-.0824 (4.27)	-.0414 (2.54)
Black	-.0780 (6.43)	-.0729 (6.26)	.0439 (3.04)	-.1067 (5.74)	-.0553 (3.63)
White	-.0662 (5.54)	-.0603 (5.26)	.0361 (2.55)	-.0910 (4.95)	-.0578 (3.88)
Other	-.0212 (1.78)	-.0143 (1.25)	.0040 (0.28)	-.0391 (2.13)	.0114 (0.76)
2005	-.0014 (0.26)	-.0021 (0.38)	.0181 (2.36)	.0140 (1.61)	
2007	.0124 (2.15)	.0113 (1.96)	.0130 (1.74)	.0105 (1.21)	
2009	-.0109 (1.96)	-.0120 (2.17)	.0134 (1.85)	-.0095 (1.14)	
2011	.0016 (0.29)	.0001 (0.03)	.0023 (0.31)	-.0008 (0.09)	
2013	.0025 (0.43)	.0004 (0.08)	.0070 (0.93)	.0101 (1.14)	.0049 (0.92)
2015	.0011 (0.19)	-.0012 (0.22)	.0173 (2.35)	.0172 (1.99)	.0018 (0.34)
2017	.0087 (1.48)	.0063 (1.09)	.0110 (1.45)	.0257 (2.94)	.0133 (2.48)
2019	.0629 (10.59)	.0609 (10.28)	.0432 (5.58)	.0800 (8.96)	.0674 (11.80)
2021		.0678 (11.68)	.0260 (3.50)	.1156 (12.93)	.0770 (13.91)
Constant	.2334	.2222	.1983	.4213	.1403
Pseudo R <sup>2</sup>	.0477	.0568	.0169	.0261	.1526
N	121,148	136,838	67,533	69,305	76,284

Notes: T-statistics in parentheses. Sample is YBRSS 2003-2021. Excluded Native Americans and 9<sup>th</sup> grade and 2003 in columns 1 -4 and 2011 in column 5. Also includes ungraded as an education grade, results not reported.

