

Exhibit 1

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
OAKLAND DIVISION

IN RE: SOCIAL MEDIA ADOLESCENT
ADDICTION/PERSONAL INJURY
PRODUCTS LIABILITY LITIGATION

THIS DOCUMENT RELATES TO:

*People of the State of California, et al. v.
Meta Platforms, Inc., et al.*

MDL No. 3047

Case Nos. 4:22-md-03047-YGR-PHK
4:23-cv-05448-YGR

EXPERT REBUTTAL REPORT OF JUSTIN McCRARY, PH.D.

January 9, 2026

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I. SUMMARY OF OPINIONS

1. In this report, I evaluate the opinions offered by Mr. Carl Saba based on the report he submitted on November 21, 2025, and specifically I evaluate the economic implications of Mr. Saba's findings in the context of Plaintiffs' allegations. In Sections II through V, I discuss my qualifications, my assignment, the allegations, and relevant background information. In Sections VI through X, I provide my opinions, which are summarized below. I define the capitalized terms used in my summary in the relevant sections that follow.

2. **Opinion 1** (*See* Section VI): Mr. Saba has tallied Meta's potential violations of the UDAP Statutes by counting monthly instances in which Teens exceeded certain thresholds of time spent on Instagram and Facebook or counting the number of instances of certain "bad encounters" by Teens on Instagram, suggesting these events are associated with consumer harm from the alleged conduct. However, Mr. Saba provides no explanation as to how the events that he tallies are associated with harm in any way, or how they resulted in any negative mental health outcomes to Teens, much less how these instances are linked to the alleged conduct and the At-Issue Features.

(i) Mr. Saba purports to calculate the number of monthly instances in which Teens spent, on average, more than certain thresholds of time on Facebook or Instagram per day, starting as low as half an hour per day. Mr. Saba notes that Plaintiffs claim that his calculations "may represent or be the result of violations of the UDAP Statutes," suggesting these events are associated with consumer harm. However, Mr. Saba provides no evidence, basis, or justification for assuming that monthly instances in which a Teen User's average daily time spent on Instagram or Facebook in UDAP States exceeded Mr. Saba's thresholds in fact caused harm, represented "excessive" or "addictive" use, or had a negative effect on users' mental health.

(ii) To the extent Mr. Saba's time spent analysis relates to Plaintiffs' claim that Instagram and Facebook are addictive to Teens, his analysis is unpersuasive because he has not reconciled the fact that the usage data that Meta produced in this matter are inconsistent with Plaintiffs' claim. Namely, the Meta data show that Instagram and Facebook account

for a small portion of Teens' total screen time across all UDAP States and that there are no consistent or universal upticks in Instagram or Facebook usage over time.

(iii) Mr. Saba provides no evidence, basis, or justification for any assumption that the ten types of "bad encounters" from the BEEF Survey that he analyzes, as reported by users, caused harm or had a negative effect on the mental health of Teens in UDAP States.

3. **Opinion 2** (*See* Section VII): To the extent that Mr. Saba's tallies of potential violations are not meaningful indicators of any consumer harm according to Plaintiffs' theories, Mr. Saba's results would fail to support a claim of widespread consumer harm. Notably, publicly available data and data from Meta do not support a claim of widespread consumer harm.

(i) According to Mr. Saba's calculations, in a given month, a Teen User in a UDAP State has either an 83.85 percent or a 99.96 percent cumulative probability of being exposed to one of his 10 identified "bad encounters" each month, which suggests that the vast majority of Teens in UDAP States were harmed during each month of the Relevant Period. Mr. Saba's calculations of instances of Teens exceeding monthly time spent thresholds also imply many UDAP State Teen Users were harmed: for example, using his half an hour threshold, 31 percent and 17 percent of Instagram and Facebook Teen Users (respectively) would be harmed each month.

(ii) If the vast majority of Teens experienced declining psychological health, one would expect to see a corroborating result when examining aggregate indicators of mental health among Teens in UDAP States, such as deteriorating mental health after the launch of the At-Issue Features of Facebook and Instagram across most mental health outcomes in all UDAP States.

(iii) However, no such corroborating results are evident in the publicly available data related to Teen mental health. The available public evidence on specific Teen mental health challenges discussed by the Amended Complaint, including being treated for mental health challenges, depression, Attention-Deficit/Hyperactivity Disorder ("ADD" or "ADHD"), anxiety, insufficient sleep, screen time, caring about their school performance, schools contacting their households about problems, feelings of sadness or hopelessness, suicidal behavior, and cyberbullying, shows that most mental health indicators have not consistently deteriorated in recent years, that trends in these indicators

diverge across UDAP States, and that mental health indicators do not tend to deteriorate following the launch of At-Issue Features. These patterns are inconsistent with the implication that the vast majority of Teens experienced declines in mental health caused by At-Issue Features of Facebook and Instagram.

4. **Opinion 3** (*See* Section VIII): Putting aside the fact that Mr. Saba does not establish a link between his tallies of potential violations and any consumer harm according to Plaintiffs' theories, Mr. Saba's tallies based on the BEEF Survey are also flawed and unreliable for additional reasons.

(i) Mr. Saba attempts to extrapolate from *weekly* rates of particular experiences reported by Instagram users (based on questions that asked users whether they experienced particular issues in the past seven days) to *monthly* rates for purposes for his tallies, but he ignores that the BEEF Survey also included questions that elicited information about whether users had *ever* experienced any of the relevant issues. Mr. Saba's computations of monthly rates of exposure to particular issues *exceed* the rates at which users reported having *ever* experienced those issues, illustrating significant flaws in his methodology and his results.

(ii) Mr. Saba's calculations of the cumulative probability of having been exposed to any of the 10 issues he identifies implicitly—and erroneously—assumes that each of those experiences must be statistically independent.

(iii) Mr. Saba assumes that the results of the BEEF Survey, which was conducted over an 11-day period in June and July 2021 (*i.e.*, during the COVID pandemic), can be extrapolated to a six-plus-year period from February 2018 through March 2024, without regard to—among other factors—potential changes in how Teens used social media over the period, and the potential impact of features that Meta rolled out on Instagram after the BEEF Survey was conducted to improve user experiences.

5. **Opinion 4** (*See* Section IX): Mr. Saba's analysis of Meta's revenues and profits from Teens and Aged-Up Teens, which he computes for disgorgement purposes, is conceptually flawed and methodologically unsound. Notably, Mr. Saba himself concludes that Meta lost money on Teens from the time they were 13 to 17 years old. Mr. Saba's own analysis of profits from affected Teens—which seeks to account for profits that Meta earned on Teen Users after

they turned 18—would also show that Meta’s net profits for those users were zero over the Relevant Period.

(i) As a threshold issue, Mr. Saba’s analysis for both Teens and Aged-Up Teens is conceptually flawed because it assumes an unsupported and highly improbable but-for world. Specifically, he assumes that, absent the alleged misconduct, these Teen Users would not generate any advertising revenue at all, which would only make sense if they never spent any time on Instagram or Facebook at any point during the Relevant Period, including after turning 18 years old. This flaw renders all of Mr. Saba’s analyses unreliable.

(ii) Even setting aside that conceptual issue, Mr. Saba’s methodology for computing revenues and gross profits for Teens and Aged-Up Teens is flawed and unreliable for other reasons. *First*, in calculating net profits for Aged-Up Teens, Mr. Saba fails to net out losses from when an Aged-Up Teen was a Teen. Mr. Saba himself concludes that Meta’s gross profits for Teens is negative, which indicates that Meta *lost money* from Teen Users during their Teen years. Yet, in calculating net profits from those users *after* they turned 18, Mr. Saba erroneously fails to account for the losses that Meta previously incurred for those same users *before* they turned 18. Had he done so, Meta’s net profits—and the total disgorgement amount—would *still* be zero. *Second*, Mr. Saba miscalculates the percentage of 17-year-olds who exceeded certain thresholds of time spent on the platforms based on his own results. *Third*, Mr. Saba estimates cohorts of 17-year-olds using stated age rather than predicted age (which he uses in other areas of his analysis). This approach, which he does not sufficiently justify, substantially inflates his profit estimates.

6. **Opinion 5** (*See* Section X): Mr. Saba’s estimate of Teen Users improperly includes non-human traffic and is therefore likely unreliable. To estimate the number of Teen Users, Mr. Saba applies a static 1.35 or 1.15 deflator to the total count of monthly active users (“MAUs”) to derive his estimate of “persons.” However, this approach implicitly assumes that every “excess” account represents a secondary account held by a genuine, allegedly harmed Teen; it ignores the prevalence of bots, spam, and business accounts within the MAU data. While Mr. Saba

implicitly acknowledges the problem of “Teen” bot traffic around July 2021, he does not attempt to address its presence in most years.

II. QUALIFICATIONS

7. I am an applied economist with expertise in econometric and statistical methodology, causal inference, corporations, antitrust, law and economics, labor, and education, among other subjects. I hold an A.B. in Public Policy from Princeton University (1996) and a Ph.D. in Economics from the University of California, Berkeley (“Berkeley”) (2003). I currently hold the position of Paul J. Evanson Professor at Columbia Law School (“Columbia”) and previously held academic positions at the University of Michigan (“Michigan”) (2003–2007) and Berkeley (2008–2018). Over the course of my academic career, I have taught courses on antitrust, corporations, law and economics, and statistics to undergraduate, M.B.A., J.D., L.L.M., and Ph.D. students.

8. From September 2009 until July 2014, I co-directed the Law and Economics Program at Berkeley Law. From 2017 to 2019, I was a member of the Board of Directors of the American Law and Economics Association. From 2024 to 2025, I served on the Board of Editors of the Journal of Law and Economics.

9. While at Berkeley, I served as the Founding Director of the Social Sciences Data Laboratory (“D-Lab”) from June 2014 to June 2017. At D-Lab, I lectured on and advised graduate students and faculty regarding high-performance computing, statistical software, and statistical techniques.

10. I have been a Faculty Research Associate of the National Bureau of Economic Research (“NBER”) since 2012. I was first asked to join the NBER in 2006 as a Faculty Research Fellow, and I co-directed the NBER Economics of Crime Working Group from 2008 to 2019. The NBER is the preeminent professional association of economists in the world, with over 1,400 members worldwide.

11. My research spans a diverse range of topics, including econometric and statistical methodology, antitrust, labor, crime, education, and other topics. In my research, I study the causes of observed social outcomes using statistical methods. In some studies, I evaluate societal harms due to, for instance, public or private policies. I have published papers in leading

economics journals, such as the American Economic Review, The Review of Economics and Statistics, the Journal of Economic Literature, and the Journal of Econometrics. Over the years, my research has been supported by Michigan, Berkeley, Columbia, the MacArthur Foundation, the NBER, the National Institutes of Health, the National Science Foundation, the Arnold Foundation, and the Robert Wood Johnson Foundation.

12. I regularly review articles for the leading peer-reviewed economics journals, including Econometrica, the American Economic Review, The Quarterly Journal of Economics, the Journal of Political Economy, The Review of Economic Studies, the Journal of Econometrics, The Review of Economics and Statistics, and the American Law and Economics Review. Peer review focuses on assessing whether submitted manuscripts employ methodologies that are consistent with accepted academic standards.

13. I have consulting and testifying experience across a range of industries and markets. My curriculum vitae is attached as Appendix A. A list of cases for which I have provided deposition or trial testimony in the last four years is attached as Appendix B.

III. ASSIGNMENT

14. I have been retained by counsel for Meta Platforms, Inc., Instagram, LLC, Meta Payments, Inc., and Meta Platforms Technologies, LLC (collectively “Meta”), to respond to opinions offered by Mr. Carl Saba submitted in his report on November 21, 2025 (“Saba Report”) in the matter brought by a coalition of Attorneys General from a number of states and commonwealths.¹ As part of my assignment, I have been asked to evaluate the economic implications of Mr. Saba’s findings in the context of Plaintiffs’ allegations.

¹ The coalition of states and commonwealths that have brought this matter includes Arizona, California, Colorado, Connecticut, Delaware, Hawai’i, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Minnesota, Nebraska, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Virginia, Washington, West Virginia, and Wisconsin. The Saba Report specifically considers the 18 states that assert Unfair and Deceptive Acts and Practices claims: California, Colorado, Connecticut, Delaware, Illinois, Indiana, Kansas, Kentucky, Louisiana, Minnesota, Nebraska, New Jersey, New York, North Carolina, Pennsylvania, South Carolina, Virginia, and Wisconsin (the “UDAP States”). See Amended Complaint for Injunctive and Other Relief, *State of Arizona et al. v. Meta Platforms, Inc. et al.*, June 9, 2025 (Sealed) (“Am. Complaint”), ¶¶ 11, 864–1171. See, e.g., Expert Report of Carl S. Saba, MBA, CVA, ASA, ABV, November 21, 2025 (“Saba Report”), footnote 2 (“I understand that 11 of the MDL States only allege violations of COPPA and the remaining 18 of the MDL States also assert UDAP claims: California, Colorado, Connecticut, Delaware, Illinois, Indiana, Kansas, Kentucky, Louisiana, Minnesota, Nebraska, New Jersey, New York, North Carolina, Pennsylvania, South Carolina, Virginia, and Wisconsin (collectively ‘UDAP States’).”).

15. I am being compensated for my work in this matter at an hourly rate of \$1,350. In addition, I have been assisted in this matter by staff of Cornerstone Research, who worked under my direction. I receive compensation from Cornerstone Research related to its support of me in this matter. My compensation in this matter is not in any way contingent or based on the content of my opinion or the outcome of this or any other matter.

16. A list of the documents that I relied upon is attached as Appendix C. I reserve the right to update or supplement my opinions and analyses as new information is made available to me.

IV. ALLEGATIONS

17. The Plaintiffs allege that Meta violated Unfair and Deceptive Acts and Practices statutes (“UDAP Statutes”) in the UDAP States between 2012 and the filing of the Amended Complaint on June 9, 2024 (the “Relevant Period”).² As I understand, violations of the UDAP Statutes can occur when a business engages in unfair or deceptive trade practices, as defined under applicable state law.

18. The Plaintiffs allege that Meta caused harm to consumers by creating “a business model focused on maximizing young users’ time and attention spent on its Social Media Platforms”; designing and deploying “harmful and psychologically manipulative product features to induce young users’ compulsive and extended Platform use”; and concealing “internal data showing the high incidence of user harms on its Social Media Platforms.”³

19. In particular, the Plaintiffs claim that Meta designed Instagram and Facebook to “target” users under the age of 18 and “incentivizes its employees to develop ways to increase the time that young users spend on its Platforms.”⁴ The Plaintiffs also claim that Meta “has developed and refined a set of psychologically manipulative Platform features designed to maximize young users’ time spent on its Social Media Platforms.”⁵

20. Additionally, the Plaintiffs claim that certain features Meta introduced to allow users to set limits for themselves, including the “Daily Limit” feature and “Take a Break” tool on

² See Am. Complaint, ¶ 19 (“Meta’s conduct is in continuing violation of the laws supporting the claims for relief in this Complaint, beginning at a time unknown to the Filing States, but no later than 2012, and such claims have continuously accrued through the present.”).

³ Am. Complaint, ¶ 2.

⁴ Am. Complaint, ¶ 3.

⁵ Am. Complaint, ¶ 4.

Instagram, were ineffective to “counteract” the features allegedly designed to maximize young users’ time spent on the Platforms.⁶

21. Plaintiffs further allege that “[i]ncreased use of social media platforms, including those operated by Meta, result in physical and mental health harms particularly for young users.”⁷

Specifically, Plaintiffs allege that “young people’s use of Meta’s Social Media Platforms is associated with” mental health harms, including: depression, anxiety, insomnia and sleep disturbances, interference with education, bullying, body image struggles and eating disorders, loneliness, inattention and hyperactivity, self-harm, and suicide and suicidal ideation.⁸

22. On the basis of those allegations (among others), the UDAP States allege that Meta’s conduct has resulted in violations of the UDAP Statute in the UDAP States.⁹ I understand that 13 of the Plaintiff States—specifically, Arizona, Hawai’i, Idaho, Maine, Maryland, Ohio, Oregon, Rhode Island, South Dakota, Washington, and West Virginia—do not bring claims under state consumer protection statutes.

23. In addition, the Plaintiffs allege that Meta violated the Children’s Online Privacy Protection Act of 1998 (“COPPA”) “by collecting the personal information of children on [Instagram and Facebook] without first obtaining (or even attempting to obtain) verifiable

⁶ Am. Complaint, ¶¶ 577–578 (“While Meta adopted so-called ‘time management’ tools, in reality, those tools cannot effectively counteract the overwhelming power of features like infinite scroll, autoplay, and other use-inducing features. In 2018, Meta launched ‘Daily Limit,’ a feature it claimed would enable users to restrict the amount of time they spend on Instagram each day. Despite the feature’s name, it does not enable users to restrict the amount of time they spend on the app.”), 581 (“In December 2021—just one day before Mosseri was scheduled to appear before Congress, and shortly after a whistleblower thrust the well-being issues Meta causes teens onto the national stage—Instagram launched the ‘Take a Break’ tool. Take a Break sends users a pop-up notification when they have spent more than a specified period of time scrolling without interruption.”).

⁷ Am. Complaint, ¶ 508.

⁸ Am. Complaint, ¶¶ 7 (“Research has shown that young people’s use of Meta’s Social Media Platforms is associated with depression, anxiety, insomnia, interference with education and daily life, and many other negative outcomes.”), 306 (“For example, an internal Meta document discussing ‘Problematic Facebook Use’ stated that ‘smartphone notifications caused inattention and hyperactivity among teens, and they reduced productivity and well-being.’”), 395 (“Internal research found that FOMO-induced usage of Meta’s Platforms results in harm to young users. For example, young girls are particularly vulnerable to bullying and harmful interactions ‘potentially due to their unwillingness to limit interactions due to fear of missing out on connections, their optimism, and (sometimes) lack of concern regarding their privacy online.’”), 508 (“Increased use of social media platforms, including those operated by Meta, result in physical and mental health harms particularly for young users, who experience higher rates of major depressive episodes, anxiety, sleep disturbances, suicide, and other mental health concerns.”), 511 (“Hours spent on social media and the internet have become more strongly associated with poor psychological health (such as self-harm behaviors, depressive symptoms, low life satisfaction, and low self-esteem) than hours spent on electronic gaming and watching TV.”).

⁹ Am. Complaint, ¶ 38 (“As detailed in the allegations below, Meta Platforms, itself and through its Defendant subsidiaries over which it exercises authority and control (collectively, Meta), has engaged in, and continues to engage in, unfair, deceptive, and unlawful activity in the Filing States and in this District.”).

parental consent.”¹⁰ The Plaintiffs allege that Meta “maintain[s] willful ignorance of its users under the age of 13” and “routinely obtains actual knowledge of under-13 users on Instagram.”¹¹

V. BACKGROUND

24. Meta is a technology company that, among other things, develops and operates Instagram and Facebook, which are both social media services.¹² Originally launched in 2010 and acquired by Meta in 2012, Instagram allows users to share photos and short-form videos.¹³ Today, Instagram is one of the core apps in Meta’s family of apps.¹⁴ Instagram was first offered on the iOS App Store in 2010, on the Google Play Store in 2012, and on desktop in 2013.¹⁵ Facebook is also a core app in Meta’s family of apps and allows users to connect with friends and family, share content, and engage with various online communities.¹⁶ Facebook was first offered on desktop as “The facebook” to Harvard students in 2004 and became Facebook.com in 2005.¹⁷

¹⁰ Am. Complaint, ¶ 632.

¹¹ Am. Complaint, ¶ 644.

¹² “Our Mission: Build the Future of Human Connection and the Technology That Makes It Possible,” *Meta*, available at <https://www.meta.com/about/company-info/> (“When Facebook launched in 2004, it changed the way people connect. Apps like Messenger, Instagram and WhatsApp further empowered billions around the world.”).

¹³ “Facebook to Acquire Instagram,” *Meta*, April 9, 2012, available at <https://about.fb.com/news/2012/04/facebook-to-acquire-instagram/> (“Facebook [Meta] announced today [April 9, 2012] that it has reached an agreement to acquire Instagram.”); “Instagram Launches,” *Instagram*, October 6, 2010, available at <https://about.instagram.com/blog/announcements/instagram-launches> (“The first version of Instagram launches to the world, and 25,000 people sign up the first day [October 6, 2010].”).

¹⁴ Meta Platforms, Inc., Form 10-K for the fiscal year ended December 31, 2024, filed on January 30, 2025 (“Meta 2024 Form 10-K”), p. 7 (“Family of Apps Products... *Instagram*. Instagram brings people closer to the people and things they love. Instagram Feed, Stories, Reels, Live, and messaging are places where people and creators can connect and express themselves through photos, video, and private messaging, and discover and shop from their favorite businesses.”).

¹⁵ MG Siegler, “Instagram Launches with the Hope Of Igniting Communication Through Images,” *TechCrunch*, October 6, 2010, available at <https://techcrunch.com/2010/10/06/instagram-launch/> (“Today [October 6, 2010], [Instagram] is officially launching in the [iOS] App Store.”); Thomas Houston, “Instagram for Android Now Available,” *The Verge*, April 3, 2012, available at <https://www.theverge.com/2012/4/3/2923562/instagram-for-android> (“Instagram just announced that it’s making an Android version of its app available today [April 3, 2012] in the Google Play Store.”); Kevin Systrom, “Introducing Your Instagram Feed on Desktop,” *Instagram*, February 5, 2013, available at <https://about.instagram.com/blog/announcements/introducing-your-instagram-feed-on-desktop> (“as of today [February 5, 2013], you can now browse your Instagram feed on the web.”).

¹⁶ Meta 2024 Form 10-K, p. 7 (“Family of Apps Products Facebook. Facebook helps give people the power to build community and bring the world closer together. It’s a place for people to share life’s moments and discuss what’s happening, nurture and build relationships, discover and connect to people with shared interests, and create economic opportunity. They can do this through Feed, Reels, Stories, Groups, Marketplace, and more.”).

¹⁷ Sarah Phillips, “A Brief History of Facebook,” *The Guardian*, July 25, 2007, available at <https://www.theguardian.com/technology/2007/jul/25/media.newmedia> (“In February 2004 Mr Zuckerberg launched ‘The facebook’... Within 24 hours, 1,200 Harvard students had signed up, and after one month, over half of the undergraduate population had a profile... It became Facebook.com in August 2005.”).

Facebook launched on the iOS App Store in 2008 and was offered on the Google Play Store in 2009.¹⁸

A. Overview of the At-Issue Features

25. According to the Amended Complaint, the “psychologically manipulative” features on Facebook and Instagram include: “Algorithmic recommendation and sequencing; Public display and quantification of engagement metrics such as Likes; Face and body image manipulation filters; Disruptive audiovisual and haptic alerts; Infinite scroll and autoplay formats; Permitting and encouraging users to create multiple accounts; and ‘Ephemeral’ presentation of social content.”¹⁹ It is unclear whether the features mentioned in the Amended Complaint constitute the complete list of features that Plaintiffs are (or will be) challenging in this case.

26. I understand that the Court dismissed Plaintiffs’ allegations related to the following features with respect to Plaintiffs’ theories of unfair and unconscionable acts and practices: infinite scroll and autoplay, ephemeral content, how Meta designed and deployed audiovisual and vibration notification and alerts, the quantification of likes, and how Meta algorithmically served content to young users.²⁰

27. I also understand the Court declined to dismiss the following features with respect to Plaintiffs’ theories of unfair and unconscionable acts and practices: cosmetic surgery filters, time

¹⁸ Michael Arrington, “iPhone App Store Has Launched (Updated),” *TechCrunch*, July 10, 2008, available at <https://techcrunch.com/2008/07/10/app-store-launches-upgrade-itunes-now/> (“Apple’s iPhone App Store is now live... Here are screen shots of the Facebook and MySpace App on iTunes.”); “Facebook for Android,” *PC Mag*, September 10, 2009, available at <https://uk.pcmag.com/android-apps/23053/facebook-for-android> (“People with Android phones like the T-Mobile G1 or myTouch 3G have been waiting a long time for an official Facebook app. Finally, an app has been released.”).

¹⁹ Am. Complaint, ¶ 118 (“These features include: Algorithmic recommendation and sequencing; Public display and quantification of engagement metrics such as Likes; Face and body image manipulation filters; Disruptive audiovisual and haptic alerts; Infinite scroll and autoplay formats; Permitting and encouraging users to create multiple accounts; and ‘Ephemeral’ presentation of social content.”).

²⁰ Order Largely Denying in Part Meta’s Motion to Dismiss the Multistate Attorneys General Complaint but Limiting the Scope of Claims; Including the Florida Attorney General Complaint; and Personal Injury Plaintiffs’ Consumer Protection and Misrepresentation Claims, *In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation*, October 15, 2024 (“Order re Motion to Dismiss”), pp. 31 (“In sum, Meta’s motion to dismiss is GRANTED to the extent the States’ allegations of unfair and unconscionable acts and practices target the following platform features: infinite scroll and autoplay; ephemeral content; how Meta designed and deployed audiovisual and vibration notifications and alerts; the quantification and display of likes; and how Meta algorithmically served content to young users.”), 96 (“The motion to dismiss is GRANTED to the extent the States’ theories of unfair and unconscionable acts and practices target the following platform features: infinite scroll and autoplay; ephemeral content; how Meta designed and deployed audiovisual and vibration notifications and alerts; the quantification and display of likes; how Meta algorithmically served content to young users.”).

management tools, and Instagram’s multiple accounts function.²¹ More specifically, I understand Plaintiffs’ remaining unfairness claims under the applicable consumer protection statutes relate to the following features of Instagram and Facebook:

(i) **Cosmetic surgery filters:** In April 2017, Facebook launched the Camera Effects Platform, which included Facebook’s Augmented Reality (“AR”) Studio, Spark AR, a tool that allows users to create third-party camera effects.²² In August 2019, Spark AR became available on Instagram.²³

(ii) **Time management tools:** In August 2018, Facebook launched an activity dashboard showing users their time spent on Facebook or Instagram and allowing users to receive a daily reminder when they had used the app for a certain amount of time.²⁴ In December 2021, Instagram launched its “Take a Break” tool. This tool alerted users when they had exceeded a specified amount of time on the app and encouraged them to step away.²⁵

Rather than claim that these features directly caused harm, Plaintiffs claim that these

²¹ Order re Motion to Dismiss, pp. 31 (“Meta’s motion to dismiss is DENIED as to the States’ allegations of unfair and unconscionable acts and practices concerning appearance altering filters; platform features that hindered time restrictions; and Instagram’s ‘multiple accounts’ function.”), 96–97 (“The motion to dismiss is DENIED as to the States’ theories of unfair and unconscionable acts and practices concerning appearance altering filters; platform features that hindered time restrictions; and Instagram’s ‘multiple accounts’ function.”).

²² “Introducing Camera Effects Platform,” *Meta*, April 18, 2017, available at <https://developers.facebook.com/blog/post/2017/04/18/Introducing-Camera-Effects-Platform/> (“[W]e’re making it possible for the whole world’s creative community to build for the Facebook camera with the launch of Camera Effects Platform... Included with this new platform are two creative tools, Frame Studio and AR Studio, that give the Facebook community the power to create a full spectrum of camera effects, from simple frames to interactive augmented reality (AR) experiences.”).

²³ “Creativity for All: Facebook’s Spark AR Now Lets Anyone Build and Share Effects on Instagram,” *Meta*, August 13, 2019, available at <https://developers.facebook.com/blog/post/2019/08/13/spark-ar-publish-to-instagram/> (“August 13, 2019... Today, we’re excited to announce that Facebook’s Spark AR platform is moving out of its Instagram publishing closed beta.”).

²⁴ “New Tools to Manage Your Time on Facebook and Instagram,” *Meta*, August 1, 2018, available at <https://about.fb.com/news/2018/08/manage-your-time/> (“Today we are announcing new tools to help people manage their time on Facebook and Instagram: an activity dashboard, a daily reminder and a new way to limit notifications... On Instagram tap “Your Activity,” and on Facebook, tap “Your Time on Facebook.” At the top, you’ll see a dashboard showing your average time for that app on that device... Below the dashboard, you can set a daily reminder to give yourself an alert when you’ve reached the amount of time you want to spend on that app for that day.”).

²⁵ Adam Mosseri, “Raising the Standard for Protecting Teens and Supporting Parents Online,” *Instagram*, December 7, 2021, available at <https://about.instagram.com/blog/announcements/raising-the-standard-for-protecting-teens-and-supporting-parents-online> (“It’s important to me that people feel good about the time they spend on Instagram, so today we’re launching ‘Take A Break’ to empower people to make informed decisions about how they’re spending their time. If someone has been scrolling for a certain amount of time, we’ll ask them to take a break from Instagram and suggest that they set reminders to take more breaks in the future.”).

tools instead fell short of adequately “empower[ing] young users to effectively self-regulate their use of Meta’s Social Media Platforms.”²⁶

(iii) **Instagram’s multiple accounts function:** In February 2016, Instagram enabled Account Switching, allowing users to switch between up to five accounts.²⁷

28. Collectively, I refer to all features that Plaintiffs challenge, excluding those dismissed by the Court, as the “At-Issue Features.”

B. Overview of Mr. Saba’s Methodology

29. In his report, Mr. Saba conducts the following four categories of analyses:

(i) He estimates the number of monthly instances in UDAP States in which an account belonging to a user aged 13 to 17 (“Teen”) spent an average amount of time exceeding certain thresholds on Instagram or Facebook;²⁸

(ii) He assesses Meta’s revenues, expenses, and profits related to UDAP State Teens and UDAP State Teens that became adults during the Relevant Period through March 2024 (“Aged-Up Teens”)—specifically, for Teens and Aged-Up Teens who exceeded certain thresholds of time spent on Instagram or Facebook on average;²⁹

(iii) He estimates the number of instances in which UDAP State Teens were exposed to specific “bad experiences” on Instagram based on the findings of the Bad Experiences and Encounters Framework Survey (“BEEF Survey”);

²⁶ Am. Complaint, ¶¶ 588–590 (“In designing its Daily Limit and Take a Break features, Meta could have provided young users with robust tools that, once enabled, empowered young users to effectively self-regulate their use of Meta’s Social Media Platforms. But instead of being able to set it and forget it, young users who make what can be a difficult choice to limit their daily use or take a break must make this difficult decision over and over again. Meta’s design choices make the proverbial wagon that much easier for young users to fall off. Upon information and belief, Meta does so because it does not want its users to avail themselves of tools that could help protect them from the addictive nature of Meta’s Platforms.”).

²⁷ Instagram (@instagram), “Starting this week, you can quickly and easily switch between multiple accounts on Instagram!,” *Instagram Post*, February 8, 2016, available at <https://www.instagram.com/p/BBiUcWDhQTy>.

²⁸ Mr. Saba’s report focuses on users in the 13–17 age range, and he refers to them as “Teens” in his report. In this report, I also refer to young people aged 13–17 as “Teens.” See Saba Report, ¶ 2 (“Section IX of this report and Schedules 2.9.1 and 2.10.1, and 2.8.8 which are appended to this report, detail the results of my analysis on the number of monthly instances in which 13-17 year old (‘Teen’) accounts averaged more than 0.5, 1, 2, 3, 4 or 5 hours per day on Instagram and Facebook.”).

²⁹ Aged-Up Teens had to have exceeded these certain thresholds of time spent on Instagram or Facebook during the time in which they were Teens on Instagram or Facebook.

(iv) He estimates the number of UDAP State Teens and Under 13 persons active on Instagram and Facebook.³⁰

30. I describe the specific methodology Mr. Saba uses across these four analyses in more detail in the remainder of this section.

1. Mr. Saba's Tallies of Monthly Instances of Teens Exceeding Certain Thresholds of Time Spent on Instagram or Facebook

31. Mr. Saba purports to count the number of instances in which Teens in UDAP States spent over certain thresholds of time on Instagram and Facebook. Mr. Saba purportedly counts the number of instances of a Teen User spending more than half an hour, one hour, two hours, three hours, four hours, or five hours per day, on average, on each of Instagram and Facebook in a given month. Mr. Saba notes that Plaintiffs claim the instances of average time spent above these thresholds in a given month "may represent or be the result of violations of the UDAP Statutes during the Relevant Time Period."³¹ In this section, I describe this approach.

32. Mr. Saba claims to "[c]alculate the number of instances in which 13-17 year olds'... accounts averaged more than 30 minutes per day, one hour per day, two hours per day, three hours per day, four hours per day, and five hours per day in a given month on the Instagram ('IG') and Facebook ('FB') platforms" for the period February 2018 through March 2024 for Instagram and February 2013 through March 2024 for Facebook.³² According to Mr. Saba, Plaintiffs may claim that a "violation" occurred every time a Teen User in a UDAP State spent these amounts of time on Instagram or on Facebook, on average, in a given month during the

³⁰ Saba Report, ¶¶ 6 ("Schedule XIV and Schedules 2.1 and 2.2 summarize the number of estimated Teen Monthly Active Persons and Daily Active Persons on Instagram and Facebook, on a monthly basis, during the Relevant Time Period."), 7 ("Section XV and Schedule 6.3.1 summarize the results of my analysis on the number of unique Teen persons that were active on IG or FB at any time during the Relevant Time Period."), 8 ("Section XVI and Schedule 7.1 summarize the number of Under 13 Daily Active Persons on IG and FB, on a yearly basis during the Relevant Time Period."), 9 ("Section XVII and Schedule 7.2 summarize the results of my analysis on the number of unique Under 13 persons that were active on Instagram or Facebook at any time during the Relevant Time Period.").

³¹ Saba Report, ¶ 17.a.

³² Saba Report, ¶¶ 17.a, 126 ("I have used data produced by Meta that shows on a monthly basis for the period February 2018 to March 2024 and for the MDL States [t]he number of MAUs on Instagram... [and t]he average time spent for Teens MAUs per day on Instagram."), 134 ("I have used data produced by Meta that shows on a monthly basis for the period February 2013 to March 2024 and for the MDL States [t]he number of MAU on Facebook... [and t]he average time spent per day for Teen MAUs on Facebook.").

Relevant Period.³³ For purposes of these analyses, he relies on data showing the number of monthly active Teen Users on Instagram produced by Meta, and he purports to count the number of Teen Users whose monthly time spent exceeded each of these thresholds, on average, in each month for each respective time period.³⁴

33. To do this, Mr. Saba claims to interpolate percentile data produced by Meta for Teen Users to identify the percentile of Teen MAU for which the user's average daily time spent on Instagram or Facebook exceeded half an hour, 1 hour, 2 hours, 3 hours, 4 hours, or 5 hours per day.³⁵ Then, Mr. Saba multiplies these purported proportions by the total number of 13–17-year-old MAU for each UDAP State in each month.³⁶ Finally, for each threshold of time spent, Mr. Saba sums the number of Teen Users meeting this threshold across all months and all UDAP States from February 2018 to March 2024 to reach his counts of purported instances for Instagram of 351 million, 182 million, 59 million, 22 million, 5 million and 148 thousand for half an hour, 1 hour, 2 hours, 3 hours, 4 hours and 5 hours, respectively.³⁷ For Facebook, Mr.

³³ Saba Report, ¶ 17.a (“I understand that the MDL Plaintiffs claim that these instances may represent or be the result of violations of the UDAP Statutes during the Relevant Time Period.”).

³⁴ Saba Report, ¶¶ 126 (“I have used data produced by Meta that shows on a monthly basis for the period February 2018 to March 2024 and for the MDL States [t]he number of MAUs on Instagram aged 13 to 17 years old [and t]he average time spent for Teens MAUs per day on Instagram.”), 132 (“I have been asked by Counsel to count the number of instances that an MAU aged 13 to 17 has spent more than 0.5, 1, 2, 3 and 4 hours a day on average for the month. The resulting number of monthly instances where Instagram UDAP State Teen MAUs spent a daily average above the designated time thresholds between February 2018 and March 2024 is shown in the table below.”), 134 (“I have used data produced by Meta that shows on a monthly basis for the period February 2013 to March 2024 and for the MDL States [t]he number of MAU on Facebook aged 13 to 17 years old [and t]he average time spent per day for Teen MAUs on Facebook”), 137 (“The resulting number of monthly instances where UDAP State Facebook Teen MAUs spent time above the designated thresholds between February 2013 and March 2024 is shown in the table below.”).

³⁵ Mr. Saba performs a linear interpolation on the percentiles of time spent on Instagram. *See* Saba Report, ¶¶ 128–129 (“By way of example, in March 2018, the 75th percentile, i.e., 75%, of MAUs in California aged 13 to 17 spent less than 3,111 seconds a day on average during the month. The 80th percentile, i.e., 80%, spent less than 3,621 seconds a day on average. Using these two data points, I estimate using linear interpolation that 79.79 percent of MAU aged 13 to 17 spent less than 3,600 seconds a day on average, i.e., 1 hour. The converse of this computation reflects that 20.21 percent of MAUs aged 13 to 17 spent more than 3,600 seconds a day on average in the month of March 2018, i.e., more than 1 hour per day on average. Using the above methodology, for each month I have determined the percentages of MAUs aged 13 to 17 that spent more than 0.5, 1, 2, 3, 4 and 5 hours per day on average in each month, i.e., more than 1,800, 3,600, 7,200, 10,800 and 14,400 seconds.”).

³⁶ Saba Report, ¶ 131 (“For each month, I then multiplied each of these 0.5, 1, 2, 3, and 4 hour percentages by the associated MAUs aged 13 to 17 for the state and month to calculate the number of MAUs aged 13 to 17 that spent more than 0.5, 1, 2, 3, and 4 hours a day on average on Instagram in a given month.”).

³⁷ Saba Report, ¶ 132 (“The resulting number of monthly instances where Instagram UDAP State Teen MAUs spent a daily average above the designated time thresholds between February 2018 and March 2024 is shown in the table below.”). Mr. Saba reports a total of over 540 million instances of UDAP State Teens averaging more than 0.5 hours per month from January 2012 through March 2024 in his summary of opinions, but his schedules and backup materials do not include this figure. 2. Saba Report, ¶ 2 (“The number of monthly instances of UDAP State Teens averaging over 0.5 hours per month during the Relevant Time Period was over 540 million for Instagram.”).

Saba sums across all months and all UDAP States from February 2013 through March 2024 to reach purported instances of 102 million, 56 million, 22 million, 10 million, 3 million and 493 thousand for half an hour, 1 hour, 2 hours, 3 hours, 4 hours and 5 hours, respectively.³⁸

2. Mr. Saba's Calculations of Meta's Revenues, Expenses, and Profits for Teens and Aged-Up Teens Exceeding Certain Thresholds of Time Spent on Instagram or Facebook

34. Mr. Saba calculates the revenues, costs, and gross profits earned by Instagram and Facebook on Teen accounts spending more than half an hour, 1 hour, 2 hours, 3 hours, 4 hours, and 5 hours per day in a given month.³⁹ Mr. Saba also calculates revenues, costs, and gross profits earned by Instagram and Facebook on Teen accounts spending more than half an hour, 1, hour, 2 hours, 3 hours, 4 hours, and 5 hours per day in a given month, for periods after the Teens turned 18 up through March 2024 ("Aged-Up Teens").⁴⁰ Mr. Saba calculates gross profits for Aged-Up Teens "for purposes of disgorgement," noting that he understands that Plaintiffs claim that "absent IG and FB's alleged violations of UDAP Statutes, IG and FB would not have earned these profits."⁴¹

a) Mr. Saba's Estimation of Profits Associated with Teens that Exceeded Time Spent Thresholds

35. First, Mr. Saba calculates Meta's revenues from affected Teens as the product of three components: (a) average revenue per user ("ARPU"), (b) the number of instances of MAU over

³⁸ Saba Report, ¶ 137 ("The resulting number of monthly instances where UDAP State Facebook Teen MAUs spent time above the designated thresholds between February 2013 and March 2024 is shown in the table below.").

³⁹ Saba Report, ¶ 17 ("I have been asked to perform the following calculations for the period from January 2012 through March 31, 2024 (Relevant Time Period) ... Calculate the revenue earned by IG and FB from Teens whose accounts averaged more than 30 minutes per day, one hour per day, two hours per day, three hours per day, four hours per day, and five hours per day in a given month ('Teen Revenues') ... Calculate the costs associated with the Teen Revenues ('Teen Costs') ... Calculate the difference between Teen Revenues and Teen Costs ('Teen Profits').").

⁴⁰ Saba Report, ¶¶ 17 ("Calculate for purposes of disgorgement, the cumulative profits earned by IG and FB on Teens accounts spending more than 30 minutes per day, one hour per day, two hours per day, three hours per day, four hours per day, and five hours per day in a given month, for periods after the Teens turned age 18 through March 2024 ('Profits From Aged-Up Teens')."), 197 ("The table below shows Instagram and Facebook revenue from the year Teens turned 18, i.e., for 2018 and 2013, respectively, to March 31, 2024, respectively."), 199 ("I also calculate COGS related to the aging up revenue calculated above.").

⁴¹ Saba Report, ¶ 17.e.

certain thresholds of time spent (which I describe above in Section V.B.1), and (c) a “time spent multiplier.”⁴² To calculate ARPU, Mr. Saba uses Instagram data produced by Meta on ad revenues earned by age bucket, including an age bucket for Teens. He then divides ad revenues for Teens by the number of Teen Users in a given month.⁴³ Mr. Saba does this calculation at the national level—*i.e.*, including Teens in states that are not Plaintiffs in this action, as well as Teens in non-UDAP States (*i.e.*, states that are Plaintiffs in this action, but which are not asserting claims under UDAP Statutes).⁴⁴ Mr. Saba’s time spent multiplier is purportedly intended to account for increased revenue associated with a user’s above average time spent.⁴⁵ Mr. Saba computes the time spent by dividing the midpoint of each threshold of time spent (*e.g.*, 90 minutes for the 1 to 2 hour threshold) by the average time spent by Teens for the same state and time period.⁴⁶

36. Next, Mr. Saba computes Meta’s costs from affected Teens. Mr. Saba apportions total costs for Meta across Instagram, Facebook, and other platforms based on their share of North American revenues.⁴⁷ He then divides those quarterly costs by the total MAUs for the quarter to obtain costs per MAU.⁴⁸ Mr. Saba then breaks the costs out between Teens and adults by adjusting the cost figure relative to the weighted average time spent for Teens and adults,

⁴² Saba Report, ¶ 150 (“I multiply monthly instances, ARPU for 13-17 year-olds, and the time spent multiplier to calculate Meta’s revenue associated with Affected Teens for each month, state, and threshold for Instagram from February 2018 to March 2024 and for Facebook from February 2013 to March 2024.”).

⁴³ Saba Report, ¶¶ 140–141 (“For Instagram, Meta produced advertising revenue by user stated age bucket for each day from January 2018 through March 2024...I then divide the monthly revenue for each age bucket by the associated number of MAUs within the given month. The result reflects the monthly ARPU for each age bucket. For example, in November 2022, IG recorded monthly advertising revenue of \$14.9 million for users 13 to 17 and reported a total of 15.4 million MAUs in that age bucket.”).

⁴⁴ Saba Report, ¶ 143 (“I apply the monthly ARPU as a nationwide average figure by age group and assume that ARPU differs across age buckets and remains relatively consistent across states for the same month and age bucket.”).

⁴⁵ Saba Report, ¶ 148 (“I calculate a time spent multiplier to account for increased revenue associated with a user’s greater time spent.”).

⁴⁶ Saba Report, ¶ 149 (“I compute the time spent multiplier by dividing the midpoint of each threshold (.5 hours, 1 hour, 2 hours, etc.) by the average time spent by Teens for the same state and time period. For example, in November 2020, California Teens spent an average of 2,668 seconds on Instagram. The midpoint of time spent for users with a daily average of 1 to 2 hours is 90 minutes, or 5,400 seconds. Therefore, the multiplier for this threshold is 5,400 divided by 2,668, or 2.02x.”).

⁴⁷ Saba Report, ¶ 157 (“I calculate shared costs to be allocated across Instagram, Facebook, and Other platforms based on the pro-rata share of reported North America quarterly advertising revenue.”).

⁴⁸ Saba Report, ¶ 159 (“I compute costs per MAU by dividing total quarterly costs for each platform by the total MAUs for the quarter. The value represents an average cost per MAU for Instagram and Facebook.”).

respectively.⁴⁹ He then apportions costs related to Teen Users with daily average time spent above certain thresholds.⁵⁰ He multiplies the number of MAU with daily average time spent above certain thresholds by U.S. costs per Teen and by the time spent multiplier.⁵¹

37. Finally, Mr. Saba calculates gross profits as revenues less apportioned costs.⁵² Mr. Saba finds negative gross profits for Teens within the Relevant Period on both platforms. For Instagram, Mr. Saba finds negative gross profits for Teens from February 2018 to March 2024 of -\$869 million.⁵³ For Facebook, Mr. Saba finds negative gross profits for Teens from February 2013 to March 2024 of -\$351 million.⁵⁴

b) Mr. Saba's Estimation of Profit for Aged-Up Teens who Exceeded Time Spent Thresholds

38. Mr. Saba also calculates Meta's revenues, costs, and gross profits for "Aged Up Teens," or Teen MAU who exceeded time spent thresholds on Instagram and Facebook and who turned 18 during the Relevant Period.⁵⁵

39. First, Mr. Saba calculates yearly revenues for each cohort of 17-year-olds during the Relevant Period. Mr. Saba uses monthly time spent and MAU data to estimate the number of 13–17-year-olds in each state in each year. He then estimates the number of 17-year-olds in each state in each year as a percent of the prior estimate for the total number of Teens, as informed by

⁴⁹ Saba Report, ¶ 160 ("Starting with the average costs per user...I adjust the cost figure relative to the weighted average time spent for Teens and adults.").

⁵⁰ Saba Report, ¶ 163 ("I apportion costs related to Teen users with daily average time spent above the specified thresholds by platform, month, and state.").

⁵¹ Saba Report, ¶ 164 ("I calculate costs by UDAP State and platform by multiplying three figures: 1) instances of MAUs with daily average time spent above certain thresholds, 2) U.S. costs per Teen, and 3) the time spent multiplier.").

⁵² Saba Report, ¶ 167 ("Meta's gross profits are calculated for each state, month, and platform as relevant revenues less apportioned costs.").

⁵³ Saba Report, Schedule 2.9.1.

⁵⁴ Saba Report, Schedule 2.10.1.

⁵⁵ Saba Report, ¶¶ 175 ("I have estimated Meta's Profits From Aged-Up Teens related to teen MAUs who spent more than 0.5 hours of average daily time on Instagram and Facebook from the year they turned 18 during the Relevant Time Period through March 31, 2024."), 197 ("The table below shows Instagram and Facebook revenue from the year Teens turned 18, i.e., for 2018 and 2013, respectively, to March 31, 2024, respectively ..."), 199 ("I also calculate COGS related to the aging up revenue calculated above.").

data produced by Meta.⁵⁶ Then, for each cohort of 17-year-olds, Mr. Saba estimated ARPU of that cohort from the year they turned 18 during the Relevant Period through March 2024.

Estimates of ARPU are based on data produced by Meta on ad revenues earned for users based on age buckets.⁵⁷ Mr. Saba assumes these cohorts of 17-year-olds generated average revenues per user as young adults (when they turned 18 and beyond), and did not apply a time spent multiplier when computing revenues for Aged-Up Teens.⁵⁸

40. Then, Mr. Saba models how each cohort of 17-year-olds would either continue or discontinue use of Instagram and Facebook during the Relevant Period. To do this, Mr. Saba estimates the annual rate of retention and attrition rate of Instagram and Facebook users.⁵⁹ Mr. Saba says he understands that, after a period of low retention when a user first joins Instagram or Facebook, retention stabilizes to 72 percent over four years.⁶⁰ He annualizes this rate to calculate a retention rate of 92 percent per year for long-term users.⁶¹ He assumes that new users are

⁵⁶ Saba Report, ¶¶ 177–178 (“I carried-over to Schedules 4.2.1 and 4.3.1 previously calculated average monthly time-spent and MAU data, from Schedules 2.9.3 and 2.10.3. I estimated the number of 13-17 year-olds, in each state in each year, as shown in Schedules 4.2.4 and 4.3.4, respectively... I thus used data contained in META3047MDL-188R-00000008 and META3047MDL-188R2-00000009 to estimate the 17 year-olds as a percentage of 13 to 17 year-old MAU. This calculation is initially performed in Schedule 2.3 carried over to Schedule 4.2.4. I then applied my estimate of the percentage of 17 year-old MAU to 13-17 year-old MAU from time-spent data, and averaged for each period. This was done for each relevant state and year.”).

⁵⁷ Saba Report, ¶ 140 (“For Instagram, Meta produced advertising revenue by user stated age bucket for each day from January 2018 through March 2024... I then divide the monthly revenue for each age bucket by the associated number of MAUs within the given month. The result reflects the monthly ARPU for each age bucket.”) Note that Mr. Saba computes yearly ARPUs for Aged-Up Teens as the average of monthly ARPUs for a year weighted by MAU counts in each month. *See* Saba Report, ¶ 180 (“For each cohort of 17-year-olds, I then estimated the ARPU of that cohort from the year they turned 18 during the Relevant Time Period through March 2024. This is shown in Schedules 4.2.3 and 4.3.3, respectively, and is calculated for each year as the average of monthly ARPUs for that year, weighted by MAU counts in each month. This calculation relied on data found in Schedules 2.8.6 and 2.8.7, respectively.”).

⁵⁸ Saba Report, ¶¶ 181 (“I note that while the cohorts of 17-year old MAU I captured in each year spent more time on the IG and FB platforms (daily average of 0.5 hours or more) relative to the average 17 year old MAU, I still assumed that they would generate average revenues per user as young adults (ARPU).”), 196 (“For each month and state, I then multiplied cumulative ARPU since year each cohort of 17-year-olds turned 18, by MAU at each relevant time-spent threshold to calculate the revenue that Meta has earned from each 17 year-old in the year they were 18 through March 2024.”).

⁵⁹ Saba Report, ¶ 183 (“As a next step, I estimated the annual rate of retention/attrition of Instagram and Facebook users, as shown in Schedules 4.2.2 and 4.3.2, respectively.”).

⁶⁰ Saba Report, ¶¶ 184–188 (“A key concept to understand is that while retention may be low in the first 180 days after a cohort of MAU sign up to Instagram or Facebook, retention increases once the cohort of MAU moves past the 180 day milestone... the U.S. Young Adult retention at... 72% for 2018-2019 MAU after 4 years.”).

⁶¹ Saba Report, ¶¶ 188–189 (“From this I have calculated a long-term retention rate of 92% per year, for existing MAU... As seen above, existing Young Adult MAU retention is 72% after 4 years. The annual retention rate that would correspond to this figure is approximately 92.1%, calculated as $(92.1\%)^4 = 72\%$ (rounded).”).

retained at a rate of 35 percent per year.⁶² He also assumes that 10 percent of 17-year-old cohorts are new users and 90 percent are long-term users to arrive at a retention rate of 86 percent per year across new and long-term users.⁶³

41. Next, Mr. Saba calculates cumulative average monthly ARPU per MAU since the year users turned 18.⁶⁴ Mr. Saba then multiplies cumulative ARPU by his estimate of the number of MAU at each relevant time spent threshold and summed the revenues.⁶⁵

42. Mr. Saba uses the same methodology he uses to compute costs for Aged-Up Teens as he does for Teens, which I describe above, and finally computes gross profits as revenues less costs.⁶⁶ For Instagram, Mr. Saba calculates \$984 million in gross profits for Aged-Up Teens who exceed half an hour on the platform as a Teen from 2013 to the first quarter of 2024.⁶⁷ For Facebook, Mr. Saba calculates \$215 million in gross profits for Aged-Up Teens who exceed half an hour on the platform as a Teen from 2013 to the first quarter of 2024.⁶⁸

3. Mr. Saba's Tallies of "Bad Encounters" Reportedly Experienced by Teens on Instagram

43. In addition to his revenue and profit calculations, Mr. Saba tallies "the number of instances in which Teens were exposed to specific bad experiences on Instagram, based on the findings of the Bad Experiences and Encounters Survey conducted by Meta."⁶⁹ Mr. Saba

⁶² Saba Report, ¶ 190 ("Based on the above annual retention rate for existing users, and a 35% annual retention rate for new users...").

⁶³ Saba Report, ¶ 193 (I have estimated that 10% of Instagram MAUs and 10% of Facebook MAUs were new users, conservatively rounding up from the figures above."), Schedule 4.4.1.

⁶⁴ Saba Report, ¶ 195 ("I then calculate total cumulative average monthly ARPU per MAU since year turned 18...").

⁶⁵ Saba Report, ¶ 196 ("For each month and state, I then multiplied cumulative ARPU since year each cohort of 17-year-olds turned 18, by MAU at each relevant time-spent threshold to calculate the revenue that Meta has earned from each 17 year-old in the year they were 18 through March 2024. I then summed the revenue from the year each cohort turned 18 for each time-spent threshold by year and by UDAP State...").

⁶⁶ Saba Report, ¶¶ 199 ("I also calculate COGS related to the aging up revenue calculated above. In doing so, I relied on the same COGS calculated for the time-spent analysis above in section XI of this report... I used the same methodology and retention estimates to calculate cumulative COGS since the year Teens turned 18... I calculate COGS by state and by year at each time spent threshold, similar to my calculations of revenue in those schedules."), 200 ("The COGS are then summarized by state and by year and subtracted from revenue to calculate Instagram and Facebook gross profits, as shown in Schedules 4.2.1 and 4.3.1, respectively.").

⁶⁷ Saba Report, Schedule 4.1.3.

⁶⁸ Saba Report, Schedule 4.1.3.

⁶⁹ Saba Report, ¶ 17.f ("Calculate the number of instances in which Teens were exposed to specific bad experiences on Instagram, based on the findings of the Bad Experiences and Encounters Survey conducted by Meta.").

purports to count the number of instances in which a Teen in a UDAP State was exposed to certain bad experiences or encounters on Instagram by interpreting and extrapolating data from a single survey conducted by Meta over an approximately two-week period in 2021.⁷⁰ Mr. Saba states that Plaintiffs claim that “instances in which Teens were exposed to specific bad experiences on Instagram, based on the findings of the Bad Experiences and Encounters Survey ... are violations of the UDAP Statutes.”⁷¹

44. The BEEF Survey was conducted from June 27 to July 8, 2021.⁷² It measured user perceptions by asking Instagram users of all ages whether they had encountered various “issues” during the previous seven days.⁷³ Mr. Saba considers 10 of the 22 issues “Bad Encounter Issues.”⁷⁴ They are: “Bully Target,”⁷⁵ “Bully Witness,”⁷⁶ “Drugs,”⁷⁷ “Hate Witness,”⁷⁸ “Negative

⁷⁰ Saba Report, ¶ 215 (“I was asked by Counsel to calculate the number of instances of Bad Encounters that Teens experienced on Instagram, using data contained in the BEEF Survey.”); Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 029 (“Data collection: June 27–July 8, 2021”).

⁷¹ Saba Report, ¶ 17.f (“Calculate the number of instances in which Teens were exposed to specific bad experiences on Instagram, based on the findings of the Bad Experiences and Encounters Survey conducted by Meta. I understand that the MDL Plaintiffs claim that these instances are violations of the UDAP Statutes.”).

⁷² Mr. Saba incorrectly reports the date range over which the BEEF Survey was conducted. Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 029 (“Data collection: June 27–July 8, 2021”); Saba Report, ¶ 62 (“I understand that the BEEF Survey was based on data collected over the period June 27 to July 28 [*sic*], 2021.”).

⁷³ Saba Report, ¶¶ 77 (“The BEEF Survey identified that around 51.6% of respondents reported experiencing at least one issue in the past 7 days, among 5 selected at random from the 22 issues.”), 69 (“The survey identified the following Rates and Frequency over last 7 days of these issues.”).

⁷⁴ Saba Report, ¶ 218 (“Of the dozens of different types of bad encounters assessed by the BEEF survey, Plaintiffs’ counsel instructed me to focus on ten of them in my calculations: Bully Target, Bully Witness, Drugs, Hate Witness, Negative Comparison, Nudity, Self Harm, Unwanted Advances, Violence, and Perceived Control (collectively, ‘Bad Encounter Issues’)... I calculate that from February 2018 through March 2024, there were over 13 billion instances in which UDAP State Teen users experienced one of the ten selected Bad Encounter Issues.”).

⁷⁵ Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033 (“Has anyone ever done any of these things to you on Instagram? Insulted you or disrespected you[,] Contacted you in an inappropriate way[,] Damaged your reputation[,] Threatened you[, or] Excluded you or left you out.”).

⁷⁶ Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033 (“Have you ever seen anyone do any of these things to someone else on Instagram? Insulted or disrespected them[,] Contact them in an inappropriate way[,] Damaged their reputation[,] Threatened them[, or] Excluded them or leave them out.”).

⁷⁷ Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033 (“Have you ever seen anyone trying to buy or sell any of the following things on Instagram? Prescription drugs [or] Illegal drugs.”).

⁷⁸ Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033 (“Have you ever seen anyone discriminating against people on Instagram because of their gender, religion, race, sexual orientation, or another part of their identity?”).

Comparison,”⁷⁹ “Nudity,”⁸⁰ “Self Harm,”⁸¹ “Unwanted Advances,”⁸² “Violence”⁸³ and “Perceived Control.”⁸⁴ For each issue, the BEEF Survey asked respondents whether they have experienced the issue in the last seven days (“Yes, during the last 7 days”, “Yes, but more than 7 days ago,” and “No”) and how many times they experienced each encounter in the last seven days (“Once”, “2-3”, “4-5”, “6-9”, or “10+”).⁸⁵ Each respondent was asked about five of the 22 issues, meaning that the sample size of responses to each issue was smaller than the aggregate number of users who completed the survey.⁸⁶

45. Data resulting from the BEEF survey included a “Rate and Average Frequency” at which Teen Users reported experiencing each of 22 different “issues” during the previous seven days.⁸⁷ Mr. Saba uses the frequencies of the 10 “Bad Encounter Issues” to extrapolate out the number of instances a Teen User in each UDAP State may have encountered each issue. For each issue, Mr. Saba starts with the average rate and frequency of respondents experiencing that issue within the

⁷⁹ Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033 (“Have you ever felt worse about yourself because of other peoples’ posts —on Instagram?”).

⁸⁰ Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033 (“Have you ever seen nudity or sexual images on Instagram that you didn’t want to see?”).

⁸¹ Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033 (“Have you ever seen someone harm themselves, or threaten to do so, on Instagram?”).

⁸² Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033 (“Have you ever received unwanted sexual advances on Instagram?”).

⁸³ Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033 (“Have you ever seen any violent, bloody, or disturbing images on Instagram that bothered you?”).

⁸⁴ Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033 (“Have you ever felt a lack of control over what you see on Instagram?”).

⁸⁵ Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033 (“All questions had the same response options as TRIPS: ‘Yes, during the last 7 days,’ ‘Yes, but more than 7 days ago,’ and ‘No.’”), 039 (“If a respondent experienced an issue (i.e., responded ‘Yes, during the last 7 days’), they were then asked *how often* they experienced that issue...Frequency, last 7 days... Once... 2-3... 4-5... 6-9... 10+.”).

⁸⁶ Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 035 (“Each respondent was asked about five issues (randomly chosen from the set of 22).”).

⁸⁷ Saba Report, ¶ 215 (“I utilized data from the BEEF Survey relating to the Rate and Average Frequency at which Teen Instagram users reported encountering certain Issues. As described above, I understand Rate to be the percentage of users who reported encountering at least one instance of a particular issue within the past seven days. I understand that, for respondents who affirmatively reported experiencing a particular issue within the last week, ‘Average Frequency’ refers to the number of times those respondents experienced the bad encounter over the preceding seven days.”).

prior seven days. He scales this weekly rate to a monthly rate by finding the probability of a Bad Encounter not occurring in a given week, exponentiating this probability by 52/12 (to approximate the number of weeks in a month), and then subtracting the result from one.⁸⁸ Mr. Saba then performs two alternate calculations of “Bad Encounter Issues”. The first assumes that each issue’s weekly rate and monthly rate are the same.⁸⁹ The second assumes that a user can experience at most one instance of a “Bad Encounter Issue” each month.⁹⁰ Mr. Saba then multiplies his extrapolated monthly rates and frequencies by the number of daily active persons (“DAP”) in each UDAP State in every month from February 2018 to March 2024 to count the total number of purported instances.⁹¹

46. Finally, Mr. Saba purports to tabulate the total instances of UDAP State Teen Users experiencing one of the 10 “Bad Encounter Issues” from February 2018 through March 2024. Mr. Saba’s calculations from applying this methodology range from 401 million to 13 billion.⁹²

4. Mr. Saba’s Estimates of Teen and Under 13 Monthly and Daily Active Persons

47. Mr. Saba purports to calculate the number of Teen and Under 13 (“U13”) monthly active persons (“MAP”) and DAP as well as the count of “unique” persons from July 2012 to March 2024. He employs distinct methodologies for Teens (ages 13–17) and U13 users (ages 9–12).

⁸⁸ Saba Report, ¶ 225 (“I converted the weekly Rate to a monthly rate by calculating the probability that the event would not occur in a given week, raising that probability to the 52/12 power (to approximate a month), and subtracting the result from 1.”).

⁸⁹ Saba Report, ¶ 225 (“I have prepared an alternative calculation of bad encounter instances... under this calculation, the weekly and monthly rate of occurrence of each bad encounter is the same.”).

⁹⁰ Saba Report, ¶ 227 (“I was asked to calculate the same figure under the assumption that each user could incur no more than one instance per month if exposed to any one of the Bad Encounter Issues.”).

⁹¹ Saba Report, ¶¶ 216 (“I then multiplied the Average Monthly Encounter per person by the number of Daily Active Persons (DAPs) in each month.”), 222 (“Next, I aggregated the number of instances all Bad Encounter Issues across all months from February 2018 to March 2024.”). See Saba Report, Schedules 5.1.1, 5.1.2.

⁹² Saba Report, ¶ 228 (“The number of instances of Bad Encounter Issues by UDAP State Teens on Instagram from February 2018 to March 2024 are summarized in the table below... Total Instances (in millions)...2,433...779...13,124...Instances, Max. of One Instance per Month per Person (in millions)...477...401.”).

a) Teen Monthly and Daily Active Persons

48. To estimate the number of Teen MAP and DAP, Mr. Saba relies on Meta's produced counts of MAU and daily active users ("DAU"). He acknowledges that individual persons may hold multiple user accounts. To convert "Users" to "Persons," Mr. Saba divides the MAU and DAU counts by an estimated "user to person multiplier." He applies a multiplier of 1.35 for Instagram and 1.15 for Facebook, which he derives from various internal Meta documents regarding account proliferation.⁹³

49. Mr. Saba notes that for Instagram, the produced user data show a significant spike in July 2021.⁹⁴ For months where his calculated MAP count exceeds the U.S. Census population data for 13–17-year-olds in a specific state, he applies a manual adjustment to cap the MAP count at 100 percent of the census population.⁹⁵

b) Unique Teen Persons

50. Mr. Saba calculates the number of "Unique Teen Persons" active over the entire 2012–March 2024 time period using two methods. First, he sums the total count of Teen MAPs at five-year intervals, assuming that the entire 13–17 demographic turns over every five years and therefore these cohorts represent completely unique sets of individuals.⁹⁶ Mr. Saba calls this first

⁹³ Saba Report, ¶ 229 ("In order to calculate Teen MAP and DAP counts, I divided MAU and DAU counts provided by Meta in Volumes 188R, 188, 215R, and 215 by an estimated user to person multiplier of 1.35 for Instagram and 1.15 for Facebook, as shown in Schedule 2.7. This schedule aggregates a number of sources from Meta's records that provide an estimate of the number of accounts per teen person at different points in time... Instagram Teen persons are estimated to have on average between 1.19 and 1.60 accounts, with a median in the dataset of 1.35 accounts... Facebook Teen persons are estimated to have on average between 1.09 and 1.24 accounts with a median in the dataset of 1.15 accounts.").

⁹⁴ Saba Report, ¶ 230 ("In reviewing all these data sets containing user counts, I noted that for Instagram, there is a significant increase in DAU and MAU counts in July 2021.").

⁹⁵ Saba Report, ¶ 230 ("For these time periods, I have applied an adjustment as needed to the user to person ratio of 1.35 such that the resulting MAP counts do not exceed 100% of annual census data for Teens in the same states, in the same time periods. My adjustment is based on a review of the relationship between persons and users for a twelve month period in close proximity to the months where MAP counts required an adjustment.").

⁹⁶ Saba Report, ¶ 233 ("The first method takes the total count of Teen MAPs at the earliest date available during the Relevant Time Period, and adds to this figure the total count of Teen MAPs at each subsequent five-year interval. Since all Teens (ages 13-17) become adults five years later, one can infer that the Teen MAPs at five-year intervals are completely new cohorts of Teens (for example, between 2012 and 2017), that is, none of them were included within the prior cohort of Teen MAPs counted five years earlier. This method is conservative in that it does not capture certain Teen persons who became active on the platform and then disengaged in between the five-year intervals. Such Teen persons would not be in the MAP counts that are five years apart, that are summed together. This method is also conservative in that it would not capture certain Teens who became active after counting its five-year cohort.").

method his “Lower Bound” method.⁹⁷ Second, he takes the Teen MAP count at the start of the Relevant Period and adds (1) the count of 13-year-olds entering the cohort each subsequent year and (2) any net increase in MAPs for the older age buckets from year to year.⁹⁸ For Instagram specifically, Mr. Saba does not have data prior to February 2018. Therefore, he adds the specific count of Instagram Teen MAPs from 2012 to his total estimate for this platform.⁹⁹ Mr. Saba calls this second method his “Conservative Estimate” method.¹⁰⁰

c) Under-13 Active Persons

51. To calculate the number of Facebook and Instagram users under the age of 13, Mr. Saba relies on third-party survey data from Thorn and the Berenson Strategy Group (the “Thorn Survey”).¹⁰¹ To calculate the number of DAP under the age of 13, he uses survey responses from 9–12-year-olds regarding whether they used the platform “at least once per day” to establish daily usage rates for the years 2019 through 2023.¹⁰² For the years prior to 2019 (for which the Thorn Survey data do not exist), Mr. Saba manufactures estimates using different extrapolation methods for each platform.¹⁰³ Specifically, for Instagram, he estimates usage based on a fixed ratio of approximately 35 percent relative to Instagram’s Teen saturation rate observed in later years. For Facebook, he applies the minimum daily usage rate observed in the later survey data,

⁹⁷ Saba Report, ¶ 238 (“Calculation Method 1 – Lower Bound.”).

⁹⁸ Saba Report, ¶ 234 (“The second method that I applied, started again with the count of Teen MAPs at the earliest available date within the Relevant Time Period. I then added to this figure the count of 13 year old Teen MAPs at one year intervals after the initial date. Because these individuals would have been 12 years old, and therefore not part of the Teen MAPs a year earlier, they can be presumed to be new additions to the population of active Teens each year. I also added to my starting figure any *increase* in teen MAPs that would correspond to the same age group from one year to the next.”).

⁹⁹ Saba Report, ¶ 235 (“Meta did not provide data sufficient to calculate this methodology for IG before February 2018. Therefore, I added IG Teen MAPs in 2012 to each respective IG calculation method to estimate the total IG Teen MAPs during the Relevant Time Period.”).

¹⁰⁰ Saba Report, ¶ 238 (“Calculation Method 2 – Conservative Estimate”).

¹⁰¹ Saba Report, ¶ 251 (“To estimate the number of U13 DAPs during the Relevant Time Period, I reference survey responses from children between the ages of 9 and 12 to a study conducted by Thorn and Benson [*sic.*] Strategy Group.”).

¹⁰² Saba Report, ¶ 251 (“For each year from 2019 to 2023, the study conducted [the Thorn Survey] regarding general platform use among minors. Among other topics, the study published whether the 9-12 year old respondents had ‘ever used’ Facebook or Instagram and whether they used each platform ‘at least once per day.’”).

¹⁰³ Saba Report, ¶ 253 (“For years prior to 2019, the Thorn study did not publish results for these metrics.”).

which is 29 percent, to the earlier years.¹⁰⁴ He then calculates the final annual counts of U13 DAP by applying these calculated use rates to the U.S. Census population data for 9–12-year-olds.¹⁰⁵

52. In addition to daily users, Mr. Saba estimates the number of unique U13 persons active on the platforms. For the years 2019–2023, he uses the percent of Thorn Survey respondents who reported having “ever used” the platform.¹⁰⁶ To generate an estimate for the years 2015–2018, he calculates an “ever used” rate by referencing the ratio between reported daily usage rate observed in 2015 and “ever used” rates observed in the 2019–2023 data.¹⁰⁷ For example, to estimate the unique 9–12-year-old persons on Instagram in California in 2015, Mr. Saba first takes the total U.S. population of 16,491,925 and multiplies it by 46 percent, the survey percentage of respondents who reported having “ever used” Instagram in 2015. Then, he multiplies this number by 12.8 percent, the ratio between 9–12-year-old daily active persons in California and 9–12-year-old daily active persons in the whole United States. This results in an estimated 975,948 unique 9–12-year-old persons on Instagram in 2015. Finally, to calculate U13 users for specific UDAP States, Mr. Saba apportions his national U13 estimate to each state based on that state’s percent of the national Teen DAP count.¹⁰⁸

¹⁰⁴ Saba Report, ¶ 253 (“Therefore, for Instagram, I estimate the percentage of 9 to 12 year olds on the platform with reference to Instagram’s saturation rate among Teens from 2012 to 2018. For example, as reflected in Schedule 7.1, 9-12 year olds using Instagram on a daily basis averaged approximately 35% of the platform’s Teen saturation rate from 2019 to 2023. I used this percentage with reference to Instagram’s Teen saturation rate from 2012 to 2018 to calculate the percentage of 9-12 year olds using Instagram at least daily for those years. For Facebook, user trends indicate that Teen users were declining between 2012 and 2018. Therefore, I use the minimum percentage observed in the study, 29%, as a conservative estimate for those earlier years.”).

¹⁰⁵ Saba Report, ¶ 254 (“Next, I apply these percentages to the annual population of U.S. 9-12 year olds to compute the total number of U.S. 9-12 years old daily active persons.”).

¹⁰⁶ Saba Report, ¶ 258 (“For the years 2019 and 2023, I use percentage of 9-12 year olds that had ever used the respective platform.”).

¹⁰⁷ Saba Report, ¶ 260 (“For 2015, I calculate the percent of U13s that ‘ever used’ the platforms with reference to the rates at which they responded to having used the platform ‘at least once per day.’... Using this relationship and the U13s active on the platforms daily, I computed the percentage of 9-12 year olds that had ever used the platform as of 2015.”).

¹⁰⁸ Saba Report, ¶ 259 (“I then applied this percentage the total U.S. 9-12 year old population for this respective year and apportioned the total by each state’s pro rata share of Teens.”).

VI. MR. SABA FAILS TO SHOW THAT THE EVENTS HE TALLIES WHICH “MAY REPRESENT VIOLATIONS OF THE UDAP STATUTES” ARE ASSOCIATED WITH HARM AND ARE CONSISTENT WITH PLAINTIFFS’ CLAIMS REGARDING ADDICTIVE OR PROBLEMATIC USE

53. Mr. Saba provides tallies of (i) monthly instances in which Teens on average exceed certain thresholds of time per day and (ii) instances of “bad encounters” that Teens reportedly experience on Instagram,¹⁰⁹ suggesting these events are associated with consumer harm. To the extent that these instances are not meaningful indicators of any consumer harm according to Plaintiffs’ theories,¹¹⁰ Mr. Saba’s results would fail to support a claim of widespread consumer harm. Yet, Mr. Saba provides no explanation as to whether or how these instances are associated with harm in any way, or whether or how the instances he tallies resulted in any negative mental health outcome to Teens using Instagram or Facebook. Further, Mr. Saba provides no explanation of whether or how these instances are linked to the alleged conduct that gives rise to Plaintiffs’ claims or to the At-Issue Features.

54. Regarding his time spent analysis, Mr. Saba provides no evidence, basis, or justification for assuming that each instance in which a Teen User’s average daily time spent on Instagram or Facebook in UDAP States exceeded Mr. Saba’s thresholds in fact caused harm, represented

¹⁰⁹ See Section V.B; Saba Report, ¶ 17 (“Calculate the number of instances in which 13-17 year olds’ (Teens or ‘Youth’) accounts averaged more than 30 minutes per day, one hour per day, two hours per day, three hours per day, four hours per day, and five hours per day in a given month on the Instagram (‘IG’) and Facebook (‘FB’) platforms. I understand that the MDL Plaintiffs claim that these instances may represent or be the result of violations of the UDAP Statutes during the Relevant Time Period... Calculate the number of instances in which Teens were exposed to specific bad experiences on Instagram, based on the findings of the Bad Experiences and Encounters Survey conducted by Meta. I understand that the MDL Plaintiffs claim that these instances are violations of the UDAP Statutes.”).

¹¹⁰ See for example, Amended Complaint ¶ 891, Colorado: (“Meta’s acts and omissions alleged herein are also likely to cause, and have caused, substantial injury to consumers that could not be reasonably avoided. Young users could not have reasonably avoided injuries resulting from Meta’s acts and omissions, nor can they do so in the future, for numerous reasons, including but not limited to Meta’s misrepresentations and failure to disclose the dangerous nature of its Social Media Platforms, and Meta’s use of psychologically manipulative engagement-inducing features, knowing that young users are especially susceptible to those features.”); ¶ 953, Illinois: (“Meta’s acts and practices alleged herein also have caused and continue to cause substantial injury to consumers that could not be reasonably avoided. Young users could not have reasonably avoided injuries resulting from Meta’s acts and practices, including because Meta misrepresented and failed to disclose the dangerous nature of its Social Media Platforms and because Meta utilized psychologically manipulative engagement-inducing features, knowing that young users are especially susceptible to those psychologically manipulative tactics.”); ¶ 1020, Minnesota: (“Meta’s acts, practices, and omissions alleged herein also have caused and continue to cause substantial injury to consumers that could not be reasonably avoided. Young users could not have reasonably avoided injuries resulting from Meta’s acts, practices, and omissions, including because Meta misrepresented and failed to disclose the dangerous nature of its Social Media Platforms and because Meta utilized psychologically manipulative engagement-inducing features, knowing that young users are especially susceptible to those psychologically manipulative tactics.”).

“excessive” or “addictive” use, or had a negative effect on users’ mental health. I discuss this further in Section VI.A below.

55. Moreover, the Plaintiffs’ claim that Instagram and Facebook are “addictive” for Teens in UDAP States is inconsistent with the usage data that Meta produced in this matter. Usage data show that Instagram and Facebook account for a small portion of Teens’ total screen time across all UDAP States and that there are no consistent or universal upticks in Instagram or Facebook usage over time, contrary to Plaintiffs’ claims and Mr. Saba’s findings (to the extent they are interpreted as evidence of addictive behaviors). In fact, I find that the percent of Teens on Instagram and Facebook at each time spent threshold for which Mr. Saba calculates tallies has generally been static or declining over time. I discuss this further in Section VI.B below.

56. Finally, Mr. Saba provides no evidence, basis, or justification for assuming that the 10 “bad encounters” from the BEEF survey caused harm or had a negative effect on the mental health of Teens in UDAP States, as identified in the Amended Complaint.¹¹¹ I discuss this further in Section VI.C below.

A. Mr. Saba Provides No Evidence that Instances of Teens in UDAP States Exceeding Certain Thresholds of Time Spent on Facebook and Instagram Resulted in Harm

57. As I describe in Section V.B.1, Mr. Saba tallies the number of instances of time spent by Teen Users in UDAP States on Instagram or Facebook over certain thresholds. Specifically, he counts the number of instances a Teen User spends more than half an hour, 1, 2, 3, 4, or 5 hours a day, on average, on Instagram or Facebook in a given month. Mr. Saba states that he understands that “the MDL Plaintiffs claim” that these instances of time spent over certain thresholds “may represent or be the result of violations of the UDAP Statutes during the Relevant Period.”¹¹² To the extent that these instances are not meaningful indicators of any

¹¹¹ Am. Complaint, ¶¶ 6 (“At the same time, Meta secretly maintained a parallel set of internal data showing shockingly high rates of harms experienced by users of its Social Media Platforms...[Meta] conceal[ed] the alarming Bad Experiences & Encounters Framework (BEEF) and Tracking Reach of Integrity Problems Survey (TRIPS) data showing frequent user harms...”), 468–472 (“The [BEEF Survey] inquire[s] about harmful content such as suicide and self-harm, negative comparison, misinformation, and other issues such as bullying, unwanted sexual advances, and hate speech or discrimination.”).

¹¹² Saba Report, ¶ 17.a.

consumer harm according to Plaintiffs’ theories, Mr. Saba’s results would fail to support a claim of widespread consumer harm.

58. However, Mr. Saba provides no evidence, basis, or justification for any assumption that each instance of a Teen User exceeding these thresholds on Instagram or Facebook in fact caused harm.¹¹³

59. First, Mr. Saba does not establish that time spent on Instagram or Facebook is an appropriate or correct metric to identify problematic use of Instagram or Facebook (let alone time spent over durations as short as a month). As an initial matter, the amount of time that Teens spend on Instagram, Facebook, other social media services, or on screens in general, has not been established as a reliable metric for assessing whether use of technology might be harmful. For example, the American Academy of Pediatrics states that one “myth is that problematic technology use is all about the amount of time spent using technology, or screen time. One Teen may use technology one hour a day and it is clearly problematic, and another [Teen] may use technology 2.5 hours a day and they are learning and thriving. *In general, the amount of screen time itself is not an adequate way to represent problematic technology use.*”¹¹⁴ Mr. Saba provides no evidence that daily or monthly instances of time spent by users over a certain hourly threshold results in mental health challenges or harm of any other kind. (I discuss the lack of evidence that Instagram and Facebook have negatively impacted the mental health of Teens in UDAP States in Section VII.B below.)

60. Second, Mr. Saba also does not establish that use exceeding the particular thresholds of time spent on Instagram or Facebook constitutes harm or represents “excessive” or “addictive” use of Instagram or Facebook. For example, Mr. Saba’s tallies depend only on an individual’s behavior in a given month, and not their aggregate behavior. Based on Mr. Saba’s methodology using average time spent on Instagram or Facebook, Mr. Saba would count one instance (and therefore, under Plaintiffs’ apparent theory, one “violation”) in a scenario where a Teen uses Instagram or Facebook for one hour on average in a given month, even if they spent zero time on

¹¹³ Setting aside the fact that Mr. Saba provides no basis for any assumption that these events are associated with consumer harm, Mr. Saba’s approach is also flawed and unreliable due to methodological errors, which I describe further in Section IX below.

¹¹⁴ “Problematic Technology Use,” *American Academy of Pediatrics*, October 17, 2023, available at <https://www.aap.org/en/patient-care/media-and-children/center-of-excellence-on-social-media-and-youth-mental-health/qa-portal/qa-portal-library/qa-portal-library-questions/problematic-technology-use/> (emphasis bolded in the source).

Instagram or Facebook in all subsequent months, and even if there was no impact on that individual's mental health from that one month of usage averaging one hour per day. Mr. Saba provides no evidence that such patterns constitute problematic use of Instagram or Facebook or are harmful. As a matter of logic, it is unclear why such a behavioral pattern would constitute excessive use of Instagram or Facebook or lead to harm.

61. Third, Mr. Saba's analysis suggests that every single instance where a Teen exceeds an average time spent threshold is associated with harm. In other words, Mr. Saba would tally that same individual again as a separate and additional "violation" (under Plaintiffs' apparent theory) if, several years later, they used Instagram or Facebook for one hour on average in another month, even if they spent zero time on Instagram or Facebook in the intervening period. This is an illustration of why the time-spent durations that Mr. Saba uses are arbitrary and bear no meaningful connection to the conduct alleged by Plaintiffs as a basis for their claims, the At-Issue Features, or any alleged harm suffered by Teens (whether as a result of the At-Issue Features or otherwise).

62. Fourth, even if average time spent per month on either Instagram or Facebook could be used as a general proxy for "excessive" use of Instagram or Facebook, the trend in total screen time, defined broadly by the CDC 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 social media" on an average school day but excluding school work among Teens in UDAP States has remained relatively stable over time despite the launch of Instagram and the introduction of the At-Issue Features.¹¹⁵ This trend is inconsistent with Plaintiffs' allegations that Instagram and Facebook are "addictive" for Teens in UDAP States.

63. To provide context on the amount of time Teens spend on screens, I provide screen time trend data on the four largest UDAP States that had the highest Teen population and the highest Teen MAUs during the Relevant Period: California, New York, Illinois, and Pennsylvania.¹¹⁶ Figure 1 shows that, in the years for which data were available, in California, New York, Illinois, and Pennsylvania, Teens have fluctuated, but remained relatively constant around an average of

¹¹⁵ "2021 YRBS Data User's Guide," *Centers for Disease Control and Prevention*, April 2023, available at https://www.cdc.gov/yrbs/files/2021/pdf/2021_YRBS_Data_Users_Guide_508.pdf, p. 85 ("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')?").

¹¹⁶ See Workpaper 1. For the remainder of this report, I refer to these states as "the four largest UDAP States."

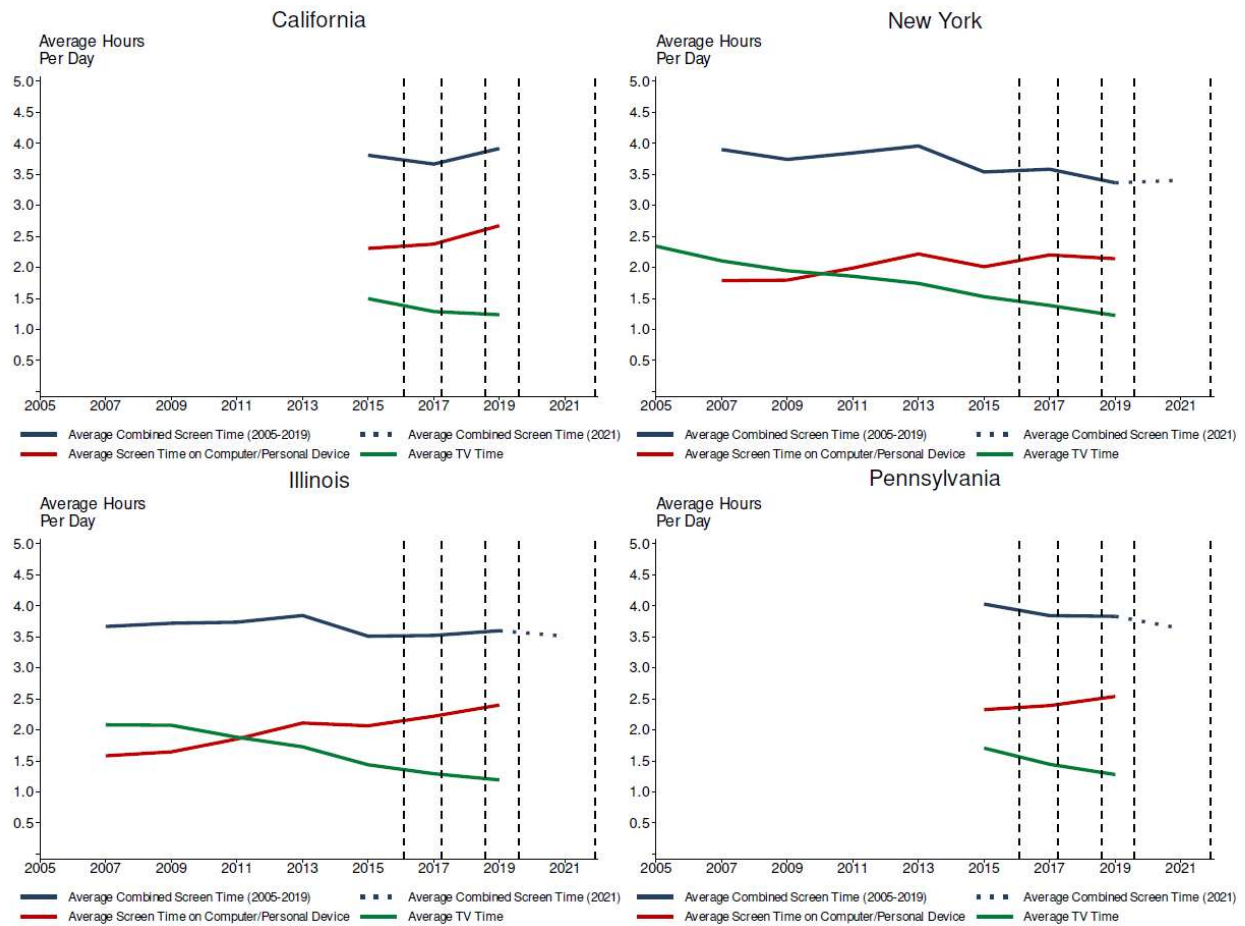
3.8, 3.7, 3.6, and 3.8 hours each day in front of a screen, respectively.¹¹⁷ While the particular devices have changed over time, and the proportion of time spent on each type of device has shifted over time, with Teens spending more time on their computers, tablets, and smartphones, and less time watching TV, the total amount of screen time has remained relatively constant.

64. In addition, I add lines on these charts denoting the timing of the features I describe in Section V.A that the Court specifically indicated were still at issue: cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. There is no apparent evidence that the timing of these features (as denoted by the lines on the chart) corresponds to an increase in screen time, suggesting a lack of evidence that time spent by Teens in UDAP States on screens was affected by the introduction of Instagram or the features I describe in Section V.A that the Court specifically indicated are still at issue, contrary to Plaintiffs' allegations and Mr. Saba's results, to the extent that his tallies are interpreted as meaningful indicators of any consumer harm according to Plaintiffs' theories. I present results for the full set of UDAP States in Appendix D, Figure D.1.

¹¹⁷ See Workpaper 2.

Figure 1

The Amount of Time Spent on Screens Has Not Increased Over Time Since the Alleged Conduct



Source: Centers for Disease Control and Prevention (CDC), Youth Risk Behavior Survey Data ("YRBS Data")

Note: This chart shows the average amount of time students report spending on computers, watching TV, or on screen time across all devices on an average school day in the YRBS data. The YRBS is a bi-annual national survey of 9th through 12th grade students in public and private schools. Responses have been restricted to 13–17-year-old students in the states of California, New York, Illinois, and Pennsylvania. YRBS is representative for each respective state. Non-responses to the charted questions have been excluded. “Average Screen Time on Computer/Personal Device” is the weighted average of responses to the question “On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work?” “Average TV Time” is the weighted average of responses to the question “On an average school day, how many hours do you watch TV?” From 2005–2019, “Average Combined Screen Time” is the weighted average of the sum of the values for the “Average Screen Time on Computer/Personal Device” and “Average TV Time” questions in the YRBS. Beginning in 2021, “Average Combined Screen Time” is the weighted average of the responses to the question “On an average school day, how many hours do you spend in front of a TV, computer, smartphone, or other electronic device watching shows or videos, playing games, accessing the Internet, or using social media (also called ‘screen time’)?” which was only included in the 2021 edition of the YRBS. For the purposes of this chart, I convert the categorical responses to these questions to numerical values. To do so, I assume that a response of “Less than 1 hour per day” or “5 or more hours per day” to any question has been interpreted as half an hour and 5 hours, respectively. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the CDC for the YRBS data. These respondent weights account for non-responses and the oversampling of certain demographic groups and ensure that the weighted totals of respondents in the survey for each grade match population projections for the survey year. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters, time management tools, and Instagram’s multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

65. Given the amount of time teens typically spend on screens, Mr. Saba’s thresholds for time spent on Instagram and Facebook, especially the half an hour and 1 hour thresholds, appear to be arbitrarily low. Nonetheless, Mr. Saba provides no justification for these time thresholds. To contextualize Mr. Saba’s lowest time thresholds, I compare them to occasions during the day during which a Teen would typically spend time on Facebook or Instagram, such as commuting or meal. For example, a 2017 study found that the average commute time to school for American high schoolers was 18 minutes.¹¹⁸ Mr. Saba’s half an hour threshold suggests that an average American high schooler would be harmed if they were to spend an equivalent amount of time on Facebook or Instagram as their commute to and from school. Similarly, a 2019 Pew Research analysis found that on average American Teens spend one hour and five minutes eating per day.¹¹⁹ Mr. Saba’s 1 hour threshold suggests that American Teens would be harmed if, on average, they spend the same amount of time on Facebook and Instagram as they spend eating.

66. Finally, Mr. Saba also fails to disentangle any purported effect of the At-Issue Features from the effect of content posted on Instagram and Facebook by its users, as well as any purported effect of the At-Issue Features from the effect of other platform features, including

¹¹⁸ Carole Turley Voulgaris et al., “Tired of Commuting? Relationships Among Journeys to School, Sleep, and Exercise Among American Teenagers,” *Journal of Planning Education and Research*, 39(2), 2017, pp. 142–154 at p. 146.

¹¹⁹ Gretchen Livingston, “The Way U.S. Teens Spend Their Time Is Changing, but Differences Between Boys and Girls Persist,” *Pew Research Center*, February 20, 2019, available at <https://www.pewresearch.org/short-reads/2019/02/20/the-way-u-s-teens-spend-their-time-is-changing-but-differences-between-boys-and-girls-persist/> (“A day in the life of a US teen Average time spent on each activity (hours: minutes)... Eating... 1:05.”).

those that the Court has dismissed.¹²⁰ Further, Mr. Saba does not disaggregate the effect from any confounding factors other than social media that may impact total screen time for Teens in UDAP States, such as factors related to the COVID-19 pandemic. Identifying or quantifying “violations” solely on the basis of arbitrarily defined time-spent thresholds—which is all that Mr. Saba’s analysis purports to do—does not disentangle any effect from factors that are not at issue on harming youth. (I discuss this further in Section VII.B.)

67. In summary, Mr. Saba does not establish that any of the amounts of time spent on Instagram and Facebook that he analyzes constitute problematic use. By failing to identify what constitutes problematic use of Instagram or Facebook and by instead using arbitrary thresholds based on time spent (without consideration of any other factors), Mr. Saba has provided no basis to validate whether the instances he tallies are connected in any way to harms experienced by Teen Users, including any mental health challenges, due to Instagram and Facebook use for Teens in UDAP States. Nor has he connected his analysis to the challenged conduct or attempted to disaggregate the impact of the At-Issue Features with any confounding factors.

B. Teen User Data Are Not Consistent with Plaintiffs’ Allegations Regarding Addictive or Problematic Use, to which Mr. Saba’s Time Spent Analysis Appears to Be Related

68. Plaintiffs allege that Meta “deployed harmful and psychologically manipulative product features to induce young users’ compulsive and extended Platform use.”¹²¹ Specifically, Plaintiffs allege that Meta’s “design choices and practices ... exploit psychological vulnerabilities of young users through the false promise that meaningful social connection lies in the next story, image, or video and that ignoring the next piece of social content could lead to social isolation.”¹²² As I describe in Section V.B.1, Mr. Saba tallies the number of monthly instances of time spent by Teen Users in UDAP States on Instagram or Facebook over certain thresholds. Mr. Saba states that Plaintiffs claim these instances of time spent over certain thresholds “may represent or be the result of violations of the UDAP Statutes during the Relevant Period,” which suggests that the purported violations may be associated with harmful

¹²⁰ See Section IV.

¹²¹ Am. Complaint, ¶ 2.

¹²² Am. Complaint, ¶ 529.

and addictive characteristics Plaintiffs refer to.¹²³ However, the usage data that Meta produced in this matter are inconsistent with Plaintiffs' claim that Instagram and Facebook induced compulsive and extended use by Teens in UDAP States. Survey data show that Instagram and Facebook account for a small portion of Teens' total screen time across all UDAP States and that usage did not increase consistently or in any obvious way over time. In fact, I find that the percent of Teen MAUs on Instagram and Facebook for incidences of time spent at each threshold that Mr. Saba tallies have generally been declining over time.

69. In Figure 2 below, I use data produced by Meta to chart the average amount of time spent on Instagram and Facebook in a given day by Teens in the four largest UDAP States (California, New York, Illinois and Pennsylvania) who are active on Instagram and Facebook in a given month. Similar analyses for all UDAP States are included in Appendix E, Figure E.1. The data show that, for the period February 2018 to March 2024 (for Instagram) or August 2020 to March 2024 (for Facebook):

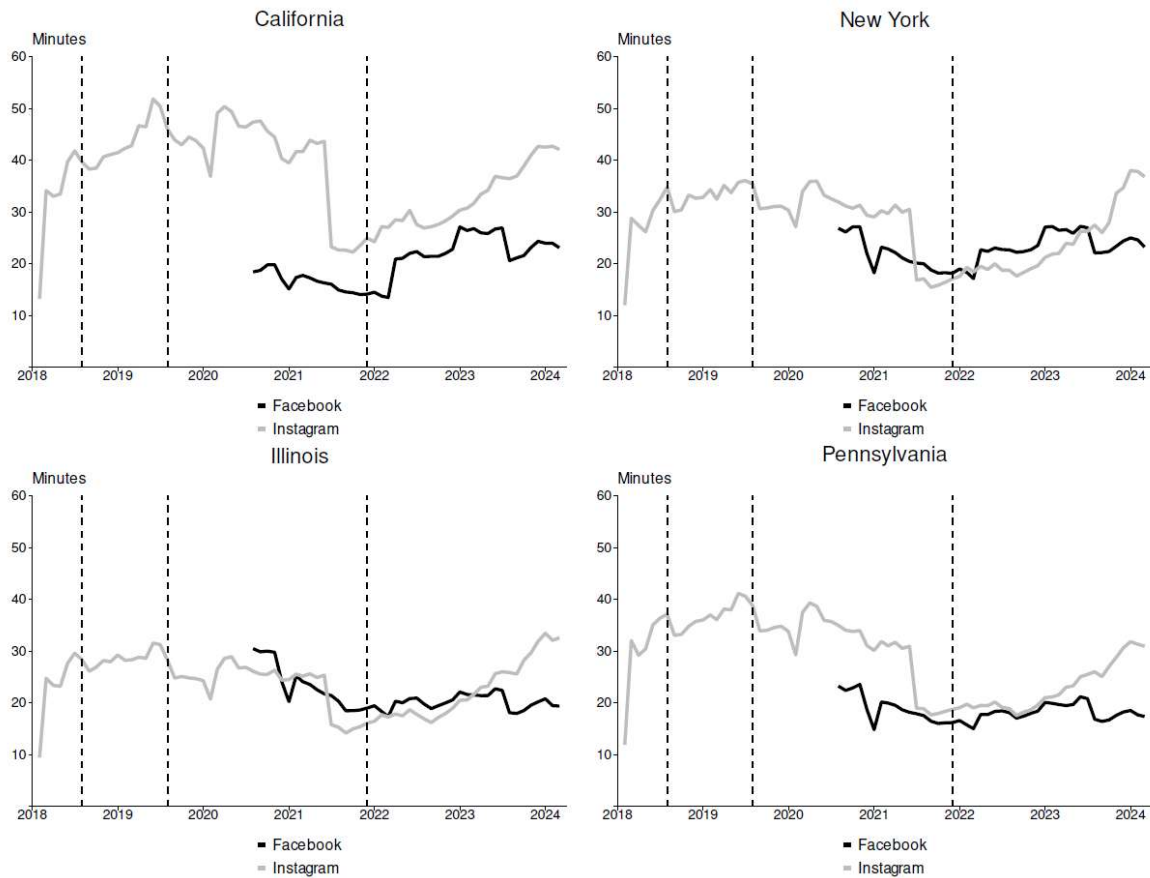
- (i) In **California**, among Teens active on Instagram or Facebook in a given month, Teens used Instagram for an average of less than 38 minutes per day and Facebook for an average of less than 21 minutes per day;
- (ii) In **New York**, among Teens active on Instagram or Facebook in a given month, Teens used Instagram for an average of less than 28 minutes per day and Facebook for an average of less than 23 minutes per day;
- (iii) In **Illinois**, among Teens active on Instagram or Facebook in a given month, Teens used Instagram for an average of less than 24 minutes per day and Facebook for an average of less than 22 minutes per day; and
- (iv) In **Pennsylvania**, among Teens active on Instagram or Facebook in a given month, Teens used Instagram for an average of less than 29 minutes per day and Facebook for an average of less than 19 minutes per day.¹²⁴

¹²³ Saba Report, ¶ 17.a.

¹²⁴ See Workpaper 3.

Figure 2

The Average Time Spent on Instagram and Facebook by Teens in the Four Largest UDAP States Who Were Active on Instagram or Facebook in a Given Month is Inconsistent with Plaintiffs' Allegations



Source: META3047MDL-289-00000120–143,169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025

Note: This chart shows the average time spent per day on Facebook and Instagram among Teen Users in the United States who are active on Facebook or Instagram in a given month, even for days when that user was not active and thus had no time spent on that day. I note that Teen Users were identified by Meta in the data using their proprietary classifier model for predicting user age. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters and time management tools. The time management tools feature has two dates as noted in Section V.A. Only the later date for the cosmetic surgery filters feature is included as the original launch was before the start of the produced usage data. The launch date for Instagram's multiple accounts function is also before the start of the produced usage data.

70. The data show that, while the highest average amount of time Teen Users spent on Instagram and Facebook in a given day in the four largest UDAP States over the period for which data are available was 52 minutes in June 2019 in California and 30 minutes in August 2020 in Illinois, respectively, that the average amount of time spent does not consistently increase over time but rather varies during the period that Mr. Saba evaluates or during the time

when the features I describe in Section V.A that the Court specifically indicated are still at issue were launched (represented with dashed vertical lines).¹²⁵ The data show that the lowest average amount of time Teen Users spent on Instagram and Facebook in a given day in the four largest UDAP States over the period for which data are available was nine minutes in February 2018 in Illinois and 13 minutes in March 2022 in California, respectively.¹²⁶ I present results for the full set of UDAP States in Appendix E, Figure E. 1.

71. Consistent with this, while the data show that the highest median daily time spent on Instagram and Facebook in a given day in the four largest UDAP States was 37 minutes in June 2019 in California and six minutes in August 2020 in Illinois respectively, the median daily time spent does not consistently increase over time but rather varies during the period Mr. Saba evaluates and during the time when the features I describe in Section V.A that the Court specifically indicated are still at issue were launched (represented with dashed vertical lines).¹²⁷ The data show that the lowest median amount of time Teen Users spent on Instagram and Facebook in a given day over the period for which data are available was two minutes in September 2021 in New York and one minute in March 2022 in California, respectively.¹²⁸ In Figure 3 below, I chart the median daily time spent across all Teen Users who logged on to Instagram or Facebook at least once in a given month. I present results for the full set of UDAP States in Appendix E, Figure E.2.

¹²⁵ See Workpaper 4.

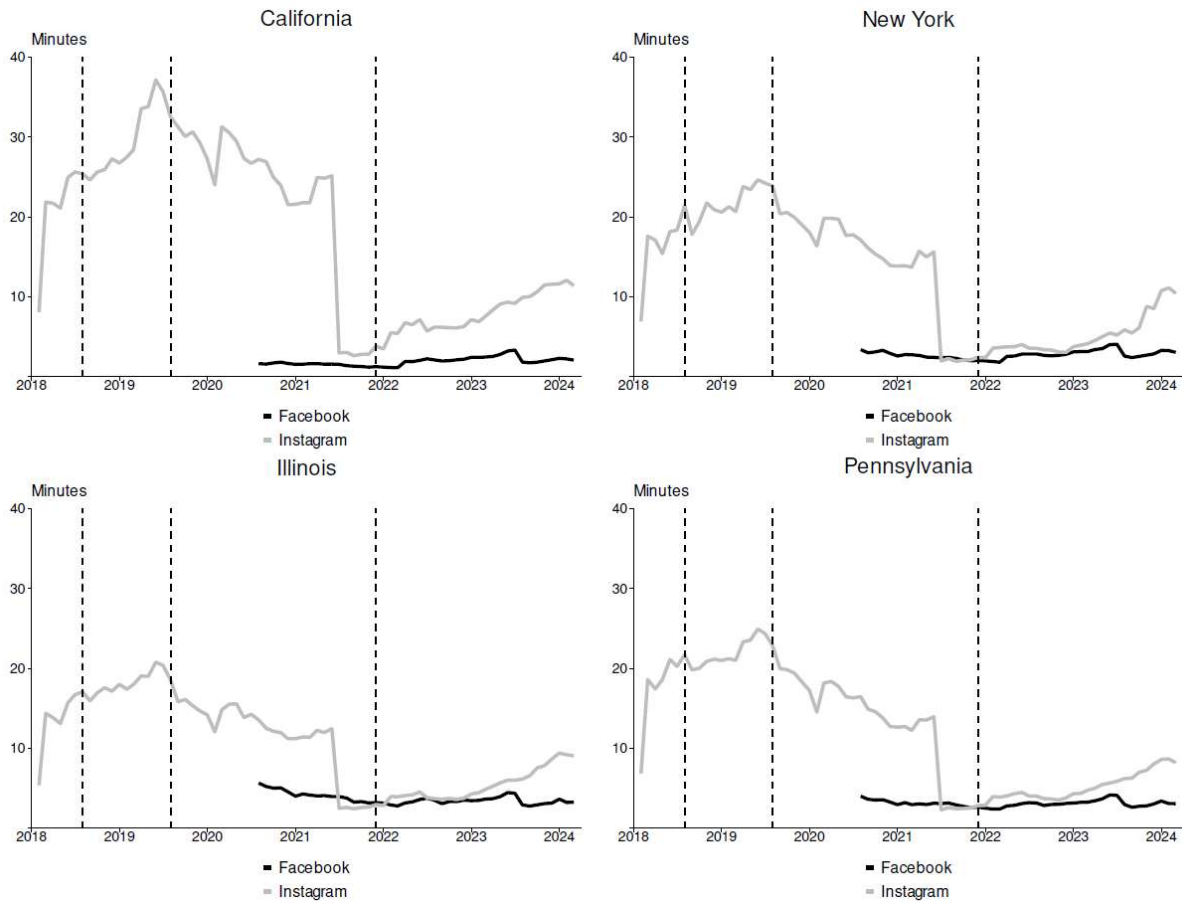
¹²⁶ See Workpaper 4.

¹²⁷ See Workpaper 4.

¹²⁸ See Workpaper 4.

Figure 3

The Median Daily Time Spent on Instagram and Facebook by Teens in the Four Largest UDAP States is Inconsistent with Plaintiffs' Allegations



Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025

Note: This chart shows the 50th percentile of the daily time spent in a given day across all Teen Users who logged on to Facebook or Instagram at least once in a given month. I note that Teen Users were identified by Meta in the data using their proprietary classifier model for predicting user age. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters and time management tools. The time management tools feature has two dates as noted in Section V.A. Only the later date for the cosmetic surgery filters feature is included as the original launch was before the start of the produced usage data. The launch date for Instagram's multiple accounts function is also before the start of the produced usage data.

72. In fact, I find that the percentage of Teens whose time spent on Instagram or Facebook exceed each of Mr. Saba's time spent thresholds has generally been flat or declined over time, with few exceptions. In Figure 4 and Figure 5, I show the percent of Teen MAUs on Instagram and Facebook, respectively, corresponding to each of Mr. Saba's time spent thresholds, using his own calculations. I do this by plotting a point corresponding to the percentage of Teen Users at

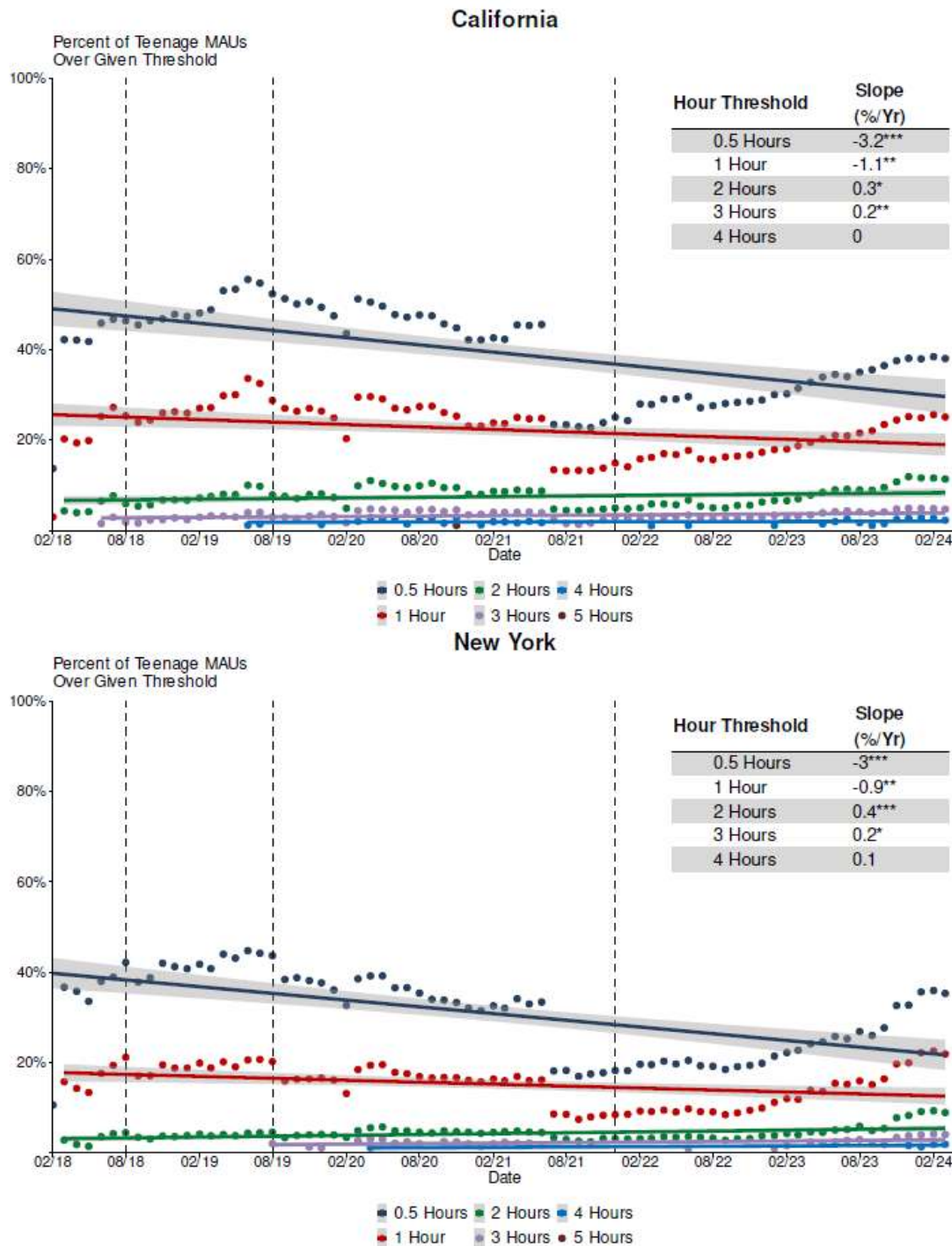
each threshold, using a different color for each threshold. For example, I plot a dark blue point to show Mr. Saba's estimate of the percentage of youth who spend an average of half an hour on Instagram per day over the course of the month. (When Mr. Saba's analysis indicates the 95th percentile, I report this as five percent of users.) In addition, I add a fitted line to show the longer-term trend in the changes of percentage points of users above the corresponding threshold. I also provide the slope of this line, denoting how statistically significant the slope is.¹²⁹ I show the dates when the features I describe in Section V.A that the Court specifically indicated are still at issue were launched represented as dashed vertical lines.

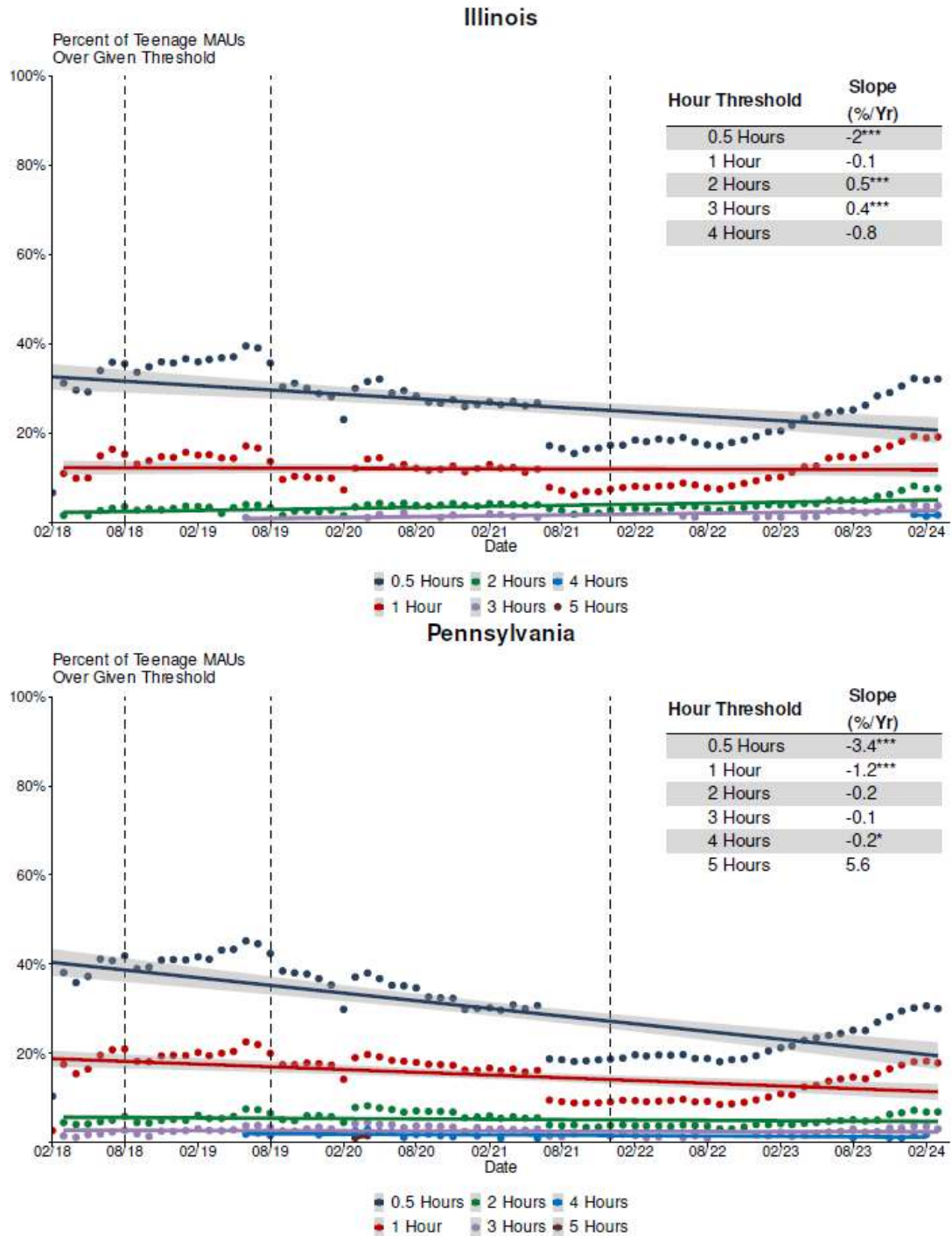
73. To the extent that Plaintiffs' claims about the addictive nature of these services are correct, then I would expect to see an obvious trend showing that an increasing percentage of Teens on Facebook and Instagram would fall into each of Mr. Saba's time spent thresholds over time. In other words, I would expect to see a statistically significant positive slope. Generally, I see static or declining slopes, and scant evidence that rates are increasing. I note that, to the extent that there are increases over time or in specific years, Plaintiffs have not tied such increases (if any) to Instagram, Facebook, or the features I describe in Section V.A that the Court specifically indicated are still at issue.

¹²⁹ I calculate standard errors using standard OLS (ordinary least squares) methodology. Because the data in Figure 4 and Figure 5 show clear "positive autocorrelation" (where neighboring points in time tend to be near one another), this simple methodology will tend to understate standard errors and therefore is more likely to find a statistically significant slope than more complex methods would. Because I am evaluating Figure 4 and Figure 5 for statistically significant, positive slopes consistent with what I would expect if plaintiff's claims were true, and I am more likely to find statistical significance, the results I draw are conservative. Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, Fifth Edition (South-Western Cengage Learning, 2012), p. 414 ("If we ignore the serial correlation and estimate the variance in the usual way, the variance estimator will usually be biased when [there is autocorrelation] because it ignores the second term in (12.4). As we will see through later examples, [positive autocorrelation] is most common ... Further, the independent variables in regression models are often positively correlated over time ... Therefore, in most economic applications ... the usual OLS variance formula ... understates the true variance of the OLS estimator.").

Figure 4

The Percent of Teen MAUs on Instagram at Each Time Spent Threshold which Mr. Saba Tallies Are Inconsistent with Plaintiffs' Allegations





Source: Saba Report, Schedule 2.9.3; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, "Re: MDL 3047," October 10, 2025

Note: This chart shows the percentage of Teen MAUs that used Instagram for more than a given threshold of time spent for the four largest UDAP States. Using these percentages, the line of best fit is created, and its slope and statistical significance is calculated. The displayed line of best fit that shows the trend over time in the percentage of Teenage MAUs over each given threshold is calculated using the Ordinary Least Squares method. The displayed slopes of these lines of best fit can be interpreted as the average annual change in percentage points of Teenage Instagram MAUs spending over the given threshold. In the table, one asterisk (*) indicates the result is statistically discernable from zero at a 95% significance level. Two asterisks indicate the result is statistically significant at a 99% significance level, and three asterisks indicate the result is statistically significant at a 99.9% significance level. The shaded grey band around the linear regression line in this plot represents the 95% confidence interval for the mean predicted value. It indicates the range within which we can be 95% confident that the true trendline for the percent of Teen MAUs above the given threshold lies. I note that Teen Users were identified by Meta in the data using their proprietary classifier model for predicting user age. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely Instagram's cosmetic surgery filters and time management tools. The launch date for Instagram's multiple accounts function is before the start of the produced usage data.

74. For Instagram, across each of the four largest UDAP States, the percent of youth at each of Mr. Saba's usage thresholds (half an hour, 1, 2, 3, 4 and 5 hours) was decreasing or generally flat, with any statistically significant marginal increase accounting for less than an average of 0.5 percentage points per year.¹³⁰ This result is not supportive of Plaintiffs' claim that Instagram users became addicted to the service and substantially increased their usage over time. I present results for the full set of UDAP States in Appendix E, Figure E.3.

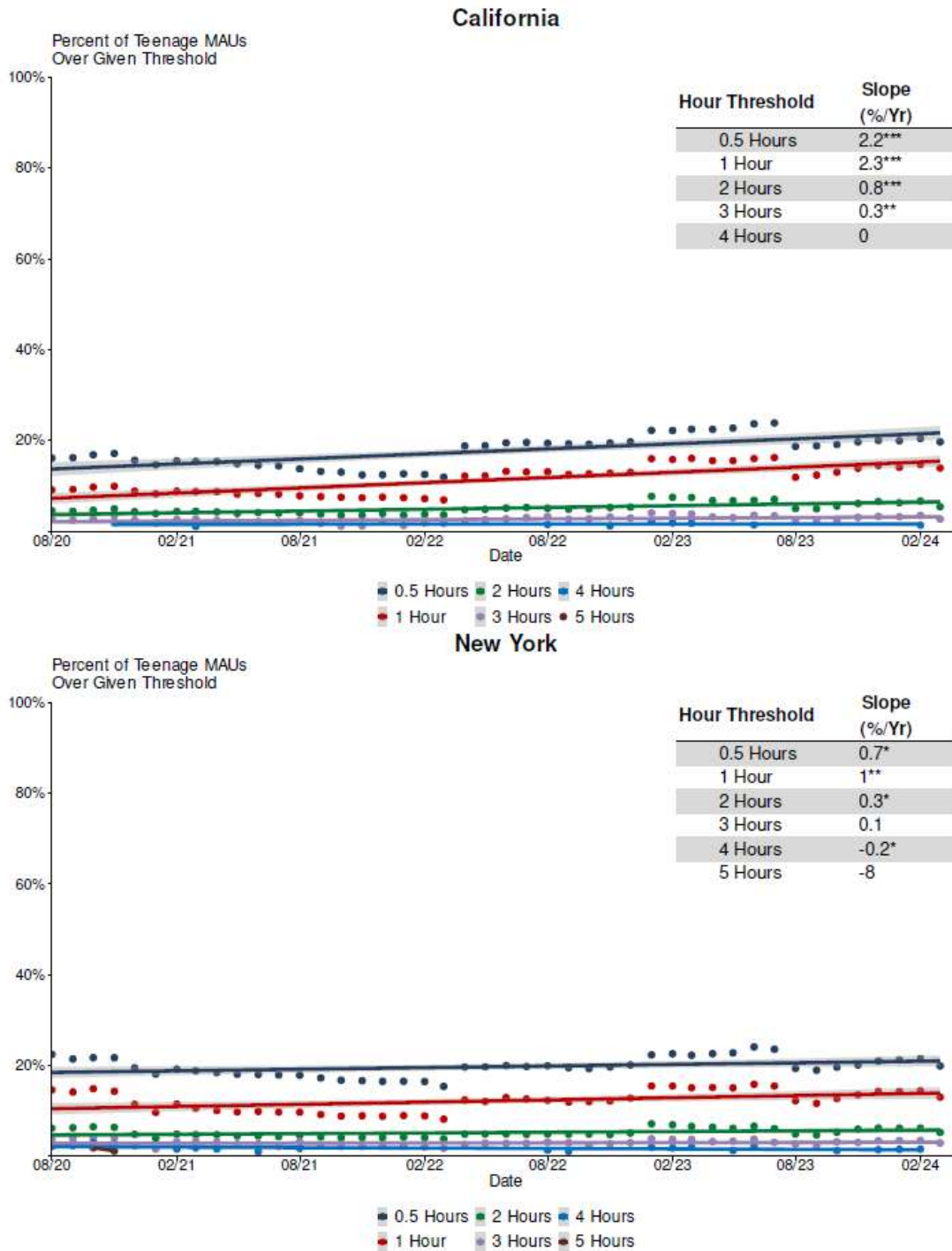
75. Similarly, in Figure 5, I show the percentage of Teen MAUs on Facebook at each time spent threshold used by Mr. Saba. In Illinois and Pennsylvania, the only statistically significant changes in slope reflect decreases over time. Additionally, while the percent of Teen MAUs on Facebook over Mr. Saba's usage thresholds in California and New York increased over time, the magnitude of any statistically significant increases in slope amount to increases that were less than an average of 2.3 percentage points per year.¹³¹ Moreover, even in California and New York, the four and five hour thresholds do not experience any statistically significant changes over time. Accordingly, these data do not provide much, if any, support for Plaintiffs' claims about the addictive qualities of Facebook. I present results for the full set of UDAP States in Appendix E, Figure E.4.

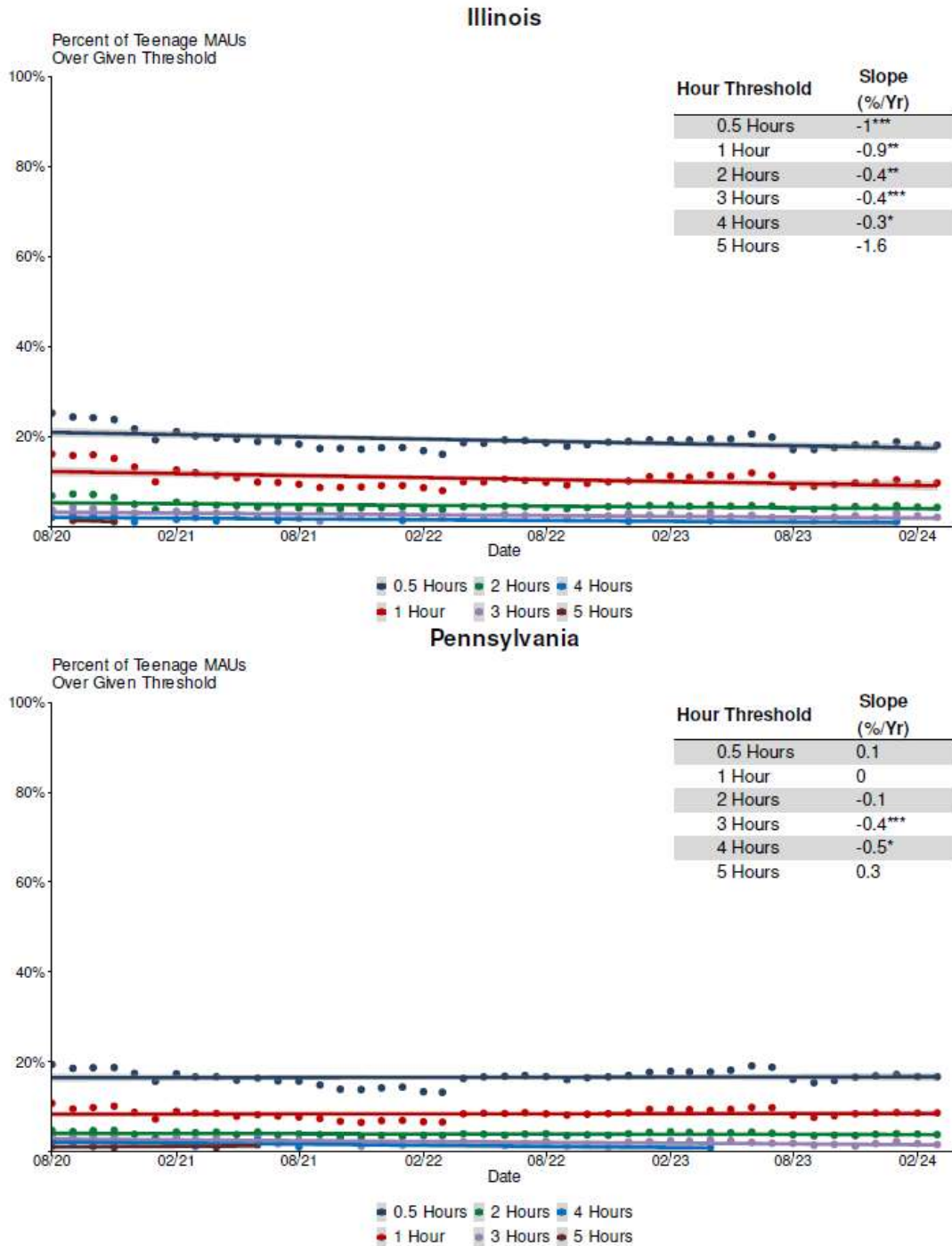
¹³⁰ The largest statistically significant marginal increase occurs in the 2 hour threshold bucket for Illinois. With the exception of Pennsylvania's 5 hour threshold for Instagram, which yielded an average annual increase of 5.6 percentage points per year, no average annual increase is above 0.5 percentage points statistically significant or not. I note that Pennsylvania only has two consecutive months with observations at or above 5 hours of time spent, per Mr. Saba's calculations.

¹³¹ The largest statistically significant marginal increase occurs in the 1 hour threshold bucket for California.

Figure 5

The Percent of Teen MAUs on Facebook at Each Time Spent Threshold which Mr. Saba Tallies Are Inconsistent with Plaintiffs' Allegations





Source: Saba Report, Schedule 2.10.3; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, "Re: MDL 3047," October 10, 2025

Note: This chart shows the percentage of Teen MAUs that used Facebook for more than a given threshold of time spent for the four largest UDAP States. Using these percentages, the line of best fit is created, and its slope and statistical significance is calculated. The displayed line of best fit that shows the trend over time in the percent of Teenage MAUs over each given threshold is calculated using the Ordinary Least Squares method. The displayed slopes of these lines of best fit can be interpreted as the average annual change in percentage points of Teenage Facebook MAUs spending over the given time threshold. In the table, one asterisk (*) indicates the result is statistically discernable from zero at a 95% significance level. Two asterisks indicate the result is statistically significant at a 99% significance level, and three asterisks indicate the result is statistically significant at a 99.9% significance level. The shaded grey band around the linear regression line in this plot represents the 95% confidence interval for the mean predicted value. It indicates the range within which we can be 95% confident that the true trendline for the percent of Teen MAUs above the given threshold lies. I note that Teen Users were identified by Meta in the data using their proprietary classifier model for predicting user age.

76. In addition to my quantitative analysis of Mr. Saba's results, I note that he also does not discuss the fact that social media is only one of many ways in which Teens spend time on screens. Teens engage in many other forms of screen time aside from social media services such as Instagram and Facebook. Indeed, recent survey data show that Instagram and Facebook are less popular among Teens compared to other applications like YouTube and TikTok.¹³² Furthermore, a recent national survey found that 13–18-year-olds only spend approximately 15.8 percent of their screen time on social media, compared to 38.9 percent and 21.7 percent on “TV/Videos” and “Games,” respectively.¹³³ These observations are inconsistent with the premise that Instagram, Facebook, and/or the At-Issue Features are solely responsible for any harm to Teens in UDAP States that may result from screen time or social media more generally.

77. Moreover, Mr. Saba provides no evidence to disentangle any purported effect of the At-Issue Features on time spent on the platform (or on harm to Teens) from the effect of other features of the platforms (including the features that were dismissed from the case), or from content posted on the platforms by third-party users. Even further, Plaintiffs cannot disentangle

¹³² Michelle Faverio and Olivia Sidoti, “Teens, Social Media and Technology 2024,” *Pew Research Center*, December 12, 2024, available at <https://www.pewresearch.org/internet/2024/12/12/teens-social-media-and-technology-2024/> (“Overall 73% of teens say they go on YouTube daily... This share includes 15% who describe their use as ‘almost constant.’ About six-in-ten visit TikTok daily. This includes 16% who report being on it almost constantly. Roughly half of teens say they go on Instagram or Snapchat every day, including about one-in-ten who say they’re on each of these platforms almost constantly... Today, 32% of teens say they use Facebook. This is down from 71% in 2014-2015...”); Katherine Schaeffer, “5 Facts About How Americans Use Facebook, Two Decades After Its Launch,” *Pew Research Center*, February 2, 2024, available at <https://www.pewresearch.org/short-reads/2024/02/02/5-facts-about-how-americans-use-facebook-two-decades-after-its-launch/> (“A third of U.S. teens ages 13 to 17 use Facebook ... [t]oday’s teens tend to gravitate toward other social media platforms, including Youtube..., TikTok..., Snapchat..., and Instagram.”).

¹³³ The Common Sense Census: Media Use by Tweens and Teens report provides statistics on engagement with various forms of media generated from a nationally representative survey of 8- to 18-year-olds. In 2019, this survey found that 13- to 18-year-olds spent an average of seven hours and 22 minutes on screens per day, and two hours 52 minutes, one hour and 36 minutes, and one hour and 10 minutes on “TV/Videos”, “Games”, and “Social Media”, respectively. Victoria Rideout and Michael B. Robb, “The Common Sense Census: Media Use by Tweens and Teens,” *Common Sense Media*, 2019, available at <https://www.commonsensemedia.org/sites/default/files/research/report/2019-census-8-to-18-full-report-updated.pdf>, p. 23.

the different forms of engagement users may have with Instagram and Facebook, including the fact that while some users may engage with or use the features I describe in Section V.A that the Court specifically indicated are still at issue, others may never do so. For example, Mr. Saba does not distinguish between users who use cosmetic surgery filters from users who primarily or exclusively use Instagram and Facebook for their chat functionality. In either case, users are tallied by Mr. Saba solely based on the average amount of time spent on Instagram or Facebook each month, regardless of whether they ever used the features I describe in Section V.A, the extent to which the features I describe in Section V.A caused them to use Instagram or Facebook more than they otherwise would, or whether the features I describe in Section V.A caused any harm at all.

78. Thus, the available data on Instagram and Facebook usage by Teen Users, showing that Instagram and Facebook generally appear to account for a small amount of Teens' time and do not demonstrate widespread, consistent increases, are inconsistent with Mr. Saba's results, to the extent his tallies are interpreted as meaningful indicators of any consumer harm according to Plaintiffs' theories.

C. Mr. Saba Provides No Evidence that his Tallies of "Bad Encounters" Reportedly Experienced by Teens on Instagram Resulted in Harm

79. The second category of purported violations assumed by Mr. Saba involve computed instances of certain "bad encounters" by Teens in UDAP States on Instagram, based on the findings of the BEEF Survey. Mr. Saba states his understanding to be that "MDL Plaintiffs claim that these instances are violations of the UDAP Statutes."¹³⁴ Mr. Saba provides background information on the survey, and notes his understanding that "one of the main purposes of the BEEF Survey appears to have been to develop a holistic and consistent picture of users' bad experiences on Instagram and for Meta to track results over time."¹³⁵ Mr. Saba's analysis appears to assume that Plaintiffs will prove that each and every bad encounter documented in the BEEF Survey will equate to a UDAP violation, and that it would therefore be appropriate to extrapolate the results of the sample to the entire population of Teen Users in the UDAP States. Yet, he does

¹³⁴ Saba Report, ¶ 17.f.

¹³⁵ Saba Report, ¶ 64.

not appear to consider whether this use of the Survey is reasonable or appropriate for that purpose. I separately discuss Mr. Saba's use of the BEEF Survey to calculate penalties in Section VIII.

80. As I discuss in Section V.B.3, Mr. Saba counts the number of "bad encounters" by extrapolating results from Meta's internal BEEF Survey. Depending on the correlation assumptions he makes, Mr. Saba assumes that, in a given month, a Teen in a UDAP State has between an 83.85 and 99.96 percent cumulative probability of being exposed to one of his 10 identified "bad encounters" each month.¹³⁶ As I address more in the next section, this result suggests that the vast majority of Teens in UDAP States were harmed during each month of the Relevant Period. However, as a preliminary matter, and as I discuss further in Section VIII below, the BEEF Survey was conducted only over two separate weeks during June and July of 2021 and Mr. Saba only considers responses about experiences in the preceding week alone (even though the survey asked respondents whether they had ever experienced each of the relevant issues). He improperly extrapolates those responses to the entire time period of February 2018 through March 2024. But even assuming that his extrapolated counts are correct or have some basis, there is no basis to assume that every instance of a "bad encounter" to a Teen User on Instagram resulted in some degree of harm, such as a decline in the user's mental health.

81. To start with, Mr. Saba provides no evidence that the 10 "bad encounters" from the BEEF survey that he analyzes are linked to declines in mental health in Teens in UDAP States, as alleged in the Amended Complaint, including depression, anxiety, ADD or ADHD, insufficient sleep, self-harm, body image issues, and suicidal behavior.¹³⁷ Mr. Saba provides no

¹³⁶ Mr. Saba's analysis related to the BEEF Survey indicates that either 83.85 percent or 99.96 percent of Teen Users will experience one of the 10 "Bad Encounters" in any given month, depending on his methodology. *See* Saba Report, Schedule 5.1.1 ("Cumulative Probability of Exposure to a Single Issue, Combined, in a Month... 99.96%."), Schedule 5.1.2 ("Cumulative Probability of Exposure to a Single Issue, Combined, in a Month... 83.85%."). Furthermore, Schedules 5.1.1 and 5.1.2 of the Saba Report show that Mr. Saba counts 2,433,419,784 purported TCPA instances, 477,488,974 purported TCPA instances, 779,072,821 purported TCPA instances, or 400,542,138 purported TCPA instances related to his BEEF Survey methodologies, depending on the specific approach he takes. Those purported instances are computed on a monthly basis over the course of 74 months, for an average of 32,884,051, 6,452,554, 10,528,011, or 5,412,732 purported instances per month across states during that period, depending on the specific approach he takes. *See* Workpaper 5, which shows the Teen population across the UDAP States was never more than 10,551,933 in any given year during the years from 2018 to 2024, the period over which Mr. Saba calculates civil penalties. Thus, Mr. Saba counts purported instances equivalent to at least 312 percent, 61 percent, 100 percent, or 51 percent of the Teen population in the UDAP States depending on the specific approach he takes. *See* Saba Report, Schedule 5.1.1, 5.1.2; Workpaper 6.

¹³⁷ As I discuss in more detail in Section V.B.3, Mr. Saba's 10 "bad encounters" include questions about "Bully Target, Bully Witness, Drugs, Hate Witness, Negative Comparison, Nudity, Self Harm, Unwanted Advances, Violence, and Perceived Control." *See* Saba Report ¶ 218.

evidence that the 10 “bad encounters” he analyzes are, in general, likely to lead to sustained mental health challenges, let alone that a *single* instance causes incremental harm to a Teen User’s mental health. Mr. Saba does not show that additional “bad encounters” on Instagram result in incremental effects on Teens’ mental health.

82. In fact, the BEEF Survey was not designed to test the effect of Instagram (let alone the At-Issue Features) on mental health. For example, the BEEF Survey merely asks Instagram users if they had certain experiences on Instagram, not whether those experiences affected their mental health.¹³⁸ I also note that many of the BEEF Survey questions that Mr. Saba relies on for his tallies of “bad encounters” were quite broad. For example, some only ask whether Instagram users have seen a particular type of content, not whether the negative content was directed at them.¹³⁹ As another example, the BEEF Survey questions Mr. Saba uses to identify “Bully Target” and “Bully Witness” “bad encounters” include experiencing or seeing someone else

¹³⁸ For example, the questions do not correspond to diagnostic questions such as the PHQ-9 questions on depression severity. See Robert L. Spitzer et al., “Patient Health Questionnaire-9 (PHQ-9),” *American Psychological Association*, available at <https://www.apa.org/depression-guideline/patient-health-questionnaire.pdf>. As determined by Mr. Saba, the “select Bad Encounter Issues” correspond to the following questions: Bully Target: “Has anyone ever done any of these things to you on Instagram? -Insulted or disrespected you -Contacted you in an inappropriate way -Damaged your reputation -Threatened you -Excluded you or left you out”; Bully Witness: “Have you ever seen anyone do any of these things to someone else on Instagram? -Insult or disrespect them -Contact them in an inappropriate way -Damage their reputation -Threaten them -Exclude them or leave them out”; Drugs: “Have you ever seen anyone trying to buy or sell any of the following things on Instagram? -Prescription drugs -Illegal drugs”; Hate Witness: “Have you ever seen anyone discriminating against people on Instagram because of their gender, religion, race, sexual orientation, or another part of their identity?”; Negative Comparison: “Have you ever felt worse about yourself because of other peoples’ posts on Instagram?”; Nudity: “Have you ever seen nudity or sexual images on Instagram that you didn’t want to see?”; Self Harm: “Have you ever seen someone harm themselves, or threaten to do so, on Instagram?”; Unwanted Advances: “Have you ever received unwanted sexual advances on Instagram?”; Violence: “Have you ever seen any violent, bloody, or disturbing images on Instagram that bothered you?”; and Perceived Control: “Have you ever felt a lack of control over what you see on Instagram?” Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033.

¹³⁹ For instance, the question for “Bullying (witness)” asks the following: “Have you ever seen anyone do any of these things to someone else on Instagram? -Insult or disrespect them -Contact them in an inappropriate way -Damage their reputation -Threaten them -Exclude them or leave them out”; the question for “SRG drug sales” asks, “Have you ever seen anyone trying to buy or sell any of the following things on Instagram? -Prescription drugs -Illegal drugs”; and the question for “Hate (witness)” asks, “Have you ever seen anyone discriminating against people on Instagram because of their gender, religion, race, sexual orientation, or another part of their identity?” Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033.

experience being “excluded” or “left out.”¹⁴⁰ Mr. Saba provides no evidence that such broad experiences have any effect on Teen mental health.

83. Additionally, Teens may have similar experiences to Mr. Saba’s “bad encounters” habitually outside of Instagram. Therefore, it is not clear how any marginal exposure constitutes harm. For example, in 2021, according to the YRBS, 55 percent of the 16 percent of Teens that reported being cyber bullied reported also being bullied at school.¹⁴¹ Similarly, according to a 2021–2022 DOJ survey, 19 percent of students reported being bullied during school. This was much lower than in 2010–2011 (28 percent).¹⁴² Of those being bullied during school, only 22 percent said that the bullying happened online or by text.¹⁴³ Mr. Saba provides no analysis to establish Instagram’s incremental effect on mental health among Teens in UDAP States, if any.

84. Further, as I discuss below in Section VIII, Mr. Saba’s computations based on the BEEF Survey are also flawed because he provides no evidence to disentangle the purported effect of the At-Issue Features on the experiences reported by users in the BEEF Survey from the effect of other features of Instagram (including the features that were dismissed from the case), or from the effect of content created or posted by Instagram users.

85. Additionally, Mr. Saba ignores the potential benefits of using Instagram for Teens in UDAP States, including facilitating connections with their peers, providing a resource for learning about current events, and serving as a source of support during difficult times.¹⁴⁴ For

¹⁴⁰ The questions are: “Bullying (Witness): Have you ever seen anyone do any of these things to someone else on Instagram? -Insult or disrespect them -Contact them in an inappropriate way -Damage their reputation -Threaten them -Exclude them or leave them out,” and “Bullying (Target): Has anyone ever done any of these things to you on Instagram? -Insulted or disrespected you -Contacted you in an inappropriate way -Damaged your reputation -Threatened you -Excluded you or left you out?” Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033.

¹⁴¹ See Workpaper 7.

¹⁴² “Student Bullying,” *National Center for Education Statistics*, July 2024, available at <https://nces.ed.gov/programs/coe/indicator/a10> (“In 2021–22, about 19 percent of students ages 12–18 reported being bullied during school, which was lower than the percentage who reported this in 2010–11 (28 percent). In 2021–22, among students who were bullied, 22 percent reported that the bullying happened online or by text.”).

¹⁴³ “Student Bullying,” *National Center for Education Statistics*, July 2024, available at <https://nces.ed.gov/programs/coe/indicator/a10> (“In 2021–22, about 19 percent of students ages 12–18 reported being bullied during school, which was lower than the percentage who reported this in 2010–11 (28 percent). In 2021–22, among students who were bullied, 22 percent reported that the bullying happened online or by text.”).

¹⁴⁴ Emily A. Vogels and Risa Gelles-Watnick, “Teens and Social Media: Key Findings from Pew Research Center Survey,” *Pew Research Center*, April 24, 2023, available at <https://www.pewresearch.org/short-reads/2023/04/24/teens-and-social-media-key-findings-from-pew-research-center-surveys/> (“Majorities of teens

example, a survey of 22,410 users across all ages and six countries, including the U.S., found that most young users believe that Instagram has no effect or is beneficial for a variety of mental health issues.¹⁴⁵ To the extent they exist, these benefits could offset all or some of the negative experiences that might occur on Instagram (or elsewhere), meaning that Instagram could be overall net neutral or positive for well-being, something Mr. Saba fails to consider in his analyses.

86. Mr. Saba also ignores the nuance inherent in many of the experiences reported in the BEEF Survey. The experiences reported by users that Mr. Saba includes in his tallies likely vary in their potential impact on a user.¹⁴⁶ For example, one question the BEEF Survey asks users is have you “ever felt a lack of control over what you see on Instagram?.” A very different question it asks users is “have you ever received unwanted sexual advances on Instagram?” It is not hard to imagine that these very different experiences would impact Teens differently, and that Teens would perceive a different level of severity for each.¹⁴⁷

report experiencing each of the four positive experiences asked about: feeling more connected to what is going on in their friends’ lives (80%), like they have a place where they can show their creative side (71%), like they have people who can support them through tough times (67%), and that they are more accepted (58%).”; Richard Wike et al., “Social Media Seen as Mostly Good for Democracy Across Many Nations, But U.S. is a Major Outlier,” *Pew Research Center*, December 6, 2022, available at <https://www.pewresearch.org/global/2022/12/06/social-media-seen-as-mostly-good-for-democracy-across-many-nations-but-u-s-is-a-major-outlier/> (“Nearly three-quarters say the internet and social media have made people more informed about current events in their own country as well as in other countries.”); Christopher St. Aubin and Jacob Liedke, “Social Media and News Fact Sheet,” *Pew Research Center*, October 16, 2024, available at <https://www.pewresearch.org/journalism/fact-sheet/social-media-and-news-fact-sheet/> (“Overall, about half of U.S. adults (53%) say they at least sometimes get news from social media, roughly stable over the last few years... Smaller shares of Americans regularly get news on Instagram (20%)”); Instagram Presentation, “Teen Mental Health,” August/September 2019, META3047MDL-003-00091414–504 at 422 (“There are many aspects of the platform that make young people feel good... [including] [c]onnecting with friends and family members[,]... [as a] [s]ource of role models and people to look up to[,]... [and] [k]eeping up with news or issues around the world”); Instagram Presentation, “Hard Life Moments-Mental Health Deep Dive,” META3047MDL-003-00095008–034 at 009 (“Across issues, a majority of users felt that Instagram either had no impact or made things better.”), 020 (“Instagram is more likely to make things better than worse.”), 022 (“They also used Instagram to find inspiration when having a hard time and get support from friends and family”); Keith Hampton et al., “Psychological Stress and Social Media Use,” *Pew Research Center*, January 15, 2015, available at <https://www.pewresearch.org/internet/2015/01/15/psychological-stress-and-social-media-use-2/> (“Specifically, the more pictures women share through their mobile phones, the more emails they send and receive, and the more frequently they use Twitter, the lower their reported stress.”).

¹⁴⁵ Instagram Presentation, “Hard Life Moments-Mental Health Deep Dive,” META3047MDL-003-00095008–034 at 009 (“Across [mental health] issues, a majority of users felt that Instagram either had no impact or made things better.”), 020 (“Generally users thought that IG made things better or had no impact.”), 022 (“Most users used Instagram to take their mind off [negative] experience.”).

¹⁴⁶ Mr. Saba focuses on the following 10 issues: “Bully Target, Bully Witness, Drugs, Hate Witness, Negative Comparison, Nudity, Self Harm, Unwanted Advances, Violence, and Perceived Control.” Saba Report, ¶ 218.

¹⁴⁷ These questions correspond to the “Perceived Control” and “Unwanted Advances” “bad encounters,” respectively. Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033.

87. The BEEF Survey also fails to capture differences in user experiences even among users that responded affirmatively to the same question. For example, one of the ten “bad encounters” that Mr. Saba includes in his tallies are affirmative responses to the following question: “Has anyone ever done any of these things to you on Instagram? -Insulted or disrespected you - Contacted you in an inappropriate way -Damaged your reputation -Threatened you -Excluded you or left you out.”¹⁴⁸ Mr. Saba’s inclusion of broad reported experiences like those reflected in this question ignores the potential differences in harm to a user that may result from threats of physical violence versus, for example, being excluded from a conversation. Respondents may also vary in what they consider being “[e]xcluded” or “left [] out.” Mr. Saba has not performed any analysis to consider the nuance in experiences reported in the BEEF Survey and has instead chosen to uniformly consider his large set of “bad outcomes.”

88. Finally, Mr. Saba ignores that many of the “bad encounters” that he includes in his computations have no connection to the At-Issue features. For example, among all survey respondents, 73.1 percent of fake account contact and 68.6 percent of unwanted sexual advances occur via direct messaging features.¹⁴⁹ However, there is no indication that any of the At-Issue Features had anything to do with any of those experiences reported by users, yet, Mr. Saba still includes all of those experiences reported by Teens as “bad encounters” for purposes of his tallies. Thus, to the extent that (1) Plaintiffs’ remaining unfairness claims under the UDAP Statutes are limited to any remaining At-Issue Features, and (2) Plaintiffs may seek use Mr. Saba’s computations of “bad experiences” based on the BEEF Survey as a quantification of penalties in connection with those unfairness claims, Mr. Saba’s tallies are inflated and unreliable because he fails to disaggregate the effect of other platform features or content created or posted by users on the experiences reported by users in the BEEF Survey. In fact, he makes no attempt at all to quantify the number of “bad experiences” reported by users that resulted from or that were caused by the At-Issue Features.

89. In sum, Mr. Saba fails to provide any analysis or basis for his assumption that each and every “bad encounter” (or, for that matter, *any* “bad encounter”) on Instagram that he includes in

¹⁴⁸ This question corresponds to the “Bully Target” “bad encounter.” Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033.

¹⁴⁹ Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 040 (“DM/chat has the two highest rates of issues across surfaces: 73.1% of the time for fake account contact, and 68.6% of the time for unwanted sexual advances.”).

his tallies is associated with harm to the user, or that any of those experiences were caused by any of the At-Issue Features. This demonstrates that any computation of purported UDAP “violations” premised on Mr. Saba’s calculations using the BEEF survey would be arbitrary and unreliable.

VII. TEEN MENTAL HEALTH DATA ARE INCONSISTENT WITH MR. SABA’S TALLIES, TO THE EXTENT THAT THEY ARE INTERPRETED AS MEANINGFUL INDICATORS OF ANY CONSUMER HARM ACCORDING TO PLAINTIFFS’ THEORIES

90. Plaintiffs allege that “[b]ased on multiple internal studies, Meta has known for years that the way it designs its Social Media Platforms causes young users to compulsively use its Platforms, thereby exponentially exposing young users to mental health harms.”¹⁵⁰

91. Consistent with this allegation, and in addition to his time spent analysis, Mr. Saba calculates instances of potential harm using Meta’s BEEF Survey to estimate instances of “bad encounters” on Instagram. To the extent that these instances of time spent and “bad encounters” are not meaningful indicators of any consumer harm according to Plaintiffs’ theories, Mr. Saba’s results would fail to support a claim of widespread consumer harm. Given that Mr. Saba identifies instances associated with the vast majority of Teens, which I explain in Section VII.A, the results of his analysis suggest that the vast majority of Teens were harmed, and harmed repeatedly. Yet, this implication is inconsistent with available mental health data – data that Mr. Saba does not examine as part of his analysis.

92. If the vast majority of Teens experienced declining psychological health, one would expect to see a corroborating result when examining indicators of mental health among Teens in UDAP States, such as consistently deteriorating mental health after the launch of the At-Issue Features of Facebook and Instagram across the mental health outcomes pointed to by Plaintiffs, and in all UDAP States. But in totality, no such corroborating results are evident in the publicly available data related to Teen mental health.

93. Based on my review, the available public evidence on mental health suggests that very few Teens in UDAP States received treatment or required treatment for mental health challenges. Further, the available public evidence on specific Teen mental health challenges discussed by the

¹⁵⁰ Am. Complaint, ¶ 528.

Amended Complaint, including depression, ADD or ADHD, anxiety, insufficient sleep, higher screen time, caring about their school performance, schools contacting their households about problems, feelings of sadness or hopelessness, suicidal behavior, and cyberbullying, is inconsistent with the implication that the vast majority of Teens in UDAP States experienced declines in mental health.¹⁵¹ I discuss this further in Section VII.B below.

A. Mr. Saba's Results Would Suggest that the Vast Majority of Teens in UDAP States Were Repeatedly Harmed

94. In his analysis of “bad encounters” on Instagram, Mr. Saba’s results suggest that the vast majority of Teens were harmed repeatedly. Mr. Saba finds that the probability that a Teen experiences at least one “bad encounter” in any given month is 99.96 percent.¹⁵² Accordingly, Mr. Saba’s results imply that the vast majority of Teens who used Instagram experienced a “bad encounter” on Instagram in any given month. As a result, over the course of a full year, and certainly over the course of the Relevant Period, Mr. Saba alleges the vast majority of Teens who used Instagram experienced a “bad encounter” repeatedly. To the extent that each of these tallied “bad encounters” were not considered to be a meaningful indicator of consumer harm, Mr. Saba’s results would fail to support a claim of widespread consumer harm.

¹⁵¹ I note the Amended Complaint discusses concerns about depression, anxiety, insomnia and sleep disturbances, interference with education, bullying, suicide, and low life satisfaction, among others. *See* Am. Complaint, ¶¶ 7 (“Research has shown that young people’s use of Meta’s Social Media Platforms is associated with depression, anxiety, insomnia, interference with education and daily life, and many other negative outcomes.”), 306 (“For example, an internal Meta document discussing ‘Problematic Facebook Use’ stated that ‘smartphone notifications caused inattention and hyperactivity among teens, and they reduced productivity and well-being.’”), 395 (“Internal research found that FOMO-induced usage of Meta’s Platforms results in harm to young users. For example, young girls are particularly vulnerable to bullying and harmful interactions ‘potentially due to their unwillingness to limit interactions due to fear of missing out on connections, their optimism, and (sometimes) lack of concern regarding their privacy online.’”), 508 (“Increased use of social media platforms, including those operated by Meta, result in physical and mental health harms particularly for young users, who experience higher rates of major depressive episodes, anxiety, sleep disturbances, suicide, and other mental health concerns.”), 511 (“Hours spent on social media and the internet have become more strongly associated with poor psychological health (such as self-harm behaviors, depressive symptoms, low life satisfaction, and low self-esteem) than hours spent on electronic gaming and watching TV.”).

¹⁵² Mr. Saba multiplies this probability times the total number of daily Instagram users in each month to compute the total number of Bad Encounters in each month. His estimate of total Bad Encounters thus assumes that Teens used Instagram once per day in the month for which the probability is applied. Saba Report, ¶ 223 (“I calculated this probability as 1 minus the cumulative product of (1 minus the Rate) for each of the ten Bad Encounter Issues, resulting in a combined monthly probability of 99.96%. I then multiplied this probability by the total number of Teen DAPs [Daily Active Persons] across all months from February 2018 to March 2024.”).

95. Mr. Saba performs an alternative tally of instances of “bad encounters” on Instagram, in which he assumes that a smaller set of Teens experience the bad encounters, and he finds that the probability that a Teen experiences at least one “bad encounter” in any given month is 83.85 percent.¹⁵³ Therefore, regardless of which of Mr. Saba’s “bad encounter” methodologies is used, his results imply that the vast majority of Teens who used Instagram experienced a “bad encounter” on Instagram in any given month. Further, even in this alternative scenario the probability that a Teen experiences at least one bad encounter in an entire year, assuming that Teen uses the platform each month, is even higher, at nearly 100 percent.¹⁵⁴

96. Additionally, were his tallies of instances of monthly time spent over certain thresholds on Instagram or Facebook not deemed to be meaningful indicators of any consumer harm according to Plaintiffs’ theories, Mr. Saba’s results would fail to support that a large portion of Teens were harmed in each UDAP State in each month based on his time spent analysis. This includes to the portion of Teen Users implicated in Mr. Saba’s time spent threshold of half an hour which equates to 31 percent and 17 percent of Instagram and Facebook MAUs, respectively.¹⁵⁵

97. Thus, to the extent that Mr. Saba’s tallies of “bad encounters” on Instagram and time spent over certain time thresholds on Instagram or Facebook are not meaningful indicators of any consumer harm, Mr. Saba’s results fail to support a claim that the vast majority of Teens in UDAP States were harmed, or harmed repeatedly.¹⁵⁶

B. The Notion that the Vast Majority of Teens in UDAP States Were Repeatedly Harmed Is Inconsistent with Teen Mental Health Data

98. Public health data do not show consistent, widespread increases in mental health challenges across outcomes cited by Plaintiffs in all UDAP States. Instead, public health data show that rates of many mental health indicators are improving or are relatively constant over time. Moreover, public health data do not show a common trend in mental health indicators

¹⁵³ Saba Report, ¶ 227 (“Using the same methodology described above for computing the cumulative probability of experiencing at least one bad encounter, I calculated the combined monthly probability to be 83.85%.”).

¹⁵⁴ $1 - (1 - 0.8385)^{12}$.

¹⁵⁵ See Workpaper 8.

¹⁵⁶ Mr. Saba’s analysis suggests that by 2020, nearly 100 percent of Teens in each of the UDAP States used Instagram once per month. See Saba Report, Schedule 6.2.

across UDAP States but instead show substantial variation in trends between UDAP States. These facts are inconsistent with Mr. Saba's tallies, which, to the extent they are not meaningful indicators of consumer harm per Plaintiffs' theories, Mr. Saba's results would fail to support a claim that the vast majority of Teens in UDAP States have experienced mental health harm from the use of Instagram or Facebook as a result of the features I describe in Section V.A that the Court specifically indicated are still at issue. To the extent that Teens in specific UDAP States have experienced increases in mental health challenges, Mr. Saba has not provided evidence that the time spent or "bad encounters" he tallies—or even Instagram, Facebook, and the features I describe in Section V.A that the Court specifically indicated are still at issue in general—are the *cause* of those mental health challenges, nor does he make any attempt to disentangle the role that potentially confounding factors may have on Teen mental health, such as the role of third-party content on social media, or the role of external factors unrelated to social media.

99. In this section, I analyze mental health indicators among Teens in UDAP States using data from the National Survey of Children's Health ("NSCH"), Mental Health Client-Level Data ("MH-CLD") from the United States Substance Abuse and Mental Health Services Administration ("SAMHSA"), and the YRBS. Each of these data sources has different metrics that relate to mental health challenges raised in the Amended Complaint.¹⁵⁷ In particular, these data sets provide information on rates of receiving treatment for mental health challenges, depression, ADD or ADHD, anxiety, insufficient sleep, screen time, caring about their school performance, schools contacting their households about problems, feelings of sadness or

¹⁵⁷ As I mention in Section VII, I note the Amended Complaint discusses concerns about depression, anxiety, insomnia and sleep disturbances, interference with education, bullying, suicide, and low life satisfaction, among others. *See* Am. Complaint, ¶¶ 7 ("Research has shown that young people's use of Meta's Social Media Platforms is associated with depression, anxiety, insomnia, interference with education and daily life, and many other negative outcomes."), 306 ("For example, an internal Meta document discussing 'Problematic Facebook Use' stated that 'smartphone notifications caused inattention and hyperactivity among teens, and they reduced productivity and well-being.'"), 395 ("Internal research found that FOMO-induced usage of Meta's Platforms results in harm to young users. For example, young girls are particularly vulnerable to bullying and harmful interactions 'potentially due to their unwillingness to limit interactions due to fear of missing out on connections, their optimism, and (sometimes) lack of concern regarding their privacy online.'"), 508 ("Increased use of social media platforms, including those operated by Meta, result in physical and mental health harms particularly for young users, who experience higher rates of major depressive episodes, anxiety, sleep disturbances, suicide, and other mental health concerns."), 511 ("Hours spent on social media and the internet have become more strongly associated with poor psychological health (such as self-harm behaviors, depressive symptoms, low life satisfaction, and low self-esteem) than hours spent on electronic gaming and watching TV.").

hopelessness, suicidal behavior, and cyberbullying.¹⁵⁸ To highlight the trends in the largest UDAP states, I present results for California, New York, Illinois, and Pennsylvania. I present my analysis for the complete set of UDAP States in Appendix F.

100. First, I do not observe consistent, widespread increases in negative outcomes across mental health indicators. If it were true that the vast majority of Teens in UDAP States were repeatedly harmed, then one would expect to see broad and consistent increases in Teen mental health challenges after the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue across many of these outcomes in each of the UDAP States. Based on my review of the available data, I do not see consistent increases in negative outcomes across mental health indicators pointed to by Plaintiffs across the UDAP States. In fact, a number of mental health indicators (rates of depression, ADD or ADHD, insufficient sleep, screen time, schools contacting Teens' households about problems, and cyberbullying) appear to generally improve or remain constant over the Relevant Period. Other indicators are more mixed. A number of UDAP States show worsening rates over time of caring about school performance, anxiety, feeling sad or hopeless, and suicidal behaviors—particularly around the COVID-19 Pandemic. However, trends in these mental health indicators generally show recent leveling and even improvement in these states, and there is substantial variation across UDAP States, with some showing broad improvements over the Relevant Period. Teen anxiety also increased across several UDAP States during the Relevant Period but declined in other UDAP States. The fact that there is variation among UDAP States in the trends in mental health

¹⁵⁸ I note that measuring mental health challenges is complicated, and there may be reasons why data show changes in mental health metrics when there is no true underlying change in the status of the populations' underlying mental health. *See*, for example, Janet Currie, "Presidential Address: Investing in Children to Address the Child Mental Health Crisis," *American Economic Review*, 115(5), 2025, pp. 1369–1399 ("Currie (2025)") at pp. 1374 ("Incentives to diagnose mental illness have also changed for providers over time. Corredor-Waldron and Currie (2024) highlight an important national change in screening practices following a 2011 recommendation from the US Preventive Services Task Force (USPSTF) that women and girls 12 and over should be screened annually for depression."), 1375 ("In addition, there have been changes in provider compensation for treating patients with more complex conditions. In 2007, Medicare introduced a new reimbursement system that allowed hospitals to charge Medicare more if people with other conditions (e.g., asthma) also had major depression. This change gave hospitals an incentive to train clinicians to code depression if present.... Similarly, a tweak to the newly implemented ICD10 classification system in October 2016 instructed ED [Emergency Department] clinicians to record suicidal ideation as a secondary diagnosis if present, which may have resulted in higher reimbursements in some cases. Changes in provider incentives also occurred because of changes in compensation practices that were associated with the introduction of managed care."), 1377 ("while it might seem desirable to track trends in ED visits as a way of assessing trends in underlying child mental health, trends in ED visits for mental health disorders are sensitive to changes in patient and provider incentives to diagnose and record mental health conditions over time.").

outcomes is at odds with Mr. Saba's analysis and Plaintiffs' allegations and suggests that these trends may be driven by other factors not at issue in this matter.

101. Additionally, to the extent that there are any increases in mental health challenges over time among Teens in UDAP States, Plaintiffs would need to disaggregate the alleged effects of any of the features of Instagram and Facebook, let alone the features I describe in Section V.A that the Court specifically indicated are still at issue, from the overall effect of social media on mental health, if any. Further, Plaintiffs would also need to control for any effects other confounding factors may have on Teen mental health, such as changes in the measurement or reporting of variables measuring needing mental health treatment, poverty and income shocks, domestic violence, school shootings, and adverse childhood experiences generally.¹⁵⁹ If Plaintiffs' allegations were true and Mr. Saba's results were reliable, then one would expect to see changes in mental health trends across the UDAP States coinciding with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue. I add lines on the charts in this section to denote the timing of these features: cosmetic surgery filters, time management features, and Instagram's multiple accounts function. I do not observe consistent changes in mental health outcomes coinciding with the dates of these features (as denoted by the lines on the charts).

102. In the remainder of this section, I present my analysis of mental health outcomes in UDAP States using data from the (1) NSCH, (2) MH-CLD, and (3) YRBS.

¹⁵⁹ Currie (2025), pp. 1378–1379 (“Overall, these sources suggest that the child mental health crisis has existed for decades and that the number of children with an underlying mental health condition has been high and relatively stable over time. In retrospect, this conclusion should not be surprising given what we know about the causes of child mental health disorders. While there is a genetic component to many mental illnesses, environmental stressors also have an impact, and may be necessary to trigger the onset of a mental health condition. Some important stressors that have been shown to impact child mental health include: poverty and income shocks (or income transfers) (see Akee, Copeland, and Simeonova 2024; Baird, de Hoop, and Özler 2013; Jones et al. 2024; Golberstein, Gonzalez, and Meara 2019), the birth of a sibling with a disability (Currie et al. 2024), domestic violence (Bhuller et al. 2024), school shootings (Rossin-Slater et al. 2020), and adverse childhood experiences generally (Blanchflower and Bryson 2024).”).

1. NSCH Mental Health Data

103. In the following paragraphs, I first analyze NSCH data.¹⁶⁰ The NSCH is an annual survey funded by the Health Resources and Services Administration, an agency of the U.S. Department of Health and Human Services and administered by the U.S. Census Bureau.¹⁶¹ The NSCH is administered to households with children and includes questions for parents on whether Teens were treated for, or needed treatment for mental health challenges; on the presence and severity of depression, anxiety, and ADD or ADHD; insufficient sleep; screen time; caring about school performance; and having school contact the household about problems.¹⁶² I analyzed the percent of Teens who reportedly were neither treated for, nor needed treatment for, mental health challenges from 2016 through 2023.¹⁶³ I also report the percent of Teens reported as having

¹⁶⁰ The NSCH is representative for UDAP States. See “2023 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, January 31, 2025, available at <https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2023-NSCH-Methodology-Report.pdf> (“2023 NSCH Methodology Report”), p. 48 (“When survey weights are used, the resulting estimates from the 2023 NSCH are representative of all non-institutionalized children aged 0 to 17 years in the U.S. and in each state and the District of Columbia who live in housing units.”).

¹⁶¹ 2023 NSCH Methodology Report, p. 5 (“Funding and direction for this survey was provided by the Health Resources and Services Administration’s Maternal and Child Health Bureau (HRSA MCHB) within the U.S. Department of Health and Human Services. The U.S. Census Bureau conducted the survey on behalf of HRSA MCHB.”).

¹⁶² “National Survey of Children’s Health,” *U.S. Census Bureau*, March 27, 2023, available at https://www.census.gov/content/dam/Census/programs-surveys/nsch/tech-documentation/questionnaires/2023/2023_NSCH-T3_FINAL.pdf, pp. 2 (“The survey should be completed by a parent or adult caregiver who lives in this household and who is familiar with this child’s health and health care.”), 3 (“Has a doctor or other health care provider EVER told you that this child has... Anxiety Problems?... Depression?”), 5 (“Has a doctor or other health care provider EVER told you that this child has Attention Deficit Disorder or Attention-Deficit/Hyperactivity-Disorder, that is ADD or ADHD?”), 8 (“DURING THE PAST 12 MONTHS, has this child received any treatment or counseling from a mental health professional?”), 12 (“DURING THE PAST 12 MONTHS, how many times has this child’s school contacted you or another adult in your household about any problems they are having with school?”), 13 (“How often does this child... Care about doing well in school?”), 14 (“DURING THE PAST WEEK, how many hours of sleep did this child get on most weeknights? ... ON MOST WEEKDAYS, about how much time did this child spend in front of a TV, computer, cellphone or other electronic device watching programs, playing games, accessing the internet or using social media? *Do not include time spent doing schoolwork.*”).

¹⁶³ My analysis begins in 2016, the first year for which NSCH data are available. Data collection for the NSCH survey begins in June, July, or August of the respective survey year and, in all survey years since 2019, has continued until the following January. See 2023 NSCH Methodology Report, p. 11 (“Data collection efforts for the 2023 National Survey of Children’s Health (NSCH) began on June 23, 2023 and continued until January 19, 2024”); “2022 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, January 31, 2025, available at <https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2022-NSCH-Methodology-Report.pdf>, p. 12 (“Data collection efforts for the 2022 National Survey of Children’s Health (NSCH) began on July 8, 2022 and continued until January 20, 2023”); “2021 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, January 31, 2025, available at <https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2021-NSCH-Methodology-Report.pdf>.

experienced depression, ADD or ADHD, anxiety, or insufficient sleep, as well as reported levels of screen time, frequency of caring about their performance in school, and the number of times their school contacted their household about problems from 2016 through 2023.¹⁶⁴ My analysis of the NSCH data presented in this section supports my conclusions that (i) there are not consistent, widespread increases in mental health challenges over time, (ii) changes in mental health outcomes vary among UDAP States, and (iii) increases in mental health challenges do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue.

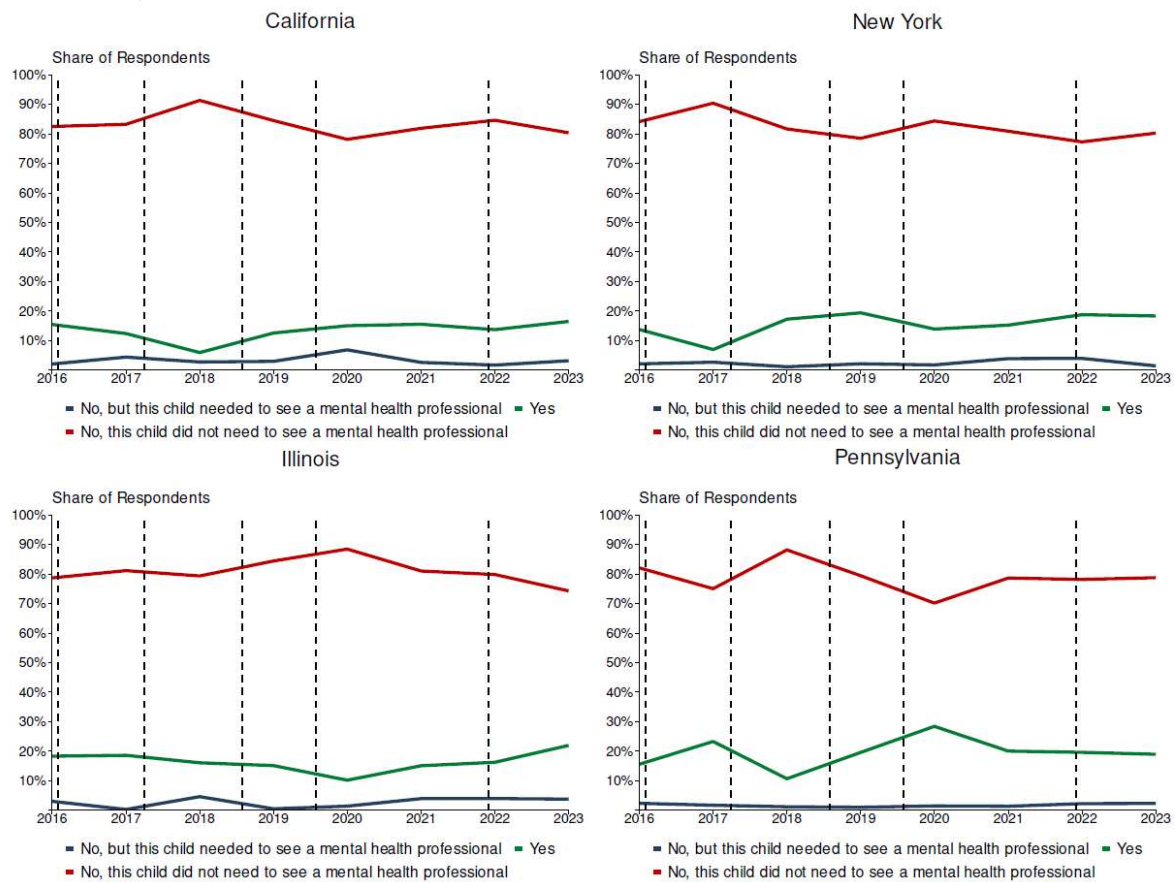
surveys/nsch/technical-documentation/methodology/2021-NSCH-Methodology-Report.pdf, p. 11 (“Data collection efforts for the 2021 National Survey of Children’s Health (NSCH) began on June 25, 2021 and continued until January 14, 2022”); “2020 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, January 31, 2025, available at <https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2020-NSCH-Methodology-Report.pdf>, p. 11 (“Data collection efforts for the 2020 National Survey of Children’s Health (NSCH) began on July 27, 2020 and continued until January 22, 2021”); “2019 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, April 10, 2024, available at <https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2019-NSCH-Methodology-Report.pdf>, p. 14 (“Data collection efforts for the 2019 National Survey of Children’s Health (NSCH) began on June 28, 2019 and continued until January 17, 2020”); “2018 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, April 10, 2024, available at <https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2018-NSCH-Methodology-Report.pdf>, p. 20 (“Data collection efforts for the 2018 National Survey of Children’s Health (NSCH) began on June 29, 2018”); “2017 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, August 2, 2018, available at <https://www.census.gov/content/dam/Census/programs-surveys/nsch/tech-documentation/methodology/2017-NSCH-Methodology-Report.pdf>, p. 20 (“Data collection efforts for the 2017 National Survey of Children’s Health (NSCH) began on August 7, 2017”); “2016 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, February 26, 2018, available at <https://www.census.gov/content/dam/Census/programs-surveys/nsch/tech-documentation/methodology/2016-NSCH-Methodology-Report.pdf>, p. 19 (“Data collection efforts for the 2016 National Survey of Children’s Health (NSCH) began on June 10, 2016”).

¹⁶⁴ Note that, in order to extrapolate the shares in the survey sample to the population of UDAP States and nationally, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to calculate the share of Teens treated by a mental health professional; Teens experiencing depression, ADHD, anxiety, or insufficient sleep; and Teens’ screen time, Teens’ frequency of caring about school performance, or Teens whose household were contacted by their school about problems. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. See 2023 National Survey of Children’s Health Methodology Report, pp. 44–45 (“The final step of the weighting process is accomplished through iterative raking to population controls attained from the ACS. The following analytical domains of interest were used: • Dimension #1 – State by Household Poverty Ratio ($\leq 100\%$, $101-200\%$, $>200\%$) • Dimension #2 – State by Household Size (≤ 3 , 4 , >4) • Dimension #3 – State Groupings by Respondent’s Education ($<$ High School, High School, $>$ High School) • Dimension #4 – State by Selected Child’s Race/Ethnicity (Hispanic, Non-Hispanic White, Non-Hispanic Black, Non-Hispanic AIAN, Non-Hispanic Asian, Non-Hispanic NHPI, Non-Hispanic 2+ Races) • Dimension #5 – State by Selected Child’s Age Group (0-5, 6-11, 12-17 years) • Dimension #6 – National Selected Child’s Race/Ethnicity • Dimension #7 – National Selected Child’s Sex by Single Age The iterative raking process uses at most 100 iterations or until the weights converge to the population totals. Weights are converged when the absolute difference between the sum of the weights within each raking cell of all eight dimensions and the control total associated with each raking cell is less than one percent of the control.”), 46 (“Finally, in the second raking process, the weights of the NSCH topical interviewed children were adjusted so that the sum of their weights equaled the ACS estimates for each state by the dimensions listed above.”).

104. The data presented in Figure 6 below show the rates of mental health treatment reported by the NSCH among Teens in the four largest UDAP States. As an initial matter, across UDAP States, the majority of Teens were reported to not have been treated, or as not needing treatment, for mental health challenges at any point during the time period for which data are available. Additionally, as shown in Figure 6, (i) the rates of teens not having been treated or not needing treatment have not consistently decreased across the time period for which data are available, (ii) changes in these rates vary among the four largest UDAP States, and (iii) any decreases in these rates do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue (as denoted by the lines on the charts). For example, while the red line denoting the share of Teens who did not need to see a mental health professional increases in some years, it decreases in others, and indeed in some UDAP States, the red line remains at a similar level in the most recent year of data as in the first across most UDAP States. I present results for the full set of UDAP States in Appendix F, Figure F.1.

Figure 6

Share of Teens in the Four Largest UDAP States Treated for Mental Health Challenges Over Time



Source: United States Census Bureau, National Survey of Children's Health Data ("NSCH Data")

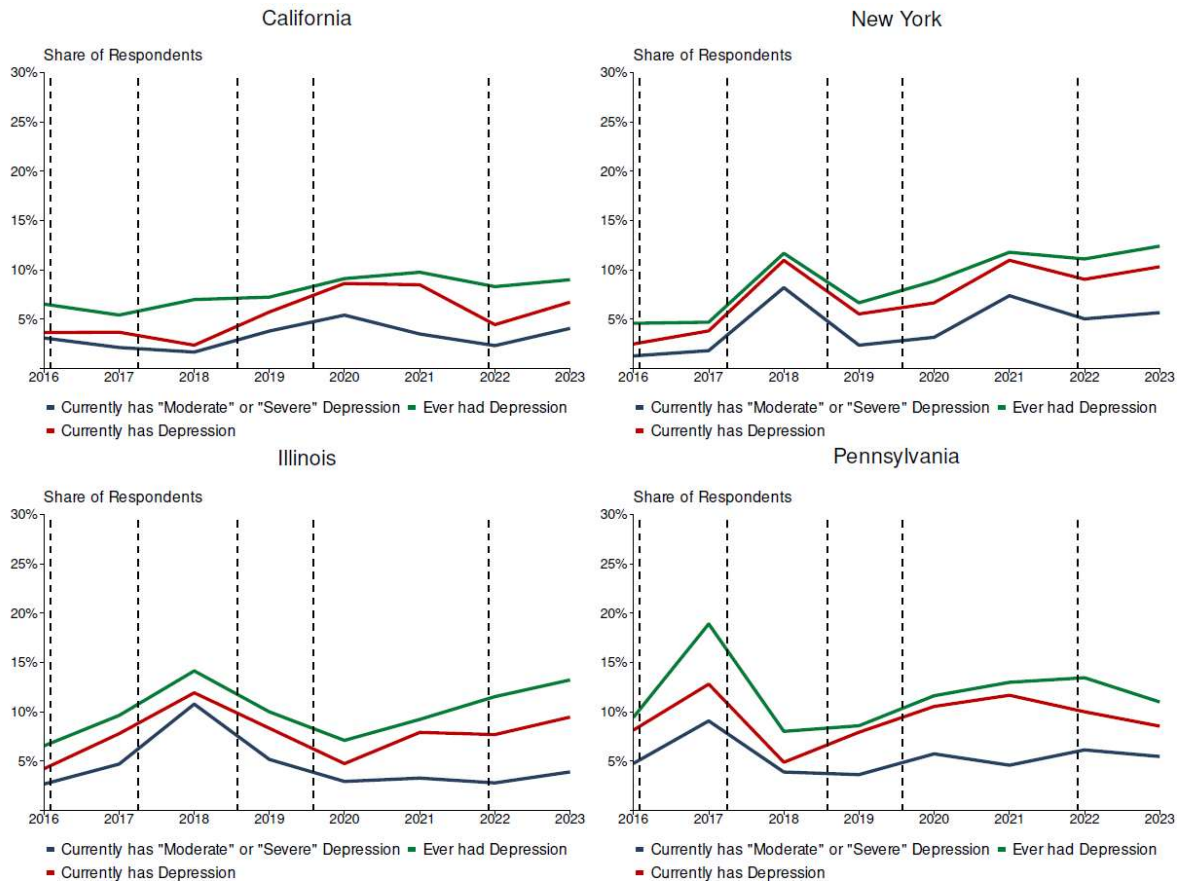
Note: This chart shows the share of parents who responded "No, this child did not need to see a mental health professional," "Yes," and "No, but this child needed to see a mental health professional," to the NSCH question "DURING THE PAST 12 MONTHS, has this child received any treatment or counseling from a mental health professional? Mental health professionals include psychiatrists, psychologists, psychiatric nurses, and clinical social workers." The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the states of California, New York, Illinois, and Pennsylvania. NSCH is also representative for each respective state. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens who saw, did not see, and did not need to see, a mental health professional in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

105. The data presented in Figure 7 below show that while rates of depression reported by the NSCH among Teens in UDAP States have generally increased, (i) they have fluctuated widely

across the time period for which data are available, (ii) changes in these rates vary among the four largest UDAP States, and (iii) any increases in rates do not appear to consistently coincide with the introduction of the features I describe in Section V.A, that the Court specifically indicated are still at issue (as denoted by the lines on the charts). For example, the rates of Teens reported to currently experience depression or moderate/severe depression shown in the red and blue lines increase substantially in some years and decrease substantially in others—in some cases by fluctuations of 50 percent or more. Further, while these rates experience year-to-year increases and decreases across all UDAP States, these changes occur at different points in time in each UDAP State and do not appear to correlate with the introduction of the features I chart. I present results for the complete set of UDAP States in Appendix F, Figure F.2.

Figure 7

Share of Teens in the Four Largest UDAP States with Depression Over Time



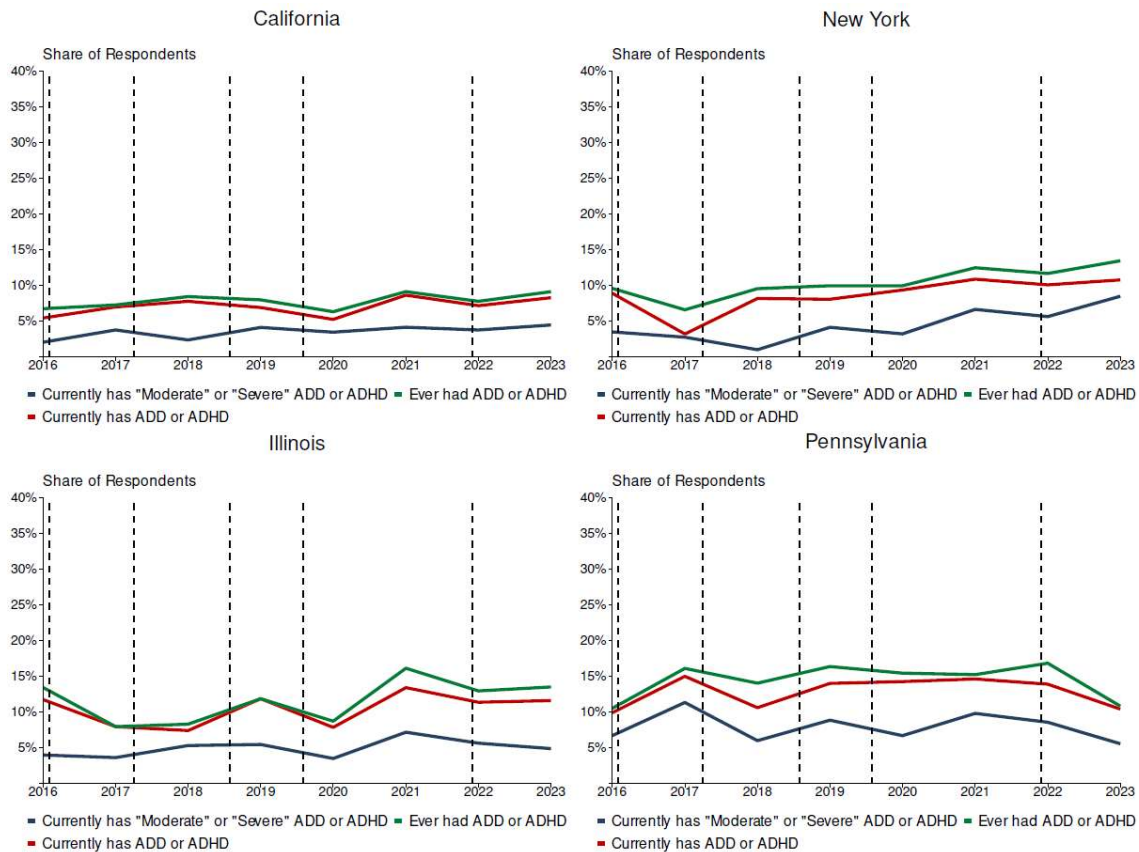
Source: NSCH Data

Note: This chart shows the share of parents who responded to the NSCH questions “Has a doctor or other health care provider EVER told you that this child has [d]epression?” with “Yes;” “If yes, does this child CURRENTLY have the condition?” with “Yes;” and “If yes, is it Mild[,] Moderate[, or] Severe?” with “Moderate” or “Severe.” The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the states of California, New York, Illinois, and Pennsylvania. NSCH is also representative for each respective state. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens experiencing depression in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

106. Similarly, the data presented in Figure 8 below show that (i) rates of ADD or ADHD among Teens in the four largest UDAP States reported by the NSCH have not consistently increased across the time period for which data are available, (ii) changes in these rates vary among the four largest UDAP States, and (iii) any increases in rates do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue (as denoted by the lines on the charts). For example, the rates of Teens currently experiencing ADD or ADHD or moderate/severe ADD or ADHD shown in the red and blue lines increase substantially in some years and decrease substantially in others, with many UDAP States showing no large changes over time. Specifically, among the four largest UDAP States, while the rate of ADD or ADHD among Teens increased slightly in New York and California, it remained relatively constant in Pennsylvania and Illinois. New York also had fluctuations in the rate of approximately 50 percent between 2016 and 2018. I present results for the full set of UDAP States in Appendix F, Figure F.3.

Figure 8

Share of Teens in the Four Largest UDAP States with ADD or ADHD Over Time



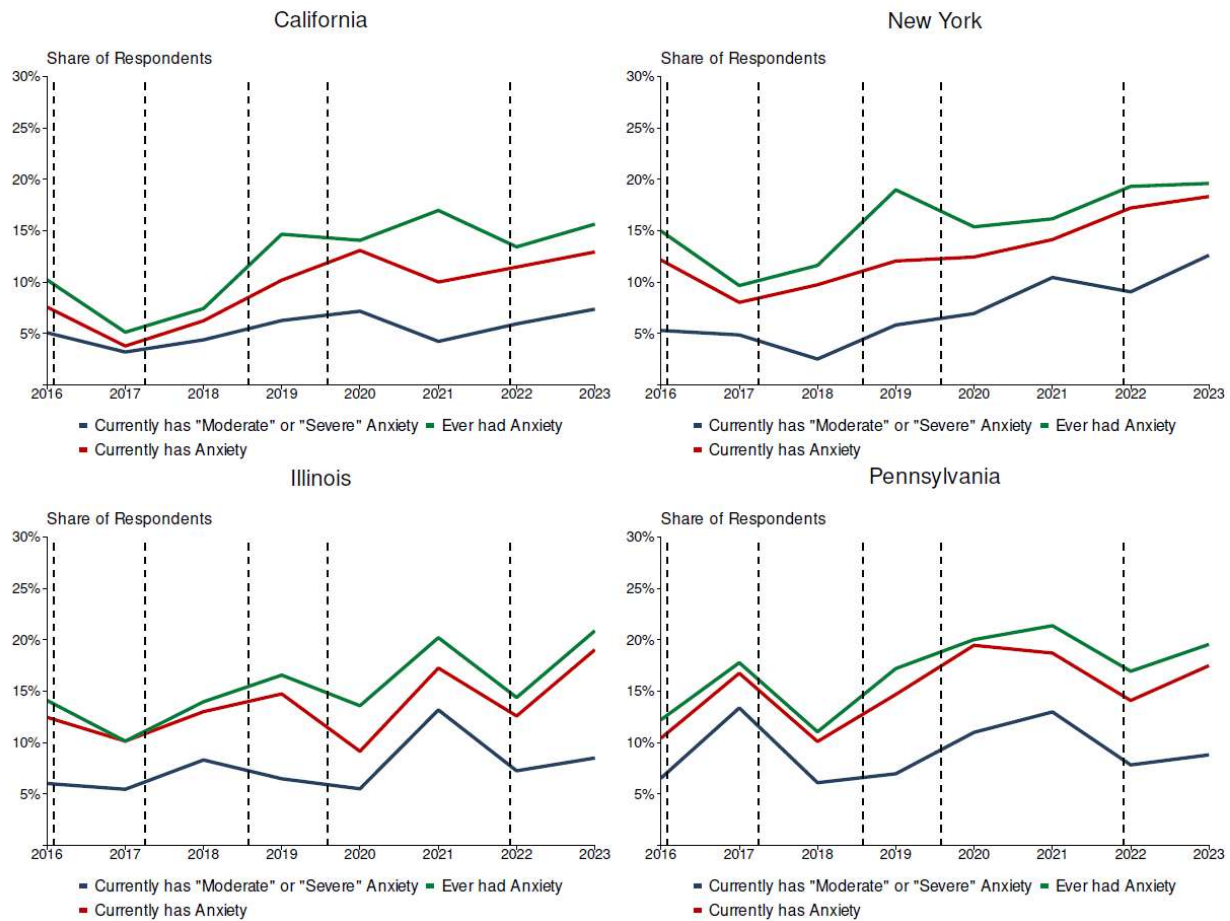
Source: NSCH Data

Note: This chart shows the share of parents who responded to the NSCH questions “Has a doctor or other health care provider EVER told you that this child has... ADD or ADHD?” with “Yes;” “If yes, does this child CURRENTLY have the condition?” with “Yes;” and “If yes, is it Mild[,] Moderate[, or] Severe?” with “Moderate” or “Severe.” The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the states of California, New York, Illinois, and Pennsylvania. NSCH is also representative for each respective state. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens experiencing ADD or ADHD in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

107. Additionally, the data presented in Figure 9 below show that while rates of anxiety among Teens in the four largest UDAP States reported by the NSCH show increases over time since 2016 (the first year for which data are available), (i) they have fluctuated across the time period for which data are available; (ii) changes in these rates vary across the four largest UDAP States; and (iii) any increases in rates do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue (as denoted by the lines on the charts). For example, there was substantial variance in the year-over-year changes in rates of anxiety across the four largest UDAP States, including after the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue. Further, I show in Appendix F, Figure F.4 that changes in the rates of Teens with anxiety varied even more in the other UDAP States, some of which showed decreases in anxiety over the Relevant Period. For example, in at least the most recent two years of data in Indiana, Kentucky, and New Jersey show declines in the rates of anxiety. Delaware, Kansas, and North Carolina similarly show declines in the rates of anxiety in the most recent year of data.

Figure 9

Share of Teens in the Four Largest UDAP States with Anxiety Over Time



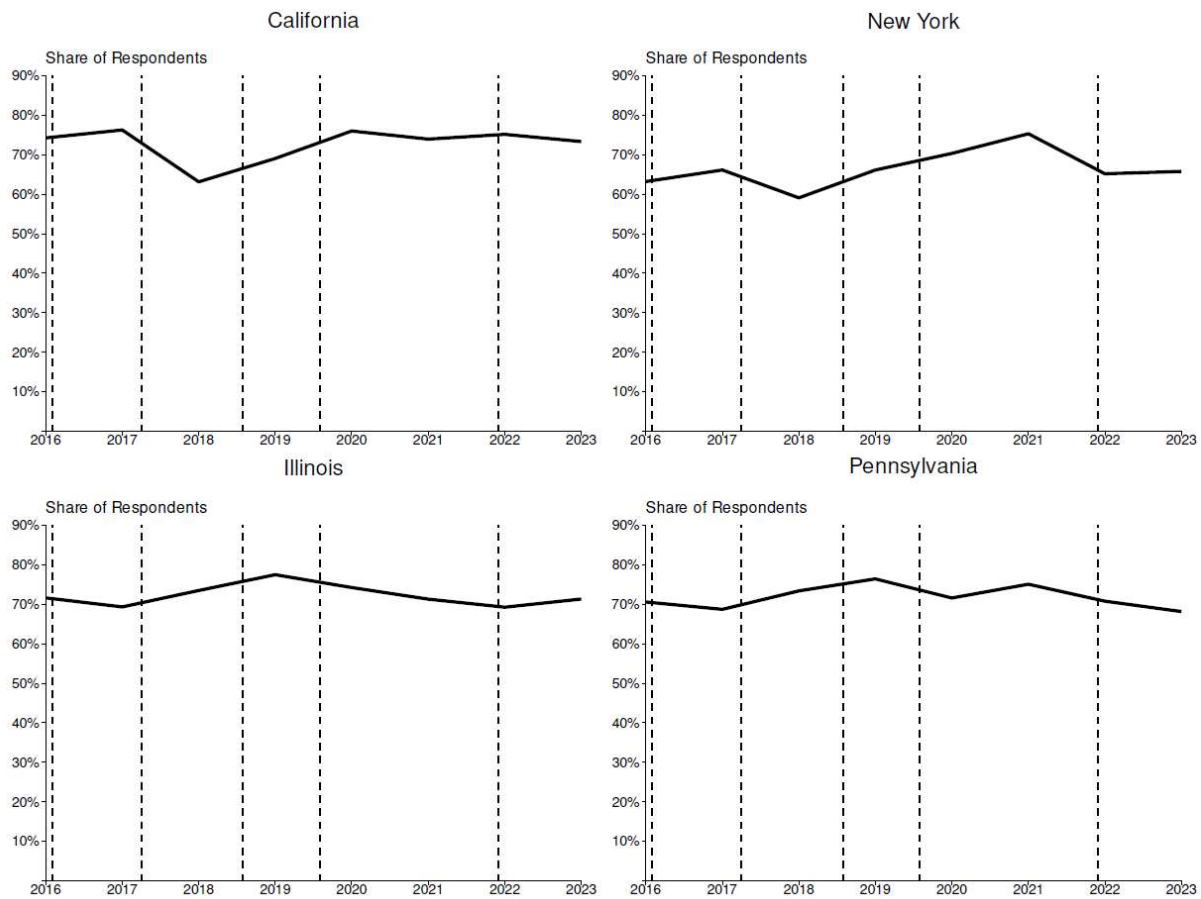
Source: NSCH Data

Note: This chart shows the share of parents who responded to the NSCH questions “Has a doctor or other health care provider EVER told you that this child has... Anxiety Problems?” with “Yes;” “If yes, does this child CURRENTLY have these problems?” with “Yes;” and “If yes, is it Mild[,] Moderate[, or] Severe?” with “Moderate” or “Severe.” The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the states of California, New York, Illinois, and Pennsylvania. NSCH is also representative for each respective state. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens experiencing anxiety in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

108. The data presented in Figure 10 below show that (i) the rate of Teens reported as having sufficient sleep (8 or more hours on most weeknights) reported by the NSCH has not consistently decreased across the time period for which data are available, (ii) changes in the rate vary across the four largest UDAP States, and (iii) any decreases in the rate do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue (as denoted by the lines on the charts). For example, the rate of Teens getting 8 or more hours of sleep on most weeknights declines in some years but increases in others, with the rate in the most recent year of data similar to the rate in the first year across all UDAP States. I present results for the full set of UDAP States in Appendix F, Figure F.5.

Figure 10

Share of Teens in the Four Largest UDAP States with 8 or More Hours of Sleep Over Time



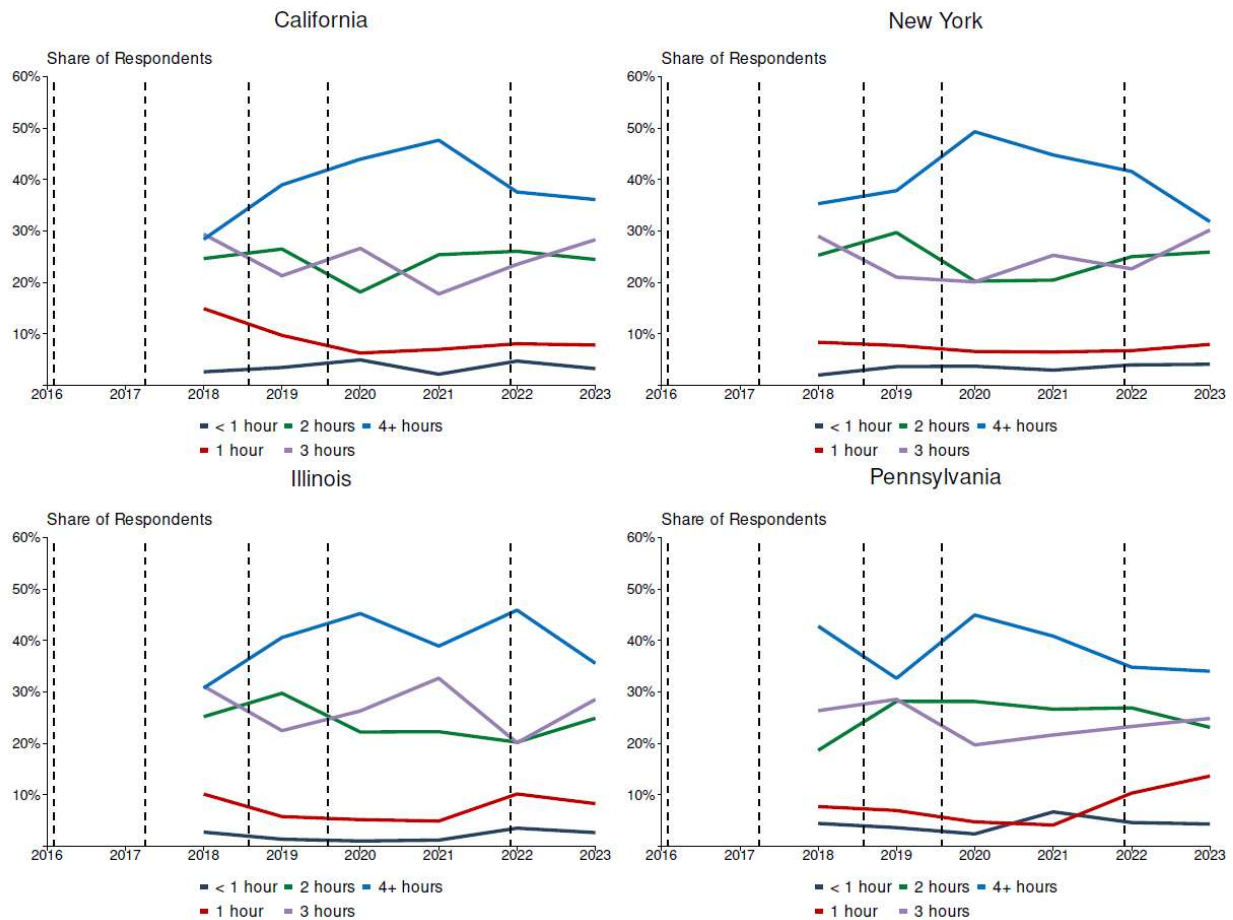
Source: NSCH Data

Note: This chart shows the share of parents who responded to the NSCH questions “During the past week, how many hours of sleep did this child get on most weeknights?” with 8 or more hours. The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the states of California, New York, Illinois, and Pennsylvania. NSCH is also representative for each respective state. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens with 8 or more hours of sleep in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

109. The data presented in Figure 11 below show that (i) the rates of Teens reporting less than 1 hour, 1 hour, 2 hours, 3 hours, and 4 or more hours of screen time as reported by the NSCH have fluctuated over the years but overall have not consistently shown increases or decreases across the full time period for which data are available; (ii) changes in the rates vary across the four largest UDAP States, and (iii) any changes in rates do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue (as denoted by the lines on the charts). For example, in many UDAP States the rates of Teens reporting less than 1 hour, 1, 2, 3, and 4 or more hours of screen time have remained at a similar level in the most recent year of data relative to the first year of data, despite fluctuations over time across UDAP States. Specifically, the light blue line showing the rate of Teens reporting 4 or more hours of screen time increases over some periods, but declines in others, with the rate in the most recent year of data below the highest rate I observe during the period for which data are available. Similarly, the green and purple lines showing the rates of Teens reporting 2 and 3 hours of screen time respectively fluctuate up and down over time. I present results for the full set of UDAP States in Appendix F, Figure F.6.

Figure 11

Share of Total Screen Time of Teens in the Four Largest UDAP States Over Time



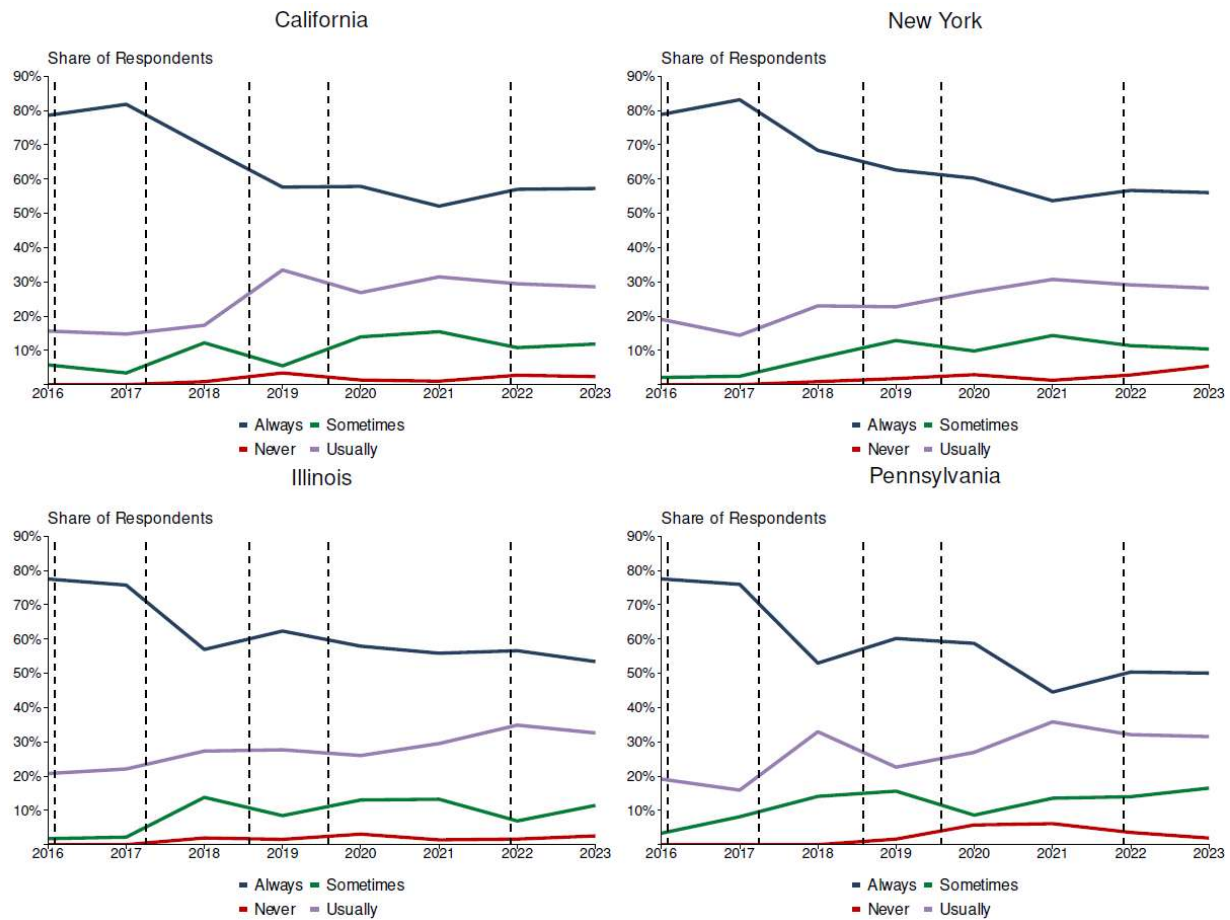
Source: NSCH Data

Note: This chart shows the share of parents who responded to the NSCH question “ON MOST WEEKDAYS, about how much time did this child spend in front of a TV, computer, cellphone or other electronic device watching programs, playing games, accessing the internet or using social media?” The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and to the states of California, New York, Illinois, and Pennsylvania. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens using screens over certain thresholds in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

110. Further, the data presented in Figure 12 below show rates of how often Teens care about their school performance in the four largest UDAP States reported by the NSCH over time from 2016 to 2023. The data show that (i) while the rate of Teens who always care about their school performance has declined over time, the rate of Teens who usually and sometimes care about their school performance has not consistently decreased across the time for which data are available (ii) changes in the rates vary across the four largest UDAP States, and (iii) any changes in rates do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue (as denoted by the lines on the charts). I present results for the full set of UDAP States in Appendix F, Figure F.7.

Figure 12

Share of Teens in the Four Largest UDAP States Who Care About School Performance Over Time



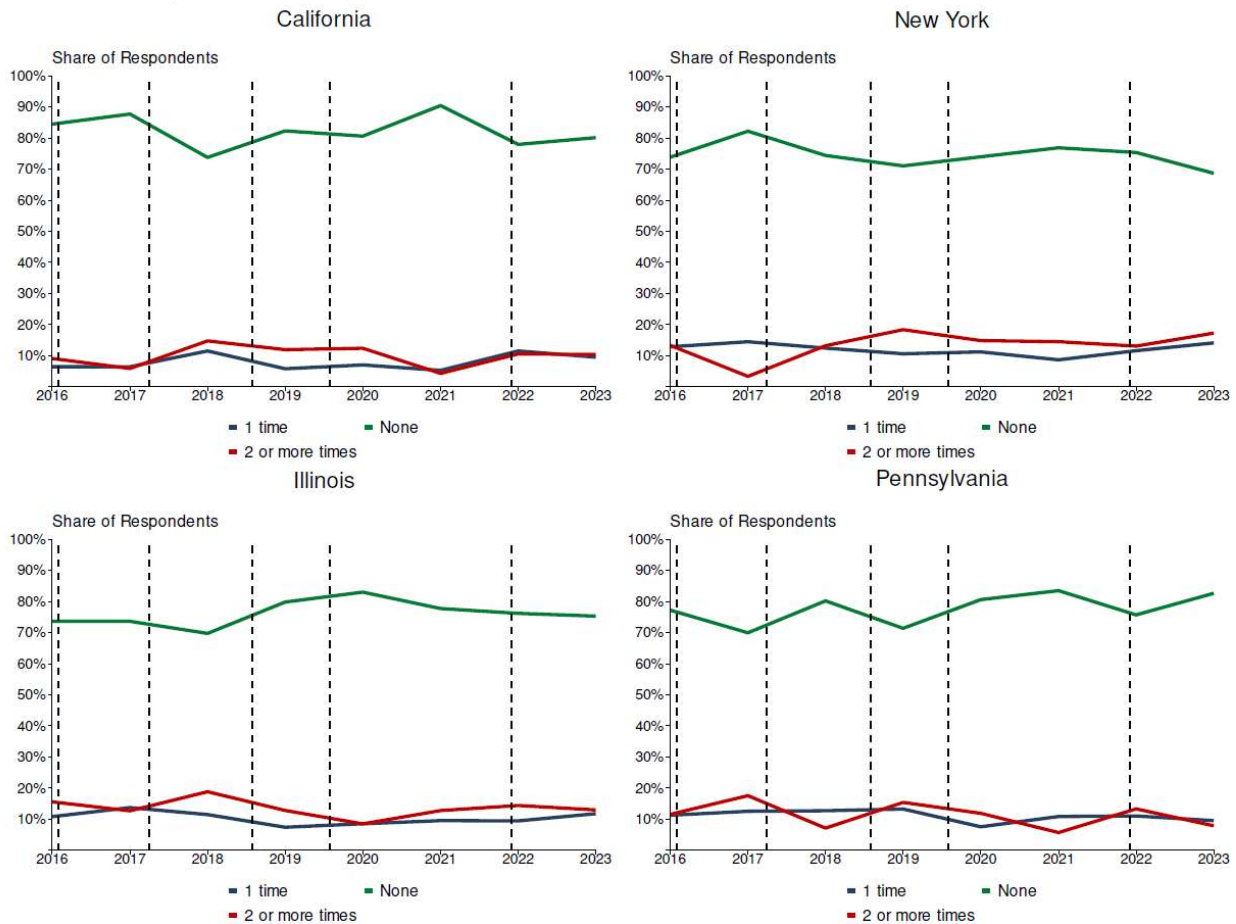
Source: NSCH Data

Note: This chart shows the share of parents who responded to the NSCH question “How often does this child... Care about doing well in school?” The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the states of California, New York, Illinois, and Pennsylvania. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens who care about school performance in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V. Namely cosmetic surgery filters, time management tools, and Instagram’s multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

111. Finally, the data presented in Figure 13 below show rates of Teens whose school contacted their household about problems in the four largest UDAP States reported by the NSCH over time from 2016 to 2023. The data show that (i) rates of Teens whose school contacted their household about problems have not consistently increased across the time period for which data are available, (ii) changes in these rates vary across the four largest UDAP States, and (iii) any increases in rates do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue (as denoted by the lines on the charts). For example, the rates of Teens whose school contacted their household about problems once or twice or more, shown in the blue and red lines respectively, increase in some periods but decline in others, and indeed in most UDAP States, the blue and red lines remain at a similar level in the most recent year of data as in the first. I present results for the full set of UDAP States in Appendix F, Figure F.8.

Figure 13

Share of Teens in the Four Largest UDAP States Whose Schools Contacted Their Households About Problems Over Time



Source: NSCH Data

Note: This chart shows the share of parents who responded to the NSCH question "DURING THE PAST 12 MONTHS, how many times has this child's school contacted you or another adult in your household about any problems they are having with school?" The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the states of California, New York, Illinois, and Pennsylvania. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens whose schools contacted their households about problems in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

2. MH-CLD Mental Health Data

112. The MH-CLD is individual-level data, available both nationally and for individual UDAP States, collected from mental health and support services operated or funded by each state's respective State Mental Health Agency and reported to SAMHSA.¹⁶⁵ The MH-CLD reports clinical diagnoses for a variety of mental health outcomes, including depression, ADD or ADHD, and anxiety.¹⁶⁶ My analysis of the MH-CLD data presented in this section supports my conclusions that (i) there are not consistent, widespread increases in mental health challenges over time, (ii) changes in mental health outcomes vary among UDAP States, and (iii) increases in mental health challenges do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue.

113. The data presented in Figure 14 below show that while the rate of diagnosed depression among Teens in three of the four largest UDAP States reported by SAMHSA has increased across the time period for which data are available, (i) it has fluctuated across the time period for which data are available, (ii) changes in the rate vary across UDAP States, and (iii) any increases in the rate do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue (as denoted by the lines on the charts). Further, in Appendix F, Figure F.9, I show that the rate of diagnosed depression also remained relatively constant in Louisiana, Minnesota, New Jersey, and Wisconsin. The rate of

¹⁶⁵ "Mental Health Client-Level Data (MH-CLD)," *U.S. Substance Abuse and Mental Health Services Administration*, February 13, 2025, available at <https://www.samhsa.gov/data/data-we-collect/mh-cld-mental-health-client-level-data> ("The Mental Health Client-Level Data (MH-CLD) collects data on all child and adult clients who received mental health and support services from programs operated or funded by State Mental Health Agency (SMHA)").

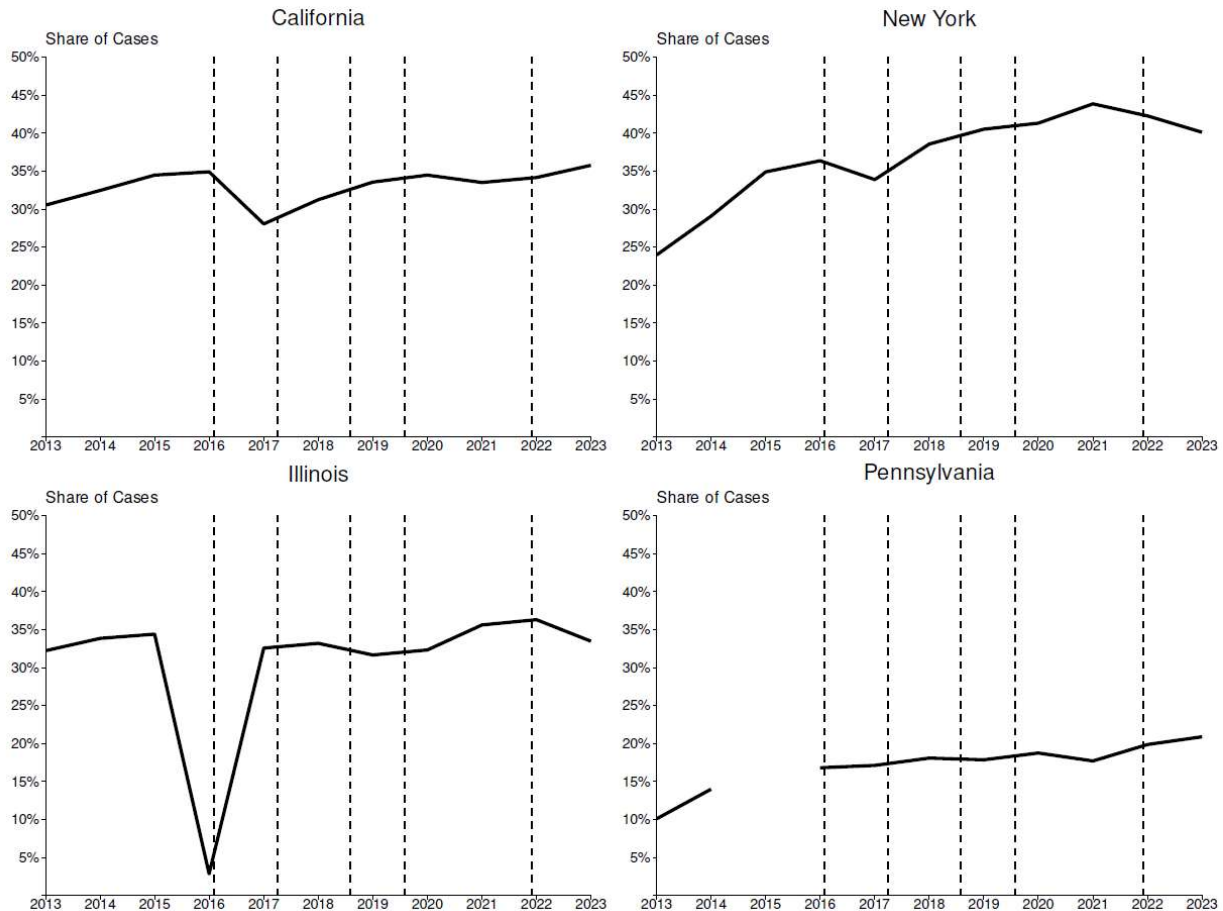
¹⁶⁶ My analysis begins in 2013, the first year for which data are available. I note that the Diagnostic and Statistical Manual of Mental Disorders ("DSM") that determines what constitutes a diagnosis for different disorders in the SAMHSA MH-CLD was revised in both 2013 and 2022. These revisions included some changes to diagnosis as well as language revisions. See "DSM History," *American Psychiatric Association*, available at <https://www.psychiatry.org/psychiatrists/practice/dsm/about-dsm/history-of-the-dsm> ("APA DSM History") ("The DSM-5-TR development effort started in Spring 2019... Although the scope of the text revision did not include conceptual changes to the criteria sets, some necessary clarifications to certain diagnostic criteria were reviewed and approved... DSM-5-TR was published in March 2022.... The work on DSM-5 began in 2000, work groups were formed to create a research agenda for the fifth major revision of DSM (DSM-5).... DSM-5 was published in 2013."); "Mental Health Client-Level Data (MH-CLD) 2023: Data on Clients Receiving Mental Health and Support Services Through State Mental Health Agencies," *U.S. Substance Abuse and Mental Health Services Administration*, 2025, available at <https://www.samhsa.gov/data/sites/default/files/reports/rpt56264/2023-MH-CLD-Annual-Report.pdf>, p. A.1 ("Mental Health Diagnosis... Non-missing categories include... Anxiety Disorders, Attention-Deficit/Hyperactivity Disorders,... [and] Depressive Disorders.").

diagnosed depression in fact declined from 2013 to 2023 in Connecticut, Delaware, and Nebraska.¹⁶⁷

¹⁶⁷ As noted above the DSM was revised in 2013 and 2022; changes in these years may be due in part to the revision.

Figure 14

Share of Teens Who Accessed Mental Health Services in the Four Largest UDAP States Diagnosed with Depression Over Time



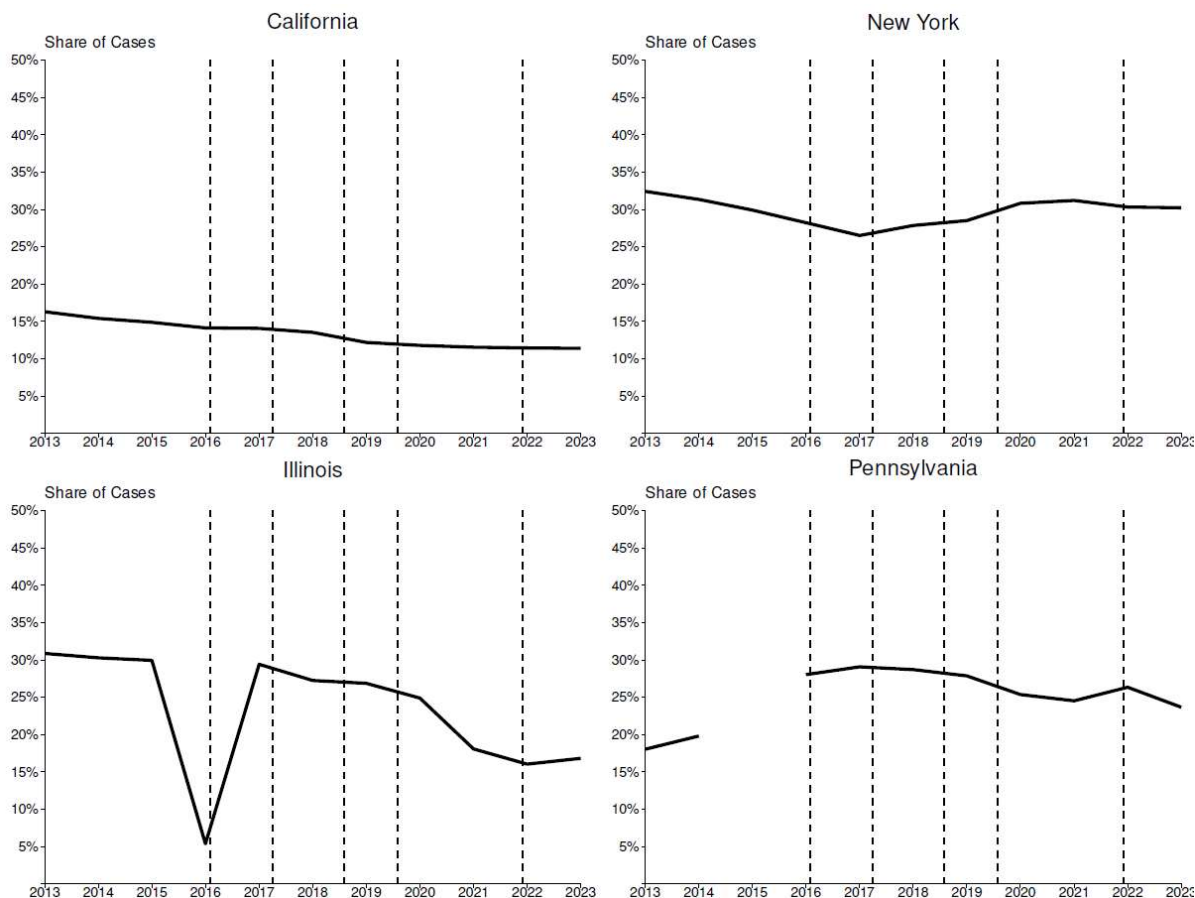
Source: United States Substance Abuse and Mental Health Services Administration (SAMHSA), Mental Health Client-Level Data ("SAMHSA MH-CLD"); APA DSM History; "Division of Mental Health Williams Semi-Annual Report #12," *Illinois Department of Human Services*, available at <https://www.dhs.state.il.us/OneNetLibrary/27897/documents/Mental%20Health/Williams/10202017/SemiAnnualReport-12.pdf> ("Williams Semi-Annual Report #12")

Note: This chart shows the proportion of individuals who were diagnosed with a depressive disorder in the SAMHSA MH-CLD, which provides annual information on the mental health characteristics for individuals who have accessed mental health services in facilities or through programs funded or operated by the state mental health facility. Data have been restricted to the 12–14 and 15–17 age groups and the states of California, New York, Illinois, and Pennsylvania. I note that some states do not report data in particular years. I note that the DSM was revised in both 2013 and 2022. These revisions included changes to diagnosis criteria as well as language revisions. I note that the 2016 decrease in diagnosis rates in Illinois coincided with a state budget impasse that had "a rippling effect on the productivity and momentum of community mental health vendors" and therefore may not reflect true trends in diagnoses. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

114. The data presented in Figure 15 below show that (i) the rate of diagnosed ADD or ADHD among Teens in the four largest UDAP States reported by SAMHSA have not consistently increased across the time period for which data are available, (ii) changes in the rate vary across the four largest UDAP States, and (iii) any increases in the rate do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue (as denoted by the lines on the charts). For example, the rate of diagnosed ADD or ADHD increases in some periods but declines in others, and indeed in some UDAP States like New York, the rate remains at a similar or lower level in the most recent year of data compared to the level in the first year. I present results for the full set of UDAP States in Appendix F, Figure F.10.

Figure 15

Share of Teens Who Accessed Mental Health Services in the Four Largest UDAP States Diagnosed with ADD or ADHD Over Time



Source: SAMHSA MH-CLD; APA DSM History; Williams Semi-Annual Report #12

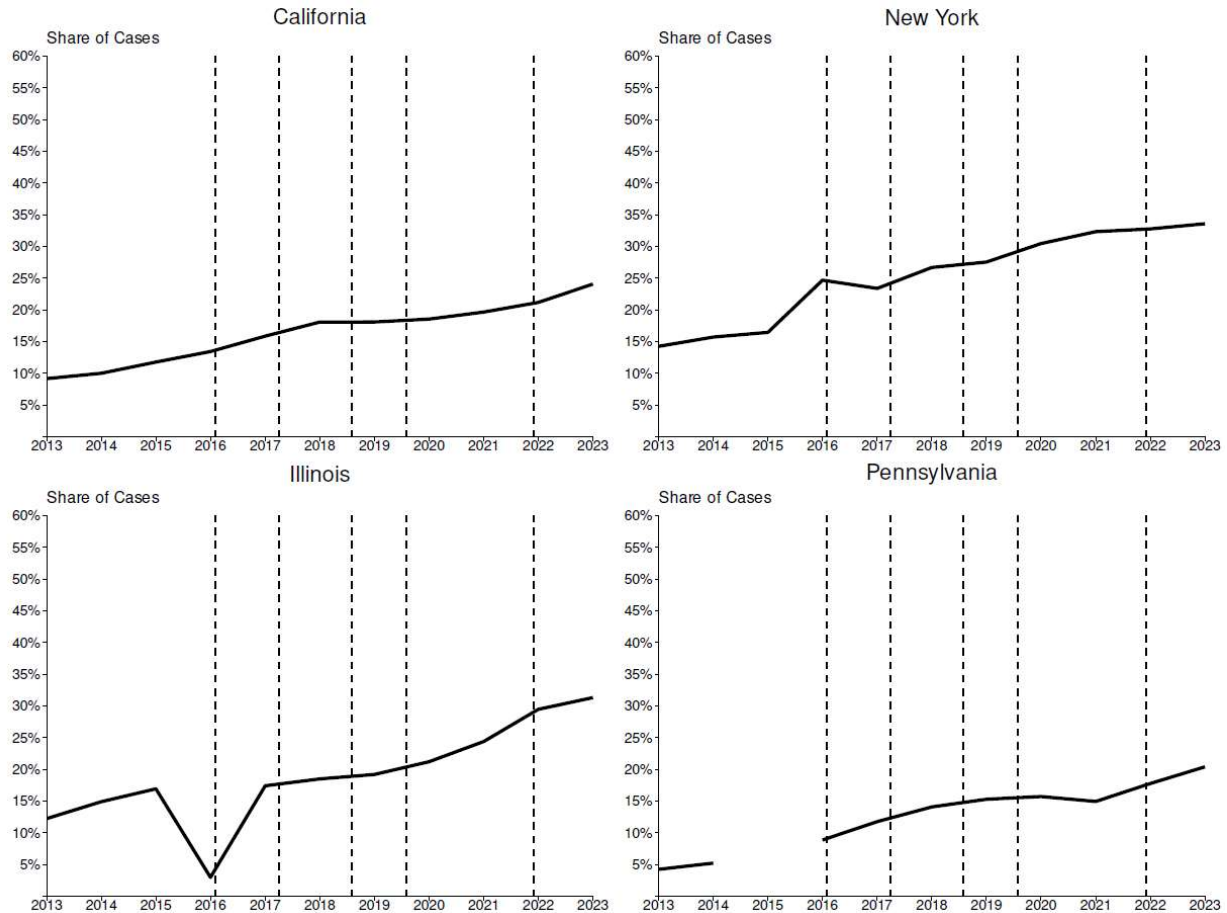
Note: This chart shows the proportion of individuals who were diagnosed with an attention deficit/hyperactivity disorder in the SAMHSA MH-CLD, which provides annual information on the mental health characteristics for individuals who have accessed mental health services in facilities or through programs funded or operated by the state mental health facility. Data have been restricted to the 12–14 and 15–17 age groups and the states of California, New York, Illinois, and Pennsylvania. I note that some states do not report data in particular years. I note that the DSM was revised in both 2013 and 2022. These revisions included changes to diagnosis criteria as well as language revisions. I note that the 2016 decrease in diagnosis rates in Illinois coincided with a state budget impasse that had “a rippling effect on the productivity and momentum of community mental health vendors” and therefore may not reflect true trends in diagnoses. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters, time management tools, and Instagram’s multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

115. The data presented in Figure 16 below show that (i) the rate of diagnosed anxiety among Teens in the four largest UDAP States reported by SAMHSA has increased, but, as shown in Appendix F, Figure F.11, it has not increased in all UDAP States, and (ii) changes in the rate vary across UDAP States. For example, while the rate of diagnosed anxiety among Teens increased in New York, California, Illinois, and Pennsylvania, I show in Appendix F, Figure F.11 that the rate of diagnosed anxiety remained constant or even declined in Delaware, Nebraska, and North Carolina.¹⁶⁸

¹⁶⁸ As noted above, the DSM was revised in 2013 and 2022; changes in these years may be due to the revision.

Figure 16

Share of Teens Who Accessed Mental Health Services in the Four Largest UDAP States Diagnosed with Anxiety Over Time



Source: SAMHSA MH-CLD; APA DSM History; Williams Semi-Annual Report #12

Note: This chart shows the proportion of individuals who were diagnosed with an anxiety disorder in the SAMHSA MH-CLD, which provides annual information on the mental health characteristics for individuals who have accessed mental health services in facilities or through programs funded or operated by the state mental health facility. Data have been restricted to the 12–14 and 15–17 age groups and the states of California, New York, Illinois, and Pennsylvania. I note that some states do not report data in particular years. I note that the DSM was revised in both 2013 and 2022. These revisions included changes to diagnosis criteria as well as language revisions. I note that the 2016 decrease in diagnosis rates in Illinois coincided with a state budget impasse that had “a rippling effect on the productivity and momentum of community mental health vendors” and therefore may not reflect true trends in diagnoses. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters, time management tools, and Instagram’s multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

3. YRBS Mental Health Data

116. The CDC’s Youth Risk Behavior Surveillance System administers the YRBS, a bi-annual national survey of a nationally representative sample of 9th through 12th grade students in public and private schools.¹⁶⁹ The YRBS includes data on Teens in UDAP States and is also representative for UDAP States.¹⁷⁰ I analyze the percent of Teens who report experiencing feelings of sadness or hopelessness, suicidal behaviors, and cyberbullying.¹⁷¹ My analysis of the YRBS data presented in this section supports my conclusions that (i) there are not consistent, widespread increases in mental health challenges over time, (ii) changes in mental health outcomes vary among UDAP States, and (iii) increases in mental health challenges do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue.

117. The data presented in Figure 17 below show that while the rate of reported feelings of sadness and hopelessness among Teens reported by the YRBS have increased over time in the UDAP States relative to the first year for which data are available, changes in mental health outcomes vary across UDAP States. For example, while the rate of reported feelings of sadness and hopelessness increased over time, including most recently, in California and New York, the rate declined in the most recent year of the data for Illinois and Pennsylvania. Similarly, I show in Appendix F, Figure F.12, that the rate of reported feelings of sadness and hopelessness

¹⁶⁹ “Youth Risk Behavior Surveillance System (YRBSS),” *Office of Disease Prevention and Health Promotion*, February 2025, available at <https://odphp.health.gov/healthypeople/objectives-and-data/data-sources-and-methods/data-sources/youth-risk-behavior-surveillance-system-yrbss> (“These surveys are conducted every two years... The national survey, conducted by the Centers for Disease Control and Prevention (CDC), provides data representative of 9th through 12th grade students in public and private schools in the United States.”).

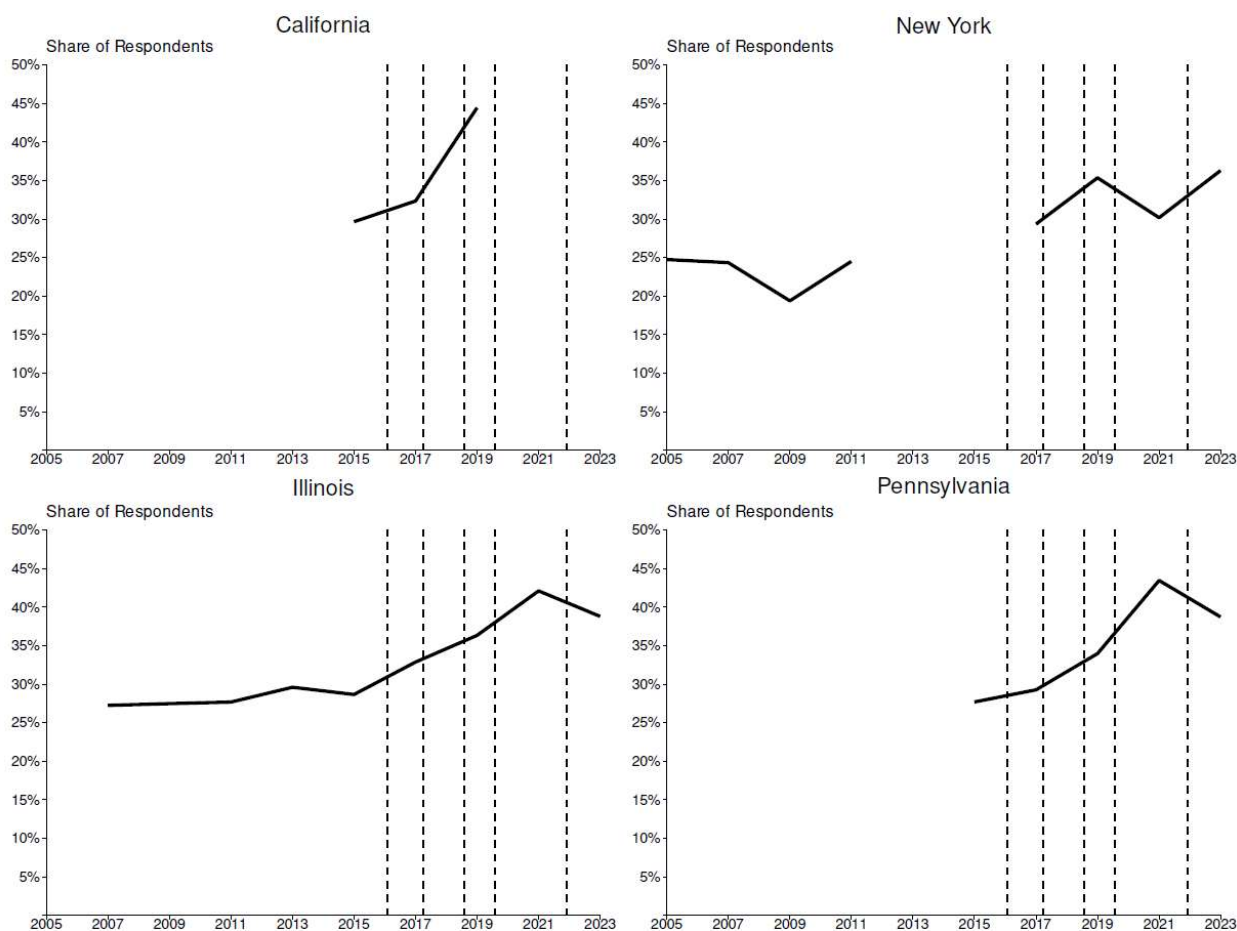
¹⁷⁰ “YRBSS Methods,” *Centers for Disease Control and Prevention*, October 8, 2024, available at <https://www.cdc.gov/yrbs/methods/index.html> (“Who do the state and local YRBSS data represent? Most state, territory, tribal government, and local YRBSS data that are weighted are representative of all public school students in grades 9–12 in the respective jurisdiction.”).

¹⁷¹ My analysis begins in 2005, the first years for which data are available. Note that, in order to extrapolate the shares in the survey sample to the population of UDAP States and nationally, responses are multiplied by respondent weights provided by the CDC for the YRBS data. These respondent weights account for non-responses and the oversampling of certain demographic groups and ensure that the weighted totals of respondents in the survey for each grade match population projections for the survey year. See “2023 YRBS Data User’s Guide,” *Centers for Disease Control and Prevention*, September 2024, available at https://www.cdc.gov/yrbs/media/pdf/2023/2023_National_YRBS_Data_Users_Guide508.pdf, p. 5 (“A weighting factor was applied to each student record to adjust for nonresponse and the oversampling of Black and Hispanic students in the sample. The final, overall weights were scaled so the weighted count of students was equal to the total sample size, and the weighted proportions of students in each grade matched population projections for each survey year.”).

declined in the most recent year of data in Indiana, Nebraska, New Jersey, North Carolina, and Virginia.

Figure 17

Share of Teens in the Four Largest UDAP States Feeling Sad or Hopeless Over Time



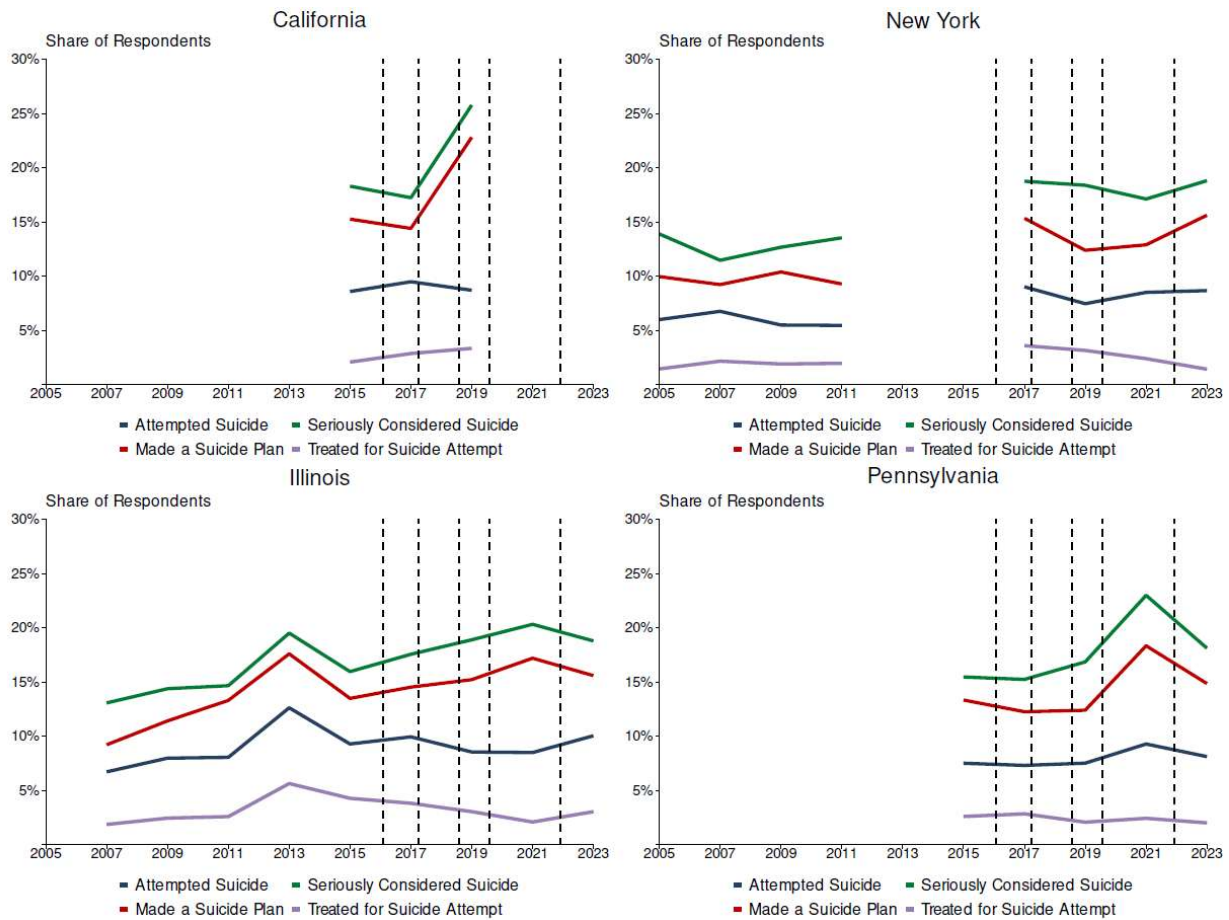
Source: Centers for Disease Control and Prevention (CDC), YRBS Data

Note: This chart shows the share of students who responded “Yes” to the following question in the YRBS: “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?” The YRBS is a bi-annual national survey of 9th through 12th grade students in public and private schools. Responses have been restricted to 13–17-year-old students in the states of California, New York, Illinois, and Pennsylvania. The state-level YRBS is representative at the state-level. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the CDC for the YRBS data. These respondent weights account for non-responses and the oversampling of certain demographic groups and ensure that the weighted totals of respondents in the survey for each grade match population projections for the survey year. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

118. The data presented in Figure 18 show the rates of reported suicidal behaviors among Teens reported by the YRBS, including seriously having considered suicide, made a suicide plan, attempted suicide, or been treated for a suicide attempt. The data indicate that (i) while the rates of Teens reporting some suicidal behaviors have increased in some UDAP States, the rates have remained relatively constant in other suicidal behaviors and other UDAP States as shown in Appendix F, Figure F.13, (ii) changes in the rates vary across UDAP States, and (iii) any increases in rates do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue (as denoted by the lines on the charts).

Figure 18

Share of Teens in the Four Largest UDAP States Reporting Suicidal Behaviors Over Time



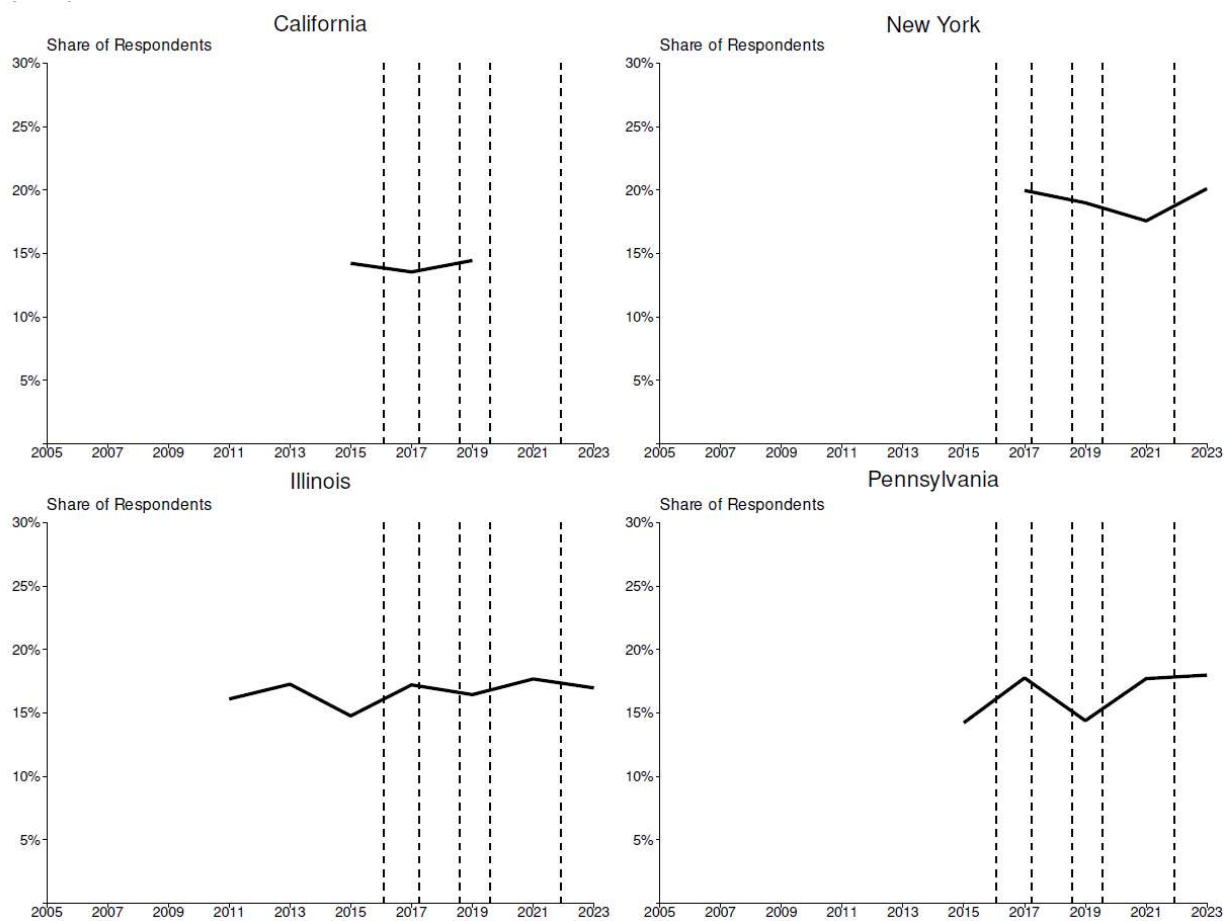
Source: Centers for Disease Control and Prevention (CDC), YRBS Data

Note: This chart shows the share of students who responded “Yes” to the following questions in the YRBS: “During the past 12 months, did you ever seriously consider attempting suicide?” “During the past 12 months, did you make a plan about how you would attempt suicide?” “During the past 12 months, how many times did you actually attempt suicide?” and “If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?” The YRBS is a bi-annual national survey of 9th through 12th grade students in public and private schools. Responses have been restricted to 13–17-year-old students and the states of California, New York, Illinois, and Pennsylvania. The state-level YRBS is representative at the state-level. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the CDC for the YRBS data. These respondent weights account for non-responses and the oversampling of certain demographic groups and ensure that the weighted totals of respondents in the survey for each grade match population projections for the survey year. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters, time management tools, and Instagram’s multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

119. The data presented in Figure 19 below show the rates of reported cyberbullying among Teens reported by the YRBS. The data indicate that (i) the rate of Teens reporting cyberbullying has not consistently increased across the time period for which data are available, (ii) changes in the rate vary across UDAP States, and (iii) any increases in rates do not appear to consistently coincide with the introduction of the features I describe in Section V.A that the Court specifically indicated are still at issue (as denoted by the lines on the charts). For example, the rate of Teens reporting cyberbullying increases in some periods but declines in others, and indeed in some UDAP States like California, New York, and Illinois, the line remains at a similar level in the most recent year of data as in the first. I present results for the full set of UDAP States in Appendix F, Figure F.14.

Figure 19

Share of Teens in the Four Largest UDAP States Who Were Cyberbullied Over Time



Source: Centers for Disease Control and Prevention (CDC), YRBS Data

Note: This chart shows the share of students who responded “Yes” to the following question in the YRBS: “During the past 12 months, have you ever been electronically bullied? (Count being bullied through texting, Instagram, Facebook, or other social media.)?” The YRBS is a bi-annual national survey of 9th through 12th grade students in public and private schools. Responses have been restricted to 13–17-year-old students in the states of California, New York, Illinois, and Pennsylvania. The state-level YRBS is representative at the state-level. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the CDC for the YRBS data. These respondent weights account for non-responses and the oversampling of certain demographic groups and ensure that the weighted totals of respondents in the survey for each grade match population projections for the survey year. The dashed vertical lines represent launch announcement months for the features described in Section V.A, namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

120. The fact that mental health trends among Teens have not demonstrated consistent, widespread increases across most mental health outcomes and in all UDAP States over time is inconsistent with Plaintiffs' assertions that Instagram, Facebook, or the features I describe in Section V.A that the Court specifically indicated are still at issue have substantially contributed to Teen mental health challenges in UDAP States. Thus, in totality, the available data on the mental health of Teens in UDAP States are inconsistent with any conclusion that Mr. Saba's tallies represent indicators of any consumer harm according to Plaintiffs' theories.

VIII. MR. SABA'S TALLIES OF "BAD ENCOUNTERS" REPORTED BY TEENS BASED ON THE BEEF SURVEY RESULTS ARE FLAWED AND UNRELIABLE

121. A key part of Mr. Saba's analysis of the BEEF Survey is his use of the average rate at which Teen respondents reported experiencing a set of issues within the last seven days, such as witnessing or being the target of bullying. His analysis incorporates the response rates directly from the survey, but then, using certain unstated assumptions, he extrapolates these weekly rates into what he claims are average rates that respondents would experience an issue within a month.¹⁷² I find his methodology to be unreliable because he makes faulty statistical assumptions when extrapolating from the BEEF Survey, yielding "bad encounter" rates that are even contradicted by other relevant data from the BEEF Survey itself. More broadly, he has made no effort to verify either the accuracy or the representativeness of the survey results and therefore has no basis to extrapolate the results to the 18 UDAP States over the entire Relevant Period.

122. The BEEF Survey asked respondents if they have experienced a range of issues, with the following response options: "Yes, during the last 7 days," "Yes, but more than 7 days ago," and "No."¹⁷³ Importantly, the first two responses can be combined to indicate whether the respondent has *ever* experienced the particular issue being asked. These responses directly contradict Mr. Saba's flawed analysis and extrapolations. For example, Mr. Saba, based on his extrapolation in Schedule 5.1.1, finds that the average monthly rate a respondent would experience a "negative

¹⁷² Saba Report, ¶¶ 215–216 ("As reflected in Schedule 5.3, I utilized data from the BEEF Survey relating to the Rate and Average Frequency at which Teen Instagram users reported encountering certain Issues... Multiplying Rate by Frequency yields the number of Average Weekly Encounters per User for each issue... In Schedule 5.2, I used this Average Weekly Encounters per person metric for each Issue (Frequency x Rate) and converted it to Average Monthly Encounters, using the number of weeks and months in a year.").