Chart 1. Kessler Score NHIS by Age

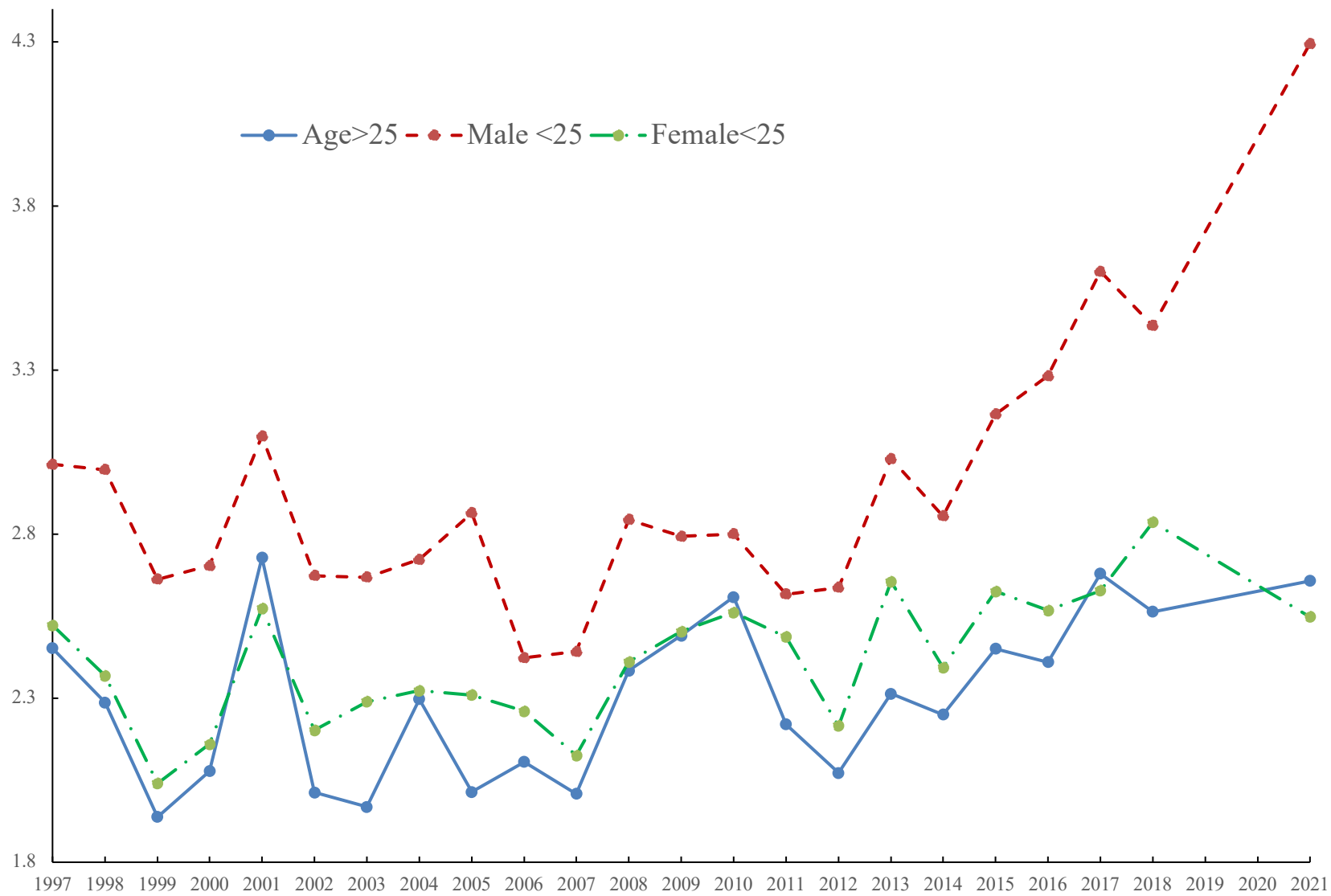


Chart 2. Mental health, 1993-2023, BRFSS