¹⁷³ Instagram Presentation, "Bad Experiences and Encounters Framework (BEEF) Survey," June 27–July 8, 2021, META3047MDL-004-00015029–063 at 033.

comparison” is 62.4 percent.¹⁷⁴ However, BEEF Survey data indicate that only 42.5 percent of Teens have *ever* experienced negative comparisons using Instagram, let alone within a given month.¹⁷⁵ Mr. Saba appears to ignore this information, which undermines the reliability of his extrapolation of a weekly rate into a monthly rate.

Figure 20

Comparison of Mr. Saba's Monthly Encounters Estimate to the Share of Respondents Ever Experiencing Issue

Issue	Weekly Encounters Rate ^[1]	Saba's Imputed Monthly Encounters Rate Estimate ^[2]	Share of Respondents Ever Experiencing Issue ^[3]	Difference Between Saba Imputed Rate and Rate of Ever Experiencing Issue
Bully Witness	28.58%	76.77%	60.68%	16.09%
Hate Witness	27.52%	75.18%	56.91%	18.27%
Perceived Control	19.31%	60.51%	39.38%	21.13%
Negative Comparison	20.24%	62.39%	42.48%	19.90%
Nudity	18.74%	59.23%	44.52%	14.71%
Violence	13.68%	47.19%	42.76%	4.43%
Unwanted Advances	13.66%	47.19%	41.96%	5.23%
Bully Target	10.13%	36.96%	36.30%	0.66%
Self Harm	7.69%	29.33%	28.86%	0.48%
Drugs	3.61%	14.69%	11.25%	3.44%

Source: META3047MDL-019-00099822; Saba Report, Schedules 5.1.1–5.1.2

Note:

[1] In his “Low” methodology (Schedule 5.1.2), Mr. Saba assumes the monthly encounters rate is the same as the weekly encounters rate in Schedule 5.1.1.

[2] In his “High” methodology (Schedule 5.1.1), Mr. Saba calculates the monthly encounters rate as $1 - ((1 - \text{weekly rate})^{(52/12)})$.

[3] Calculated as the share of respondents answering either “Yes, during the last 7 day” or “Yes, but more than 7 days ago” when asked if they have ever had the specific bad experience.

123. His flawed assumption is also evident when comparing his purported monthly rates of exposure with findings from other studies evaluating similar experiences. For instance, a 2021 Thorn survey reports that “83% of 9-17 year olds who had an online sexual interaction reacted [by] reporting/blocking/muting,” and that “37% of 9-17 year olds who had an online sexual interaction told a parent/caregiver/trusted adult/peer.”¹⁷⁶ In contrast, the BEEF Survey reported that only 66.5 percent of survey respondents who experience unwanted sexual advances blocked

¹⁷⁴ Saba Report, ¶ 223, footnote 274 (“Schedule 5.1.1. The Rates for each of the ten Bad Encounter Issues are... 62.39% (Negative Comparison).”).

¹⁷⁵ The “ever” rate refers to answering the BEEF Survey with either, “Yes, the last 7 days” or “Yes, more than 7 days ago.” See META3047MDL-019-00099822, Sheet “issues x age.”

¹⁷⁶ “Responding to Online Threats: Minors’ Perspectives on Disclosing, Reporting, and Blocking,” *Thorn*, May 2021, available at https://info.thorn.org/hubfs/Research/Responding%20to%20Online%20Threats_2021-Full-Report.pdf, p. 19.

or muted the account, while only 4.8 percent “[t]alked to a parent or close friend about it.”¹⁷⁷

These discrepancies suggest that Mr. Saba’s interpretation of the BEEF Survey results is unreliable, and his analysis may not accurately reflect the actual rates of such experiences.

124. Mr. Saba also calculates the “[c]umulative [p]robability of [e]xposure to a [s]ingle [of the ten] [i]ssue[s], [c]ombined,” arriving at a probability of 99.96 percent.¹⁷⁸ I find this methodology is also flawed. In addition to using inflated monthly rates as inputs to his calculation, Mr. Saba makes a number of assumptions that are unsupported. In particular, he assumes, without any evidence, that exposure to each encounter is random and statistically independent (*i.e.*, the probability of each encounter is independent from the likelihood of a repeat encounter, both over time and within a person). For Mr. Saba’s cumulative probability calculation to be accurate and reliable, there is an implicit assumption that each of the events he includes must be statistically independent, that is, the likelihood of each occurring is not dependent on another event. If a user who witnessed bullying one week was more likely to experience that same bad encounter another week, Mr. Saba’s estimates in Schedule 5.1.1 would be flawed. Similarly, if a user who witnessed bullying in one week was more likely to also be a target of bullying, Mr. Saba’s estimates in both Schedules 5.1.1 and 5.1.2 would be flawed. However, Mr. Saba does not provide any basis to make such assumptions of statistical independence.

125. Mr. Saba attempts to partially address one of these concerns in Schedule 5.1.2, which, rather than assuming no correlation between “bad encounters” over a month (*i.e.*, an individual with a bad encounter in one week is equally likely to have a bad encounter in the next week as an individual who did not have a bad encounter the first week)), assumes 100 percent correlation over that month.¹⁷⁹ He finds that when he addresses one of these concerns, his results fall from 2.4 billion instances to 779 million, a 67 percent drop.¹⁸⁰ However, he continues to assume without evidence that someone who has not been exposed to nine of ten bad encounters is equally likely to be exposed to the tenth as someone who has been exposed to nine bad

¹⁷⁷ Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063 at 043.

¹⁷⁸ Saba Report, Schedule 5.1.1.

¹⁷⁹ Saba Report, ¶ 225 (“I have prepared an alternative calculation of bad encounter instances in Schedule 5.1.2. These calculations very conservatively assume that there is 100% correlation between the Teens who experience a particular bad encounter in each successive week.”).

¹⁸⁰ Saba Report, ¶ 226 (“As shown in Schedule 5.1.2, the total number of instances from February 2018 to March 2024 is over 779 million, covering all ten Bad Encounter Issues.”).

encounters categories. This maintained assumption of independence appears implausible and unsupported.

126. In addition to these flaws, Mr. Saba's assumption that the BEEF Survey is applicable to the period of his analysis is without basis and likely incorrect. The BEEF Survey was conducted from June 27 through July 8, 2021.¹⁸¹ This 11-day period, which included a holiday weekend, occurred around the time of the COVID-19 pandemic, when Teens may have interacted with social media differently. Mr. Saba assumes, without any credible justification, that the BEEF Survey results are representative of Teens' experiences on Instagram for the entire period from February 1, 2018 through March 2024.¹⁸²

127. Meta rolled out new features on Instagram both before and after the BEEF Survey period. These updates, particularly those introduced after the survey, may have improved user experiences, potentially rendering the survey findings inapplicable to subsequent periods. In fact, many of these features were designed to target the very issues that Mr. Saba focuses on in the BEEF Survey. For example, in 2023, Meta rolled out its "Take It Down" tool which was designed to "prevent the spread of young [users'] intimate images."¹⁸³ In early 2024, Meta rolled out a feature to restrict search results for sensitive topics, including "results in Instagram Search related to suicide, self-harm and eating disorders."¹⁸⁴ In late 2024, Instagram launched Teen Accounts, which have built-in privacy and safety features, to provide a safer experience for young users.¹⁸⁵ Appendix H shows a timeline of the features launched on Instagram after the BEEF Survey that were intended to improve the user experience on Instagram. While Mr. Saba

¹⁸¹ Instagram Presentation, "Bad Experiences and Encounters Framework (BEEF) Survey," June 27–July 8, 2021, META3047MDL-004-00015029–063 at 029.

¹⁸² Mr. Saba expresses that he believes this is a "reasonable assumption" but does not attempt to explain why. *See* Saba Report, ¶ 217 ("While the reasonableness of this assumption will ultimately be decided by the trier of fact, I find this to be a reasonable assumption.").

¹⁸³ *See* "Meta Help Center: Timeline of Tools, Features and Resources to Help Support Teens and Parents," *Meta*, available at <https://www.meta.com/help/policies/809291991003600/>; Appendix H.

¹⁸⁴ *See* "Meta Help Center: Timeline of Tools, Features and Resources to Help Support Teens and Parents," *Meta*, available at <https://www.meta.com/help/policies/809291991003600/>; Appendix H.

¹⁸⁵ "Introducing Instagram Teen Accounts: Built-In Protections for Teens, Peace of Mind for Parents," *Instagram*, September 17, 2024, available at <https://about.instagram.com/blog/announcements/instagram-teen-accounts> ("The new Teen Account protections are designed to address parents' biggest concerns... Private accounts... Messaging restrictions... Sensitive content restrictions... Limited interactions... Time limit reminders... Sleep mode enabled.").

cites to testimony by Arturo Bejar, who was dismissive of some of these Features he reviewed,¹⁸⁶ Mr. Saba cites to no quantitative evidence that these were completely ineffective. Moreover, Mr. Saba does not consider how these initiatives may have improved user experiences after the BEEF Survey was conducted. To the extent that these features did indeed improve the Teen User experience, they undermine Mr. Saba's extrapolation methodology he uses in his analysis of the BEEF Survey.

128. For these reasons, Mr. Saba's analysis is flawed and unreliable.

IX. MR. SABA'S CALCULATIONS OF META'S REVENUES AND GROSS PROFIT FOR AGED-UP TEENS WHO EXCEEDED CERTAIN THRESHOLDS OF TIME SPENT ON INSTAGRAM OR FACEBOOK ARE FLAWED AND UNRELIABLE

129. As I discuss in Section V.B.2, Mr. Saba calculates the revenues, costs, and gross profits earned by Instagram and Facebook on Teen accounts spending more than half an hour, 1 hour, 2 hours, 3 hours, 4 hours, and 5 hours per day in a given month during the period for which users were Teens and Aged-Up Teens. Mr. Saba calculates gross profits for Aged-Up Teens "for purposes of disgorgement," noting that he understands that Plaintiffs claim that "absent IG and FB's alleged violations of UDAP Statutes, IG and FB would not have earned these profits."¹⁸⁷

130. Importantly, I note that while Mr. Saba estimates positive gross profits for Aged-Up Teens, Mr. Saba's estimates of Meta's gross profits for Teens is negative, indicating that Meta does not profit from Teen Users during their Teen years.¹⁸⁸ Regardless, for both Teens and Aged-Up Teens, Mr. Saba's analysis is conceptually flawed, methodologically unsound, and unreliable.

(i) Specifically, Mr. Saba's analysis of both Teens and Aged-Up Teens assumes an unsupported and highly improbable but-for world. Mr. Saba assumes that, absent the alleged misconduct, these Teen Users would not generate any advertising revenue at all. This assumption can only make sense if, absent the alleged misconduct, they would have

¹⁸⁶ Saba Report, ¶¶ 84–85 ("I have reviewed deposition testimony by Mr. Arturo Bejar on certain of the above features introduced by Meta... Mr. Bejar testified that, notwithstanding Meta's February 7, 2019 public announcement of 'further changes to our approach on self-harm content'... the Company 'had not addressed the issues' at the time of that announcement.'").

¹⁸⁷ Saba Report, ¶ 17, 17.e

¹⁸⁸ See Section V.B.2.

never spent any time on Instagram or Facebook at any point during the Relevant Period through March 2024, including after turning 18 years old. I discuss this further in Section IX.A below.

(ii) Not only is Mr. Saba's analysis of Meta's revenues and gross profits conceptually flawed, his methodology for computing these revenues and gross profits is also flawed and unreliable for a variety of reasons. In particular, Mr. Saba (i) fails to net out losses from when an Aged-Up Teen was a Teen, (ii) miscalculates the percentage of 17-year-olds above a certain threshold of time based on his own results, and (iii) uses stated age (rather than predicted age as he does at other points in his analysis) to identify cohorts of 17-year-olds without sufficient justification.¹⁸⁹ Additionally, Mr. Saba presents results for Teens and Aged-Up Teens that are highly sensitive to the low time spent thresholds he uses, namely the half an hour and 1 hour daily average time thresholds. I discuss this further in Section IX.B below.

A. Mr. Saba's Approach to Estimating Meta's Revenues and Gross Profit for Aged-Up Teens Is Conceptually Flawed

131. Counterfactual analysis is a common approach that economists use to assess the isolated impact of a specific event. In essence, it compares the actual world with a hypothetical world in which the event in question did not occur. The difference between the outcomes in the hypothetical world, *i.e.*, the "but-for" world, and the actual world represents the isolated impact of the event in question. Applying this framework to Mr. Saba's analysis sheds light on the assumptions he is making in his analysis of gross profit for Aged-Up Teens.

132. As I discuss in Section V.B.2, Mr. Saba calculates Meta's revenues, costs, and gross profits for any Aged-Up Teens who exceeded certain time spent thresholds on Instagram and Facebook in any single month during the period for which Mr. Saba performs his analysis and who turned 18 during the Relevant Period. Notably, Mr. Saba's analysis is intended to estimate

¹⁸⁹ I note that there may be additional methodological flaws in Mr. Saba's analysis of Meta's revenues and gross profits for Teens and Aged-Up Teens. For example, Mr. Saba does not take into account geographic variation in Meta's revenues and gross profits for Teens and Aged-Up Teens. He also assumes, without basis, that Meta's revenues, costs, and profits for Teens and Aged-Up Teens linearly increase with each additional increment of time a user spends on Instagram or Facebook. Additionally, Mr. Saba uses a retention of Aged-Up Teens year-over-year on Instagram and Facebook that fails to account for variation over time in retention rates on Instagram and Facebook as well as variation in retention rates between the two services.

100 percent of the estimated profits from this group for the purpose of disgorgement (and relies on Mr. Saba's understanding that absent the violations, these profits would not have been earned).¹⁹⁰

133. Mr. Saba's analysis assumes that in the "but-for" world absent Meta's alleged violations of UDAP Statutes, Meta would not have earned any profits associated with Aged-Up Teen Users who exceeded certain thresholds of time spent as Teen Users. This is equivalent to assuming that, in this counterfactual world absent the alleged misconduct, these Aged-Up Teens would not have used Instagram or Facebook at all after turning 18. This is an aggressive and unsupported assumption.

134. First, total screen time data, which I address in Section VI.A, indicate that as early as 2007, Teens spent on average 3.7 hours per day or more on screen time.¹⁹¹ Therefore, it is highly plausible that even absent the alleged conduct, some Teens would have spent at least 30 minutes per day on Instagram or Facebook.

135. Second, there is no intuitive explanation for why Teens spending 30 minutes per day on average should be treated differently from Teens spending 29 minutes per day on average, or how these different use patterns as Teens would translate into such drastically different use patterns as adults in the counterfactual world. Yet, Mr. Saba calculates profits for the purpose of disgorgement for the 30 minute group but not the 29 minute group.

136. Regarding time spent as Aged-Up Teens, Mr. Saba could have proposed a more plausible assumption, such as an assumption that certain Teens would have just spent *less* time on Instagram and Facebook (instead of *no* time) when they became adults. This would require him to assume that for these users, less profit would have been earned in the but-for world, not zero profits. If Mr. Saba had posited a less extreme assumption like this, he would have obtained a far lower estimate of disgorged profits associated with affected Teens. However, Mr. Saba accepts Plaintiffs' claim that "absent IG and FB's alleged violations of UDAP Statutes, IG and FB would not have earned these profits", yet he provides no support for this assumption, namely why Teens would have spent less time on the platform, how much less time they would have spent,

¹⁹⁰ Saba Report, ¶ 17.e ("I understand that the MDL Plaintiffs claim that absent IG and FB's alleged violations of UDAP Statutes, IG and FB would not have earned these profits.").

¹⁹¹ See Workpaper 9.

what profits would have been, and any support for the assumption that the cause of the additional time spent in the actual world was related to the alleged conduct and the At-Issue Features.¹⁹²

B. Mr. Saba's Execution of his Methodology for Estimating Meta's Revenues and Gross Profits for Teens and Aged-Up Teens is Flawed and Unreliable

137. Not only is Mr. Saba's analysis of Meta's revenues and gross profits conceptually flawed, his methodology for computing these revenues and gross profits is also flawed and unreliable. Mr. Saba inappropriately inflates his calculations of Meta's revenues and gross profits for the purposes of disgorgement. In particular, Mr. Saba (i) fails to net out losses from when an Aged-Up Teen was a Teen, (ii) miscalculates the percentage of 17-year-olds above a certain threshold of time based on his own results, and (iii) uses stated age (rather than predicted age as he does at other areas of his analysis) to identify cohorts of 17-year-olds.¹⁹³ Additionally, Mr. Saba presents results for Teens and Aged-Up Teens that are highly sensitive to the low time spent thresholds he uses, namely the half an hour and 1 hour daily average time thresholds.

138. First, Mr. Saba inflates his calculations of Meta's revenues and gross profits for the purposes of disgorgement by failing to net out losses from when Aged-Up Teens were Teens. Mr. Saba notably estimates Meta's gross profits for Teens to be negative, indicating that Meta does not profit from Teen Users during their Teen years, and in fact incurs losses during this time of a user's life.¹⁹⁴ Despite this, Mr. Saba goes on to estimate Meta's gross profits for these same Teens as Aged-Up Teens, from the time they turned 18 during the Relevant Period onwards, with no consideration for Meta's losses during the time these Aged-Up Teens were Teens. Specifically, Mr. Saba does not subtract Meta's losses from the time during which Aged-Up Teens were Teens from the gross profits he presents for the purposes of disgorgement. As shown in Figure 21 below, if Mr. Saba had netted out these losses, his estimates of gross profits for

¹⁹² Saba Report, ¶ 17.e.

¹⁹³ I note that there may be additional methodological flaws in Mr. Saba's analysis of Meta's revenues and gross profits for Teens and Aged-Up Teens. For example, Mr. Saba does not take into account geographic variation in Meta's revenues and gross profits for Teens and Aged-Up Teens. He also assumes, without basis that Meta's revenues, costs, and profits for Teens and Aged-Up Teens linearly increase with each additional increment of time a user spends on Instagram or Facebook. Additionally, Mr. Saba uses a retention of Aged-Up Teens year-over-year on Instagram and Facebook that fails to account for variation over time in retention rates on Instagram and Facebook as well as variation in retention rates between the two services.

¹⁹⁴ See Section V.B.2.

Meta for the purposes of disgorgement aggregated across all UDAP States would have been zero overall.¹⁹⁵ Regarding specific thresholds, had Mr. Saba netted, he would show a net loss for every time spent threshold for Facebook except the half an hour to 1 hour threshold, and for Instagram, a net loss for every time spent threshold except the half an hour to 1 hour, 1 hour to 2 hour, and 5 hour thresholds. For Facebook, the half an hour to 1 hour threshold would be reduced by 71 percent. For Instagram, the half an hour to 1 hour threshold would be reduced by 42 percent, the 1 hour to 2 hour threshold would be reduced by 99 percent, and the 5 hour threshold would be reduced by 93 percent. I present net profits calculated analogously for each UDAP State in Appendix I, Figure I.1. Thus, for the purposes of disgorgement, Mr. Saba provides a misleading and unjustified amount of gross profits Meta earned over the course of the Relevant Period.

Figure 21

Mr. Saba's Estimates of Meta's Net Profits Associated with "Affected" Teens and Aged-Up Teens by Time Threshold Across All UDAP States

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$510.0	\$330.6	\$102.3	\$33.4	\$6.4	\$1.4	\$984.0
Teen Profit	-\$215.3	-\$325.9	-\$179.1	-\$127.5	-\$48.4	-\$1.2	-\$897.4
Net Profit	\$294.7	\$4.7	-\$76.8	-\$94.1	-\$42.0	\$0.1	\$86.7
<i>Facebook (millions)</i>							
Aged-Up Teen Profit	\$112.4	\$68.6	\$20.3	\$10.6	\$2.6	\$0.8	\$215.3
Teen Profit	-\$79.9	-\$115.1	-\$65.9	-\$68.9	-\$17.6	-\$3.1	-\$350.5
Net Profit	\$32.5	-\$46.5	-\$45.6	-\$58.3	-\$14.9	-\$2.4	-\$135.2

Source: Saba Report, Schedules 2.8.8, 2.9.1, 2.10.1, 4.1.3

Note: Profits are calculated by summing the aggregate gross profits across all UDAP States in Saba's schedules.

139. Mr. Saba also inflates his calculations of Meta's revenues and gross profits for Aged-Up Teens by miscalculating the number of 17-year-olds above a certain threshold of time spent

¹⁹⁵ Net profits for Instagram would be \$86.7 million and -\$135.2 million for Facebook, bringing total net profit for Meta to be negative, and therefore, profits to be disgorged would be zero.

based on his own results for both Instagram and Facebook from 2018 to 2024.¹⁹⁶ As I discuss in Section V.B.1, Mr. Saba uses a linear interpolation method to approximate the percentiles of monthly Teen Users for which the length of sessions exceeded half an hour, 1 hour, 2 hours, 3 hours, 4 hours, or 5 hours.¹⁹⁷ In some months, the 99th percentile of average daily time spent is below the time spent threshold imposed by Mr. Saba. Without an upper bound, Mr. Saba cannot interpolate the number of Teen Users exceeding a certain amount of time spent on either Instagram or Facebook in these months. Accordingly, for these months, he does not provide an estimate of the number of Teens exceeding these time spent thresholds. However, when Mr. Saba purports to calculate the average count of Teens in each month above a certain amount of time spent to determine gross profits, he fails to include these months where the number of Teens is zero in his calculation.¹⁹⁸ He does not provide any basis for this decision, and it has the effect of biasing upward his purported calculation for the average number of Teens exceeding time spent for certain thresholds. If Mr. Saba had appropriately factored in these months in his estimates of annual Teen Users (despite not being able to estimate a Teen count using his methodology), his estimates of gross profits for Aged-Up Teens would have been substantially lower for certain time thresholds, as I show below in Figure 22. I present similar results broken out for each UDAP State in Appendix I, Figure I.2. Thus, Mr. Saba inappropriately overstates his purported calculation of gross profits earned on Aged-Up Teens from the Relevant Period.

¹⁹⁶ Mr. Saba does not calculate the number of users exceeding thresholds at the monthly level for the Instagram Aged-Up Teen profits from 2013 to 2017. Meta did not produce data for the period between 2013 to 2017. Instead, Mr. Saba imputes these profits by adjusting Teen Census population counts by Instagram saturation rates and by the average rate of users exceeding thresholds from 2018 to 2024. By using the average rates of users exceeding thresholds from 2018 to 2024, Mr. Saba assumes that Teens would use Instagram and Facebook in the nascent years of these services at a similar rate to current usage. However, this contradicts Plaintiffs' belief that Meta has endeavored to make these services more addictive, increasing the number of users and usage per user over time. *See* Saba Report, Schedules 2.1–2.8.

¹⁹⁷ Saba Report, ¶¶ 128–129 (“I then performed the following calculation for each month. By way of example, in March 2018, the 75th percentile, i.e., 75%, of MAUs in California aged 13 to 17 spent less than 3,111 seconds a day on average during the month. The 80th percentile, i.e., 80%, spent less than 3,621 seconds a day on average. Using these two data points, I estimate using linear interpolation that 79.79 percent of MAU aged 13 to 17 spent less than 3,600 seconds a day on average, i.e., 1 hour. The converse of this computation reflects that 20.21 percent of MAUs aged 13 to 17 spent more than 3,600 seconds a day on average in the month of March 2018, i.e., more than 1 hour per day on average. Using the above methodology, for each month I have determined the percentages of MAUs aged 13 to 17 that spent more than 0.5, 1, 2, 3, 4 and 5 hours per day on average in each month, i.e., more than 1,800, 3,600, 7,200, 10,800 and 14,400 seconds.”).

¹⁹⁸ Saba Report, ¶ 130 (“I was not able to estimate the percentage that spent more than 3 hours per day on average for certain months because the percentile data did not allow for linear interpolation. The same was true for certain months for 4 and 5 hours per day: in such cases, I have not calculated any number of MAUs aged 13 to 17 spending more than 3, 4, or 5 hours a day on average on Instagram in that month.”).

Figure 22

Mr. Saba's Gross Profits for "Aged-Up" Teens After Adjusting His Methodology to Not Exclude Months when He Does Not Estimate Any Teen Users in a Given Threshold

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram (millions)</i>			
2–3 Hours Threshold	\$102.3	\$105.0	2.6%
3–4 Hours Threshold	\$33.4	\$32.8	-1.6%
4–5 Hours Threshold	\$6.4	\$3.5	-45.5%
5+ Hours Threshold	\$1.4	\$0.2	-86.9%
Total (2+ Hours)	\$143.4	\$141.4	-1.4%
<i>Facebook (millions)</i>			
2–3 Hours Threshold	\$20.3	\$21.3	5.0%
3–4 Hours Threshold	\$10.6	\$7.6	-28.4%
4–5 Hours Threshold	\$2.6	\$1.9	-28.8%
5+ Hours Threshold	\$0.8	\$0.1	-84.0%
Total (2+ Hours)	\$34.3	\$30.9	-9.9%

Source: Saba Report, Schedules 4.1.3, 4.2.1, 4.2.2, 4.2.4, 4.3.1, 4.3.2, 4.3.4

Note: Gross Profits by Mr. Saba are pulled from Schedule 4.1.3. Gross Profits adjusted for average method substitute zero for months previously shown to have MAU counts that were not able to be interpolated. Percent change in profits is calculated as adjusted profits minus Saba's profits, divided by Saba's profits.

140. Mr. Saba also inflates his calculations of Meta's revenues and gross profits for Aged-Up Teens on Instagram based on how he quantifies the estimated size of 17-year-olds cohorts (which, as I explain in Section V.B.2, is part of his methodology for estimating aged-up Teen profits of "affected" users).

141. Mr. Saba notes that "[f]rom January 2018 to September 2021, Meta's user data did not break out the total [Instagram] users by stated age."¹⁹⁹ Mr. Saba also notes that "Meta did not have and in any case did not produce data necessary to make [users by stated age] calculations for Instagram for the period 2013 to 2017."²⁰⁰ To address this, Mr. Saba applies the proportion of Teens that are 17 in October 2021 through December 2021 based on the *stated age* variable to estimates for the counts of Teen MAUs in two different ways. First, for the years 2013 to 2017, Mr. Saba computes the total percentage of stated 17-year-old users to Teen Users across states in

¹⁹⁹ Saba Report, ¶ 142.

²⁰⁰ Saba Report, ¶ 202.

2021, and applies this percentage to his estimated count of Teen MAUs in each year.²⁰¹ Second, for the years 2018 to 2020, Mr. Saba uses the percentage of stated 17-year-old users to total Teen Users within each state in 2021, and applies this percentage to the count of Teen MAUs in each state and year obtained from data produced by Meta.²⁰² Mr. Saba could have instead used the proportion of Teens that are 17-year-olds in 2022 based on the *predicted age* variable, which Mr. Saba uses in other areas of his analysis.²⁰³ Predicted age, based on Meta's Age Affinity model, considers a variety of inputs including a user's stated age and is used internally by Meta for tasks such as evaluating "growth by age ranges."²⁰⁴ In a deposition, Meta indicated that it was not "aware of a better method that Meta has for predicting user's single-year ages" than using predicted age based on Meta's Age Affinity model.²⁰⁵ The proportion of Teens that are 17 is lower using this predicted age than it is using stated age in each year in which both variables exist in the data used by Mr. Saba.²⁰⁶ If Mr. Saba had used proportion of Teens that are 17-year-olds in 2022 based on the *predicted age* variable rather than the proportion based on the *stated age* variable, his estimates of gross profits for Aged-Up Teens would have been substantially lower, as I show below in Figure 23. I present similar results broken out for each UDAP State in

²⁰¹ See Saba Report, Schedule 4.5.1. I note that data on the number of Teen MAUs on Instagram from 2013 to 2017 have not been produced. To estimate the number of Teen MAUs on Instagram, Mr. Saba first estimates the number of MAPs on Instagram in each year using the U.S. Census Teen Population and Teen saturation rate percentages obtained from documents produced by Meta. Mr. Saba then "multiplie[s] estimated US Teen Maps for each year in Schedule 2.5 by a user to person multiplier of 3.5 (Schedule 2.8.1) to derive an estimate of US Teen MAUs on IG. These MAUs [are] then apportioned to the UDAP States claims based on their relative percentage of total US MAU between 2018 – 2021." See Saba Report, ¶ 173.

²⁰² See Saba Report, Schedules, 4.2.1, 4.2.4.

²⁰³ Mr. Saba uses *predicted age* to compute the total percentage of 17-year-old users to Teen Users beginning in 2022 when the variable becomes available in data for Instagram. See Saba Report, Schedule 2.3

²⁰⁴ Deposition of Nicholas Edward Carver Wakefield, 30(b)(6) for Meta Platforms, Inc., June 10, 2025 ("Wakefield 30(b)(6) Deposition"), 28:19–29:6 ("Q. Okay. And what data is the Age Affinity model prediction based on? A. It's a model. It's going to use a lot of different signals. It would be really -- it would be almost impossible for me to name all the different bits of data used. Q. Can you give me some examples of the data that the model uses? A. Well, I mean, stated age is an input to the model. Yeah. M-hm."), 30:5–9 ("Q. Okay. What kinds of business reasons do people use the Age Affinity model for at Meta? A. Really hard for me to recall all the different -- but you could be looking at just growth by age ranges.").

²⁰⁵ Wakefield 30(b)(6) Deposition, 31:6–31:13 ("Are you aware of a better method that Meta has for predicting user's single-year ages? ... THE WITNESS: ... I'm not aware of a better method.").

²⁰⁶ See Workpaper 10, Cover Letter from Isaac D. Chaput of Covington & Burling LLP, "Re: MDL 3047," August 5, 2025. I observe that the total counts of 17-year-olds based on *predicted age* are higher than the total counts of 17-year-olds based on *stated age*. This is true broadly for all Teens, not only 17-year-olds. The net effect of these lower counts of all Teens using *staged age* is that the proportion of 17-year-olds based on stated age, (as opposed to the count of 17 year olds based on stated age), is higher than the proportion of 17-year olds based on *predicted age*. As discussed, Mr. Saba uses the proportion of 17-year-olds based on *stated age* in October 2021 through December 2021, rather than counts of 17-year olds, to estimate the number of 17-year-olds in 2013 through 2021.

Appendix I, Figure I.3. Thus, Mr. Saba inappropriately overstates his estimate of gross profits earned on Aged-Up Teens over the course of the Relevant Period.

Figure 23

Mr. Saba's Instagram Gross Profits for "Aged-Up" Teens After Adjusting His Methodology to Use Predicted Age Instead of Stated Age to Estimate 17-Year-Old Cohorts

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram (millions)</i>			
2–3 Hours Threshold	\$102.3	\$93.6	-8.5%
3–4 Hours Threshold	\$33.4	\$30.5	-8.5%
4–5 Hours Threshold	\$6.4	\$5.8	-9.0%
5+ Hours Threshold	\$1.4	\$1.2	-10.3%
Total (2+ Hours)	\$143.4	\$131.1	-8.6%

Source: Saba Report, Schedules 4.1.3, 4.2.1, 4.2.2, 4.2.4

Note: Gross Profits by Mr. Saba are pulled from Schedule 4.1.3. Gross Profits adjusted for 17-year-old rate use the threshold user information for Schedule 4.2.1 and the 17-year-old rate information from Schedule 4.2.4 to use 2022 predicted age information instead of 2021 stated age information. Percent change in profits is calculated as adjusted profits minus Saba's profits, divided by Saba's profits.

142. Finally, I also note that the Gross Profits Mr. Saba estimates for Teens and Aged-Up Teens are highly sensitive to the low time spent thresholds he uses, namely the half an hour and 1 hour daily average time thresholds. Specifically, the combined profits associated with Mr. Saba's half hour and 1 hour thresholds comprise \$841 million and \$181 million of Meta's profits for Instagram and Facebook, respectively, equating to 85 percent and 84 percent of total Gross Profits for Aged-Up Teens.²⁰⁷

X. MR. SABA'S ESTIMATE OF TEEN USERS ON INSTAGRAM OR FACEBOOK IS FLAWED AND UNRELIABLE

143. Mr. Saba's estimate of Teen Users improperly includes non-human traffic. As I discuss in more detail in Section V.B.4.a), to estimate Teen Users Mr. Saba applies a static 1.35 or 1.15 deflator to the total count of MAU to derive his estimate of "persons." However, this approach implicitly assumes that every "excess" account represents a secondary account held by a genuine, allegedly harmed Teen. However, this assumption ignores the prevalence of bots, spam,

²⁰⁷ See Workpaper 11.

and business accounts within the MAU data.²⁰⁸ While Mr. Saba implicitly acknowledges the problem of “Teen” bot traffic through some manual adjustments to his deflator in 2021, he does not attempt to address its presence in most years.

144. Mr. Saba implicitly concedes that the Instagram data include some non-human traffic. For example, in many months his standard multiplier converting Teen MAU to Teen MAP resulted in a state Teen MAP count that exceeded the total corresponding U.S. Census Teen population.²⁰⁹ To address this impossibility, Mr. Saba’s “lower bound” methodology abandons his universal multiplier and manually adjusts it in months where Teen MAP would otherwise exceed the Census Teen population. This override effectively acknowledges that the raw MAU data contained significant non-human volume. However, Mr. Saba fails to explain why this issue would be limited to Instagram alone. The July 2021 anomaly confirms that the foundational dataset captures bot activity, rendering a simple “user-to-person” ratio unreliable for estimating Teens.

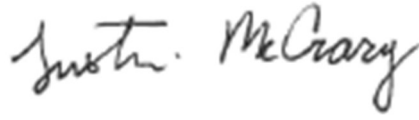
145. Mr. Saba’s second “conservative” methodology to count total unique Teen Users across the Relevant Period inherits these flaws because it relies on the same tainted Teen MAP counts as its primary input.²¹⁰ By calculating unique users based on year-over-year “net growth” in Teen MAP, the model misinterprets non-human increases in MAU as new human users. While the error of including bot traffic is most obvious during the July 2021 anomaly, Mr. Saba does not otherwise attempt to address the presence of bots at all in the Facebook data nor the Instagram data, except in months his methodology forecasts Teen MAP exceeding 100 percent of the U.S. Census Teen population.

²⁰⁸ For example, the results of the BEEF Survey find that 19 percent of Teen Users report encountering a fake account in the past week, on average. This could suggest bot and spam accounts that Mr. Saba fails to appropriately account for. *See* Saba Report, Schedule 5.3.

²⁰⁹ Saba Report, ¶ 230 (“For these time periods [July 2021 to January 2022], I have applied an adjustment as needed to the user to person ratio of 1.35 such that the resulting MAP counts do not exceed 100% of annual census data for Teens in the same states, in the same time periods. My adjustment is based on a review of the relationship between persons and users for a twelve month period in close proximity to the months were MAP counts required an adjustment.”).

²¹⁰ *See* Section V.B.4.

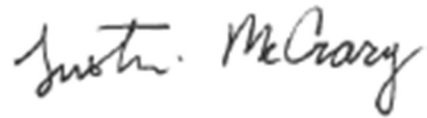
Executed in Austin, Texas, on January 9, 2026.

A handwritten signature in black ink that reads "Justin. McCrary". The signature is written in a cursive, slightly slanted style.

Justin McCrary

The undersigned hereby certifies their understanding that they owe a primary and overriding duty of candor and professional integrity to help the Court on matters within their expertise and in all submissions to, or testimony before, the Court. The undersigned further certifies that their report and opinions are not being presented for any improper purpose, such as to harass, cause unnecessary delay, or needlessly increase the cost of litigation.

January 9, 2026

A handwritten signature in black ink that reads "Justin McCrary". The signature is written in a cursive, slightly slanted style.

Justin McCrary

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Areas of Interest

Research– Antitrust, Financial Markets, Law and Economics, Econometric Methodology, Criminal Justice, Employment Discrimination, Labor Markets, Financial Regulation, Healthcare, Intellectual Property

Teaching– Antitrust; Antitrust at Trial; Corporations; Law and Economics; Litigation, Economics, and Statistics

Current Academic Appointments

University of Texas at Austin
2025–26 Distinguished Visiting Professor, School of Law
2025–26 Visiting Professor, School of Civic Leadership
2025–26 Fellow, Civitas Institute

Columbia University
2018– Paul J. Evanson Professor of Law
2018– Fellow, Program in the Law and Economics of Capital Markets

National Bureau of Economic Research
2012– Faculty Research Associate

Past Academic Appointments

National Bureau of Economic Research
2008–19 Co-director, Crime Working Group
2006–12 Faculty Research Fellow

University of California, Berkeley
2014–17 Director, Social Sciences Data Laboratory (D-Lab)
2010–19 Professor of Law
2008–10 Assistant Professor of Law

Columbia University
Fall 2017 Samuel Rubin Visiting Professor of Law

University of Michigan
2003–07 Assistant Professor, Gerald R. Ford School of Public Policy
2003–07 Assistant Professor, Department of Economics (courtesy)

Government and Public Service

Rosalyn Yalow Charter School
2023–25 Member, Board of Directors
2023–25 Member, Finance Committee

California Law Revision Commission
2023–24 Consultant, Study of Antitrust Law

Committee on National Statistics
2022 Reviewer, National Academies of Sciences, Engineering, and Medicine

Securities and Exchange Commission

2022–24 Signatory, Intergovernmental Personnel Agreement
European Central Bank (Banco de España)
2013–14 Economist
Equal Employment Opportunity Commission
2000–16 Signatory, Intergovernmental Personnel Agreement
California Department of Justice
2011–12 Consultant
Federal Reserve Bank of New York
1996–98 Assistant Economist

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Ph.D. Economics, University of California, Berkeley, 2003
A.B. Public Policy, Princeton University, 1996

Languages

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Hobbies

Chess, Squash, Classical guitar

Scholarship

Applying the Hypothetical Monopsonist Test for Labor Market Definition (with Elisa Olivieri and Graham McKee)
The Antitrust Source, May 2025
A Fractional Solution to a Stock Market Mystery (with Robert P. Bartlett and Maureen O'Hara)
Financial Analyst Journal (lead article), May 2025
The Market Inside the Market: Odd-Lot Quotes (with Robert P. Bartlett and Maureen O'Hara)
Review of Financial Studies, Volume 38, Issue 3, March 2025
Tiny Trades, Big Questions: Fractional Shares (with Robert P. Bartlett and Maureen O'Hara)
Journal of Financial Economics, Volume 157, July 2024
What To Do When You Can't Use '1.96' Confidence Intervals for IV (with David S. Lee, Marcelo Moreira, Jack Porter, and Luther Yap)
NBER working paper # 31893, 2024
Robust Conditional Wald Inference for Over-Identified IV (with David S. Lee, Marcelo Moreira, Jack Porter, and Luther Yap)
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Valid t -Ratio Inference for IV (with David S. Lee, Marcelo Moreira, and Jack Porter)
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American Law and Economics Review, Volume 23, Issue 1, Spring 2021

Copyright and Economic Viability: Evidence from the Music Industry (with Kristelia A. Garcia and James Hicks)
Journal of Empirical Legal Studies, Volume 17, Issue 4, December 2020

Subsidizing Liquidity with Wider Ticks: Evidence from the Tick Size Pilot Study Timestamps (with Robert P. Bartlett)
Journal of Empirical Legal Studies, Volume 17, Issue 2, June 2020

Dark Trading at the Midpoint: Pricing Rules, Order Flow, and Price Discovery (with Robert P. Bartlett)
Journal of Law, Finance, and Accounting, Volume 4, Issue 2, 2019

How Rigged Are Stock Markets?: Evidence from Microsecond Timestamps (with Robert P. Bartlett)
Journal of Financial Markets, Volume 45, September 2019

A Reconsideration of Copyright's Term (with Kristelia A. Garcia)
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Why We Need Police (with Deepak Premkumar)
Chapter 3 in *The Cambridge Handbook of Policing in the United States*, Tamara Rice Lave and Eric Jr. Miller, eds., Cambridge University Press, June 2019

Are U.S. Cities Underpoliced? Theory and Evidence (with Aaron Chalfin)
Review of Economics and Statistics, Volume 100, Issue 1, March 2018, 167–186

The Deterrence Effect of Prison: Dynamic Theory and Evidence (with David S. Lee)
Advances in Econometrics, Volume 38, 2017, editors Matias D. Cattaneo and Juan Carlos Escanciano
2018 Emerald Literati Award, Outstanding Author Contribution

Criminal Deterrence: A Review of the Literature (with Aaron Chalfin)
Journal of Economic Literature, Volume 55, Number 1, March 2017, 5–48 (lead article)

Unmarked? Criminal Record Clearing and Employment Outcomes (with Jeffrey Selbin (lead author) and Joshua Epstein)
Journal of Criminal Law and Criminology, Volume 108, Number 1, 2017 (lead article)

Conservative Tests Under Satisficing Models of Publication Bias (with Garret Christensen and Daniele Fanelli)
PLOS One, Volume 11, Number 2, February 22, 2016

The Ph.D. Rises in American Law Schools, 1960–2011: What Does It Mean for Legal Education? (with Joy Milligan and James Phillips)
Journal of Legal Education, Volume 65, Number 543, Spring 2016

Shall We Haggle in Pennies at the Speed of Light or in Nickels in the Dark?: How Minimum Price Variation Regulates High Frequency Trading and Dark Liquidity (with Robert P. Bartlett)
Working Paper, 2015

New Evidence on the Finite Sample Properties of Propensity Score Matching and Reweighting Estimators (with Matias Busso and John DiNardo)
Review of Economics and Statistics, Volume 96, Number 5, December 2014

Measuring Benchmark Damages in Antitrust Litigation (with Daniel L. Rubinfeld)
Journal of Econometric Methods, Volume 3, January 2014

Do Sexually Violent Predator Laws Violate Double Jeopardy or Substantive Due Process: An Empirical Inquiry (with Tamara Lave)
Brooklyn Law Review, Volume 78, Summer 2013, Number 4, 1391–1439

- General Equilibrium Effects of Prison on Crime: Evidence From International Comparisons (with Sarath Sanga)
Cato Papers on Public Policy, Volume 2, 2012
- Controlling Crime: Strategies and Tradeoffs* (co-edited with Phil Cook and Jens Ludwig), Chicago: University of Chicago Press, 2011.
- The Effect of Female Education on Fertility and Infant Health: Evidence from School Entry Laws Using Exact Date of Birth (with Heather Royer)
American Economic Review, Volume 101, Number 1, February 2011
- Comment on “Free to Punish? The American Dream and the Harsh Treatment of Criminals”, by Rafael di Tella and Juan Dubra
Cato Papers on Public Policy, Volume 1, 2011
- Dynamic Perspectives on Crime
in *Handbook of the Economics of Crime*, Chapter 4, Edward Elgar, 2010
- Incomes in South Africa Since the Fall of Apartheid (with Murray Leibbrandt and James Levinsohn)
Journal of Globalization and Development, Volume 1, Issue 1, January 2010
- Following Germany’s Lead: Using International Monetary Linkages to Estimate the Effect of Monetary Policy on the Economy (with Julian di Giovanni and Till von Wachter)
Review of Economics and Statistics, Volume 91, Number 2, May 2009
- Manipulation of the Running Variable in the Regression Discontinuity Design: A Density Test
Journal of Econometrics, Volume 142, Issue 2, February 2008
- The Effect of Court-Ordered Hiring Quotas on the Composition and Quality of Police
American Economic Review, Volume 97, Number 1, March 2007
- Using Electoral Cycles in Police Hiring to Estimate the Effect of Police on Crime: Comment
American Economic Review, Volume 92, Number 4, September 2002

Referee

Econometrica

American Economic Review

Quarterly Journal of Economics

Journal of Political Economy

Review of Economic Studies

Journal of Econometrics

Journal of Economic Literature

Review of Economics and Statistics

Journal of the American Statistical Association

American Economic Journal

Advances in Econometrics

American Law and Economics Review

International Law and Economics Review Journal

of Labor Economics

Journal of Econometric Methods

Industrial and Labor Relations Review

Journal of Law and Economics

Journal of Empirical Legal Studies

Journal of Urban Economics

Journal of Quantitative Criminology

American Political Science Review

American Sociological Review

Stanford Law Review

Yale Law Journal

Columbia Law Review

Other Activities

2024–25 Member, Board of Editors, *Journal of Law and Economics*

2024–25 Member, Board of Directors, and CFO, Centaura Inc

2023–24 Member, Board of Directors, WayRay AG

2019–21 Member, Board of Directors, Plectica, LLC

2017–19 Member, Board of Directors, American Law and Economics Association

2007–19 Co-Director (with Phil Cook and Jens Ludwig), *Crime Working Group*, National Bureau of Economic Research

2009–14 Co-Director, *Law and Economics Program*, University of California, Berkeley

Courses Taught

Texas

2025–26 Antitrust (Spring)

Columbia

2024–25 L6293: Antitrust and Trade Regulation (Fall); L9069: Law and Economics (Fall); L6231: Corporations (Spring); L8856: Antitrust at Trial (Spring)

2023–24 L6293: Antitrust and Trade Regulation (Fall); L8856: Antitrust at Trial (Fall); L6916: Litigation, Economics, and Statistics (Spring); L6231: Corporations (Spring)

2022–23 L6293: Antitrust and Trade Regulation (Spring); L6916: Litigation, Economics, and Statistics (Spring)

2021–22 L6231: Corporations (Fall); L6916: Litigation, Economics, and Statistics (Fall); L6293: Antitrust and Trade Regulation (Spring)

2020–21 L6293: Antitrust and Trade Regulation (Fall); L6916: Litigation, Economics, and Statistics (Fall); L6231: Corporations (Spring)

2019–20 L6293: Antitrust and Trade Regulation (Fall); L6916: Litigation, Economics, and Statistics (Fall)

2018–19 L6916: Litigation, Economics, and Statistics (Fall); L6231: Corporations (Spring)

2017–18 L6231: Corporations (Fall)

Berkeley

- 2016-17 Law 244.4: Litigation and Statistics (Fall); Law 216: Law and Economics Workshop (Fall); Law 218.6: Law and Economics of Discrimination (Fall)
- 2015-16 Law 250: Business Associations (Fall); Law 244.4: Litigation and Statistics (Fall); Letters and Science 39D: Race, Policing, and Data Science (Fall)
- 2014-15 Law 250: Business Associations (Fall); Law 250S: Business Associations (Summer)
- 2013-14 Law 250S: Business Associations (Summer)
- 2012-13 Law 250: Business Associations (Fall); Law 250S: Business Associations (Summer); Law 209.3: Introductory Statistics (Fall)
- 2011-12 Law 250: Business Associations (Fall); Law 250S: Business Associations (Summer); Law 209.3: Introductory Statistics (Fall); Law 251.31: Introduction to Law, Economics, and Business (Spring); Legal Studies 145: Law and Economics I (undergraduate)
- 2010-11 Law 250: Business Associations (Fall); Law 250S: Business Associations (Summer); Law 216: Law and Economics Workshop (Fall and Spring); Legal Studies 145: Law and Economics I (undergraduate); Law 209.6: Topic in Quantitative Methods (JSP); Econ 250C: Labor Economics (graduate, shared course with 209.6)
- 2009-10 Law 216: Law and Economics Workshop (Fall and Spring); Law 209.32: Quantitative Methods II (JSP)
- 2008-09 Legal Studies 145: Law and Economics I (undergraduate); Law 209.3: Quantitative Methods I (JSP); Law 209.32: Quantitative Methods II (JSP)
- 2007-08 Legal Studies 145: Law and Economics I (undergraduate); Law 209.3: Quantitative Methods I (JSP)

Michigan

Introduction to Quantitative Methods (policy), First Econometrics Field Course (economics), Advanced Economic Theory (policy)

Grants and Fellowships

- 2007-2010 NIH, Constructive Proposals for Dealing With Attrition (with John DiNardo)
- 2009 Committee on Research, Junior Faculty Research Grant, UC Berkeley
- 2006-2009 NIH, The Effect of Female Education on Fertility and Infant Health (with Heather Royer, Grant # R03 HD051713)
- 2006-2011 NSF, New Instrumental Variables Estimates of the Effects of Schooling and Military Service: Empirical Strategies Using Non-Public-Use Data (with Josh Angrist and Stacey Chen)
- 2005 RWJ Foundation Health and Society Scholars Program, Small Grant Program
- 2004 Rackham Interdisciplinary Grant, University of Michigan
- 2004 CLOSUP Grant, University of Michigan
- 2004 National Poverty Center Grant, University of Michigan
- 2002-2003 Chancellor's Dissertation Year Fellowship, UC Berkeley

Presentations

- 2023–2024 Columbia University, School of Law; Columbia University, Economics Department
- 2022–2023 Northwestern University, School of Law
- 2018–2019 Columbia University, School of Law; Conference on Empirical Legal Studies, University of Michigan
- 2017–2018 Columbia University, School of Law; Georgetown University, School of Law
- 2016–2017 George Mason University, School of Law; University of Michigan, Economics Department (Summer, Fall); Equities Leaders Summit; University of Zürich, Department of Economics; ETH (Swiss Federal Institute of Technology) Zürich, Law and Economics; Northwestern University, School of Law; Duke University, School of Law; Duke University, Information Initiative
- 2015–2016 Goldman Sachs; University of California, Berkeley, School of Law; University of Virginia, School of Law; University of California, Irvine; Equal Employment Opportunity Commission; National Bureau of Economic Research, Summer Institute
- 2014–2015 Duke University; Federal Reserve Bank of New York; Equal Employment Opportunity Commission (EEODataNet); American Law and Economics Association (discussant); New York University (NYU / Penn Law and Finance Conference); National Bureau of Economic Research, Summer Institute (discussant)
- 2013–2014 University of Southern California, School of Law; London School of Economics; Bank of Spain; CEMFI; Carlos III; University of Zaragoza; University of Rotterdam; University of Maastricht; University of Göteborg
- 2012–2013 University of California, Los Angeles, School of Law
- 2011–2012 University of Oregon, Department of Economics; University of British Columbia, Department of Economics; Brown University, Department of Economics; University of Rochester, Department of Economics; Cato Institute; National Bureau of Economic Research, Summer Institute; Harvard Law School
- 2010–2011 Northwestern, School of Law; University of Wisconsin, Department of Economics; Brookings Institution; Cato Institute
- 2009–2010 University of Chicago, School of Law; Cornell University, School of Law and Department of Economics; University of Michigan, School of Law and Department of Economics; University of Virginia, School of Law, Olin Conference
- 2008–2009 University of California, Los Angeles, School of Law; University of Arizona, School of Law and Department of Economics; Stanford University, School of Law and Department of Economics; University of Miami, Department of Economics
- 2007–2008 Northwestern University, School of Law; University of Michigan, Department of Economics; National Bureau of Economic Research, Summer Institute; Florida State University
- Prior to 2007–2008, presentations are at departments of economics, unless otherwise noted*
- 2006–2007 University of Michigan, Program in Survey Methodology; Public Policy Institute of California; Brown University
- 2005–2006 University of Michigan; University of California, Irvine; University of California, Santa Barbara; University of California, Santa Cruz; California State University, Long Beach; University of Western Ontario; University of Toronto; University of Illinois, Chicago; University of Chicago, Graduate School of Business; APPAM; University of Florida; University of California, Berkeley, School of Law; Princeton University; RAND; Hebrew University (conference in honor of Reuben Gronau); Stanford University, University of Wisconsin, Madison; Northwestern University; Crime and Economics Summer Workshop, University of Maryland
- 2004–2005 Federal Reserve Bank of Chicago; University of Illinois, Urbana-Champaign; University of Michigan, William Davidson Institute; University of Maryland; Urban Institute; American Economics Association Meetings; City University of New York Health Economics Seminar; University of Wisconsin, Madison; Stanford University; University of California, Davis; University of California, Berkeley, Labor Lunch; NBER Summer Institute, Education/Labor Studies

- 2003–2004 University of Michigan; APPAM; NBER Labor Studies Meeting (Fall); Massachusetts Institute of Technology; Harvard University, Kennedy School; University of California, Los Angeles; University of California, San Diego; Columbia University; University of California, Berkeley; NBER Summer Institute, Monetary Policy; NBER Summer Institute, Labor Studies
- 2002–2003 University of California, San Diego; University of California, Los Angeles; RAND Institute; University of Chicago, Graduate School of Business; University of Chicago, Harris School of Public Policy; University of Michigan, Ford School of Public Policy; Columbia University; Dartmouth College; Federal Reserve Bank of New York; Boston University

Last updated: December 19, 2025

Testimony in the Past Four Years

Richard Dennis, Michael Glass, and Port 22, LLC v The Andersons, Inc. and Cargill, Inc.

United States District Court for the Northern District of Illinois, Eastern Division

Putative class action antitrust commodities (wheat) case

Testimony regarding antitrust economics and damages methodologies, causation, inferential statistics, and commodities markets (physical, futures, options)

Retained by The Andersons and Cargill

Merits report filed on December 19, 2025

Deposed on January 26, 2024

Report filed on December 20, 2023

Confidential arbitration matter

American Arbitration Association

Antitrust case

Testimony regarding market definition, market power, and competitive effects in video game distribution

Testified at arbitration hearings between December 2024 and December 2025

In Re Outpatient Medical Center Employee Antitrust Litigation

United States District Court for the Northern District of Illinois (Eastern Division)

Putative class action antitrust labor case

Testimony regarding market definition, market power, competitive effects, procompetitive rationale, regression methodology, labor markets

Retained by joint defense group (DaVita, SCA, and USPI)

Declaration file on November 13, 2025

Deposed on June 12, 2025

Report filed on April 16, 2025

Leinani Deslandes and Stephanie Turner v McDonald's USA, LLC

U.S. District Court for the Northern District of Illinois (Eastern Division)

Putative class action antitrust labor case

Testimony regarding franchising and vertical restraints, procompetitive benefits of vertical restraints, incentives, monopsony theory, general versus specific human capital, and salary structure models

Retained by McDonald's USA, LLC

Deposed on November 13, 2025

Reply report on remand filed on May 23, 2025

Deposed on May 12, 2025

Affirmative report on remand filed on March 28, 2025

Deposed on May 10, 2021 (via video)

Class certification report filed on April 15, 2021

State of New Mexico v Meta Platforms, Inc and Instagram LLC

United District Court of the District of New Mexico

Unfair or deceptive practices case, public nuisance

Testimony regarding social media, teen mental health, abatement programs, and econometrics

Retained by Meta

Deposed on October 29, 2025

Supplemental summary of opinions filed on October 24, 2025

Rebuttal summary of opinions filed on August 29, 2025

Affinity Credit Union, Greenstate Credit Union, and Consumers Co-op Credit Union v Apple, Inc.

United States District Court for the Northern District of California (Oakland Division)

Putative class action antitrust case

Testimony regarding market definition, market power, competitive effects, procompetitive rationale, yard-stick methodology, payment systems

Retained by Apple

Deposed on July 15, 2025

Report filed on June 18, 2025

Crownalytics, LLC v SPINS LLC, DAAP LLC, and Circana LLC

United States District Court for the District of Colorado

Antitrust (monopolization) case

Testimony regarding market definition, market power, and competitive effects

Retained by SPINS and Circana

Deposed on July 9, 2025

Report filed on June 20, 2025

In re: Bank of America California Unemployment Benefits Litigation

District Court of the Southern District of California

Case alleging slow payment of Covid checks in California

Testimony regarding the unemployment insurance program literature and the time value of money

Retained by Bank of America

Deposed on June 5, 2025

Report filed on April 4, 2025

FTC v Amazon

United States District Court for the Western District of Washington

Consumer deception case

Testimony regarding statistical methodologies

Retained by Amazon

Deposed on May 30, 2025

Report filed on April 23, 2025

Glencore and Glencore Grain v Louis Dreyfus Company

United State District Court of the Northern District of Illinois

Antitrust commodities (cotton) market case

Testimony regarding market definition, market power, and competitive effects

Retained by Louis Dreyfus Company

Deposed on May 28, 2025

Report filed on March 14, 2025

Paul Orshan, et al. v Apple Inc.

United States District Court for the Northern District of California

Putative class action consumer products liability case

Testimony regarding the law and economics of damages

Retained by Apple, Inc.

Report filed on May 8, 2025

Deposed on January 9, 2024

Report filed on December 12, 2023

Deposed on June 8, 2022 (via video)

Report filed on May 17, 2022

State of California, ex rel., Edelweiss Fund, LLC, v JP Morgan Chase Bank, et al.

Superior Court of the State of California

VRDO case

Testimony regarding market definition, market power, and competitive effects

Retained by the joint defense group

Deposed on May 8, 2025

Reply report filed on April 11, 2025

Affirmative report filed on March 14, 2025

The Collection LLC v Porsche Cars North America

Circuit Court of the 11th Judicial Circuit, Miami-Dade County

Antitrust case

Testimony regarding local market demand and a new proposed Porsche dealership

Retained by Porsche

Deposed on March 27, 2025

Report filed on February 3, 2025

In re Cattle and Beef Antitrust Litigation

U.S. District Court for the District of Minnesota

Putative class action antitrust commodities (cattle) case

Testimony regarding liability, class certification, regression methodology, and exchange and direct and indirect seller claimed damages

Retained by the joint defense group

Deposed on March 19 and 20, 2025

Class certification report filed on January 24, 2025

MLRN LLC v U.S. Bank National Association

Supreme Court of the State of New York

Mortgage-backed securities case (servicing)

Testimony regarding sampling and statistical methods

Retained by U.S. Bank

Deposed on March 14, 2025

Report filed on February 14, 2025

Target v Visa; 7-Eleven v Visa

U.S. District Court for the Southern District of New York

Antitrust case

Testimony regarding liability, two-sided markets, market power, and credit and debit card payment systems

Retained by Mastercard

Deposed on December 19, 2024

Report filed on October 1, 2024

Federal Trade Commission, et al. v The Kroger Company and Albertsons Companies, Inc.

United States District Court for the District of Oregon

§13(b) merger case

Testimony regarding labor market definition (product and geographic), market power, merger effects, and bargaining theory

Retained by Kroger

Trial testimony on September 12, 2024

Deposed on July 18, 2024

Report filed on July 1, 2024

Favell et al. v University of Southern California

United States District Court of the Central District of California

Putative class action alleging tuition overpayment

Testimony regarding damages methodologies and conjoint analysis

Retained by USC

Deposed on September 2, 2024

Report filed on August 22, 2024

IKB International S.A. in Liquidation and IKB Deutsche Industriebank AG v U.S. Bank N.A.

Supreme Court of the State of New York, County of New York

Mortgage-backed securities case (servicing)

Testimony regarding sampling and statistical methods

Retained by U.S. Bank

Deposed on July 23, 2024

Report filed on June 28, 2024

Attorney General for the Commonwealth of Massachusetts v Uber Technologies, Inc. and Lyft, Inc.

Superior Court of the Commonwealth of Massachusetts for the County of Suffolk

Alleged misclassification of employees as independent contractors

Testimony regarding two-sided markets and platform companies

Retained by Uber Technologies, Inc.

Trial testimony on May 31, 2024

Deposed on January 27, 2024 (via video)

Report filed on October 13, 2023

IKB International S.A. in Liquidation and IKB Deutsche Industriebank AG v Morgan Stanley, et al.

Supreme Court of the State of New York, County of New York

Mortgage-backed securities case (servicing)

Testimony regarding sampling and statistical methods

Retained by Morgan Stanley

Deposed on May 15, 2024

Report filed on September 30, 2022

State of New York ex rel., Edelweiss Fund, LLC v JP Morgan Chase & Co., et al.

Supreme Court of State of New York, County of New York

Qui tam action alleging collusion and/or coordination on the part of remarketing agents and thus municipal government overpayment for variable rate demand obligation (VRDO) interest rates

Testimony regarding cartel theory, economic incentives, market power, barriers to entry, and random versus selected samples and bootstrap methodologies

Retained by the joint defense group

Deposed on May 2, 2024

Report filed on March 15, 2024

Mayor and City Council of Baltimore v Purdue Pharma L.P., et al.

Circuit Court for Baltimore City

Prescription opioid medication litigation

Testimony regarding causation, economics of crime, abatement plan, damages

Retained by Janssen

Deposed on April 26, 2024

Report filed on February 23, 2024

Chuba Hubbard et al. v NCAA et al.

United States District Court for the Northern District of California

Putative class action antitrust labor case

Testimony regarding damages methodologies and causation

Retained by NCAA

Deposed on April 15, 2024

Report filed on March 27, 2024

Palm Beach Tanning, Inc., et al., v Sunless, Inc.

United States District Court for the Northern District of Ohio

Intellectual property and antitrust dispute

Testimony regarding antitrust economics and damages methodologies

Retained by Sunless

Deposed on February 21, 2024

Report filed on January 16, 2024

The Collection v Holman North Miami and Porsche Cars North America

State of Florida, Division of Administrative Hearing

Proposed new car dealership case

Testimony regarding local market demand and a new proposed Porsche dealership

Retained by Porsche Cars North America

Deposed on January 17, 2024 (via video)

Deposed on January 11, 2024

Reply report filed on December 22, 2023

Report filed on November 11, 2023

Erica Frasco v Flo Health, Inc., Google, LLC, Facebook, Inc., AppsFlyer, Inc., and Flurry, Inc.

United States District Court for the Northern District of California

Putative class action data breach and privacy case

Testimony regarding liability and damages

Retained by Flurry, Inc.

Deposition on August 24, 2023 (via video)

Report filed on June 27, 2023

Confidential Arbitration

American Arbitration Association

Intellectual property and antitrust (monopolization) dispute

Testimony regarding damages

Retained by Black Knight

Testified at arbitration hearing on May 18, 2023

Deposition on December 8, 2022

Report filed on October 25, 2022

State of Illinois ex rel., Edelweiss Fund, LLC v JP Morgan Chase & Co., et al.

Circuit Court of Cook County, Illinois, County Department, Law Division

Qui tam action alleging collusion and/or coordination on the part of remarketing agents and thus municipal government overpayment for variable rate demand obligation (VRDO) interest rates

Testimony regarding cartel theory, economic incentives, market power, barriers to entry, and random versus selected samples and bootstrap methodologies

Retained by the joint defense group

Deposed on April 5, 2023

Report filed on February 6, 2023

National Fair Housing Alliance et al. v Deutsche Bank National Trust, as Trustee; Deutsche Bank Trust Company Americas, as Trustee; Ocwen Loan Servicing, LLC; and Altisource Solutions, Inc.

United States District Court for the Northern District of Illinois, Eastern Division

Housing maintenance discrimination

Testimony regarding causation, economics of housing market

Retained by Deutsche Bank, Ocwen, and Altisource

Deposed on March 31, 2023 (via video)

Declaration filed on February 28, 2023

Report filed on February 21, 2023

In re Payment Card Interchange Fee and Merchant Discount Antitrust Litigation

United States District Court for the Eastern District of New York

Antitrust case

Testimony regarding liability, two-sided markets, market power, and credit and debit card payment systems

Retained by Mastercard

Deposed on March 24, 2023

Reply Report filed on January 13, 2023

Report filed on September 30, 2022

Palmer, Piroumian, Cox, and Franchitt v Cognizant Technology Solutions Corporation and Cognizant Technology Solutions U.S. Corporation

United States District Court for the Central District of California

Putative class action employment discrimination case

Testimony regarding regression and statistical methodologies, the Yule-Simpson paradox and omitted variable bias, causation, personnel economics, self-selection, the economics of immigration, and damages methodologies

Retained by Cognizant

Deposed on January 23, 2023 (via video)

Deposed on July 5, 2022 (via video)

Report filed on June 10, 2022

In re: Broiler Chicken Grower Antitrust Litigation Haff Poultry, Inc., et al. v Tyson Foods, Inc., et al.

United States District Court for the Eastern District of Oklahoma

Putative class action antitrust monopsony case

Testimony regarding information sharing, no-poach allegations, causation, and damages estimation

Retained by Pilgrim's and Sanderson

Deposition on December 22, 2022

Report filed on November 18, 2022

Walter Peters v Apple Inc.

Superior Court for the State of California, County of Los Angeles

Putative class action consumer products liability case

Testimony regarding event study methodology, extent of unharmed class members, and statistics

Retained by Apple, Inc.

Deposed on September 2, 2022 (via video)

Report filed on July 26, 2022

Appellant The Mount Sinai Hospital's OMHA Appeal (No. 3-7103567206)

Centers for Medicare and Medicaid Services

Centers for Medicare and Medicaid Services investigation

Testimony regarding statistics and damages estimation

Retained by Mt. Sinai

Testified before administrative law judge on August 30, 2022 (via audio)

Report filed on July 18, 2018

National Fair Housing Alliance et al. v Bank of America, National Association; Bank of America Corp.; and Safeguard Properties Management

United States District Court for the District of Maryland

Housing maintenance discrimination

Testimony regarding causation, economics of housing market

Retained by Bank of America

Supplemental declaration filed on August 31, 2022

Deposed on February 28, 2022 (via video)

Supplemental report filed on February 14, 2022

Report filed on November 5, 2021

Jessica Robinson, Stacey Jennings, and Priscilla McGowan v Jackson Hewitt, Inc. and Tax Services of America, Inc.

United States District Court for the District of New Jersey

Putative class action antitrust labor case

Testimony regarding the economics of franchising, general and specific human capital, and intrabrand restraints

Retained by Jackson Hewitt

Deposed on June 1, 2022

Report filed on April 25, 2022

City and County of San Francisco and the People of the State of California v Purdue Pharma L.P., et al.

United States District Court for the Northern District of California

Prescription opioid medication litigation

Testimony regarding causation, economics of crime, regression methodology

Retained by Endo Pharmaceuticals Inc., Endo Health Solutions Inc., Par Pharmaceutical, Inc., Par Pharmaceutical Companies, Inc., and Endo International plc

Deposed on January 10, 2022 (via video)

Report filed on December 2, 2021

Last updated: January 7, 2026

Appendix C

Documents Relied Upon

Academic Articles

- Carole Turley Voulgaris et al., “Tired of Commuting? Relationships Among Journeys to School, Sleep, and Exercise Among American Teenagers,” *Journal of Planning Education and Research*, 39(2), 2017, pp. 142–154
- Janet Currie, “Presidential Address: Investing in Children to Address the Child Mental Health Crisis,” *American Economic Review*, 115(5), 2025, pp. 1369–1399

Books and Book Chapters

- Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, Fifth Edition (South-Western Cengage Learning, 2012)

Bates Stamped Documents

- Instagram Presentation, “Bad Experiences and Encounters Framework (BEEF) Survey,” June 27–July 8, 2021, META3047MDL-004-00015029–063
- Instagram Presentation, “Hard Life Moments-Mental Health Deep Dive,” META3047MDL-003-00095008–034
- Instagram Presentation, “Teen Mental Health,” August/September 2019, META3047MDL-003-00091414–504
- META3047MDL-019-00099822
- META3047MDL-188R-000000008
- META3047MDL-289-00000120–143
- META3047MDL-289-00000169–193

Depositions

- Deposition of Nicholas Edward Carver Wakefield, 30(b)(6) for Meta Platforms, Inc., June 10, 2025

Expert Reports

- Expert Report of Carl S. Saba, MBA, CVA, ASA, ABV, November 21, 2025, with Schedules

Appendix C

Legal Documents

- Amended Complaint for Injunctive and Other Relief, *State of Arizona et al. v. Meta Platforms, Inc. et al.*, June 9, 2025 (Sealed)
- Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” August 5, 2025
- Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025
- Order Largely Denying in Part Meta’s Motion to Dismiss the Multistate Attorneys General Complaint but Limiting the Scope of Claims; Including the Florida Attorney General Complaint; and Personal Injury Plaintiffs’ Consumer Protection and Misrepresentation Claims, *In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation*, October 15, 2024

Publicly Available Data

- Centers for Disease Control and Prevention, Youth Risk Behavior Survey Data
- United States Census Bureau, National Survey of Children’s Health Data
- United States Substance Abuse and Mental Health Services Administration (SAMHSA), Mental Health Client-Level Data

SEC Filings

- Meta Platforms, Inc., Form 10-K for the fiscal year ended December 31, 2024, filed on January 30, 2025

Webpages

- “2016 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, February 26, 2018, available at <https://www.census.gov/content/dam/Census/programs-surveys/nsch/tech-documentation/methodology/2016-NSCH-Methodology-Report.pdf>
- “2017 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, August 2, 2018, available at <https://www.census.gov/content/dam/Census/programs-surveys/nsch/tech-documentation/methodology/2017-NSCH-Methodology-Report.pdf>
- “2018 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, April 10, 2024, available at <https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2018-NSCH-Methodology-Report.pdf>

Appendix C

- “2019 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, April 10, 2024, available at <https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2019-NSCH-Methodology-Report.pdf>
- “2020 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, January 31, 2025, available at <https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2020-NSCH-Methodology-Report.pdf>
- “2021 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, January 31, 2025, available at <https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2021-NSCH-Methodology-Report.pdf>
- “2021 YRBS Data User’s Guide,” *Centers for Disease Control and Prevention*, April 2023, available at https://www.cdc.gov/yrbs/files/2021/pdf/2021_YRBS_Data_Users_Guide_508.pdf
- “2022 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, January 31, 2025, available at <https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2022-NSCH-Methodology-Report.pdf>
- “2023 National Survey of Children’s Health Methodology Report,” *U.S. Census Bureau*, January 31, 2025, available at <https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2023-NSCH-Methodology-Report.pdf>
- “2023 YRBS Data User’s Guide,” *Centers for Disease Control and Prevention*, September 2024, available at https://www.cdc.gov/yrbs/media/pdf/2023/2023_National_YRBS_Data_Users_Guide_508.pdf
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- Christopher St. Aubin and Jacob Liedke, “Social Media and News Fact Sheet,” *Pew Research Center*, October 16, 2024, available at <https://www.pewresearch.org/journalism/fact-sheet/social-media-and-news-fact-sheet/>
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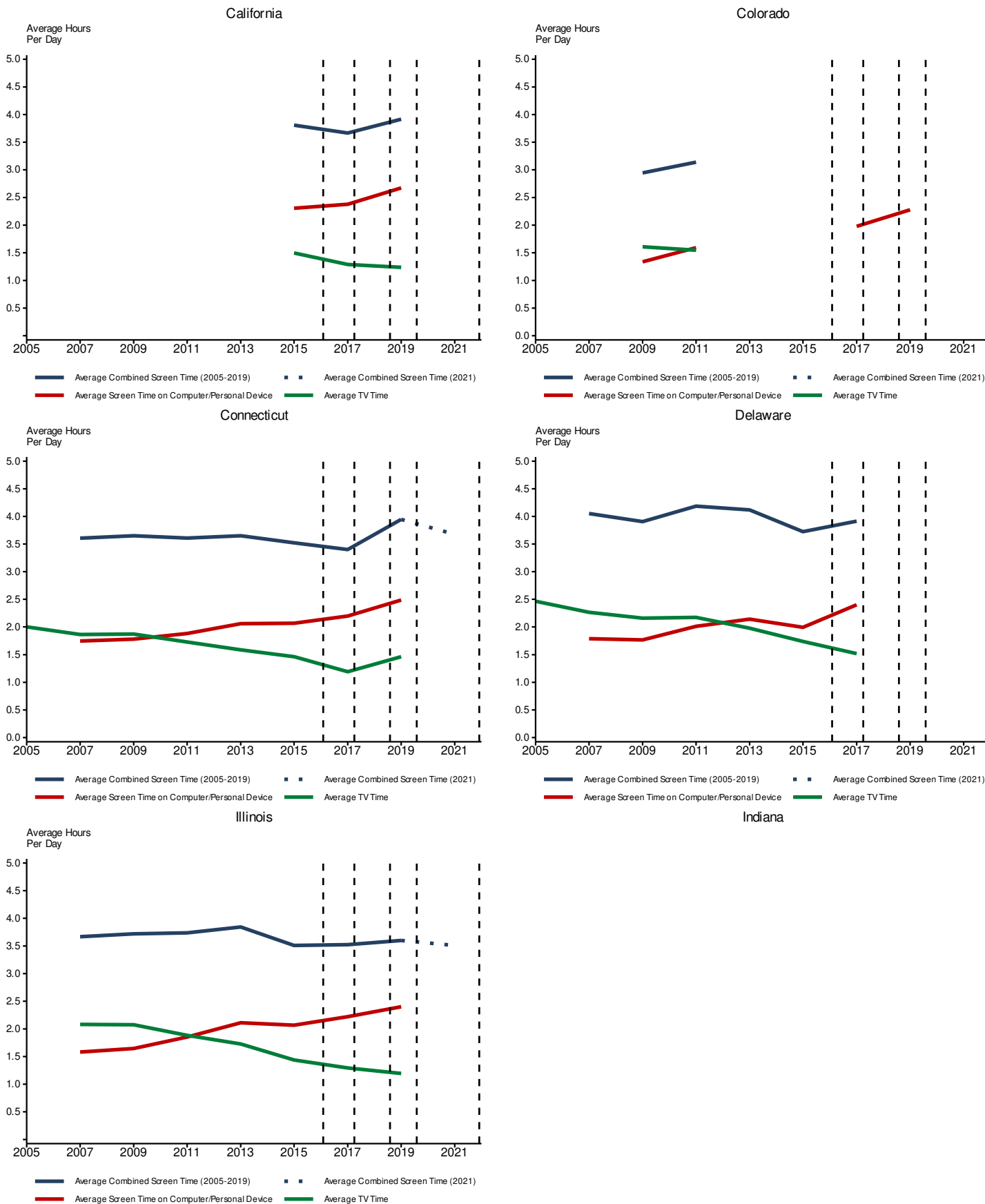
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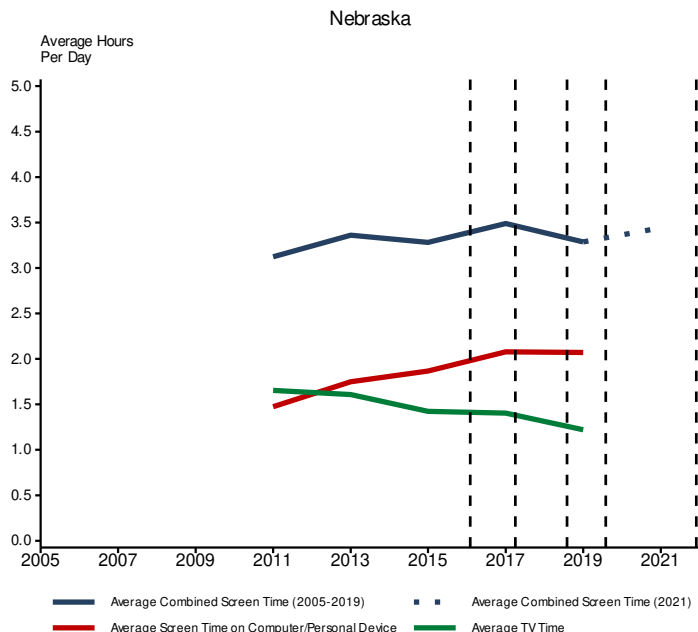
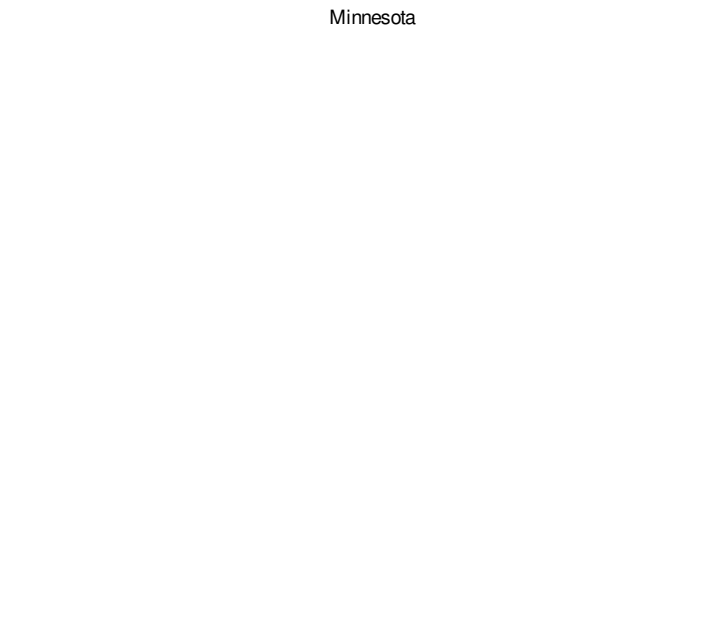
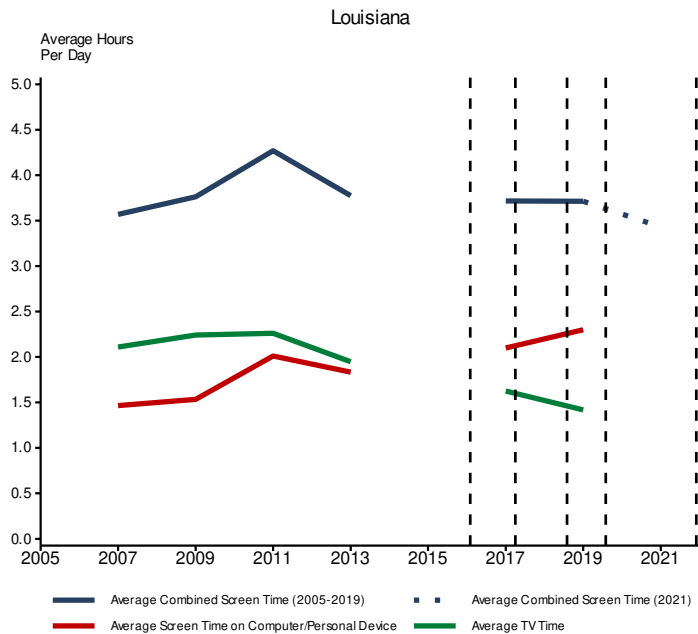
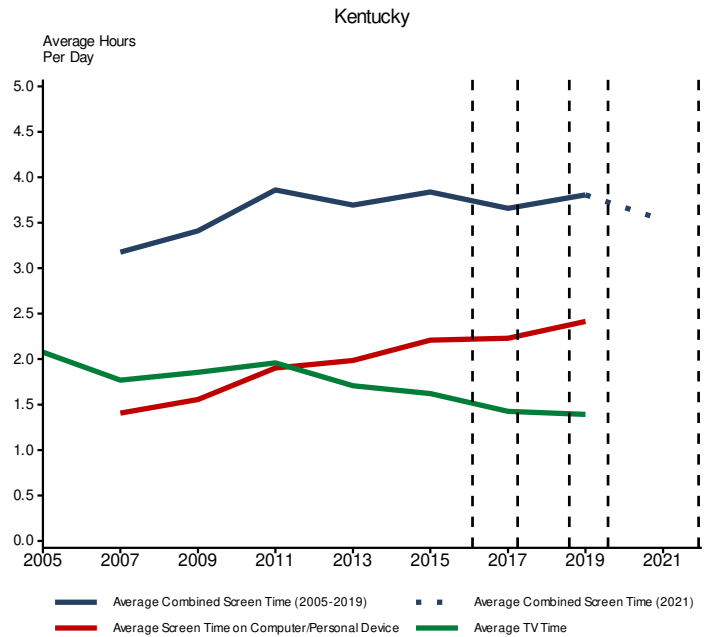
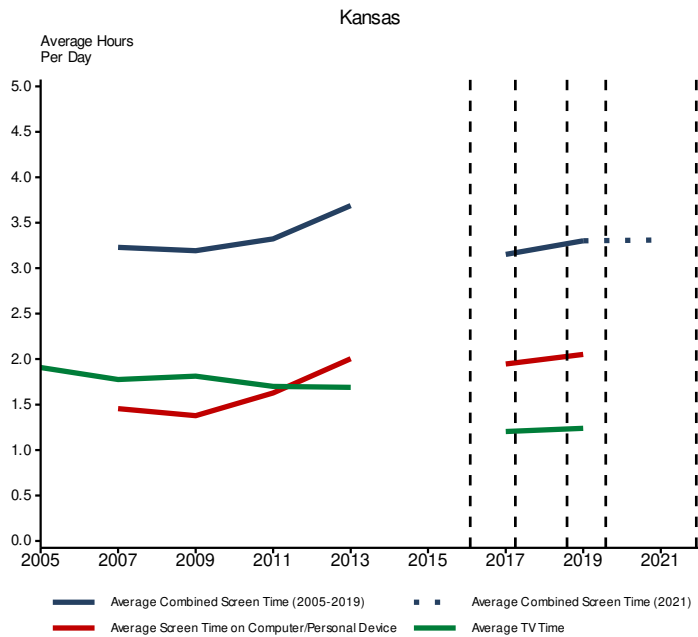
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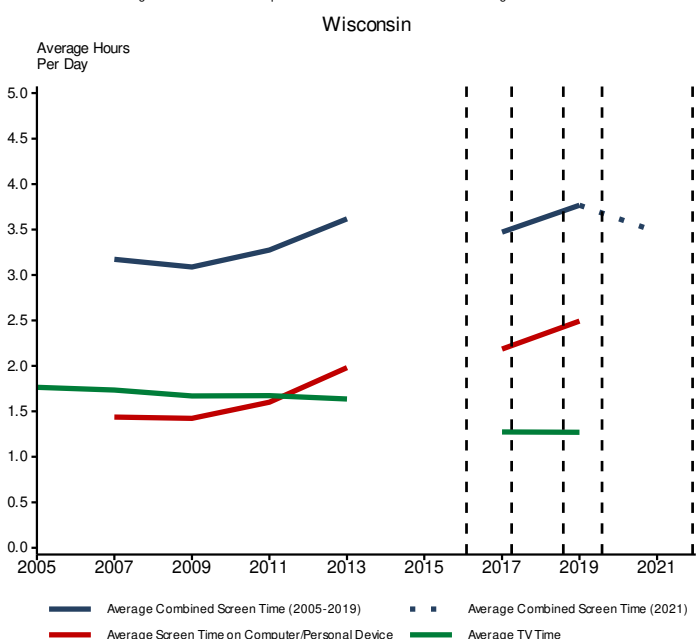
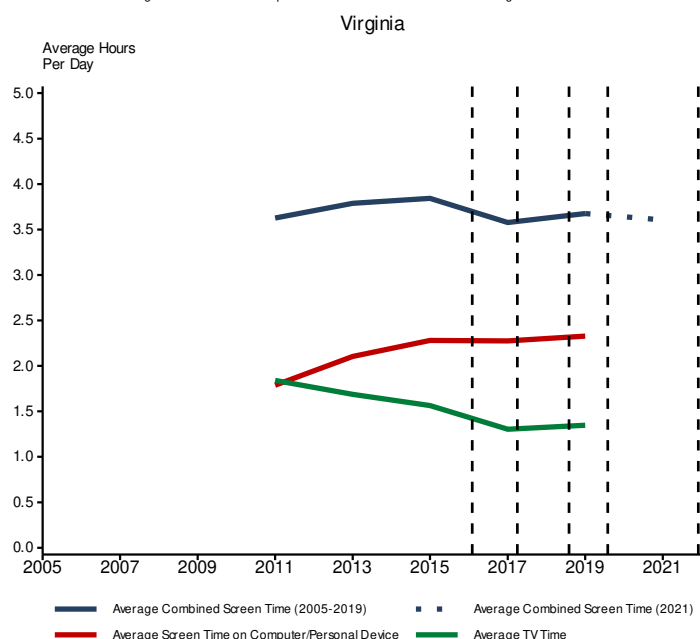
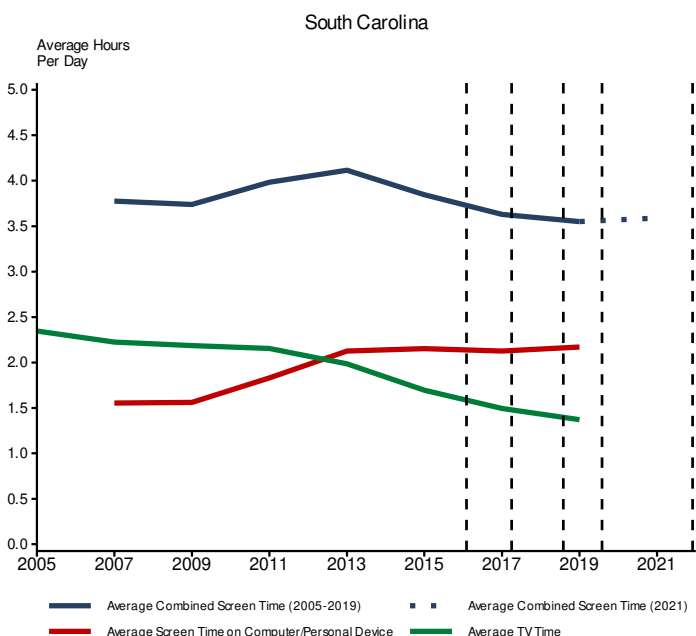
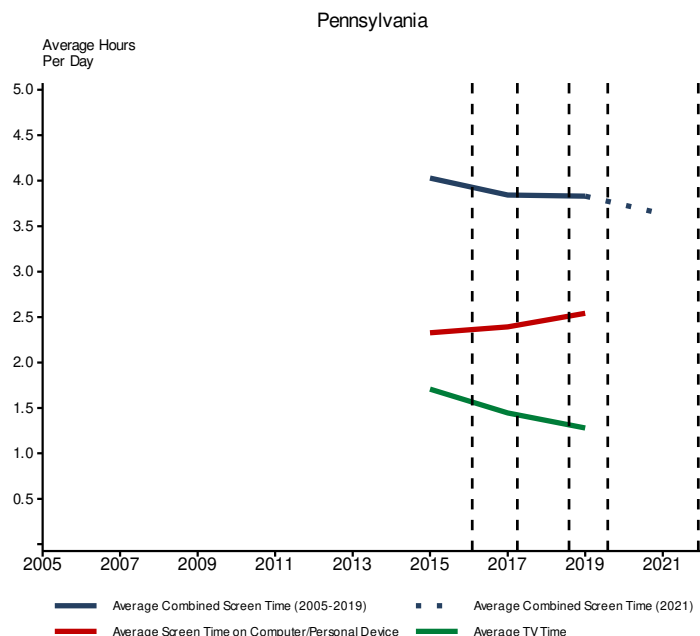
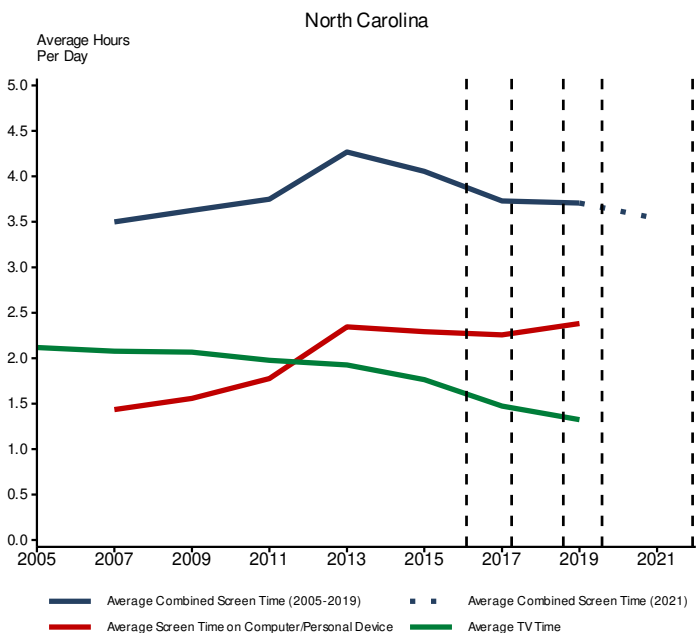
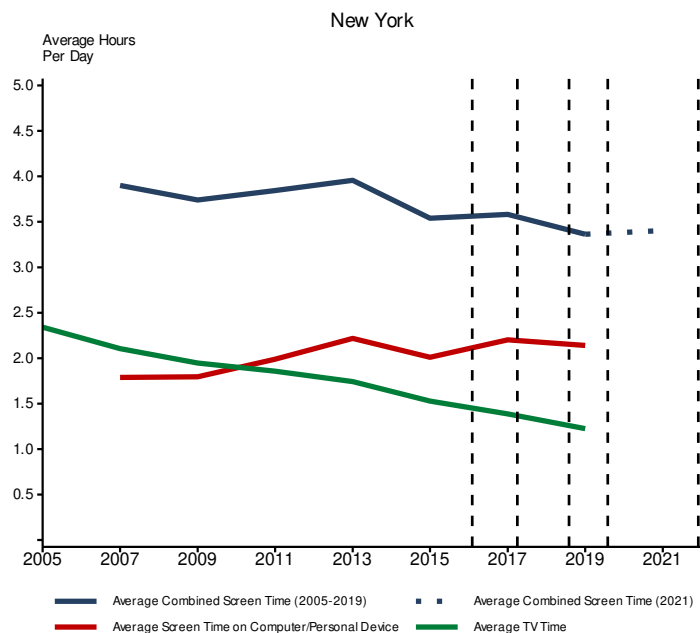
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Note: In addition to the materials on this list, I relied upon everything else cited in my report, figures, and appendices.

APPENDIX D TOTAL TIME SPENT ON SCREENS FOR THE UDAP STATES**Figure D.1 The Amount of Time Spent on Screens Has Not Increased Over Time Since the Alleged Conduct**



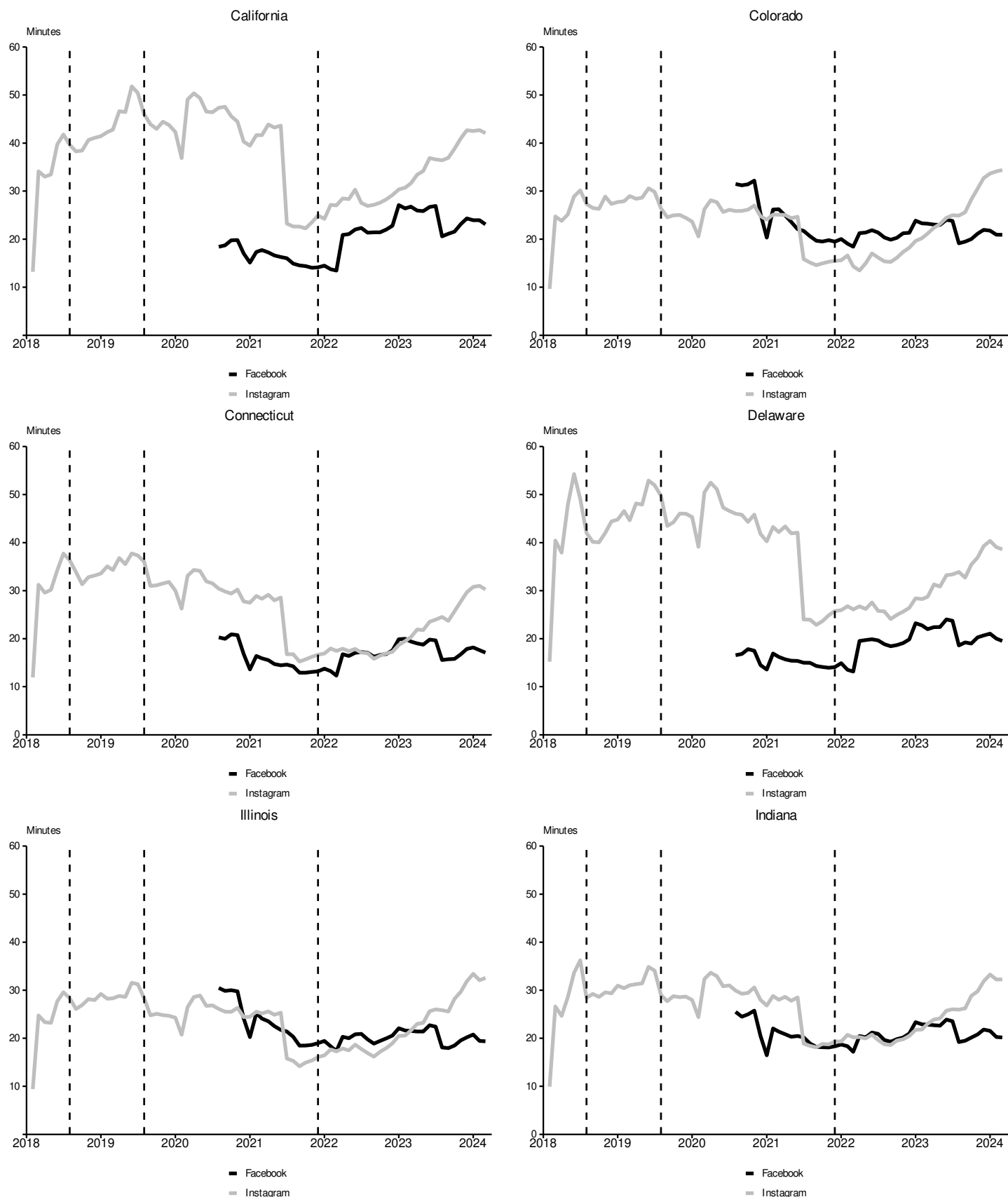


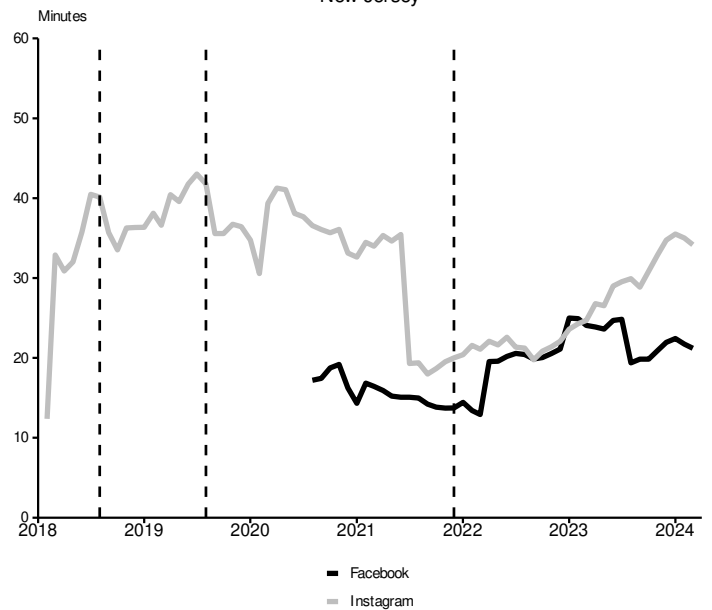
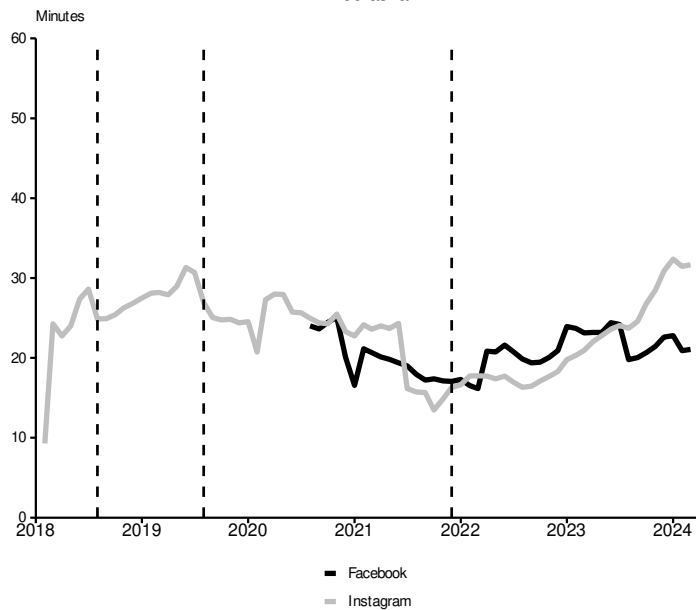
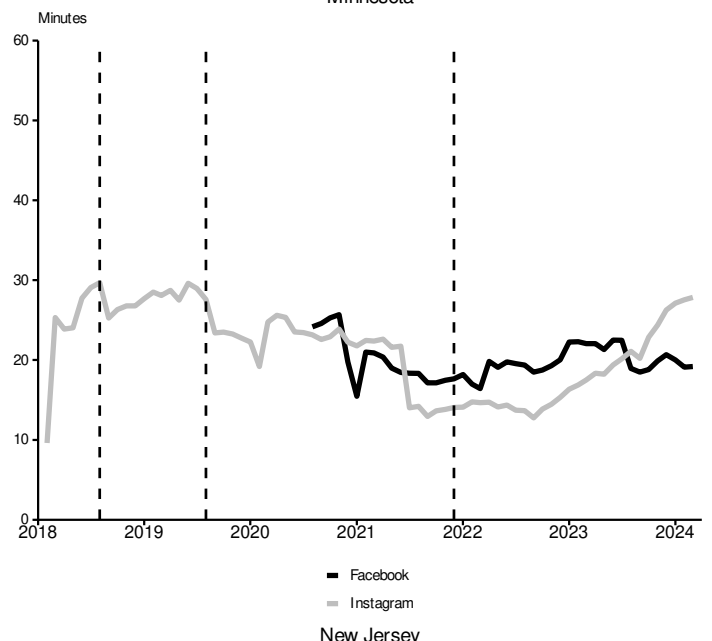
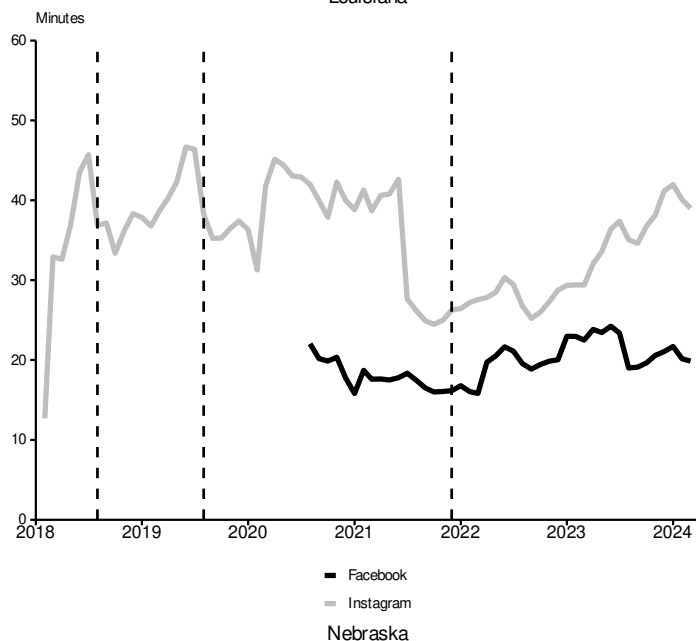
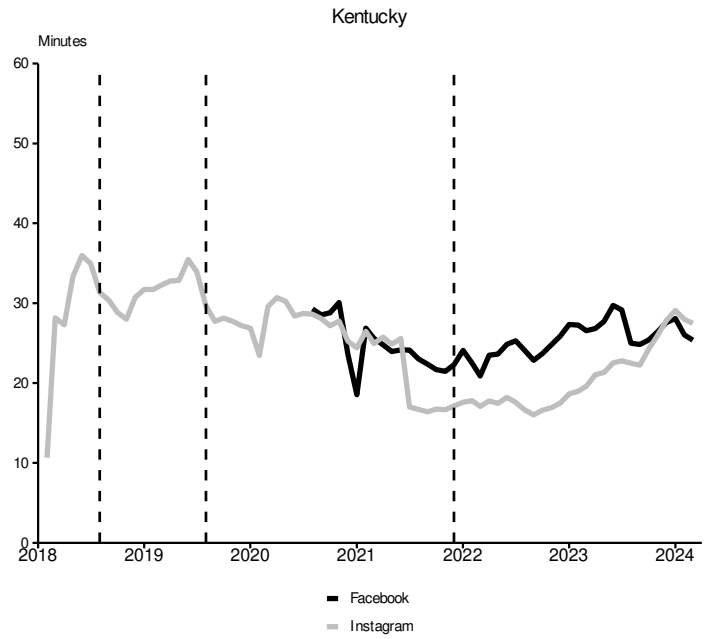
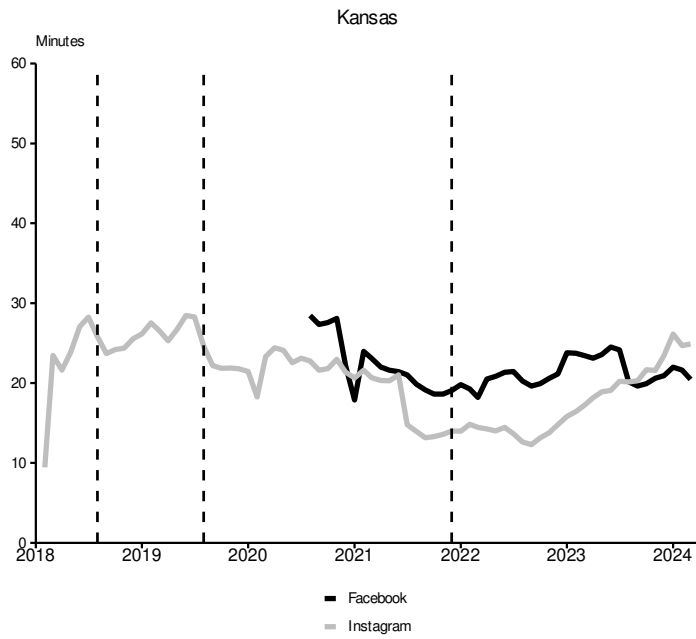
Source: Centers for Disease Control and Prevention (CDC), Youth Risk Behavior Survey Data (“YRBS Data”)

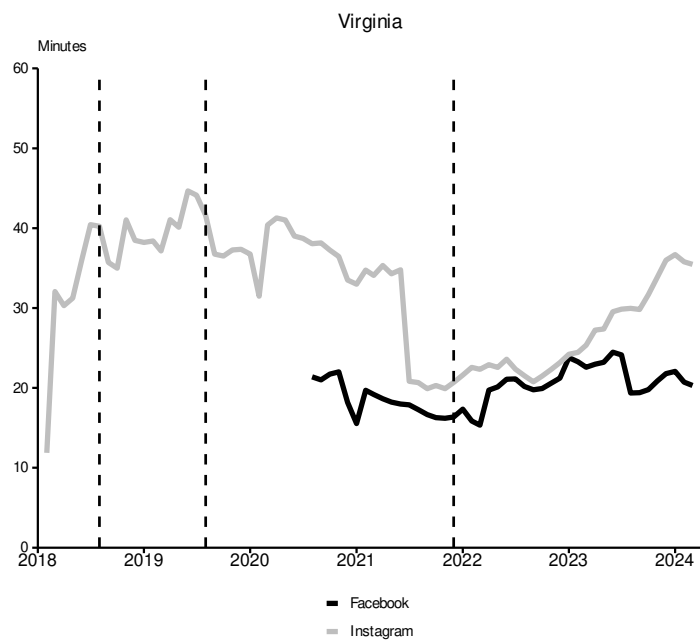
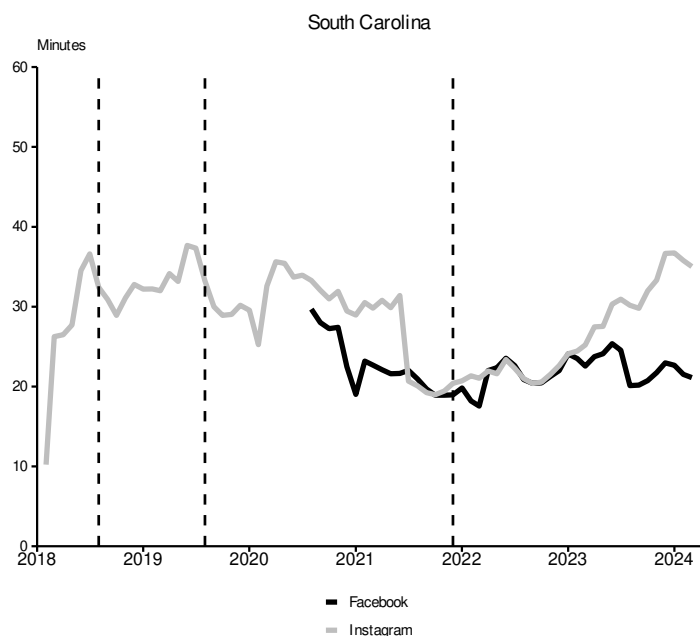
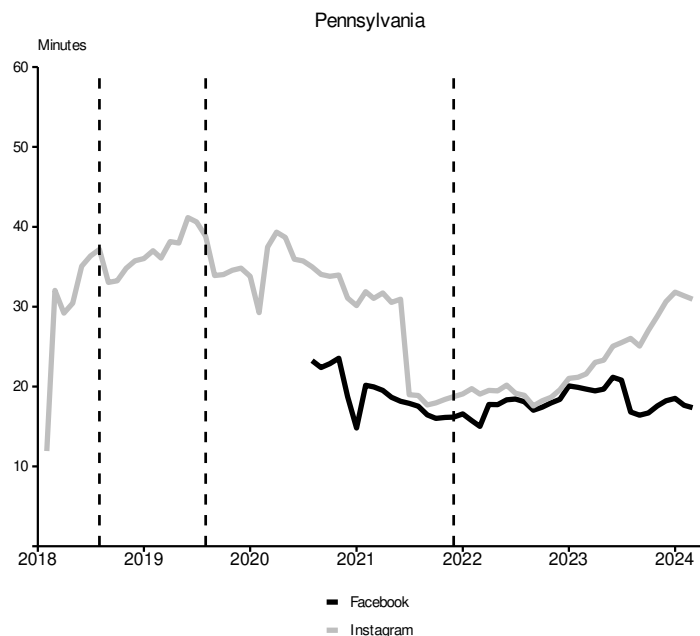
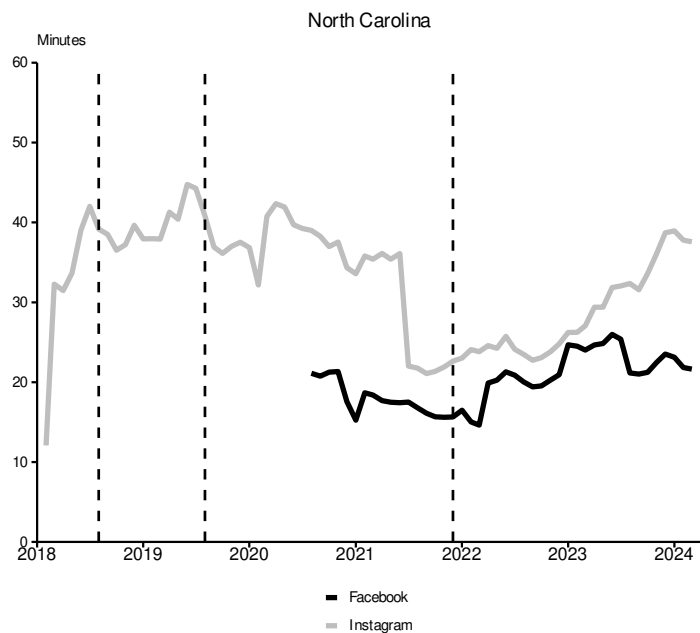
Note: These charts correspond to the charts in Figure 1 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the average amount of time students report spending on computers, watching TV, or on screen time across all devices on an average school day in the YRBS data. The YRBS is a bi-annual national survey of 9th through 12th grade students in public and private schools. Responses have been restricted to 13–17-year-old students in the UDAP States. YRBS is representative for each respective state. Non-responses to the charted questions have been excluded. “Average Screen Time on Computer/Personal Device” is the weighted average of responses to the question “On an average school day, how many hours do you play video or computer games or use a computer for something that is not school work?” “Average TV Time” is the weighted average of responses to the question “On an average school day, how many hours do you watch TV?” From 2005–2019, “Average Combined Screen Time” is the weighted average of the sum of the values for the “Average Screen Time on Computer/Personal Device” and “Average TV Time” questions in the YRBS. Beginning in 2021, “Average Combined Screen Time” is the weighted average of the responses to the question “On an average school day, how many hours do you spend in front of a TV, computer, smartphone, or other electronic device watching shows or videos, playing games, accessing the Internet, or using social media (also called ‘screen time’)?” which was only included in the 2021 edition of the YRBS. For the purposes of this chart, I convert the categorical responses to these questions to numerical values. To do so, I assume that a response of “Less than 1 hour per day” or “5 or more hours per day” to any question has been interpreted as half an hour and 5 hours, respectively. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the CDC for the YRBS data. These respondent weights account for non-responses and the oversampling of certain demographic groups and ensure that the weighted totals of respondents in the survey for each grade match population projections for the survey year. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram’s multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

APPENDIX E USAGE TRENDS FOR THE UDAP STATES BY OUTCOME

Figure E.1 The Average Time Spent on Instagram and Facebook by Teens in UDAP States Who Were Active on Instagram and Facebook in a Given Month is Inconsistent with Plaintiffs' Allegations



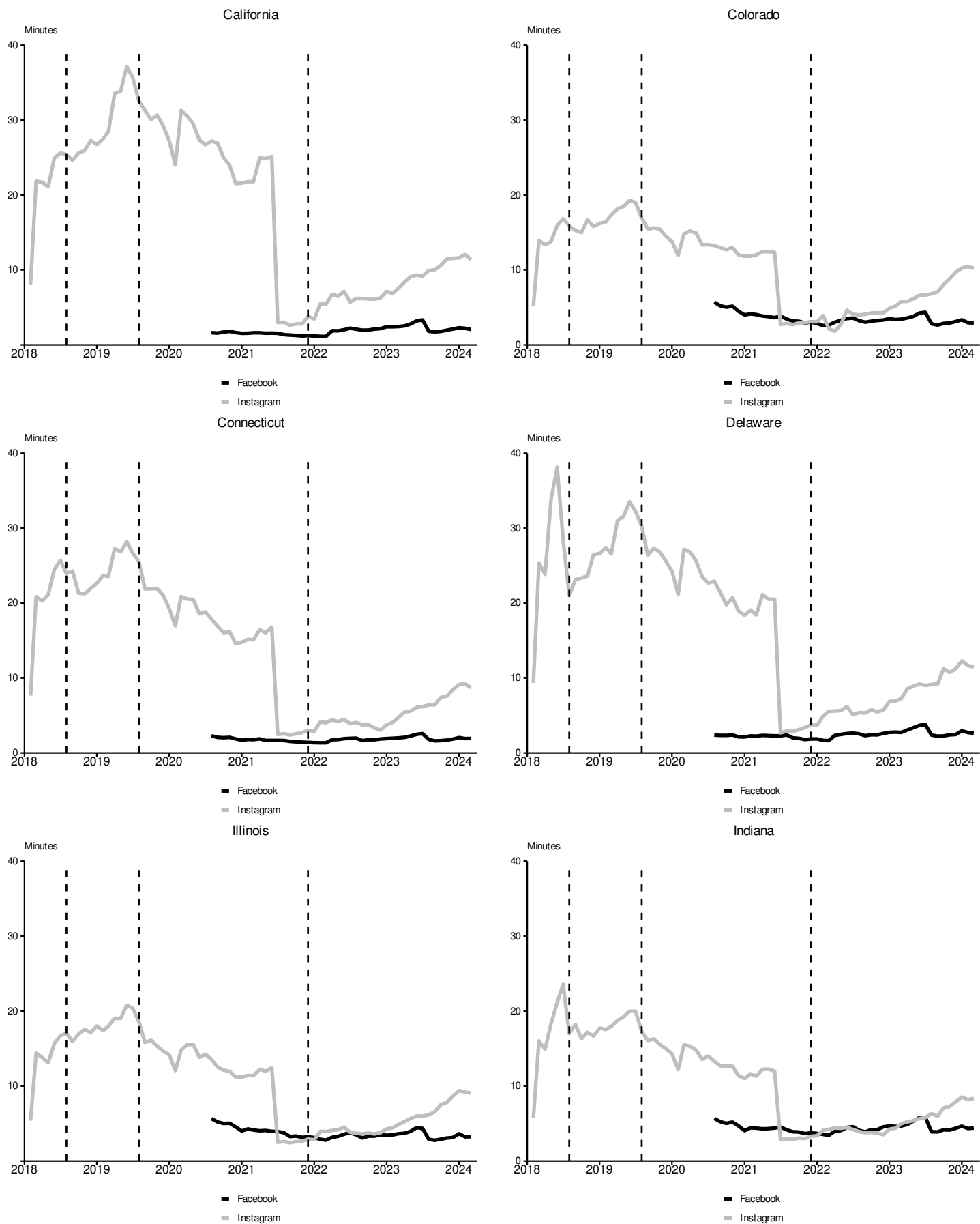


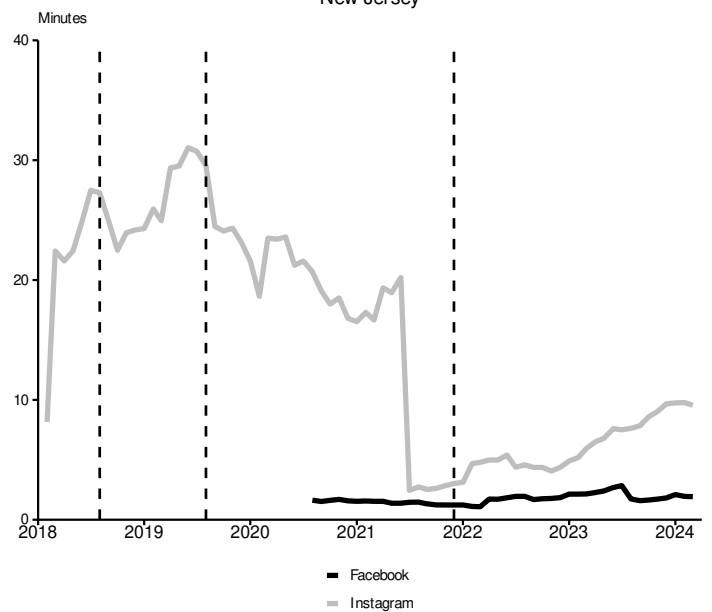
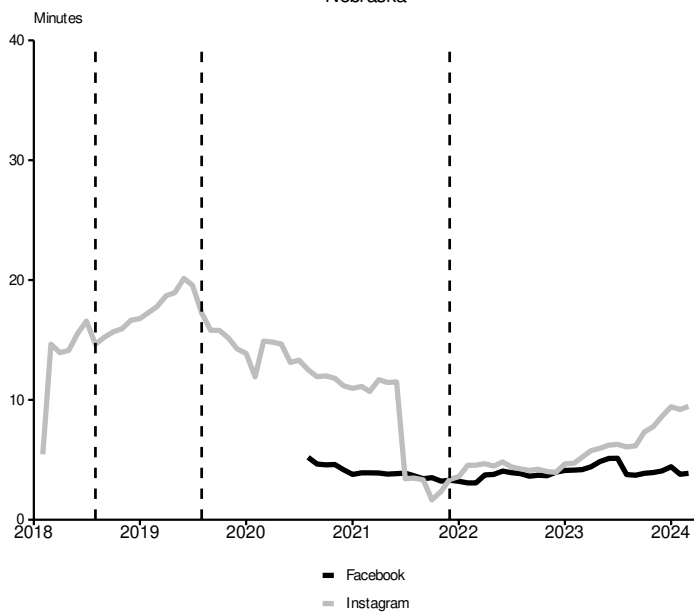
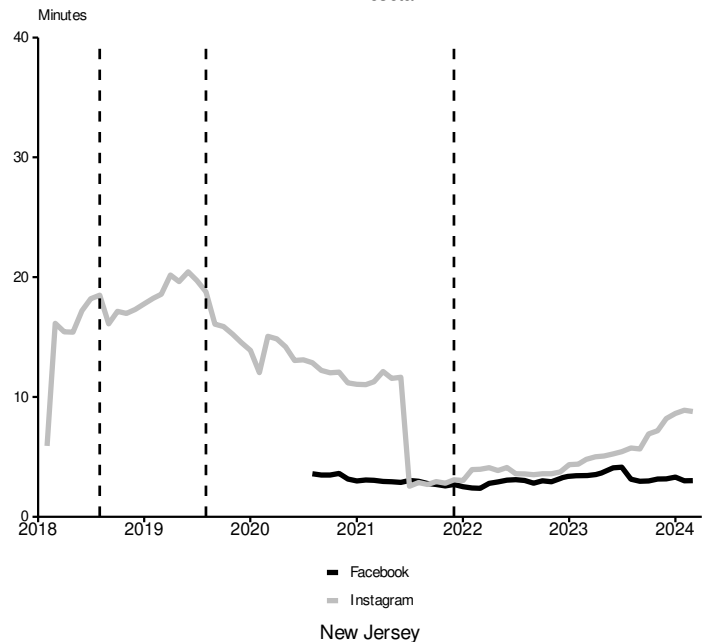
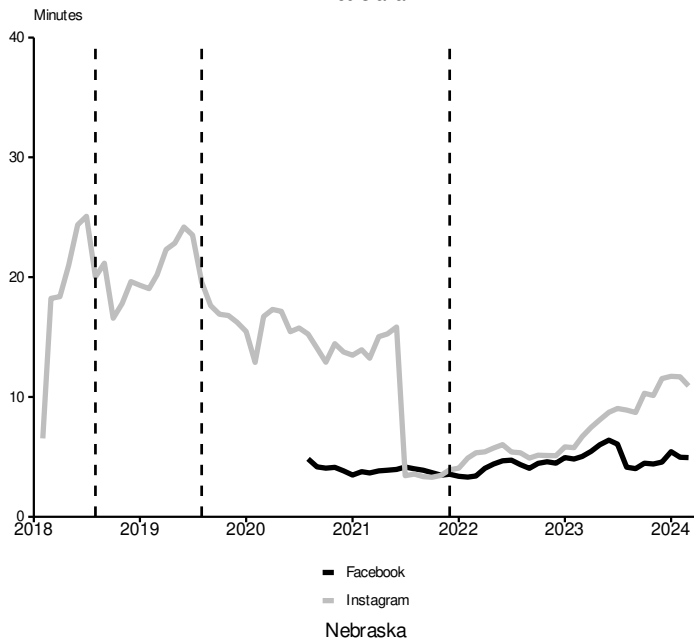
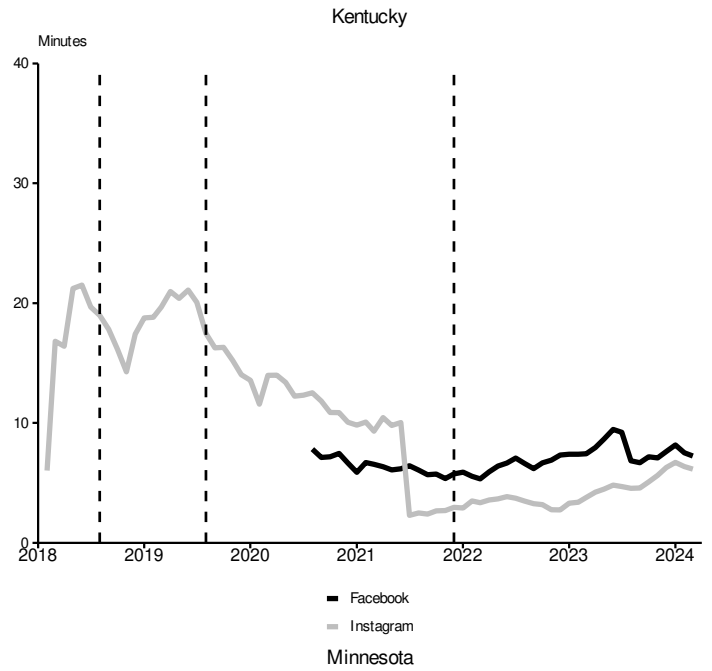
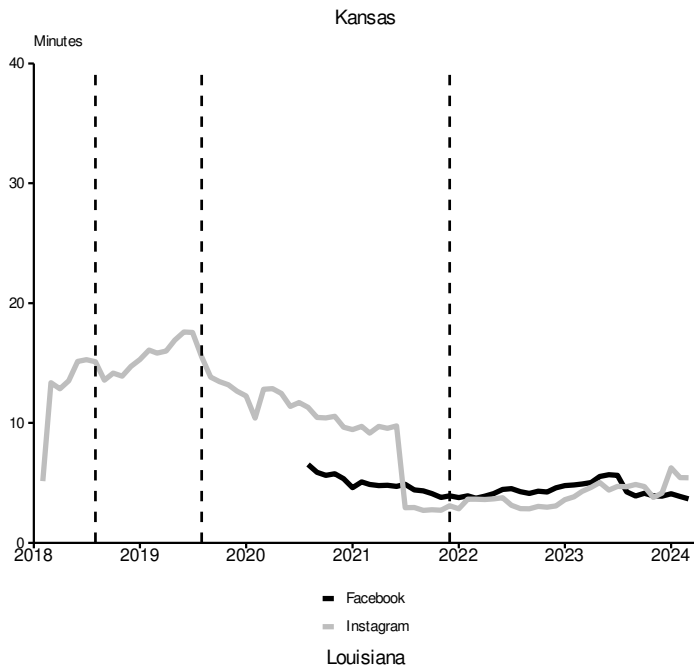


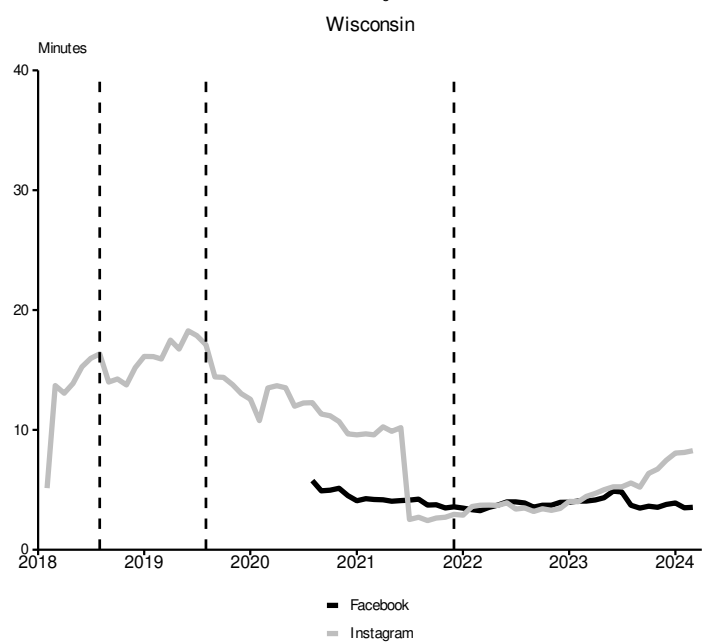
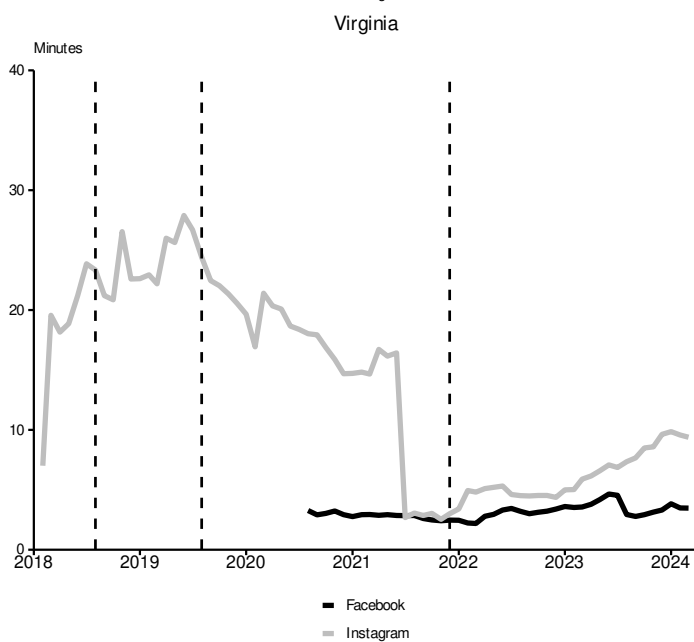
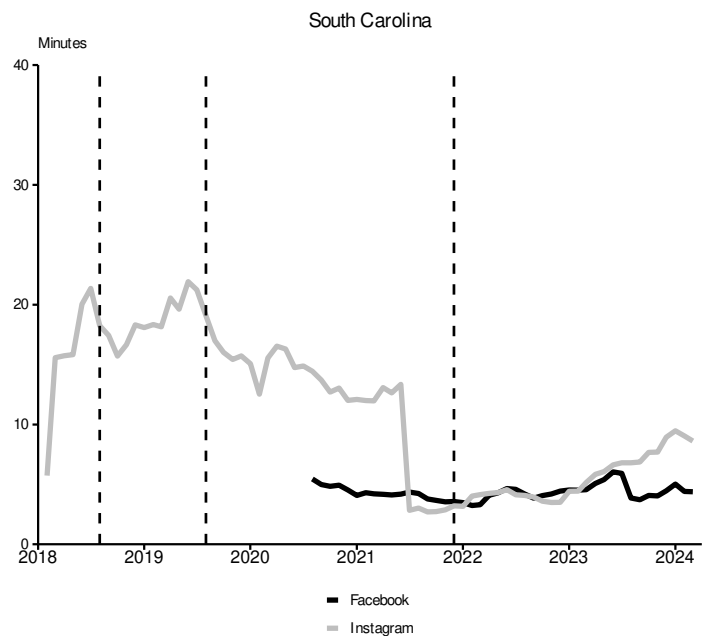
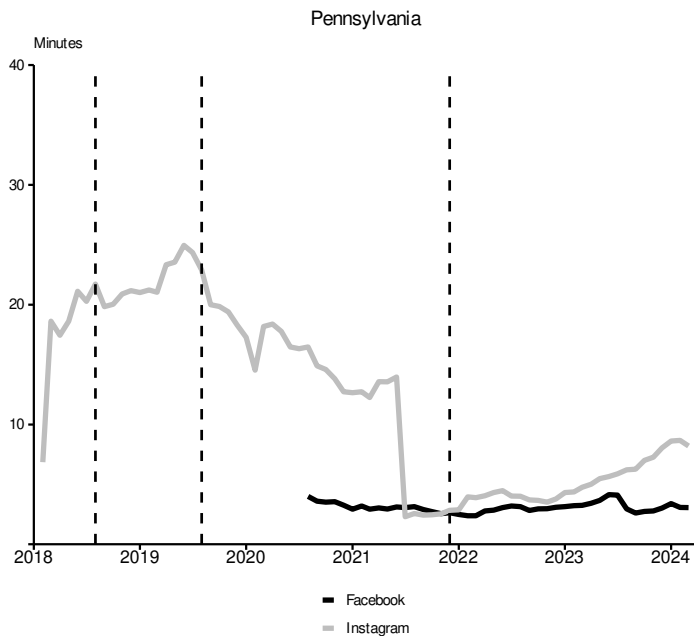
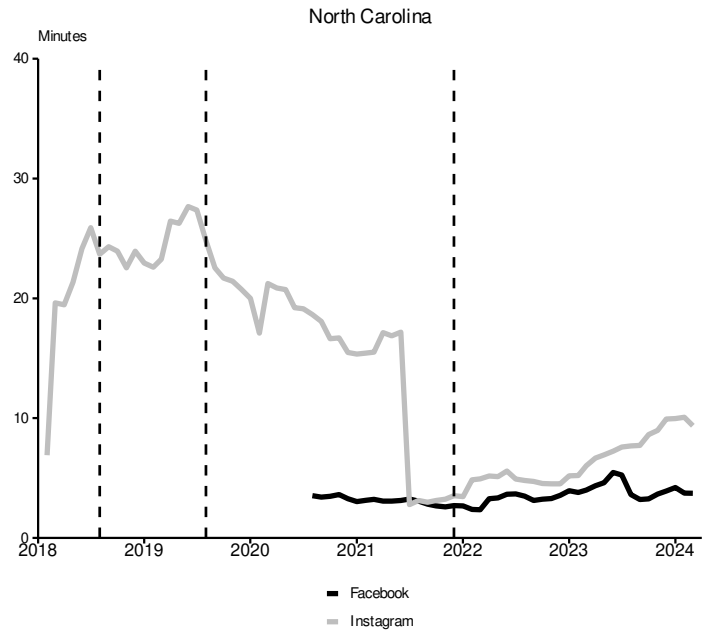
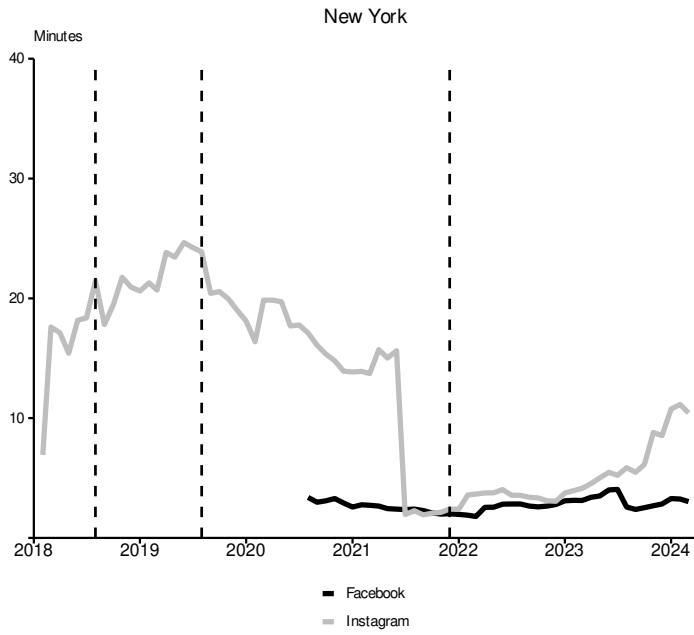
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025

Note: These charts correspond to the charts in Figure 2 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the average time spent per day on Facebook and Instagram among Teen Users in the United States who are active on Facebook or Instagram in a given month, even for days when that user was not active and thus had no time spent on that day. I note that Teen Users were identified by Meta in the data using their proprietary classifier model for predicting user age. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters and time management tools. The time management tools feature has two dates as noted in Section V.A. Only the later date for the cosmetic surgery filters feature is included as the original launch was before the start of the produced usage data. The launch date for Instagram's multiple accounts function is also before the start of the produced usage data.

Figure E.2 The Median Daily Time Spent on Instagram and Facebook by Teens in UDAP States is Inconsistent with Plaintiffs' Allegations



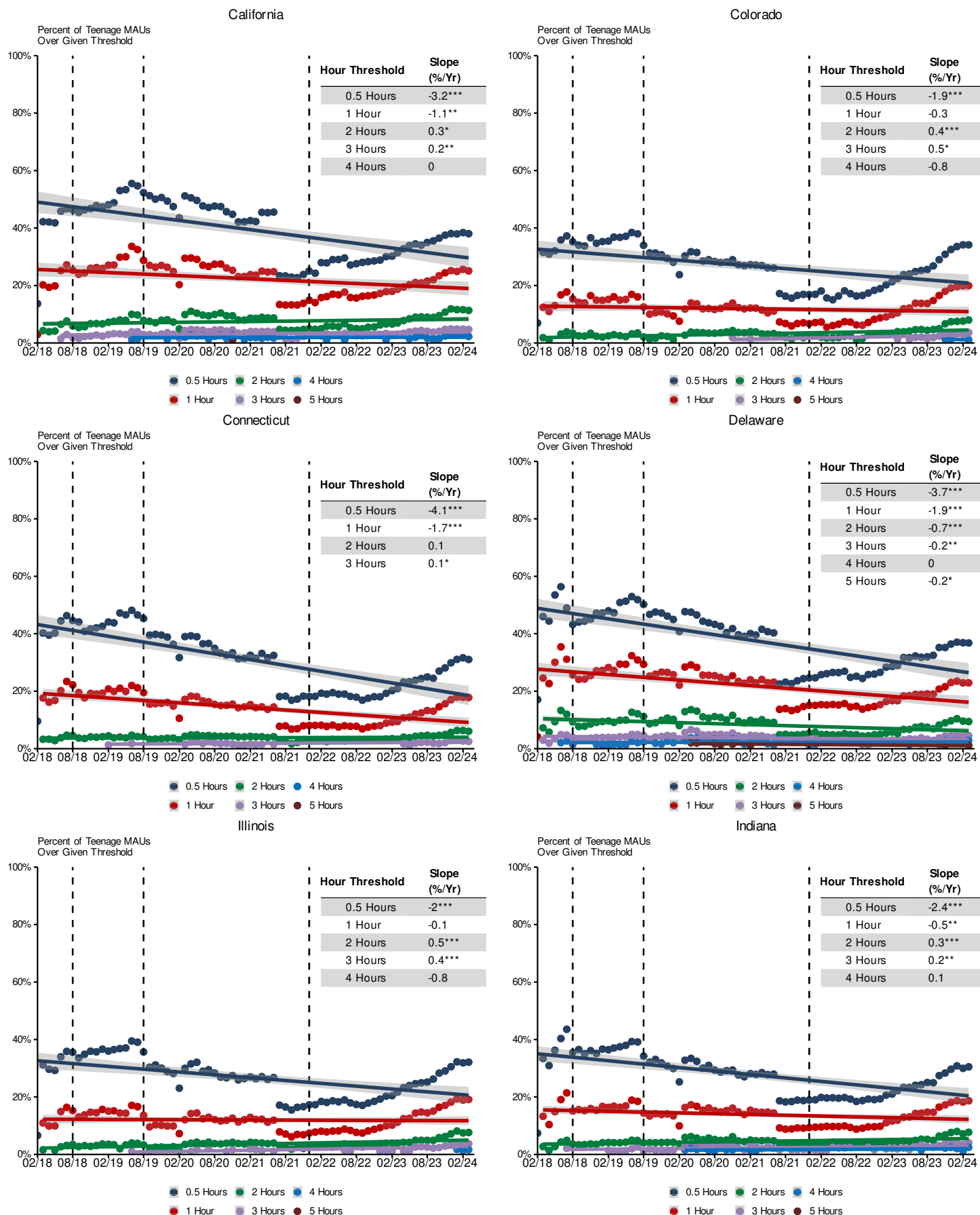




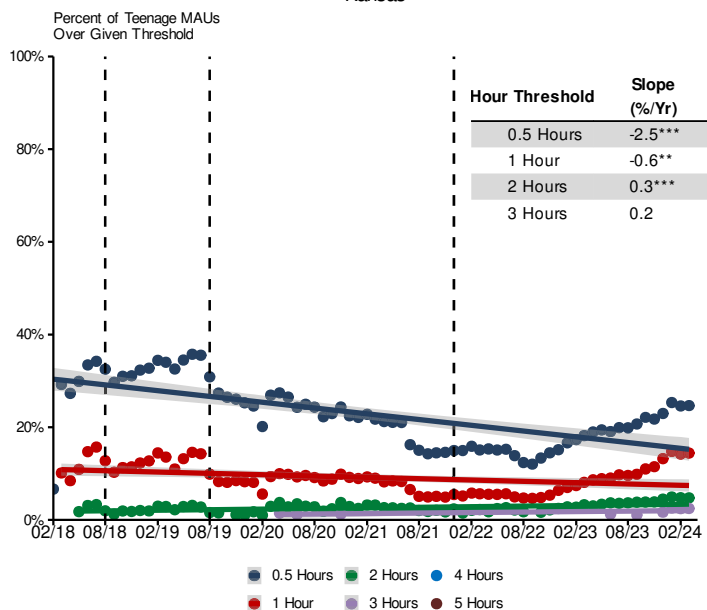
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Note: These charts correspond to the charts in Figure 3 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the 50th percentile of the daily time spent in a given day across all Teen Users who logged on to Facebook or Instagram at least once in a given month. I note that Teen Users were identified by Meta in the data using their proprietary classifier model for predicting user age. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters and time management tools. The time management tools feature has two dates as noted in Section V.A. Only the later date for the cosmetic surgery filters feature is included as the original launch was before the start of the produced usage data. The launch date for Instagram's multiple accounts function is also before the start of the produced usage data.

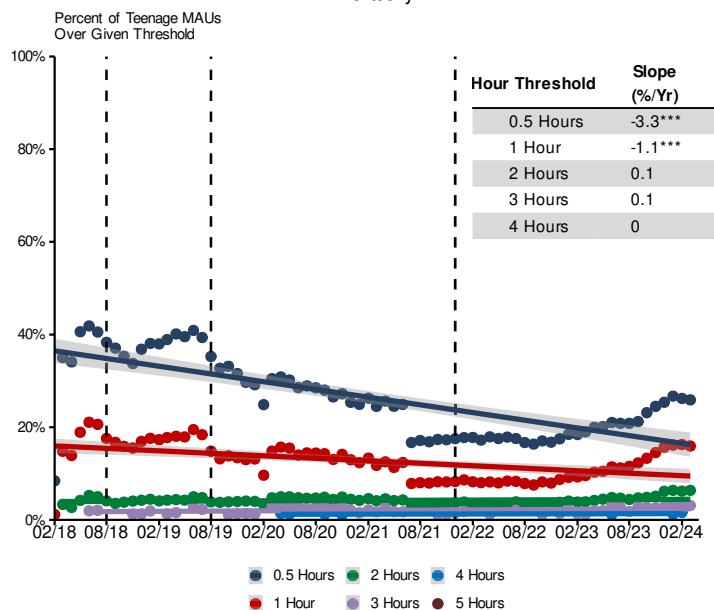
Figure E.3 The Percent of Teen MAUs on Instagram at Each Time Spent Threshold which Mr. Saba Tallies Are Inconsistent with Plaintiffs' Allegations



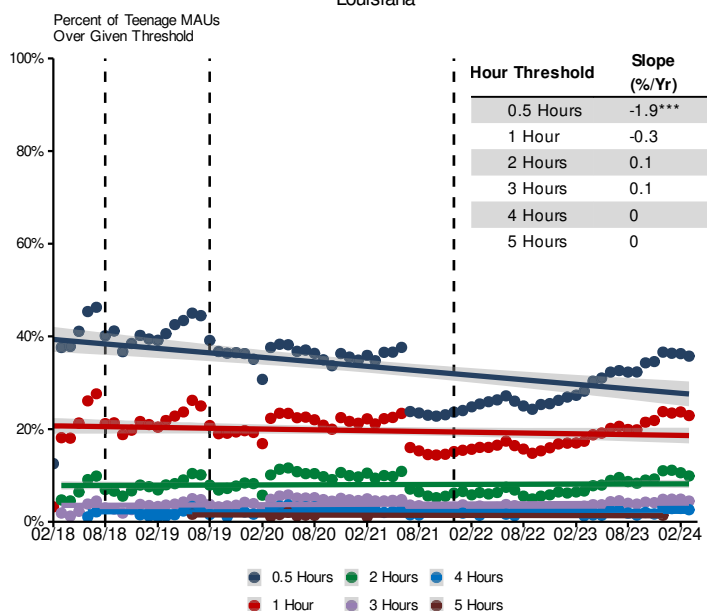
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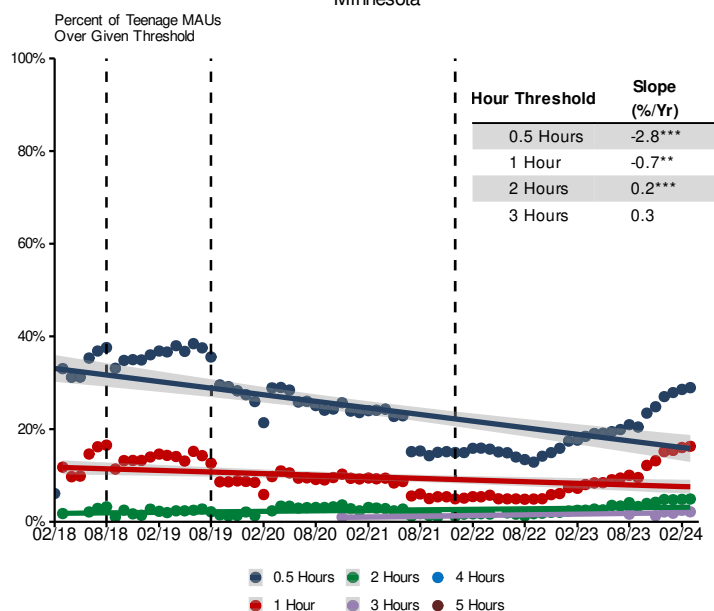
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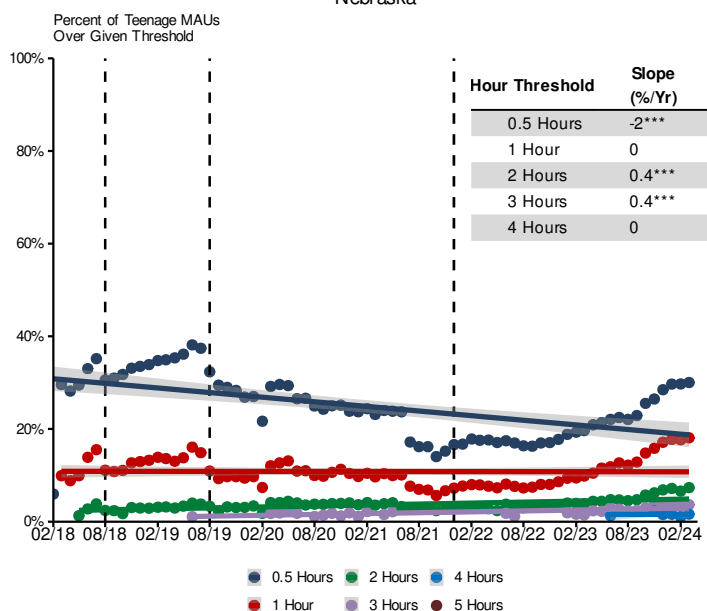
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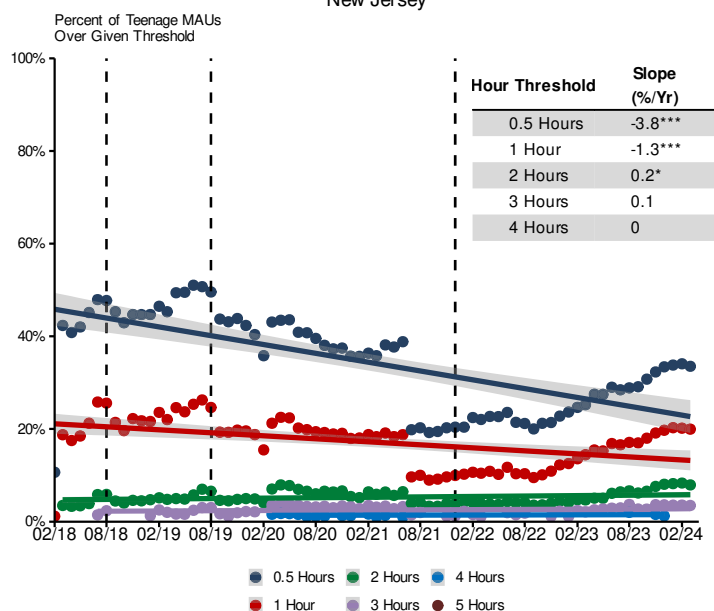
Minnesota

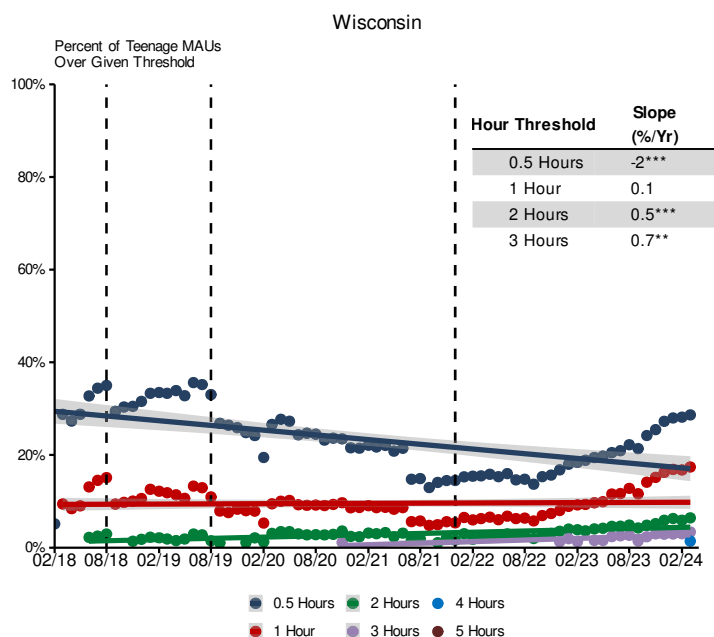
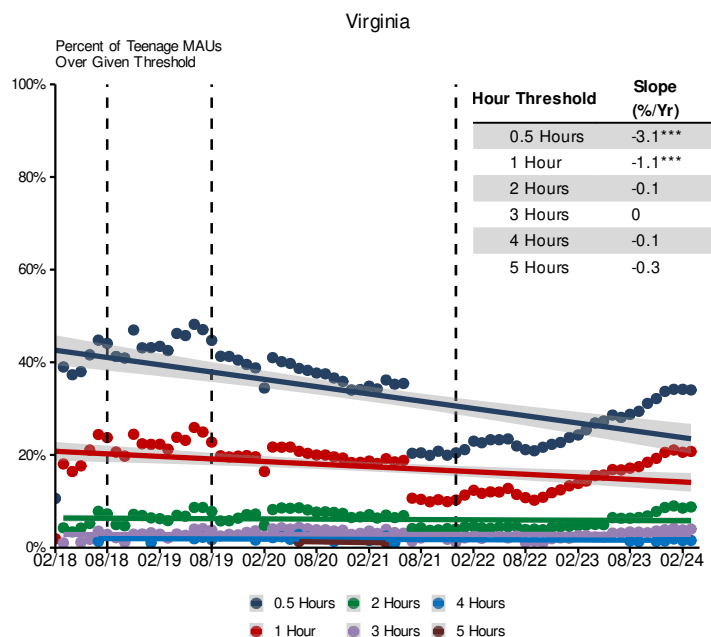
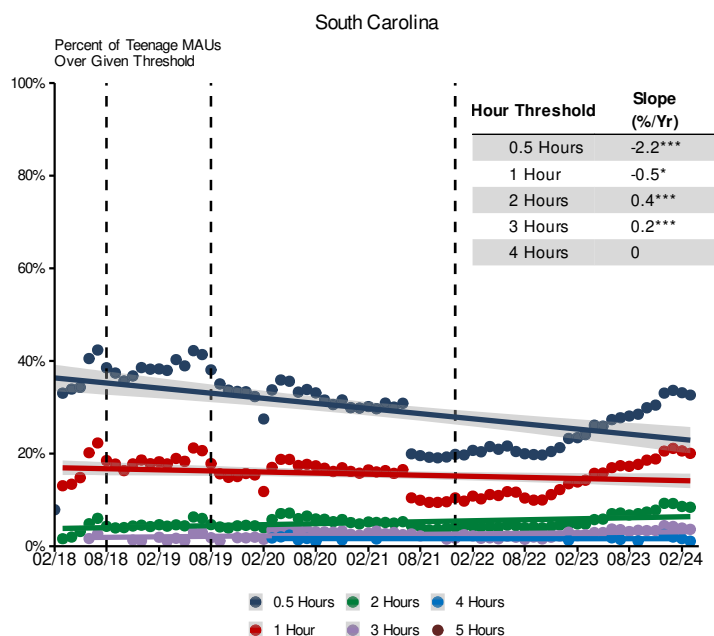
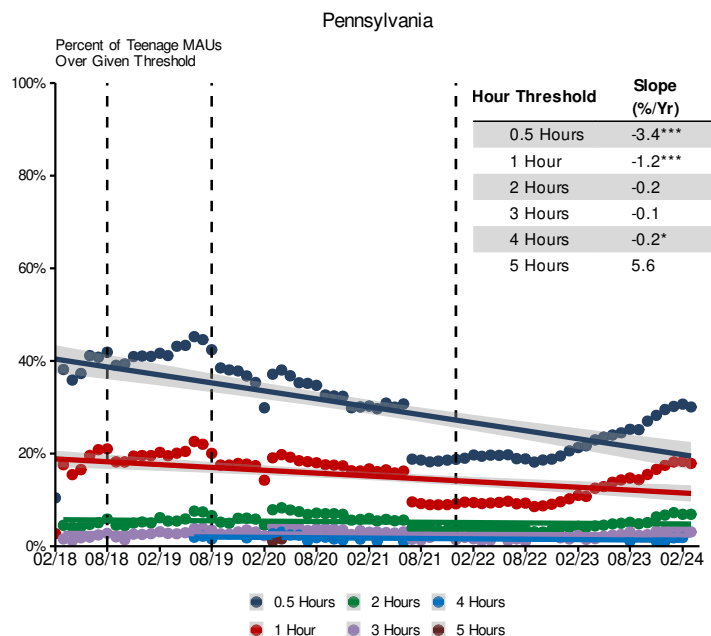
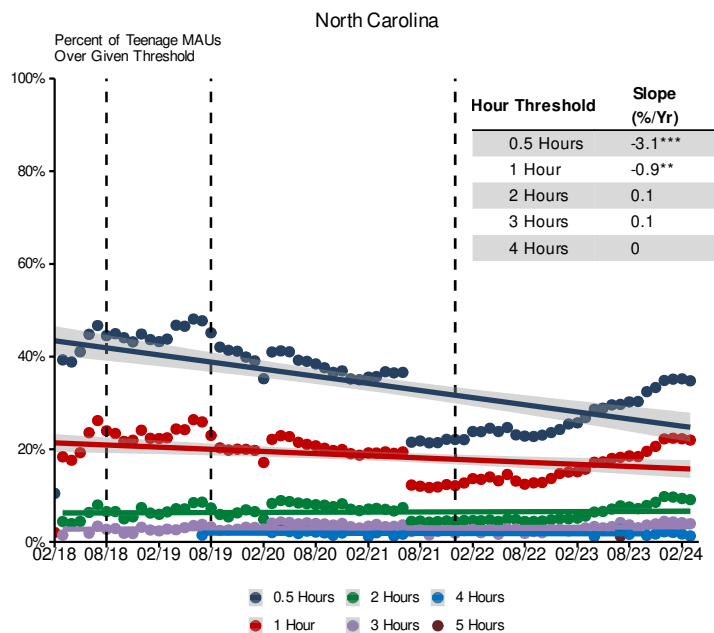
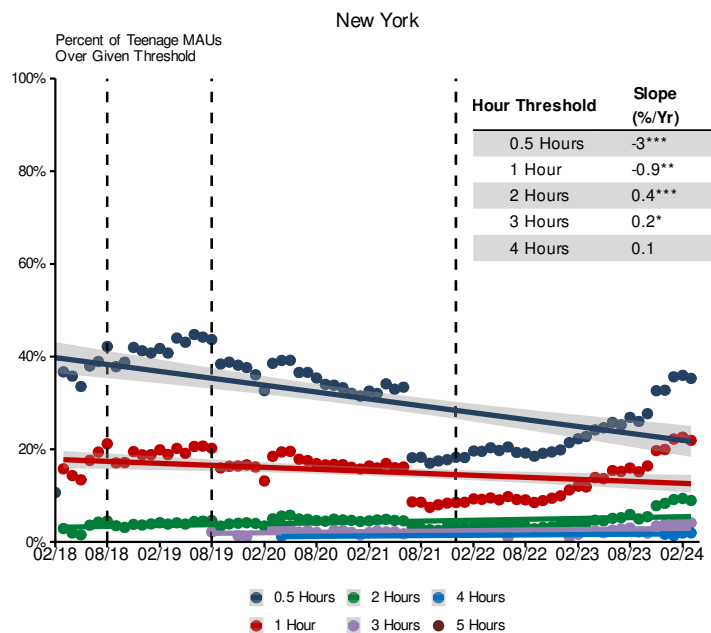


Nebraska



New Jersey

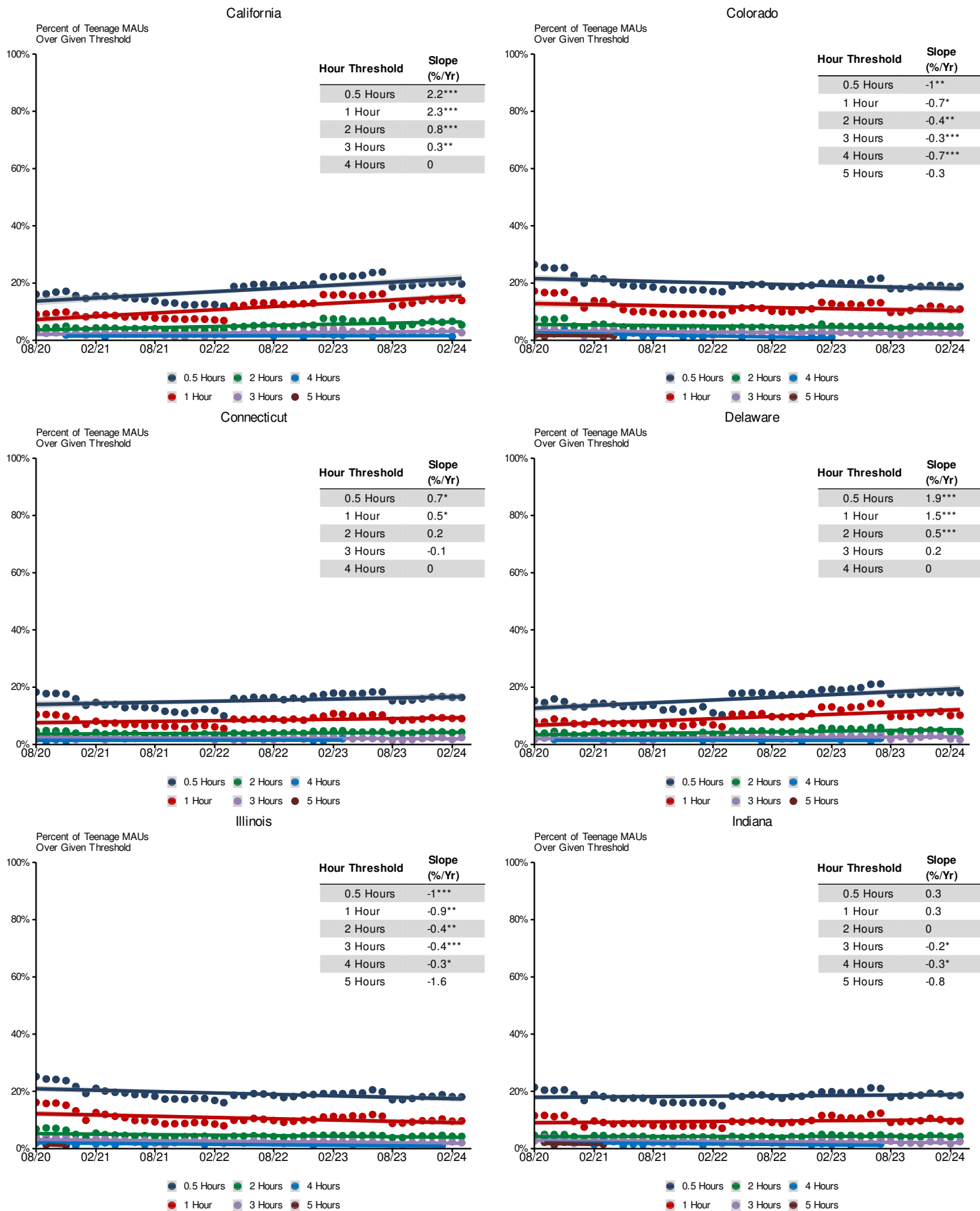




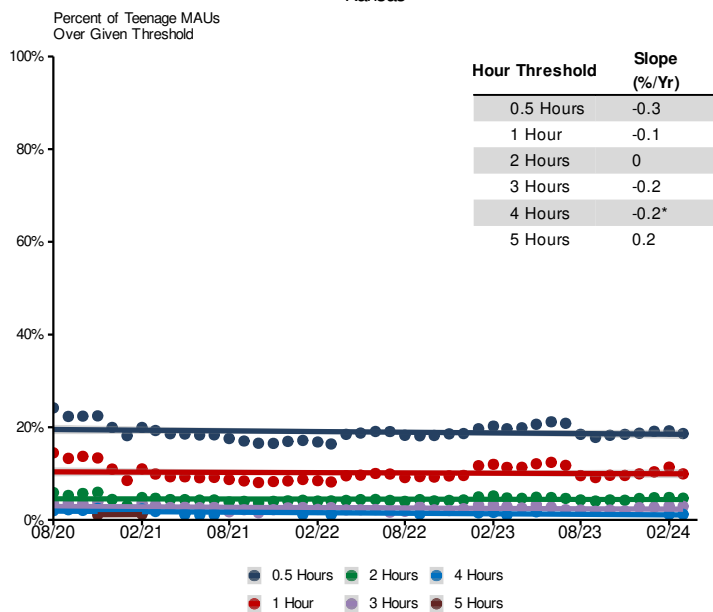
Source: Saba Report, Schedule 2.9.3; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, "Re: MDL 3047," October 10, 2025

Note: These charts correspond to the charts in Figure 4 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the percentage of Teen Users that used Instagram for more than a given threshold of time spent for the UDAP States. Using these percentages, the line of best fit is created, and its slope and statistical significance is calculated. The displayed line of best fit that shows the trend over time in the percentage of Teenage MAUs over each given threshold is calculated using the Ordinary Least Squares method. The displayed slopes of these lines of best fit can be interpreted as the average annual change in percentage points of Teenage Instagram MAUs spending over the given threshold. In the table, one asterisk (*) indicates the result is statistically discernable from zero at a 95% significance level. Two asterisks indicate the result is statistically significant at a 99% significance level, and three asterisks indicate the result is statistically significant at a 99.9% significance level. The shaded grey band around the linear regression line in this plot represents the 95% confidence interval for the mean predicted value. It indicates the range within which we can be 95% confident that the true trendline for the percent of Teen MAUs above the given threshold lies. I note that Teen Users were identified by Meta in the data using their proprietary classifier model for predicting user age. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely Instagram's cosmetic surgery filters and time management tools. The launch date for Instagram's multiple accounts function is before the start of the produced usage data.

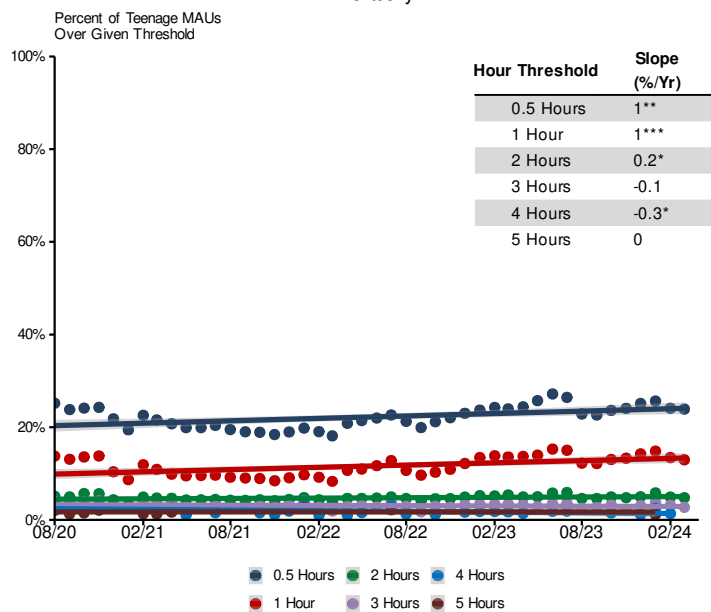
Figure E.4 The Percent of Teen MAUs on Facebook at Each Time Spent Threshold which Mr. Saba Tallies Are Inconsistent with Plaintiffs' Allegations



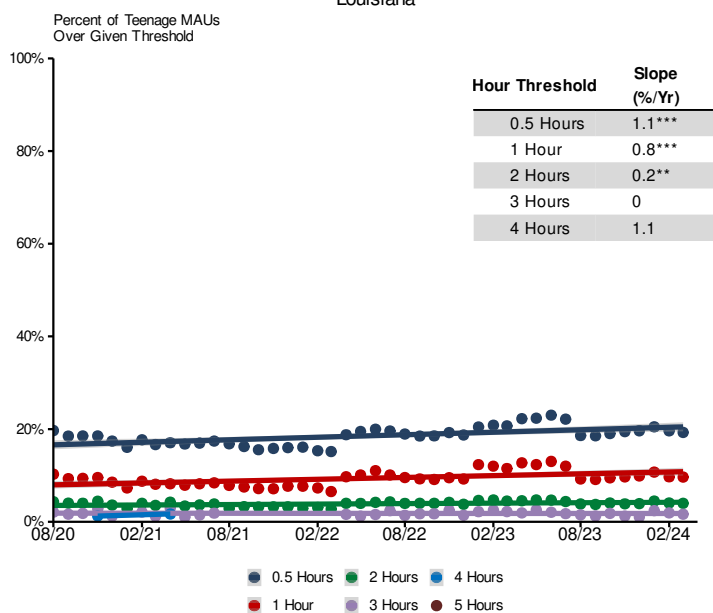
Kansas



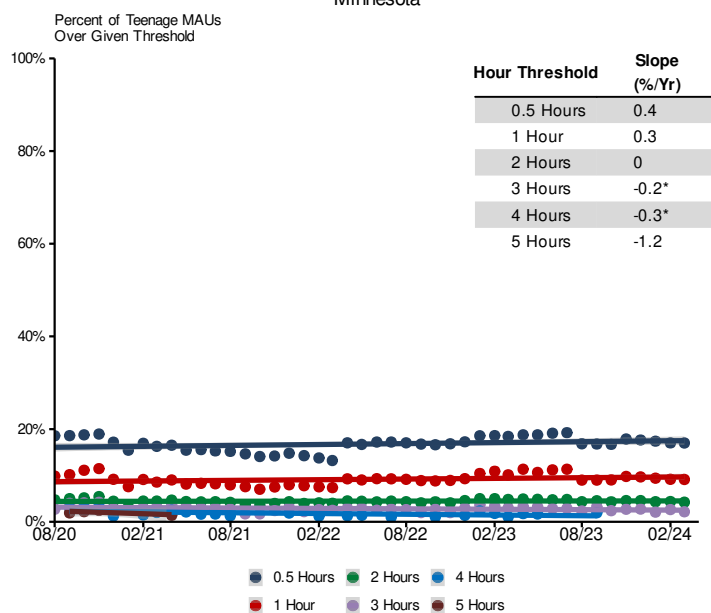
Kentucky



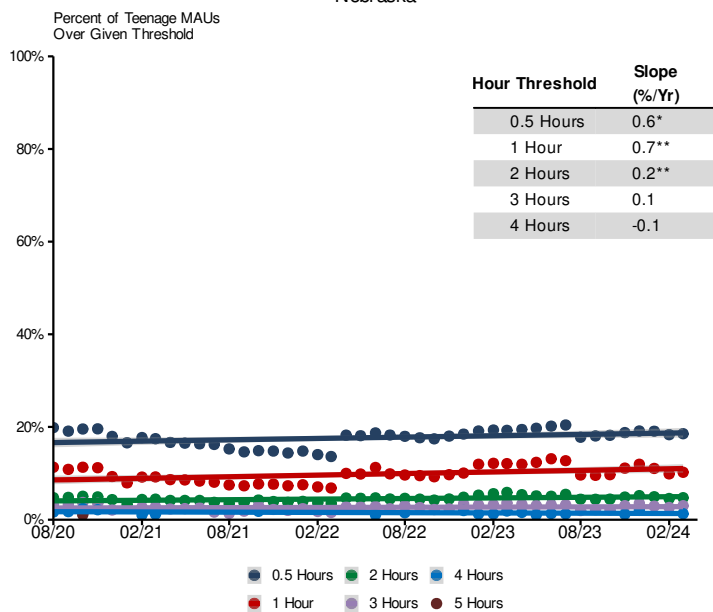
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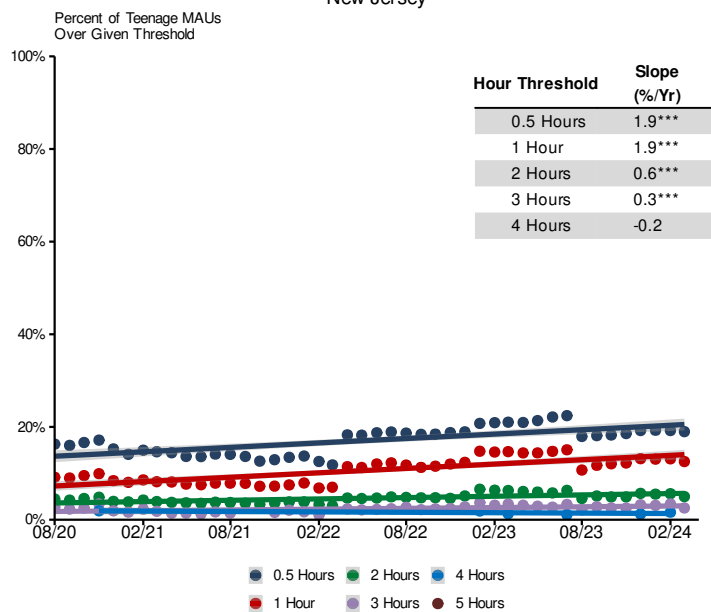
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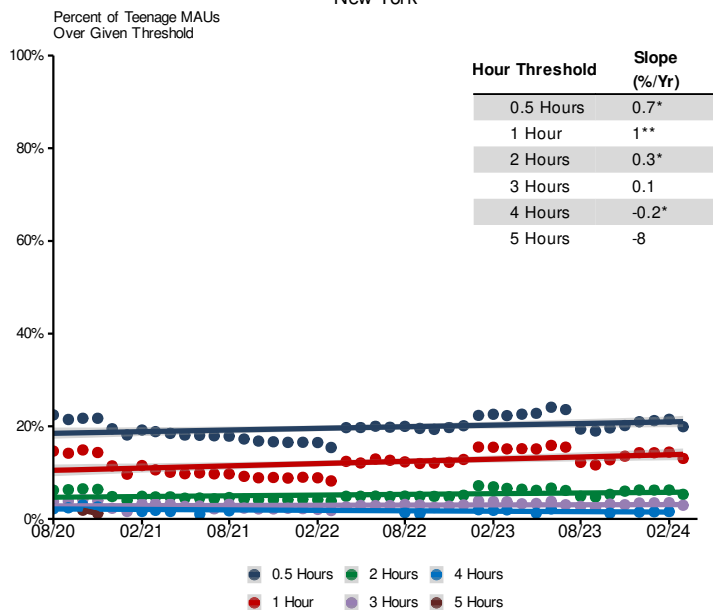
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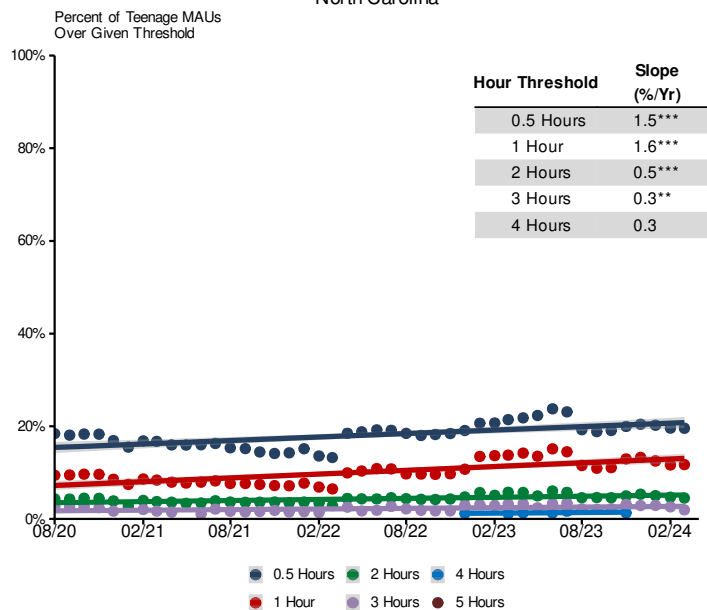
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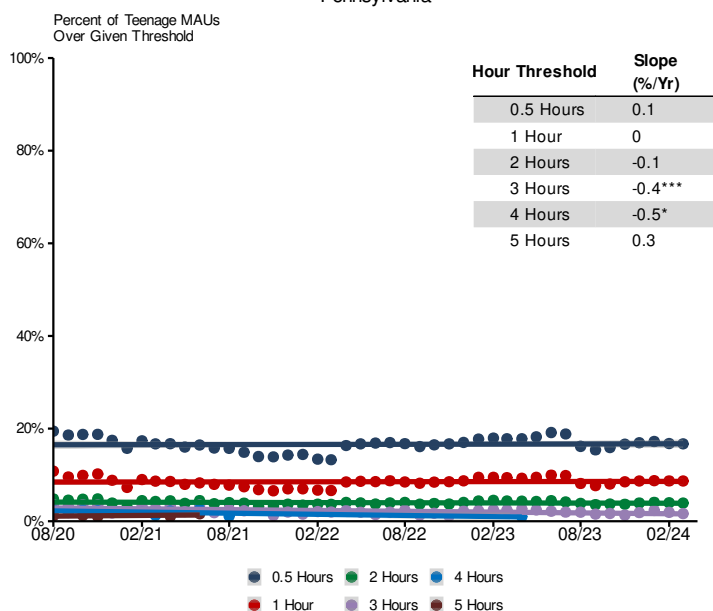
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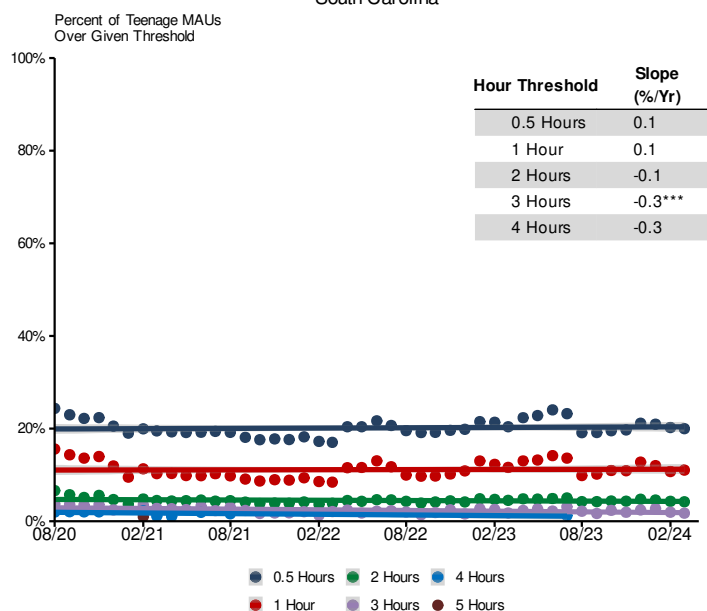
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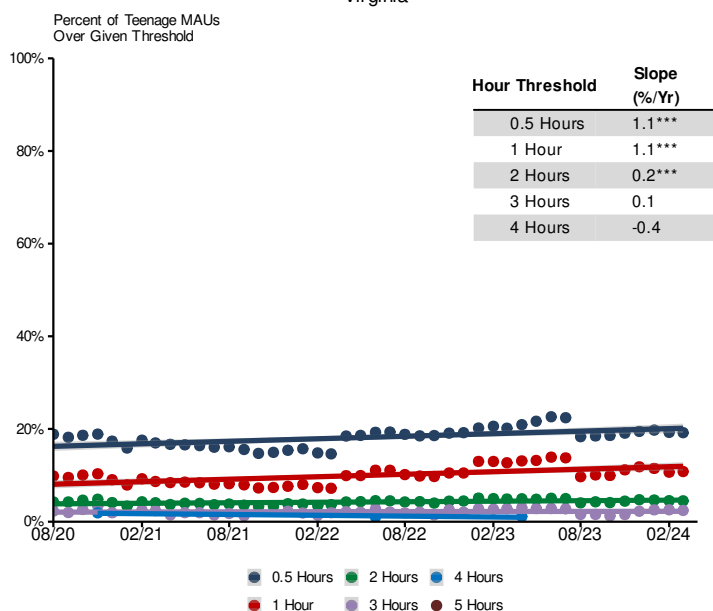
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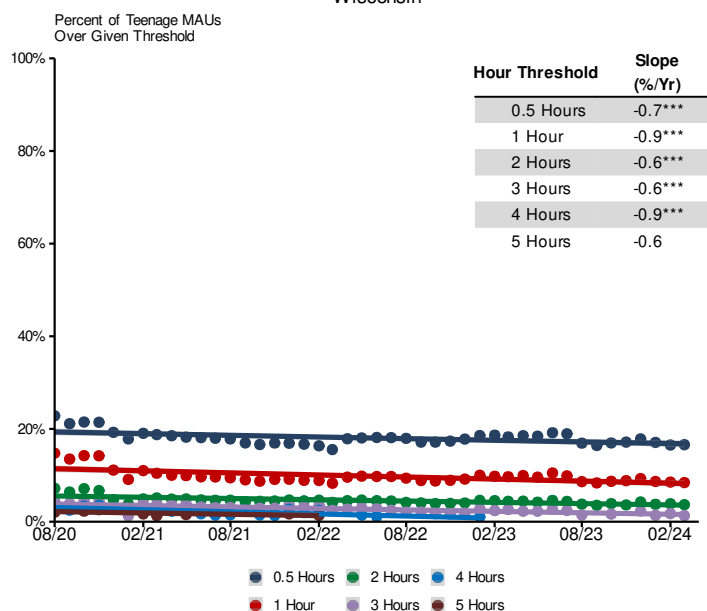
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Virginia



Wisconsin

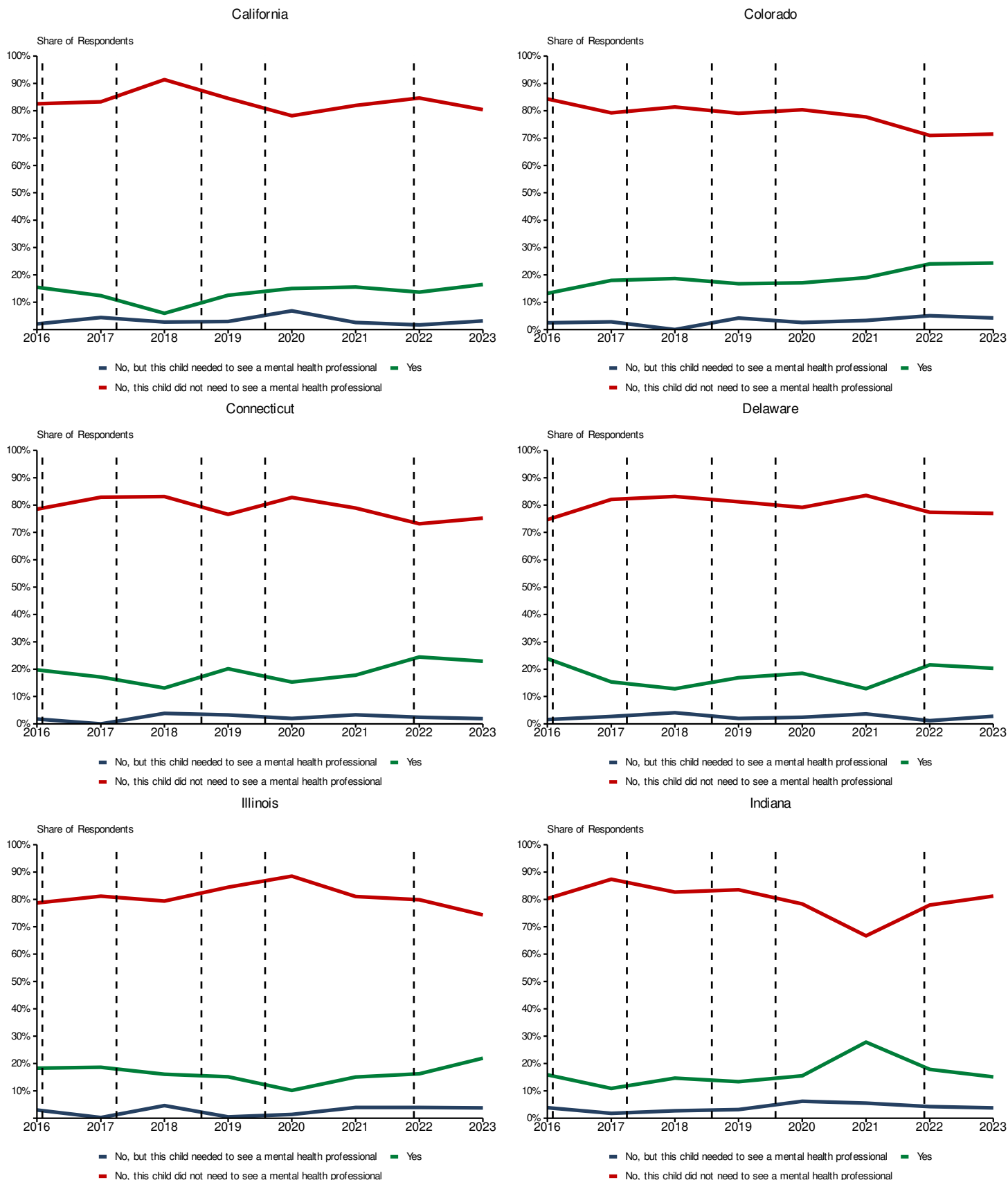


Source: Saba Report, Schedule 2.10.3; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, "Re: MDL 3047," October 10, 2025

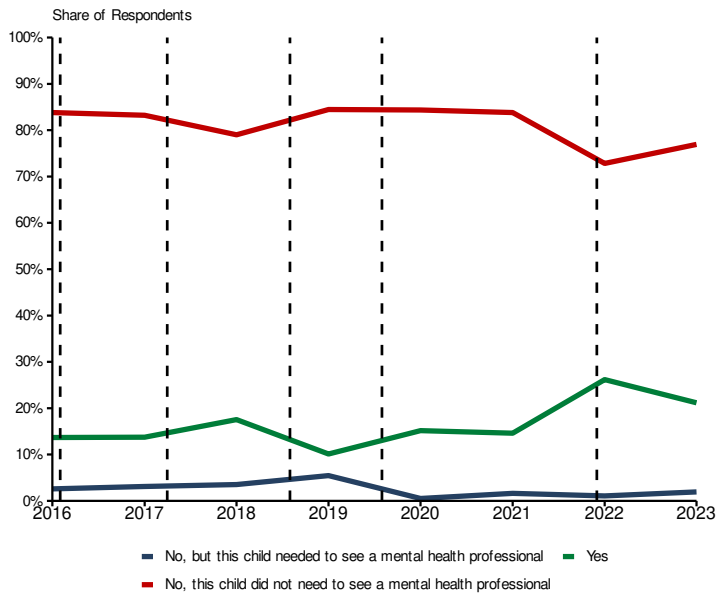
Note: These charts correspond to the charts in Figure 5 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the percentage of Teen Users that used Facebook for more than a given threshold of time spent for the UDAP States. Using these percentages, the line of best fit is created, and its slope and statistical significance is calculated. The displayed line of best fit that shows the trend over time in the percentage of Teenage MAUs over each given threshold is calculated using the Ordinary Least Squares method. The displayed slopes of these lines of best fit can be interpreted as the average annual change in percentage points of Teenage Facebook MAUs spending over the given threshold. In the table, one asterisk (*) indicates the result is statistically discernable from zero at a 95% significance level. Two asterisks indicate the result is statistically significant at a 99% significance level, and three asterisks indicate the result is statistically significant at a 99.9% significance level. The shaded grey band around the linear regression line in this plot represents the 95% confidence interval for the mean predicted value. It indicates the range within which we can be 95% confident that the true trendline for the percent of Teen MAUs above the given threshold lies. I note that Teen Users were identified by Meta in the data using their proprietary classifier model for predicting user age.

APPENDIX F MENTAL HEALTH TRENDS FOR THE UDAP STATES BY OUTCOME NSCH

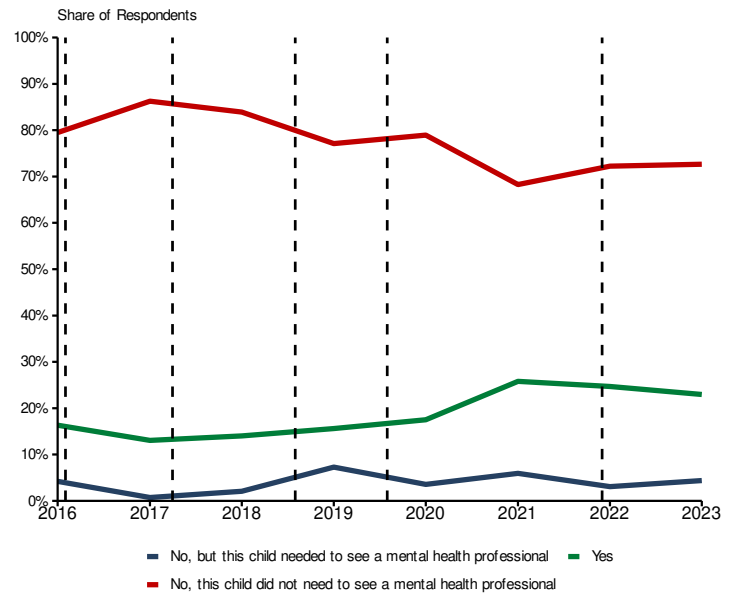
Figure F.1 Share of Teens in UDAP States Treated for Mental Health Challenges Over Time



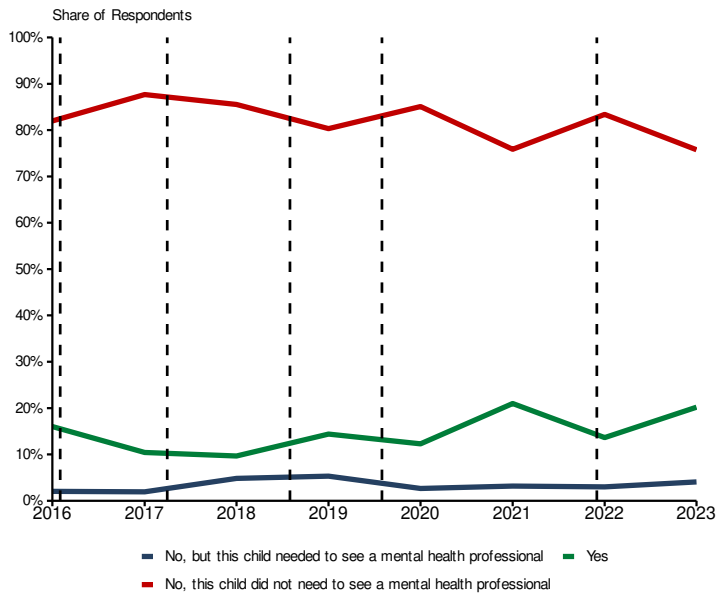
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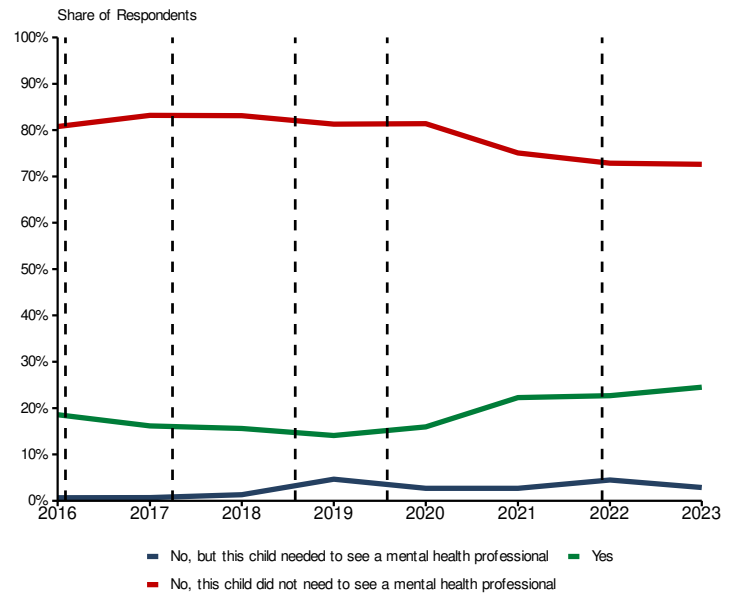
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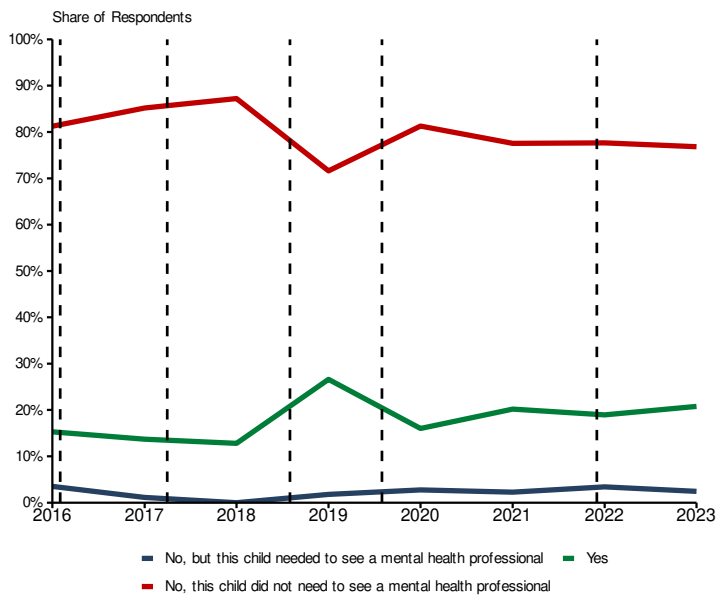
Louisiana



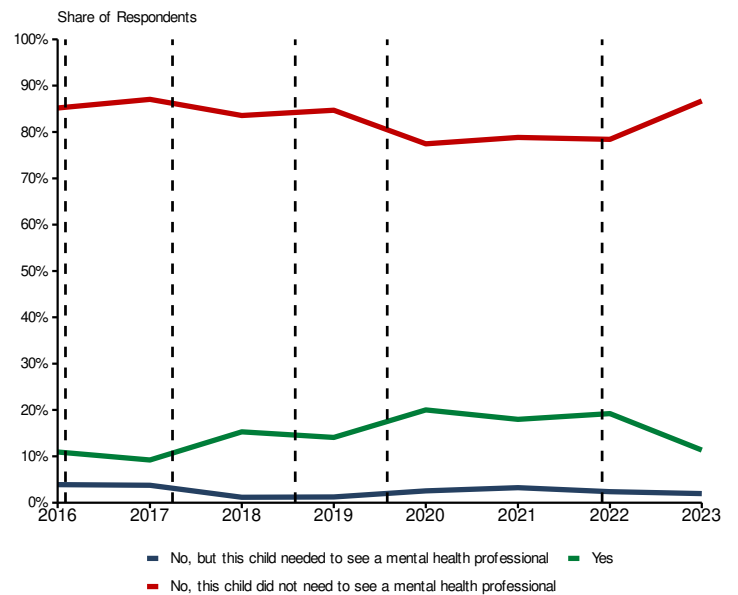
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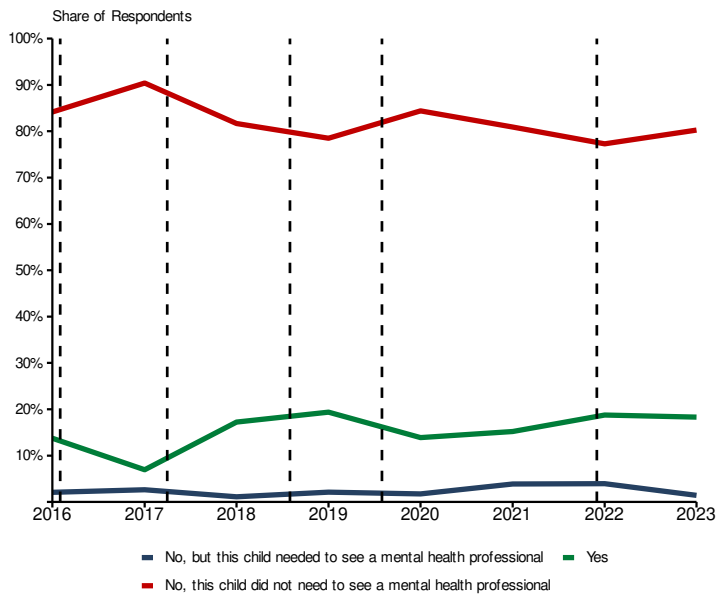
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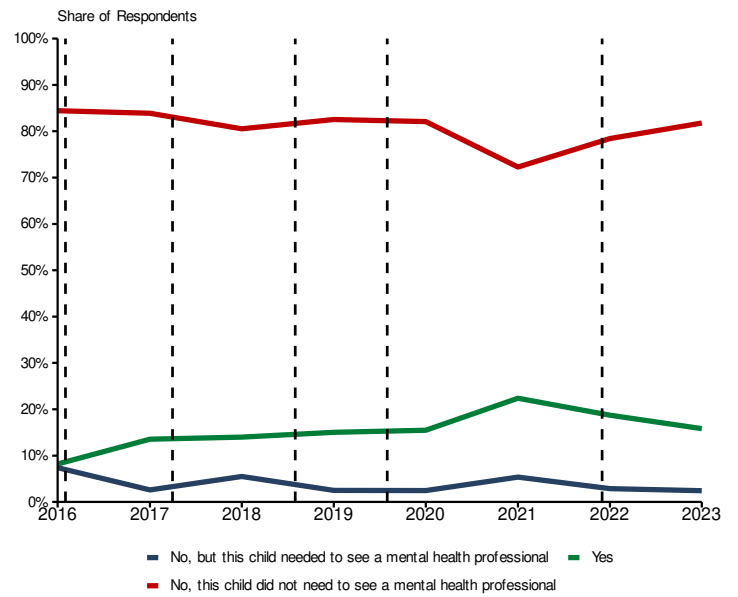
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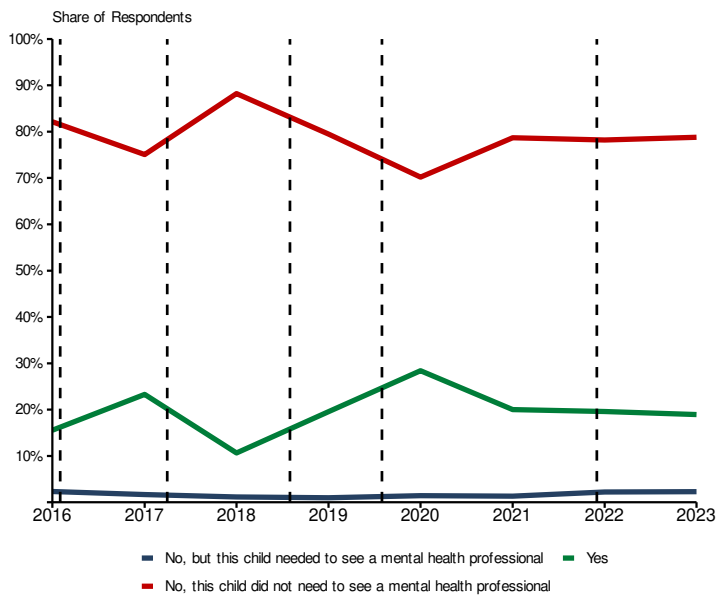
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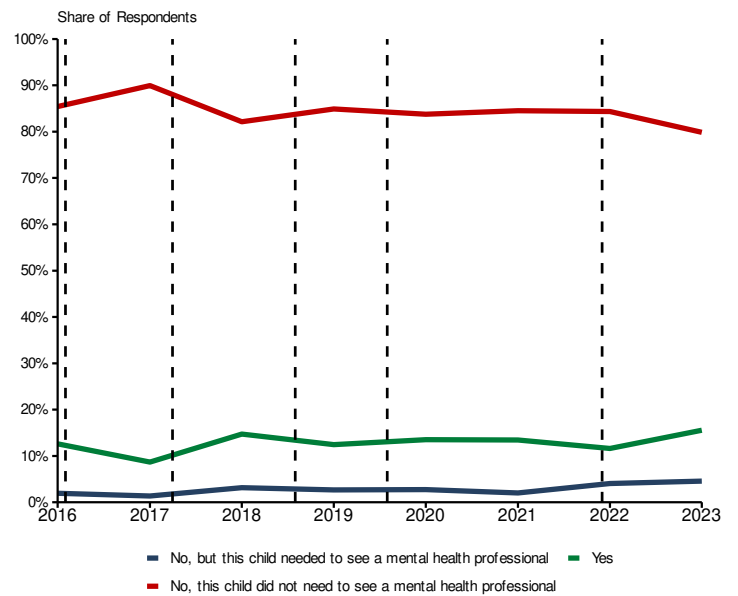
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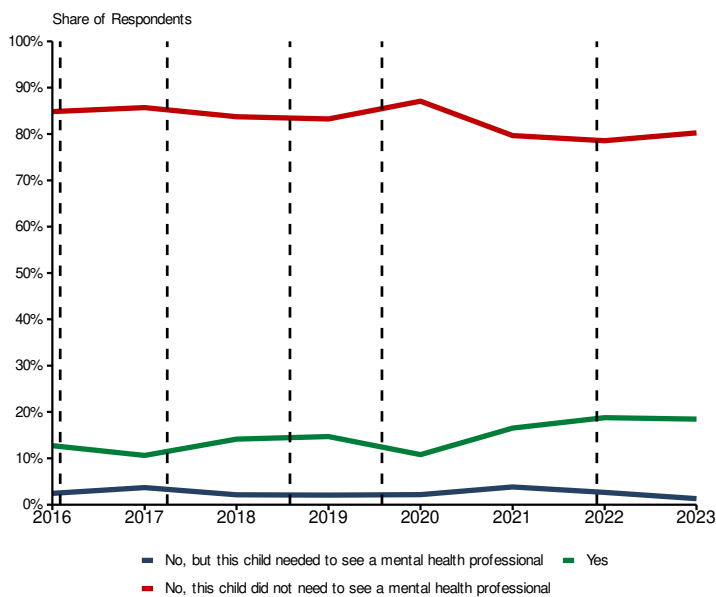
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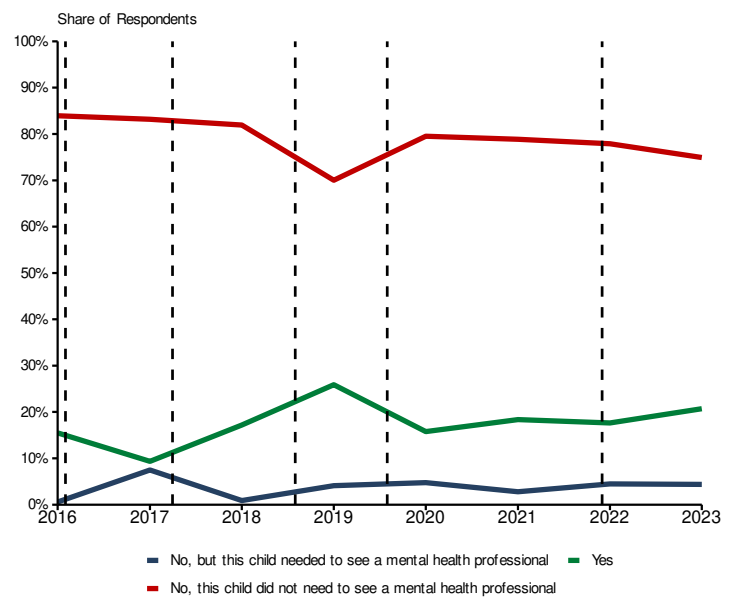
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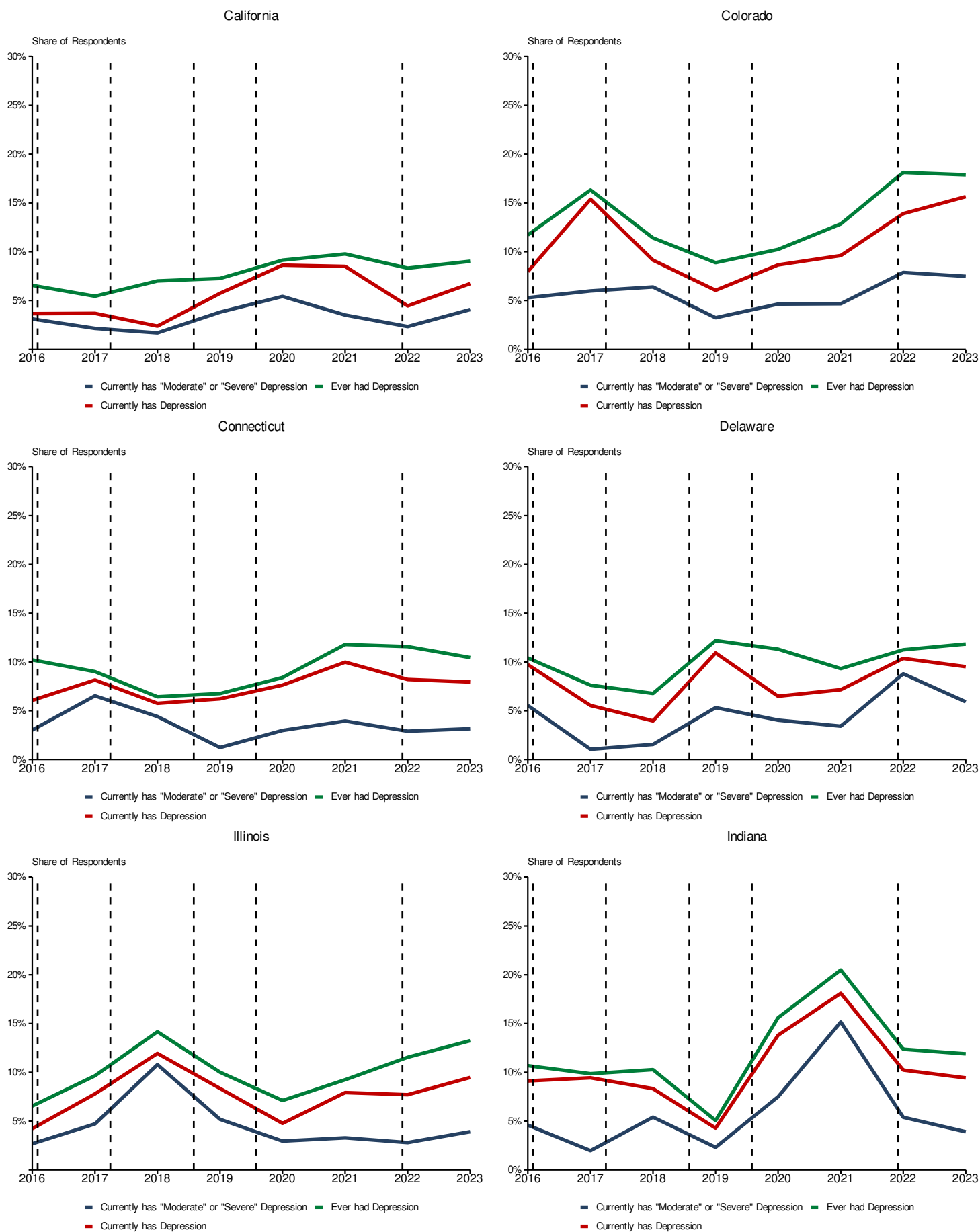
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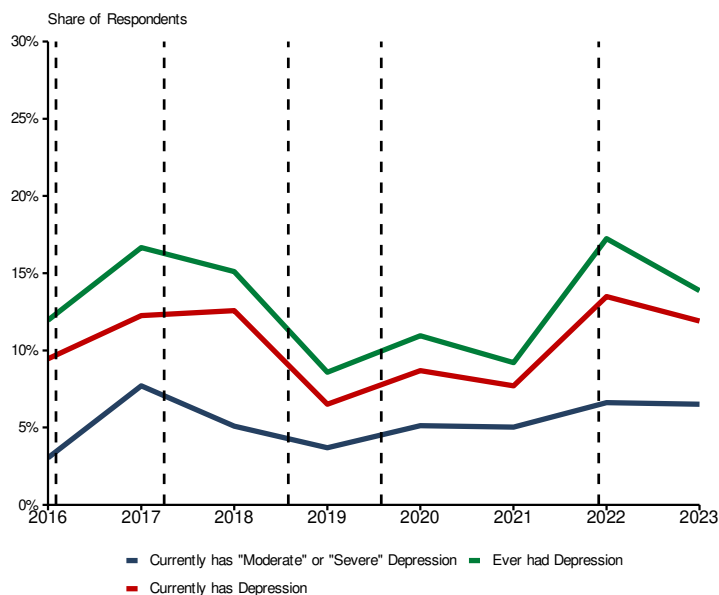
Source: United States Census Bureau, National Survey of Children's Health Data ("NSCH Data")

Note: These charts correspond to the charts in Figure 6 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the share of parents who responded "No, this child did not need to see a mental health professional," "Yes," and "No, but this child needed to see a mental health professional," to the NSCH question "DURING THE PAST 12 MONTHS, has this child received any treatment or counseling from a mental health professional? Mental health professionals include psychiatrists, psychologists, psychiatric nurses, and clinical social workers." The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the UDAP States. NSCH is also representative for each respective state. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens who saw, did not see, and did not need to see, a mental health professional in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

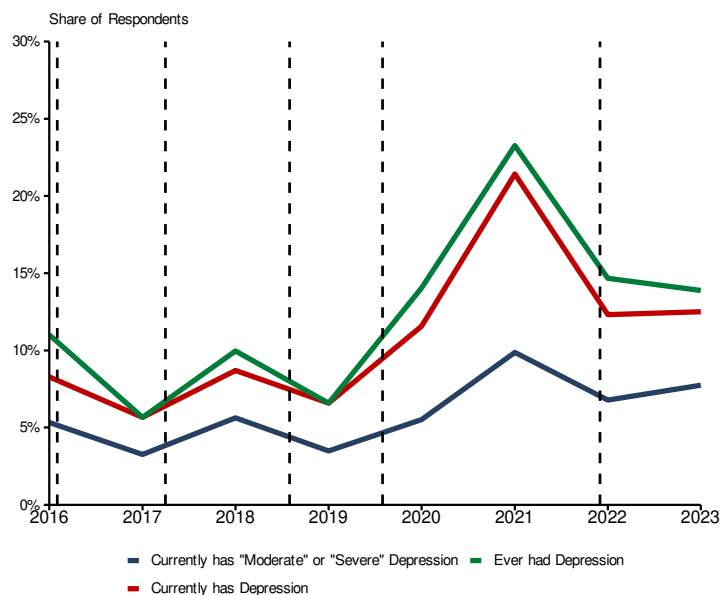
Figure F.2 Share of Teens in UDAP States with Depression Over Time



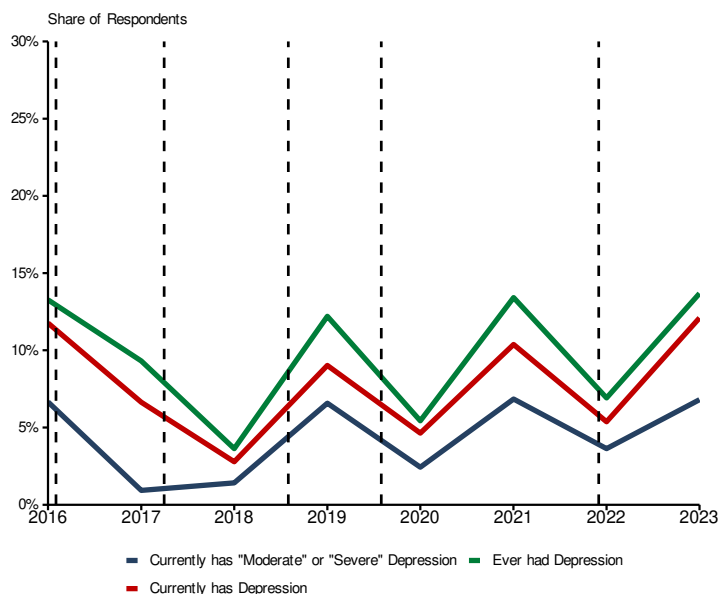
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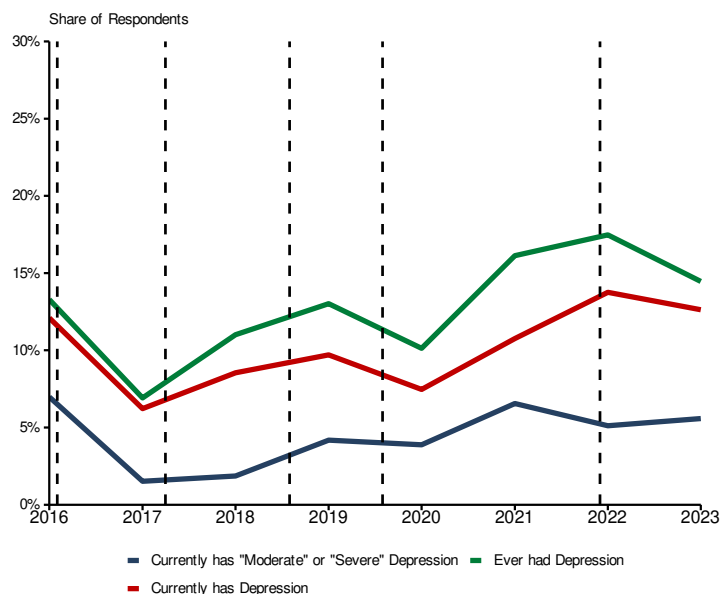
Kentucky



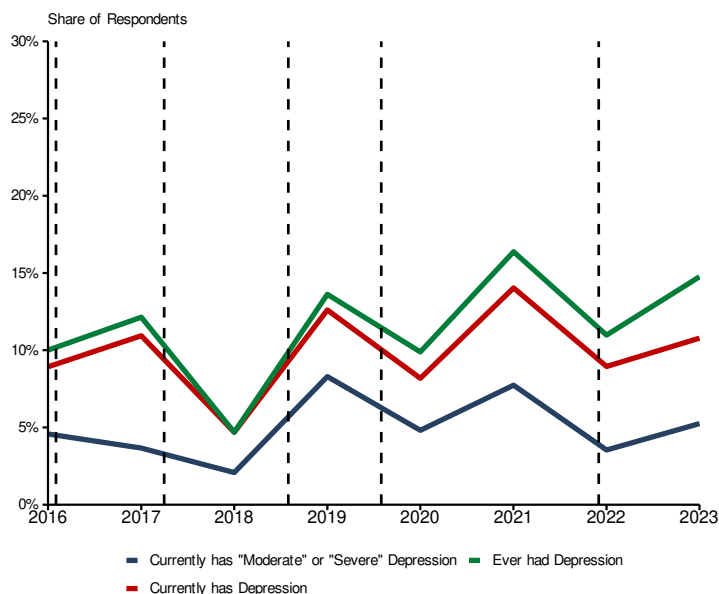
Louisiana



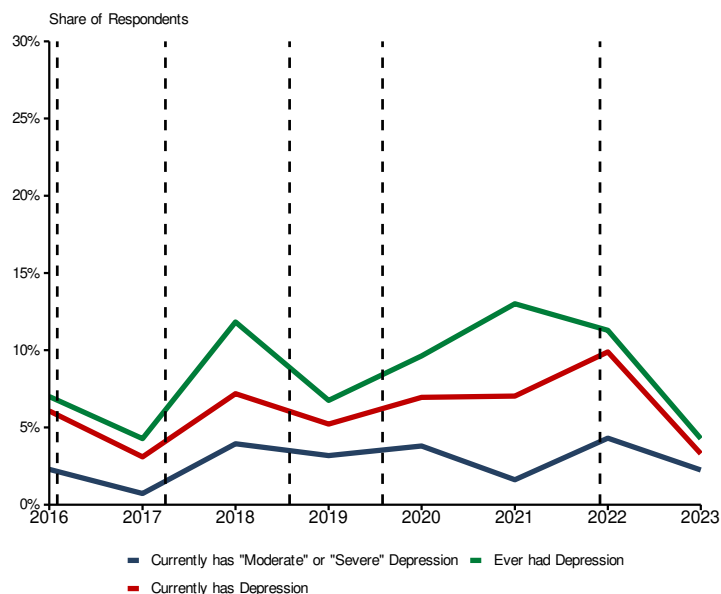
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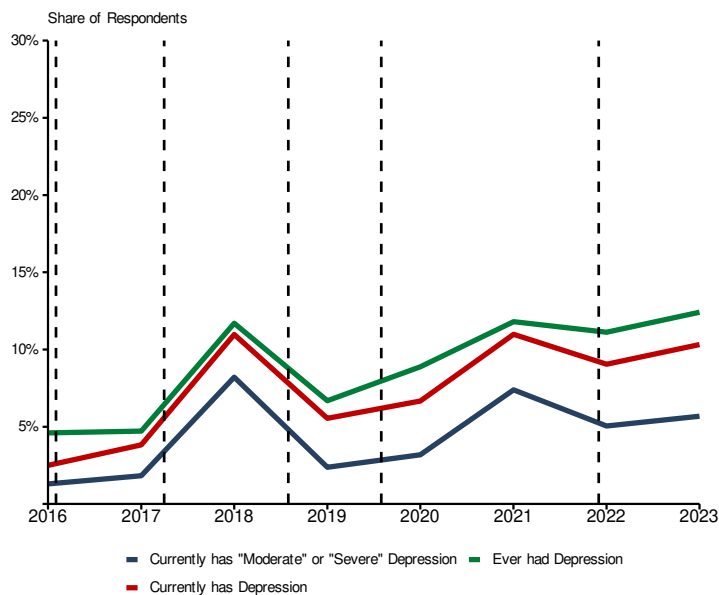
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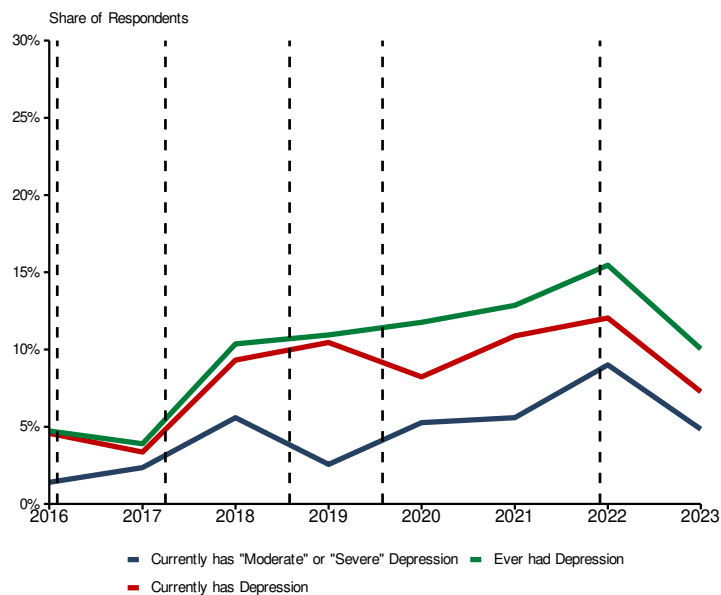
New Jersey



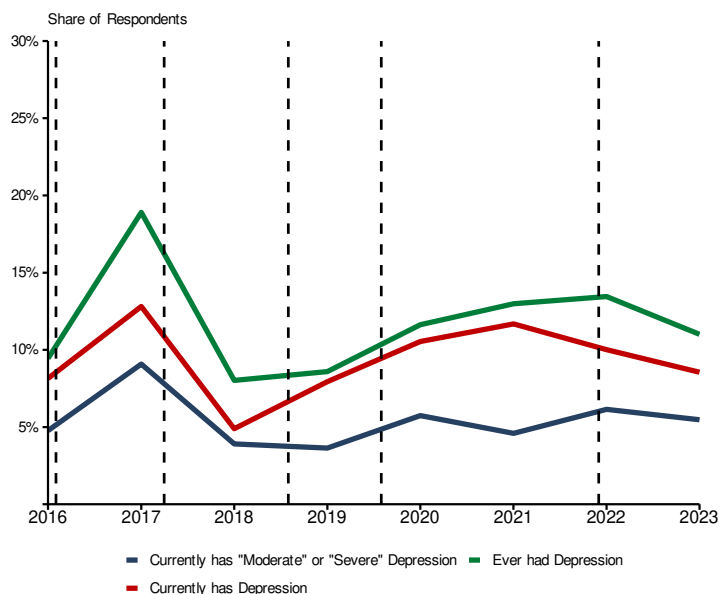
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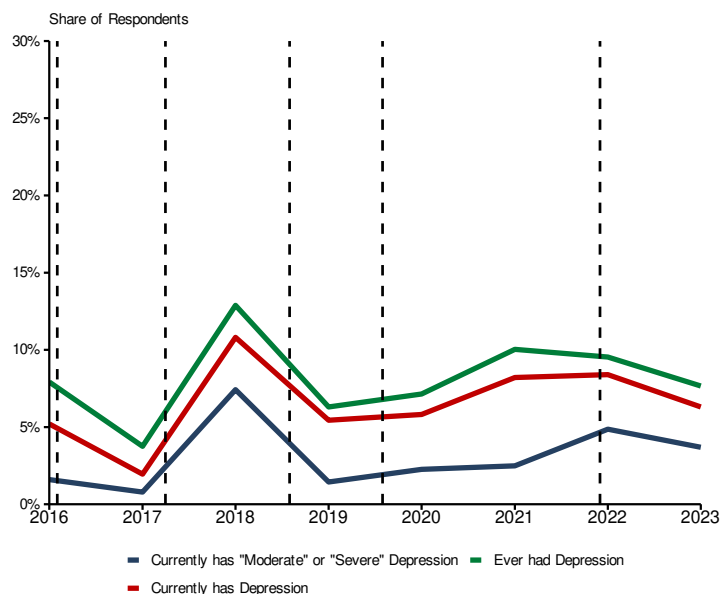
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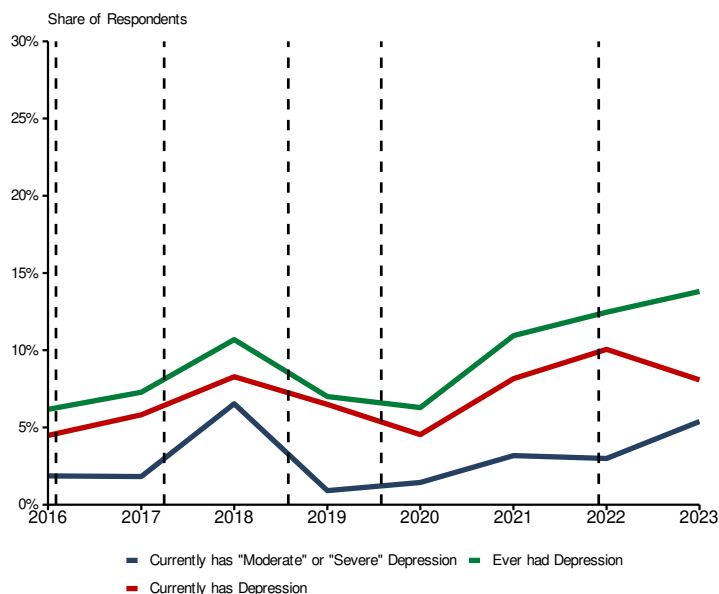
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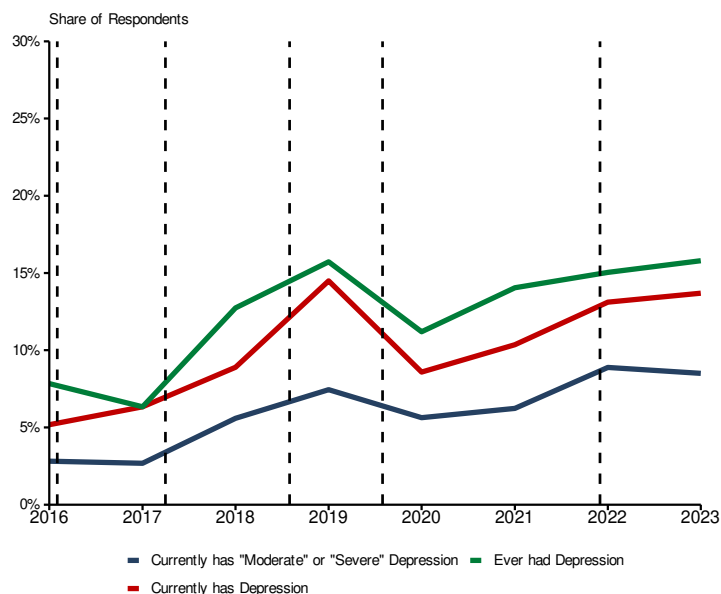
South Carolina



Virginia



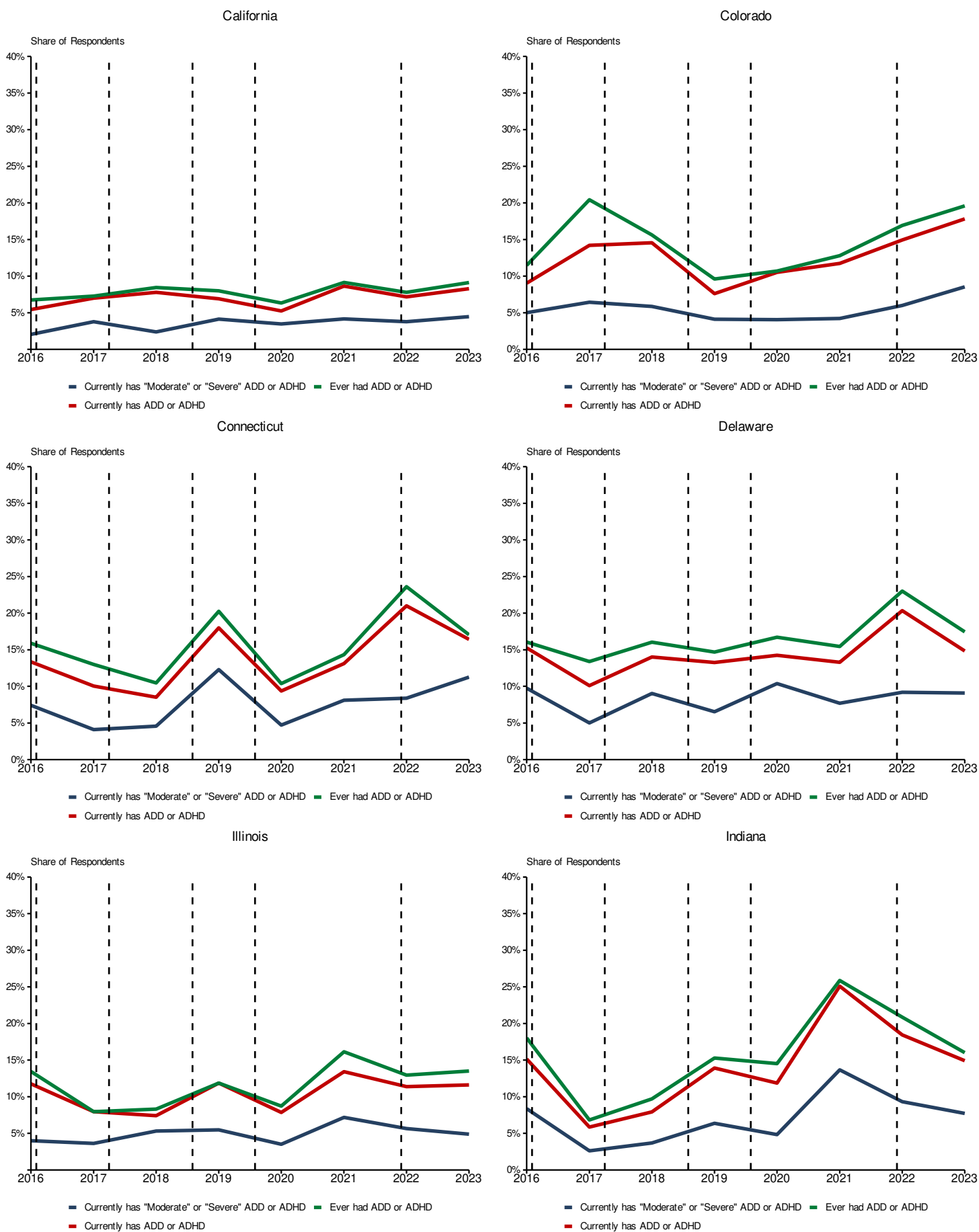
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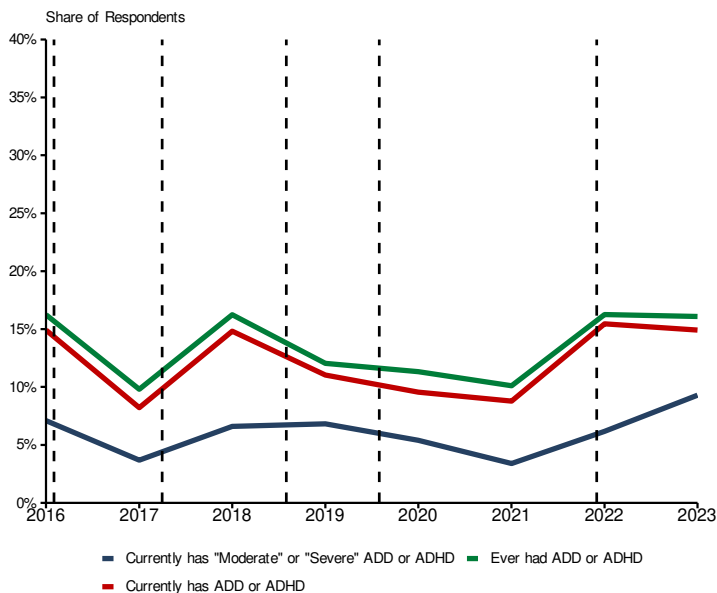
Source: NSCH Data

Note: These charts correspond to the charts in Figure 7 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the share of parents who responded to the NSCH questions “Has a doctor or other health care provider EVER told you that this child has [d]epression?” with “Yes;” “If yes, does this child CURRENTLY have the condition?” with “Yes;” and “If yes, is it Mild[,] Moderate[, or] Severe?” with “Moderate” or “Severe.” The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the UDAP States. NSCH is also representative for each respective state. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens experiencing depression in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

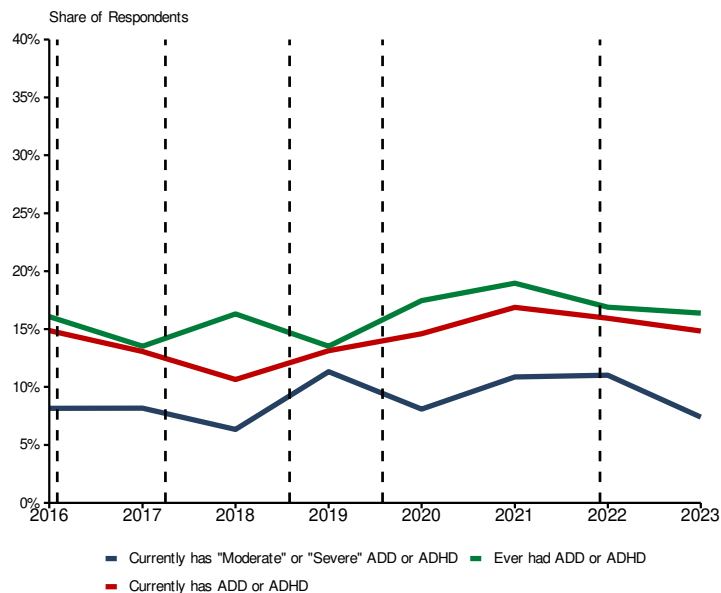
Figure F.3 Share of Teens in UDAP States with ADD or ADHD Over Time



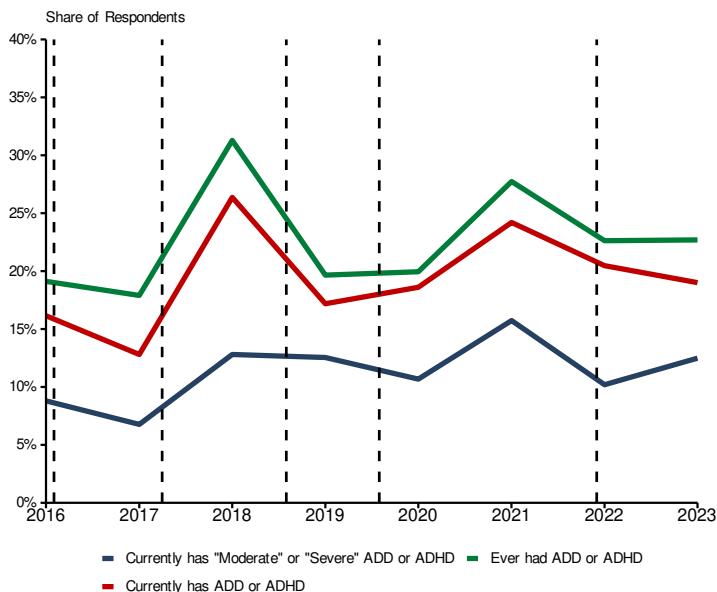
Kansas



Kentucky



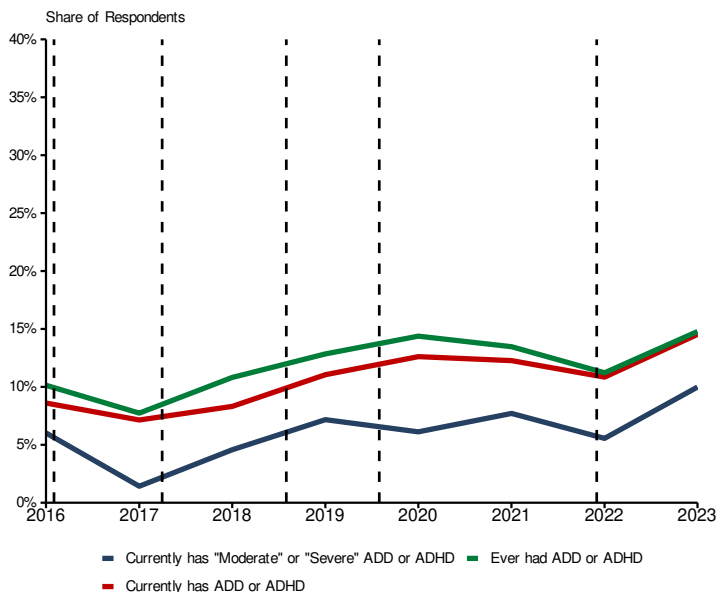
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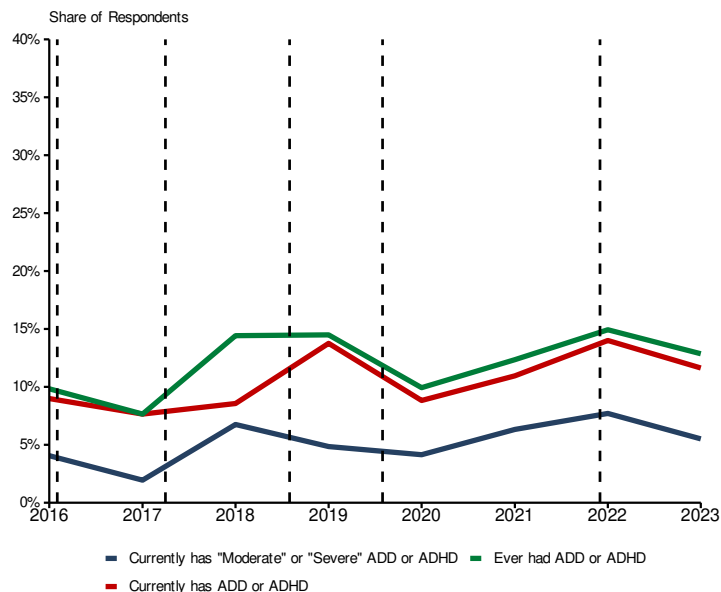
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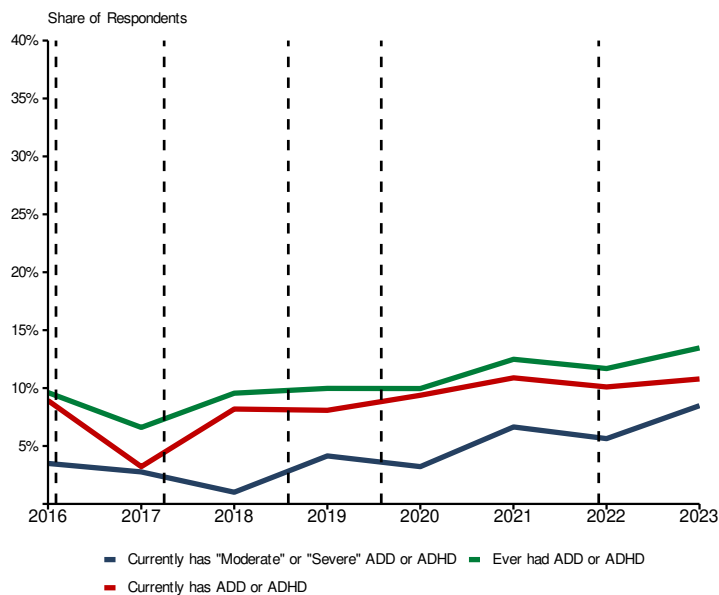
Nebraska



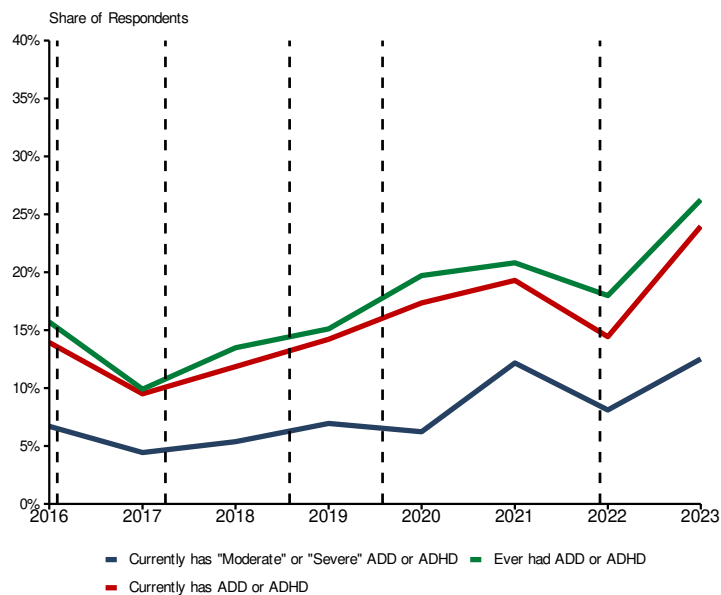
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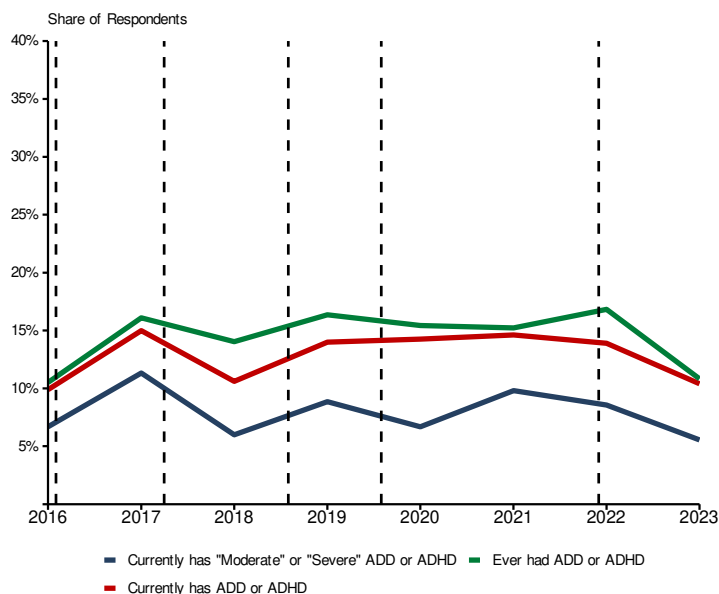
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North Carolina



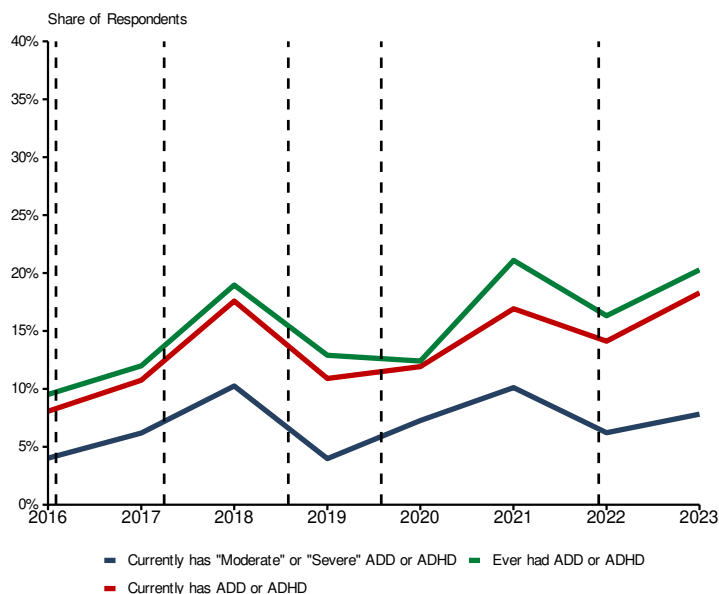
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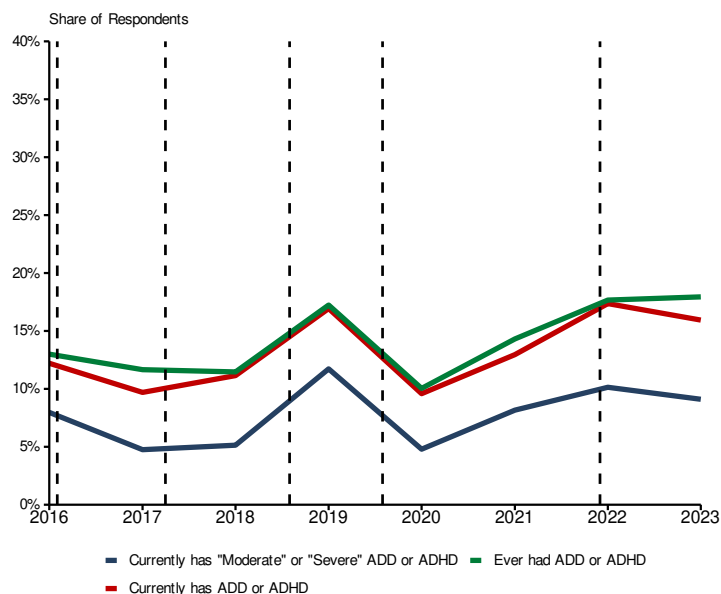
South Carolina



Virginia



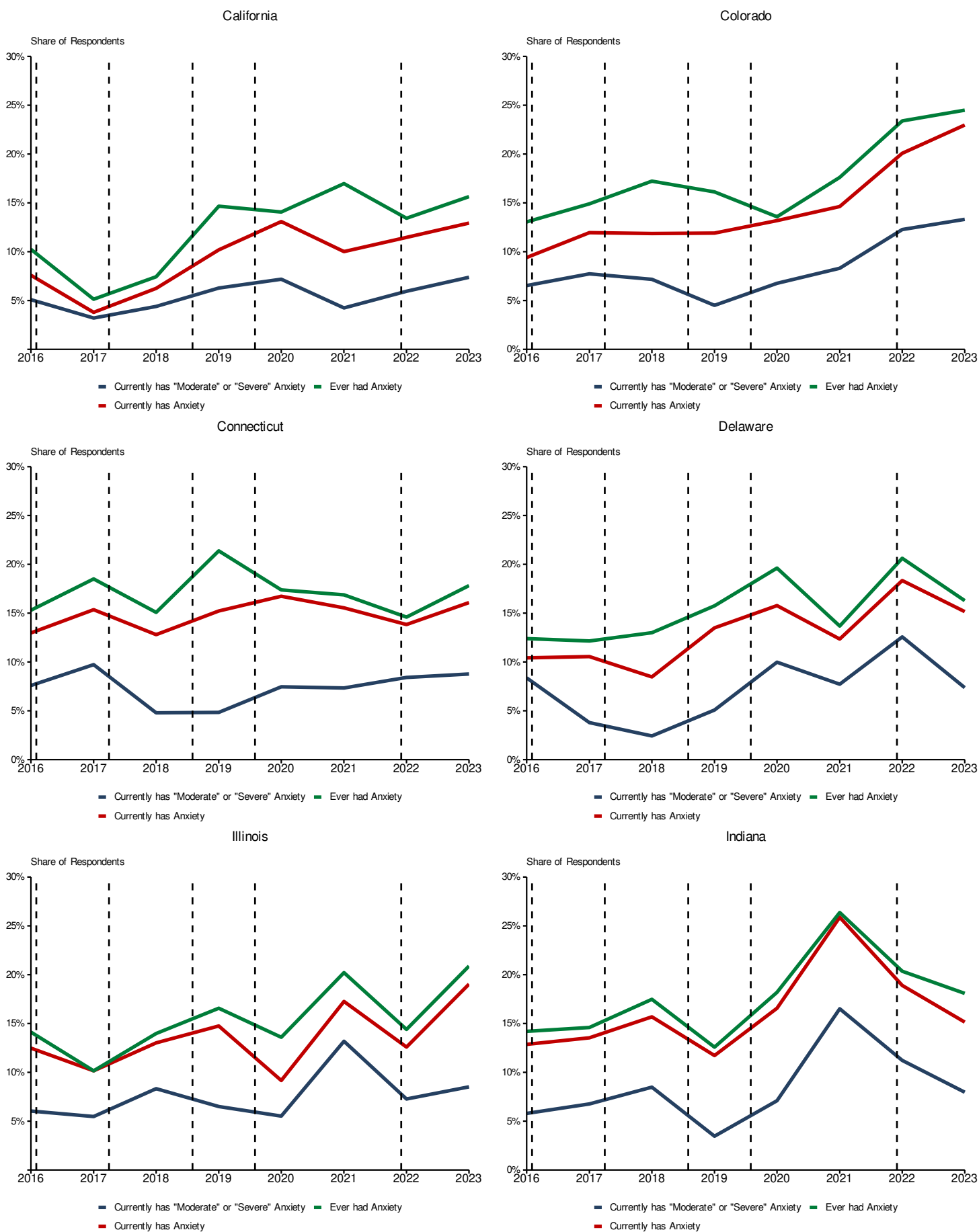
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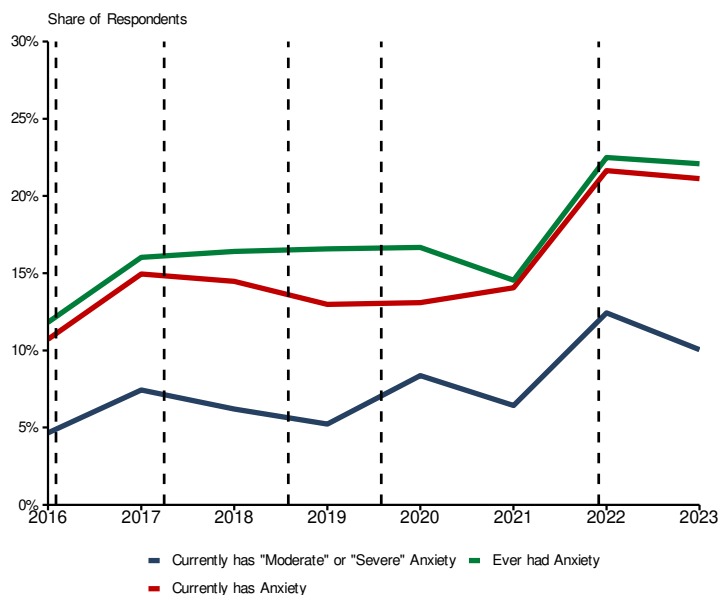
Source: NSCH Data

Note: These charts correspond to the charts in Figure 8 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the share of parents who responded to the NSCH questions “Has a doctor or other health care provider EVER told you that this child has... ADD or ADHD?” with “Yes;” “If yes, does this child CURRENTLY have the condition?” with “Yes;” and “If yes, is it Mild[,] Moderate[, or] Severe?” with “Moderate” or “Severe.” The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the UDAP States. NSCH is also representative for each respective state. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens experiencing ADD or ADHD in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