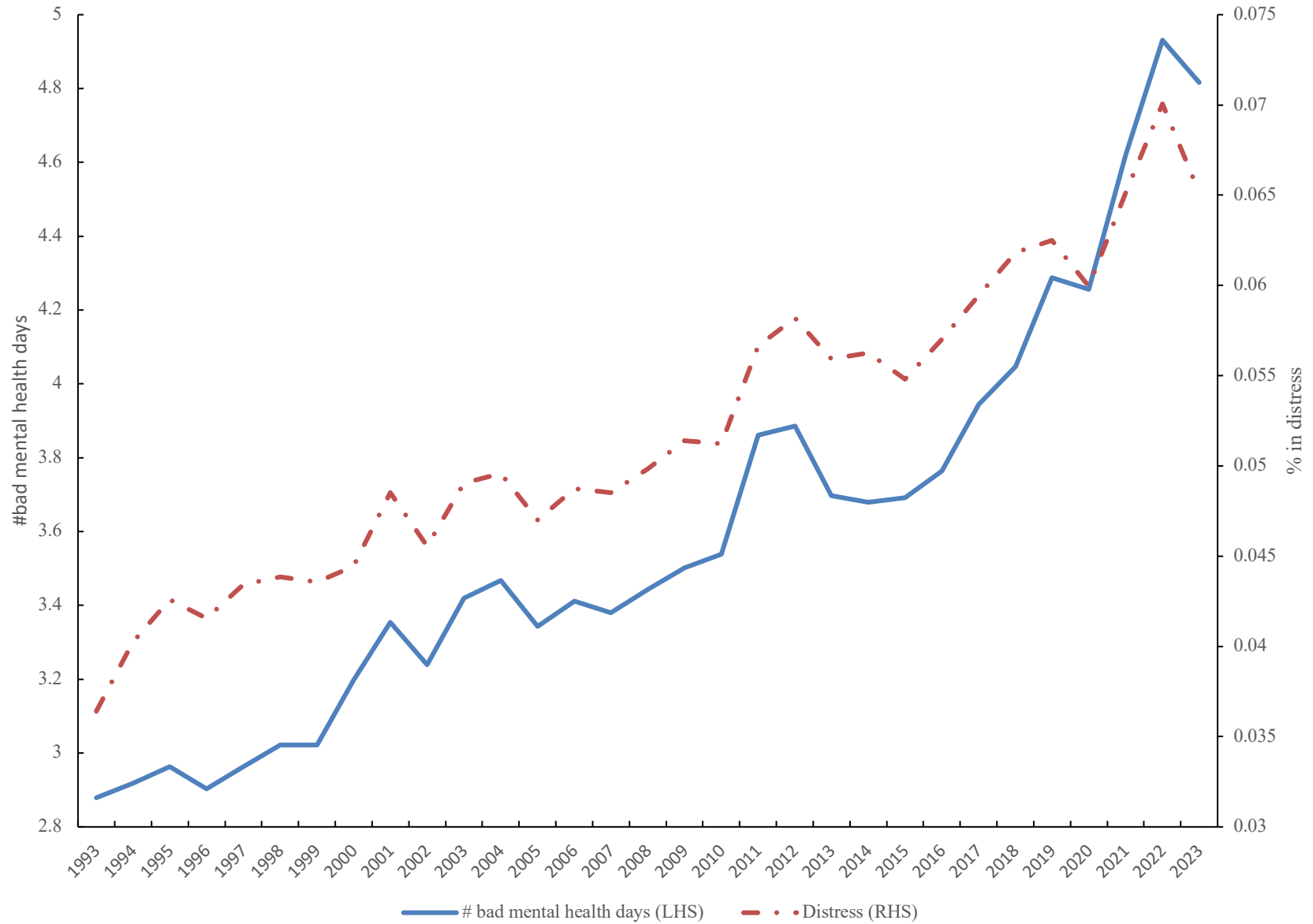


Chart 3. Physical health, 1993-2023, BRFSS

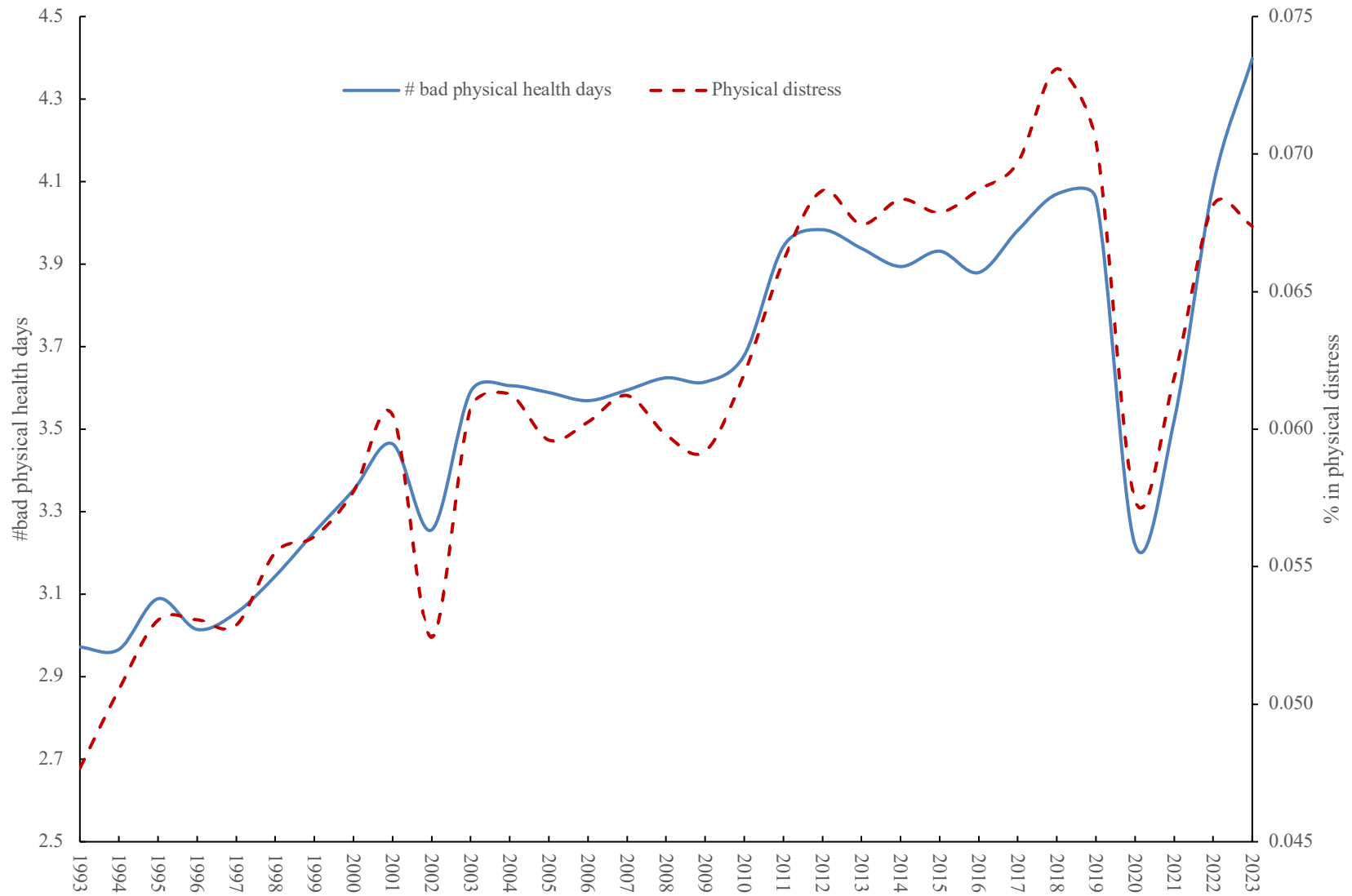