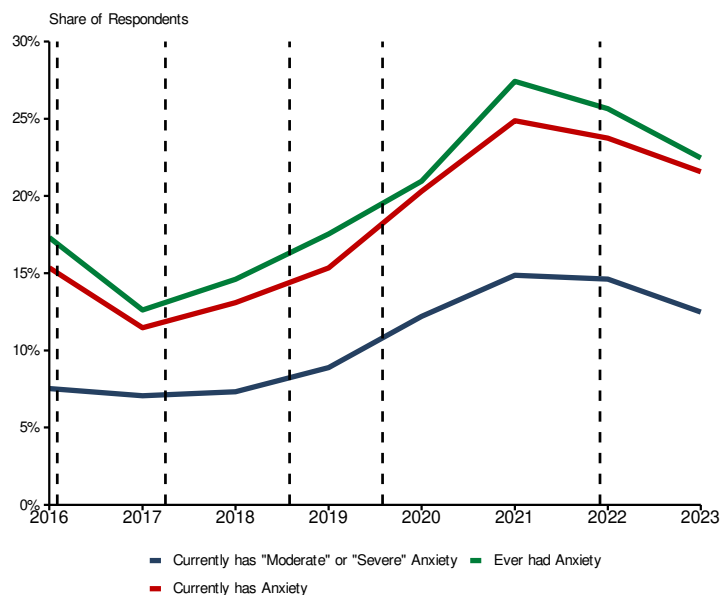
Figure F.4 Share of Teens in UDAP States with Anxiety Over Time



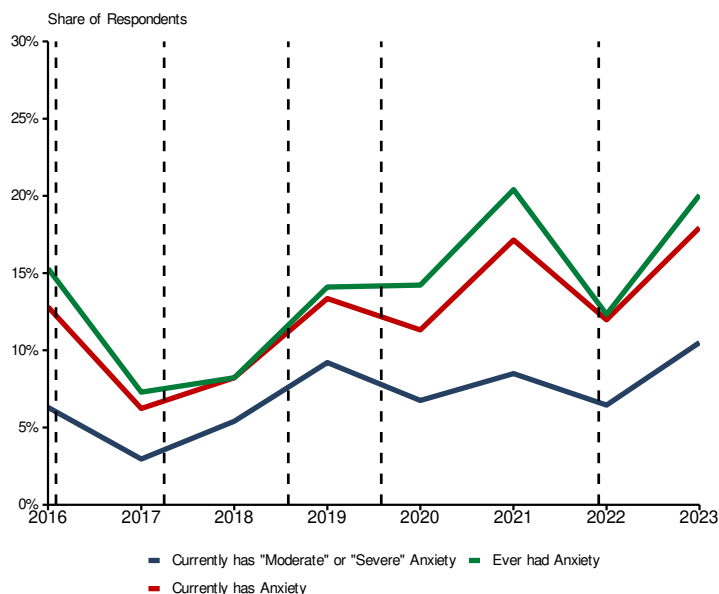
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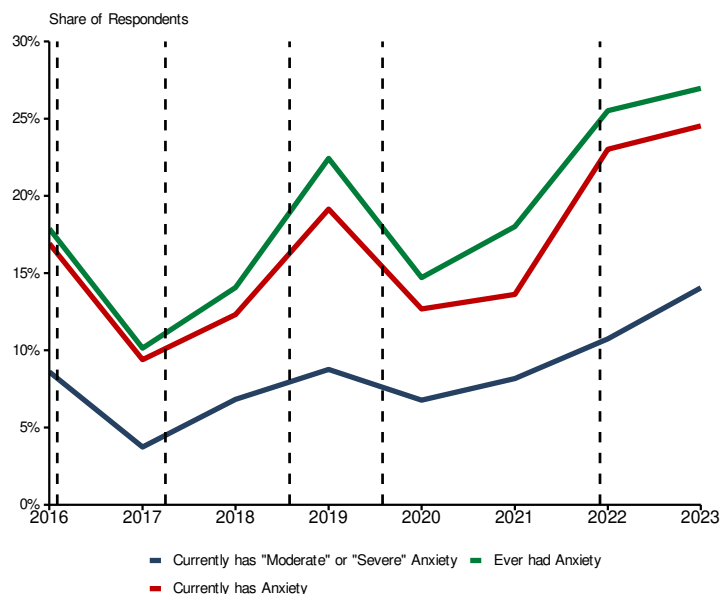
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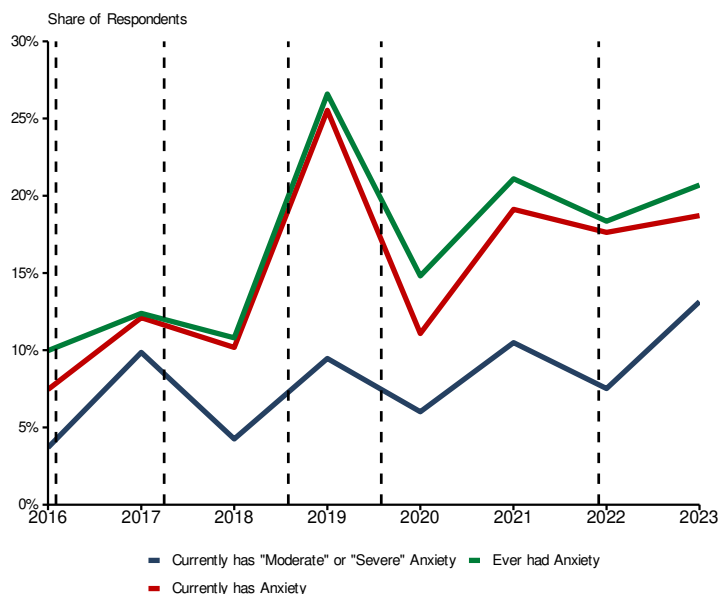
Louisiana



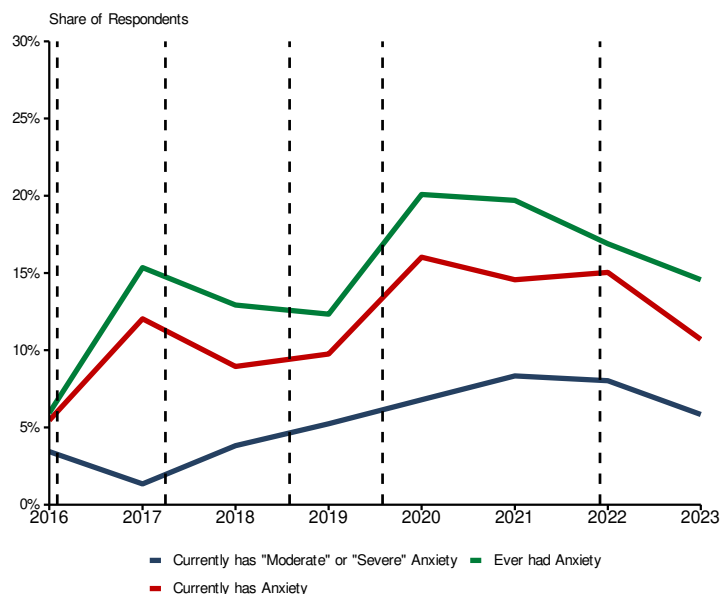
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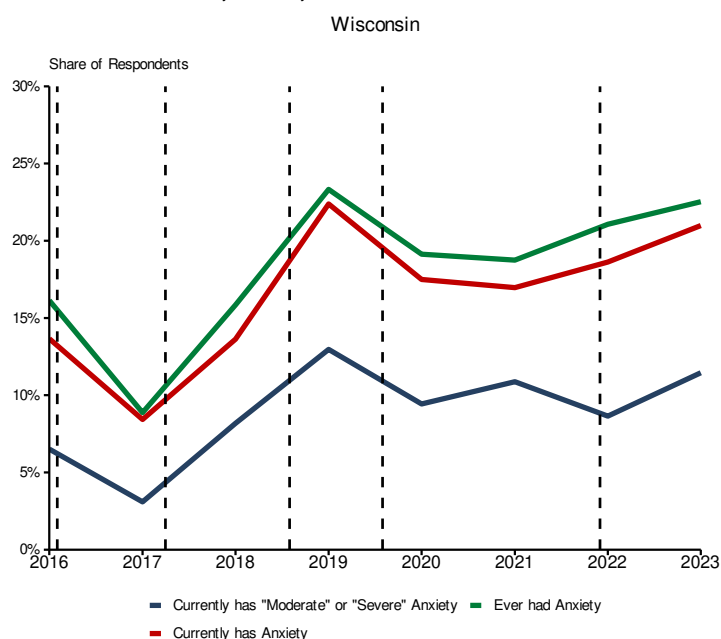
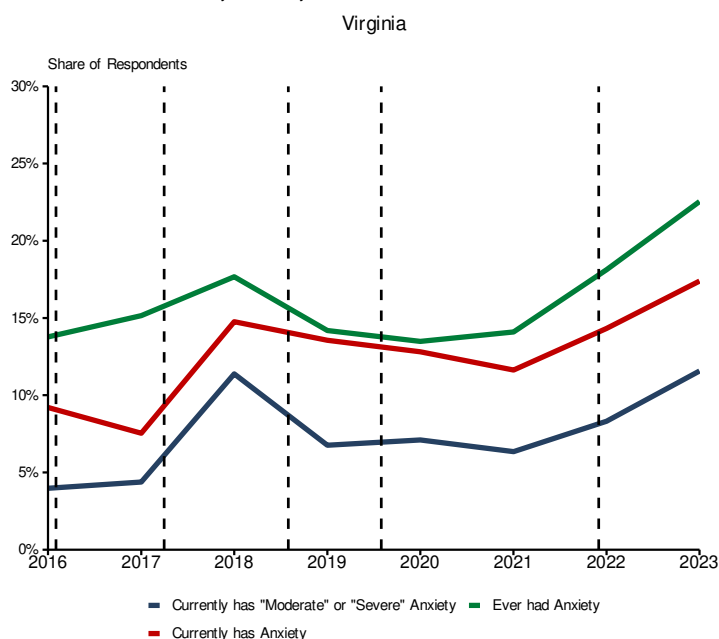
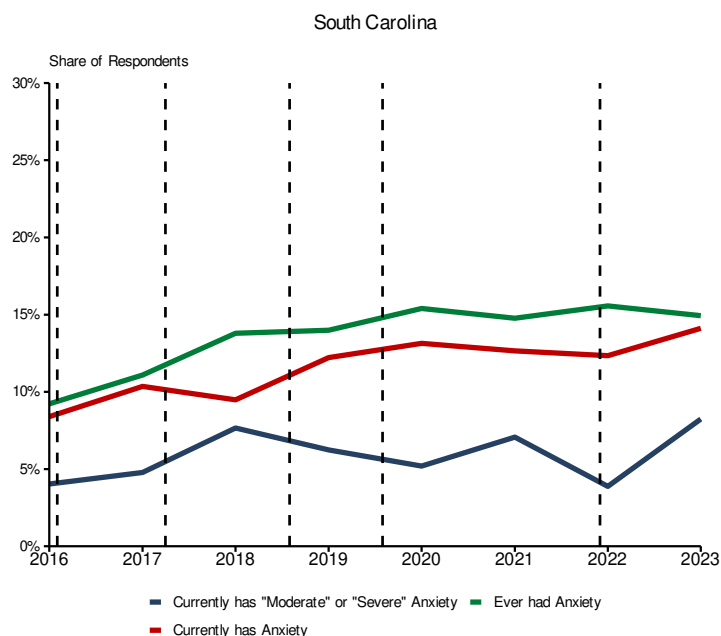
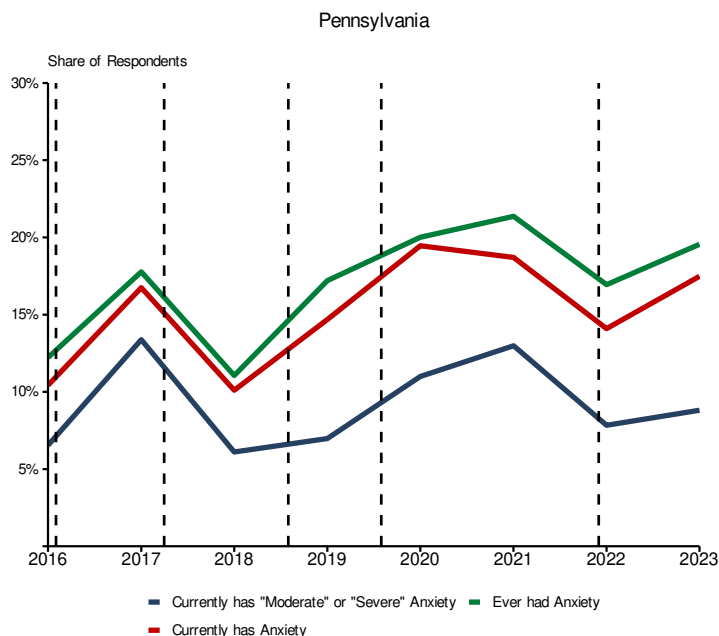
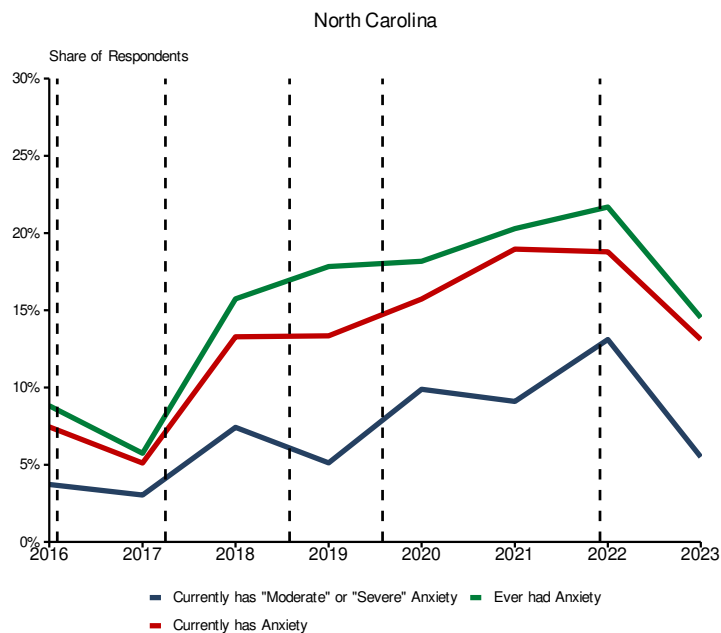
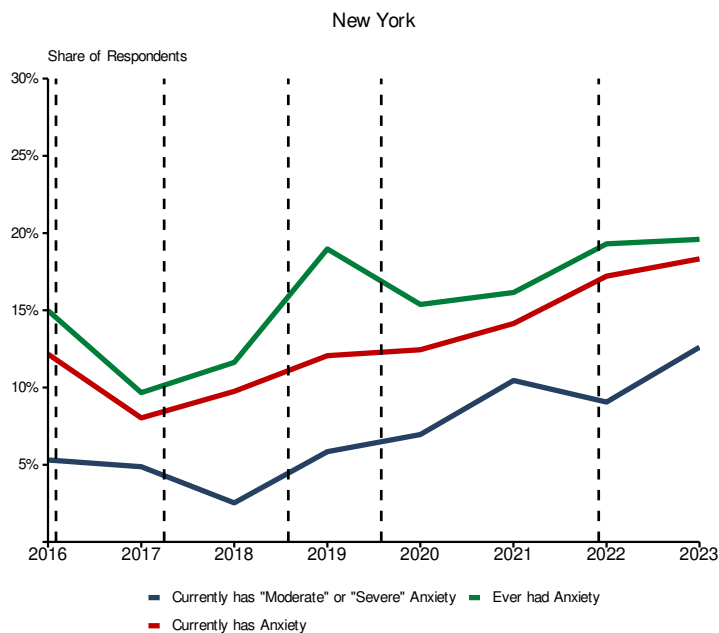


Nebraska



New Jersey

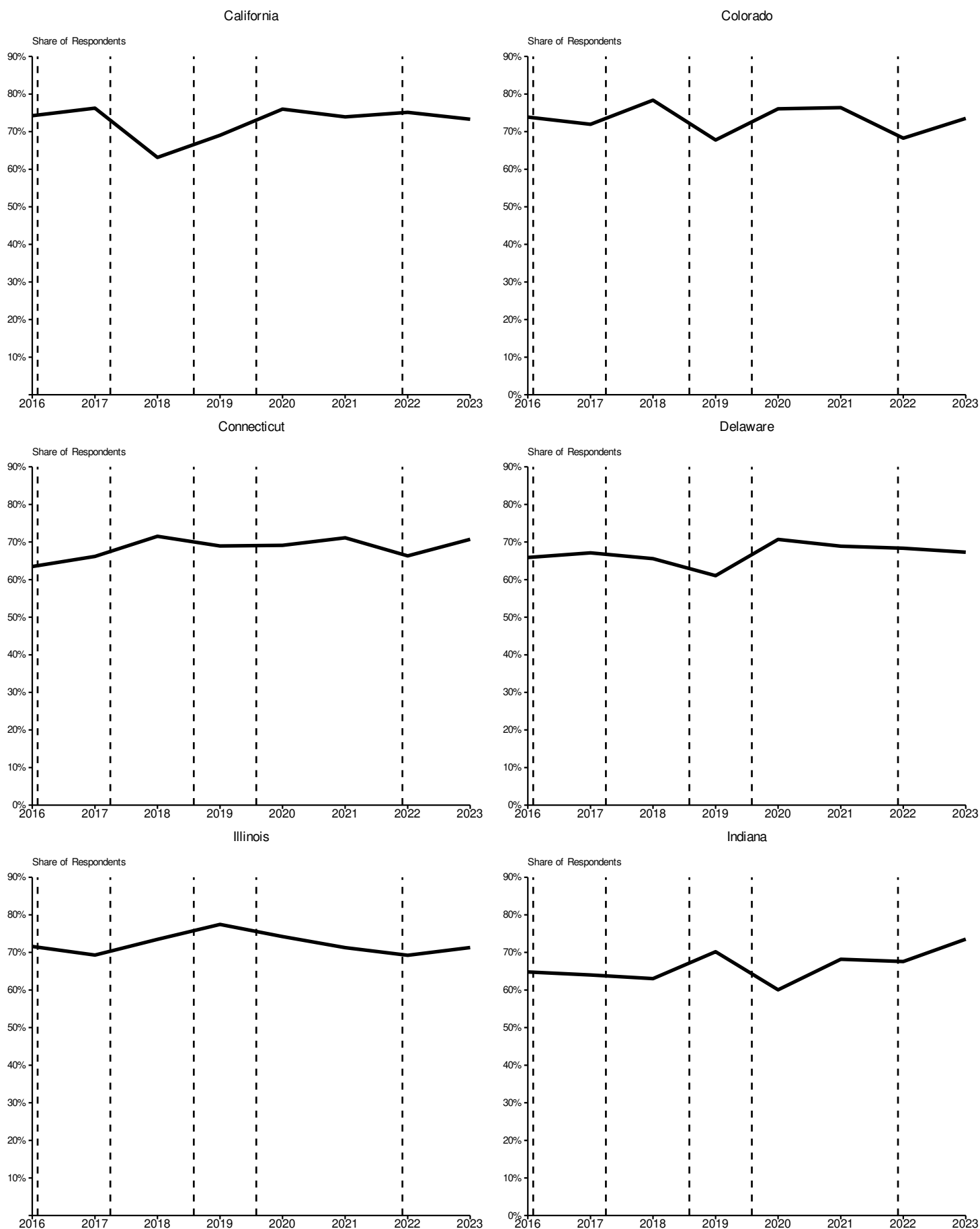




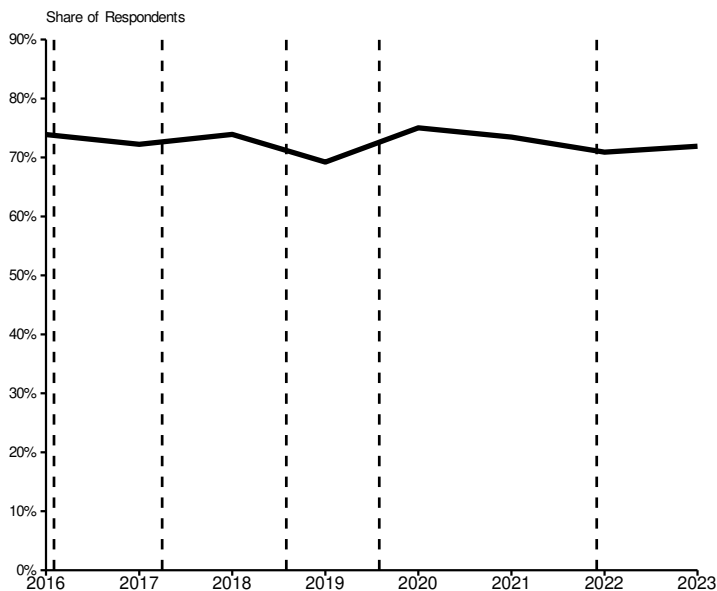
Source: NSCH Data

Note: These charts correspond to the charts in Figure 9 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the share of parents who responded to the NSCH questions “Has a doctor or other health care provider EVER told you that this child has... Anxiety Problems?” with “Yes;” “If yes, does this child CURRENTLY have these problems?” with “Yes;” and “If yes, is it Mild[,] Moderate[, or] Severe?” with “Moderate” or “Severe.” The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the UDAP States. NSCH is also representative for each respective state. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens experiencing anxiety in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

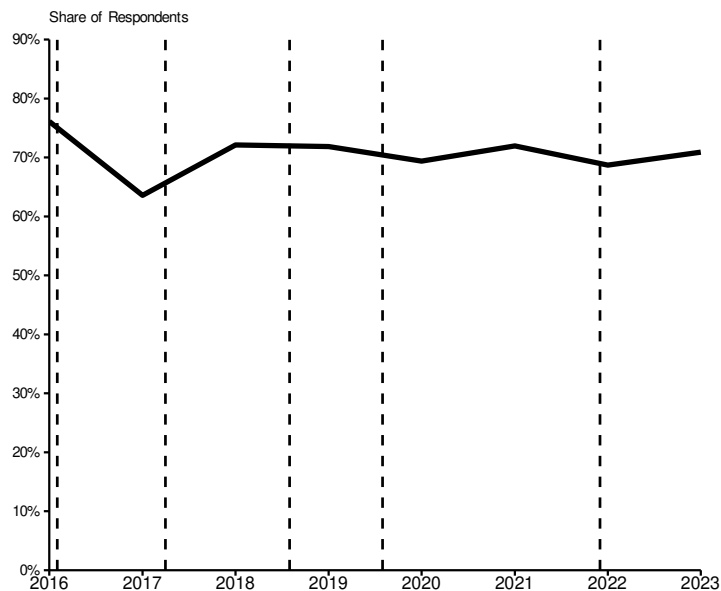
Figure F.5 Share of Teens in UDAP States with 8 or More Hours of Sleep Over Time



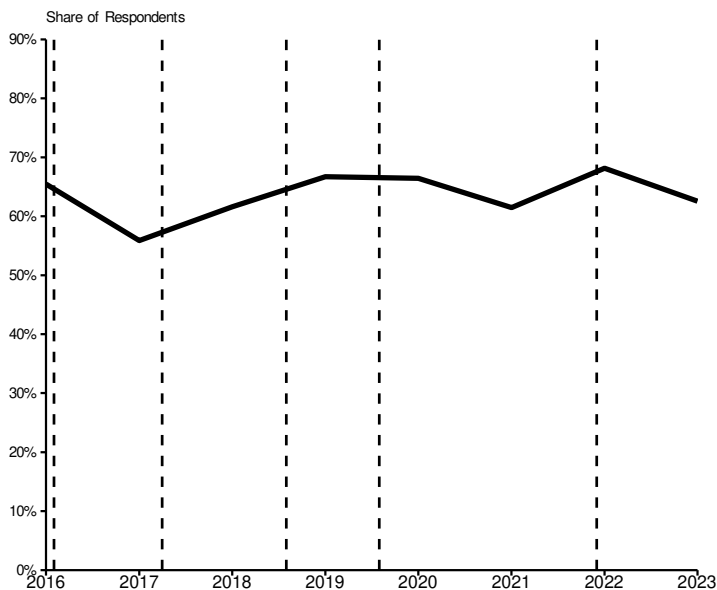
Kansas



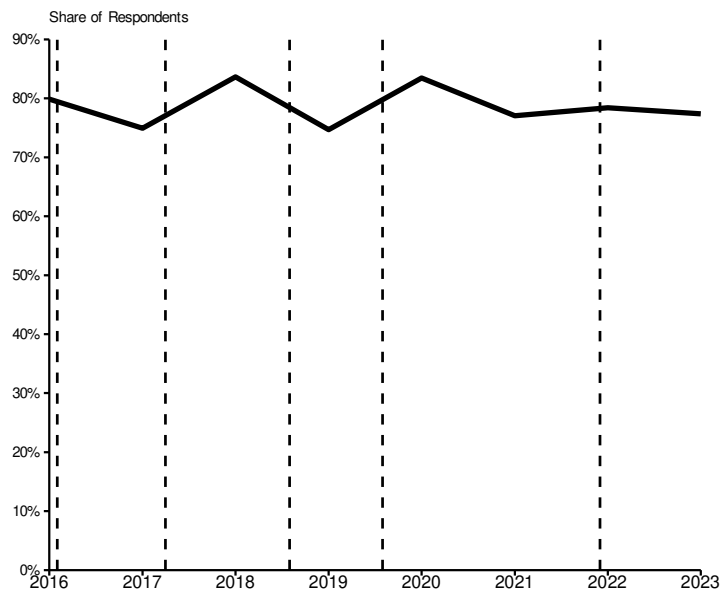
Kentucky



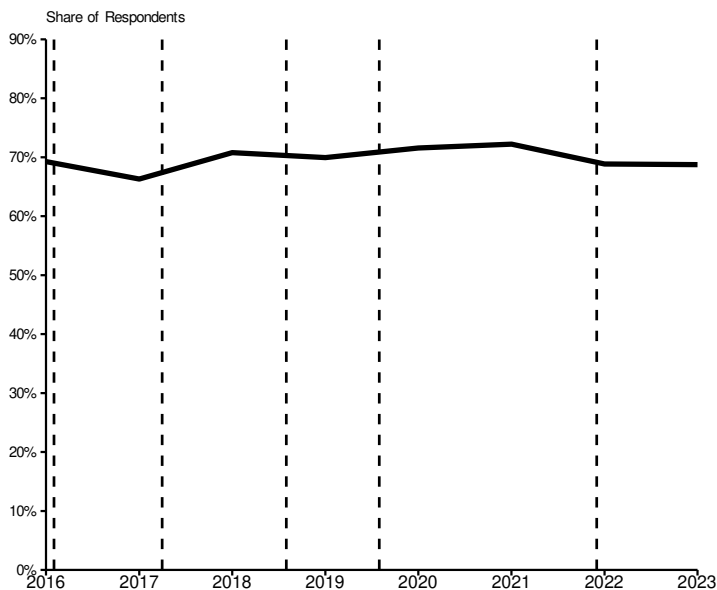
Louisiana



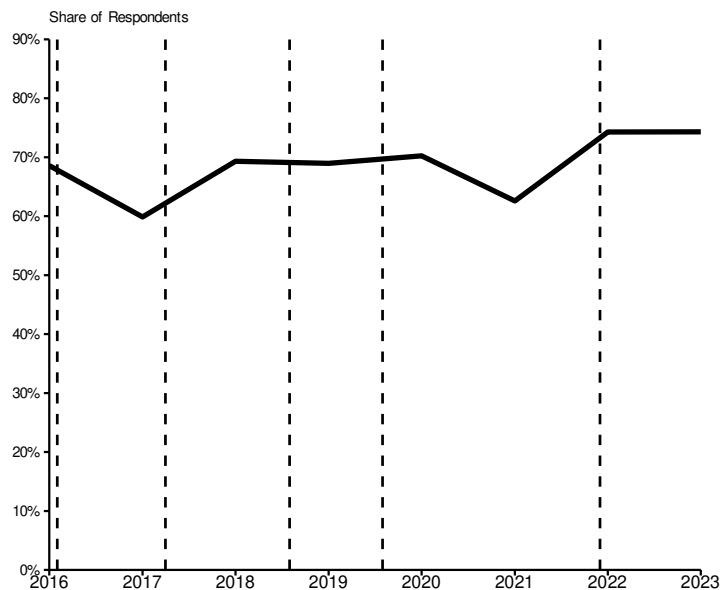
Minnesota

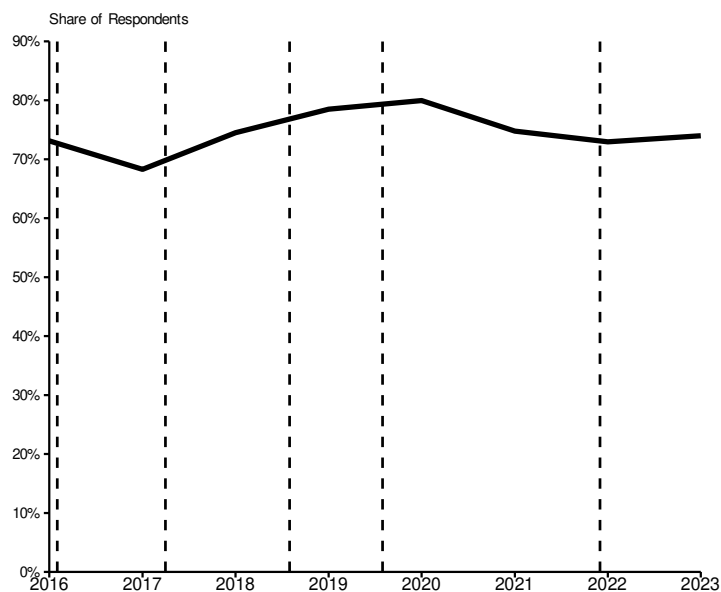
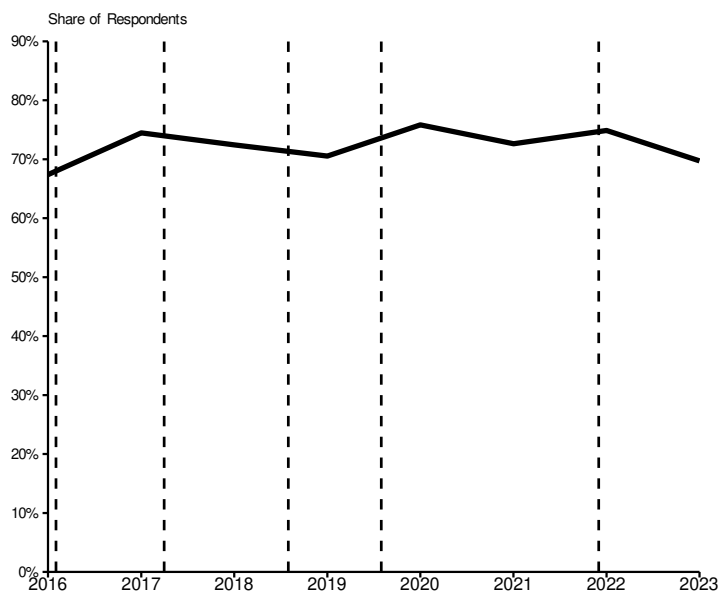
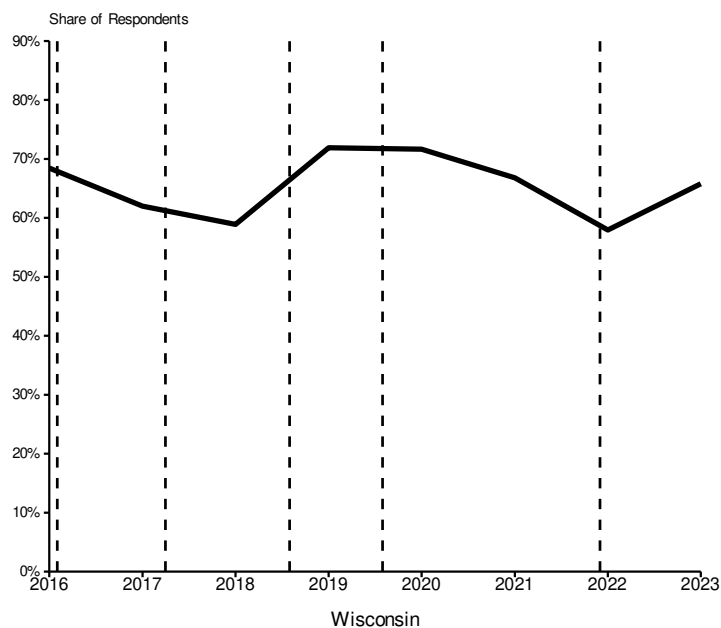
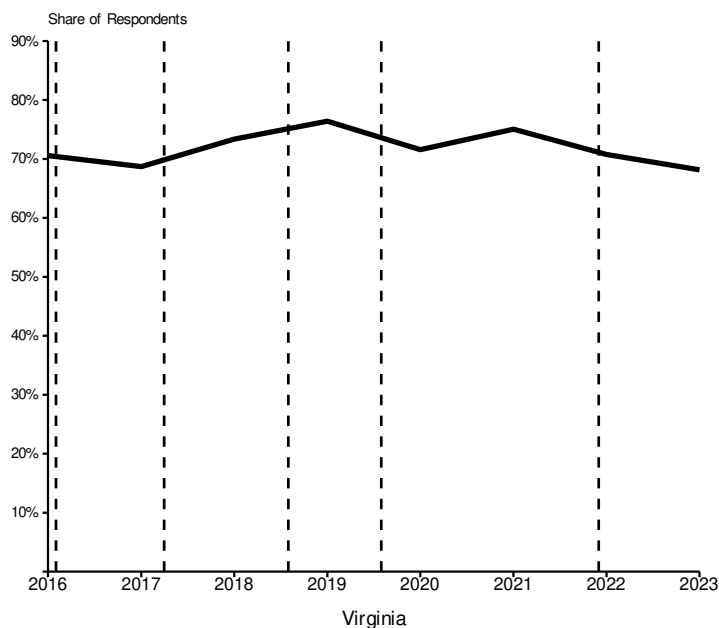
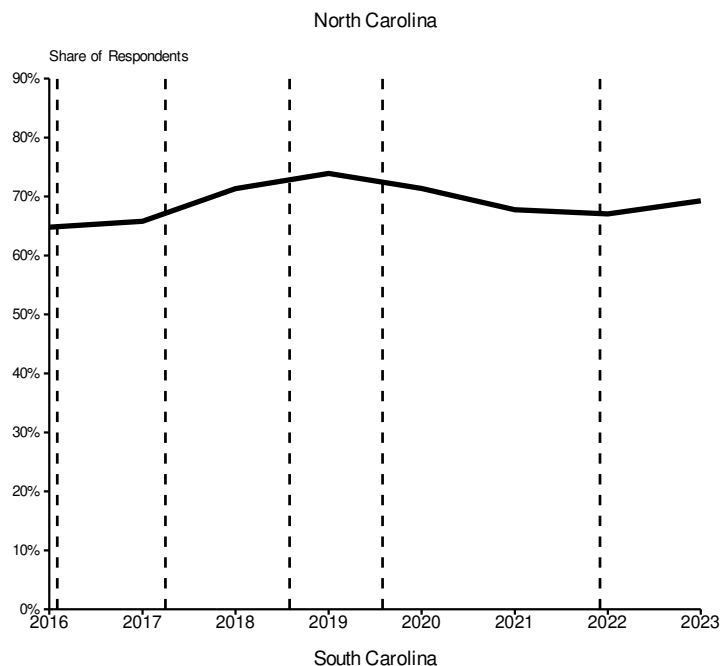
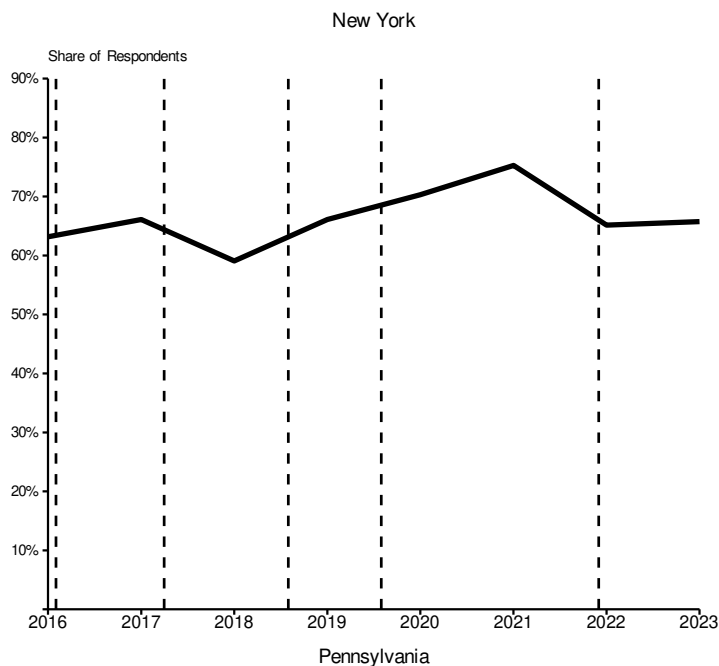


Nebraska



New Jersey

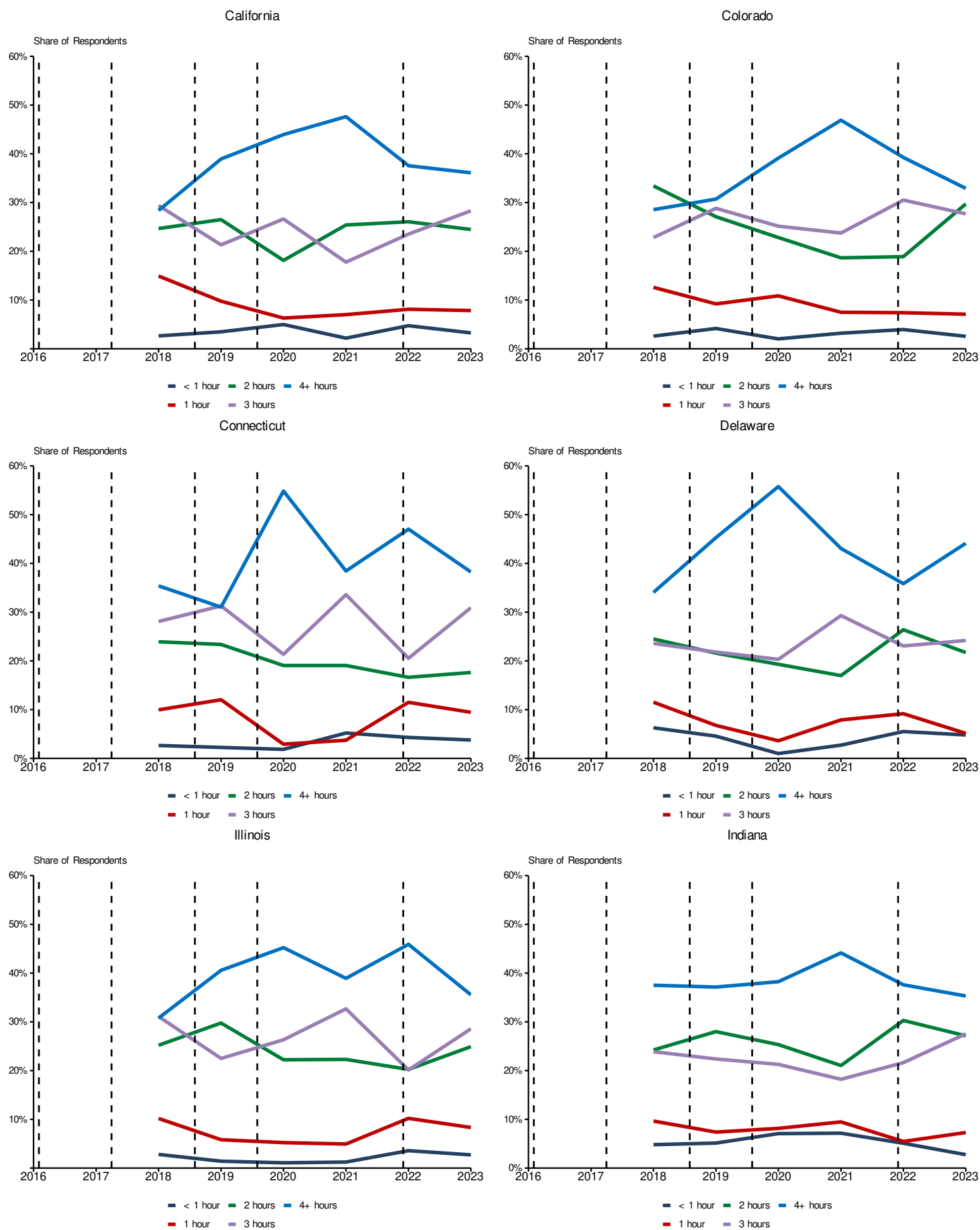




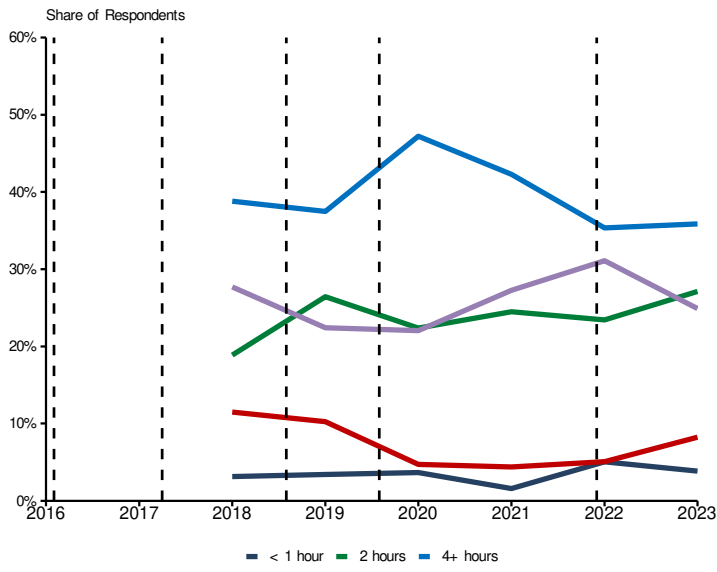
Source: NSCH Data

Note: These charts correspond to the charts in Figure 10 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the share of parents who responded to the NSCH questions “During the past week, how many hours of sleep did this child get on most weeknights?” with 8 or more hours. The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the UDAP States. NSCH is also representative for each respective state. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens with 8 or more hours of sleep in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

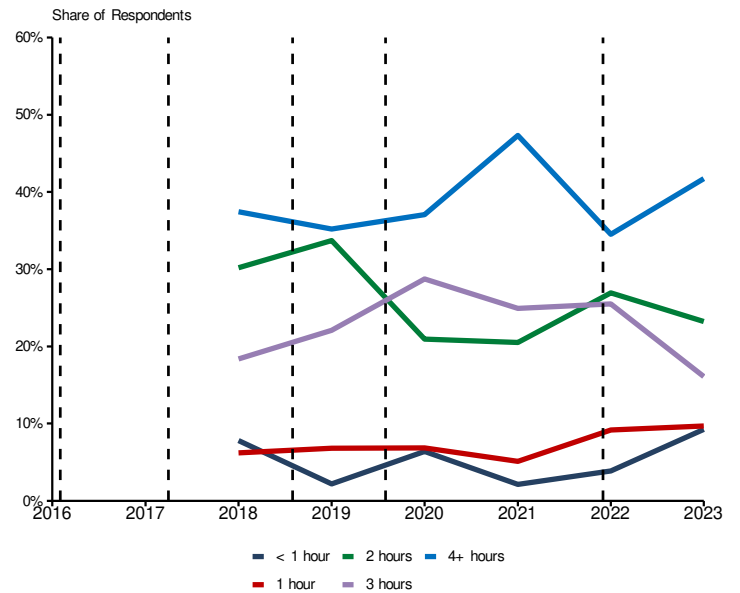
Figure F.6 Share of Total Screen Time of Teens in UDAP States Over Time



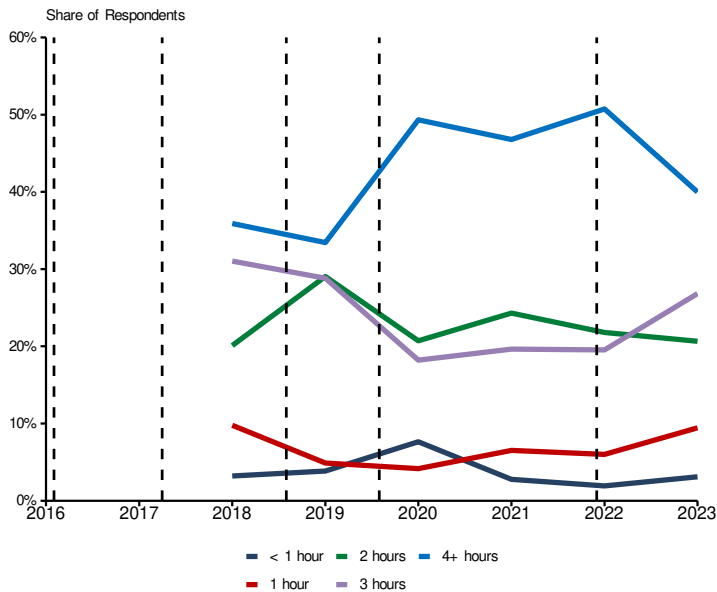
Kansas



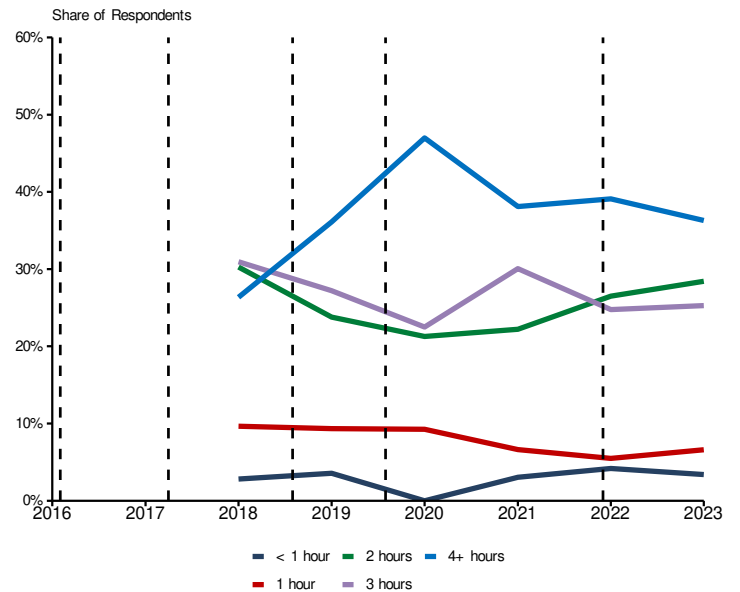
Kentucky



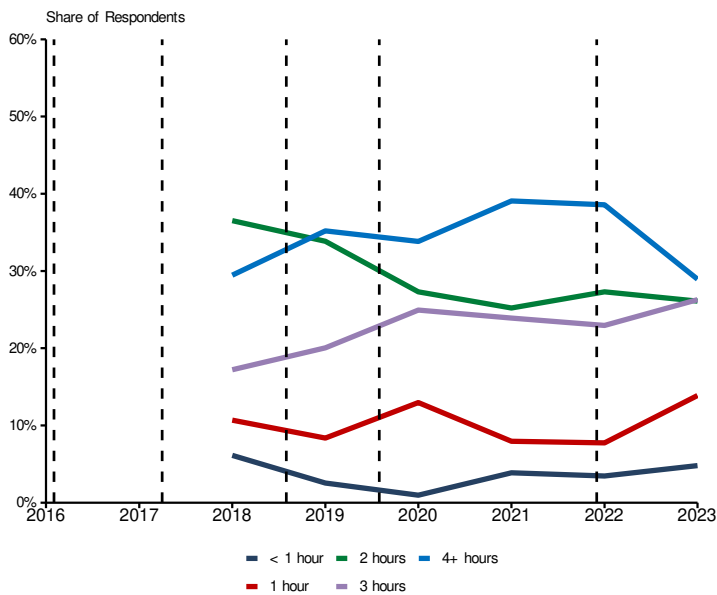
Louisiana



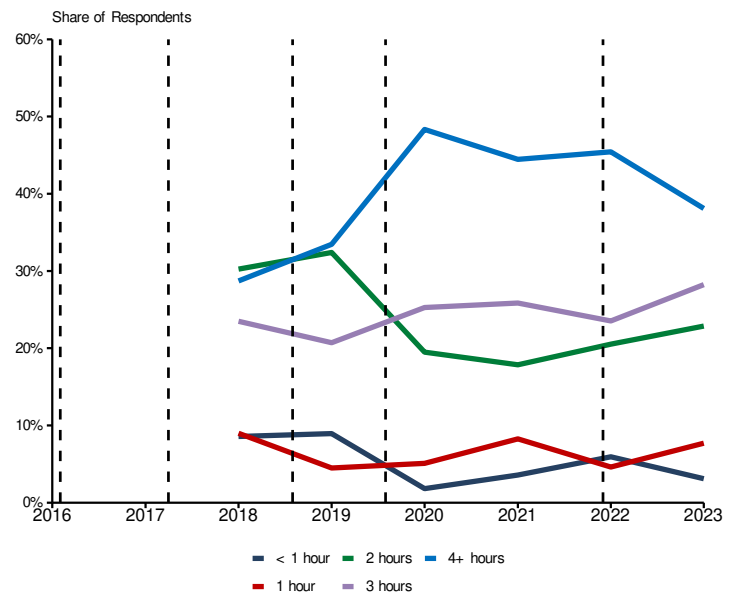
Minnesota

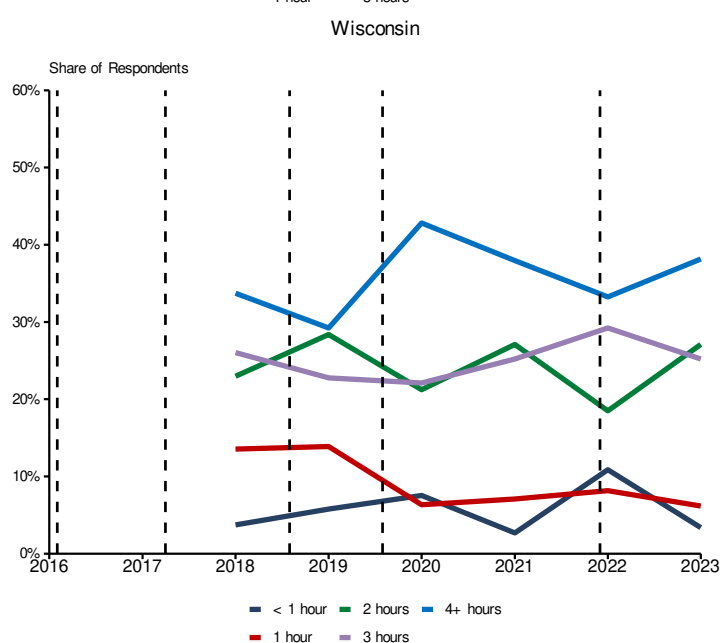
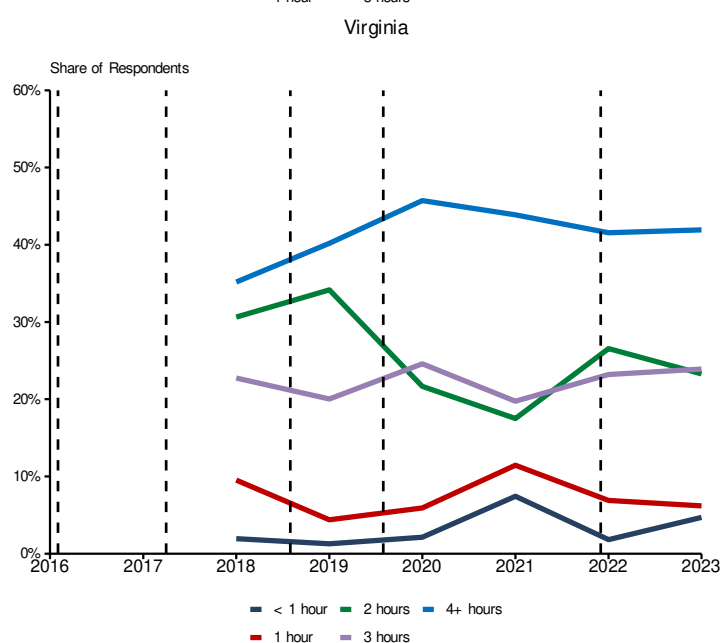
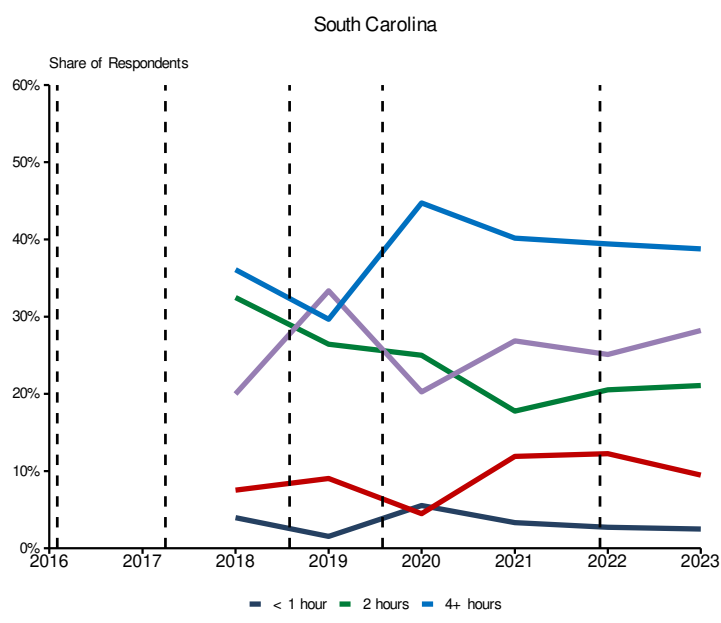
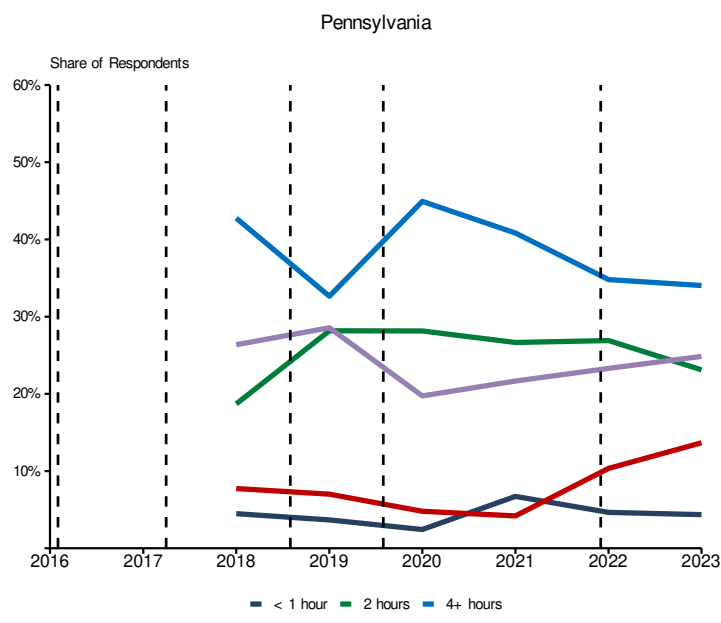
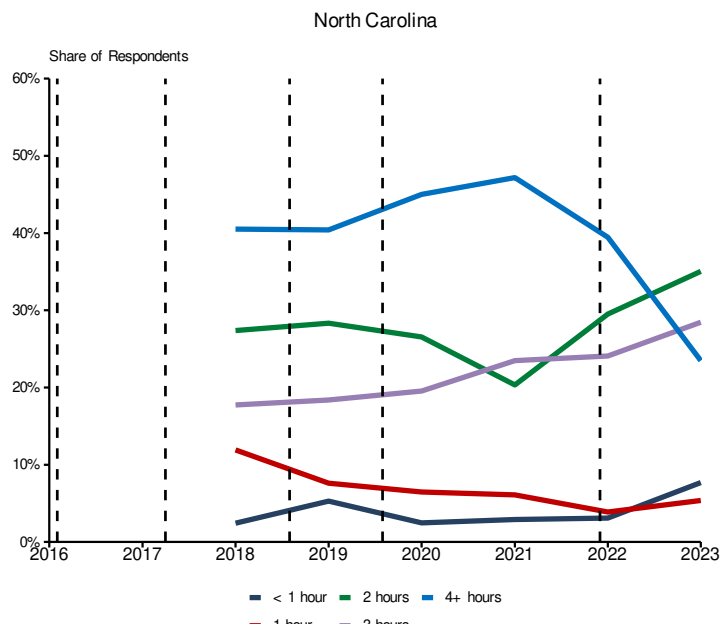
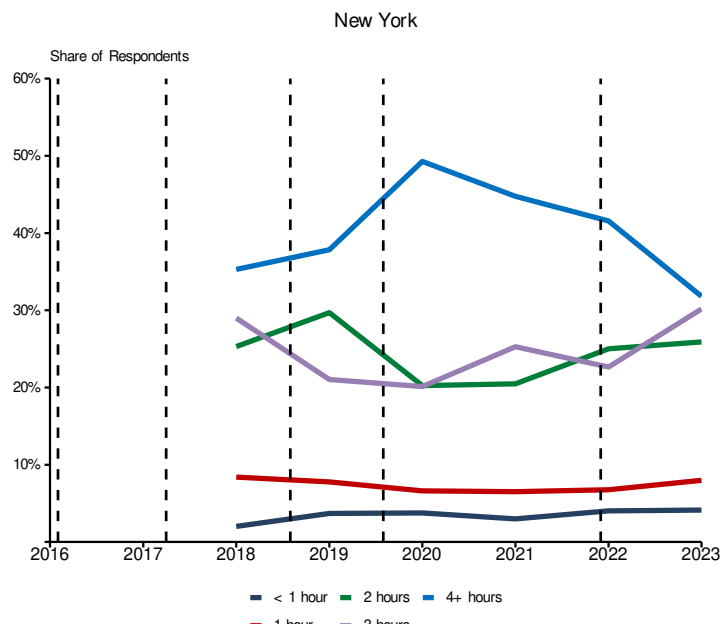


Nebraska



New Jersey

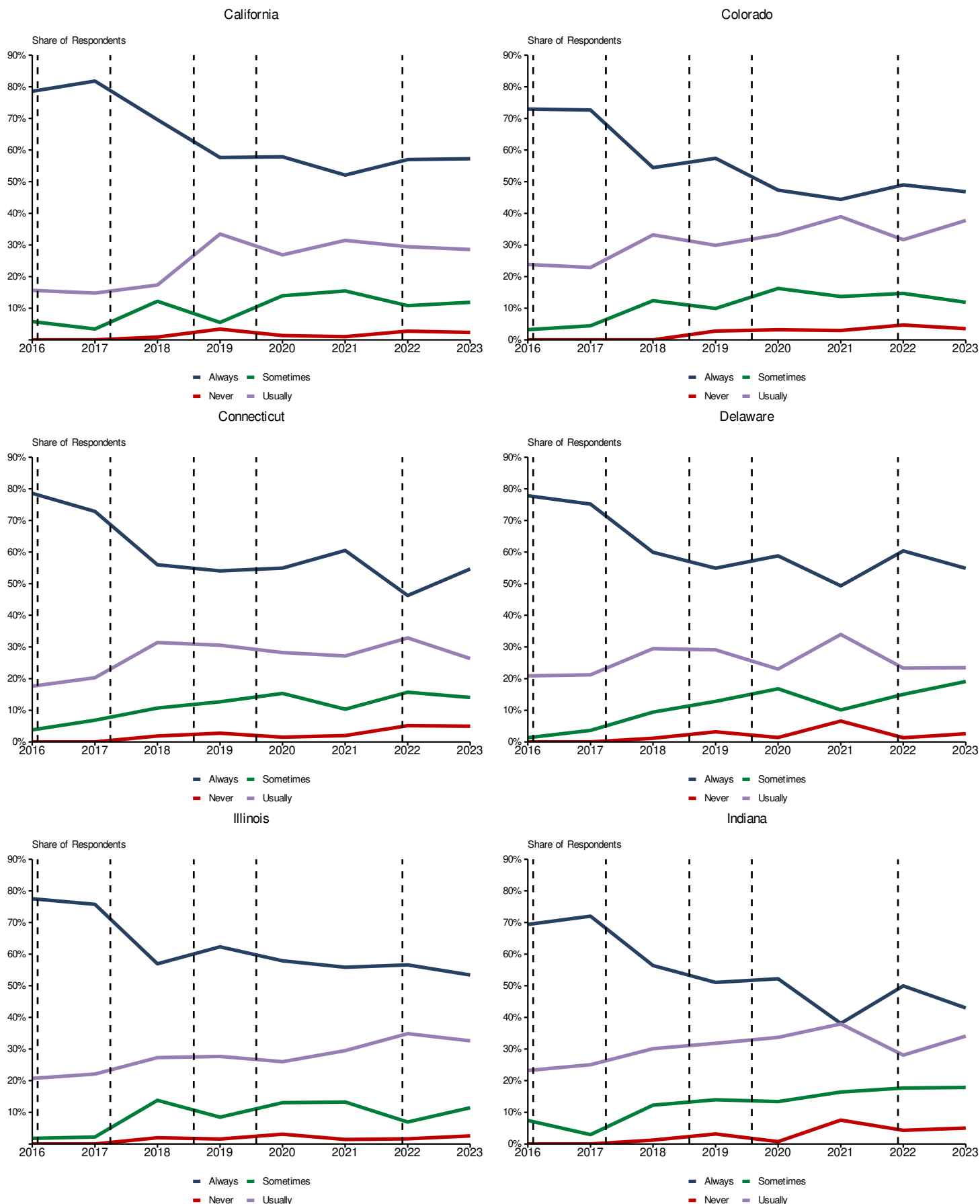




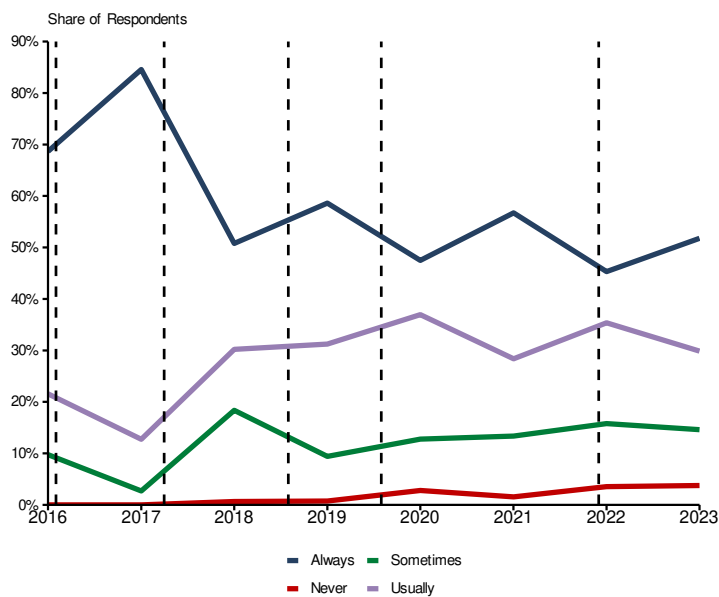
Source: NSCH Data

Note: These charts correspond to the charts in Figure 11 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the share of parents who responded to the NSCH question “ON MOST WEEKDAYS, about how much time did this child spend in front of a TV, computer, cellphone or other electronic device watching programs, playing games, accessing the internet or using social media?” The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and to the UDAP States. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens using screens over certain thresholds in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

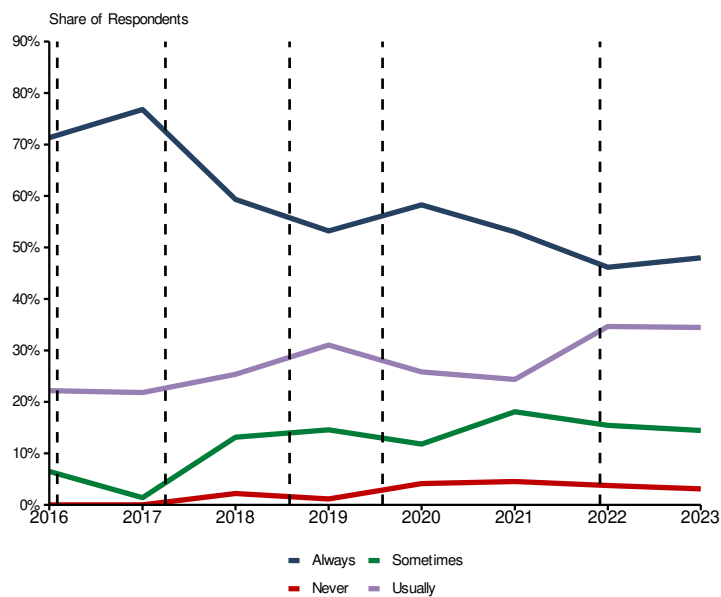
Figure F.7 Share of Teens in UDAP States Who Care About School Performance Over Time



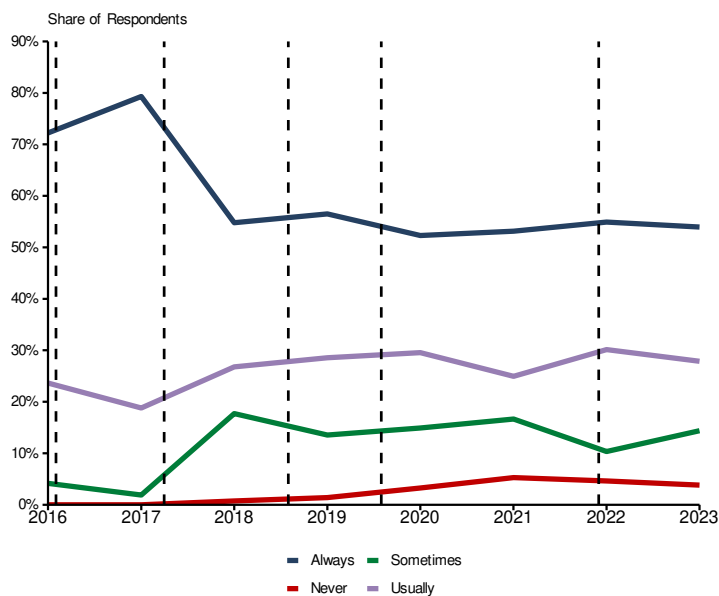
Kansas



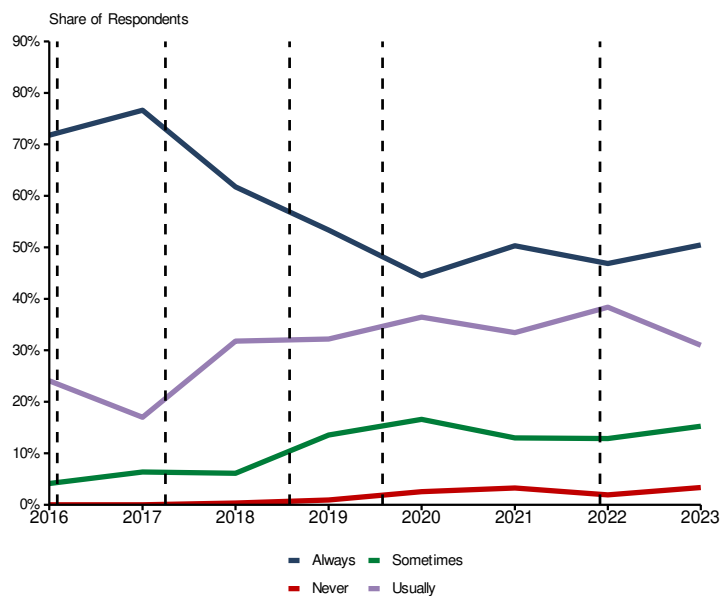
Kentucky



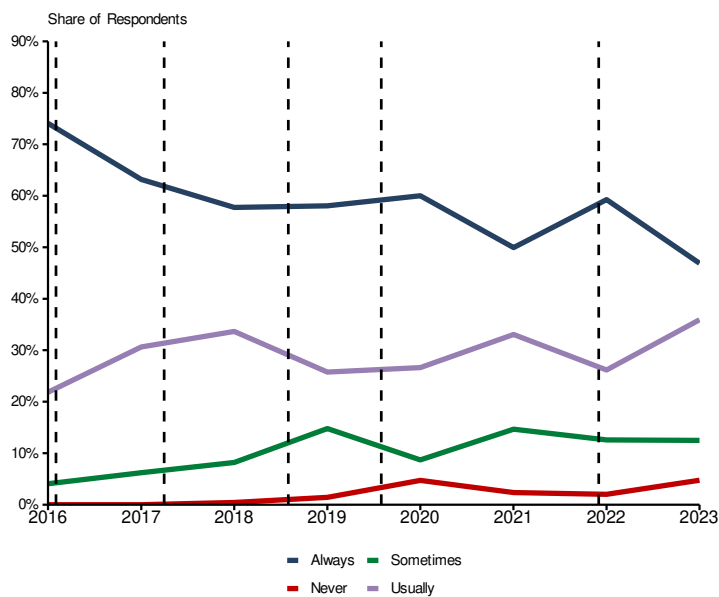
Louisiana



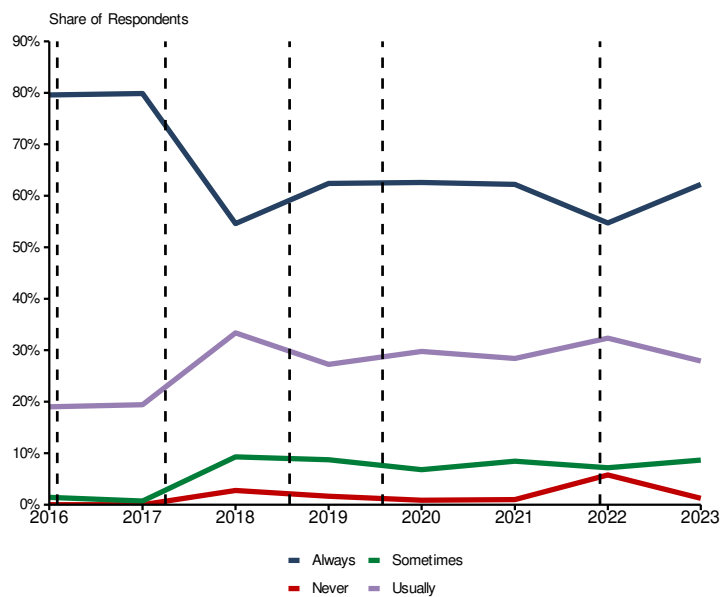
Minnesota

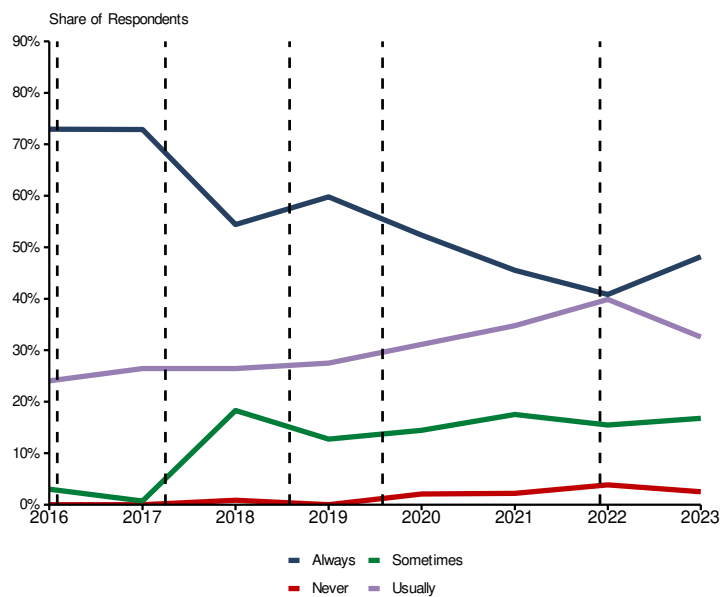
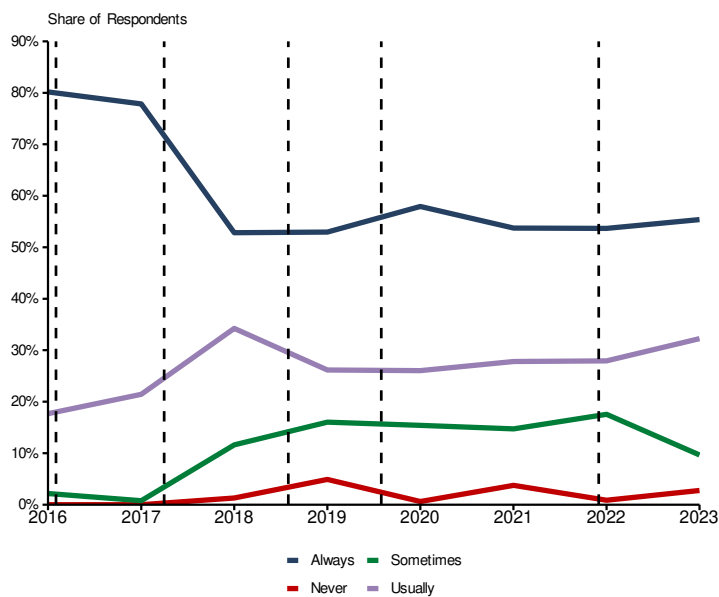
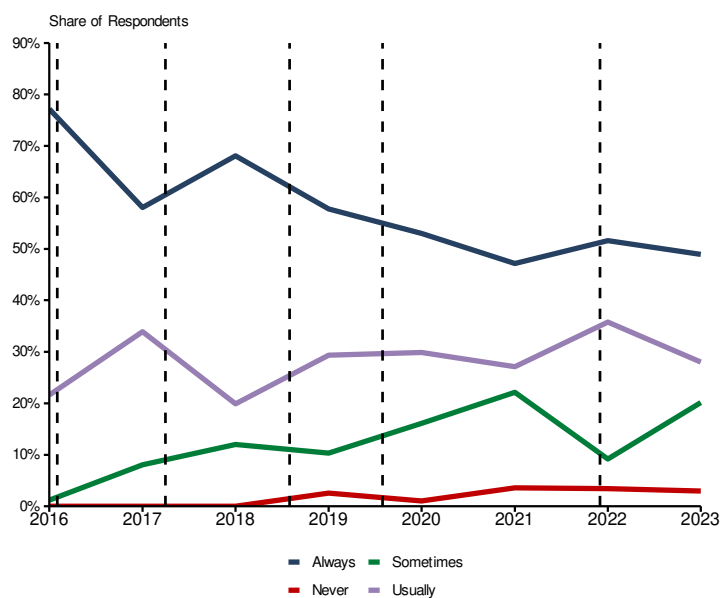
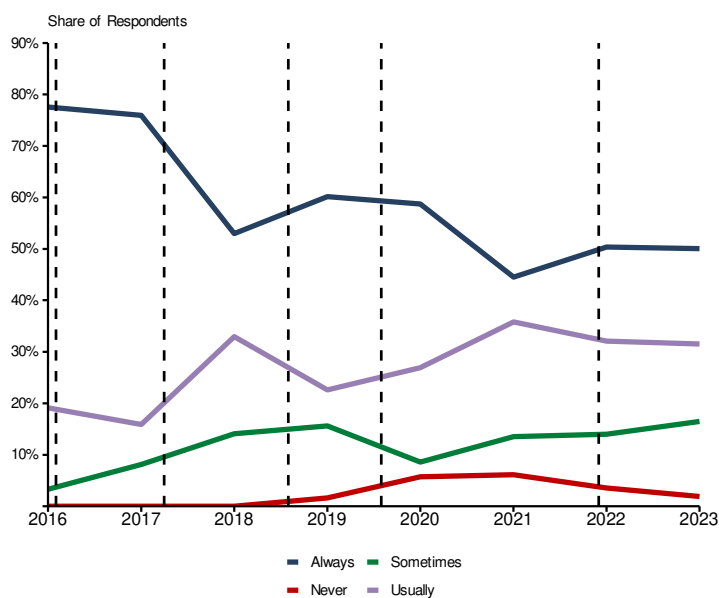
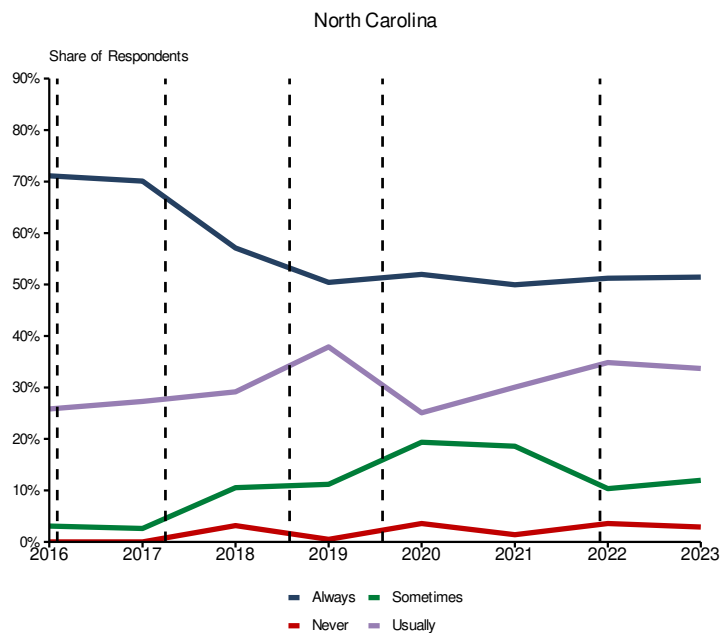
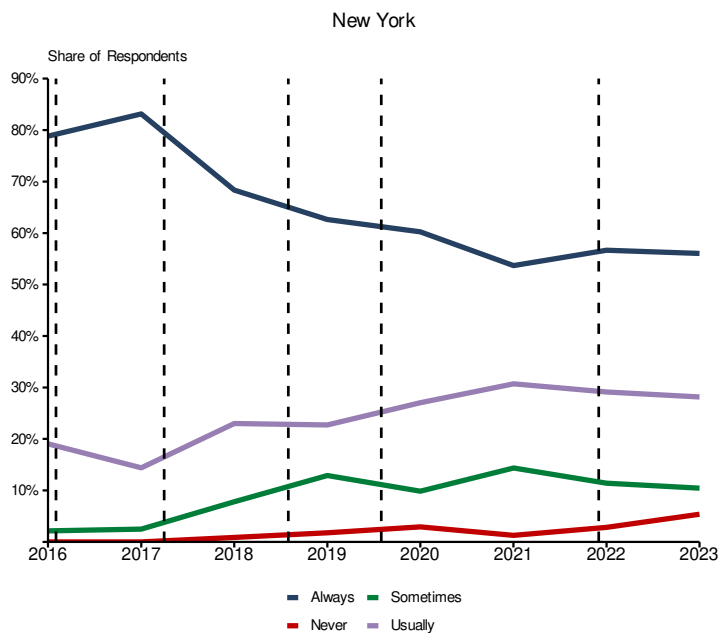


Nebraska



New Jersey

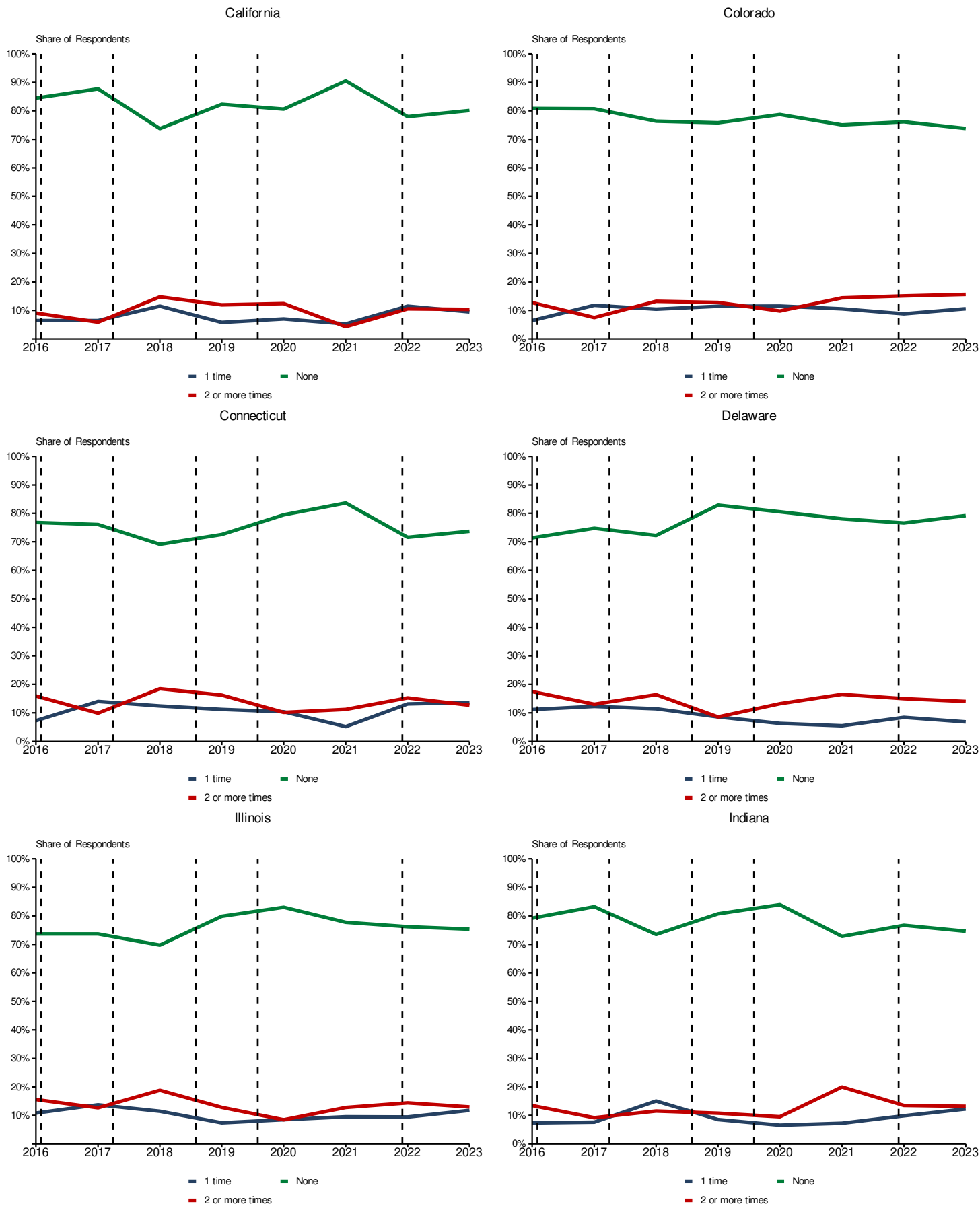




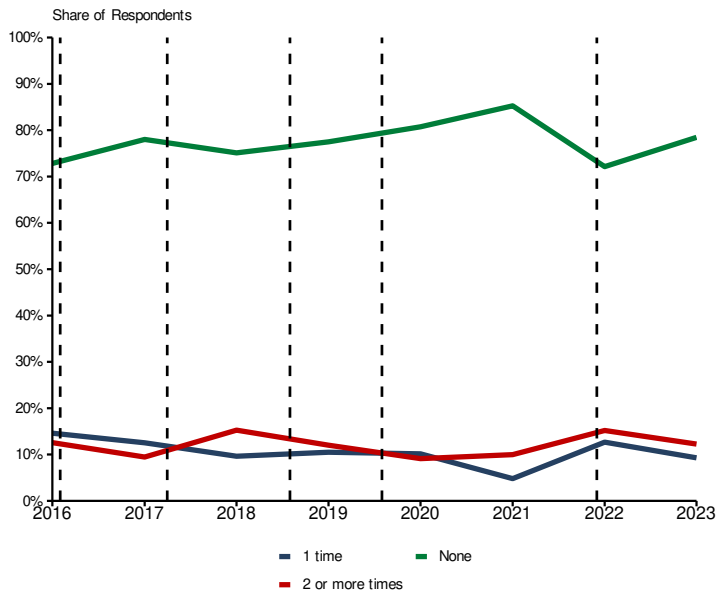
Source: NSCH Data

Note: These charts correspond to the charts in Figure 12 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the share of parents who responded to the NSCH question “How often does this child... Care about doing well in school?” The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the UDAP States. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens who care about school performance in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

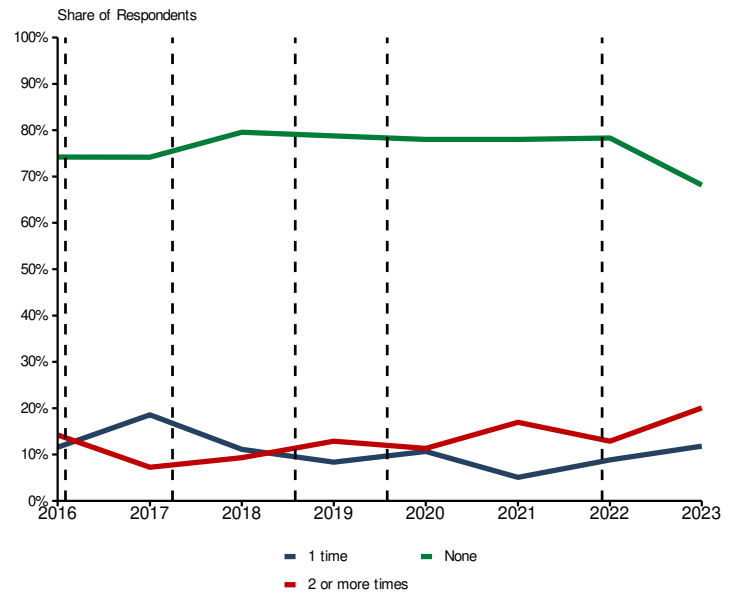
Figure F.8 Share of Teens in UDAP States Whose Schools Contacted Their Households About Problems Over Time



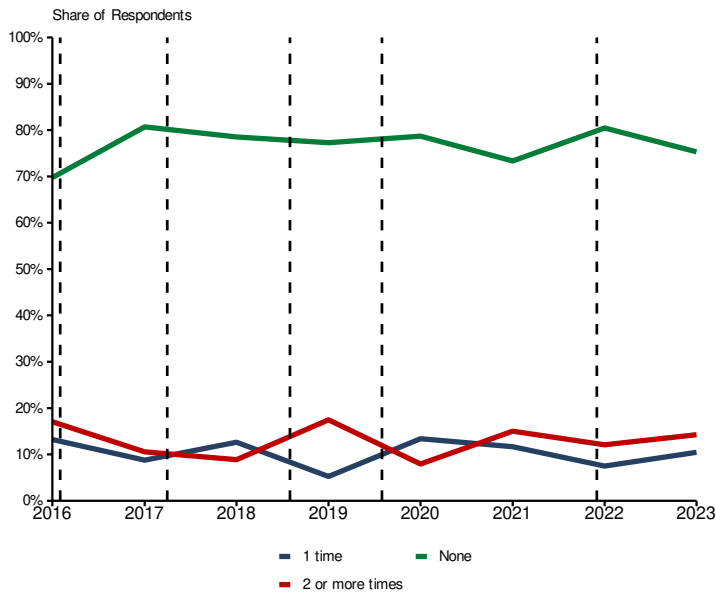
Kansas



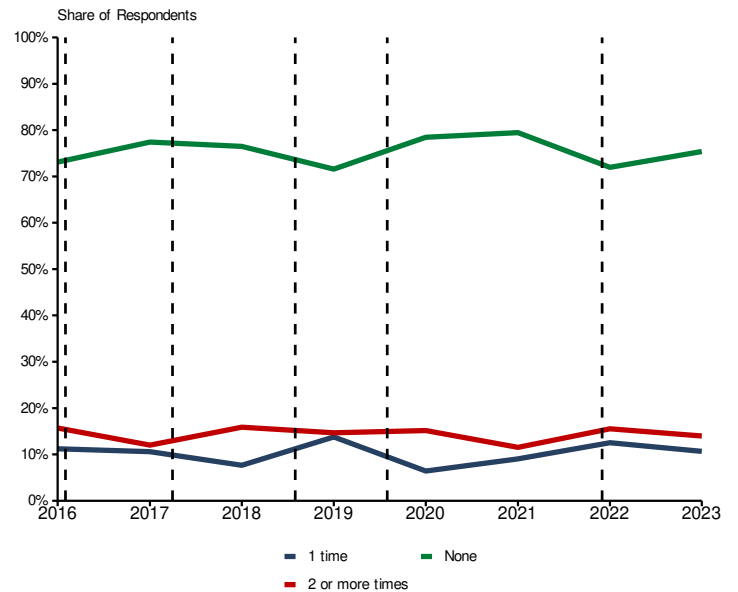
Kentucky



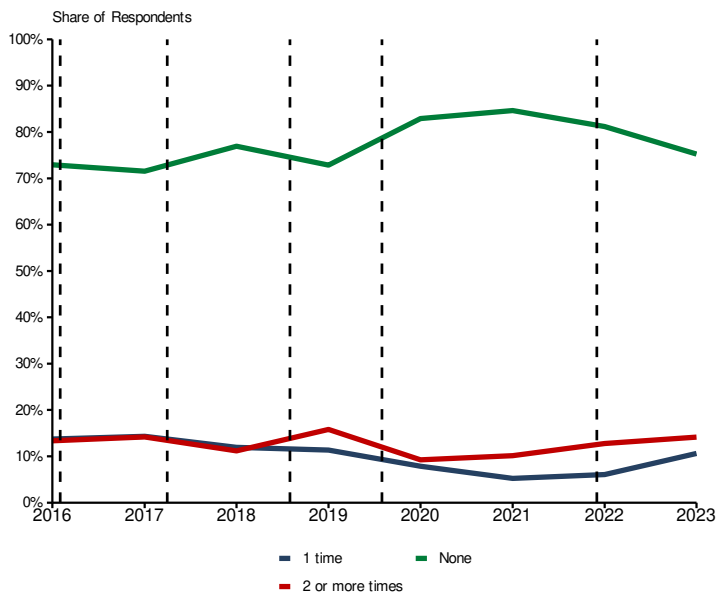
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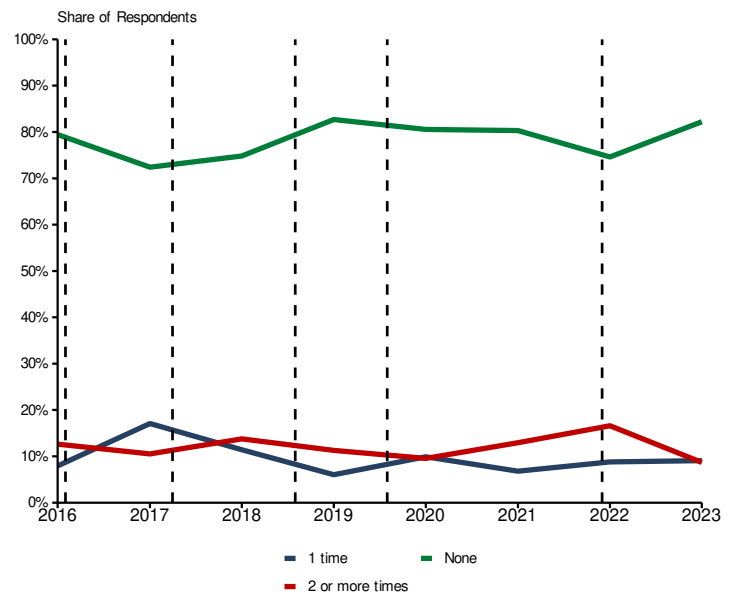
Minnesota

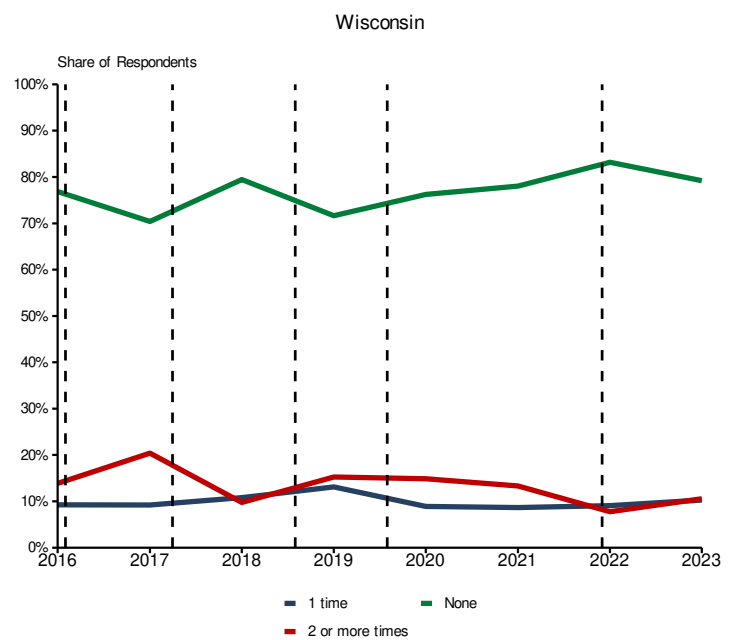
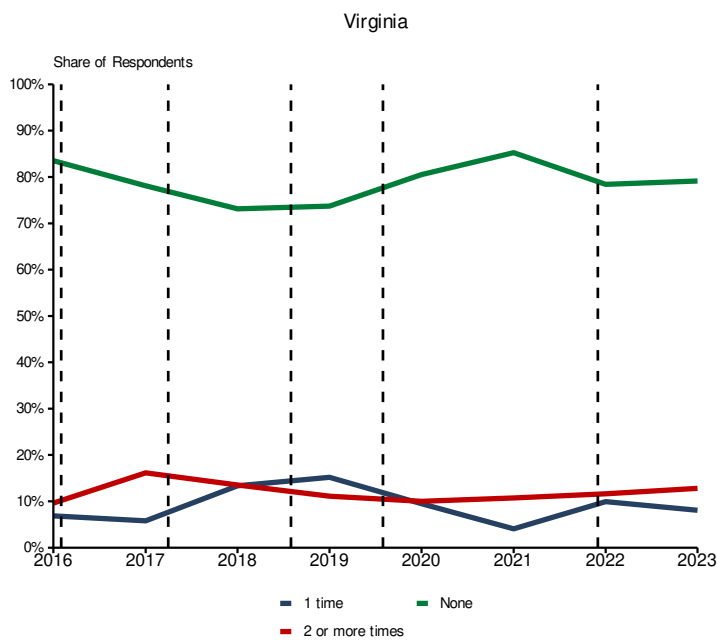
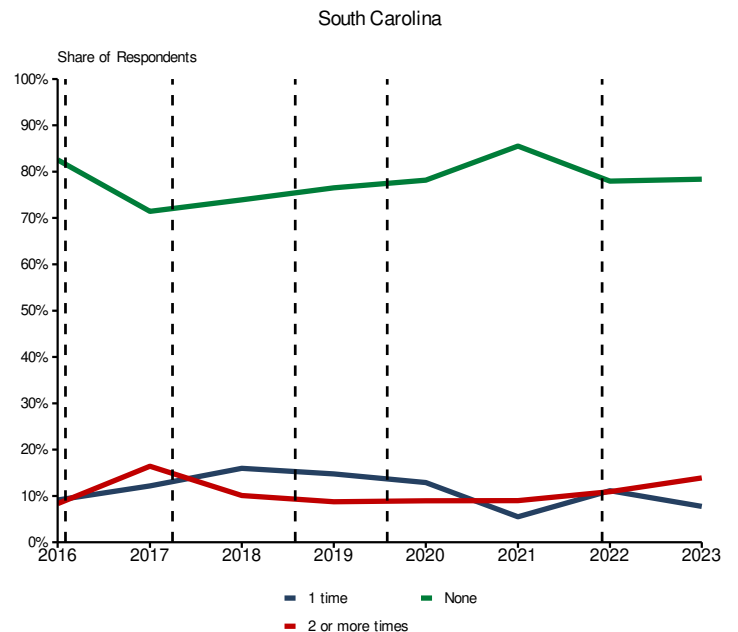
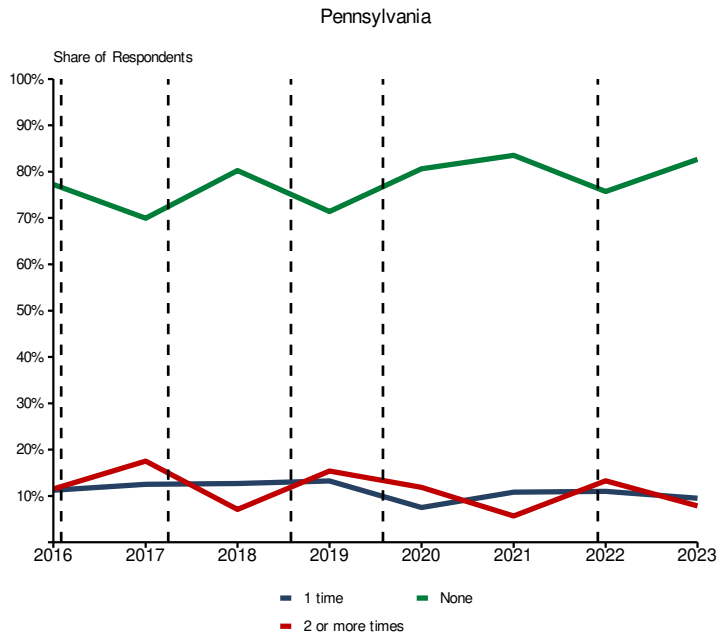
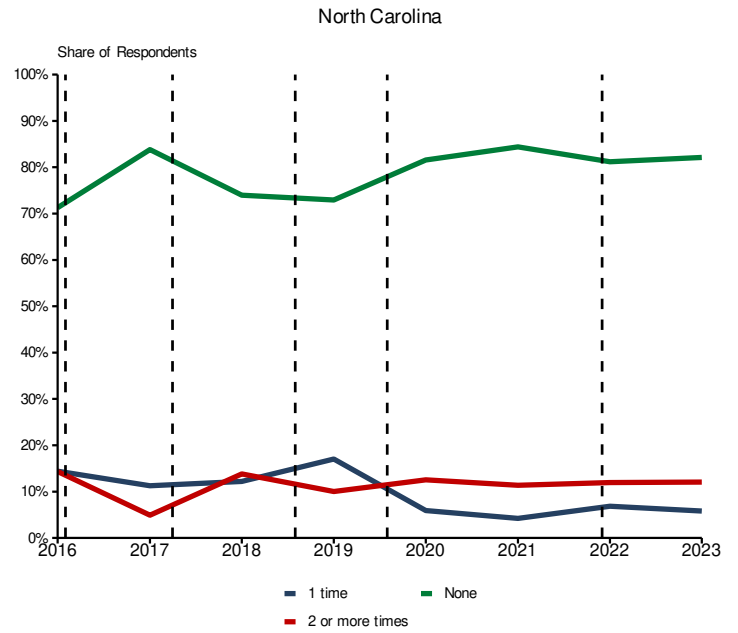
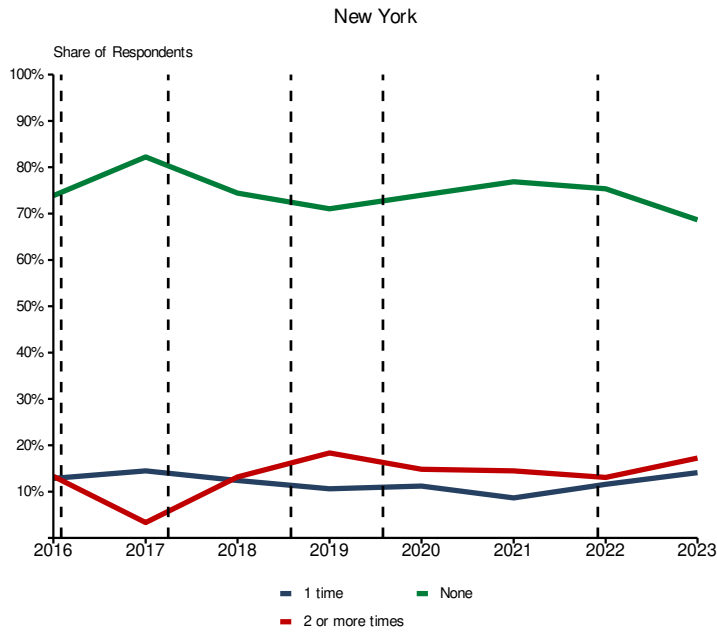


Nebraska



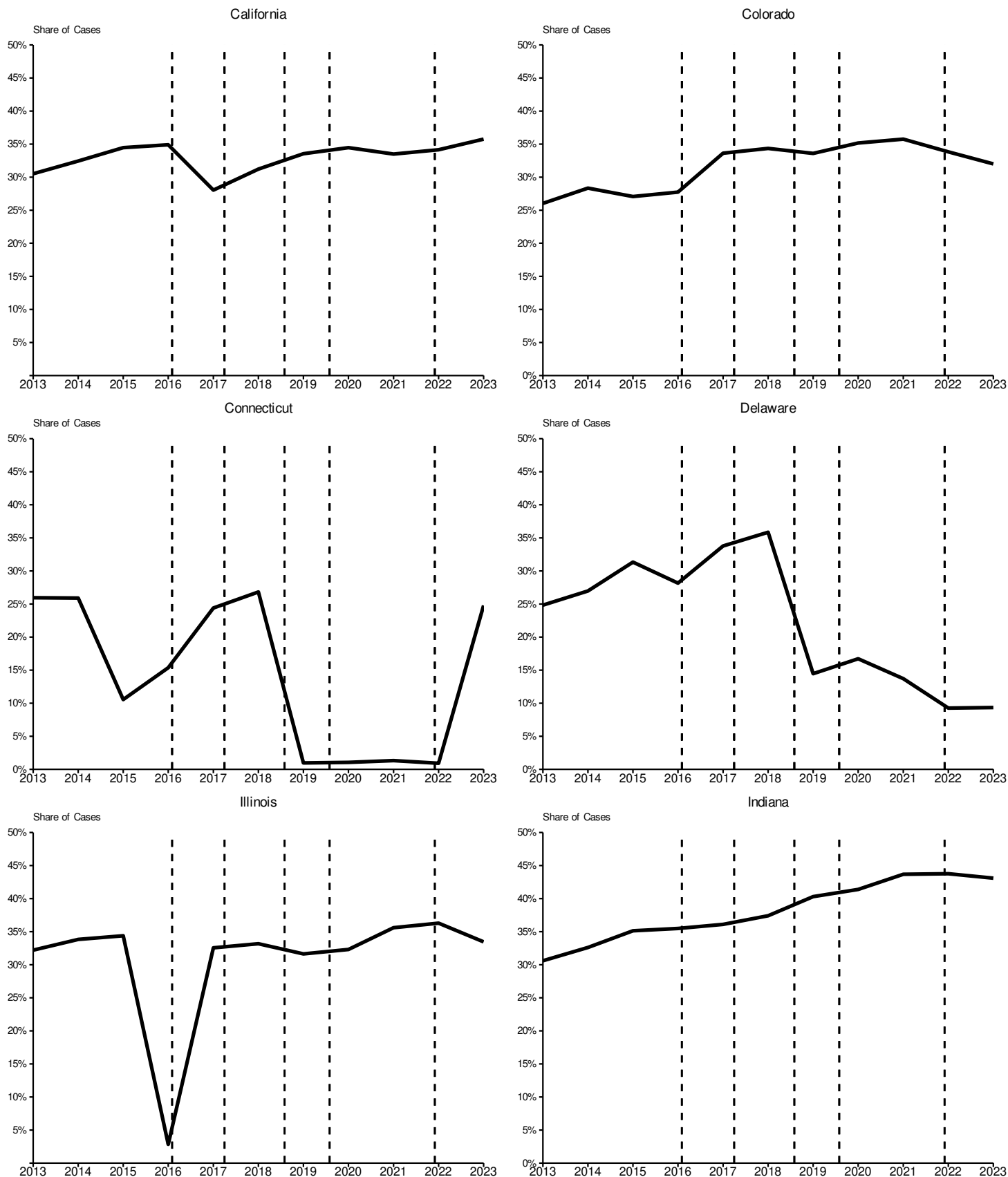
New Jersey

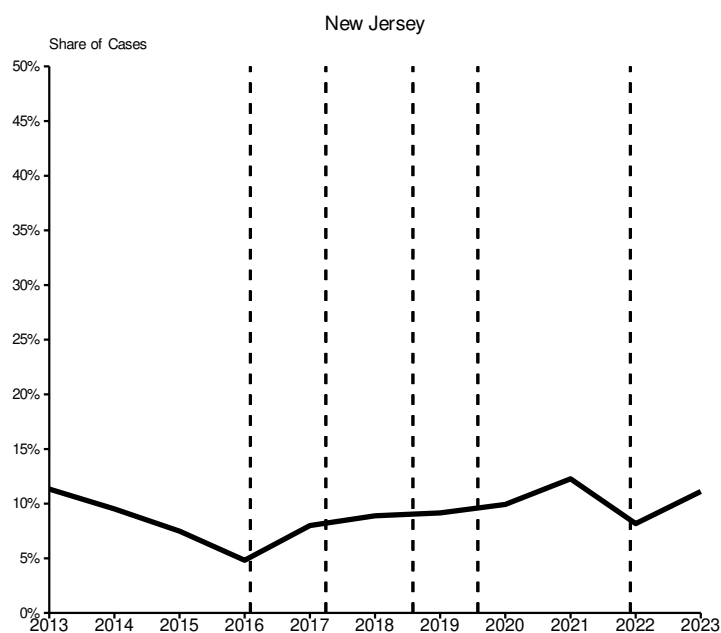
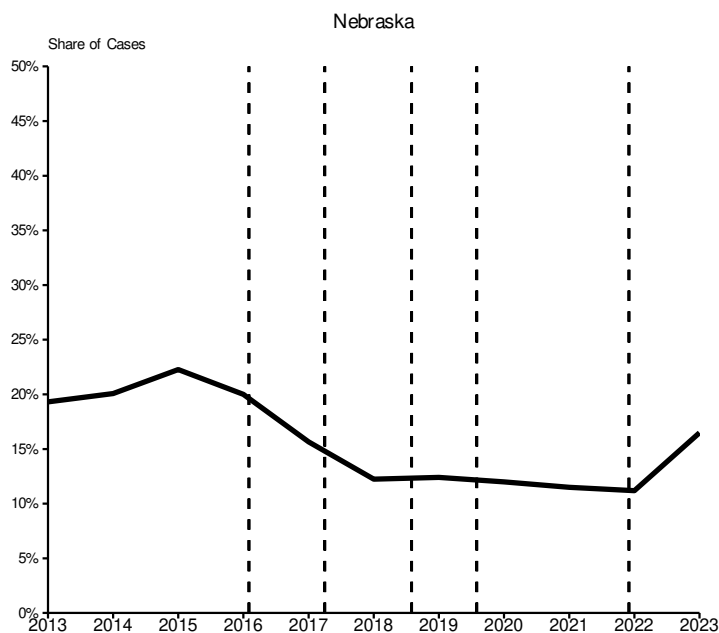
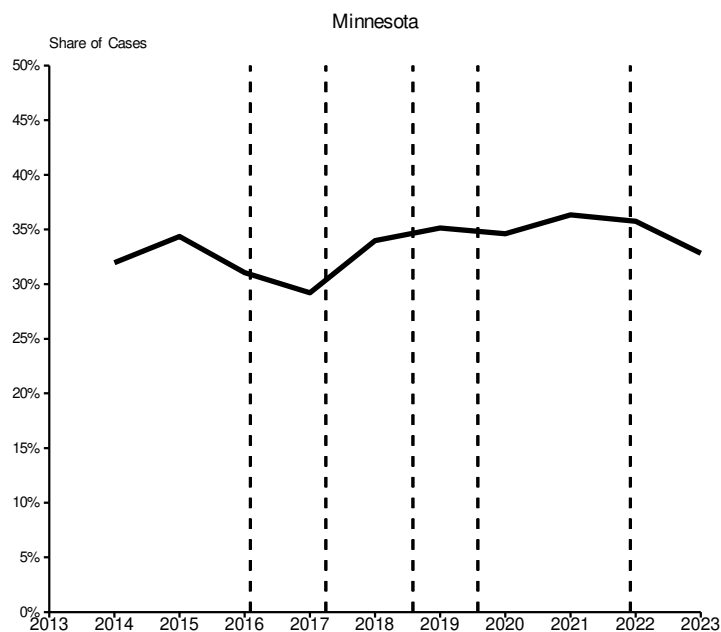
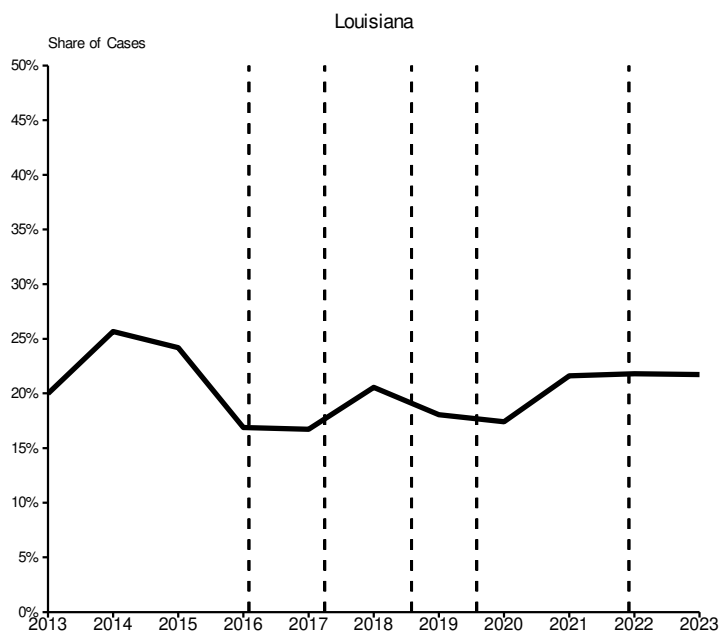
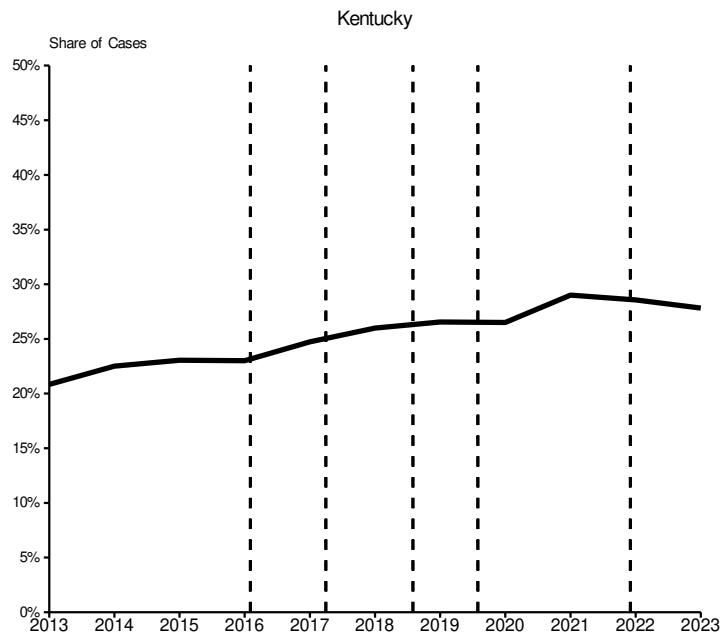
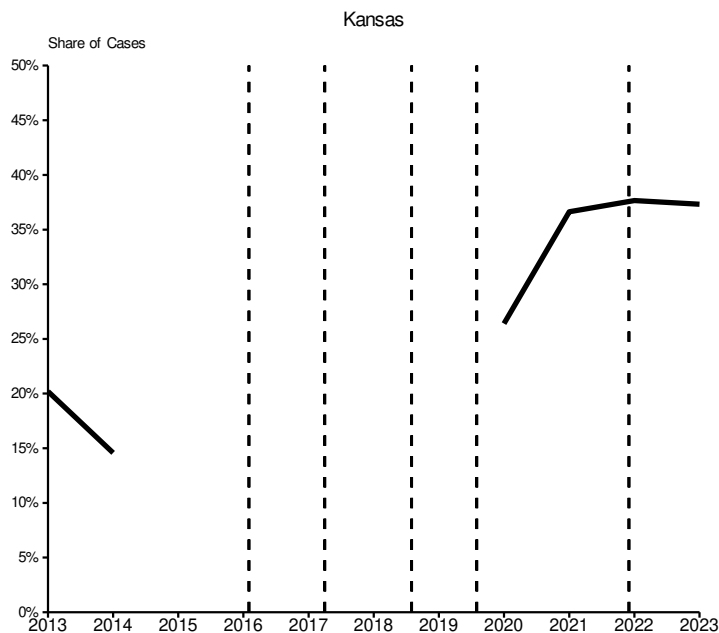


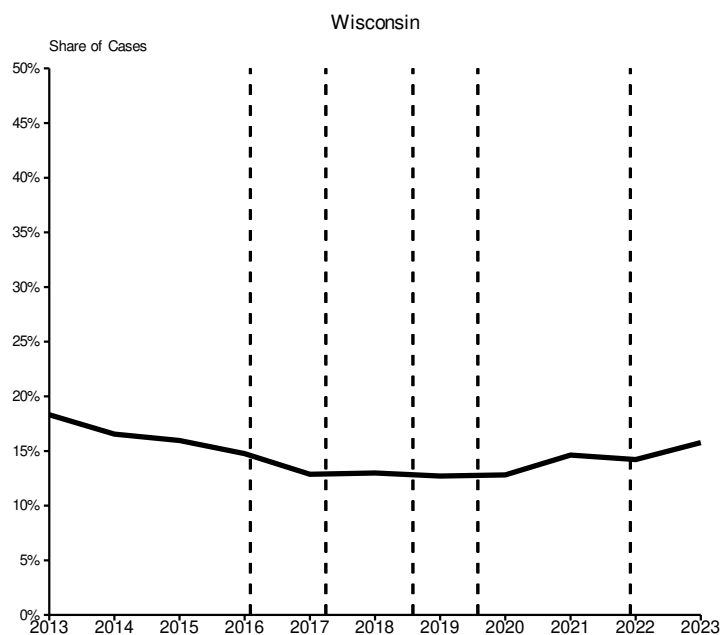
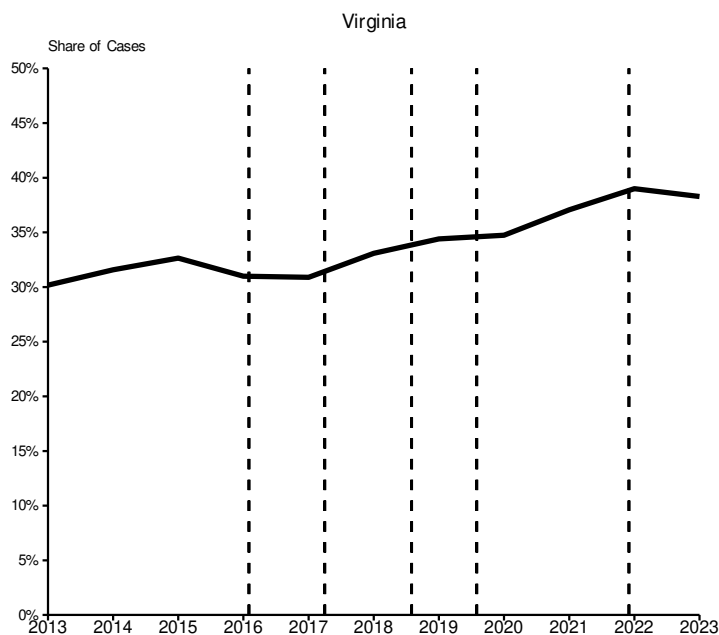
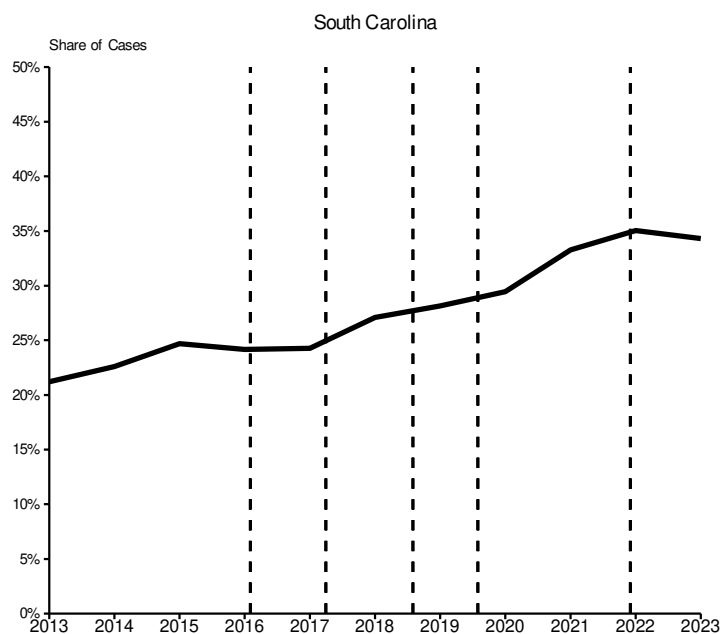
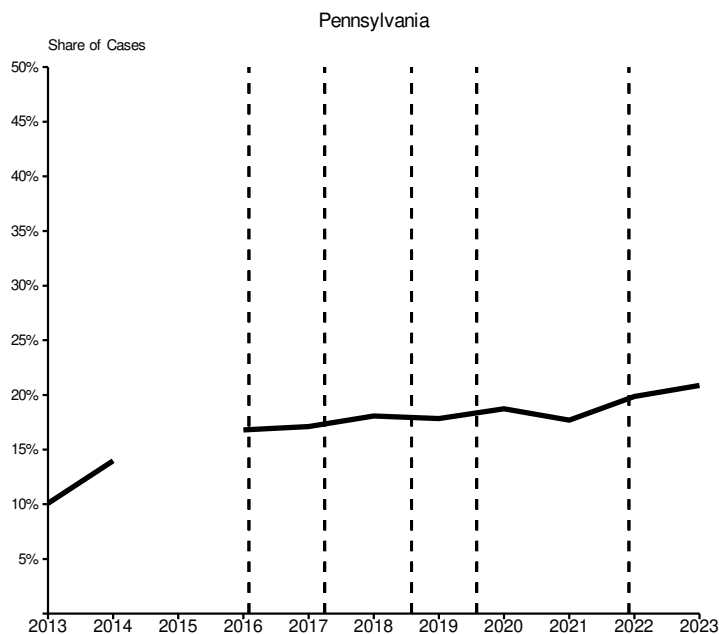
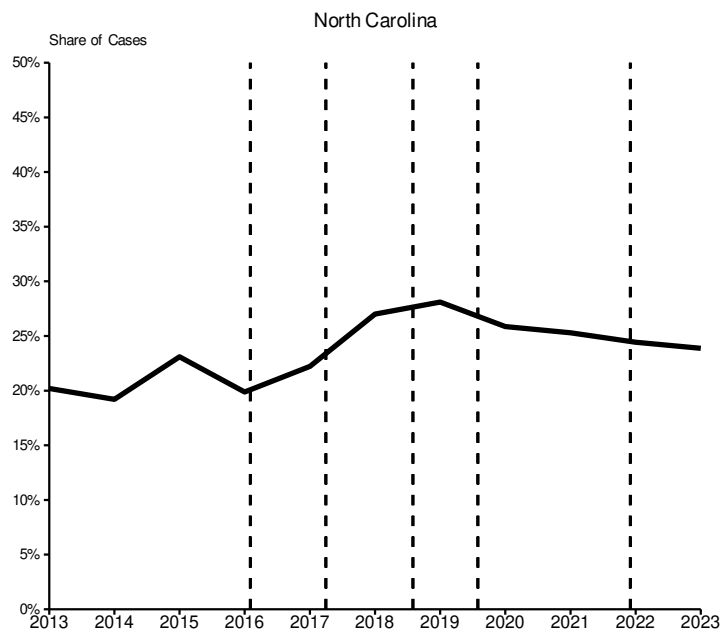
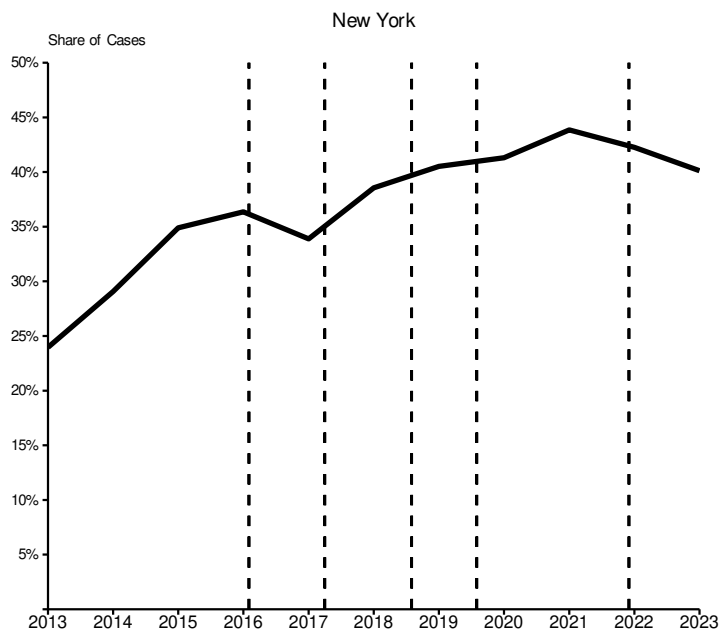


Source: NSCH Data

Note: These charts correspond to the charts in Figure 13 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the share of parents who responded to the NSCH question "DURING THE PAST 12 MONTHS, how many times has this child's school contacted you or another adult in your household about any problems they are having with school?" The NSCH is an annual nationally representative survey of children between 0–17 years of age. Responses have been restricted to 13–17-year-olds and the UDAP States. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the U.S. Department of Health and Human Services for the NSCH data to estimate the share of Teens whose schools contacted their households about problems in the state. These respondent weights account for demographic and socio-economic differences between the sample and population estimates and ensure that the weighted totals of respondents in the survey match population estimates by age group, race/ethnicity, sex, poverty, education, and household characteristics. Responses are weighted by the following age groups: 0–5, 6–11, 12–17 years old. Weighting has not been further adjusted to account for age filtering to 13–17-year-old Teens as the survey results do not provide specific weights for this subgroup. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

MH-CLD**Figure F.9 Share of Teens Who Accessed Mental Health Services in UDAP States Diagnosed with Depression Over Time**

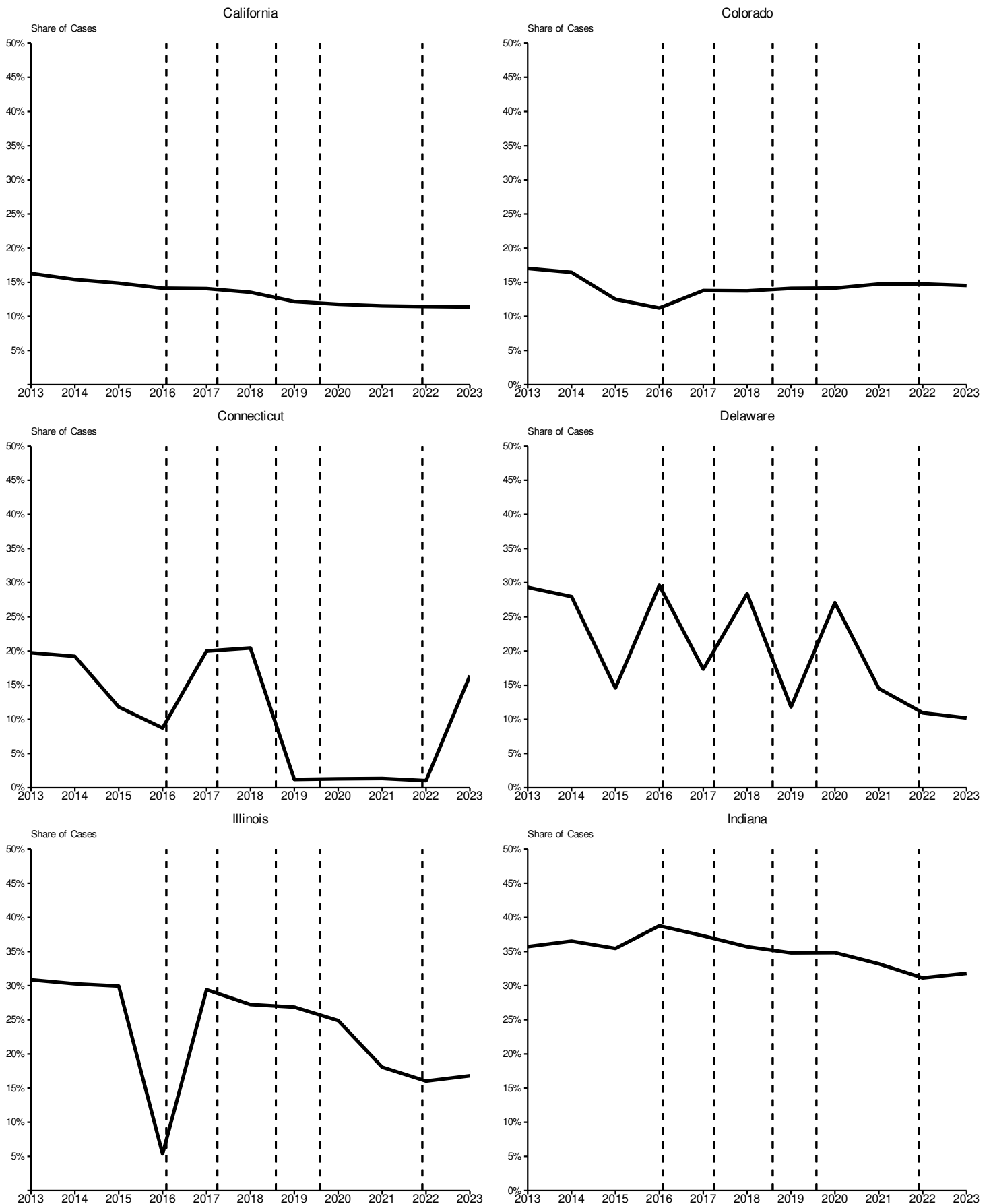


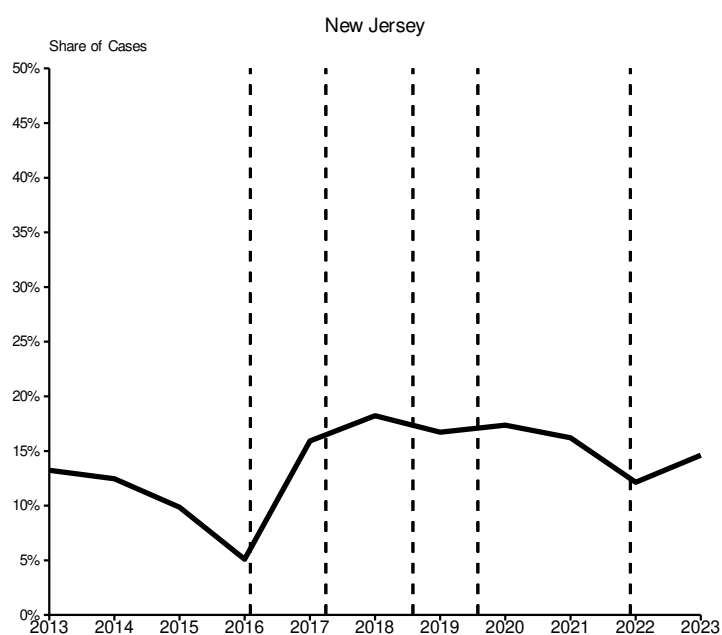
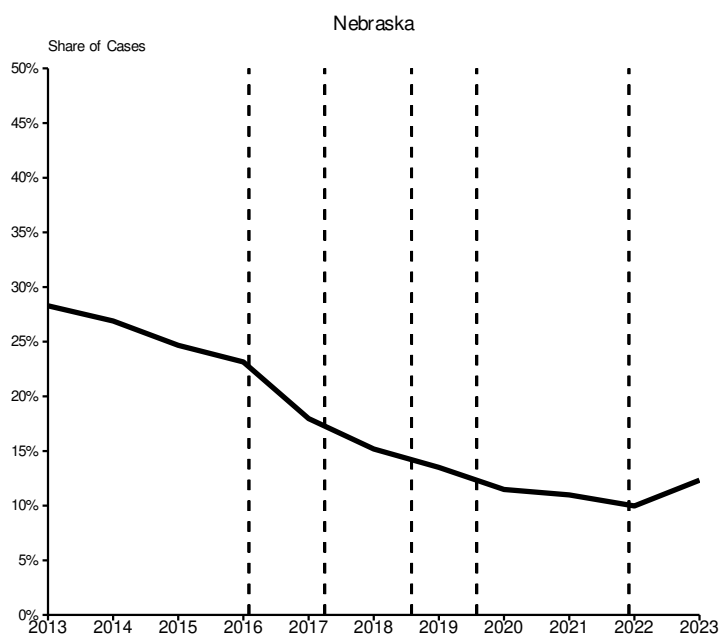
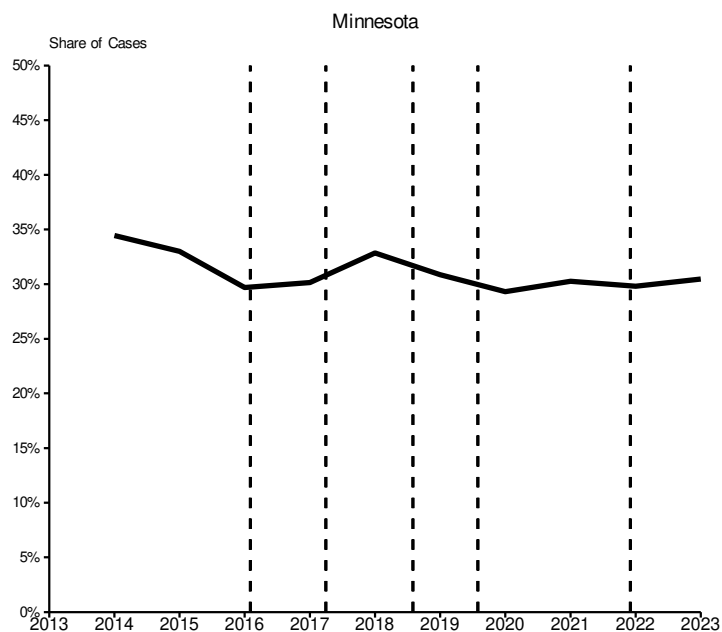
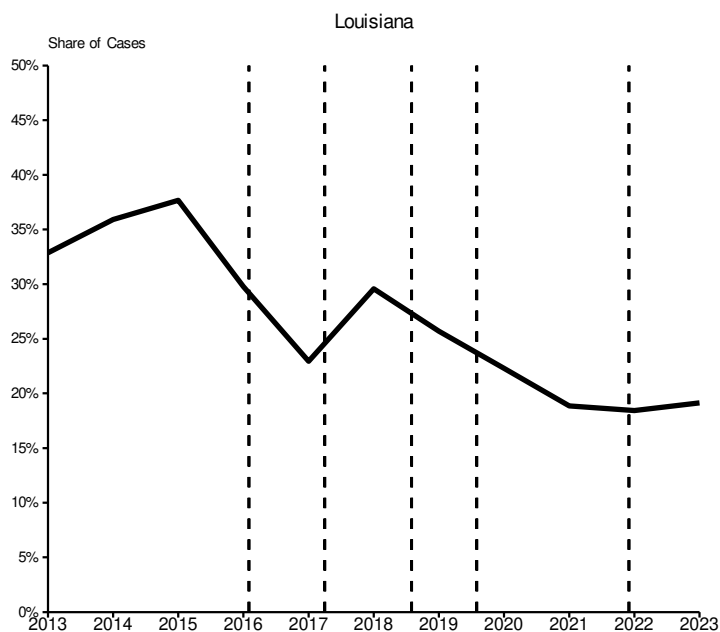
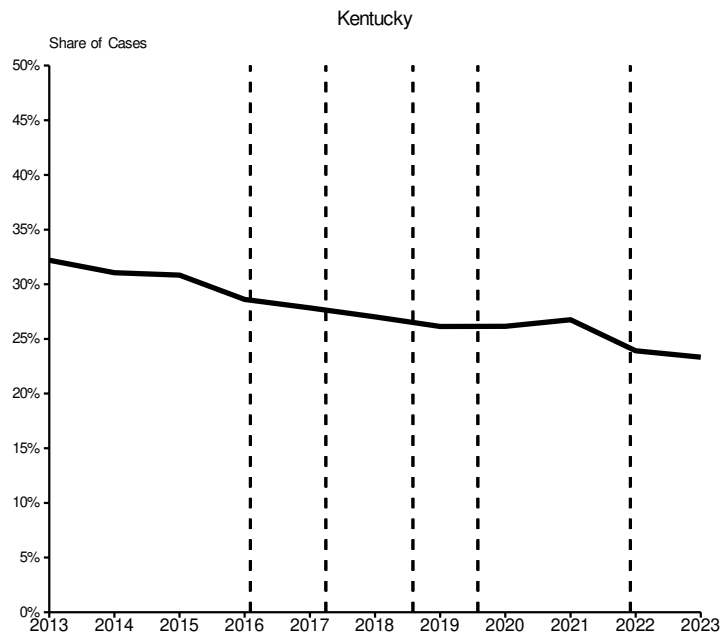
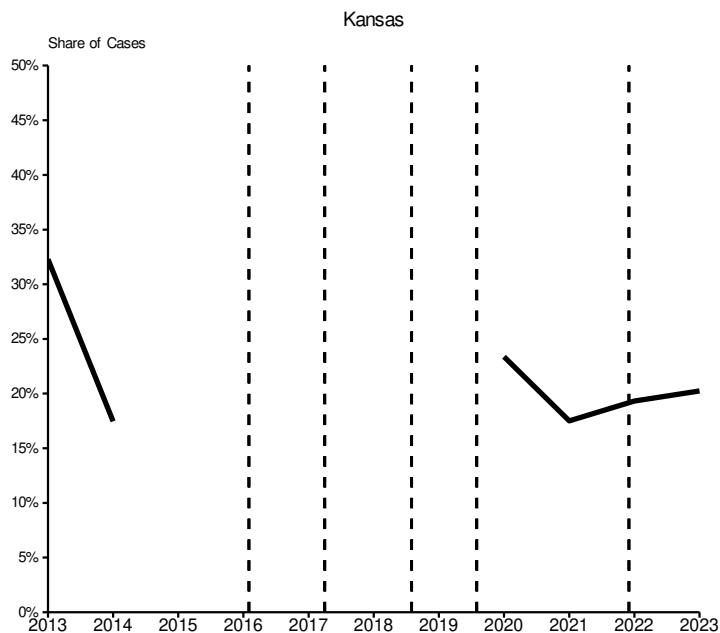


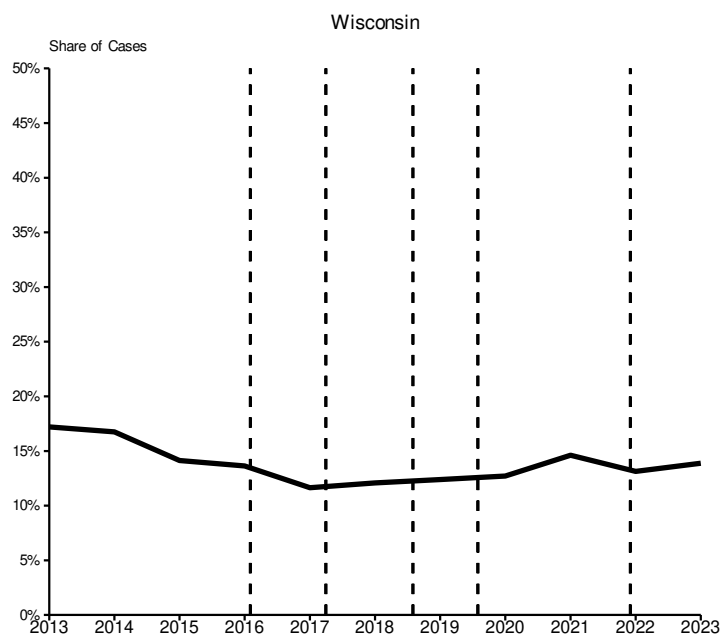
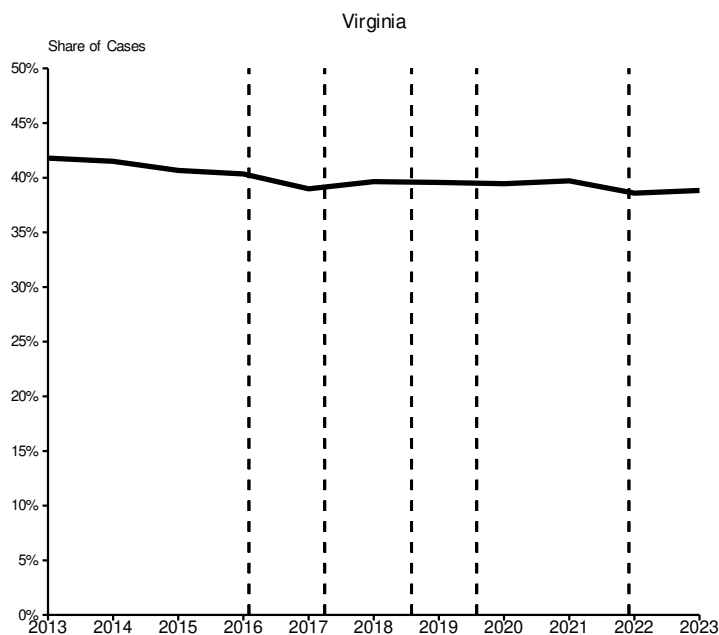
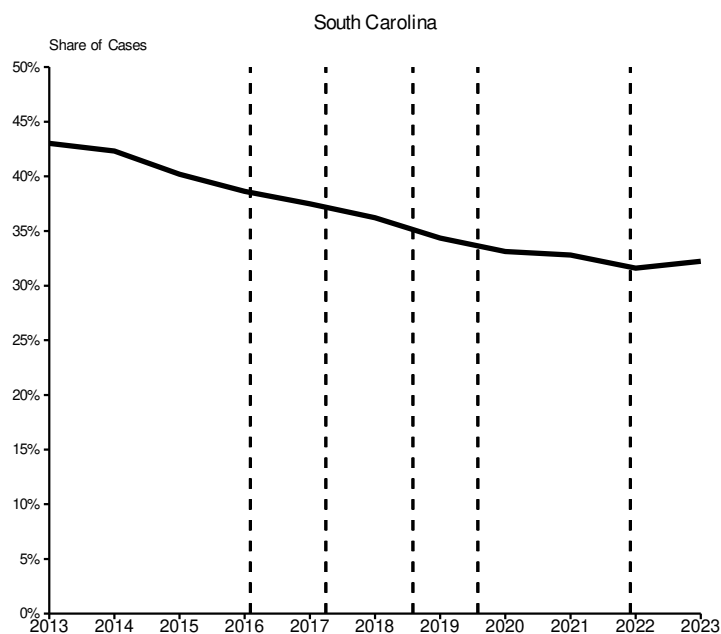
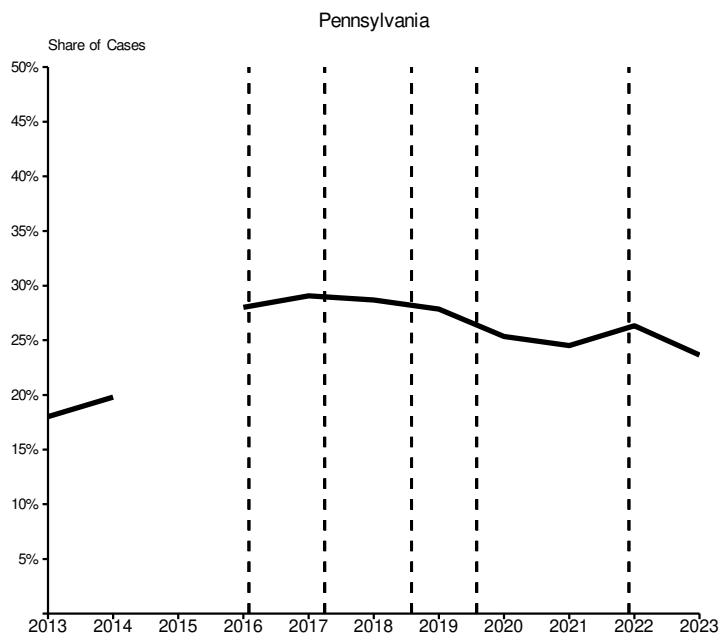
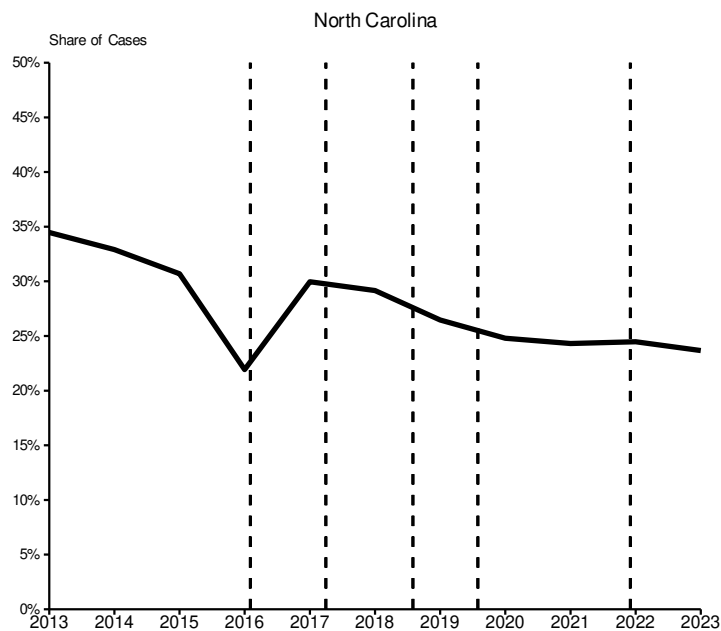
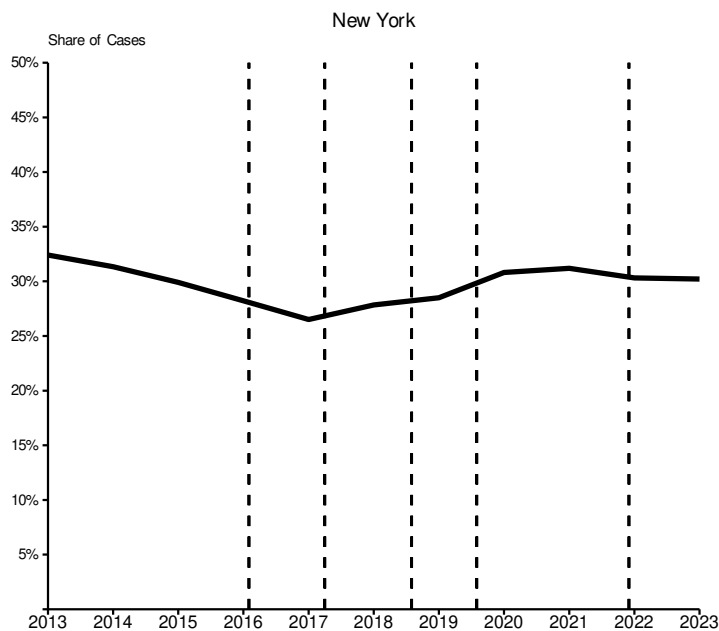
Source: United States Substance Abuse and Mental Health Services Administration (SAMHSA), Mental Health Client-Level Data (“SAMHSA MH-CLD”); APA DSM History; “Division of Mental Health Williams Semi-Annual Report #12,” Illinois Department of Human Services, available at <https://www.dhs.state.il.us/OneNetLibrary/27897/documents/Mental%20Health/Williams/10202017/SemiAnnualReport-12.pdf> (“Williams Semi-Annual Report #12”)

Note: These charts correspond to the charts in Figure 14 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the proportion of individuals who were diagnosed with a depressive disorder in the SAMHSA MH-CLD, which provides annual information on the mental health characteristics for individuals who have accessed mental health services in facilities or through programs funded or operated by the state mental health facility. Data have been restricted to the 12–14 and 15–17 age groups and the UDAP States. I note that some states do not report data in particular years. I note that the DSM was revised in both 2013 and 2022. These revisions included changes to diagnosis criteria as well as language revisions. I note that the 2016 decrease in diagnosis rates in Illinois coincided with a state budget impasse that had “a rippling effect on the productivity and momentum of community mental health vendors” and therefore may not reflect true trends in diagnoses. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

Figure F.10 Share of Teens Who Accessed Mental Health Services in UDAP States Diagnosed with ADD or ADHD Over Time



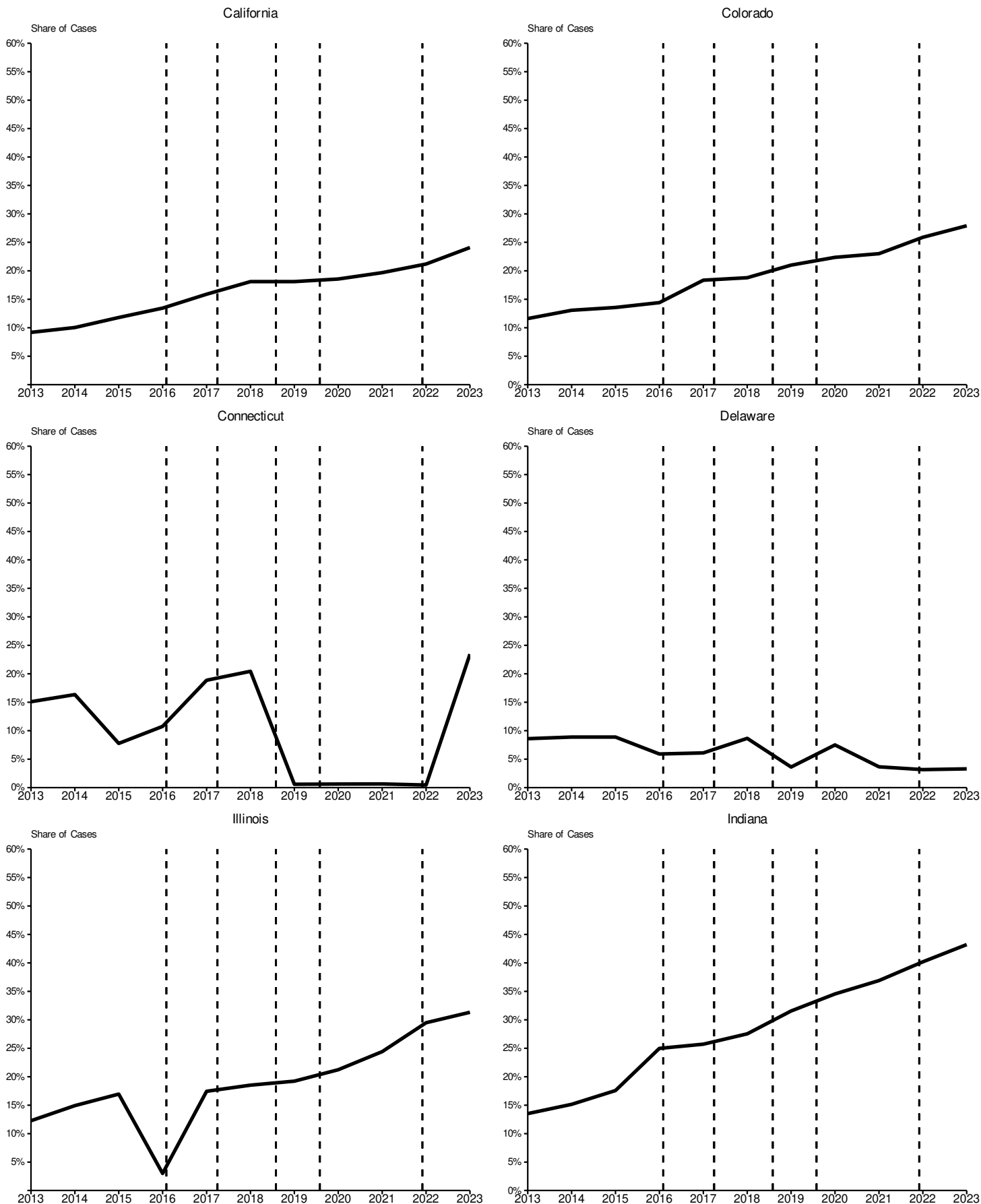


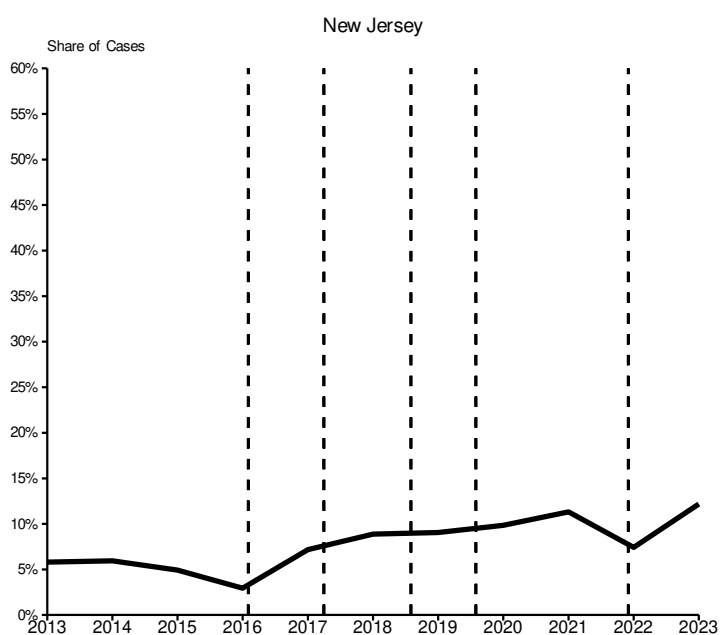
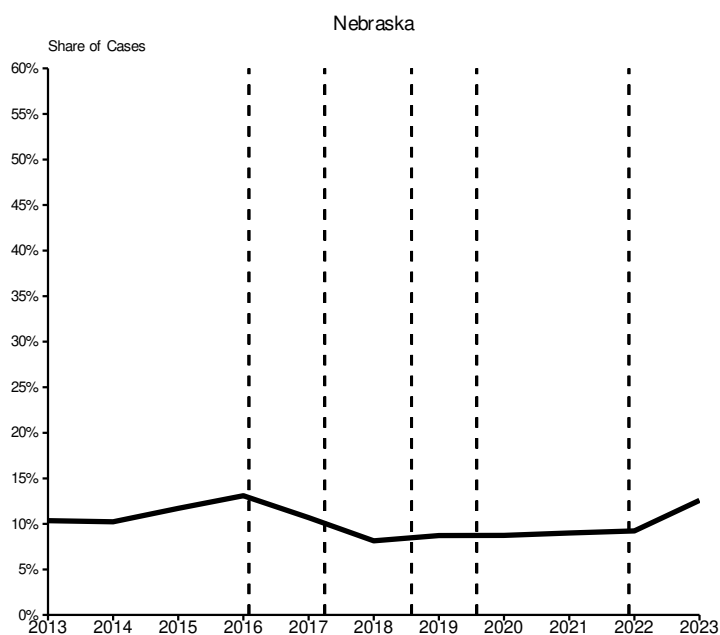
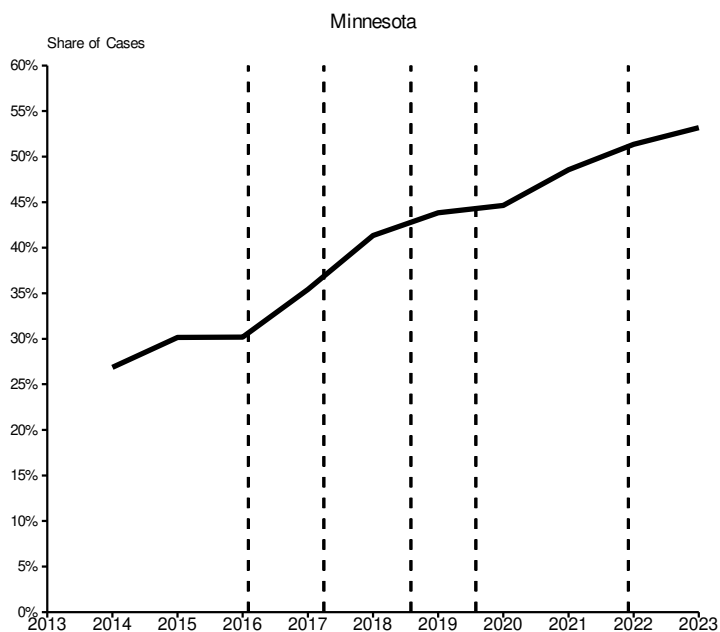
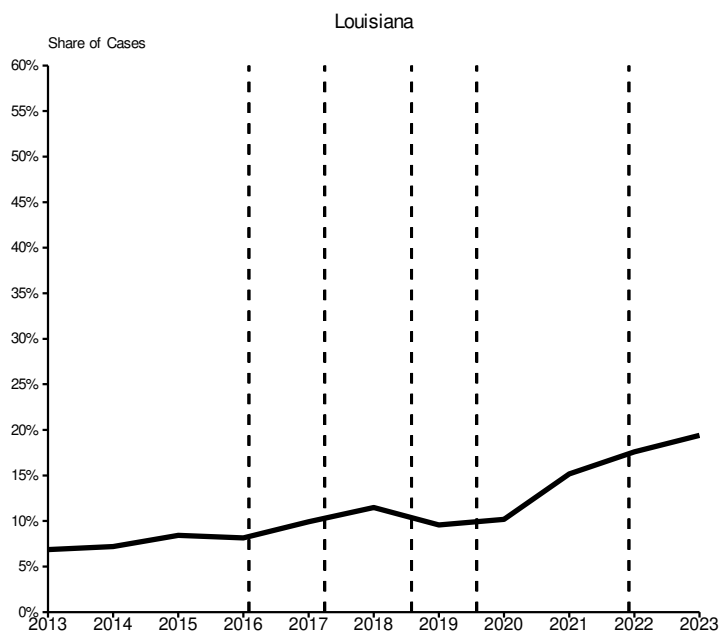
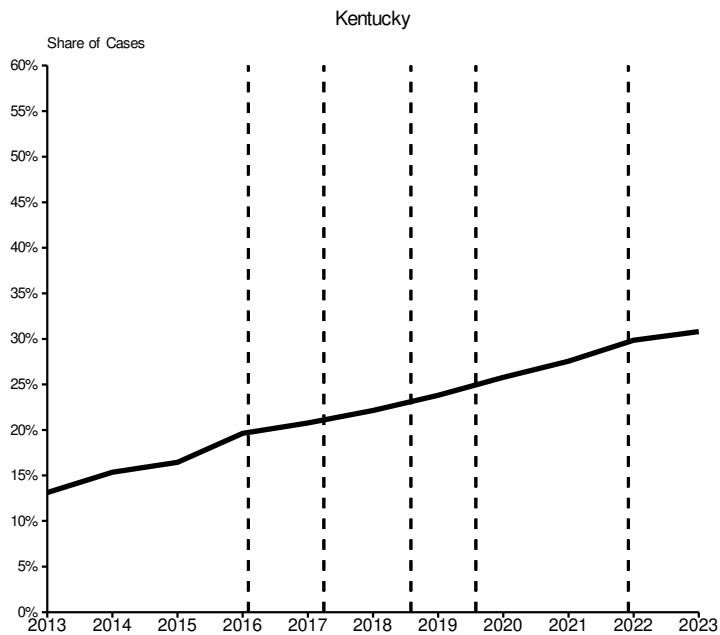
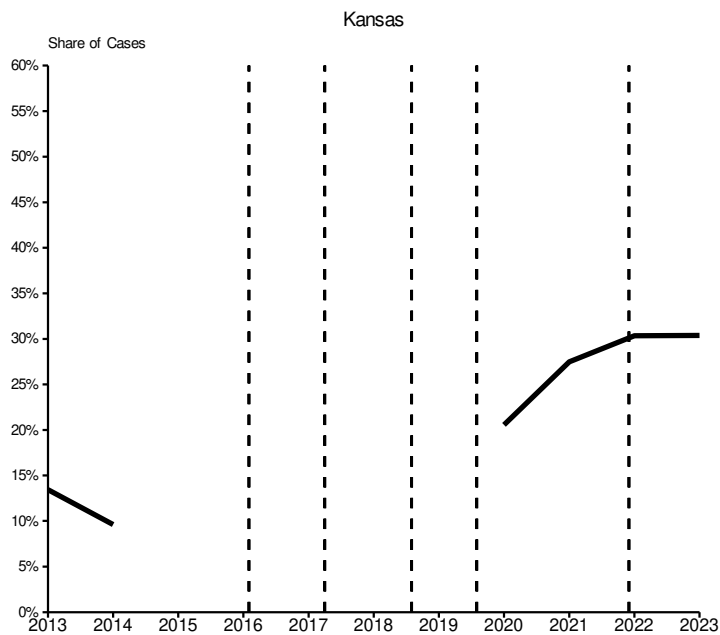


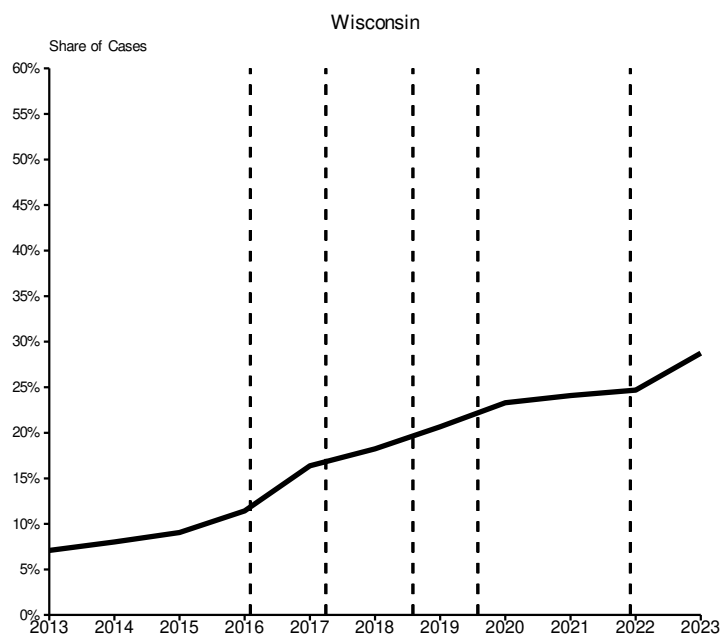
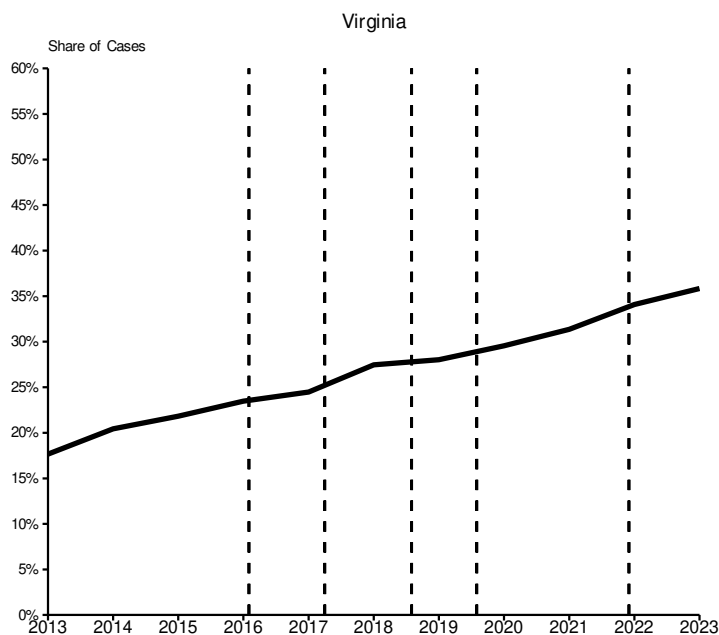
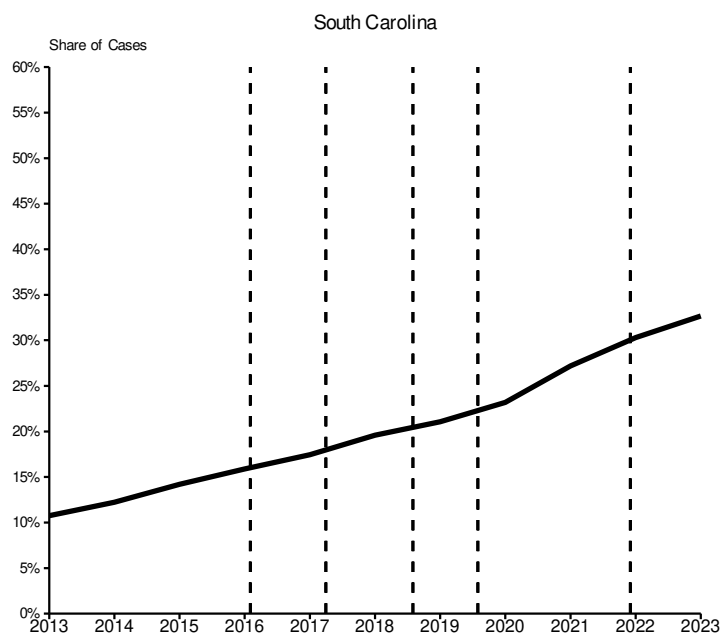
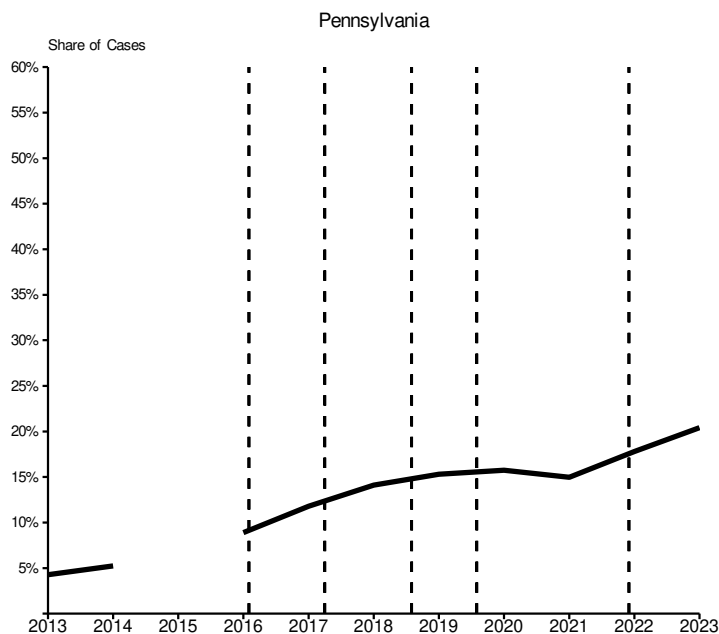
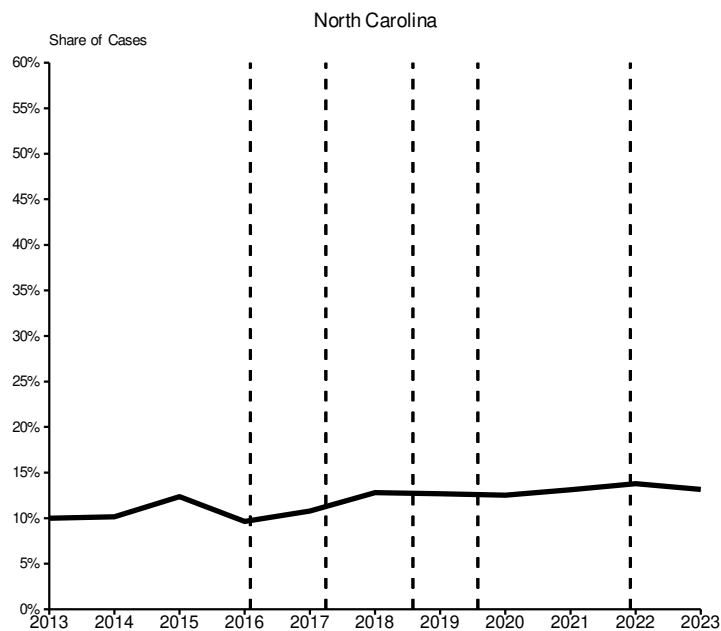
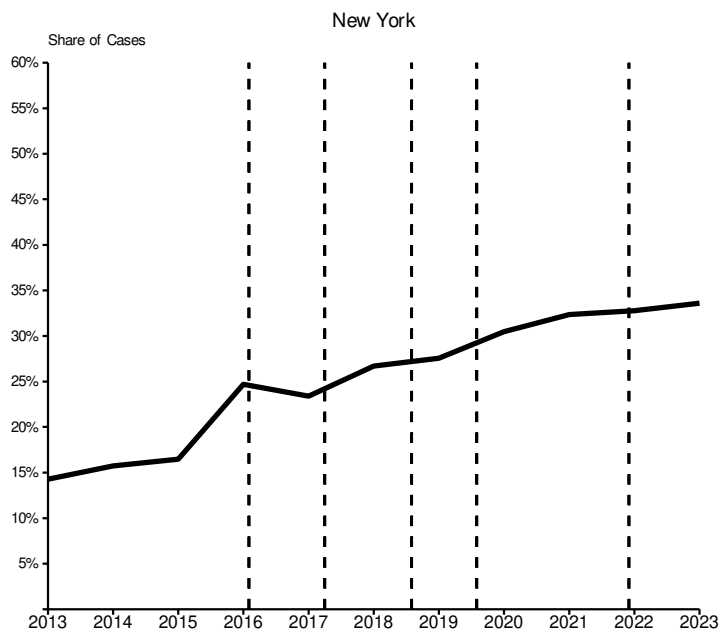
Source: SAMHSA MH-CLD; APA DSM History; Williams Semi-Annual Report #12

Note: These charts correspond to the charts in Figure 15 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the proportion of individuals who were diagnosed with an attention deficit/hyperactivity disorder in the SAMHSA MH-CLD, which provides annual information on the mental health characteristics for individuals who have accessed mental health services in facilities or through programs funded or operated by the state mental health facility. Data have been restricted to the 12–14 and 15–17 age groups and the UDAP States. I note that some states do not report data in particular years. I note that the DSM was revised in both 2013 and 2022. These revisions included changes to diagnosis criteria as well as language revisions. I note that the 2016 decrease in diagnosis rates in Illinois coincided with a state budget impasse that had “a rippling effect on the productivity and momentum of community mental health vendors” and therefore may not reflect true trends in diagnoses. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

Figure F.11 Share of Teens Who Accessed Mental Health Services in UDAP States Diagnosed with Anxiety Over Time

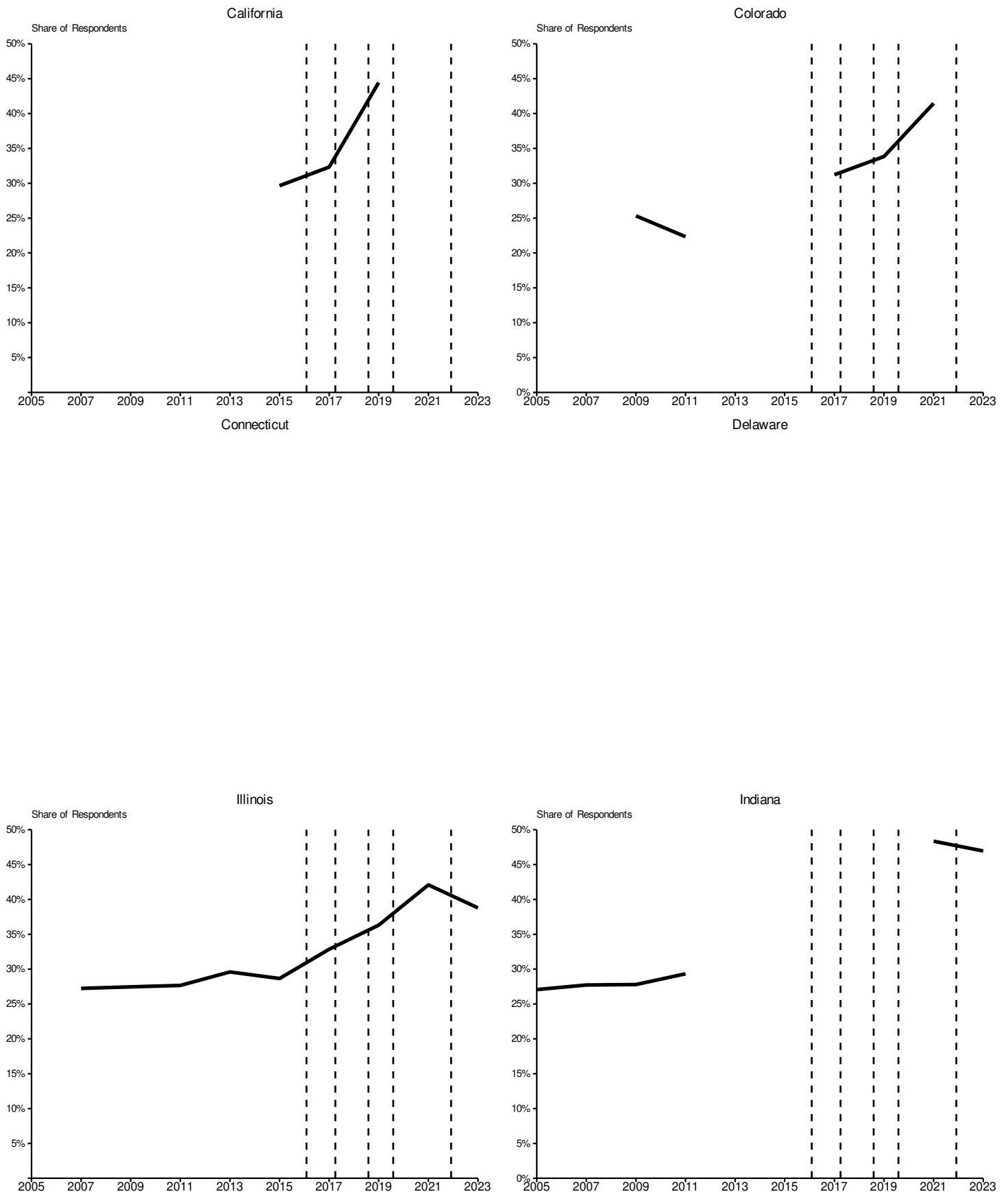


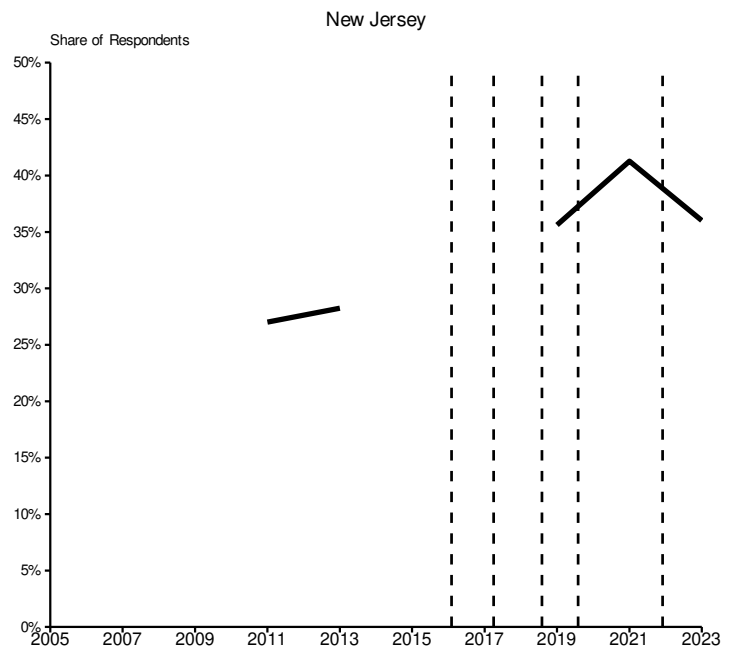
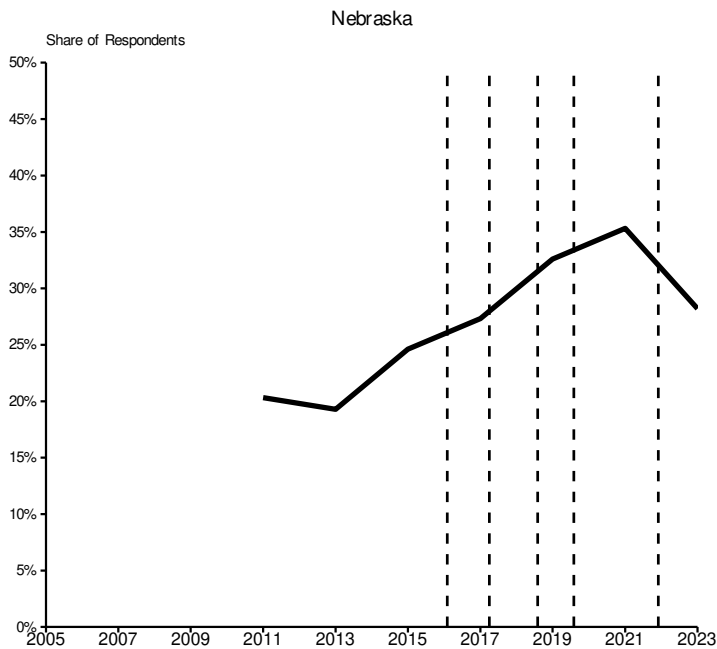
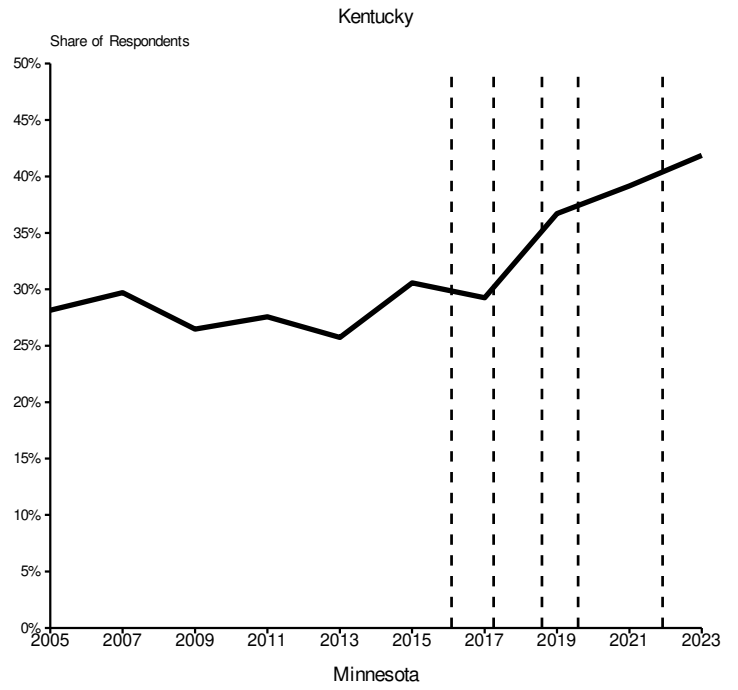
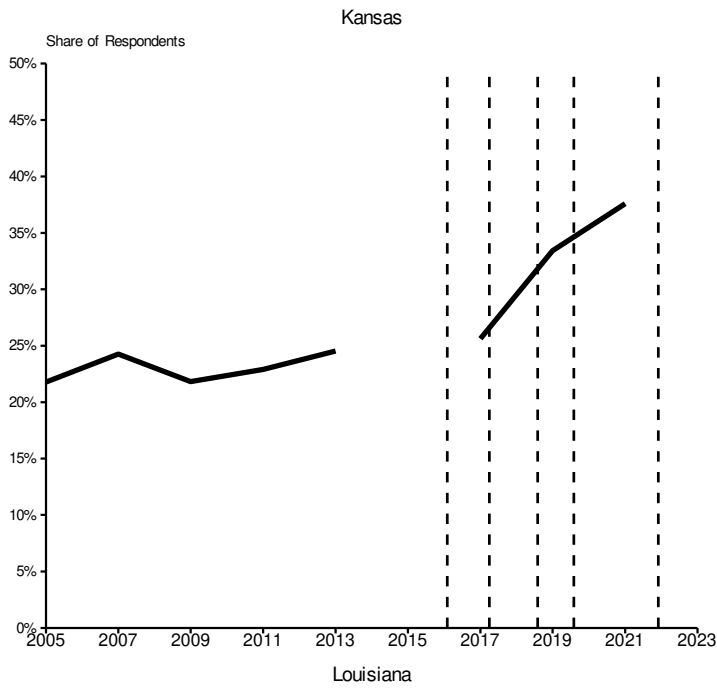


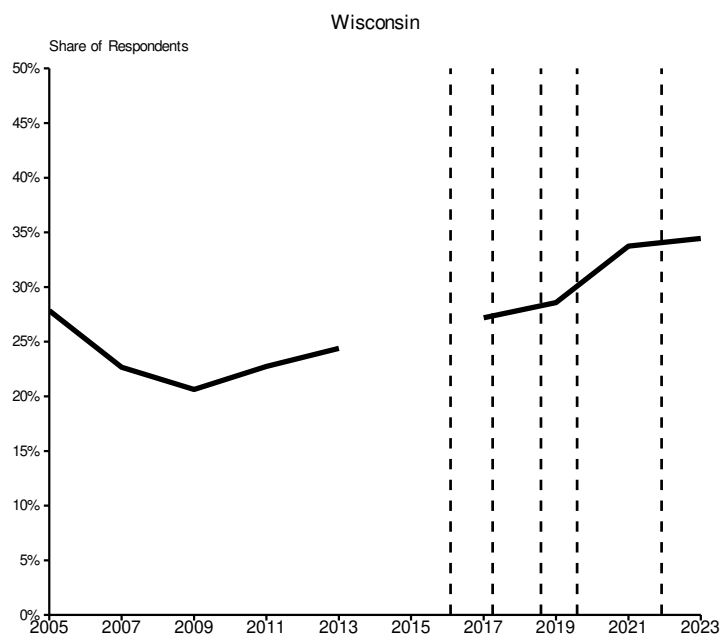
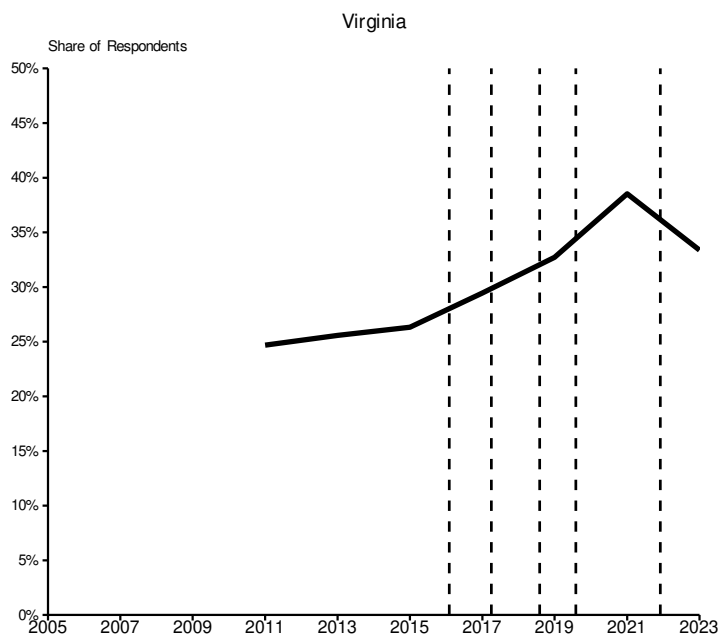
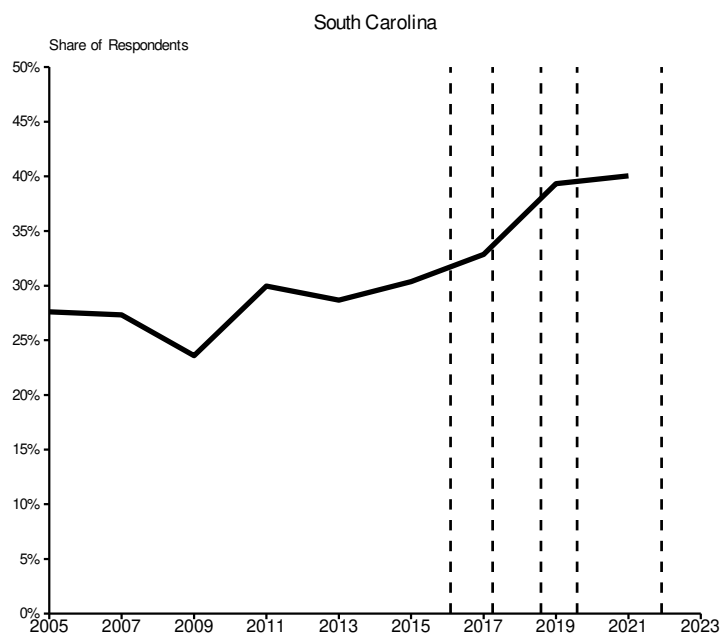
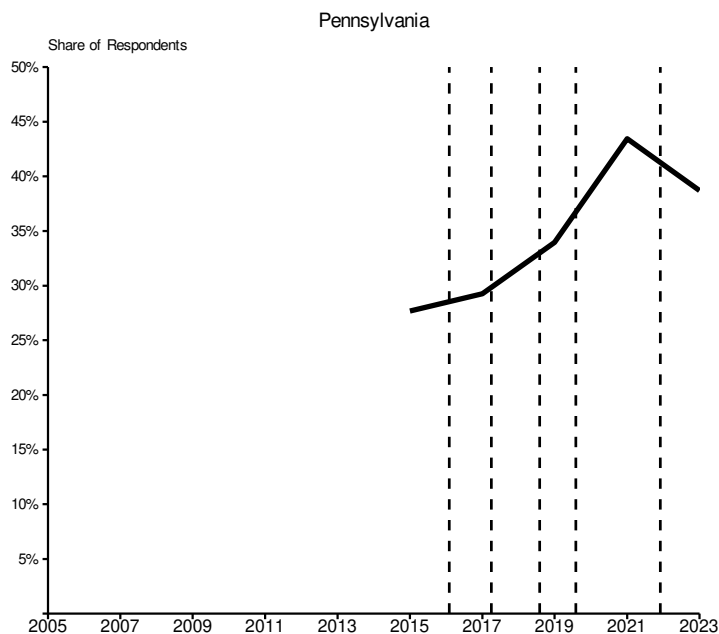
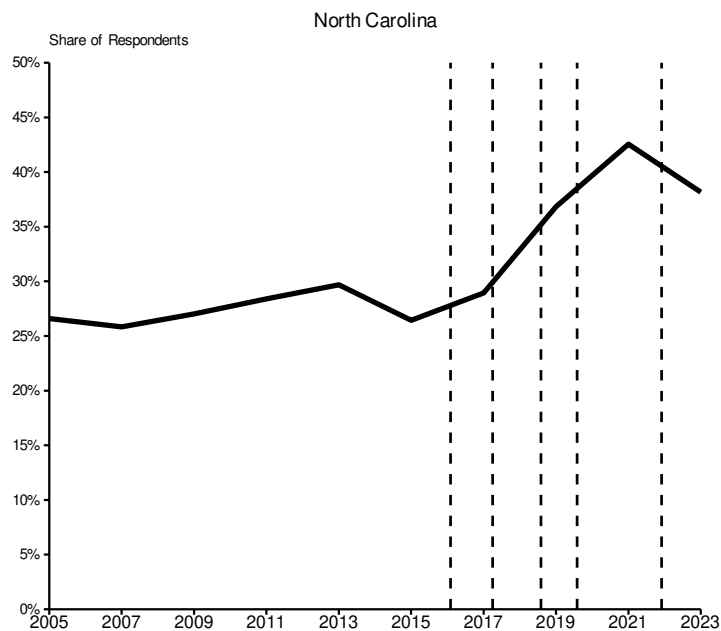
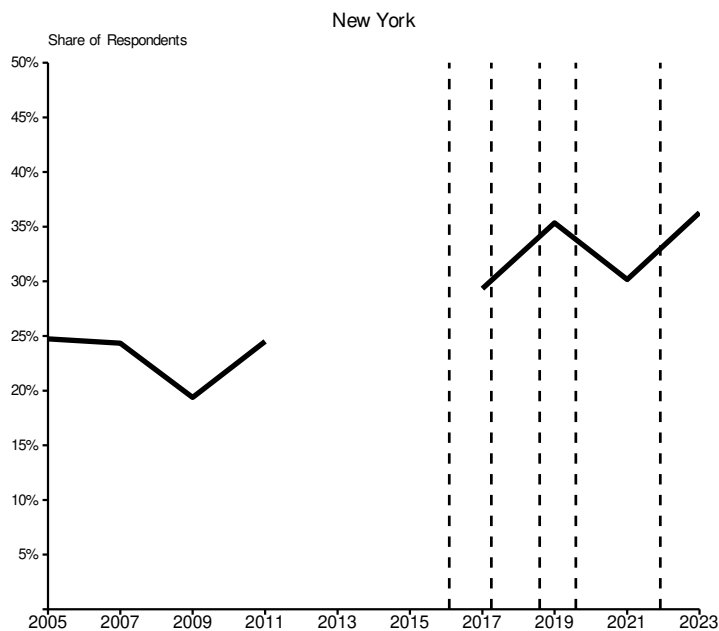


Source: SAMHSA MH-CLD; APA DSM History; Williams Semi-Annual Report #12

Note: These charts correspond to the charts in Figure 16 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the proportion of individuals who were diagnosed with an anxiety disorder in the SAMHSA MH-CLD, which provides annual information on the mental health characteristics for individuals who have accessed mental health services in facilities or through programs funded or operated by the state mental health facility. Data have been restricted to the 12–14 and 15–17 age groups and the UDAP States. I note that some states do not report data in particular years. I note that the DSM was revised in both 2013 and 2022. These revisions included changes to diagnosis criteria as well as language revisions. I note that the 2016 decrease in diagnosis rates in Illinois coincided with a state budget impasse that had “a rippling effect on the productivity and momentum of community mental health vendors” and therefore may not reflect true trends in diagnoses. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

YRBS**Figure F.12 Share of Teens in UDAP States Feeling Sad or Hopeless Over Time**

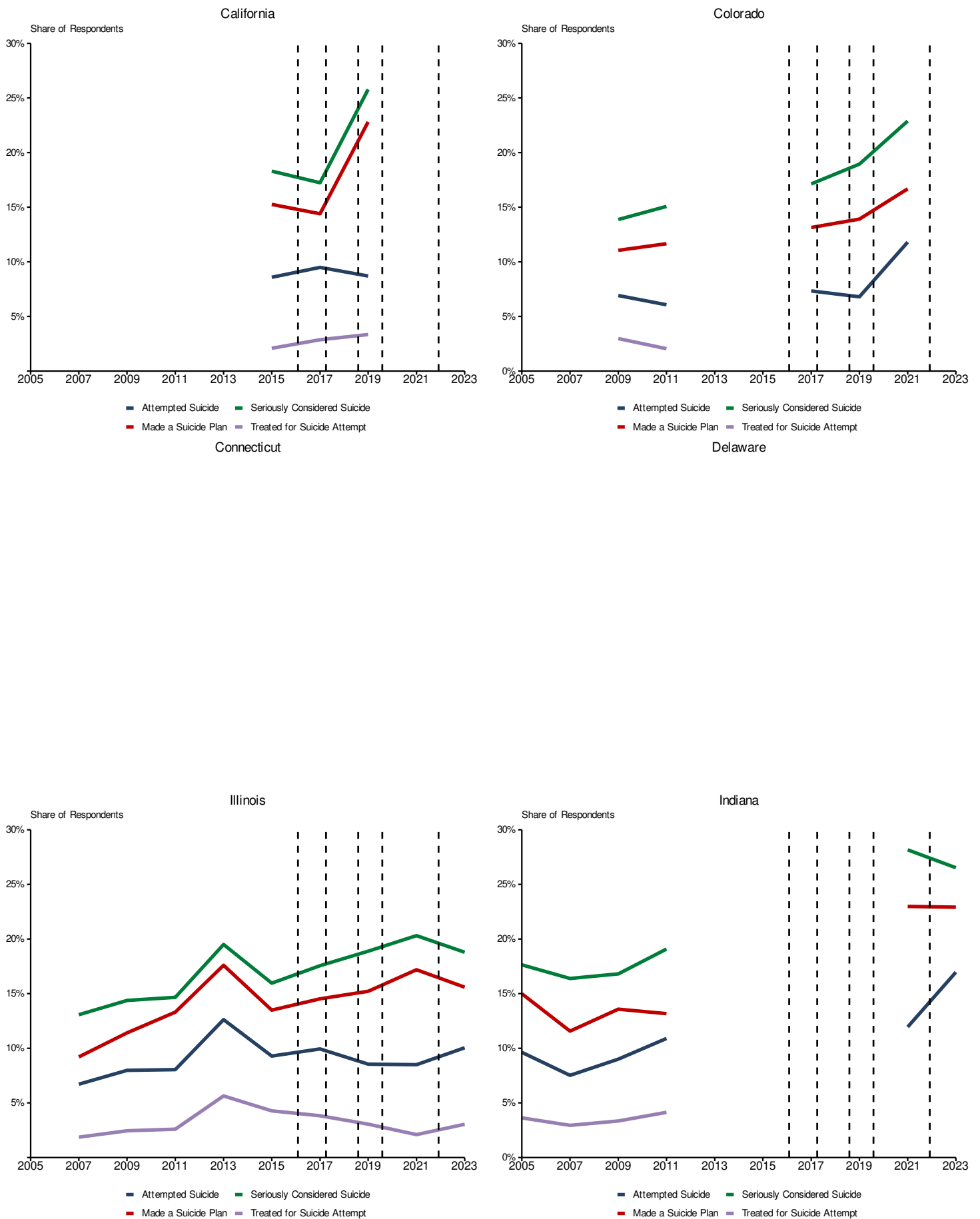


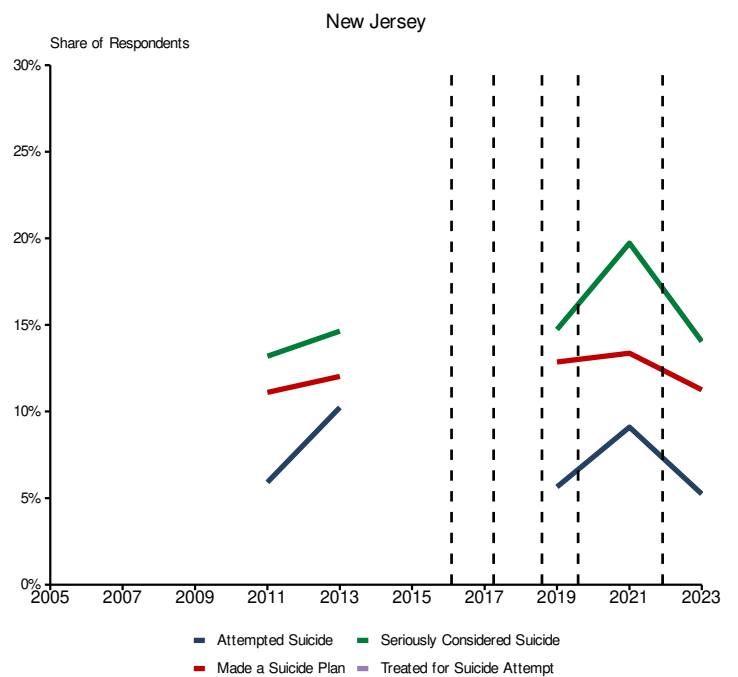
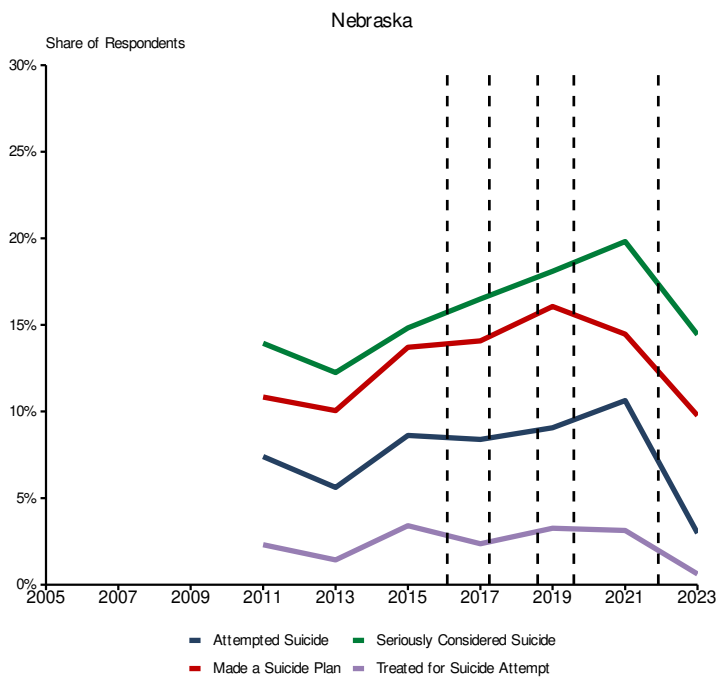
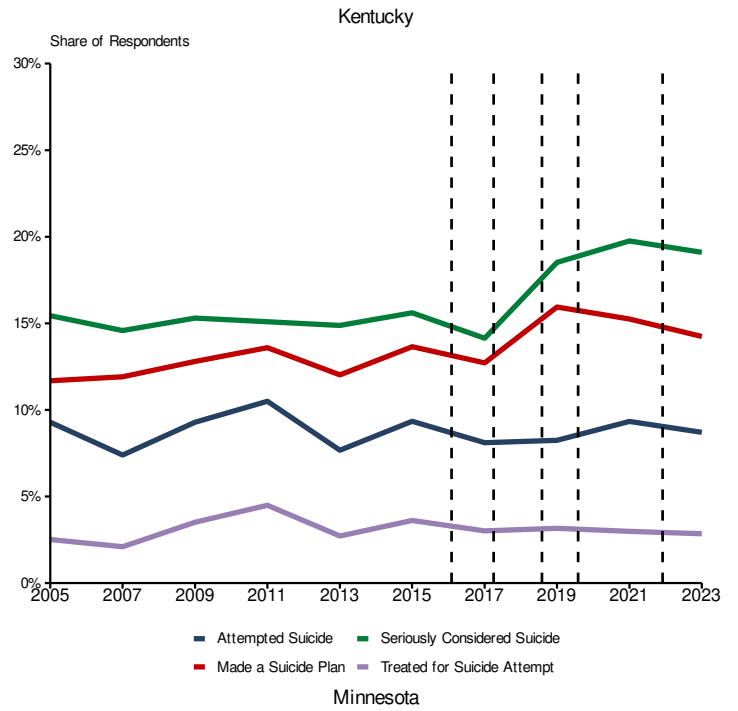
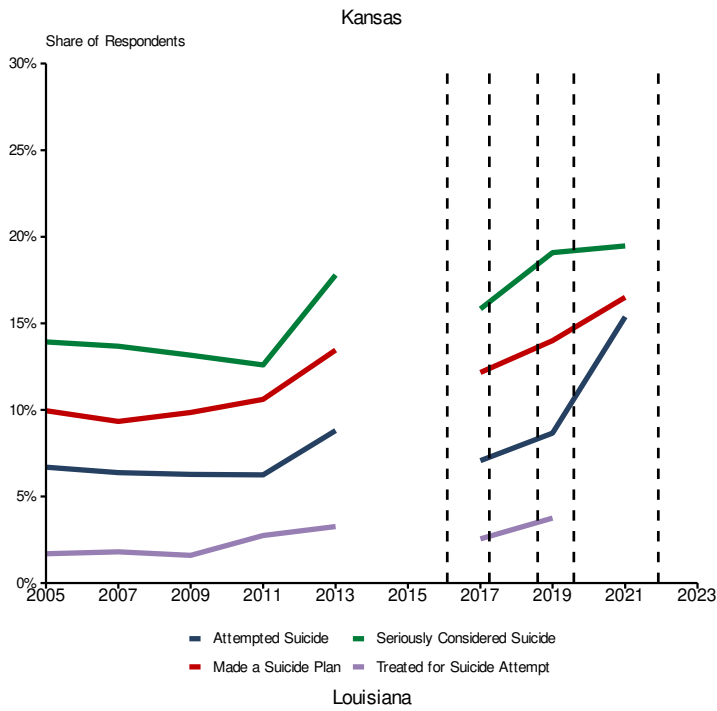


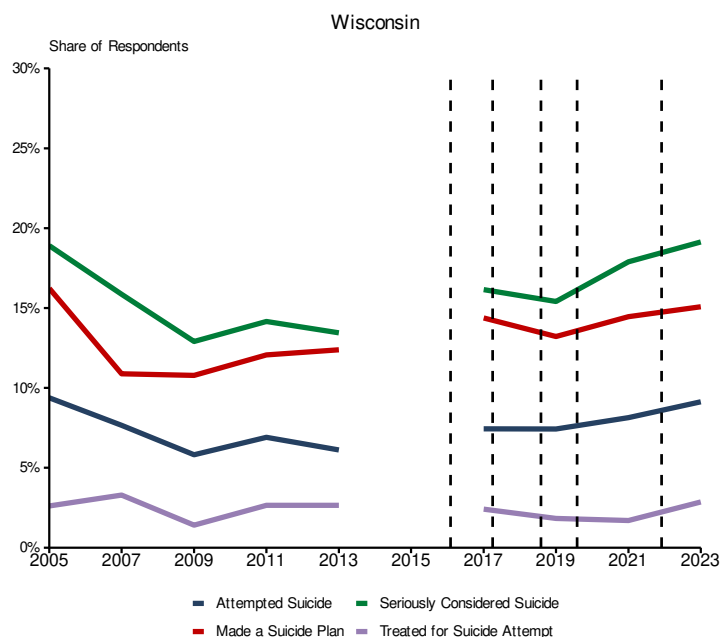
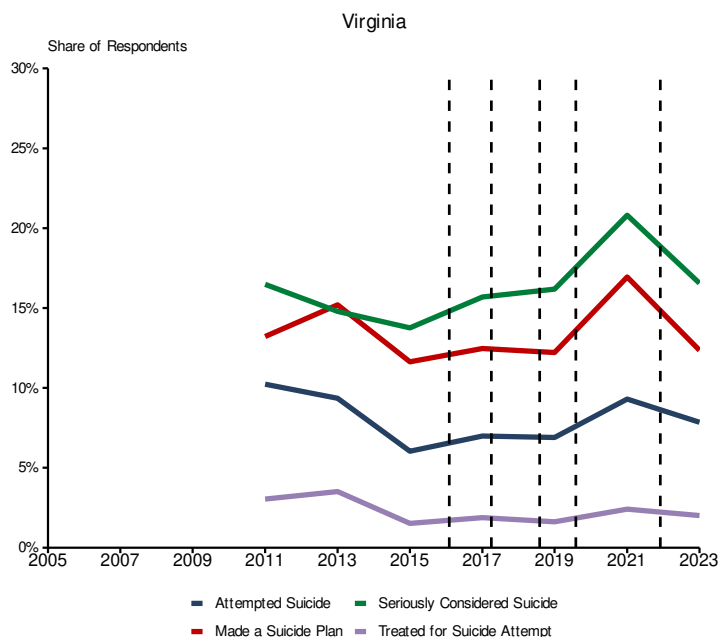
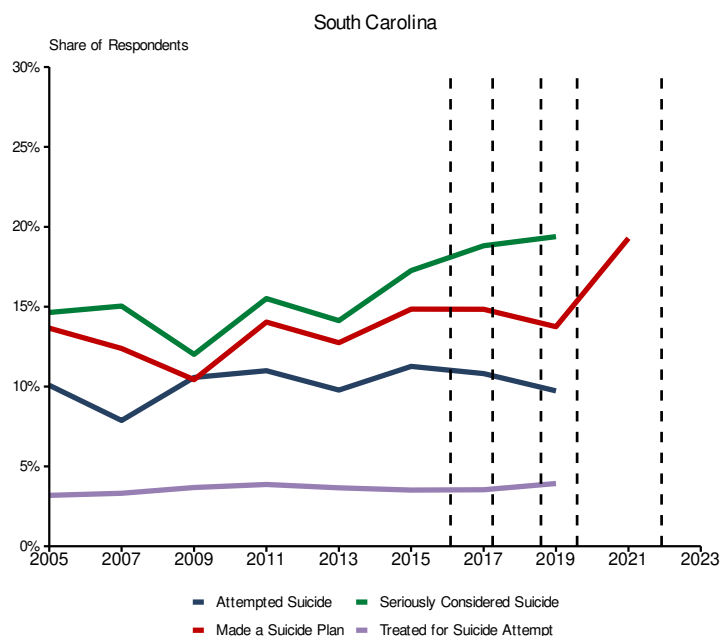
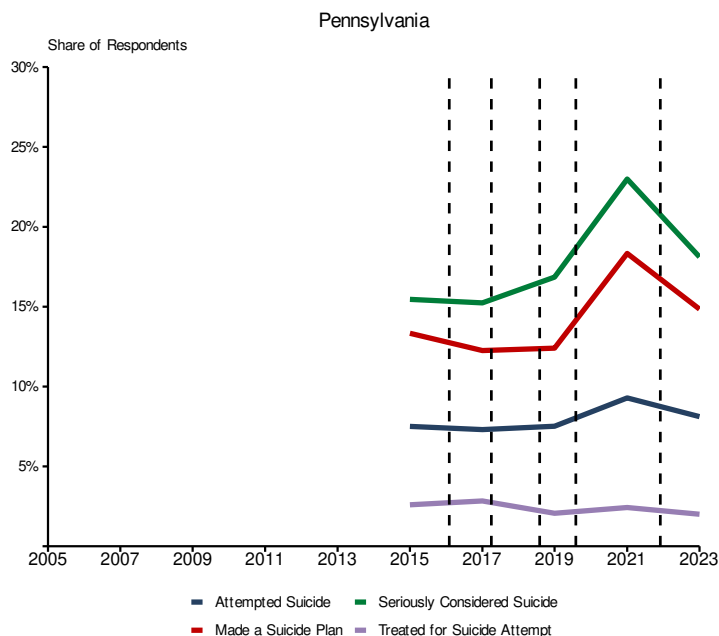
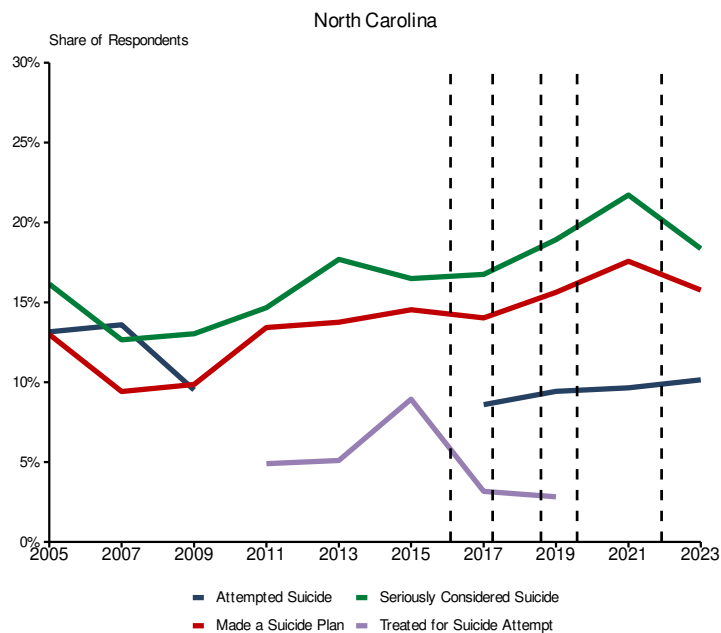
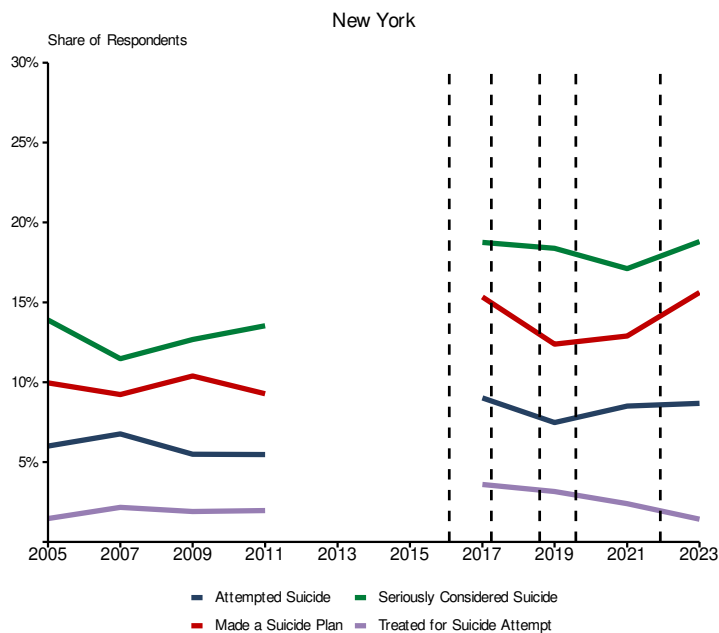
Source: Centers for Disease Control and Prevention (CDC), Youth Risk Behavior Survey Data (“YRBS Data”)

Note: These charts correspond to the charts in Figure 17 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the share of students who responded “Yes” to the following question in the YRBS: “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?” The YRBS is a bi-annual national survey of 9th through 12th grade students in public and private schools. Responses have been restricted to 13–17-year-old students in the UDAP States. The state-level YRBS is representative at the state-level. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the CDC for the YRBS data. These respondent weights account for non-responses and the oversampling of certain demographic groups and ensure that the weighted totals of respondents in the survey for each grade match population projections for the survey year. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

Figure F.13 Share of Teens in UDAP States Reporting Suicidal Behaviors Over Time





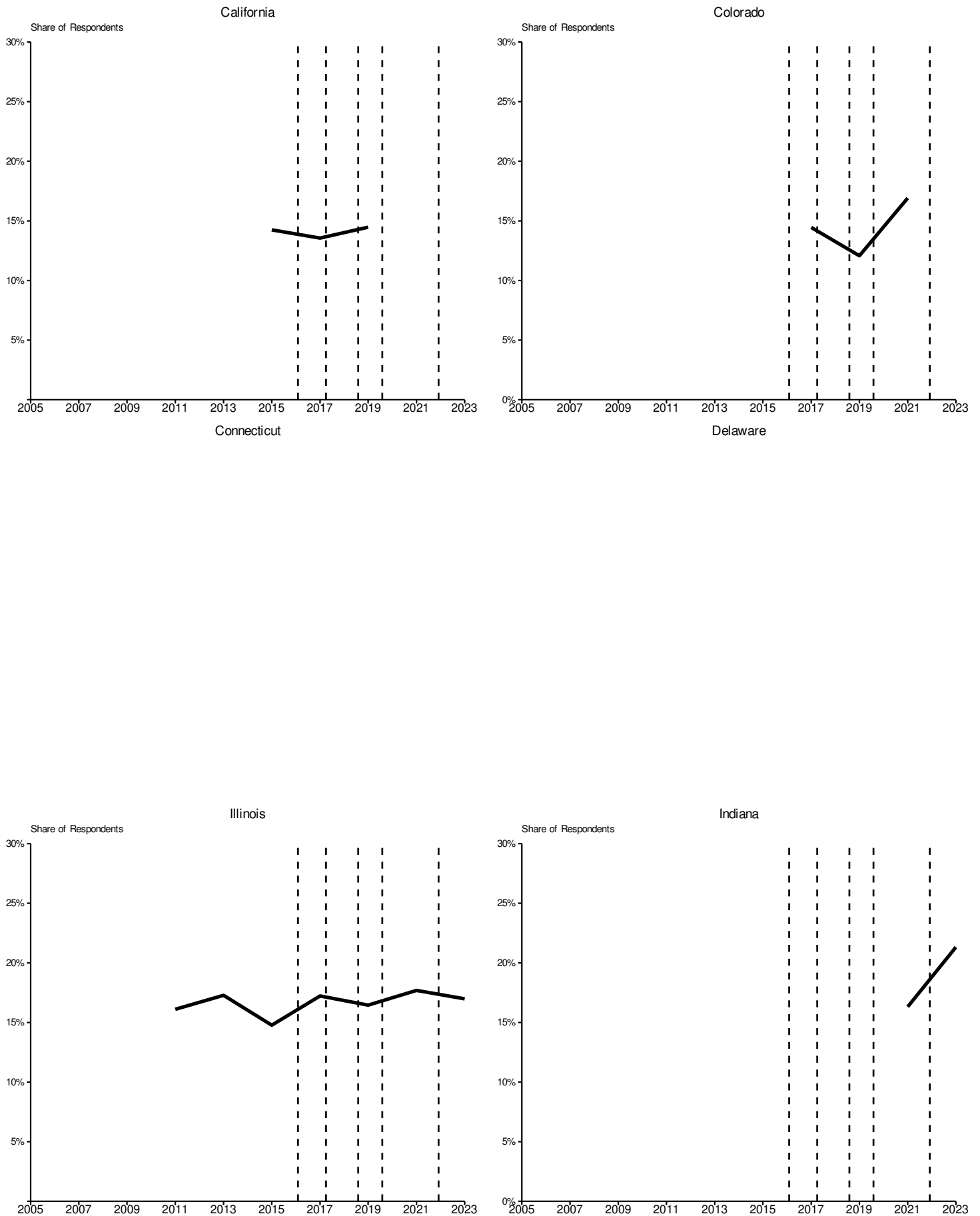


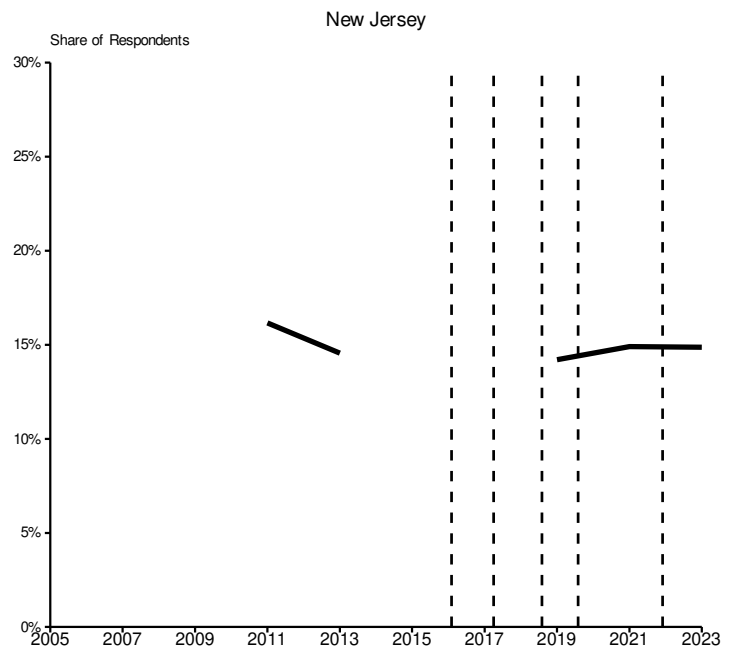
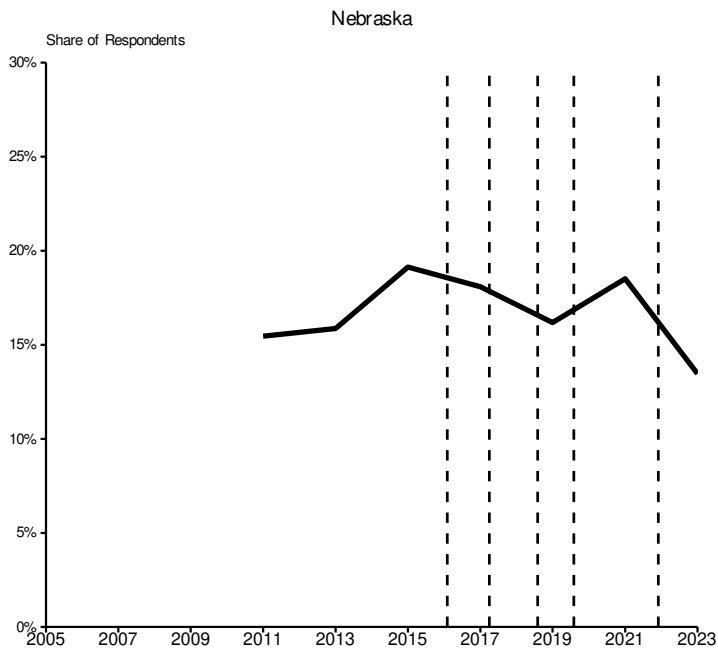
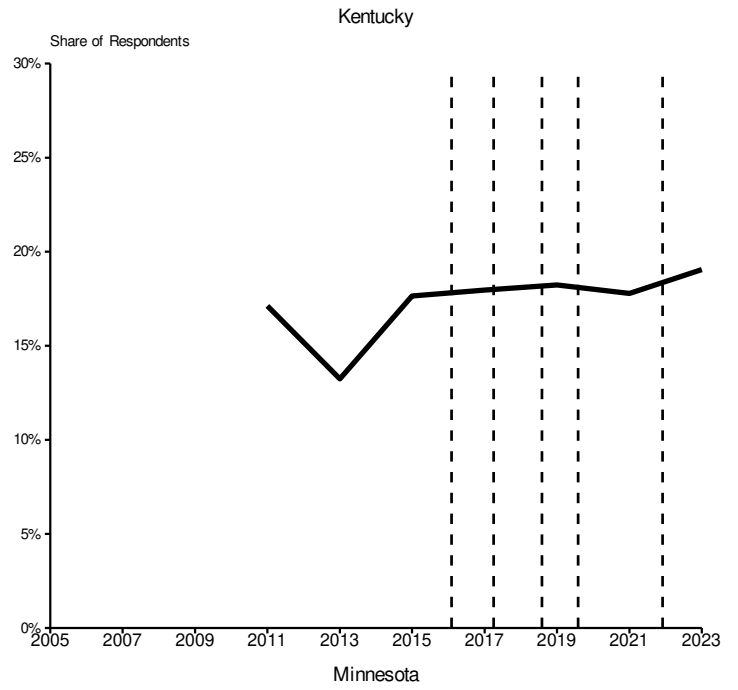
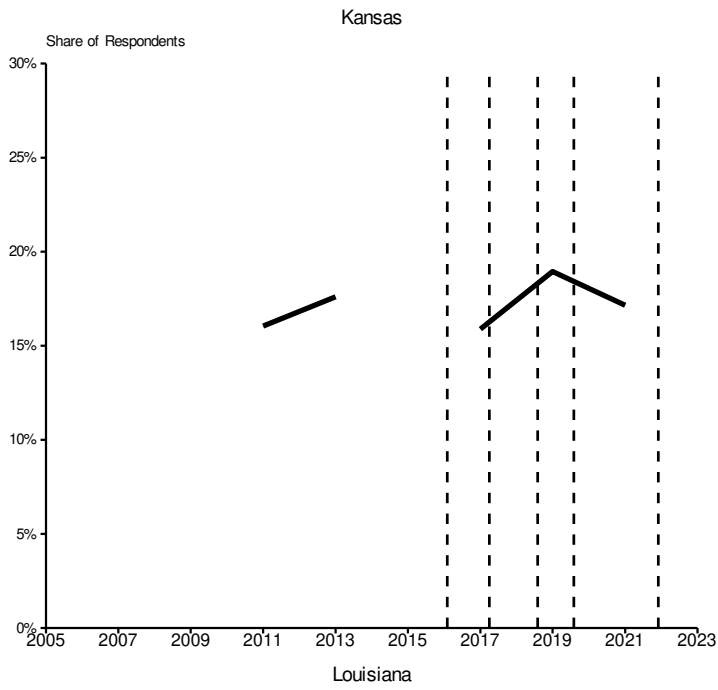
Source: YRBS Data

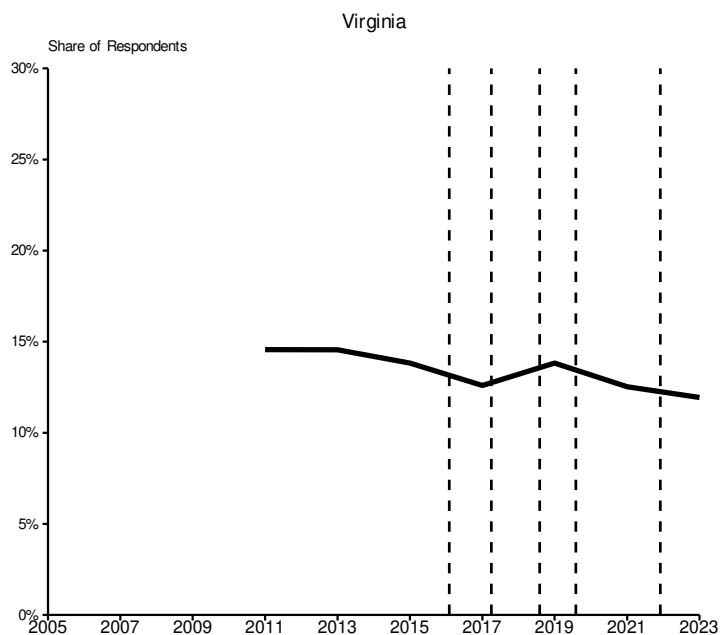
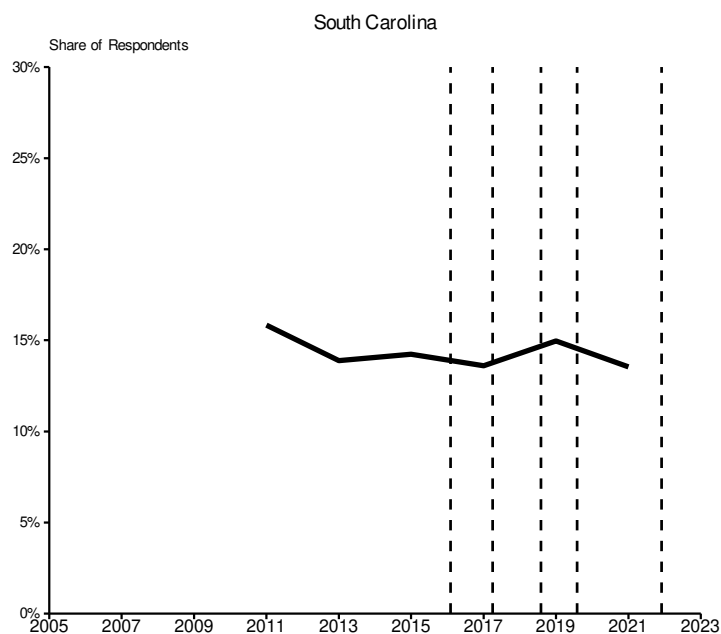
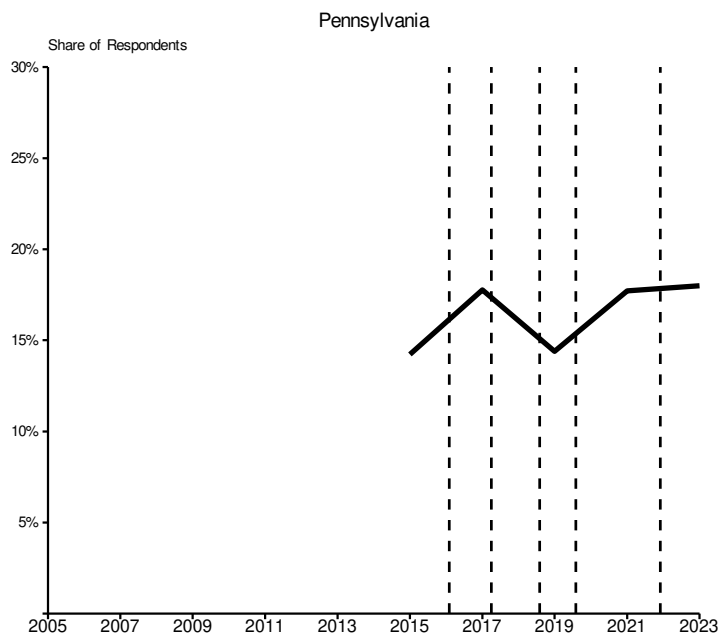
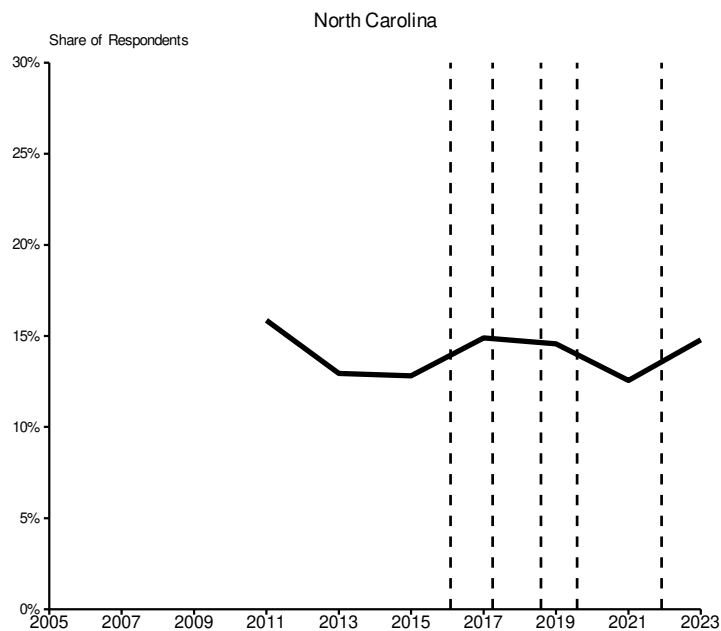
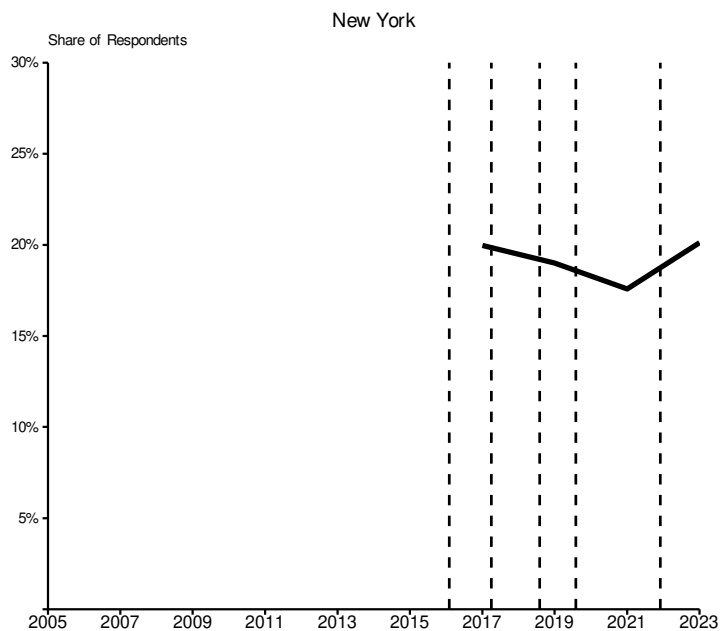
Note: These charts correspond to the charts in Figure 18 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the share of students who responded “Yes” to the following questions in the YRBS: “During the past 12 months, did you ever seriously consider attempting suicide?” “During the past 12 months, did you make a plan about how you would attempt suicide?” “During the past 12 months, how many times did you actually attempt suicide?” and “If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?”

The YRBS is a bi-annual national survey of 9th through 12th grade students in public and private schools. Responses have been restricted to 13–17-year-old students and the UDAP States. The state-level YRBS is representative at the state-level. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the CDC for the YRBS data. These respondent weights account for non-responses and the oversampling of certain demographic groups and ensure that the weighted totals of respondents in the survey for each grade match population projections for the survey year. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

Figure F.14 Share of Teens in UDAP States Who Were Cyberbullied Over Time





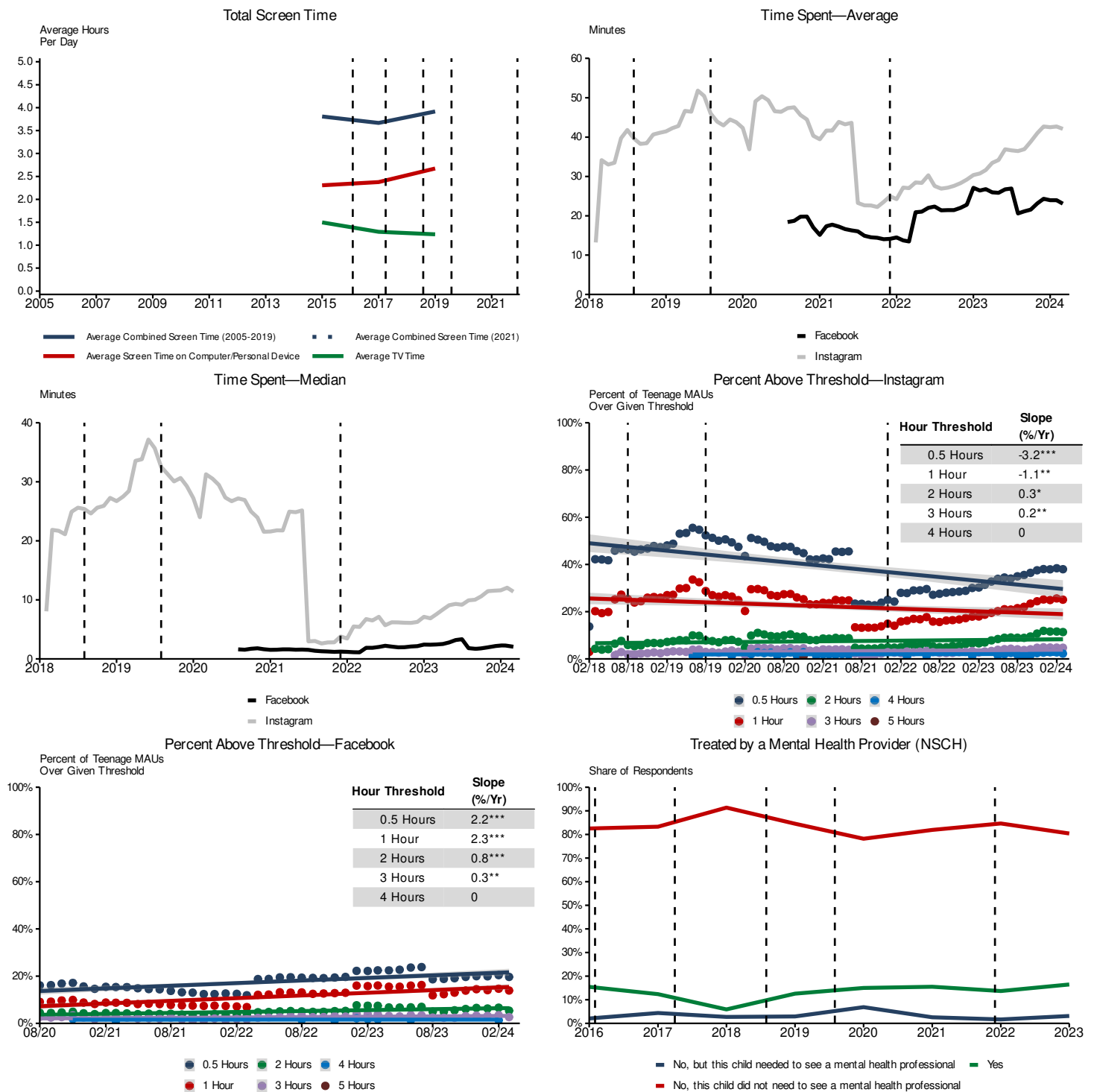


Source: YRBS Data

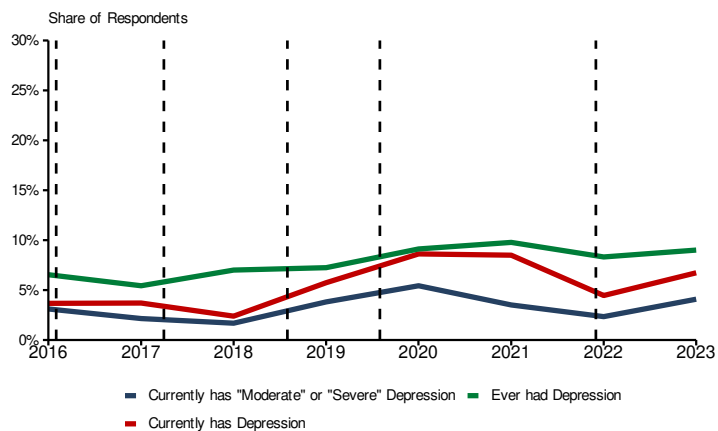
Note: These charts correspond to the charts in Figure 19 in my report, which show the results of my analysis for the four largest UDAP States (California, New York, Illinois, and Pennsylvania). This chart shows the share of students who responded “Yes” to the following question in the YRBS: “During the past 12 months, have you ever been electronically bullied? (Count being bullied through texting, Instagram, Facebook, or other social media.)?” The YRBS is a bi-annual national survey of 9th through 12th grade students in public and private schools. Responses have been restricted to 13–17-year-old students in the UDAP States. The state-level YRBS is representative at the state-level. Non-responses to the charted question have been excluded. In order to extrapolate the shares in the survey sample to the population of each respective state, responses are multiplied by respondent weights provided by the CDC for the YRBS data. These respondent weights account for non-responses and the oversampling of certain demographic groups and ensure that the weighted totals of respondents in the survey for each grade match population projections for the survey year. The dashed vertical lines represent launch announcement months for the features described in Section V.A., namely cosmetic surgery filters, time management tools, and Instagram's multiple accounts function. The time management tools feature and cosmetic surgery filters each have two dates as noted in Section V.A.