Chart 4. Mental and Physical Well Being Age <25, BRFSS

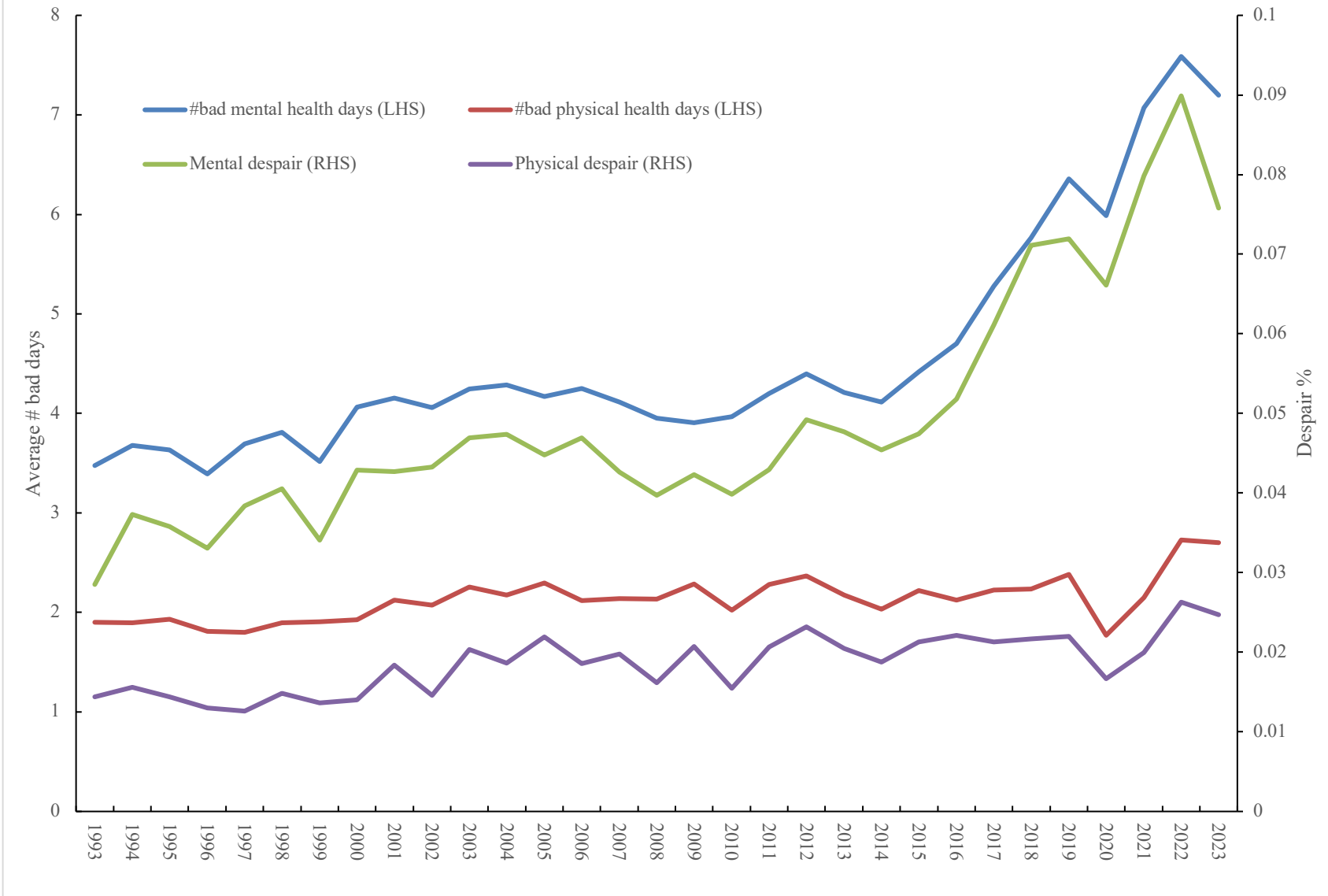


Chart 5 - Mental and physical distress % by gender age under 25, BRFSS

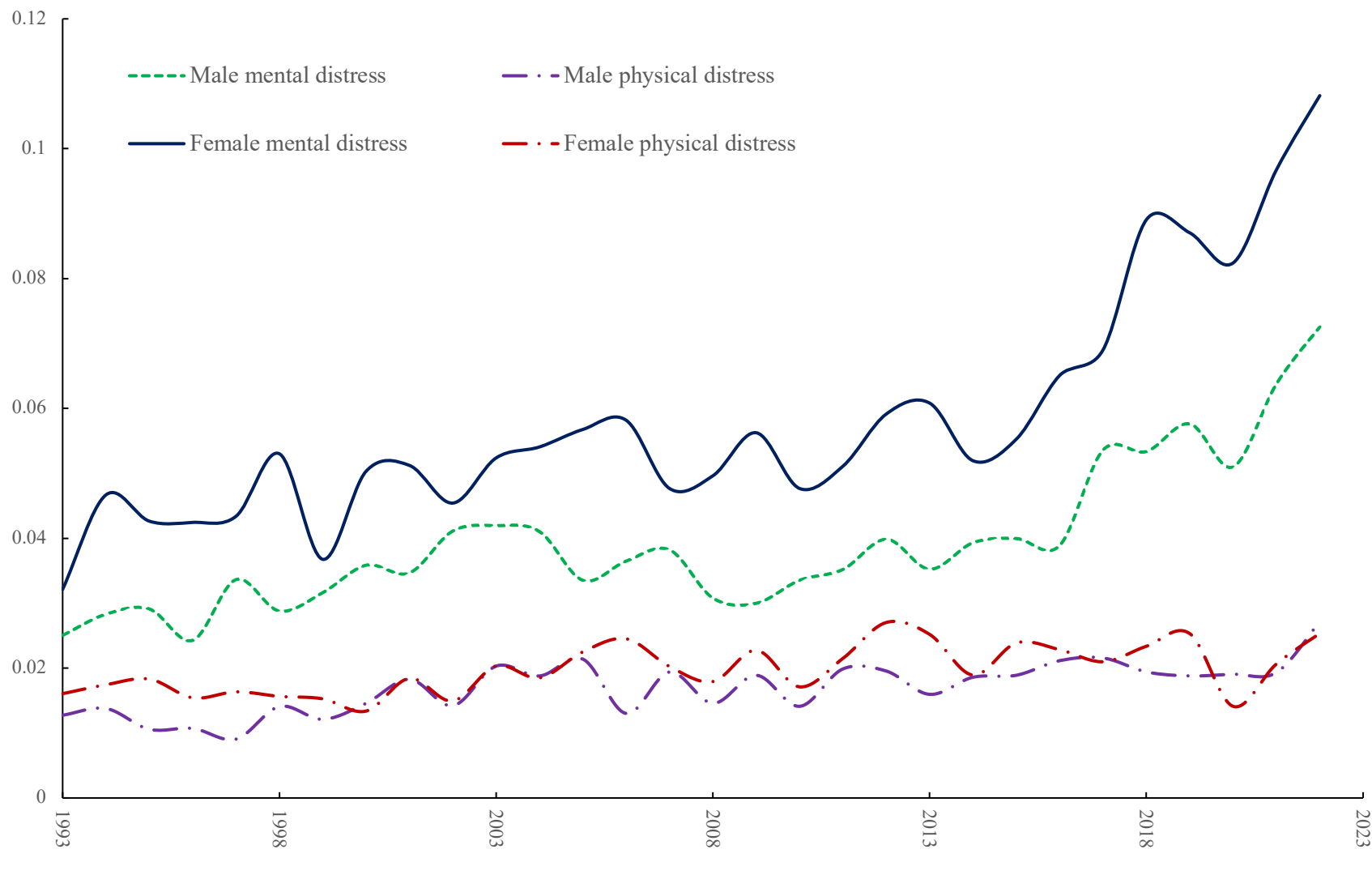


Chart 6. Mental and Physical Well Being Age 25 and Over, BRFSS