APPENDIX G MENTAL HEALTH AND USAGE TRENDS BY UDAP STATE

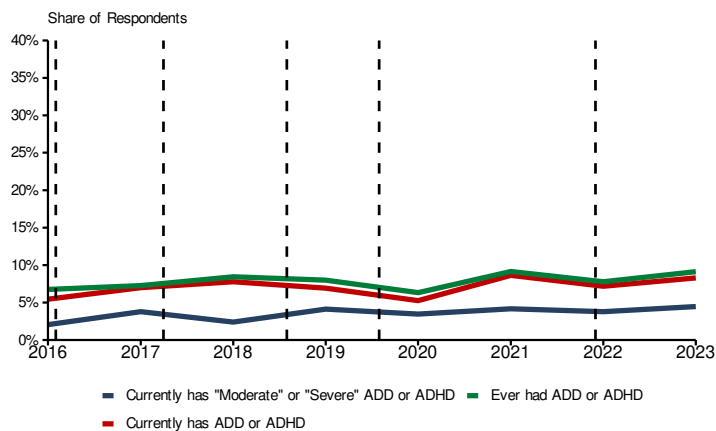
Figure G.1 California



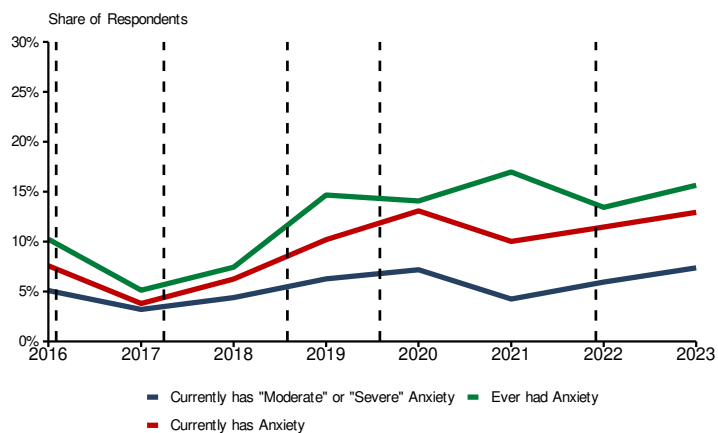
Depression(NSCH)



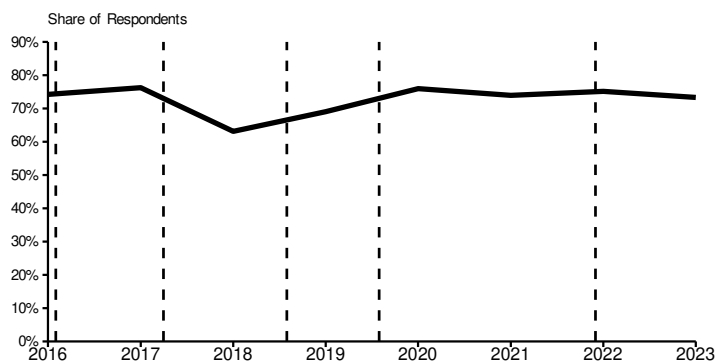
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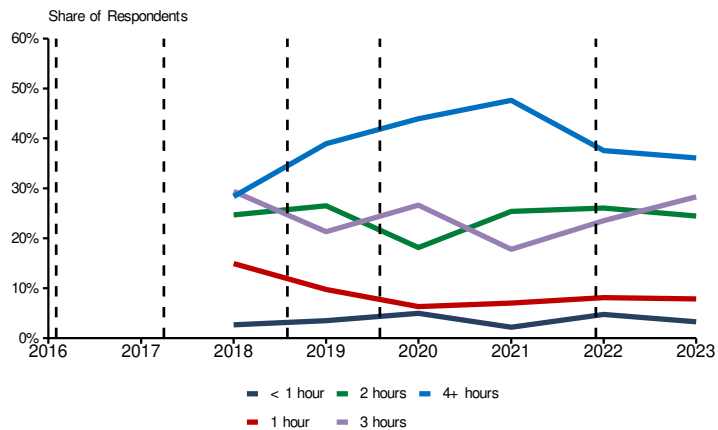
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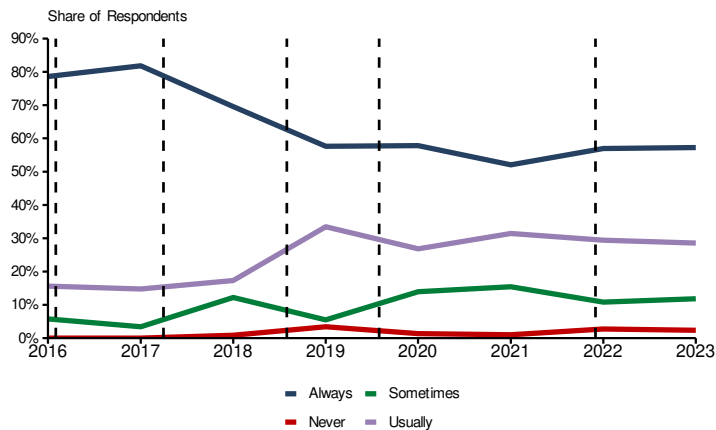
8 or More Hours of Sleep (NSCH)



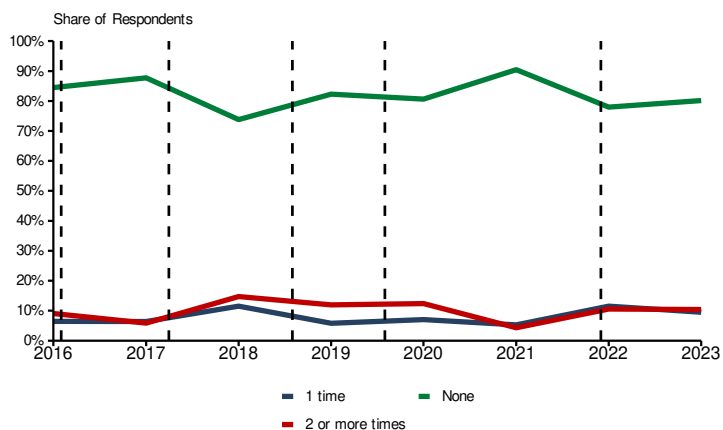
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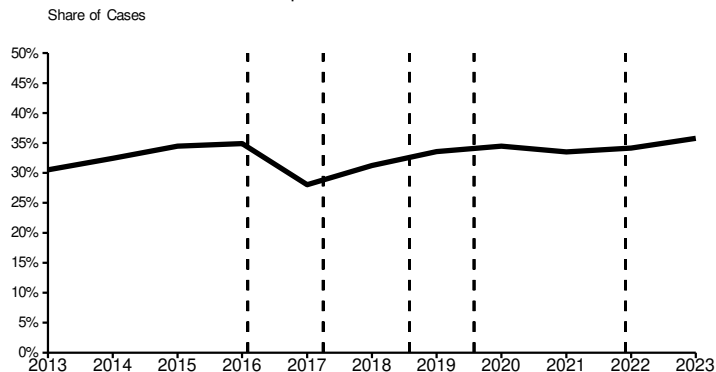
Cares About School Performance (NSCH)

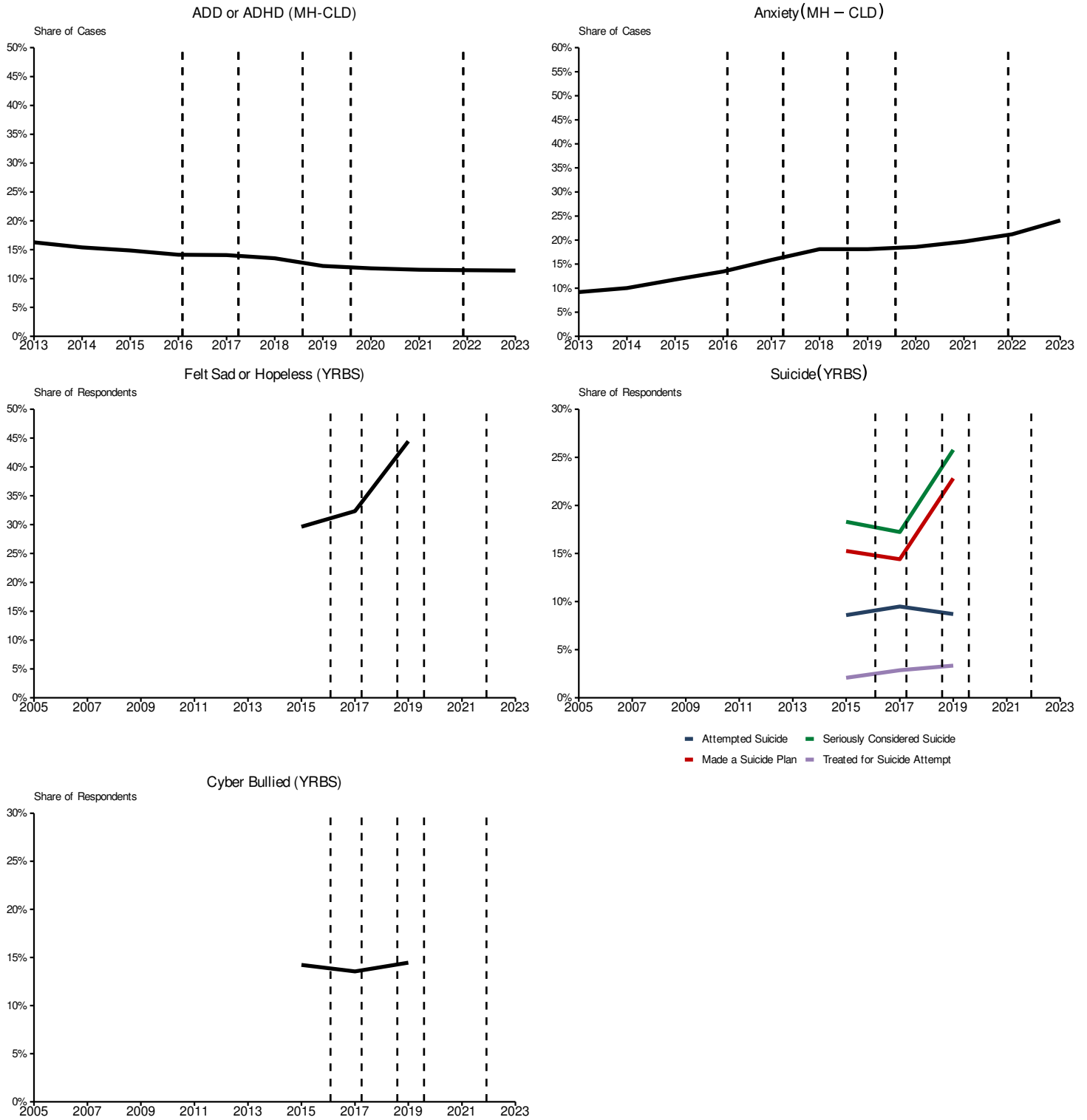


Families Contacted by Schools (NSCH)



Depression(MH - CLD)

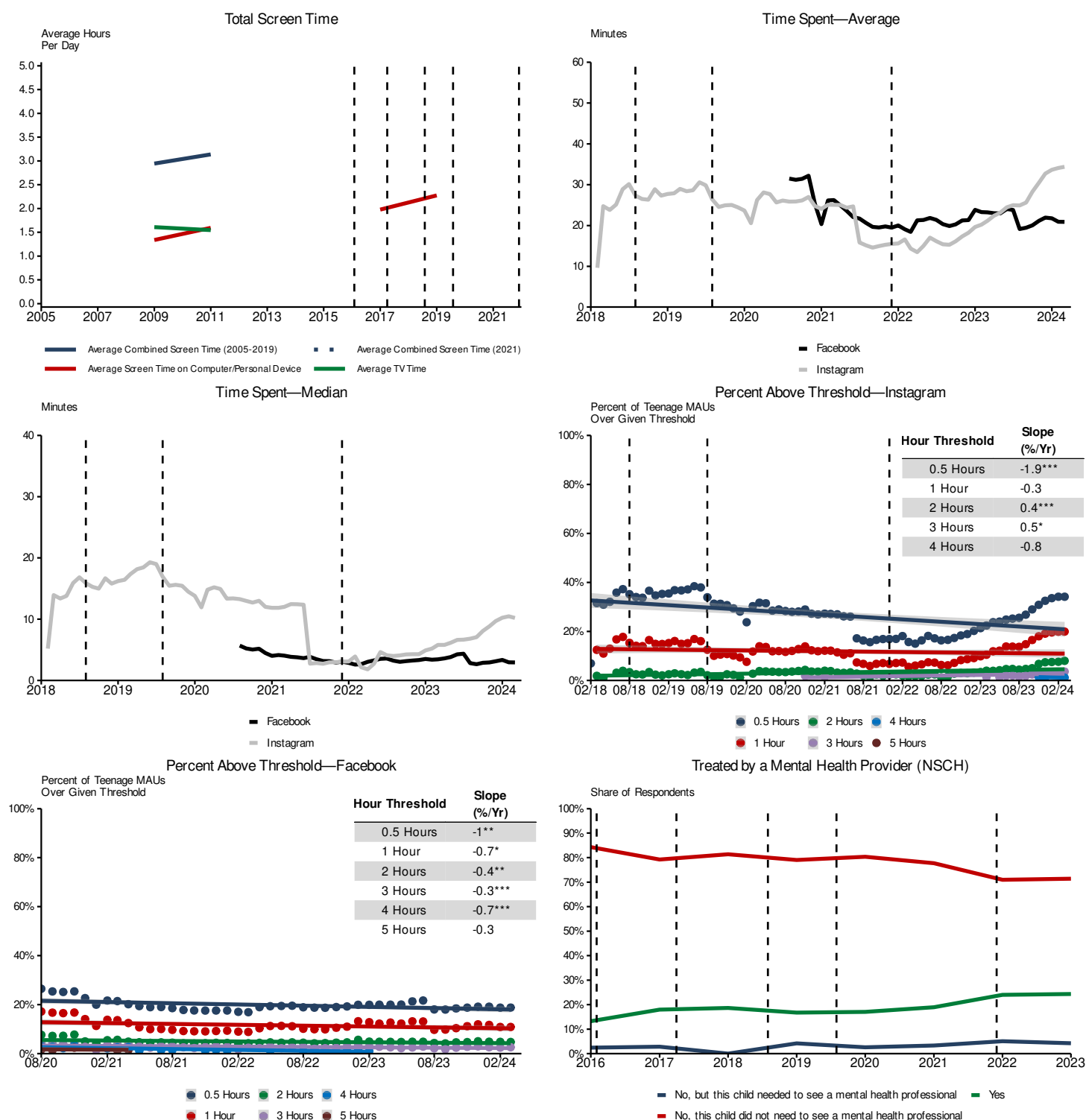




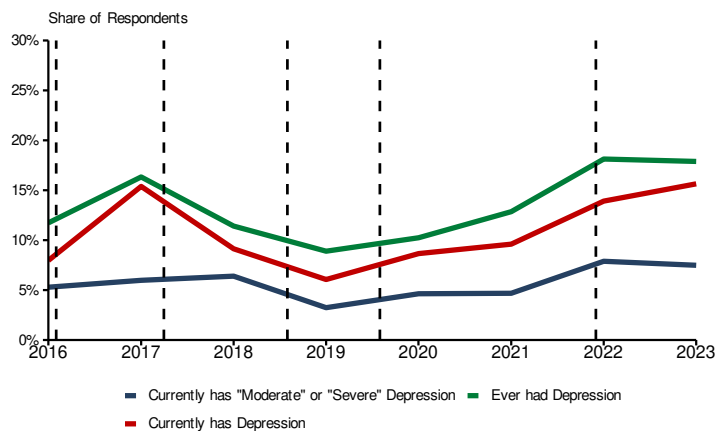
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

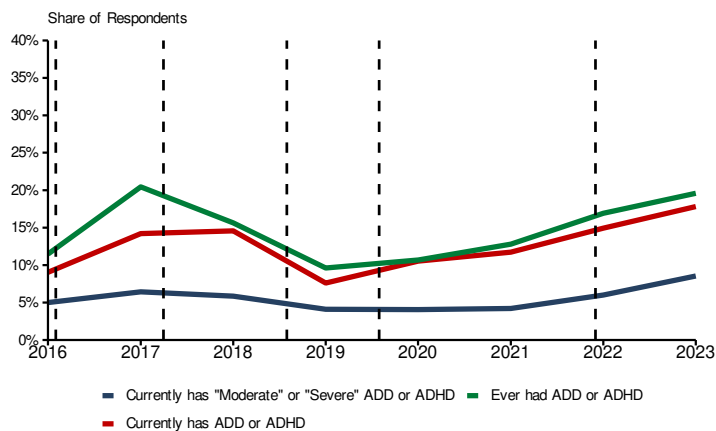
Figure G.2 Colorado



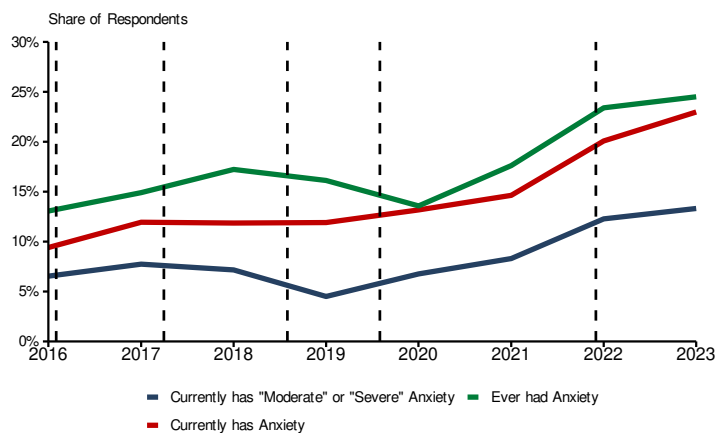
Depression(NSCH)



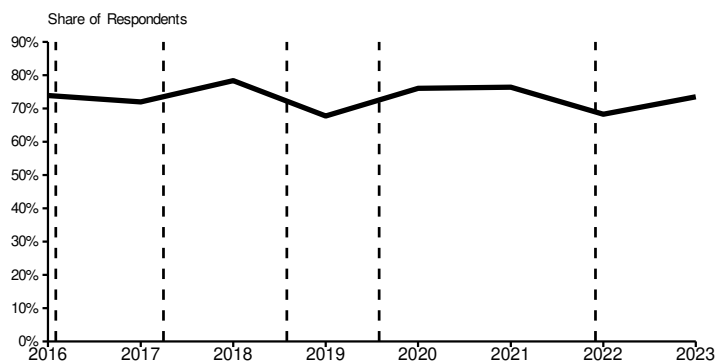
ADD or ADHD (NSCH)



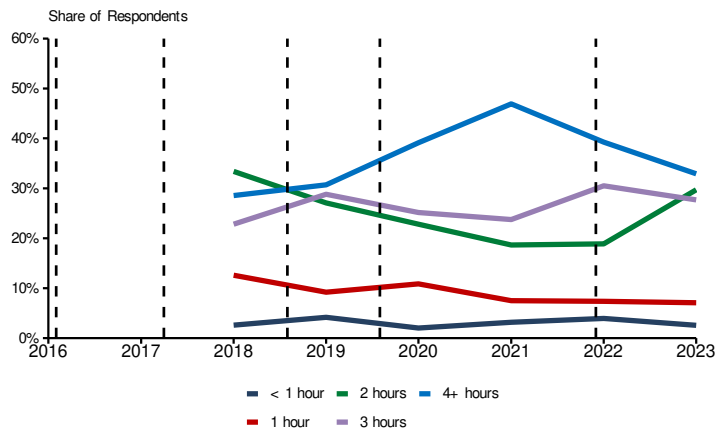
Anxiety(NSCH)



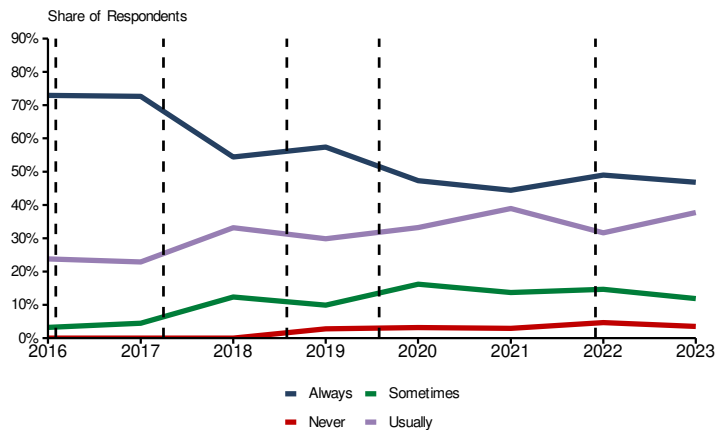
8 or More Hours of Sleep (NSCH)



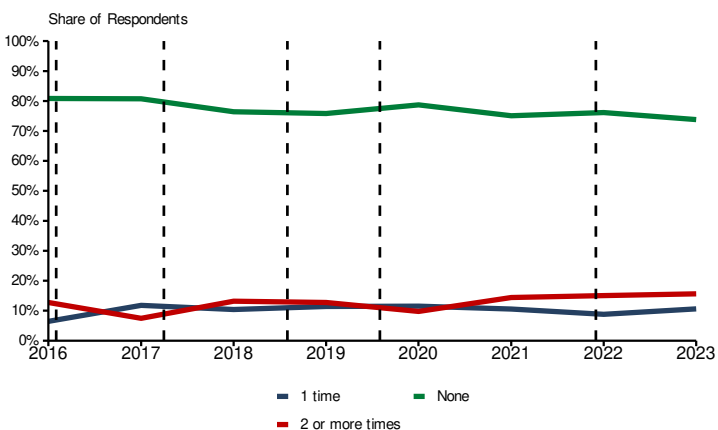
Screen Time (NSCH)



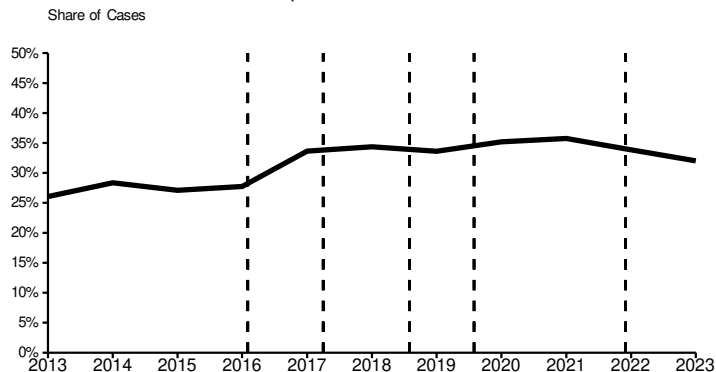
Cares About School Performance (NSCH)

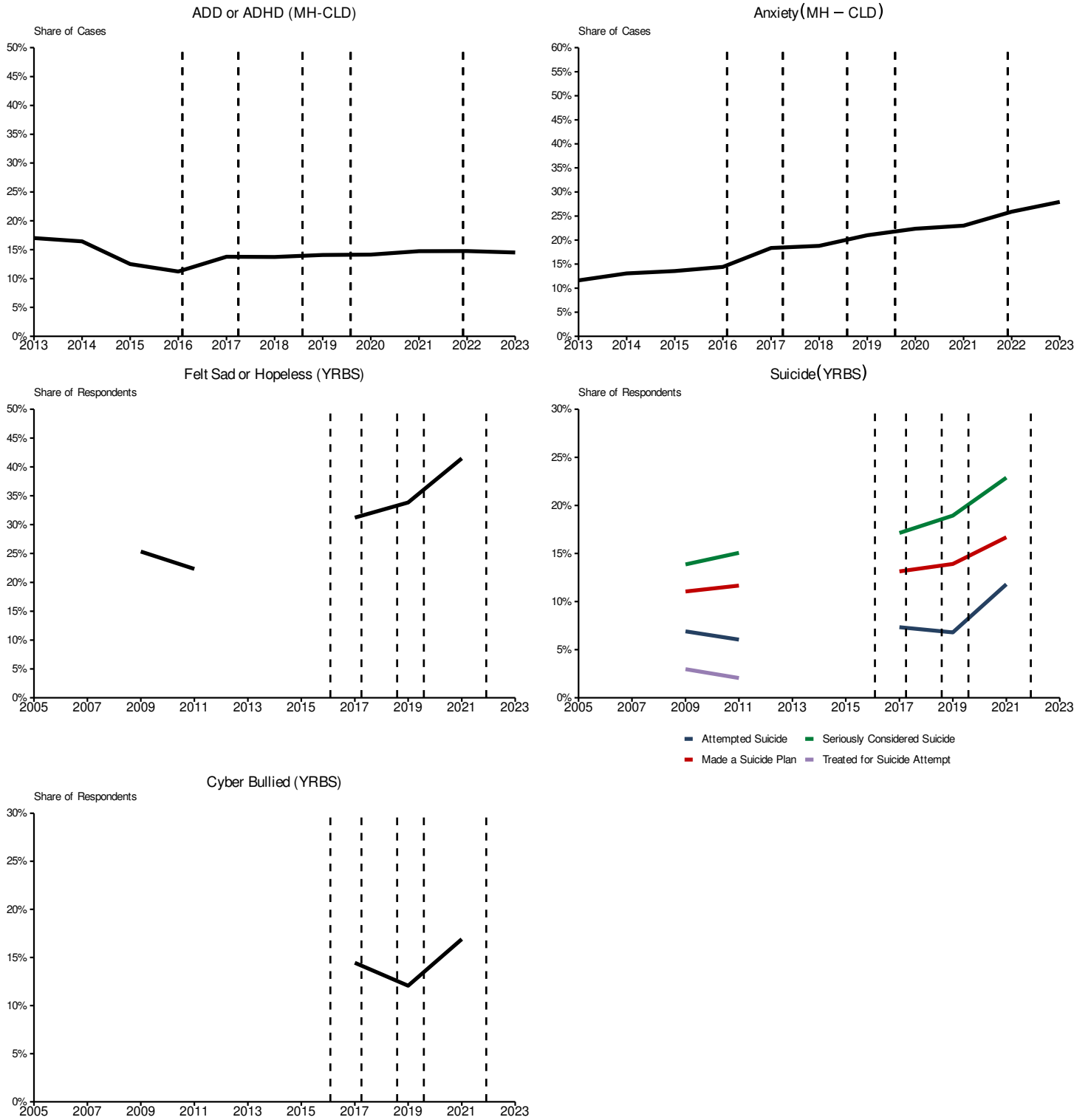


Families Contacted by Schools (NSCH)



Depression(MH - CLD)

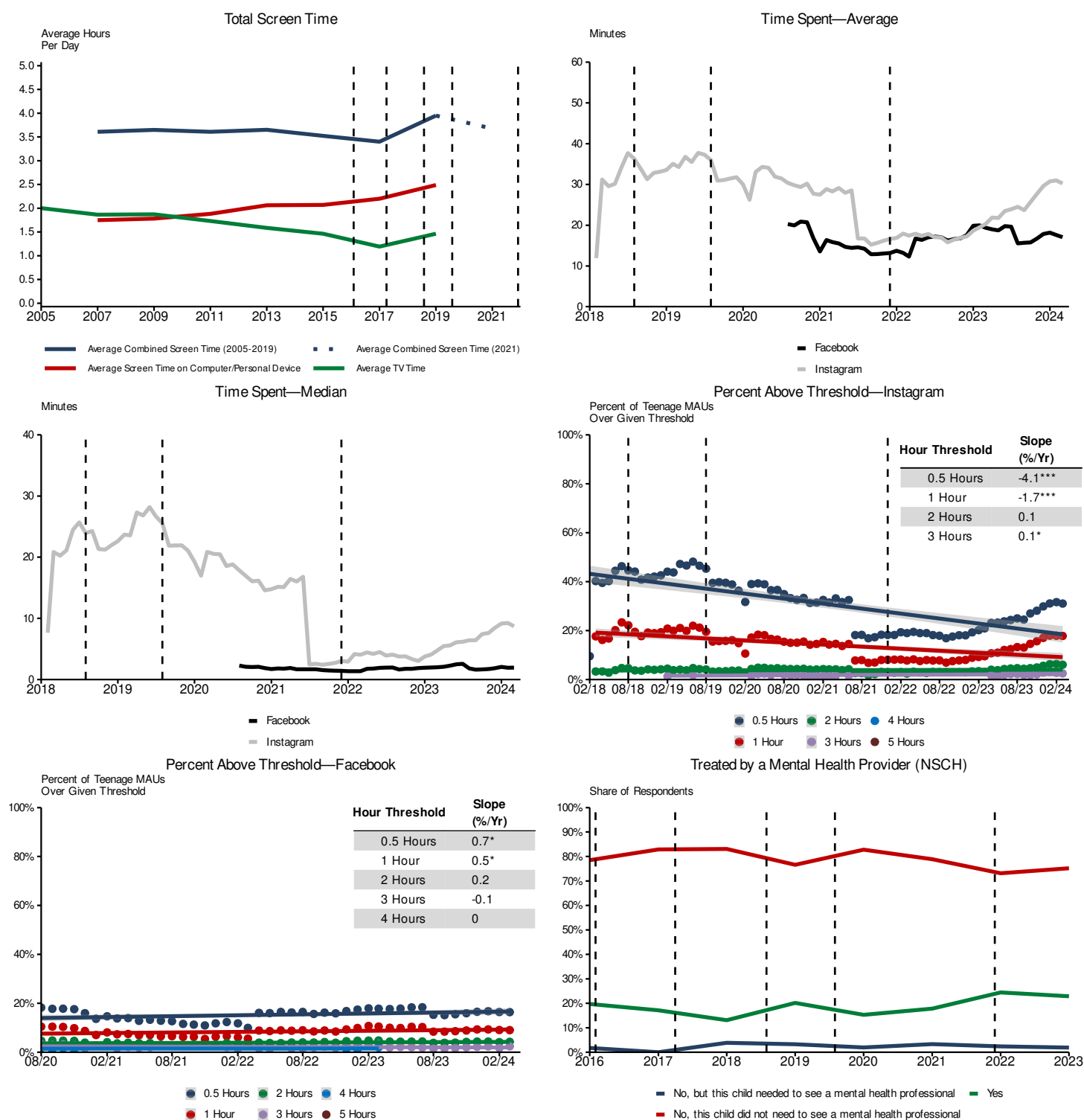




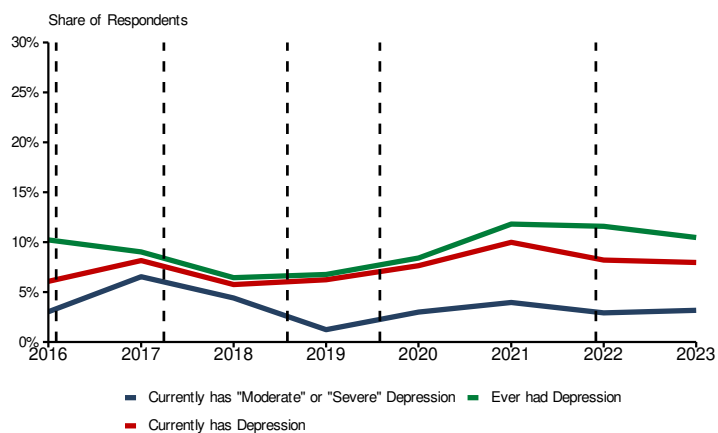
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

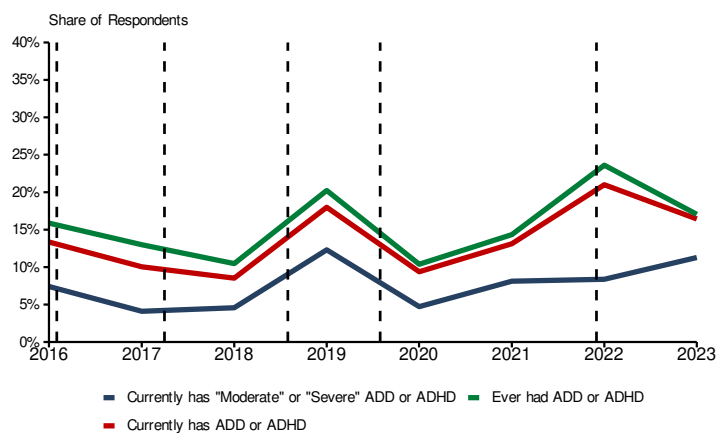
Figure G.3 Connecticut



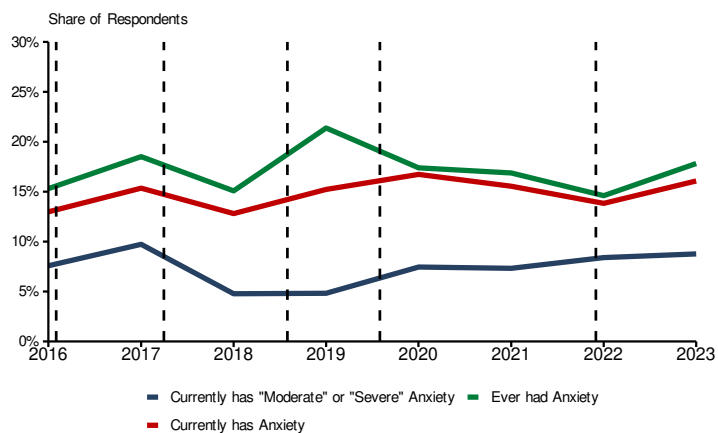
Depression(NSCH)



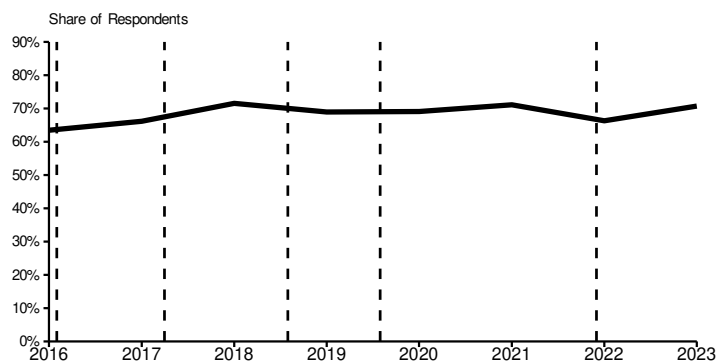
ADD or ADHD (NSCH)



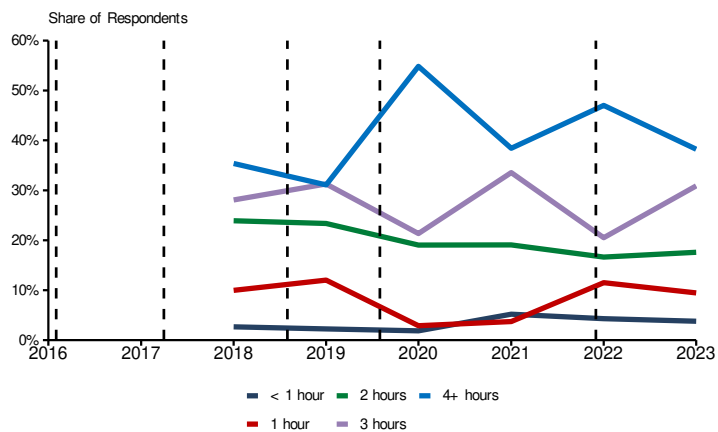
Anxiety(NSCH)



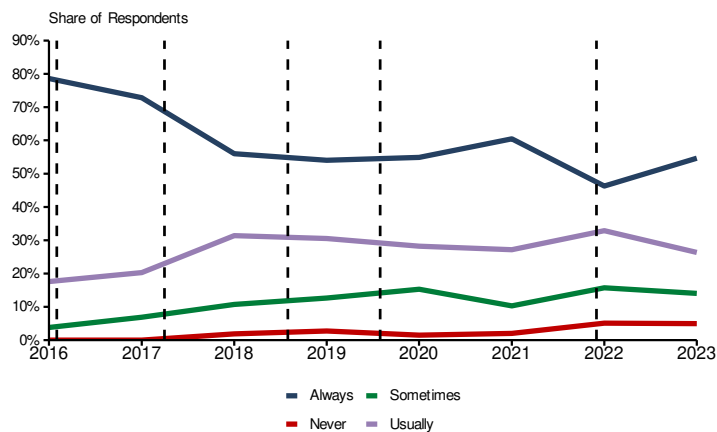
8 or More Hours of Sleep (NSCH)



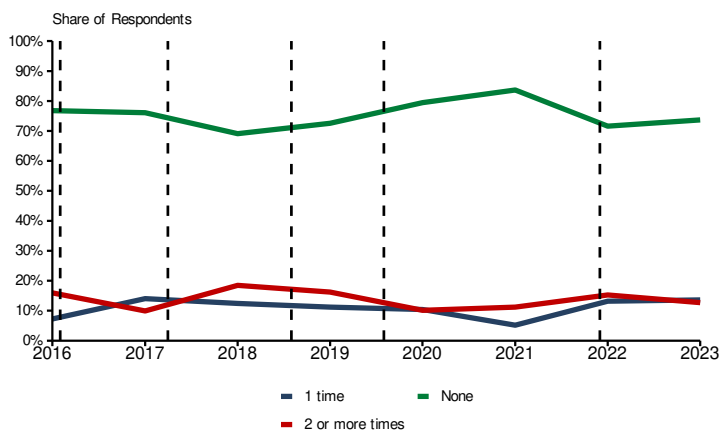
Screen Time (NSCH)



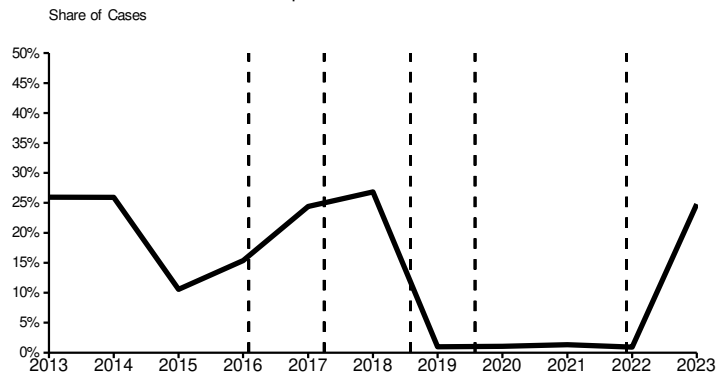
Cares About School Performance (NSCH)

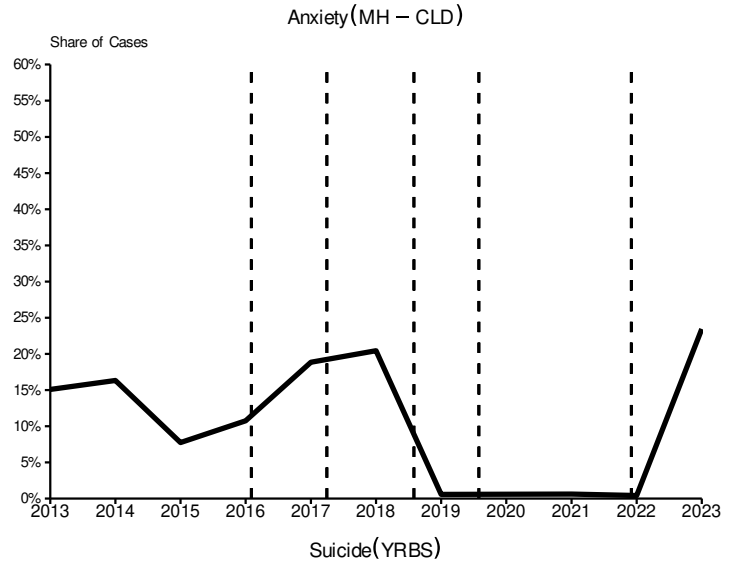
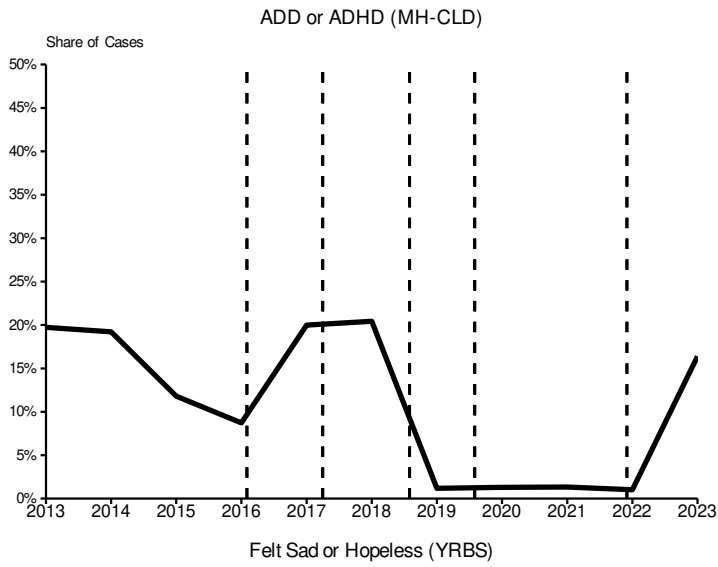


Families Contacted by Schools (NSCH)



Depression(MH – CLD)



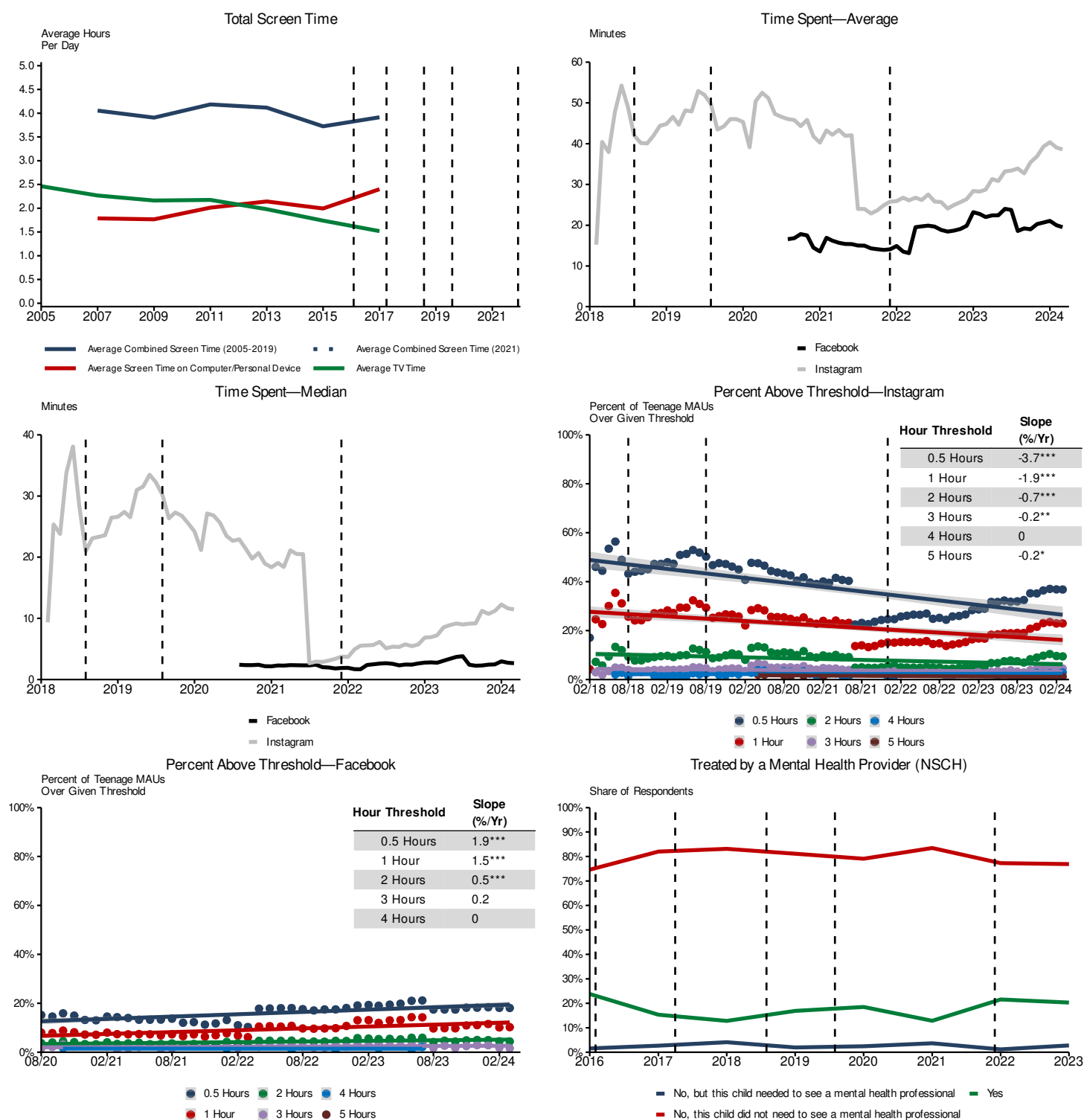


Cyber Bullied (YRBS)

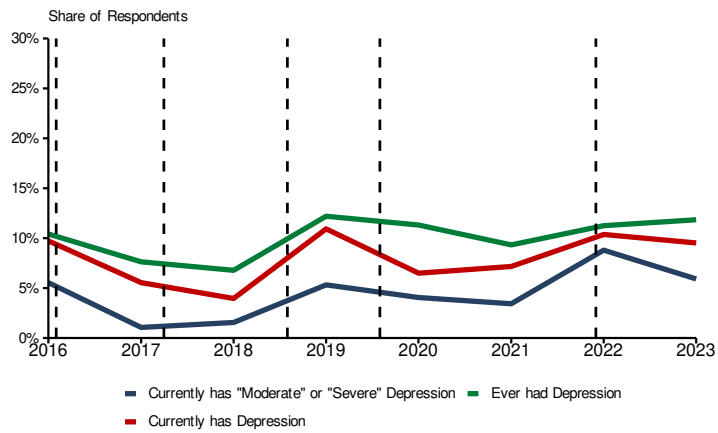
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

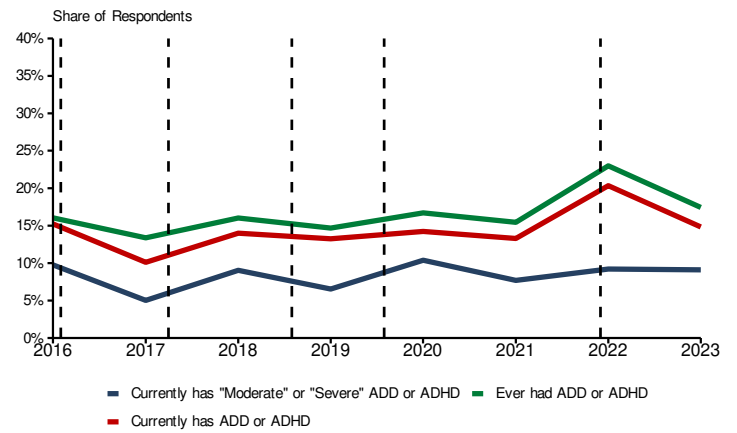
Figure G.4 Delaware



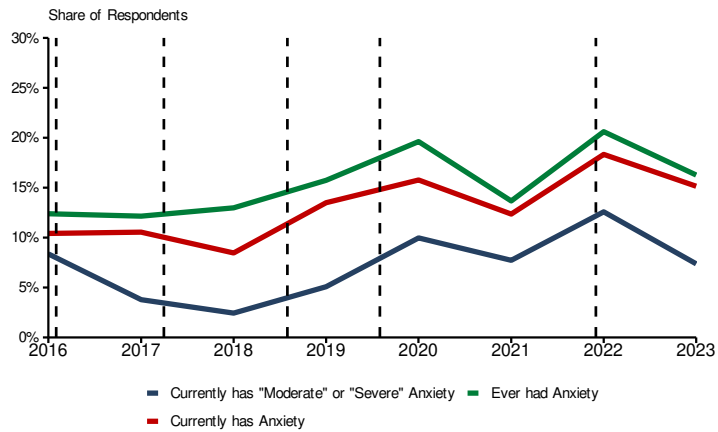
Depression(NSCH)



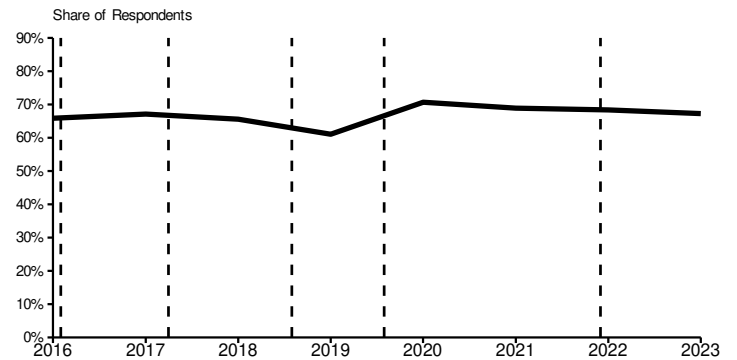
ADD or ADHD (NSCH)



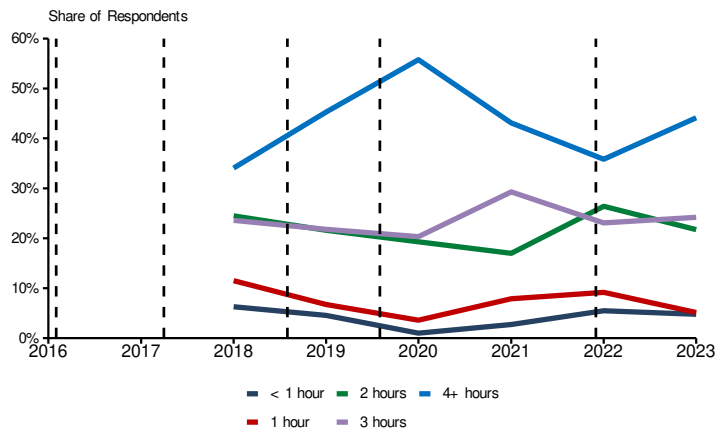
Anxiety(NSCH)



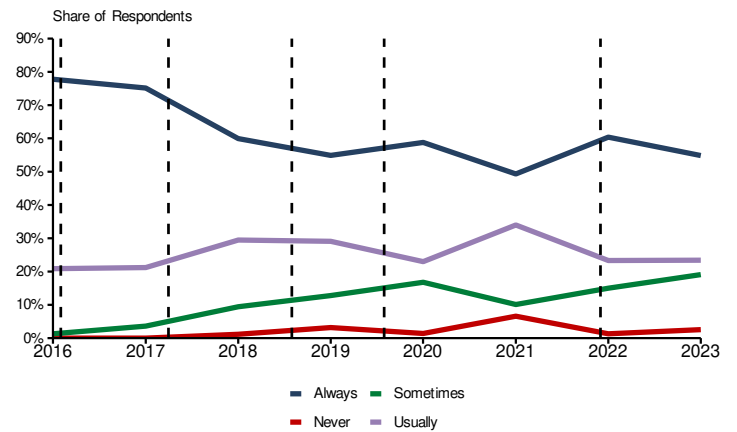
8 or More Hours of Sleep (NSCH)



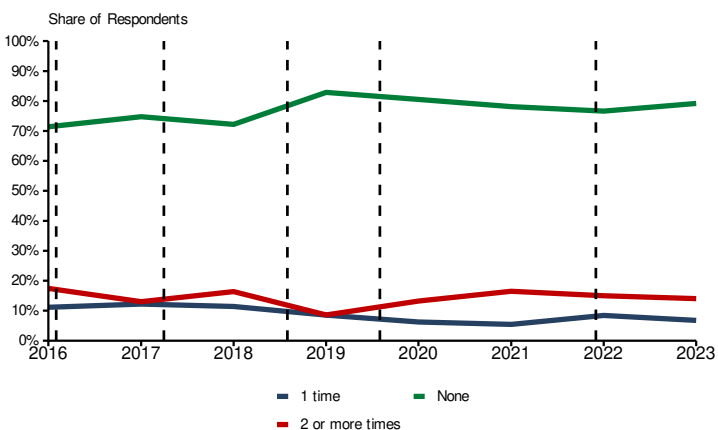
Screen Time (NSCH)



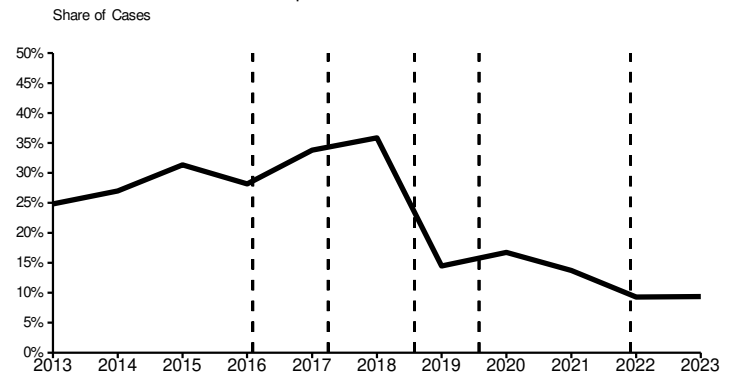
Cares About School Performance (NSCH)

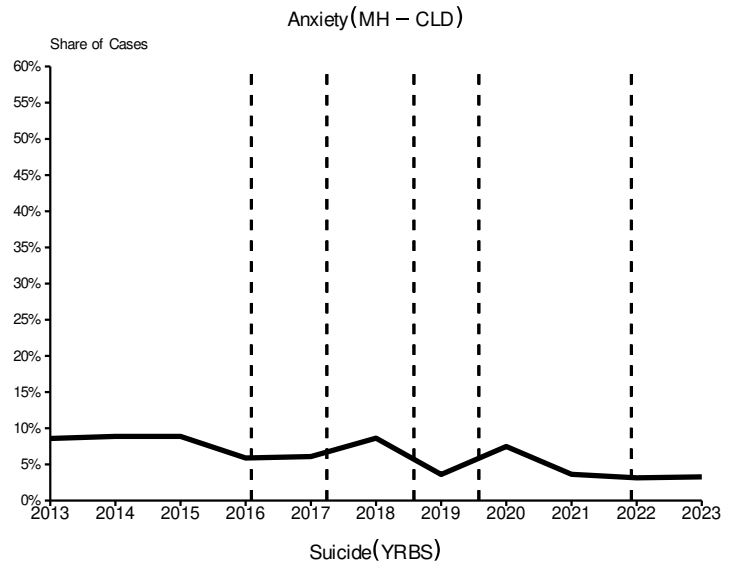
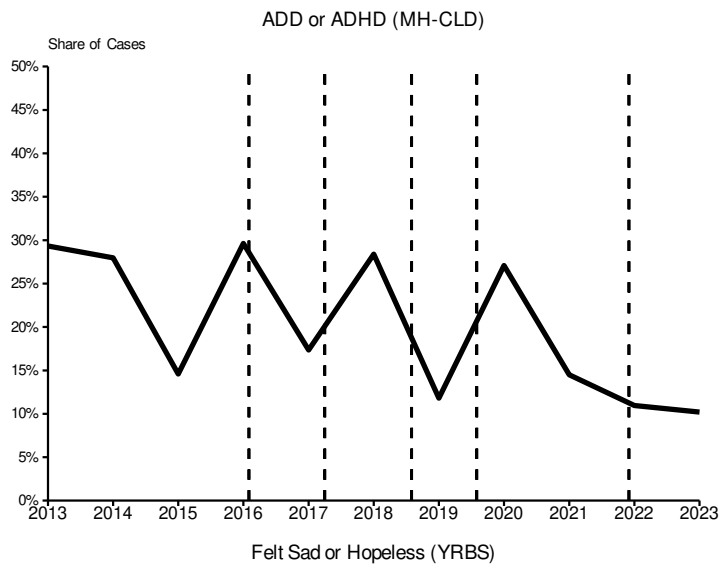


Families Contacted by Schools (NSCH)



Depression(MH – CLD)



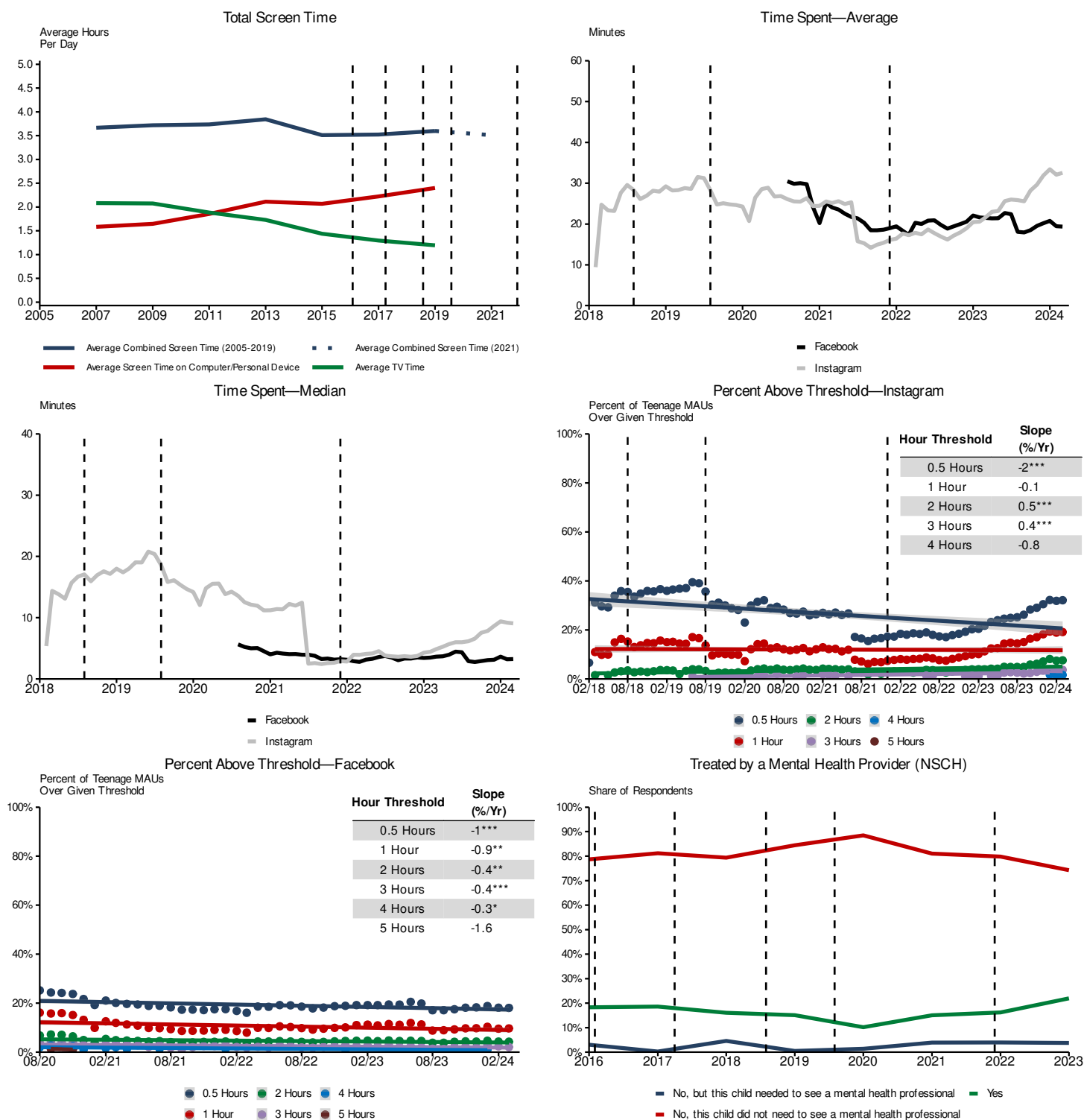


Cyber Bullied (YRBS)

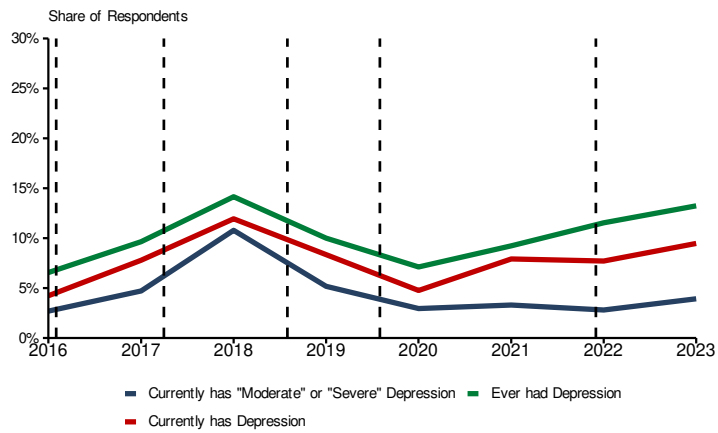
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

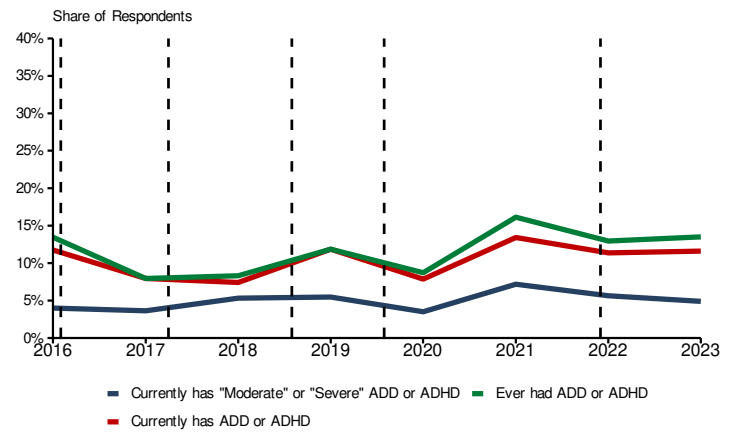
Figure G.5 Illinois



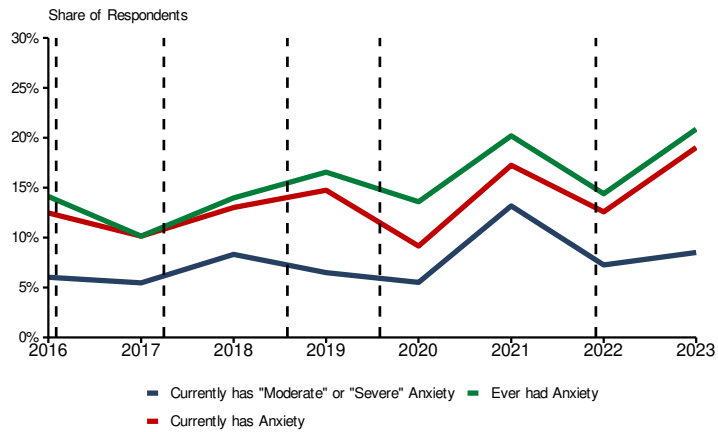
Depression(NSCH)



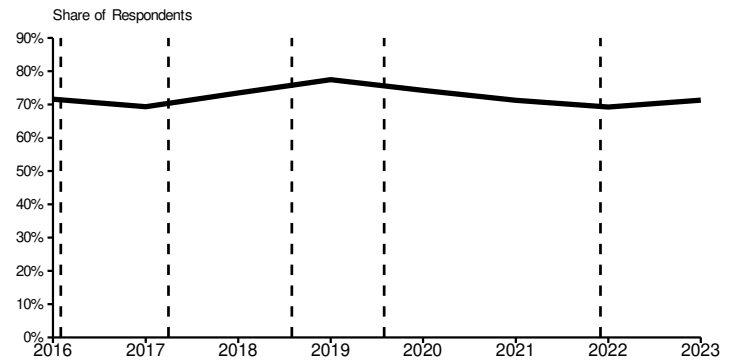
ADD or ADHD (NSCH)



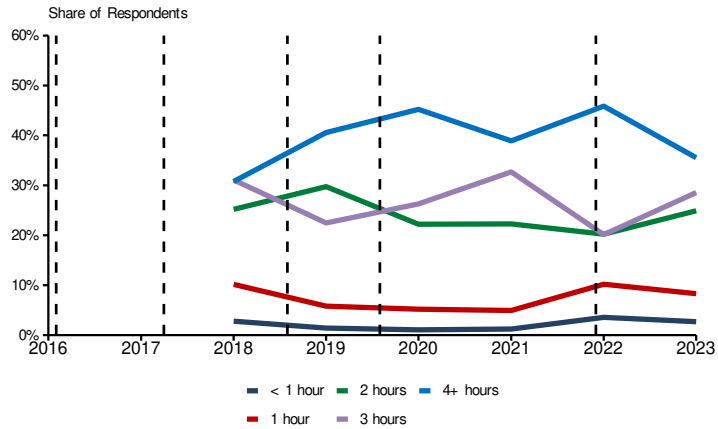
Anxiety(NSCH)



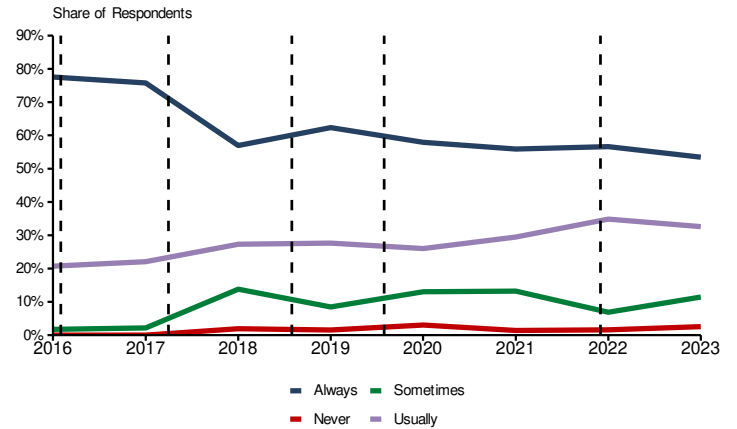
8 or More Hours of Sleep (NSCH)



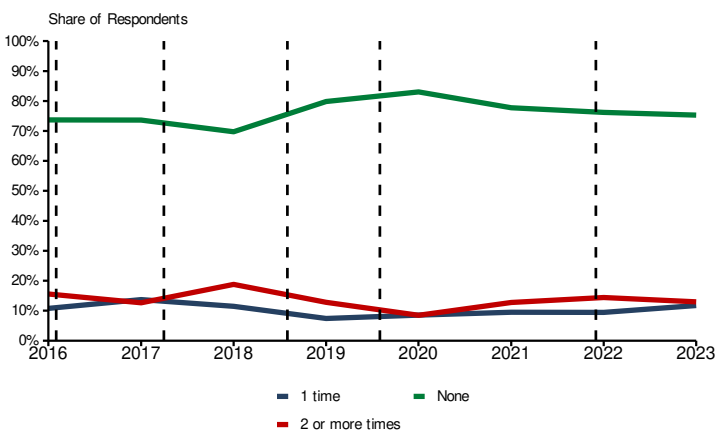
Screen Time (NSCH)



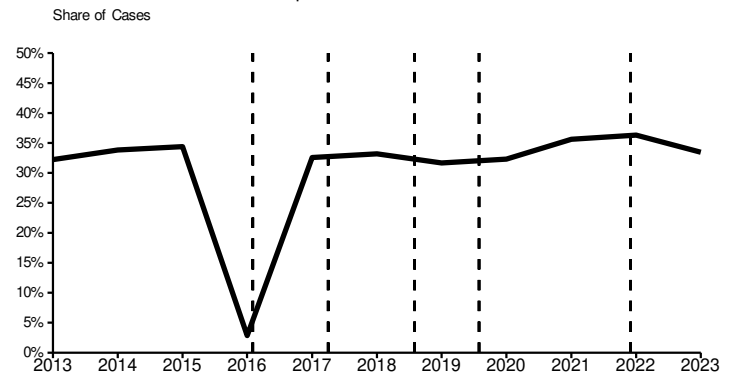
Cares About School Performance (NSCH)

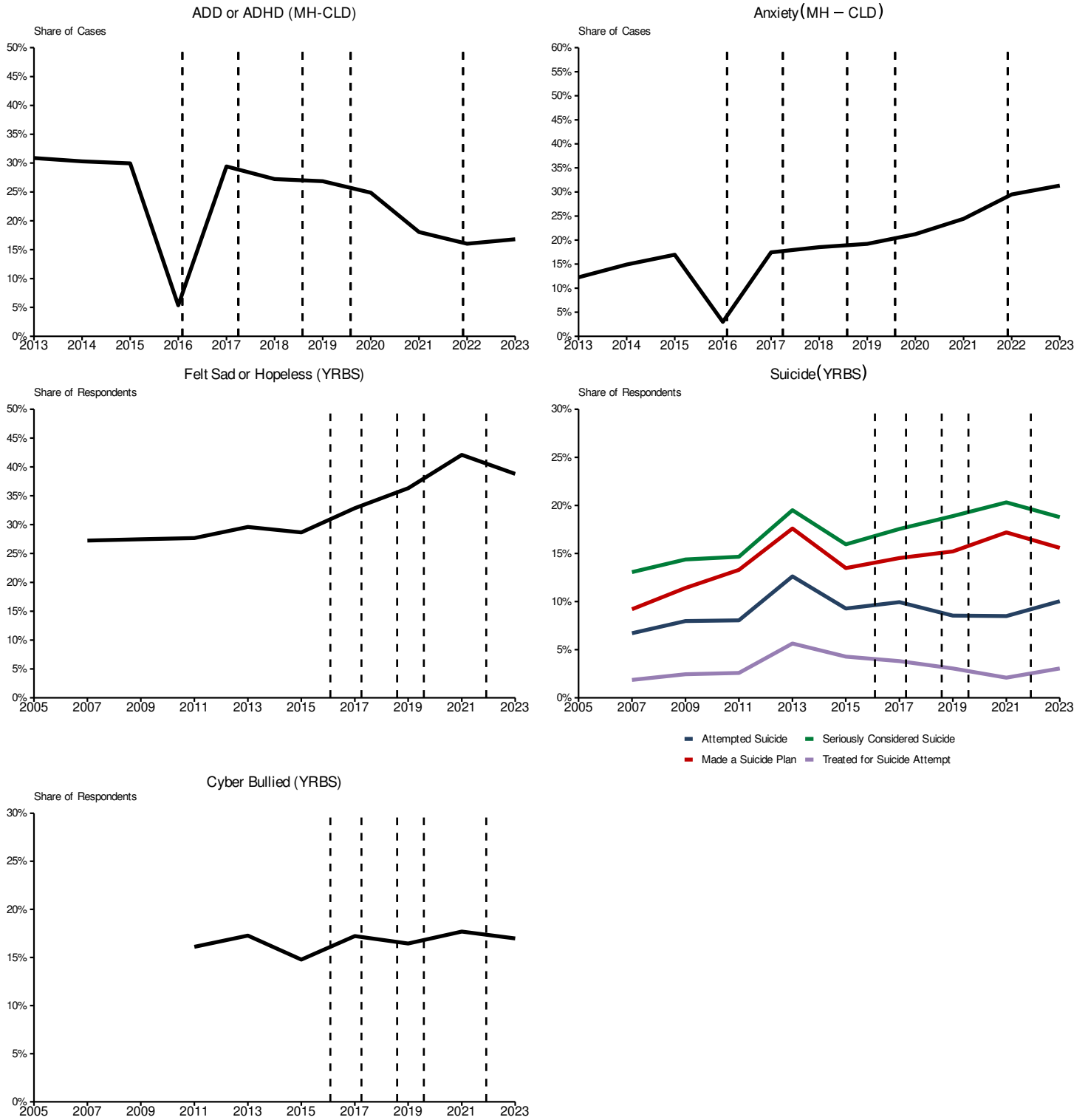


Families Contacted by Schools (NSCH)



Depression(MH – CLD)

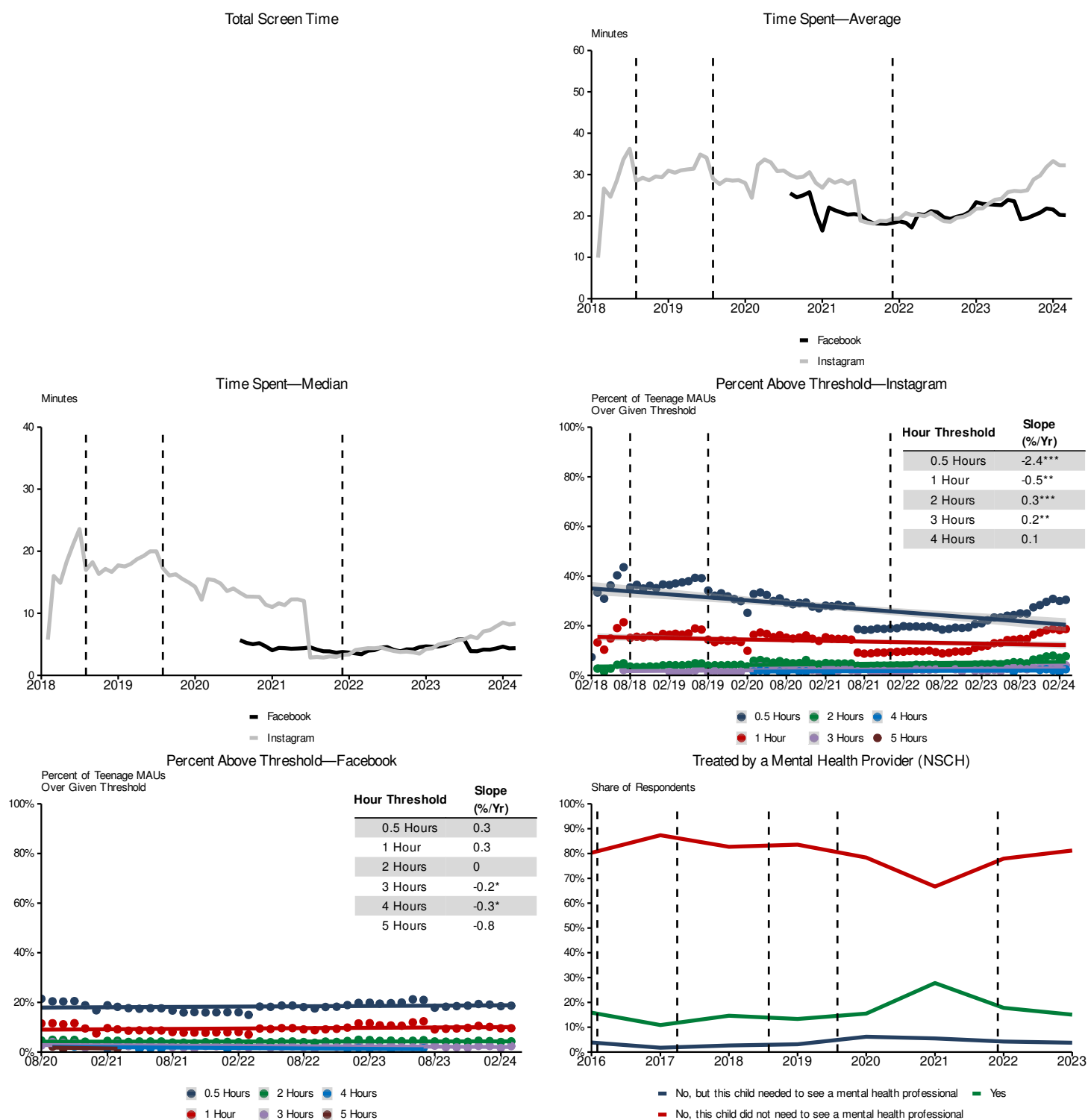




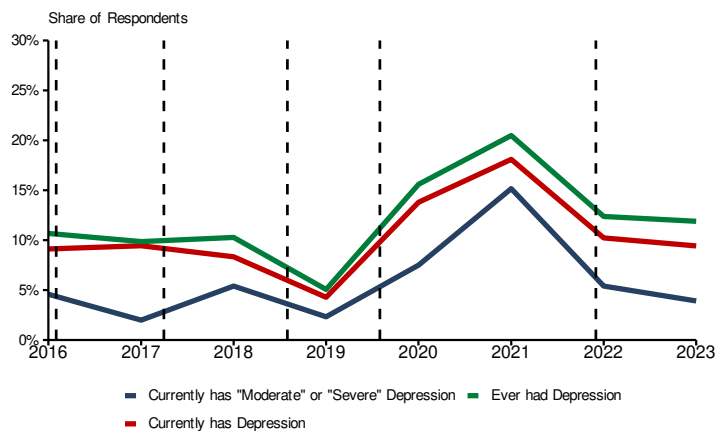
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data; Williams Semi-Annual Report #12

Note: See Appendices D–F for additional details. I note that the 2016 decrease in diagnosis rates in Illinois coincided with a state budget impasse that had “a rippling effect on the productivity and momentum of community mental health vendors” and therefore may not reflect true trends in diagnoses.

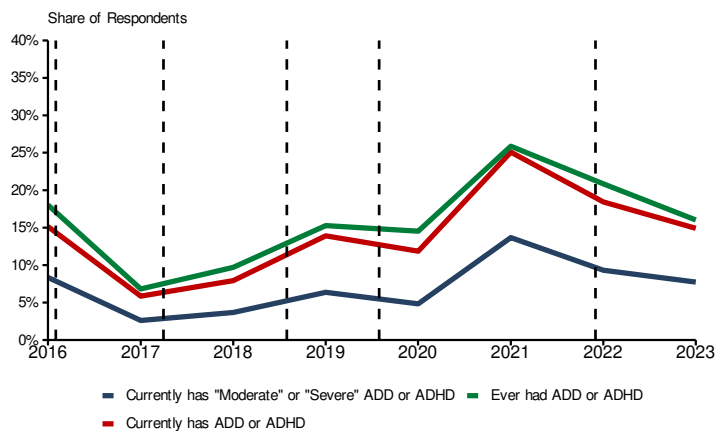
Figure G.6 Indiana



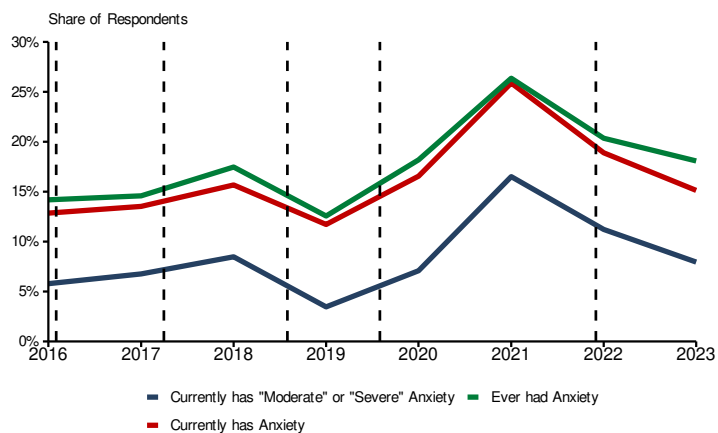
Depression(NSCH)



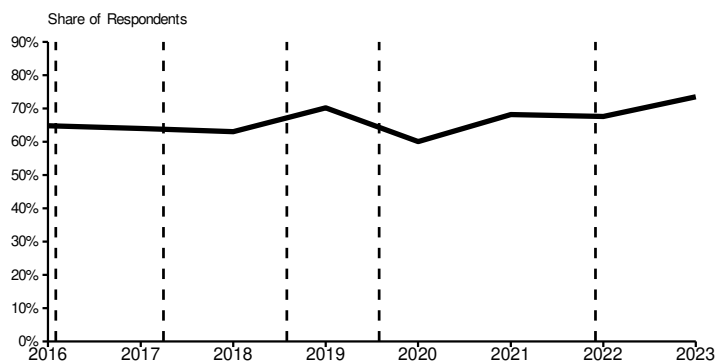
ADD or ADHD (NSCH)



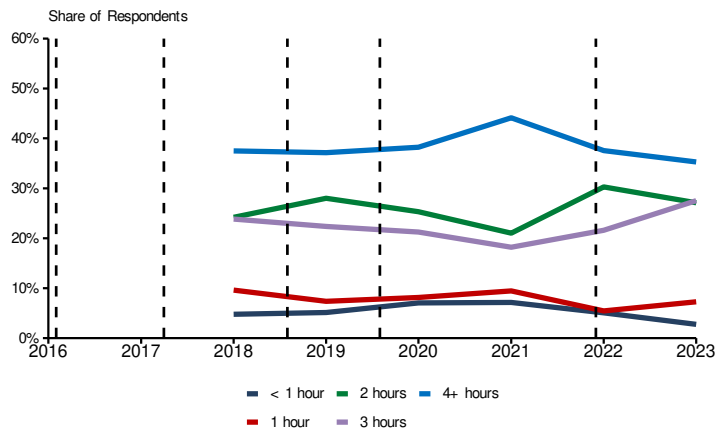
Anxiety(NSCH)



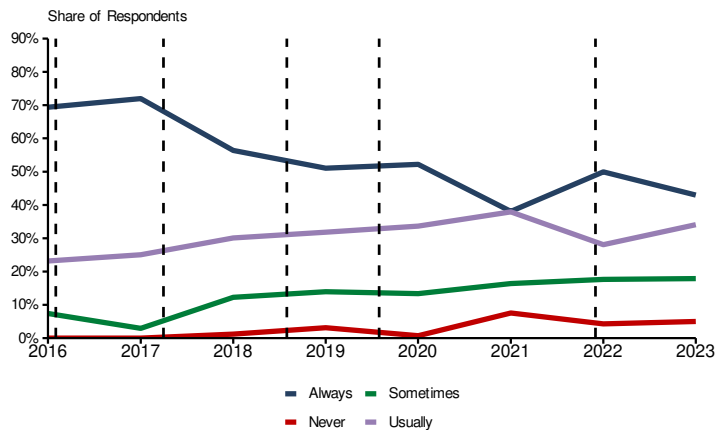
8 or More Hours of Sleep (NSCH)



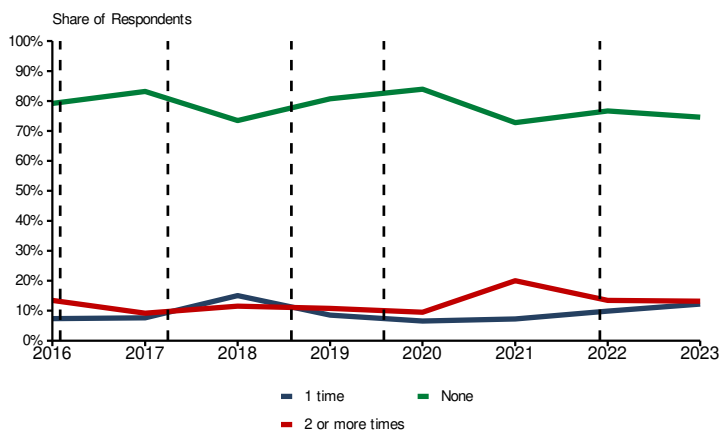
Screen Time (NSCH)



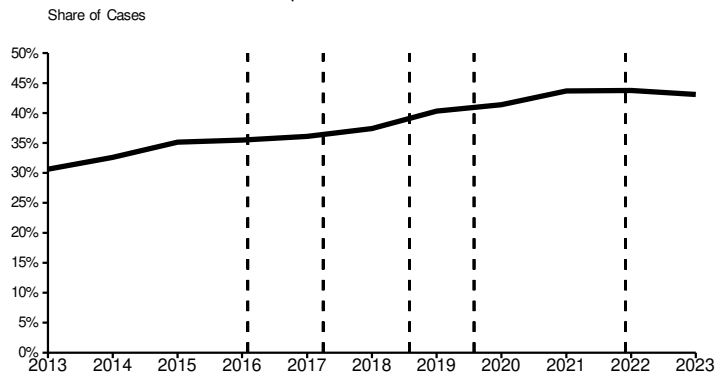
Cares About School Performance (NSCH)

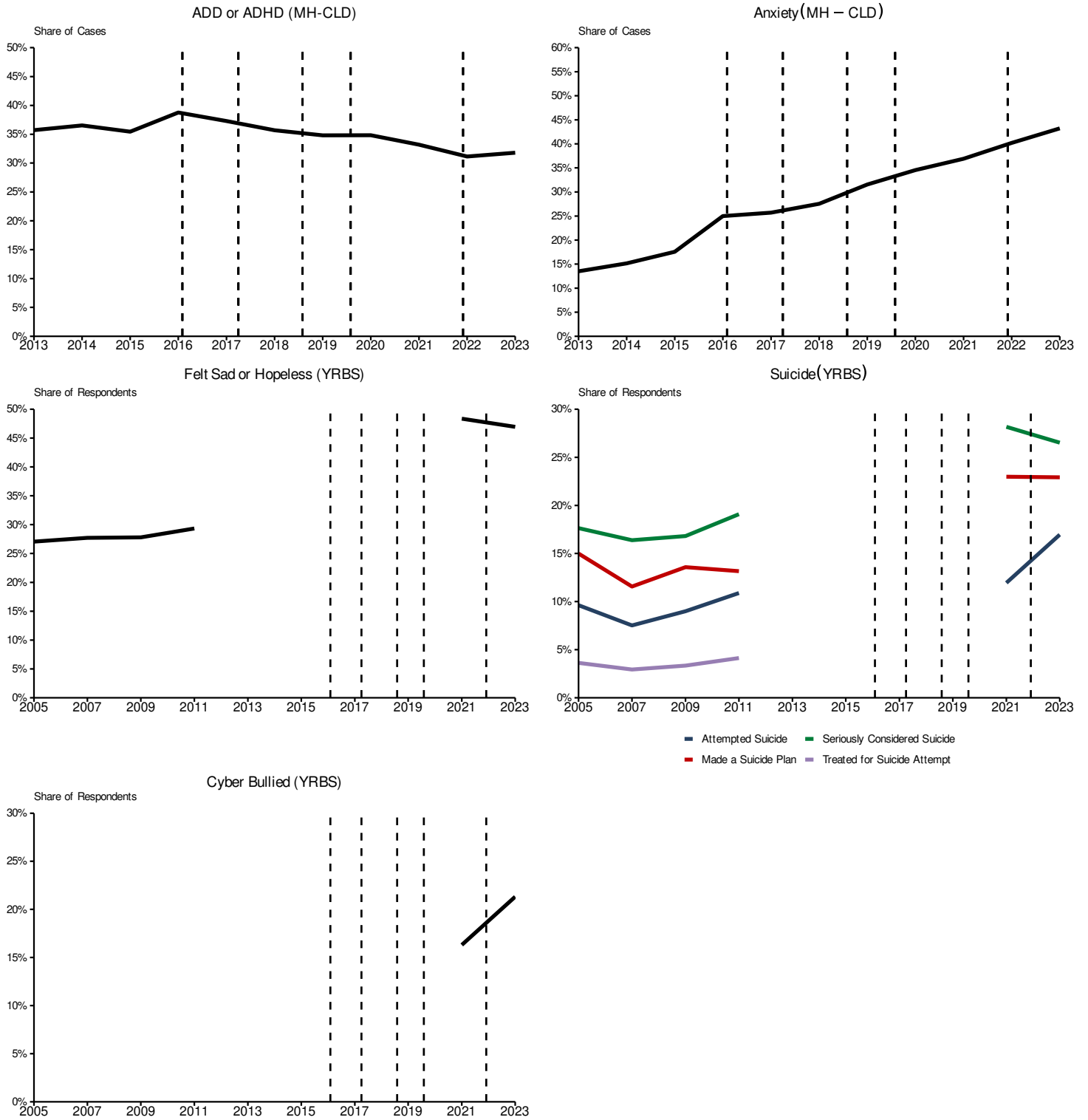


Families Contacted by Schools (NSCH)



Depression(MH - CLD)

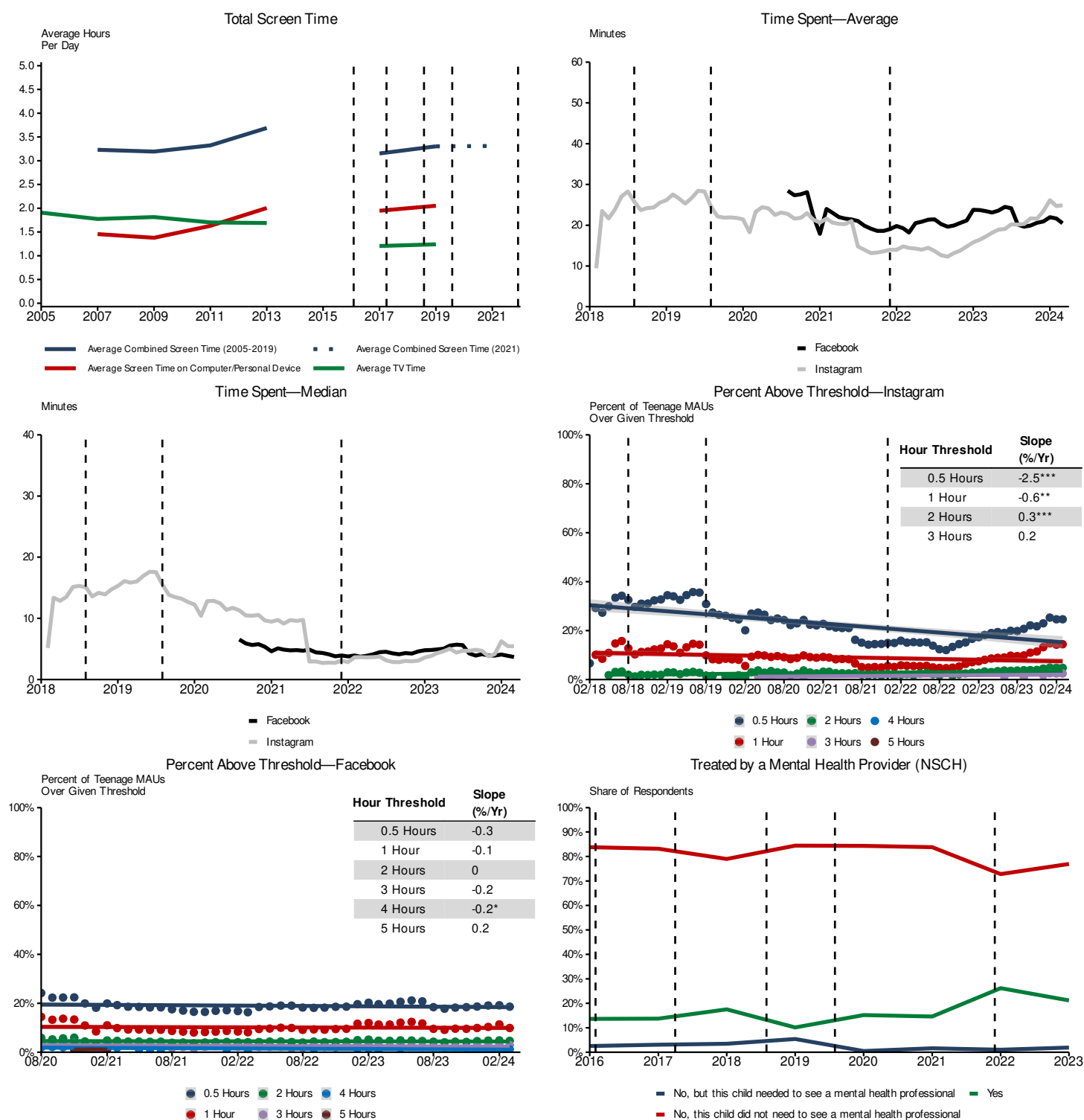




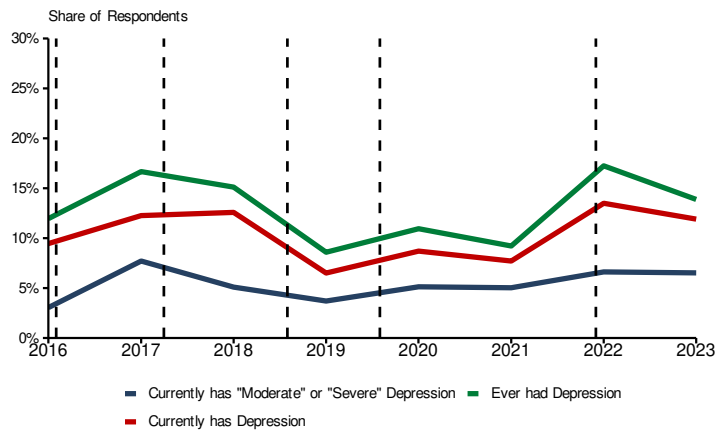
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

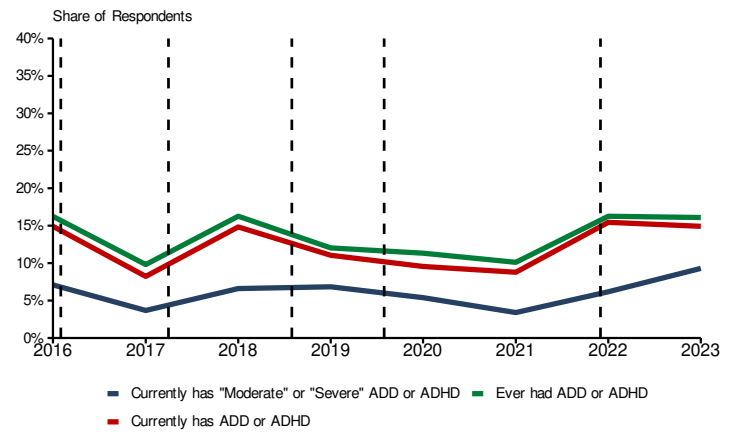
Figure G.7 Kansas



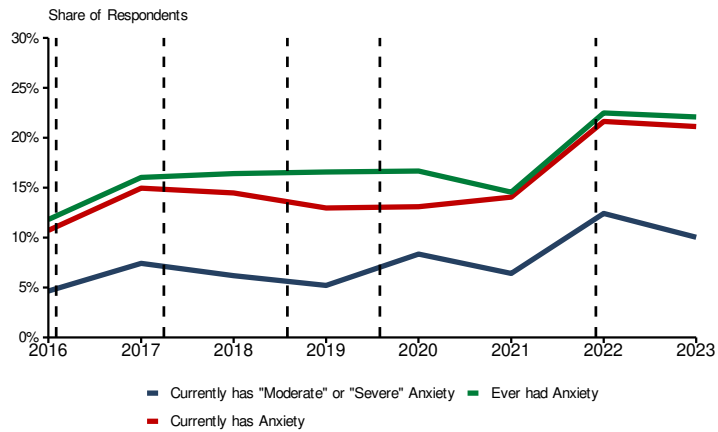
Depression(NSCH)



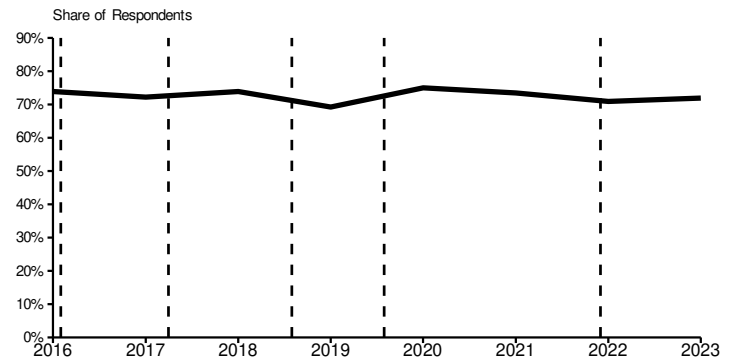
ADD or ADHD (NSCH)



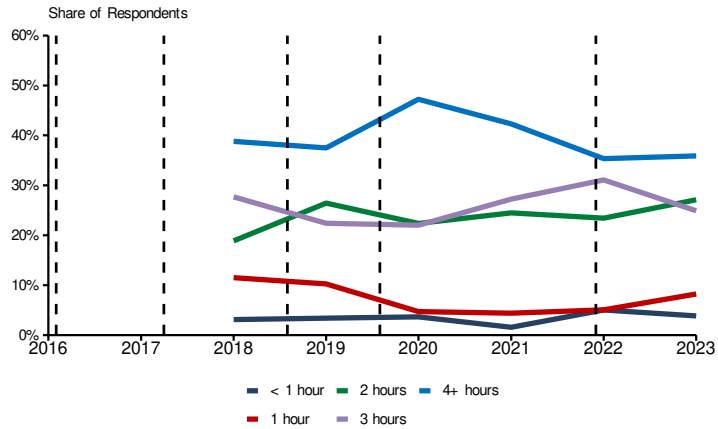
Anxiety(NSCH)



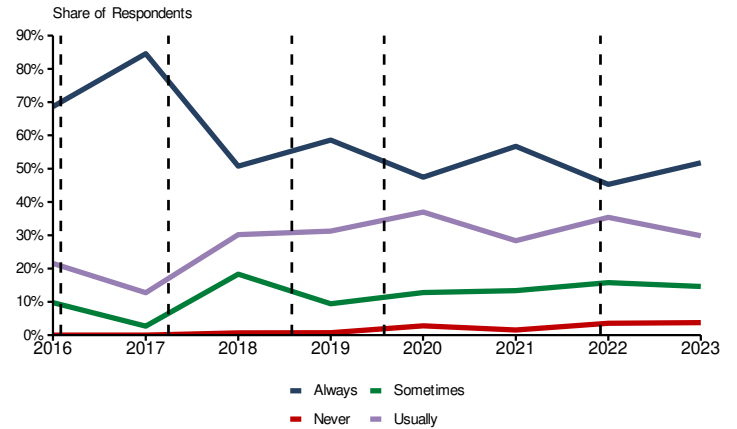
8 or More Hours of Sleep (NSCH)



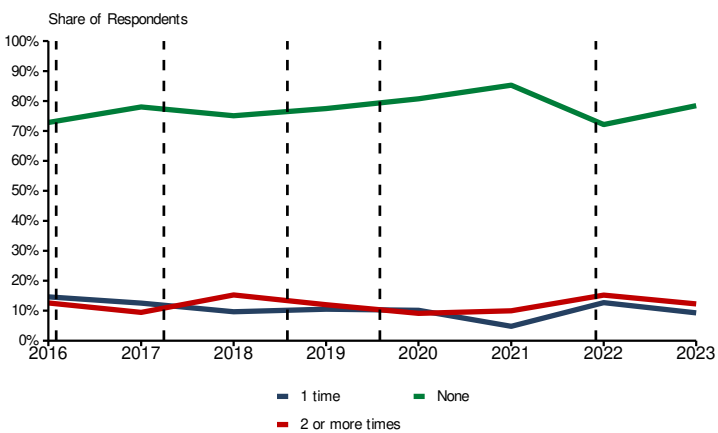
Screen Time (NSCH)



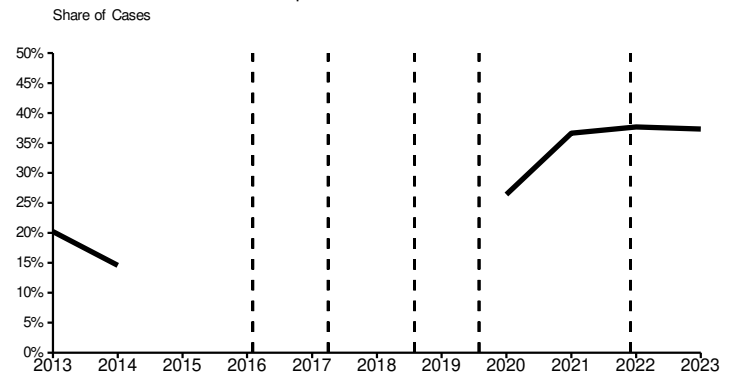
Cares About School Performance (NSCH)

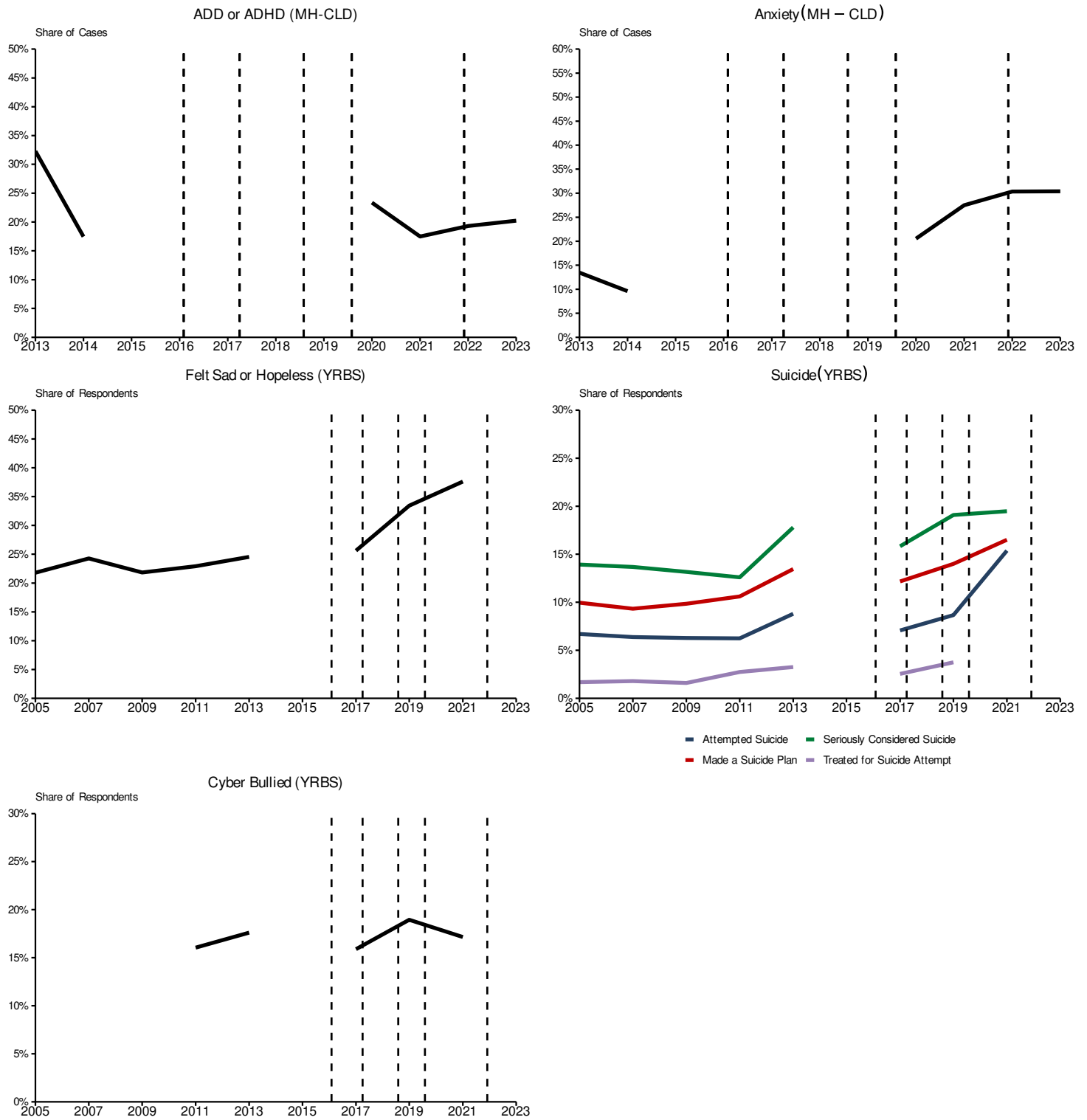


Families Contacted by Schools (NSCH)



Depression(MH - CLD)

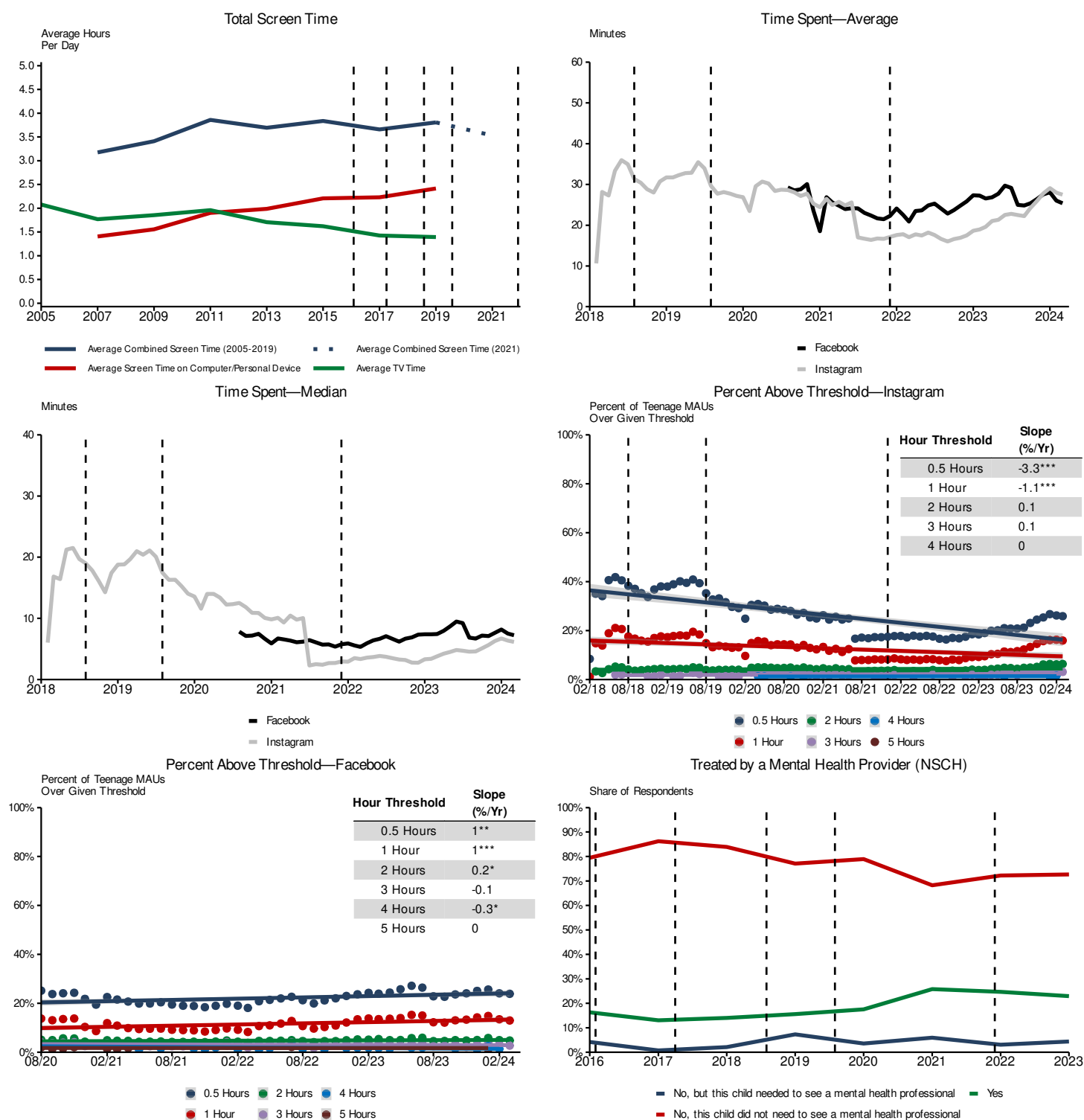




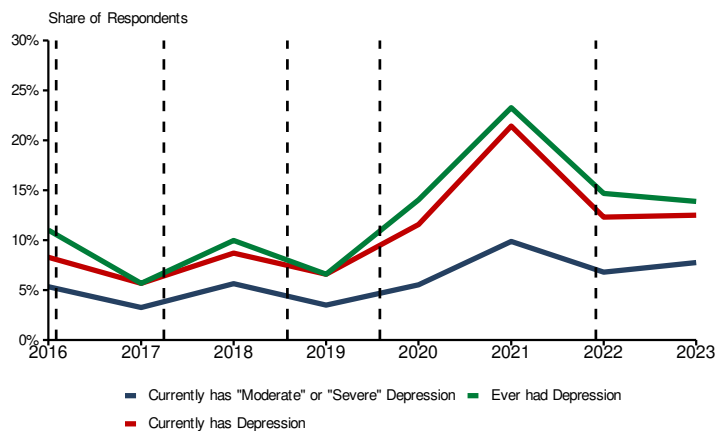
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

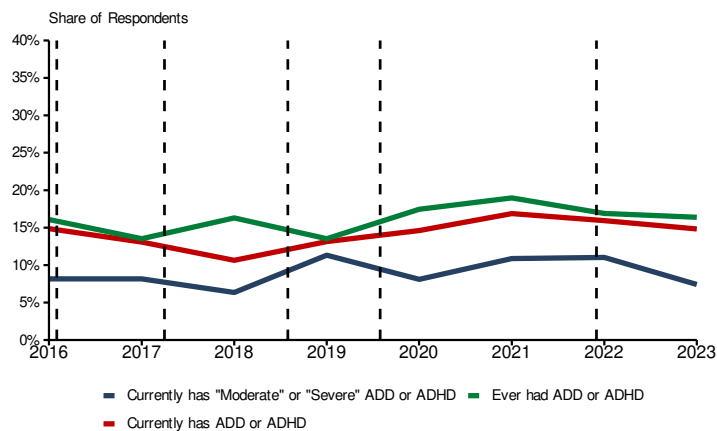
Figure G.8 Kentucky



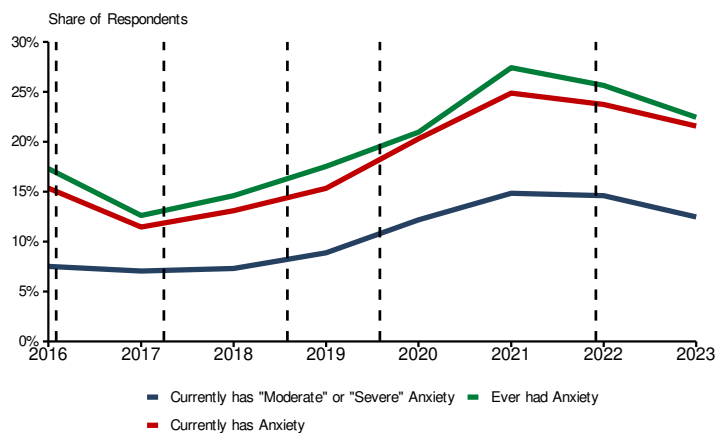
Depression(NSCH)



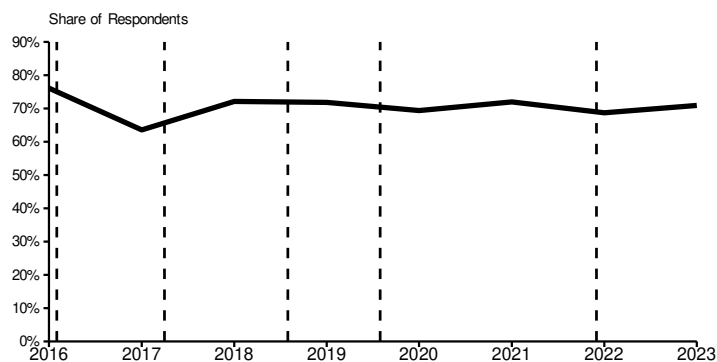
ADD or ADHD (NSCH)



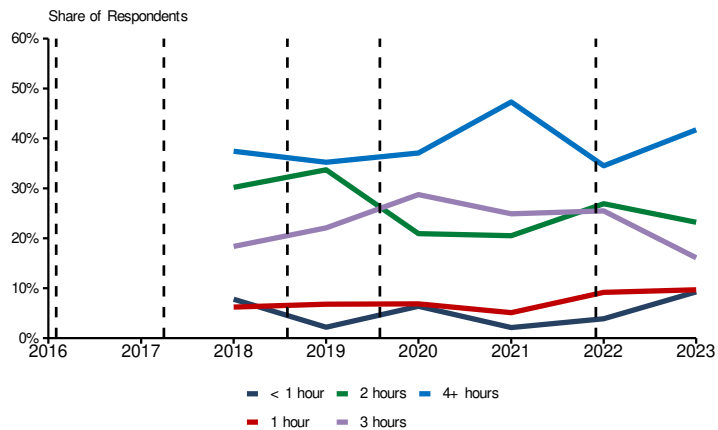
Anxiety(NSCH)



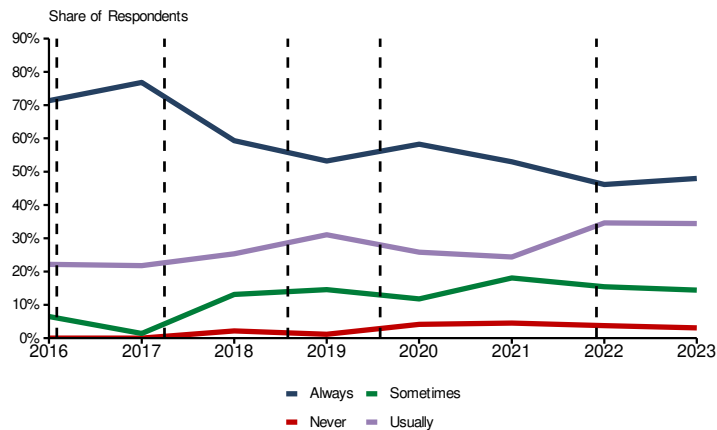
8 or More Hours of Sleep (NSCH)



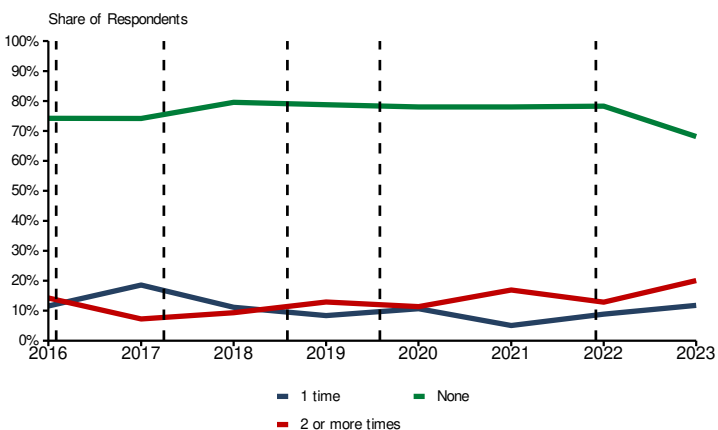
Screen Time (NSCH)



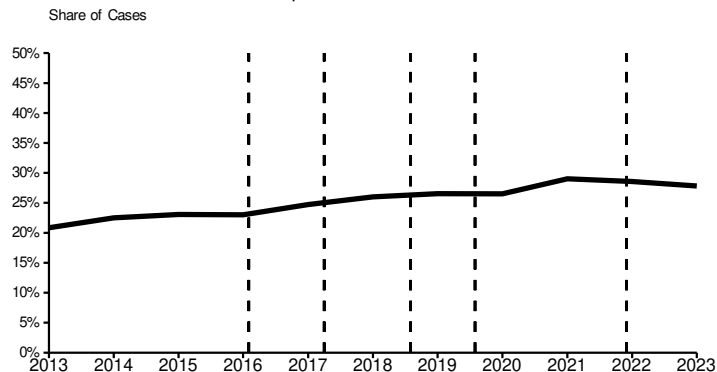
Cares About School Performance (NSCH)

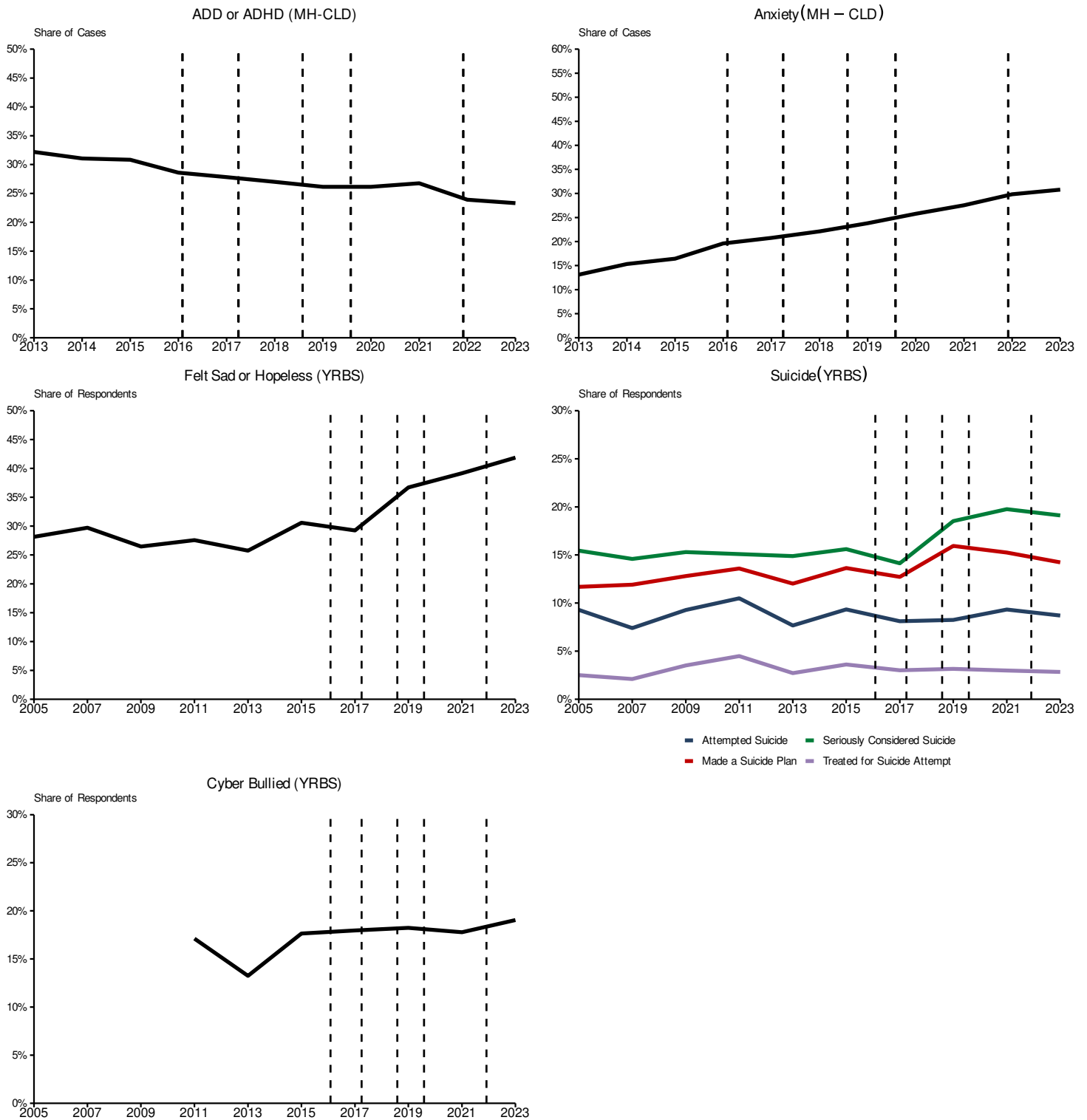


Families Contacted by Schools (NSCH)



Depression(MH - CLD)

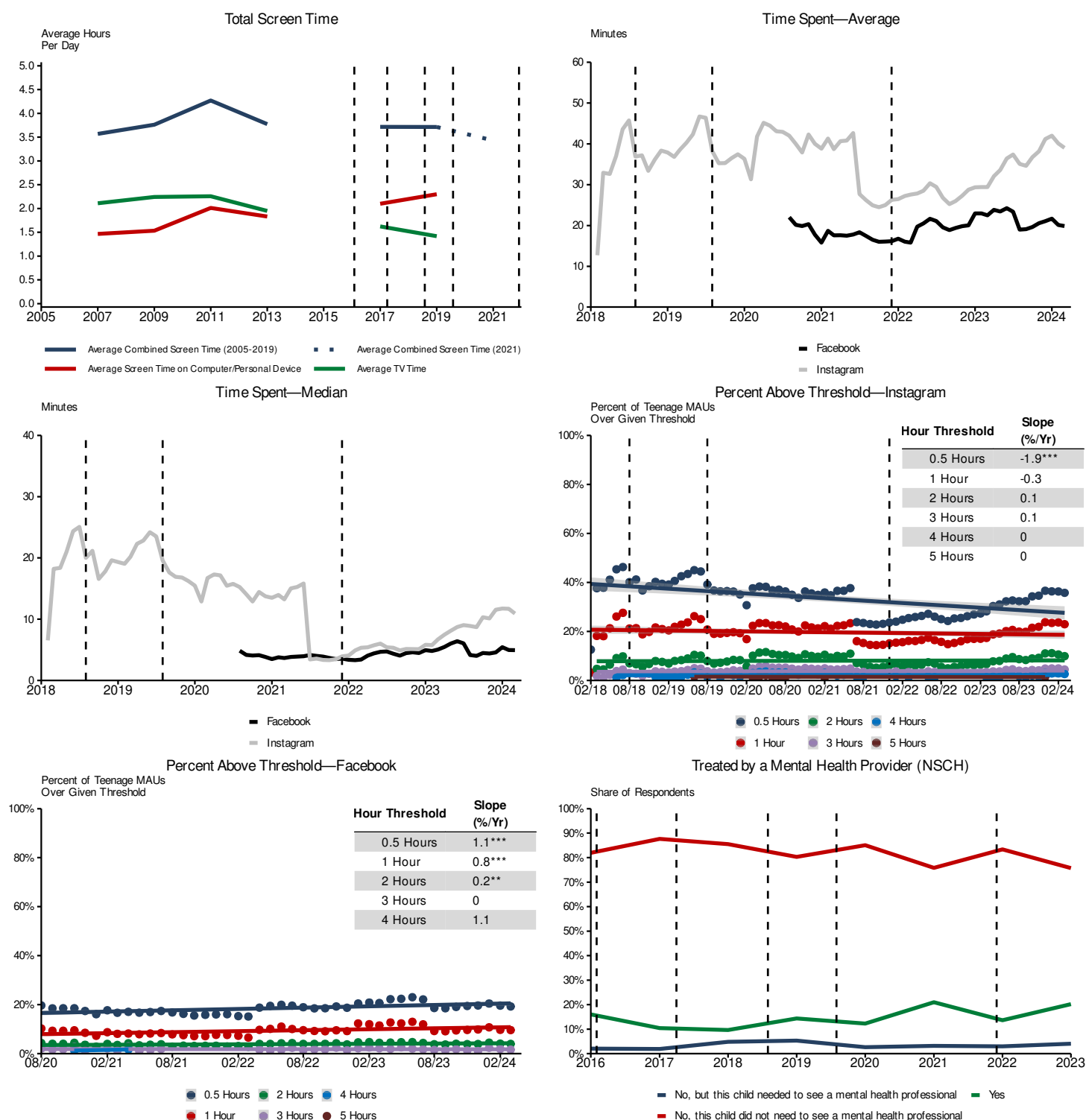




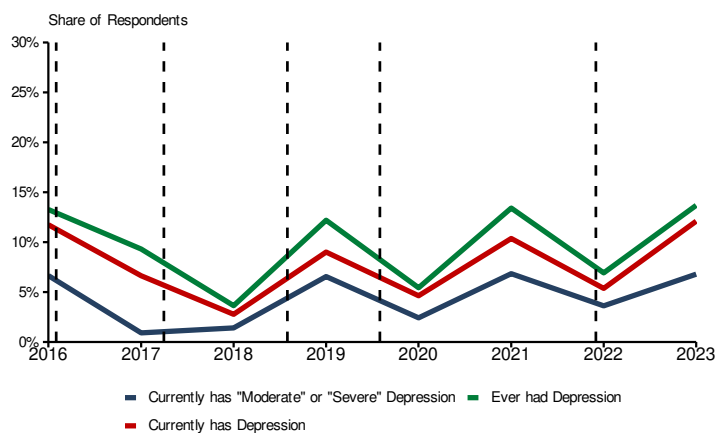
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

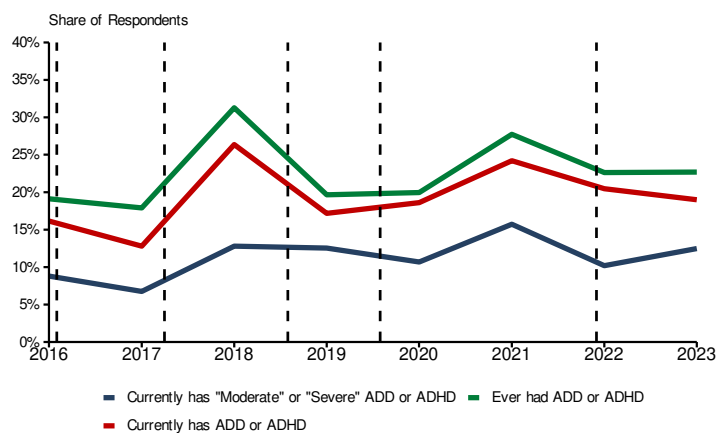
Figure G.9 Louisiana



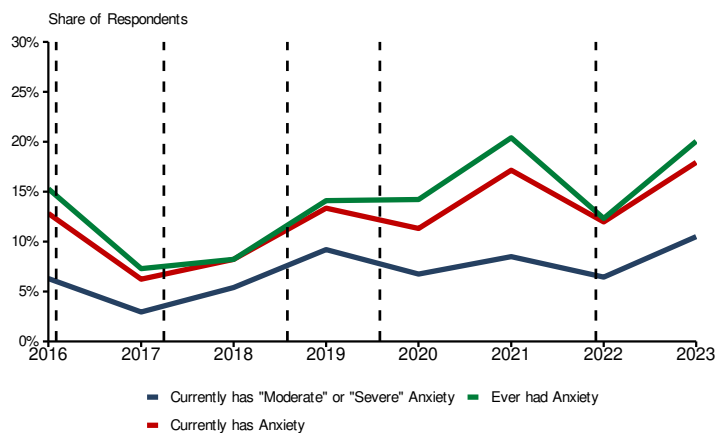
Depression(NSCH)



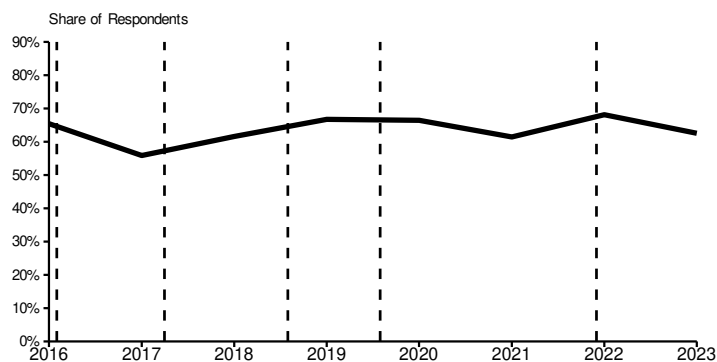
ADD or ADHD (NSCH)



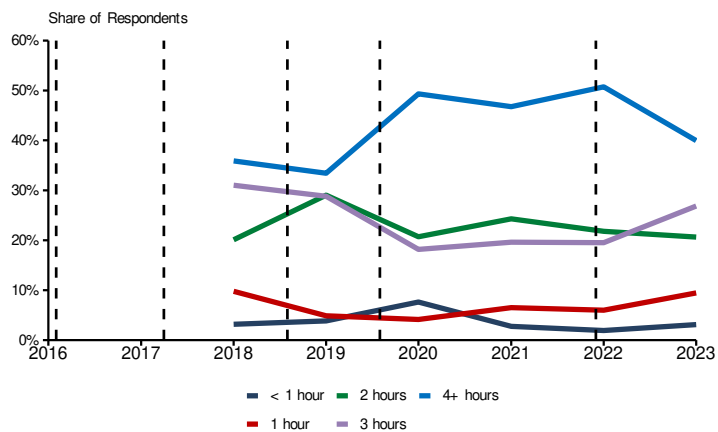
Anxiety(NSCH)



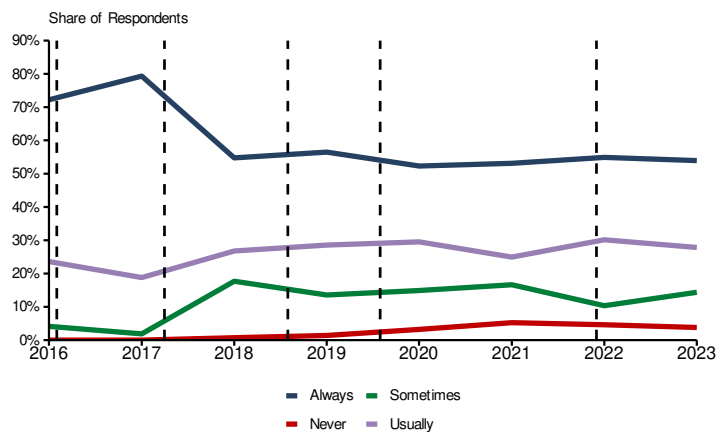
8 or More Hours of Sleep (NSCH)



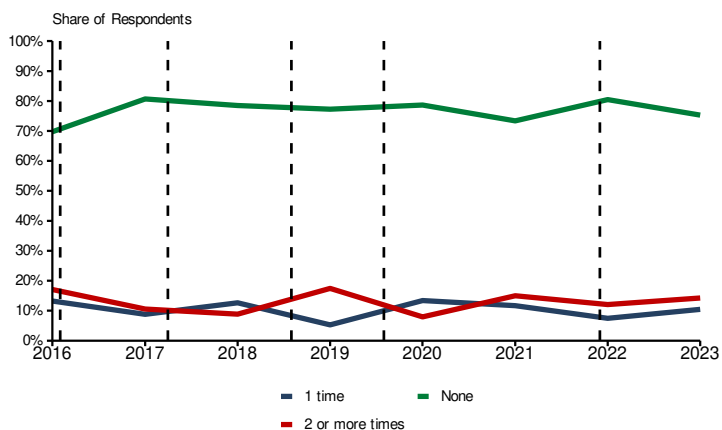
Screen Time (NSCH)



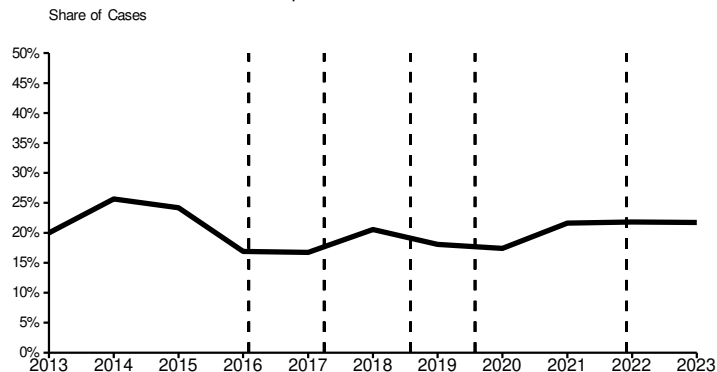
Cares About School Performance (NSCH)