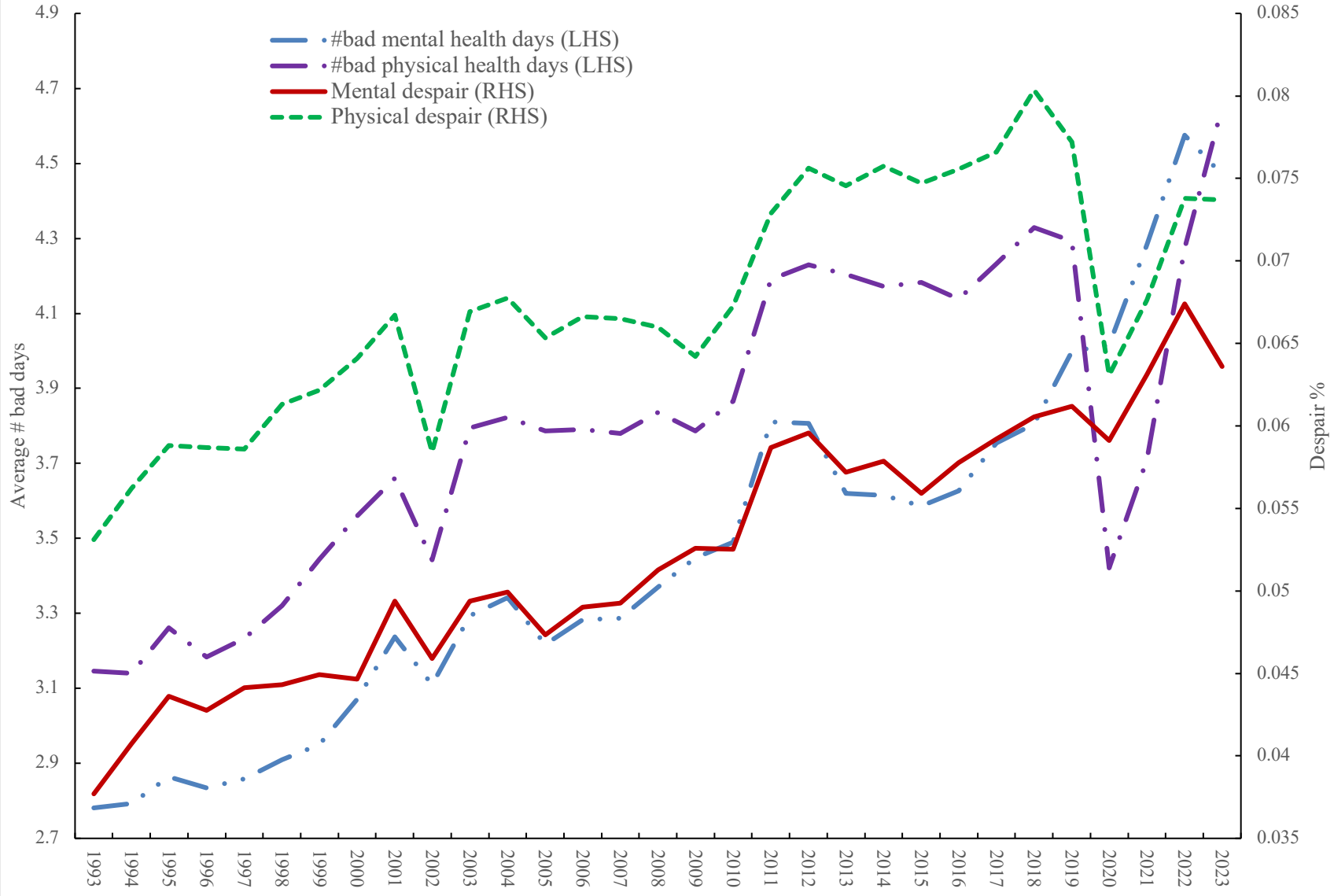


Chart 7. Despair for young females and prime age less educated whites, BRFSS