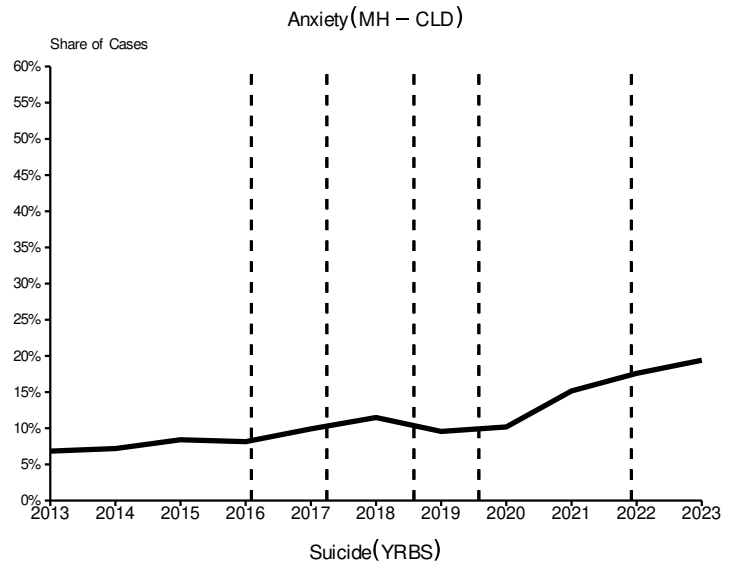
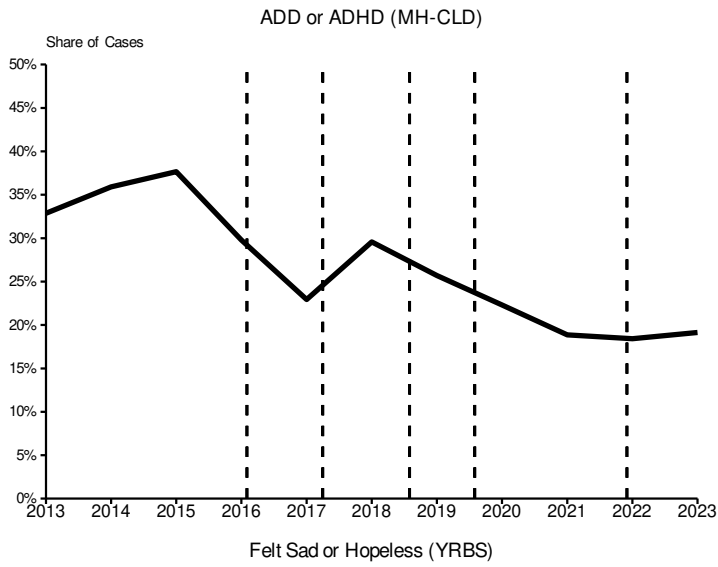


Families Contacted by Schools (NSCH)



Depression(MH – CLD)



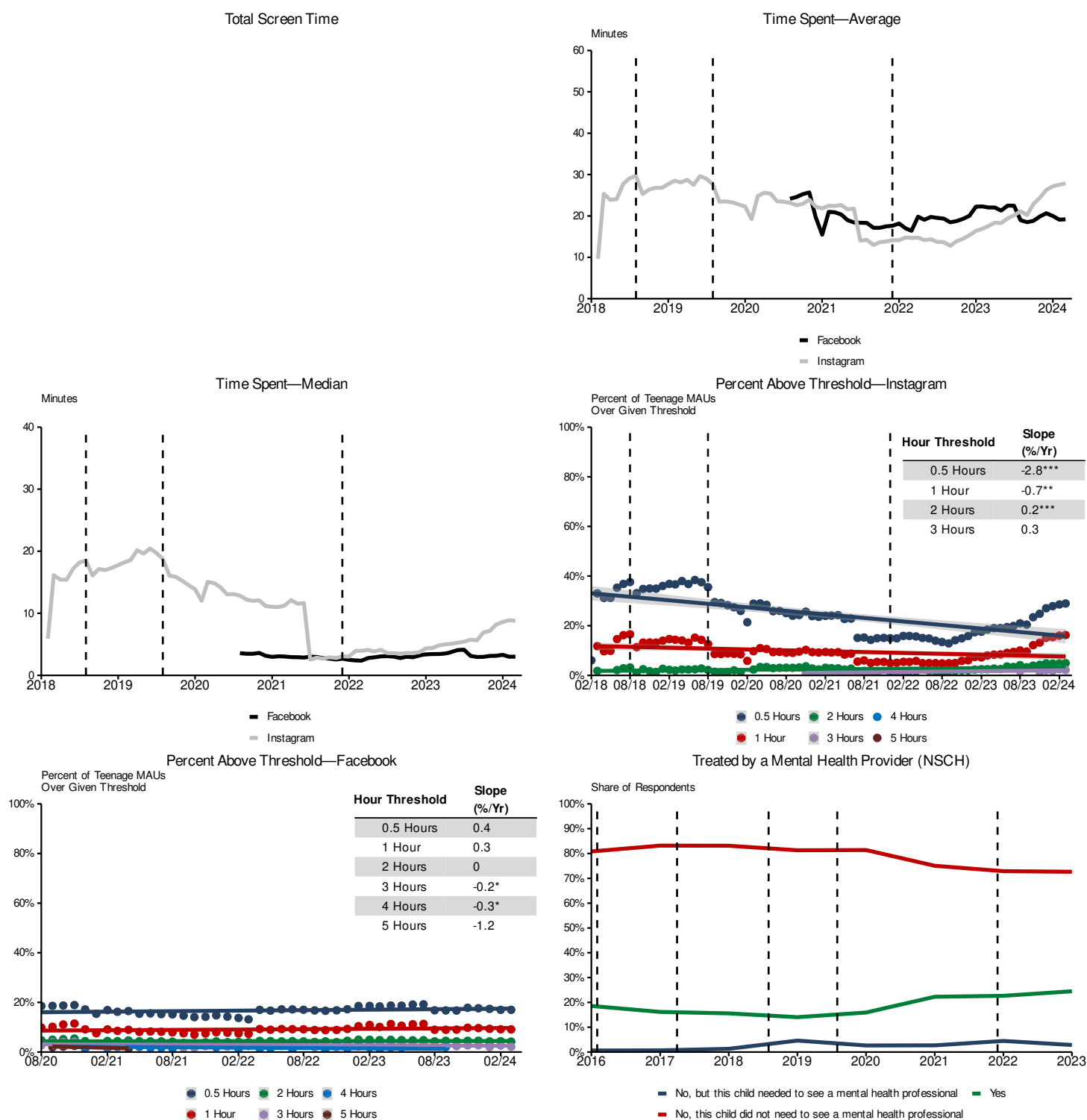


Cyber Bullied (YRBS)

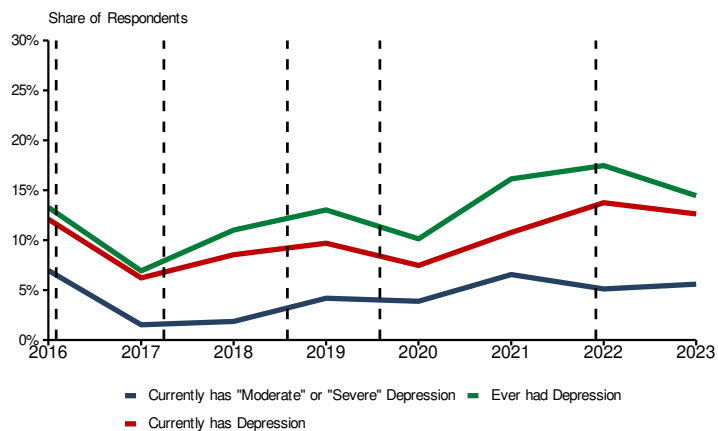
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

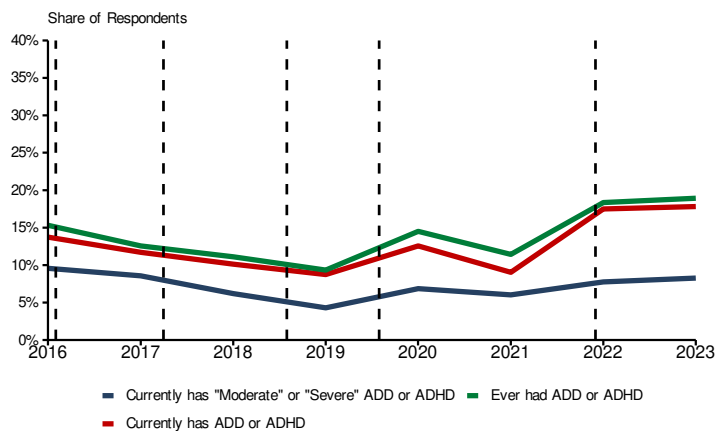
Figure G.10 Minnesota



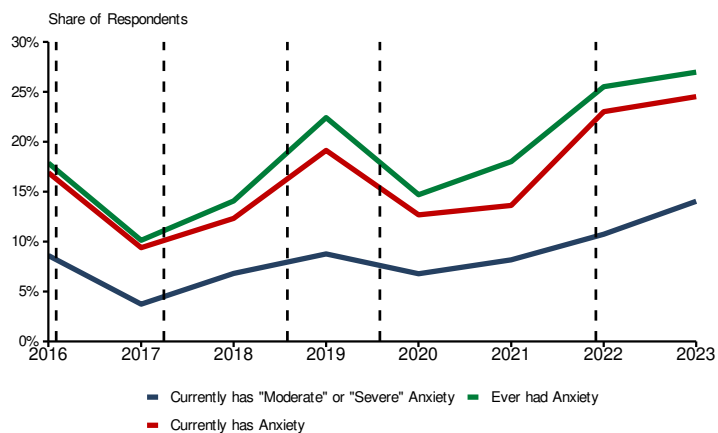
Depression(NSCH)



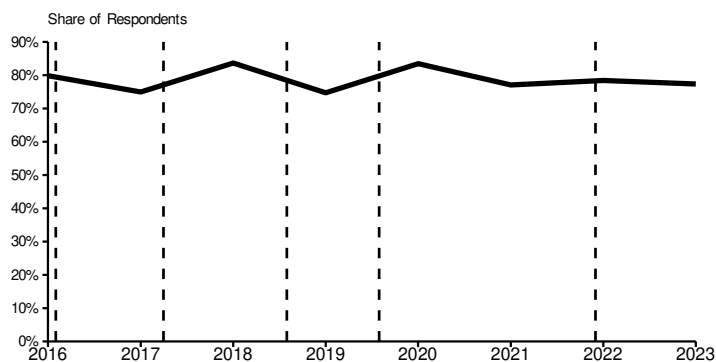
ADD or ADHD (NSCH)



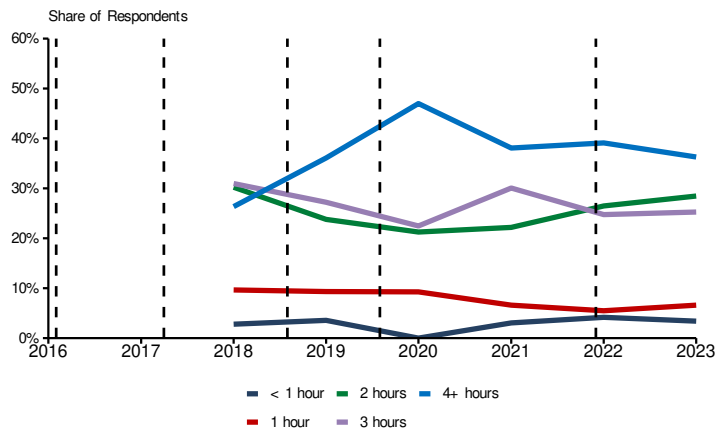
Anxiety(NSCH)



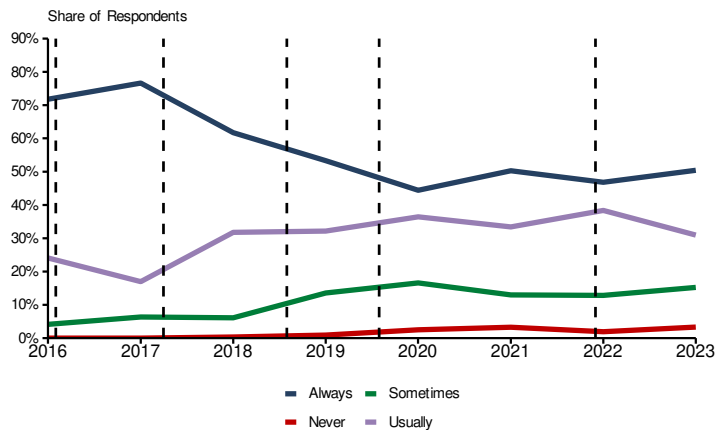
8 or More Hours of Sleep (NSCH)



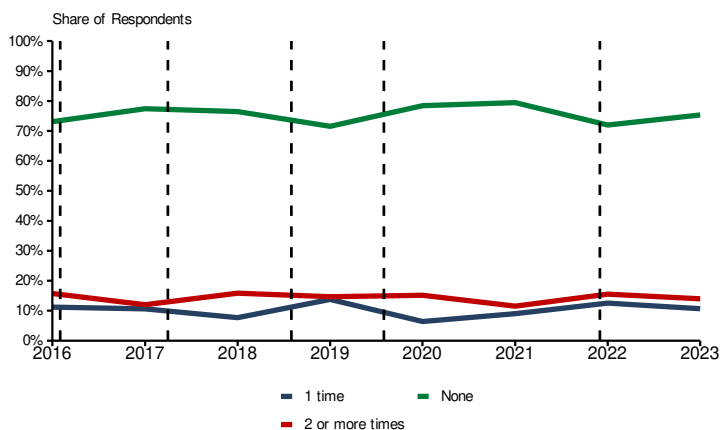
Screen Time (NSCH)



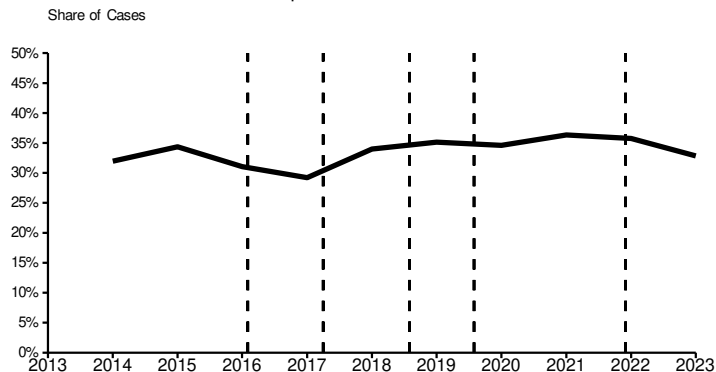
Cares About School Performance (NSCH)

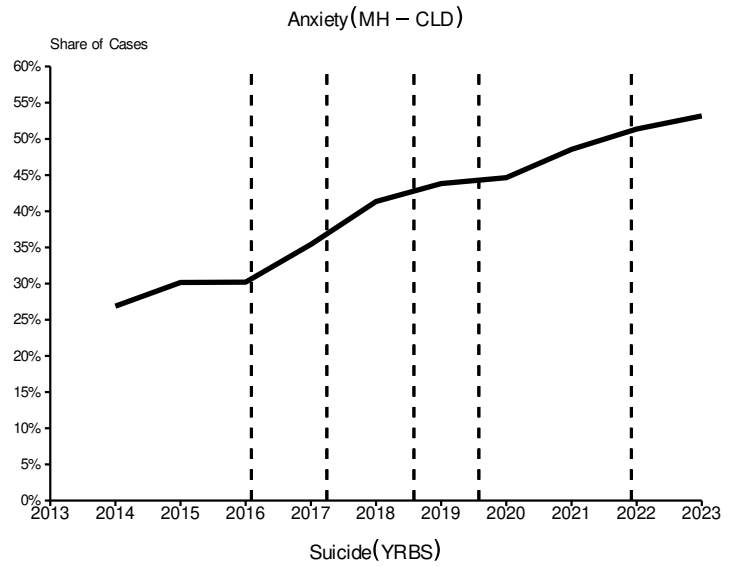
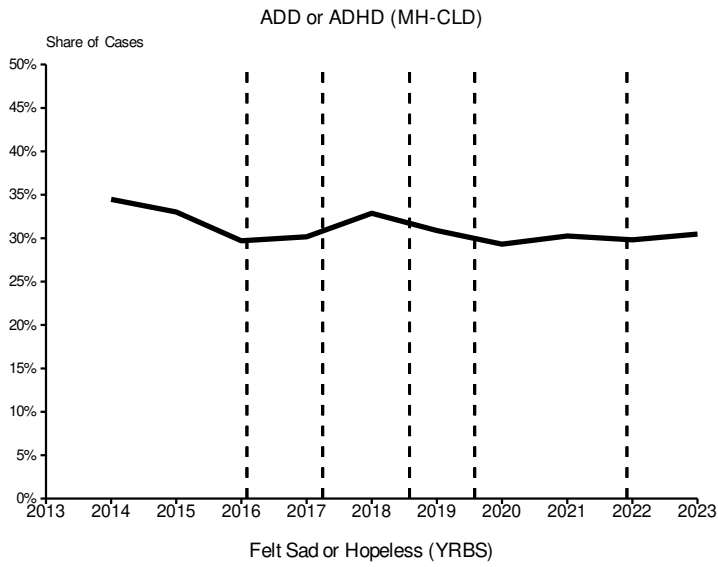


Families Contacted by Schools (NSCH)



Depression(MH - CLD)



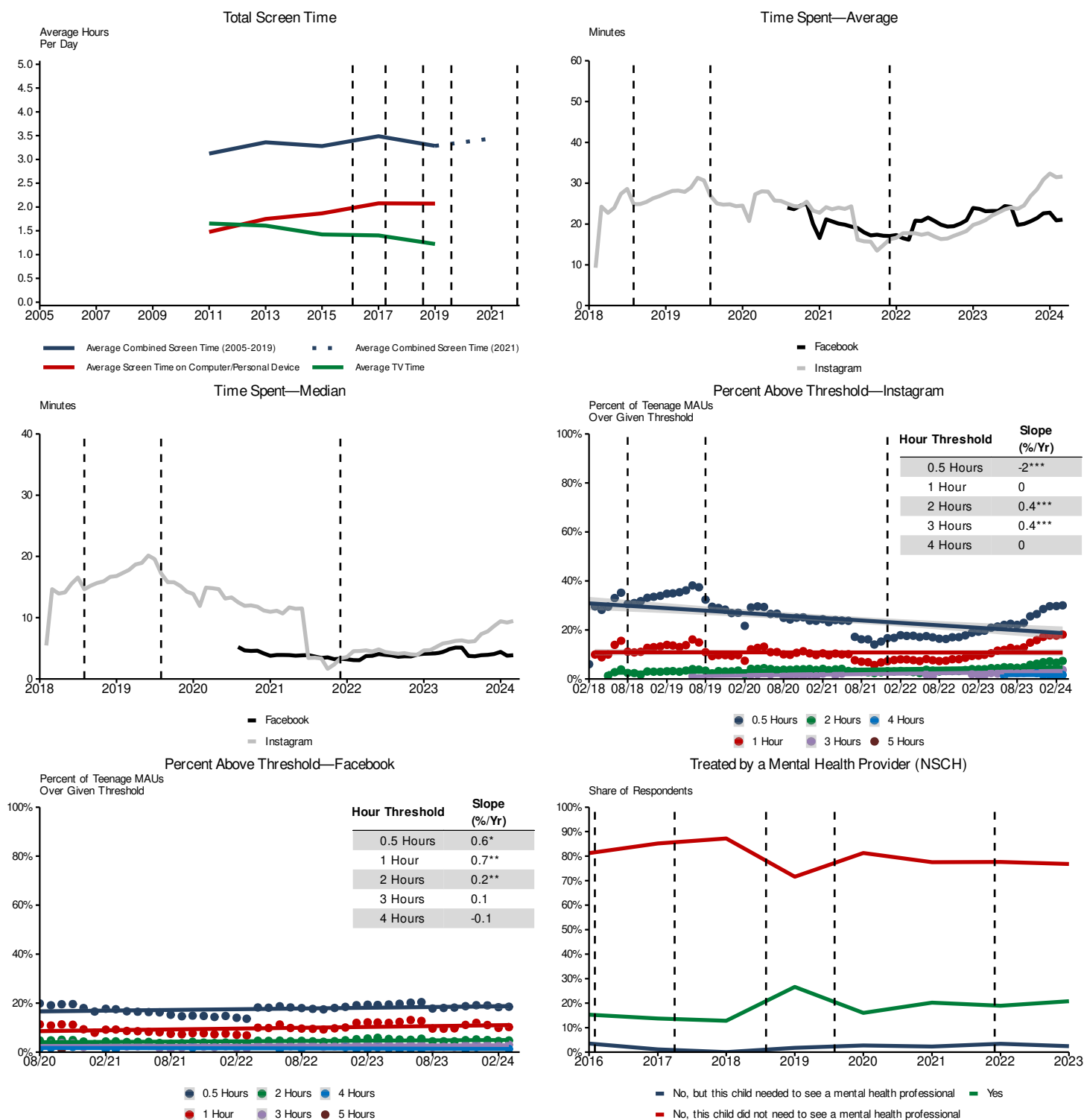


Cyber Bullied (YRBS)

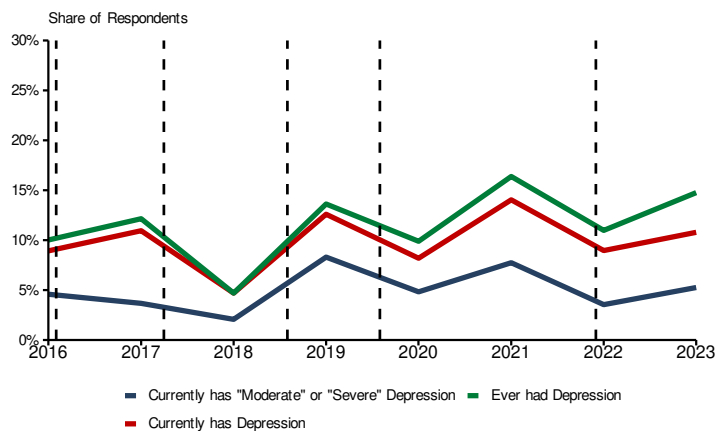
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

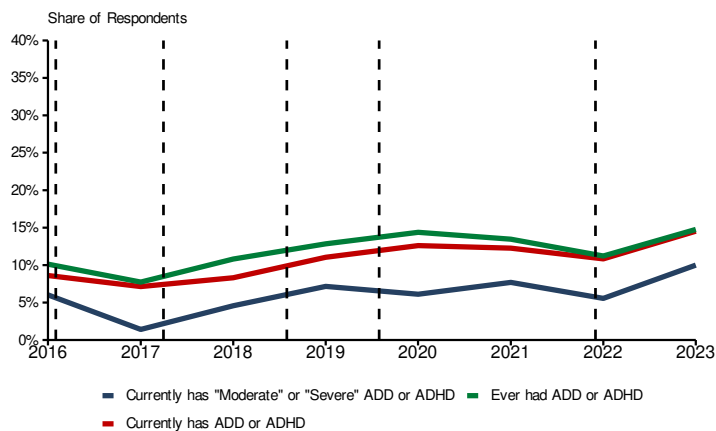
Figure G.11 Nebraska



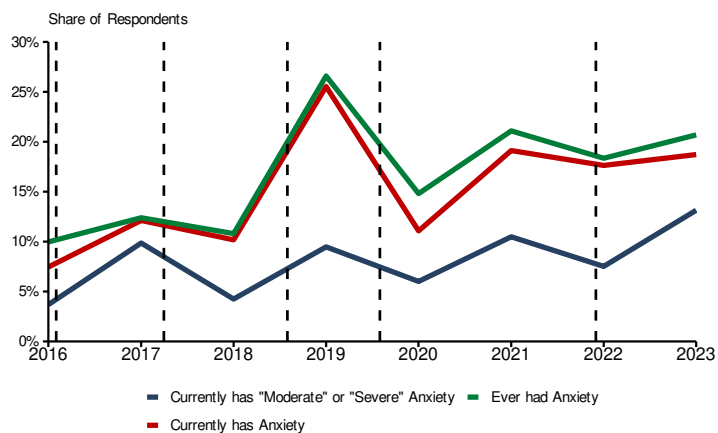
Depression(NSCH)



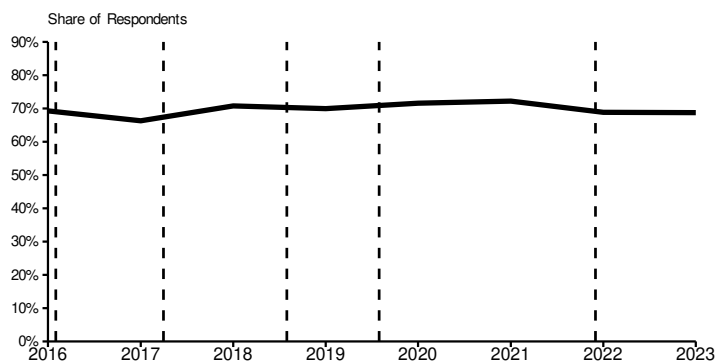
ADD or ADHD (NSCH)



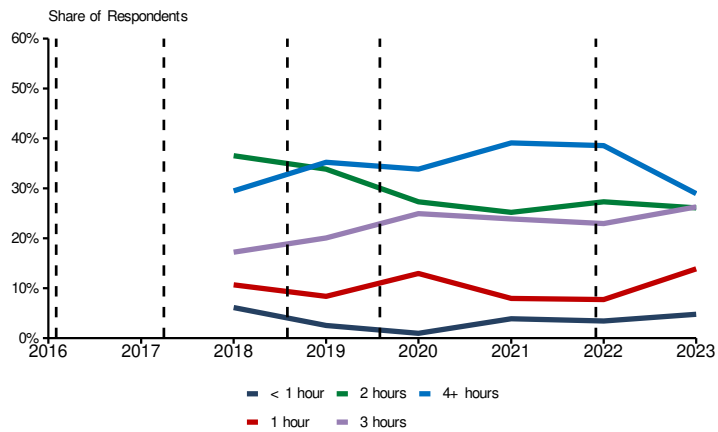
Anxiety(NSCH)



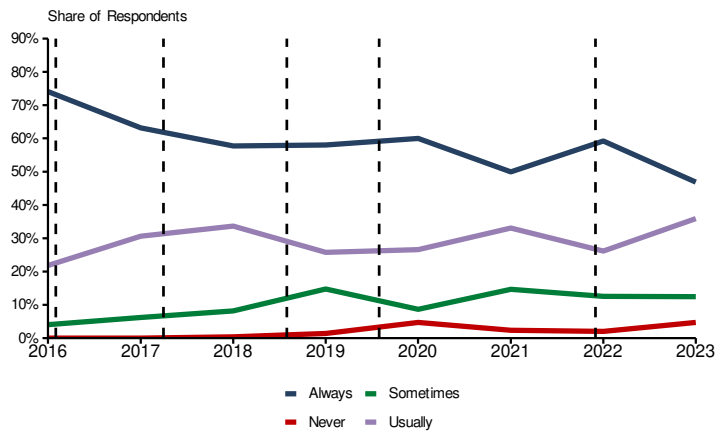
8 or More Hours of Sleep (NSCH)



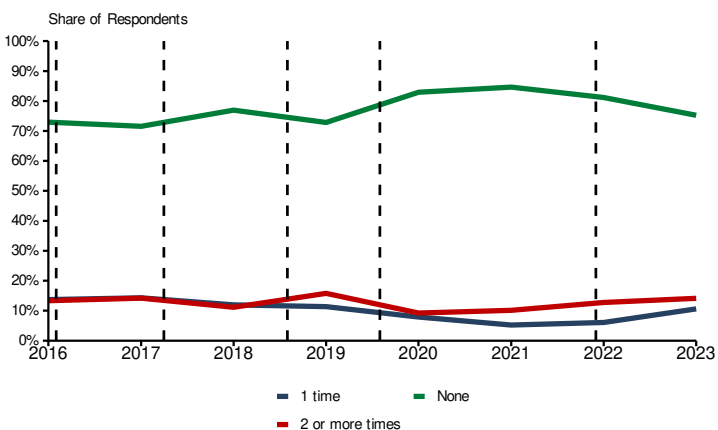
Screen Time (NSCH)



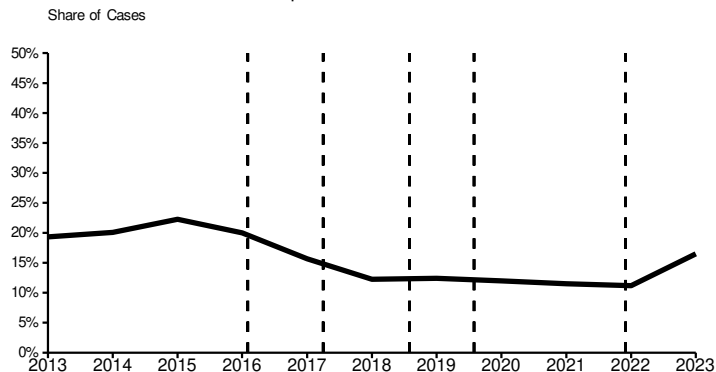
Cares About School Performance (NSCH)

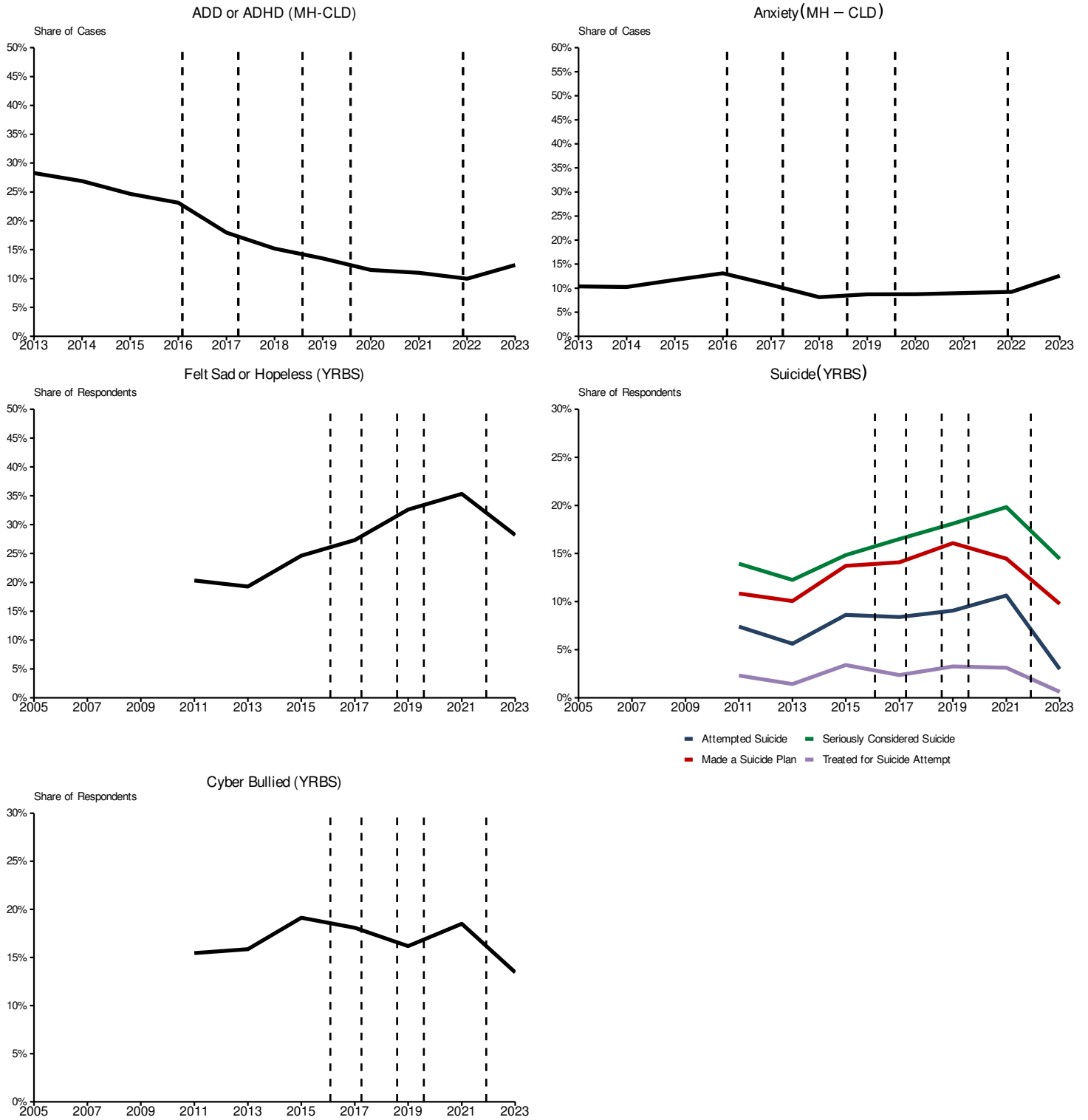


Families Contacted by Schools (NSCH)



Depression(MH - CLD)

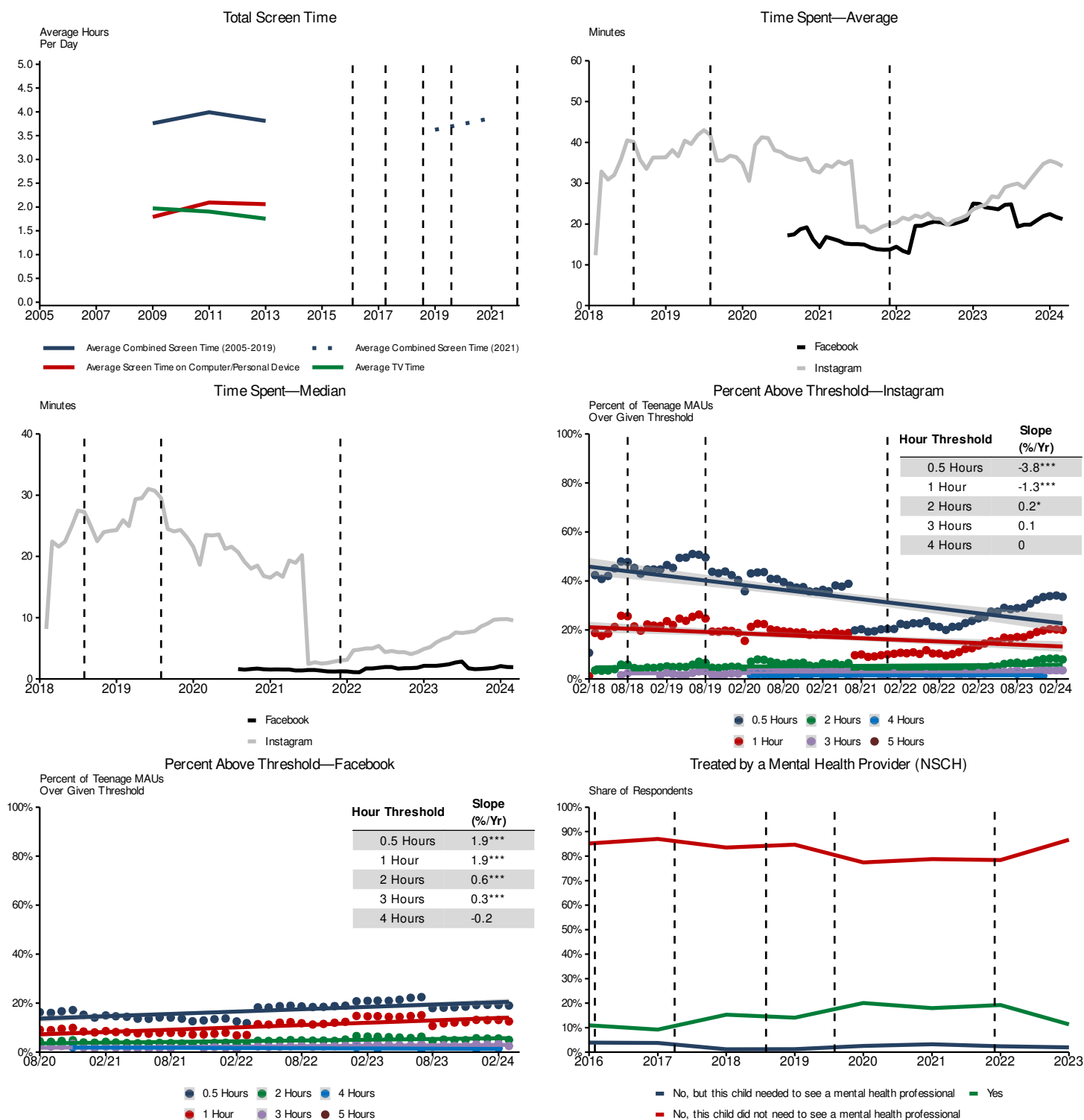




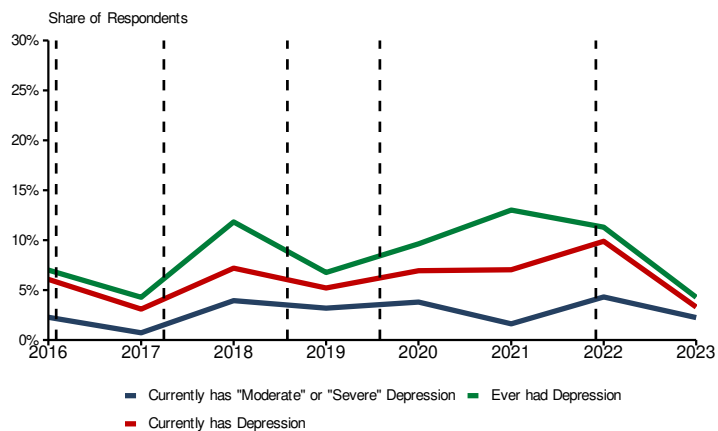
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

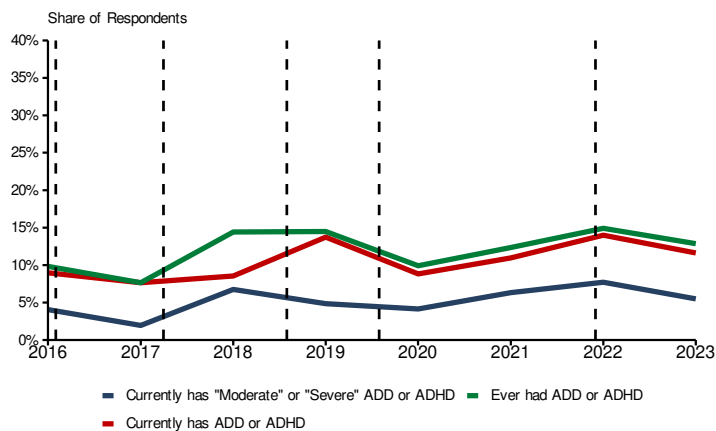
Figure G.12 New Jersey



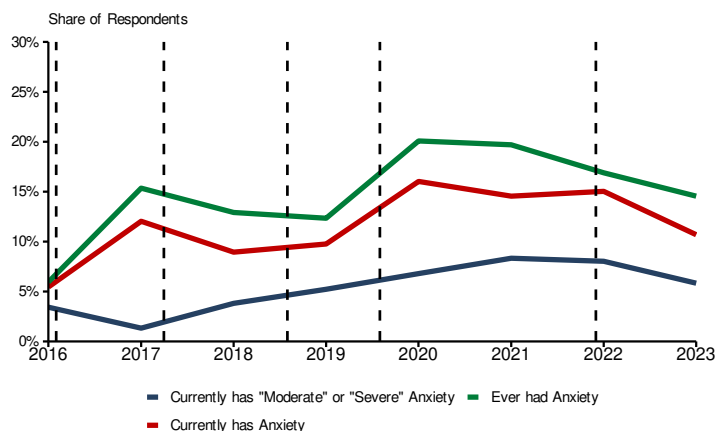
Depression(NSCH)



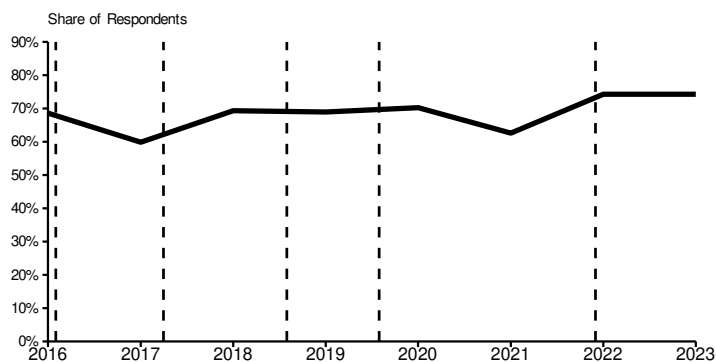
ADD or ADHD (NSCH)



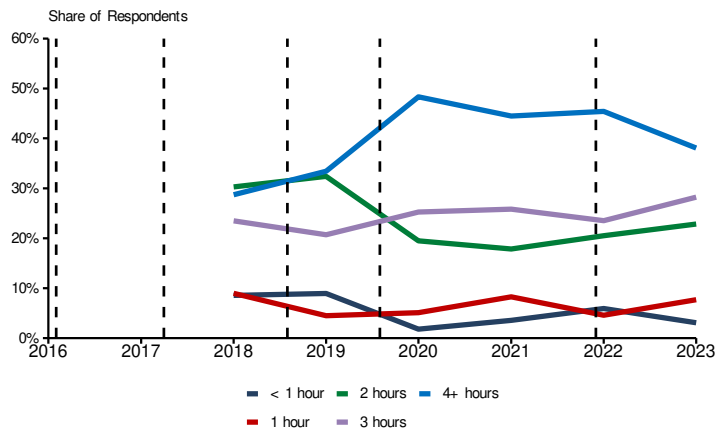
Anxiety(NSCH)



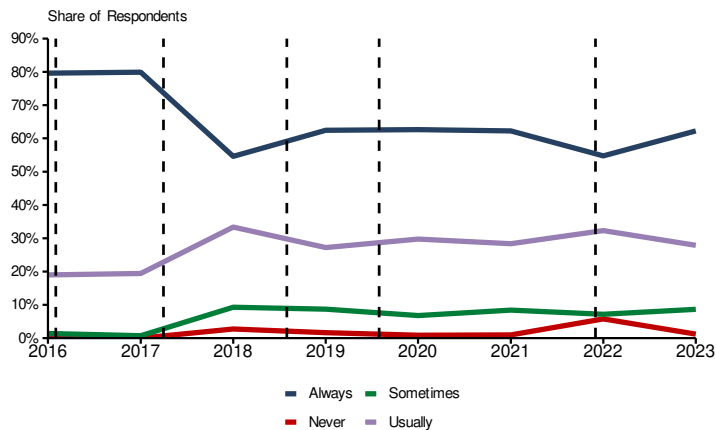
8 or More Hours of Sleep (NSCH)



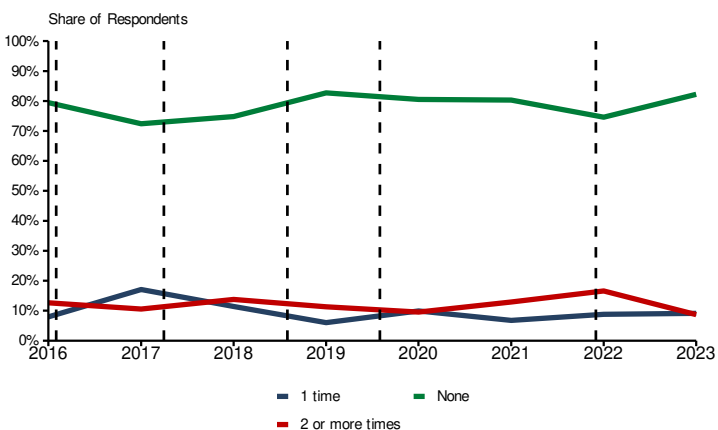
Screen Time (NSCH)



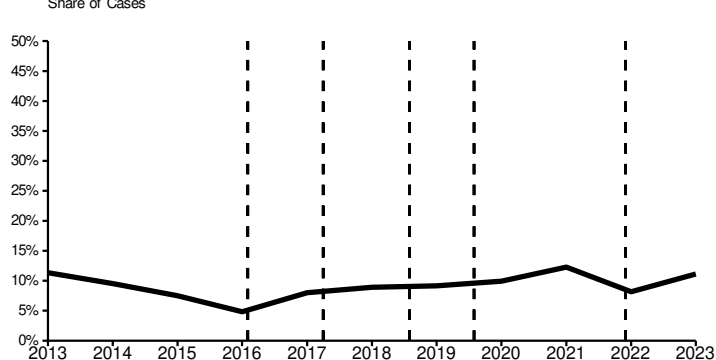
Cares About School Performance (NSCH)

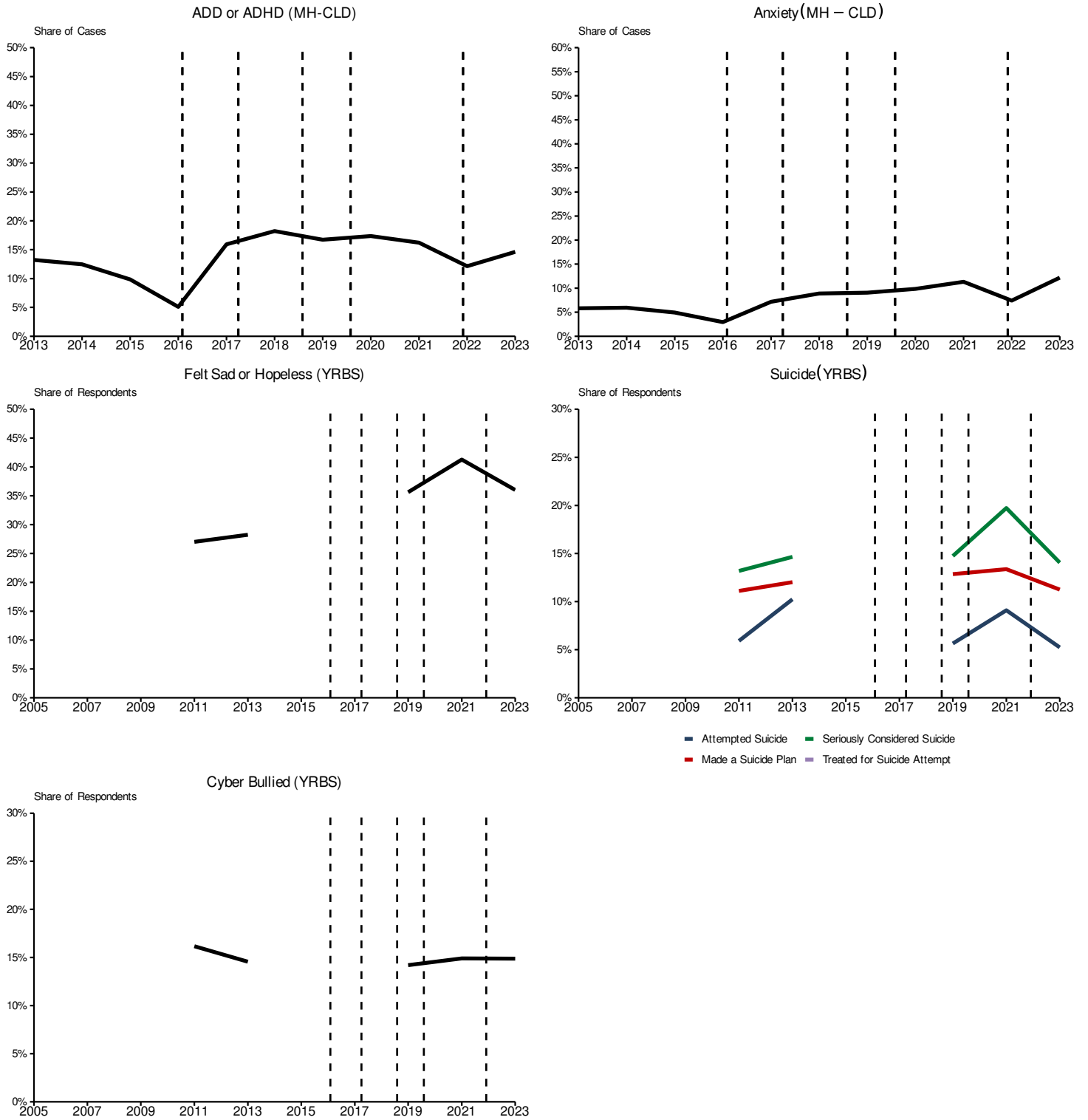


Families Contacted by Schools (NSCH)



Depression(MH - CLD)

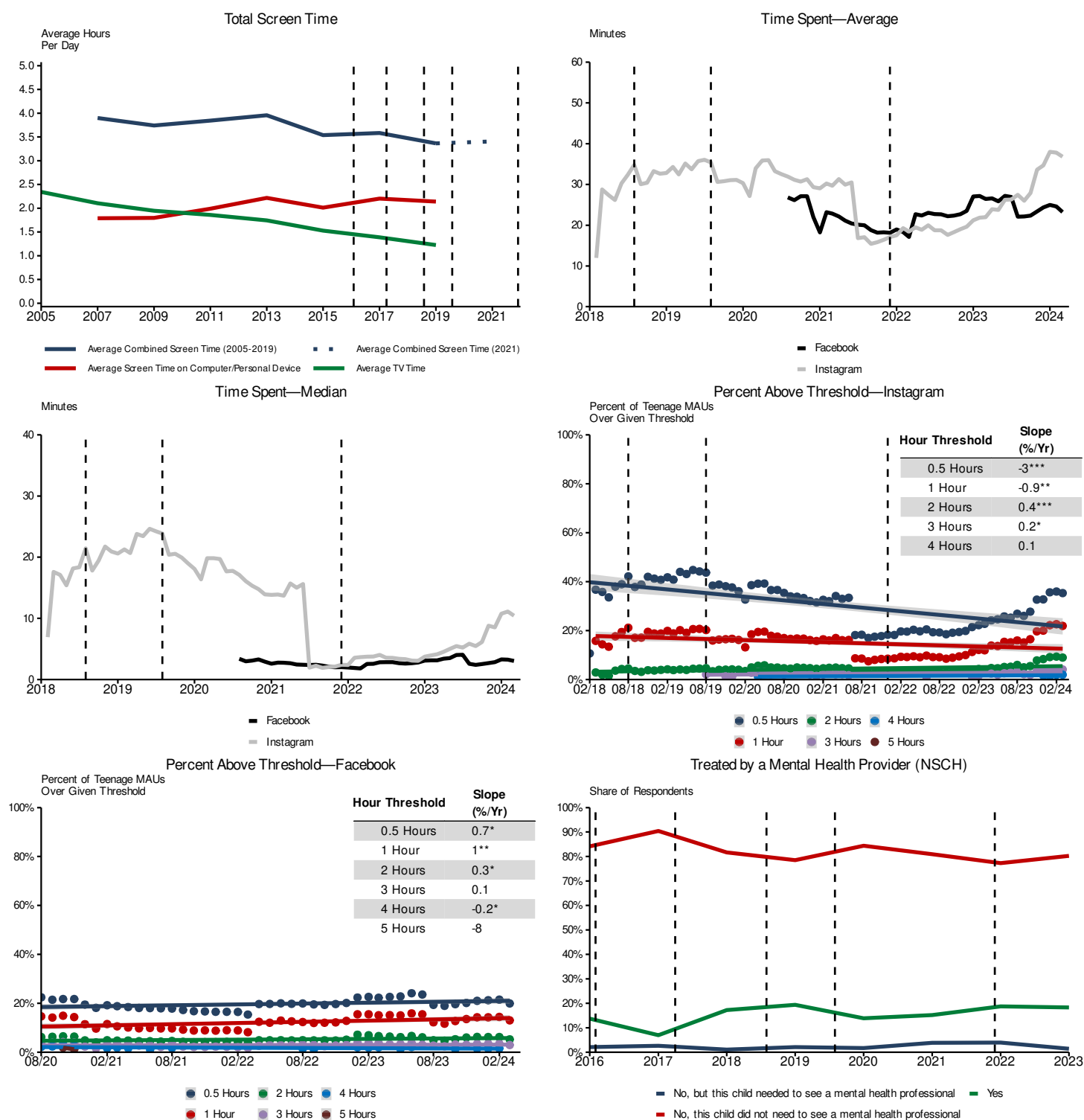




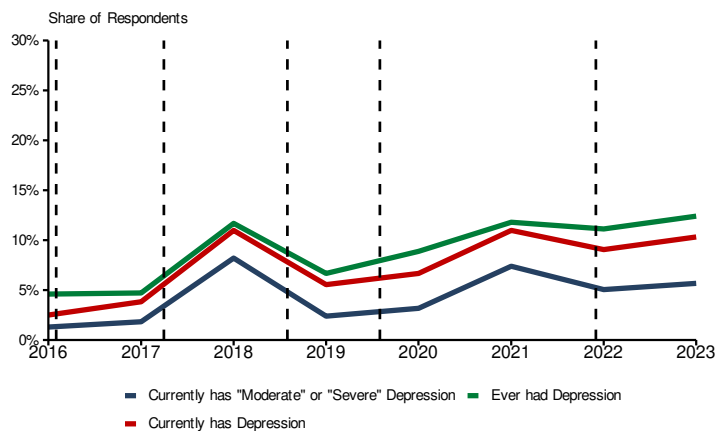
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

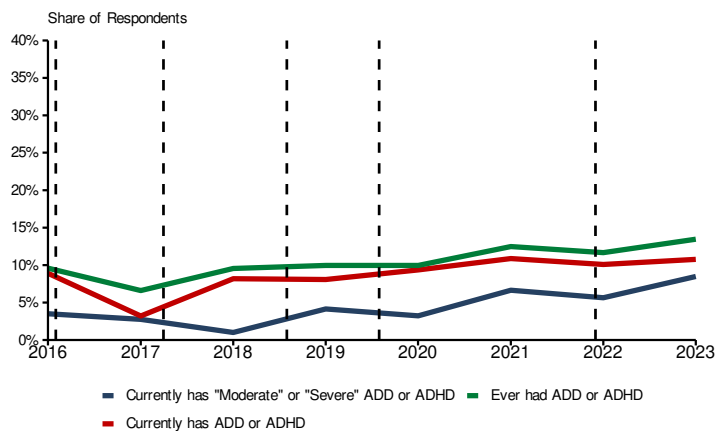
Figure G.13 New York



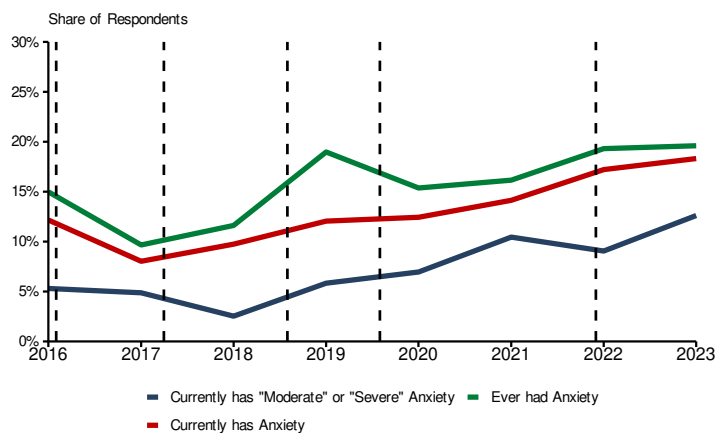
Depression(NSCH)



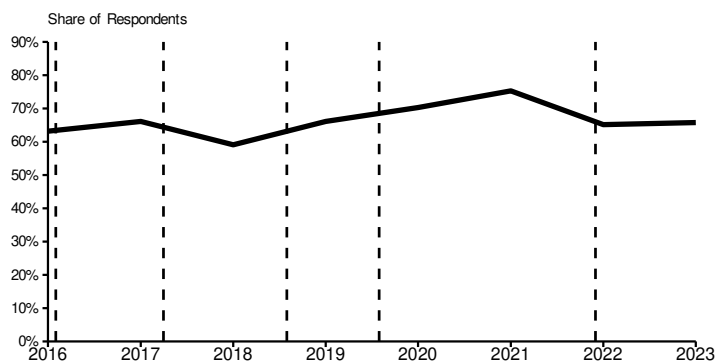
ADD or ADHD (NSCH)



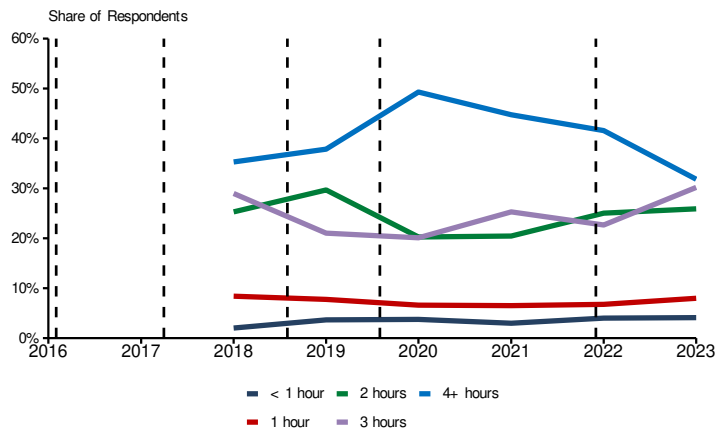
Anxiety(NSCH)



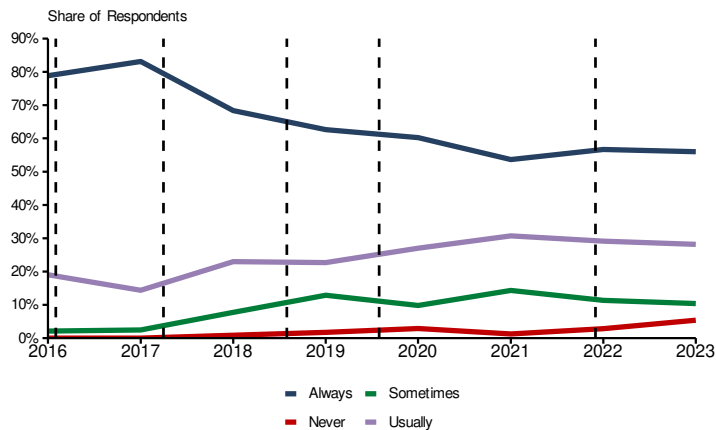
8 or More Hours of Sleep (NSCH)



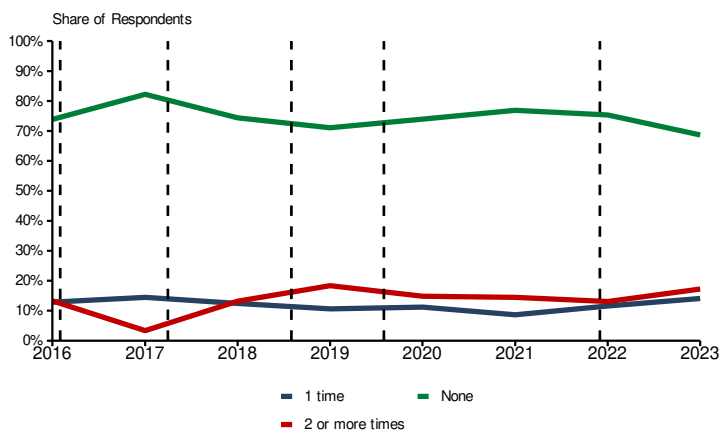
Screen Time (NSCH)



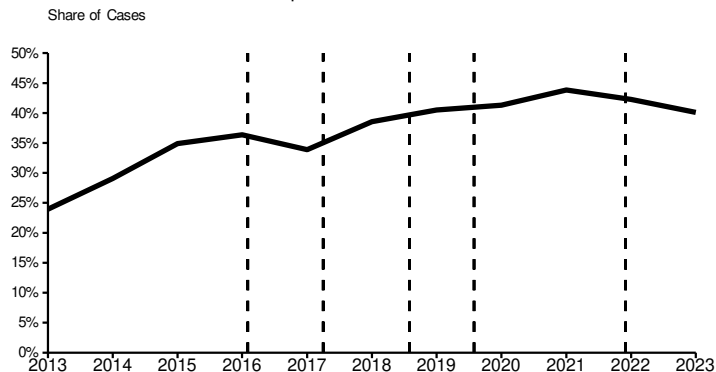
Cares About School Performance (NSCH)

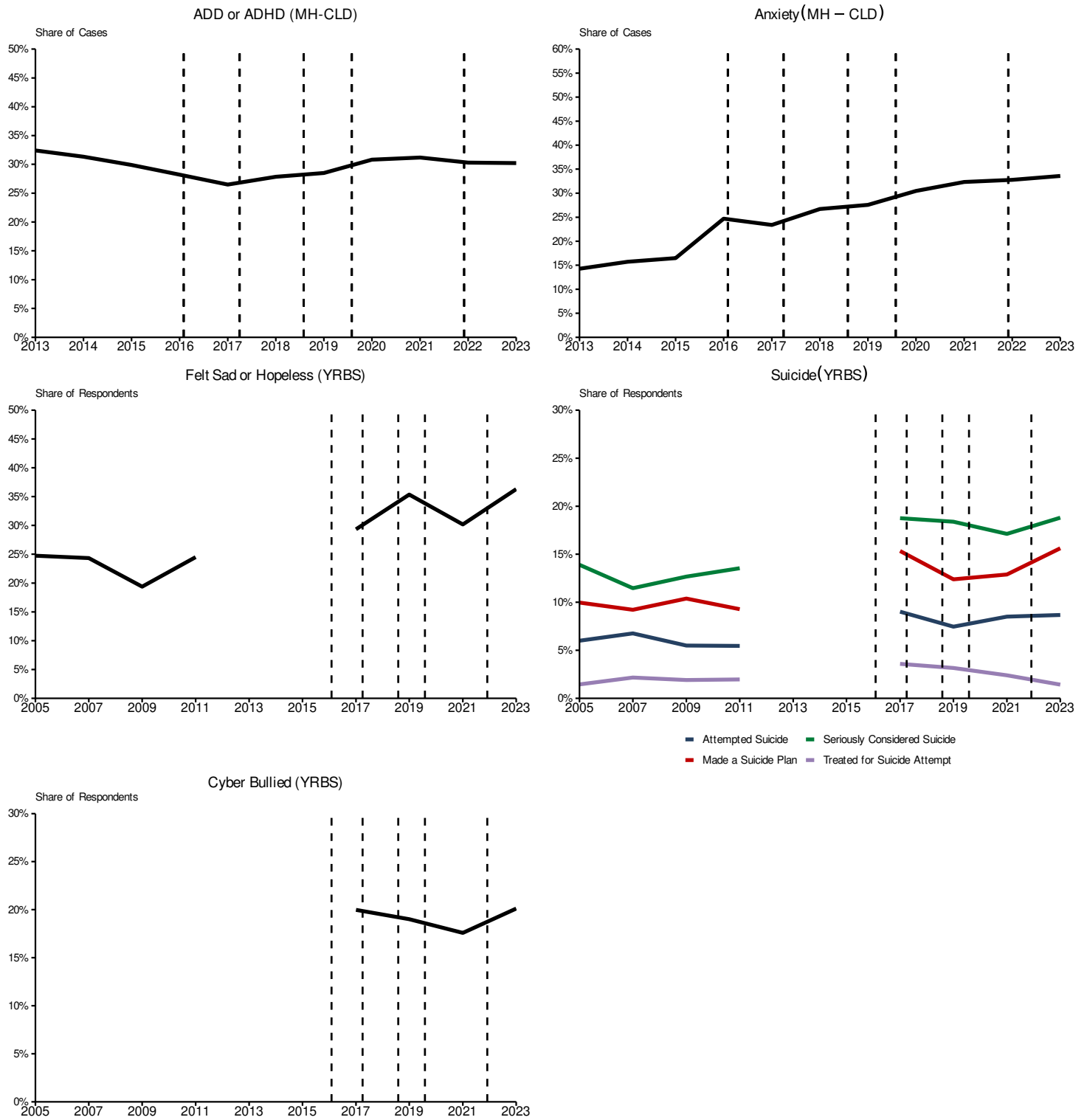


Families Contacted by Schools (NSCH)



Depression(MH – CLD)

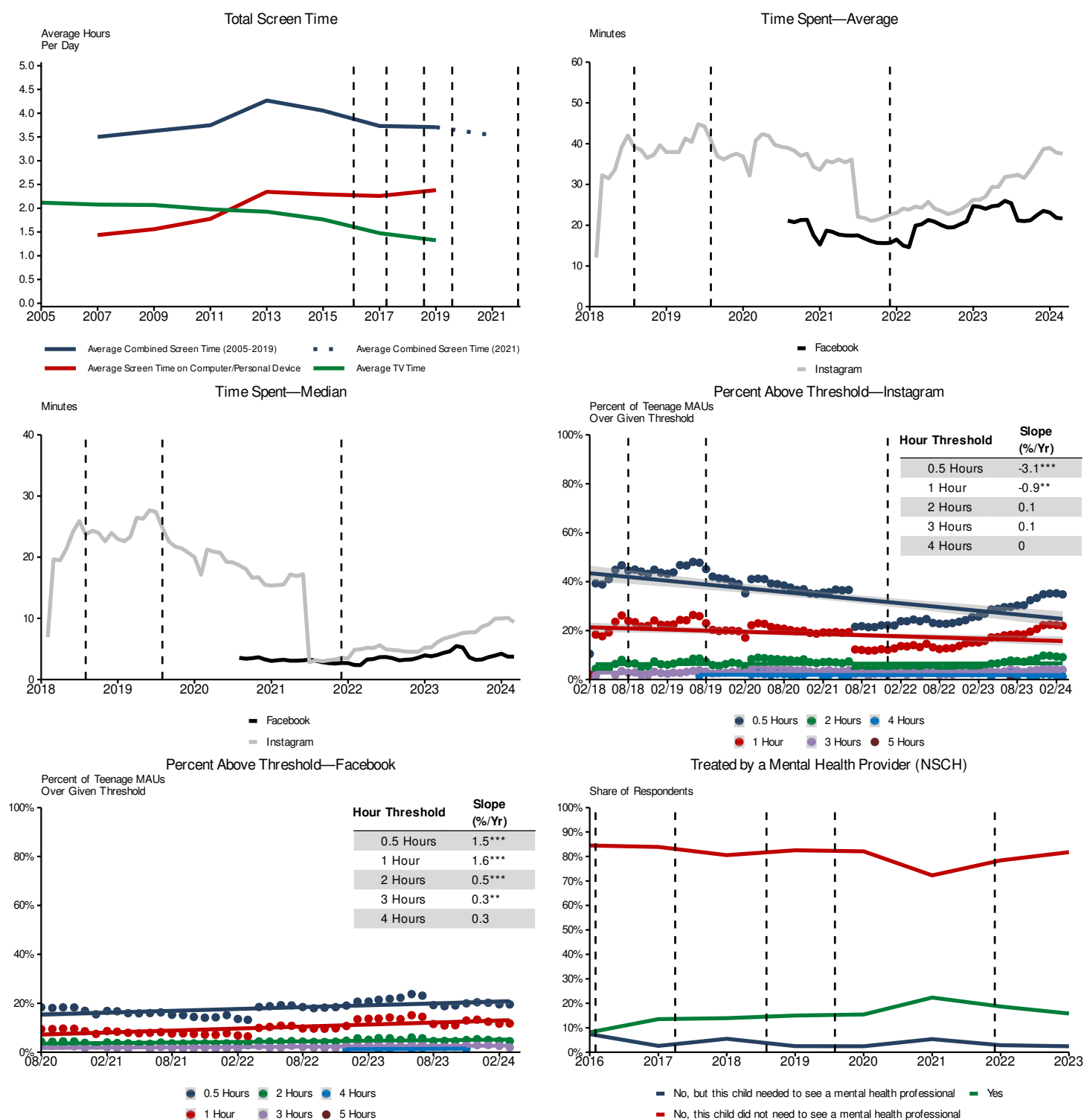




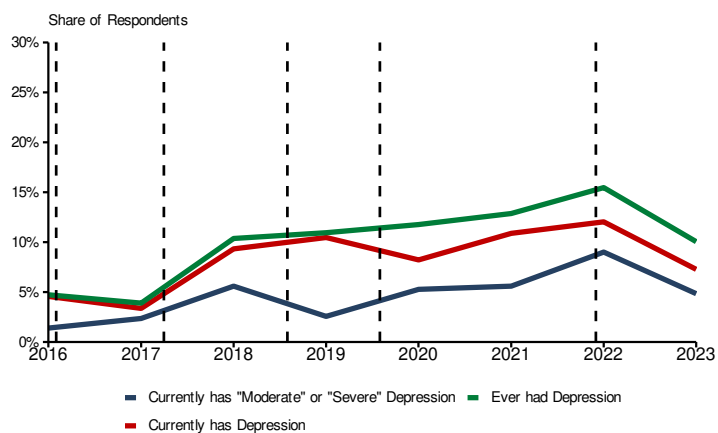
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

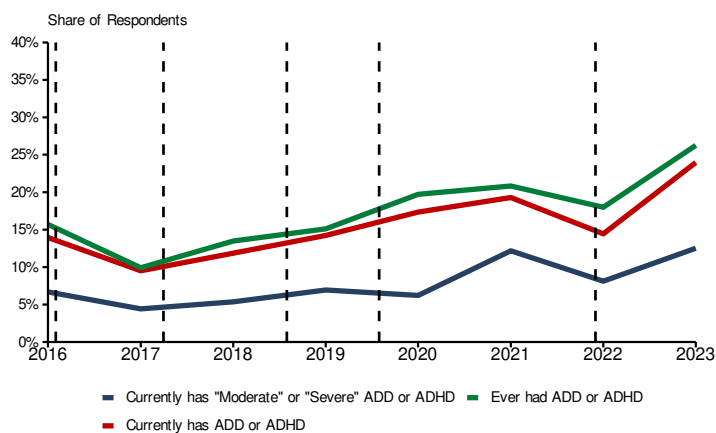
Figure G.14 North Carolina



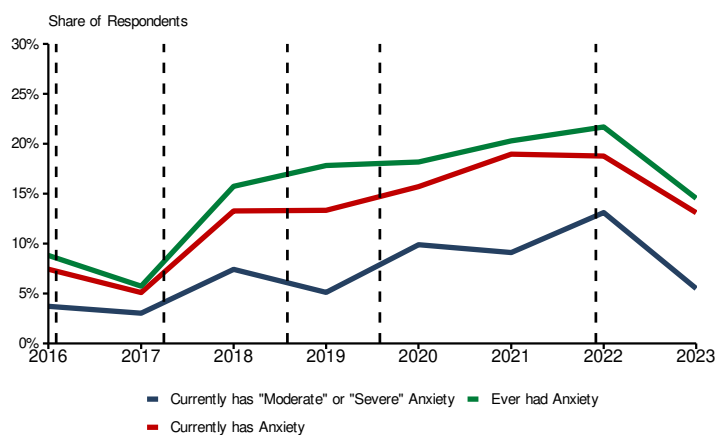
Depression(NSCH)



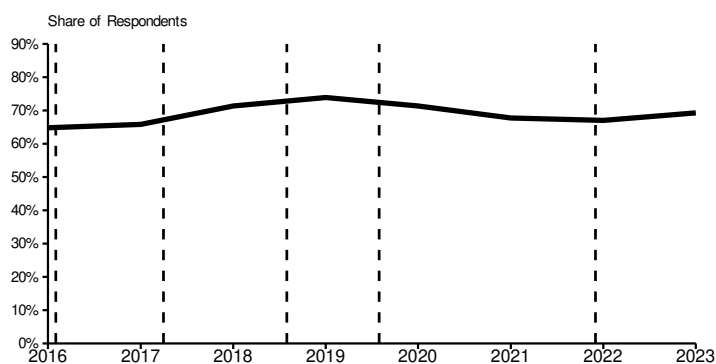
ADD or ADHD (NSCH)



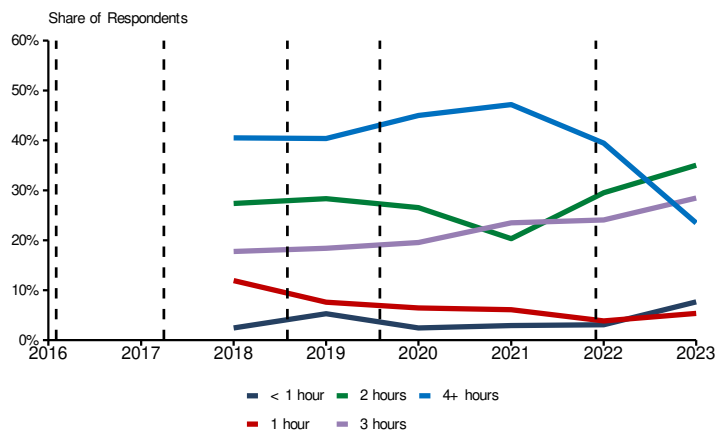
Anxiety(NSCH)



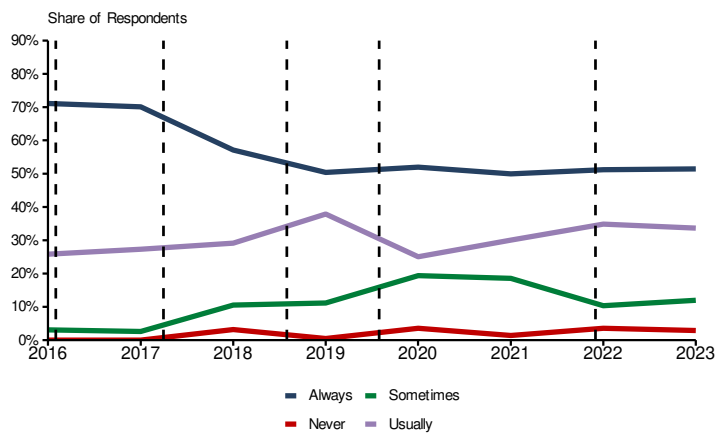
8 or More Hours of Sleep (NSCH)



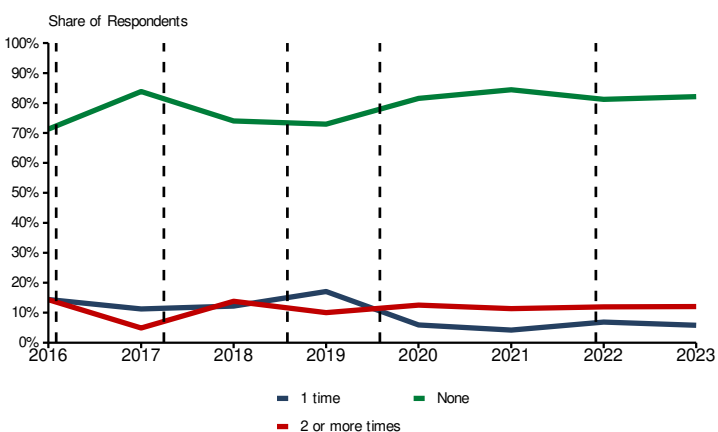
Screen Time (NSCH)



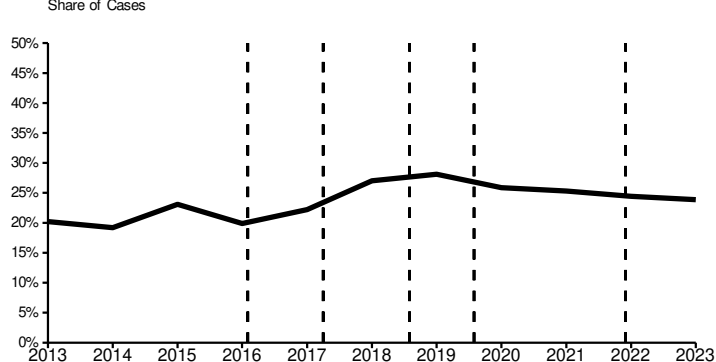
Cares About School Performance (NSCH)

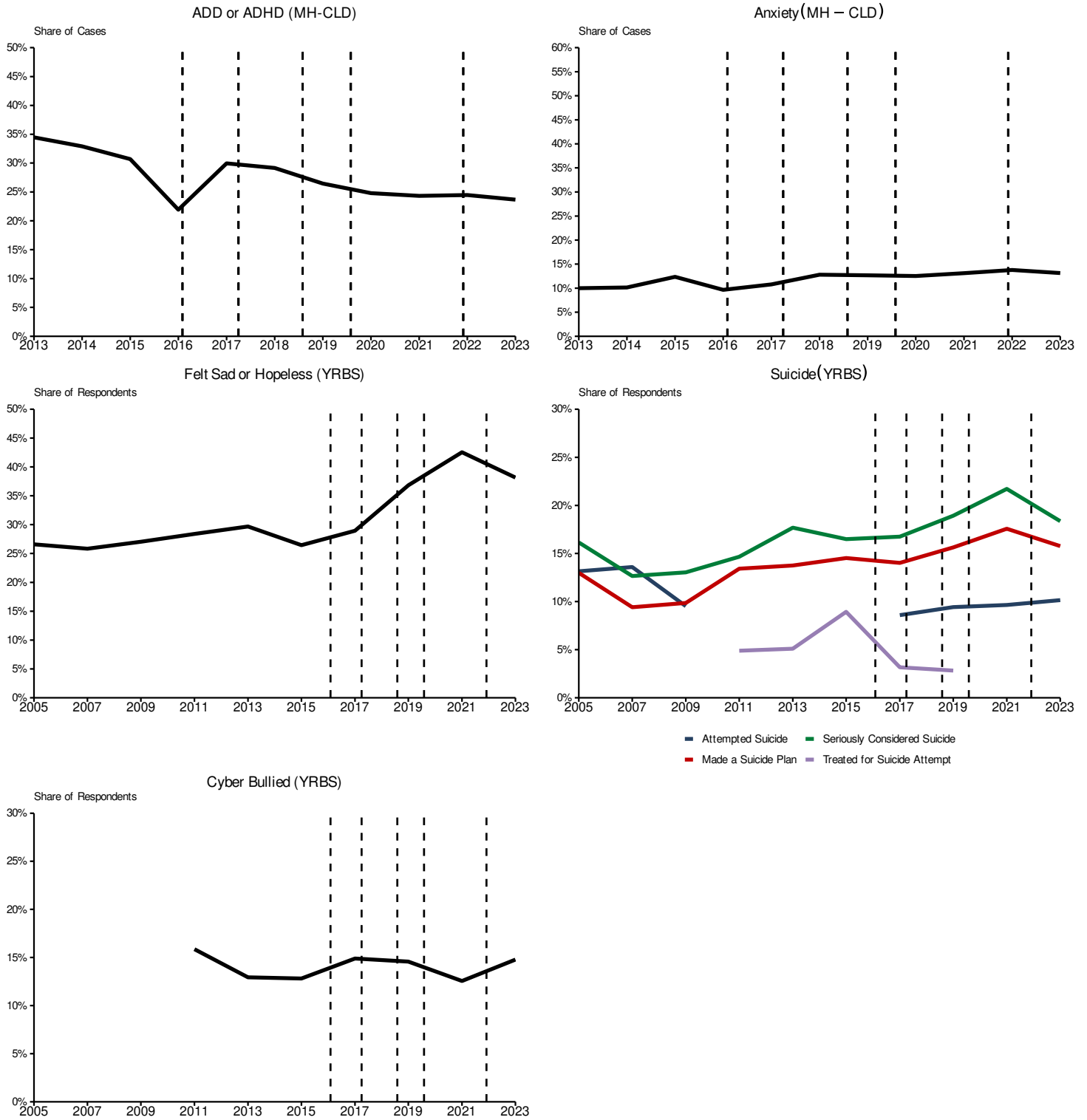


Families Contacted by Schools (NSCH)



Depression(MH - CLD)

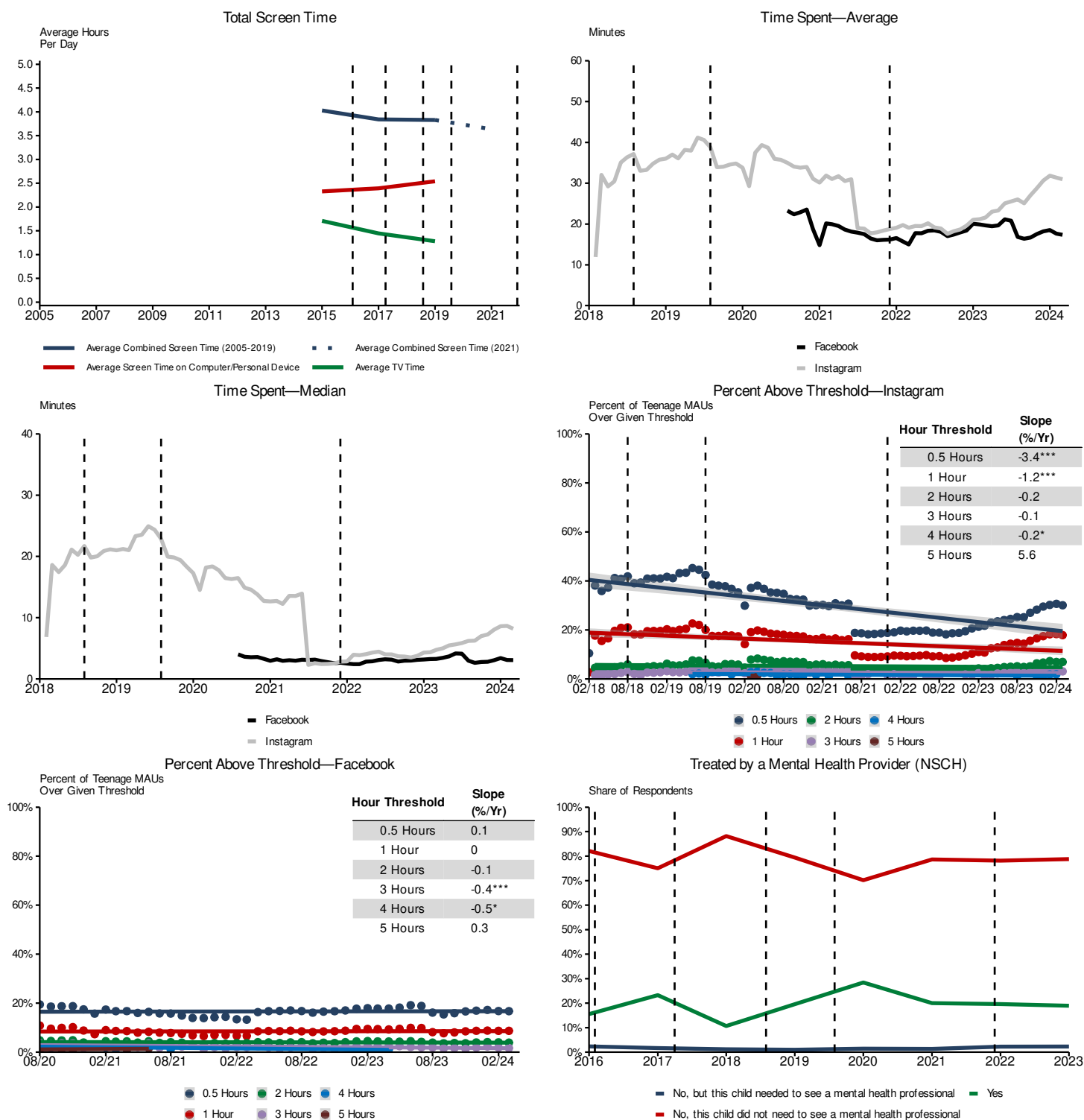




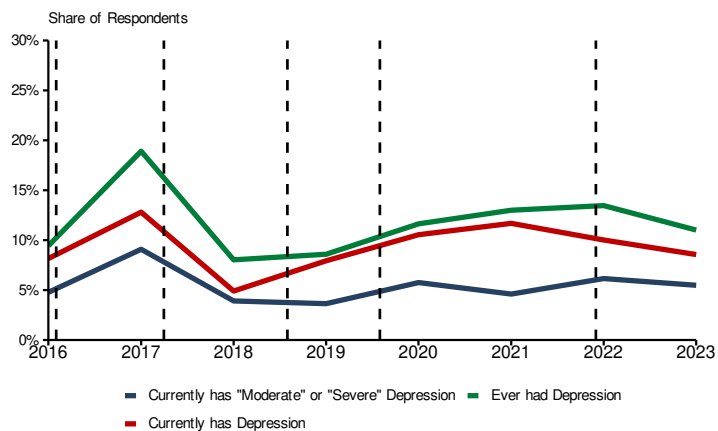
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

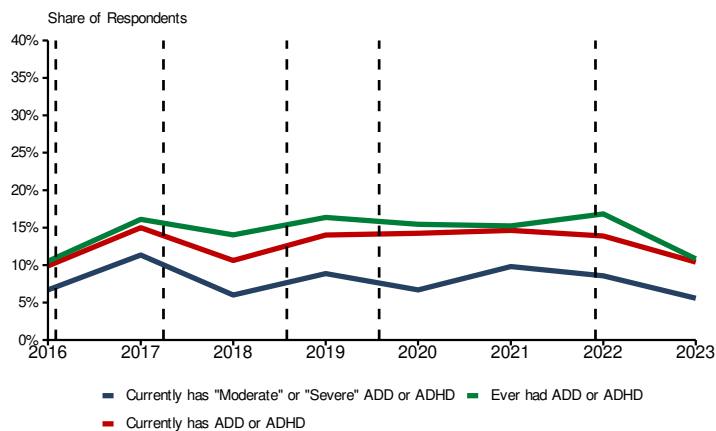
Figure G.15 Pennsylvania



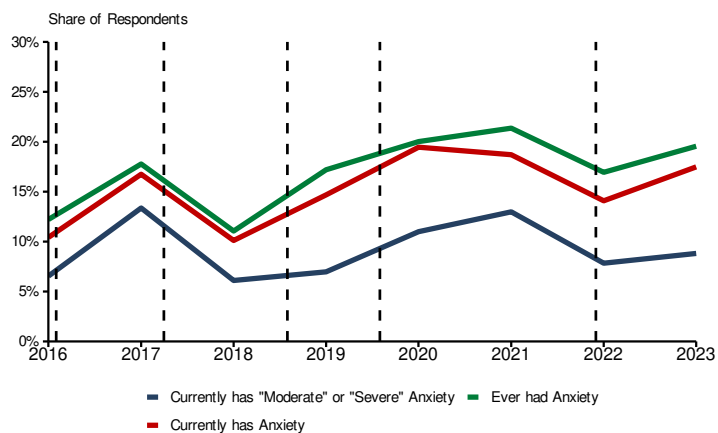
Depression(NSCH)



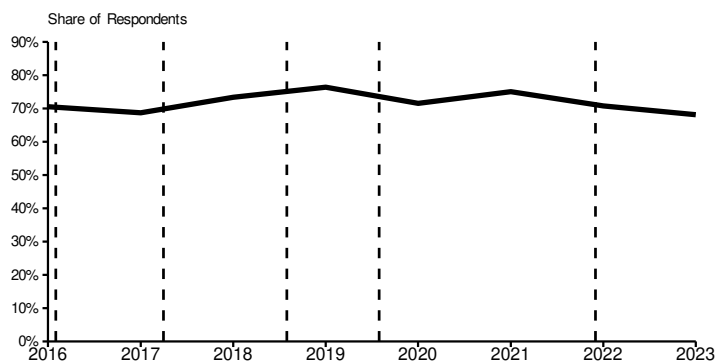
ADD or ADHD (NSCH)



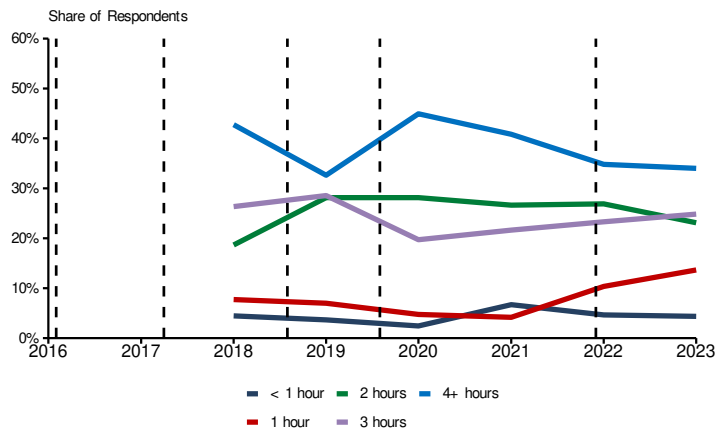
Anxiety(NSCH)



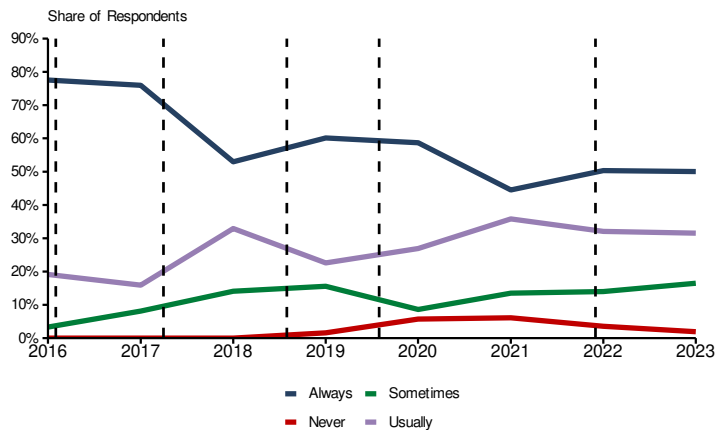
8 or More Hours of Sleep (NSCH)



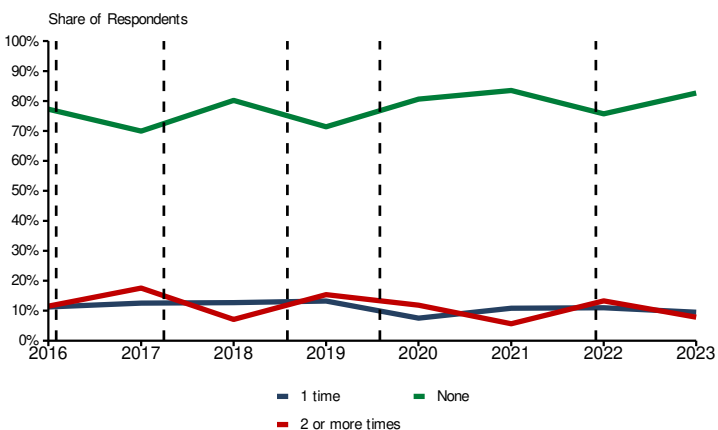
Screen Time (NSCH)



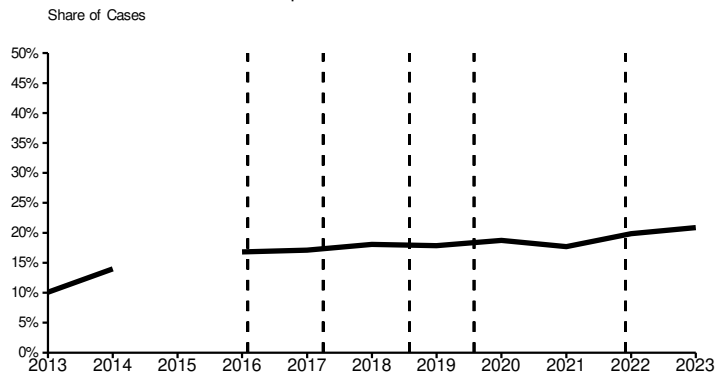
Cares About School Performance (NSCH)

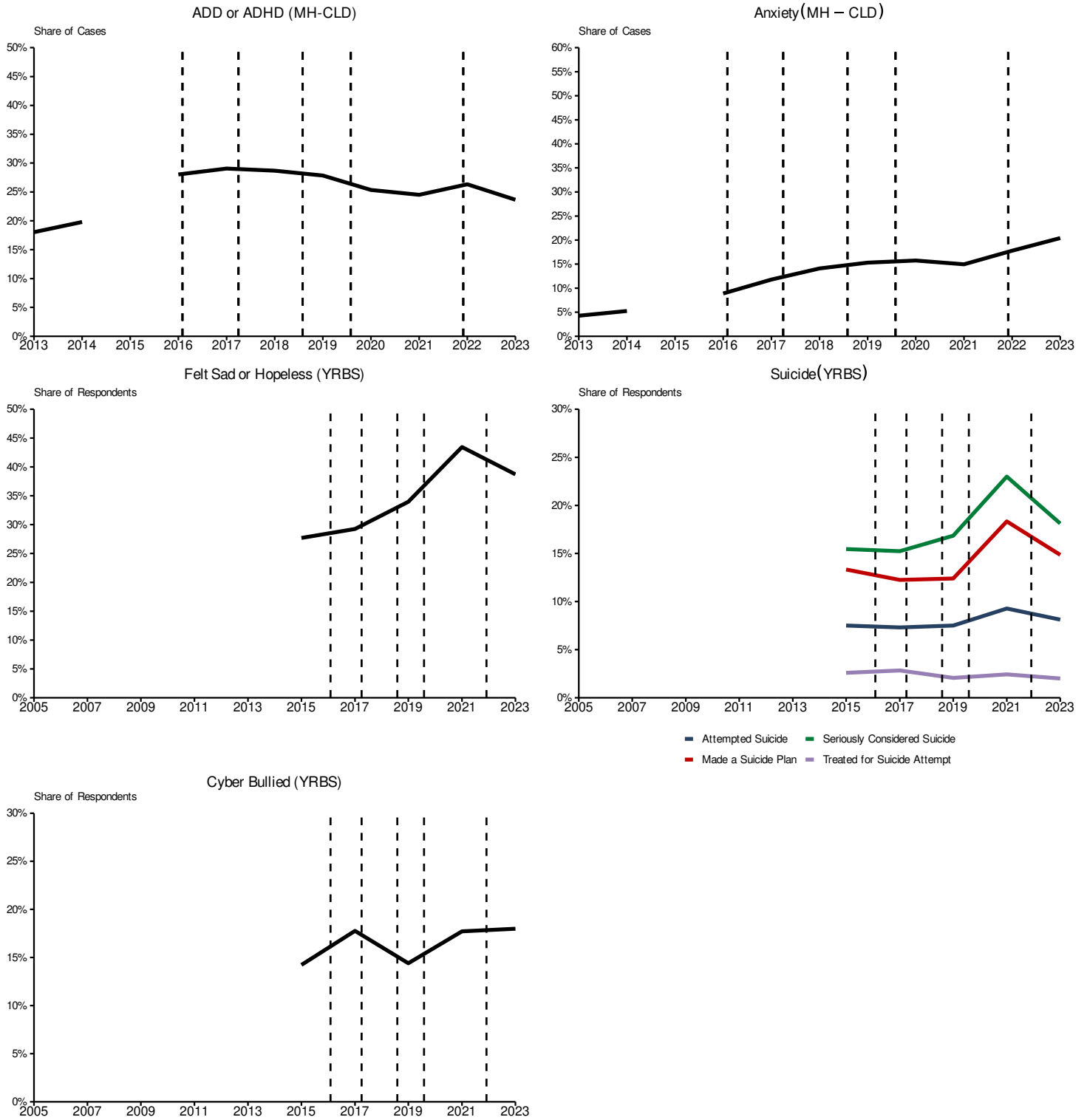


Families Contacted by Schools (NSCH)



Depression(MH - CLD)

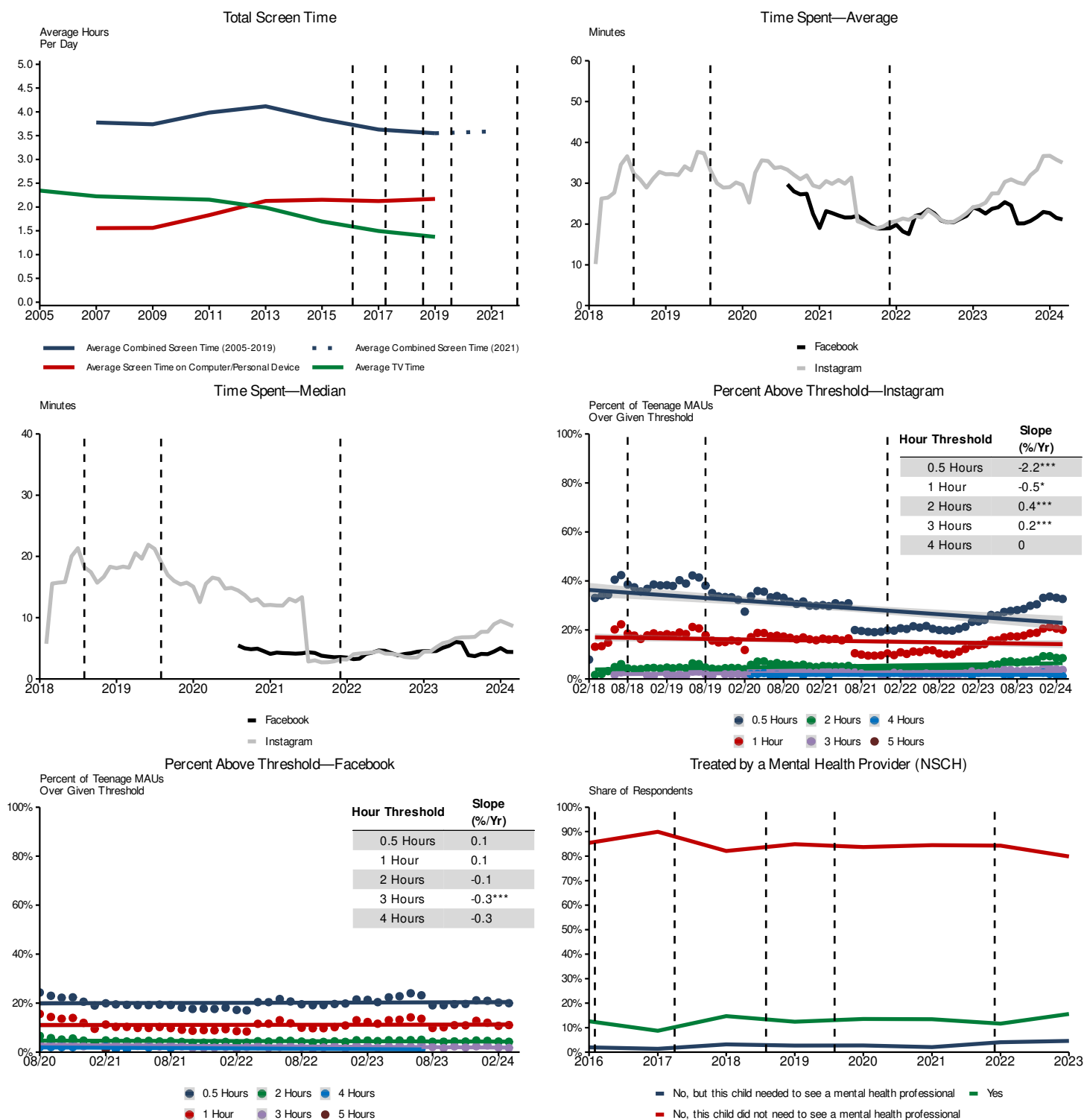




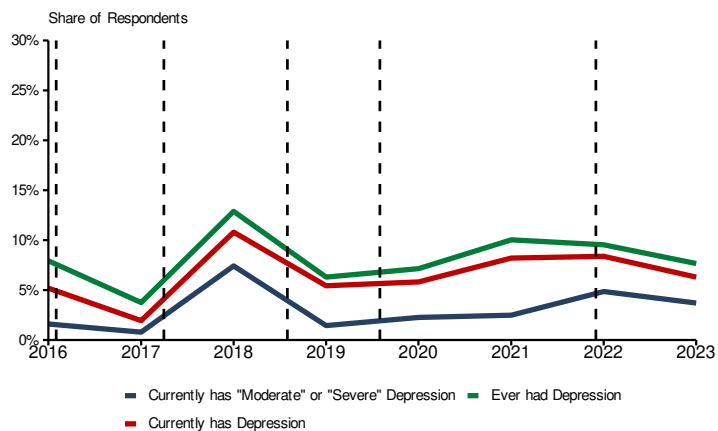
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

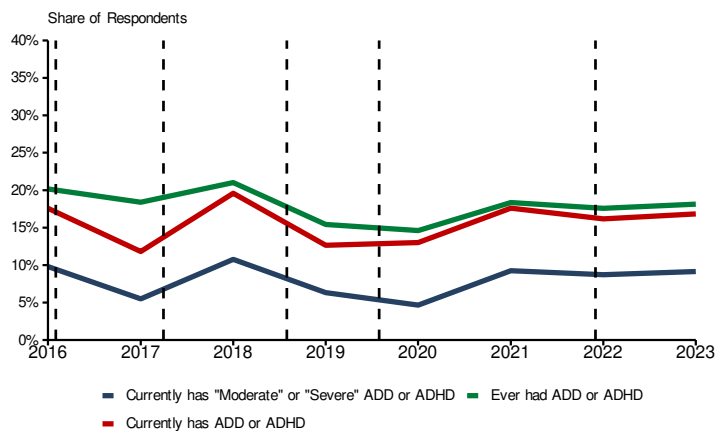
Figure G.16 South Carolina



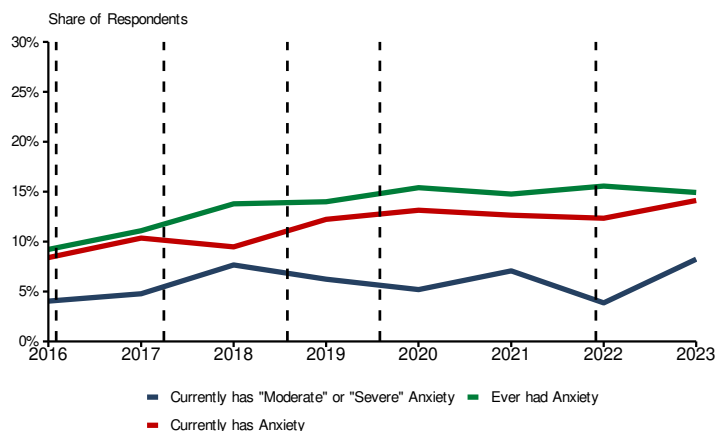
Depression(NSCH)



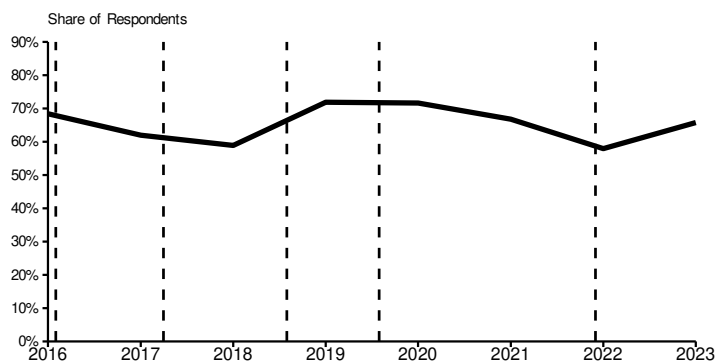
ADD or ADHD (NSCH)



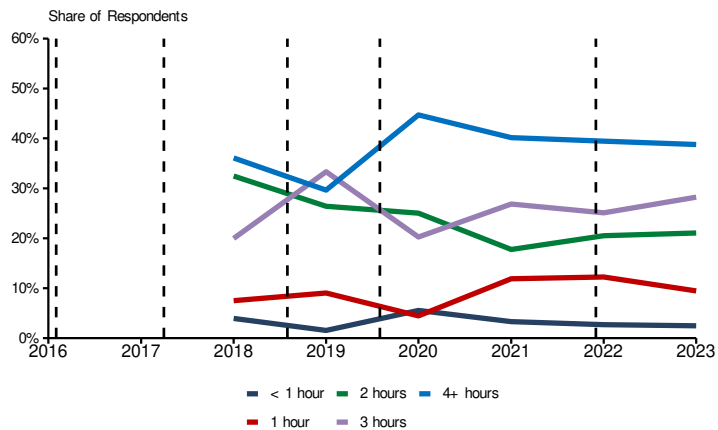
Anxiety(NSCH)



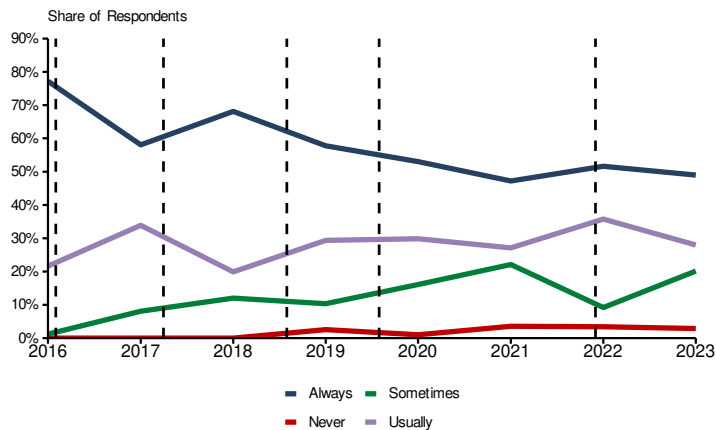
8 or More Hours of Sleep (NSCH)



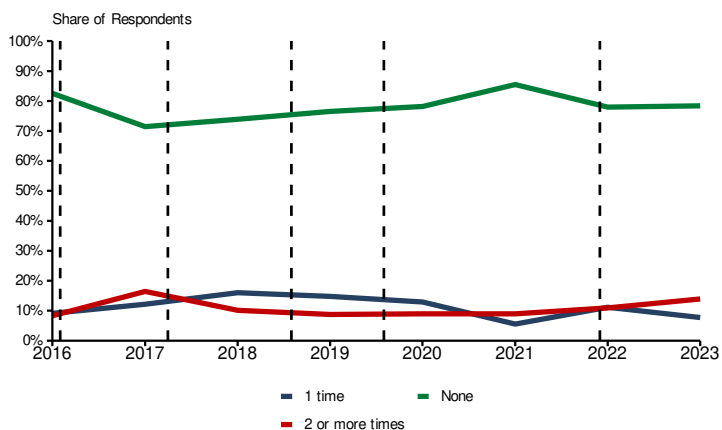
Screen Time (NSCH)



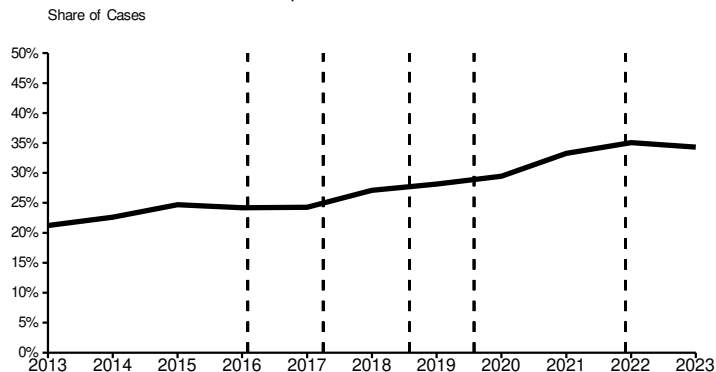
Cares About School Performance (NSCH)

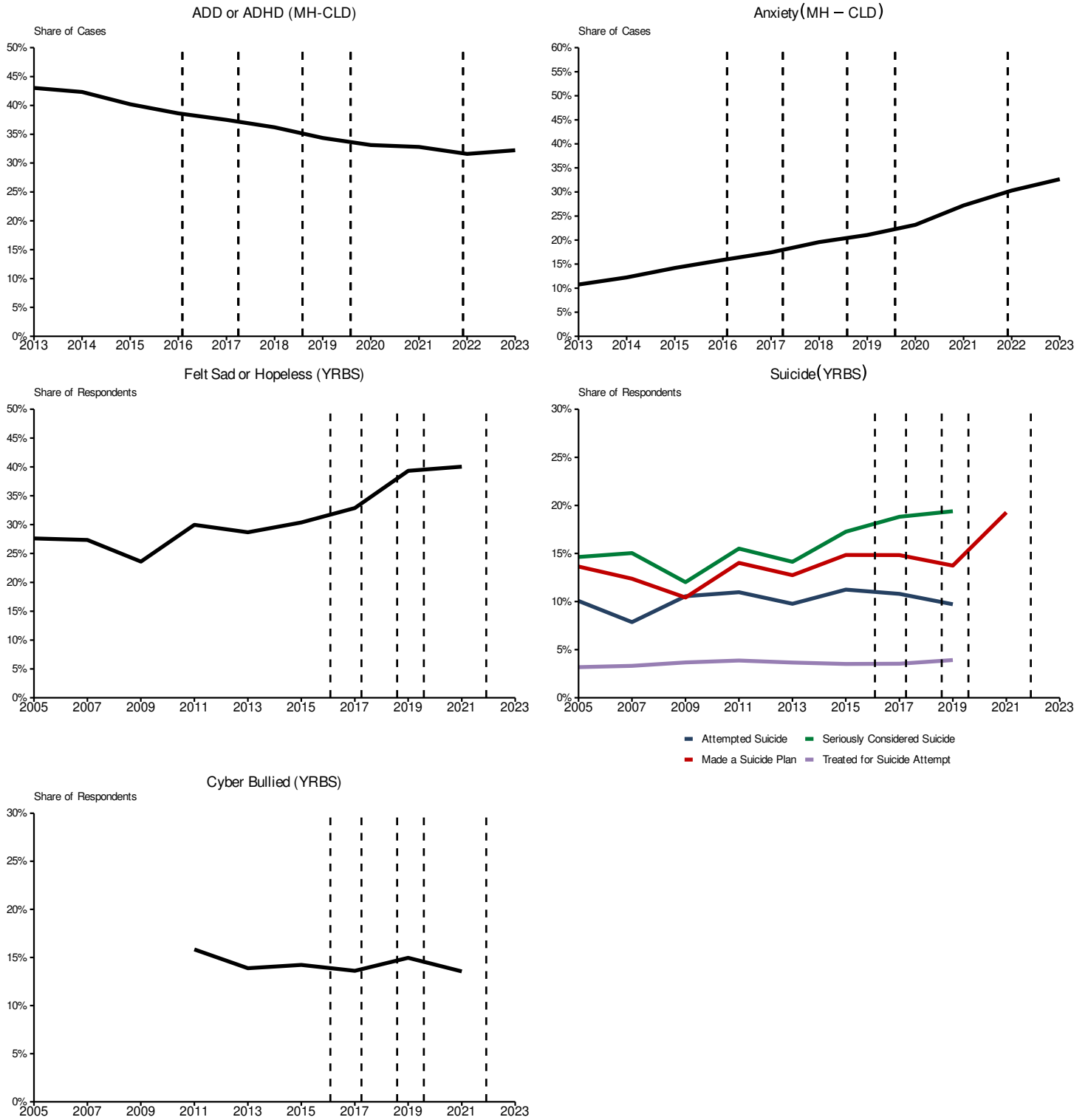


Families Contacted by Schools (NSCH)



Depression(MH - CLD)

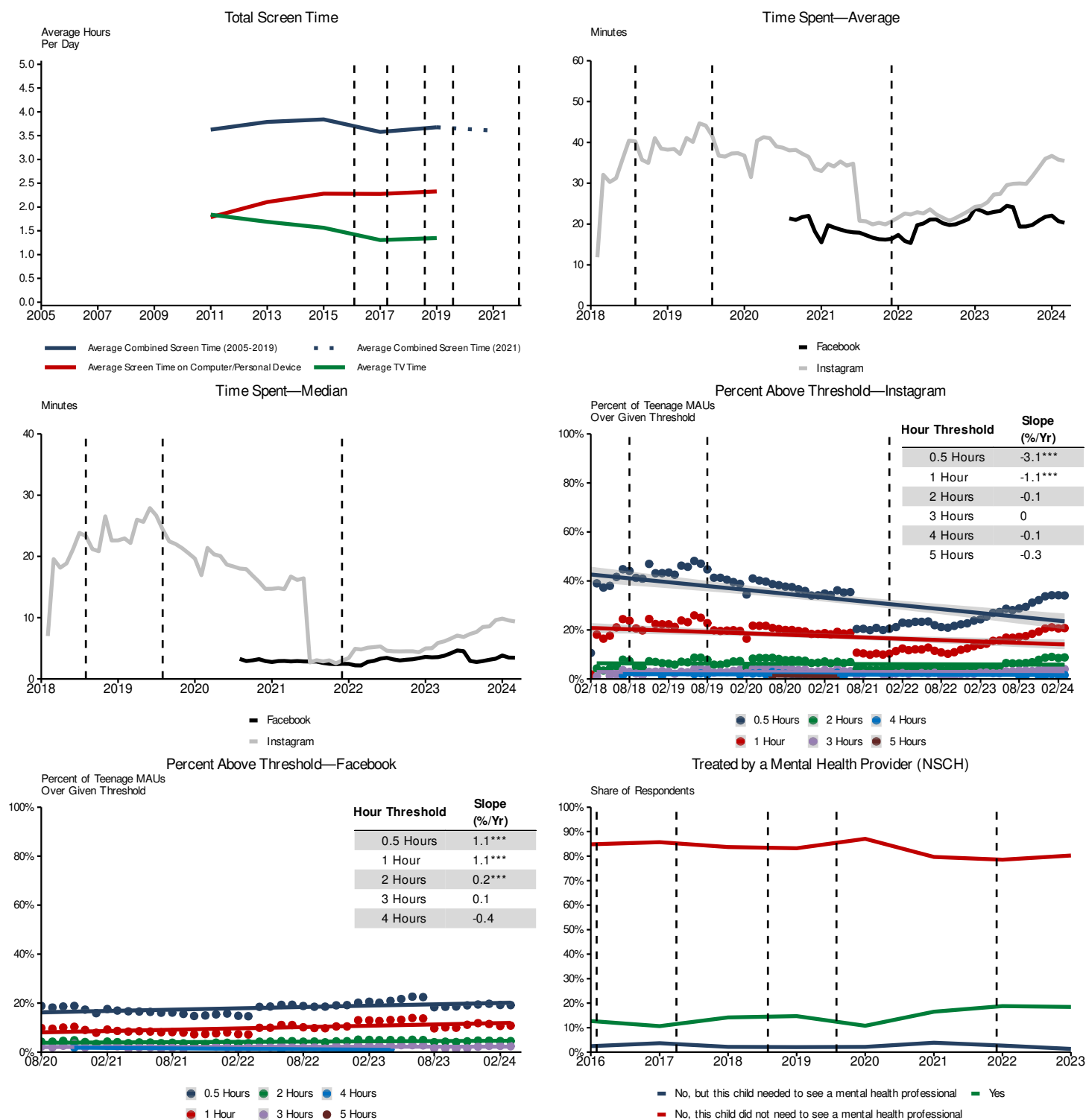




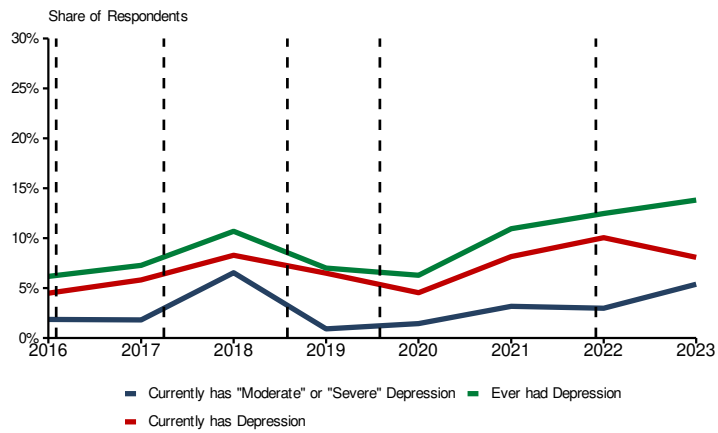
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

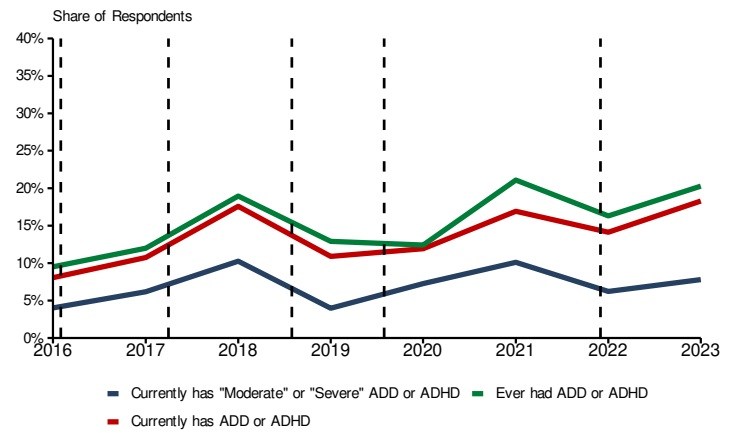
Figure G.17 Virginia



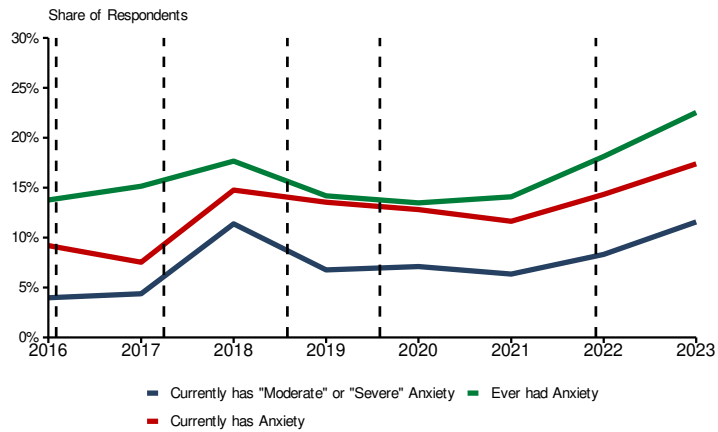
Depression(NSCH)



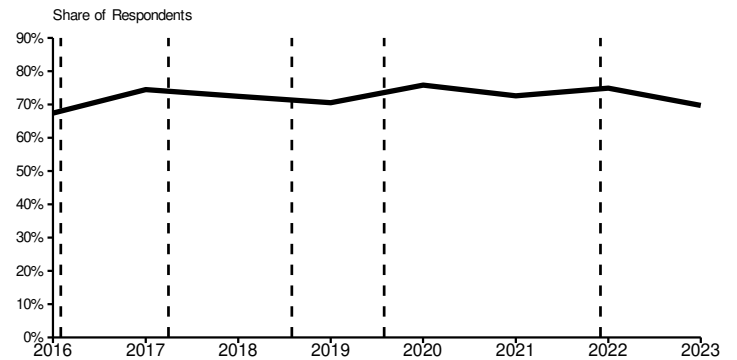
ADD or ADHD (NSCH)



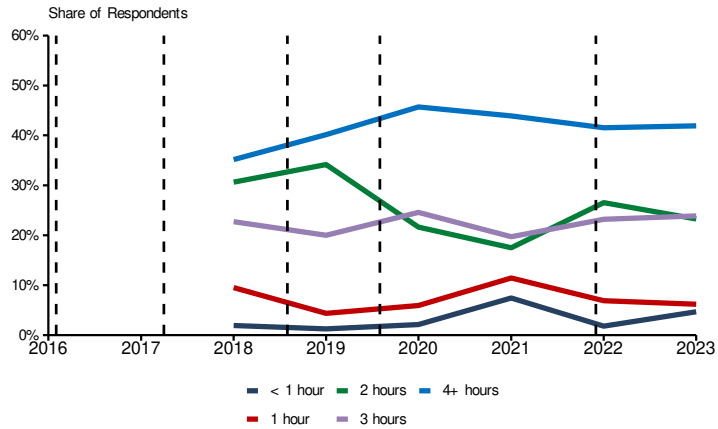
Anxiety(NSCH)



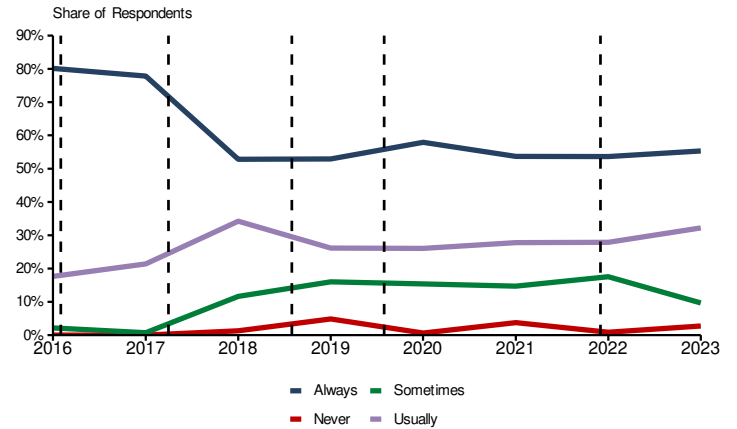
8 or More Hours of Sleep (NSCH)



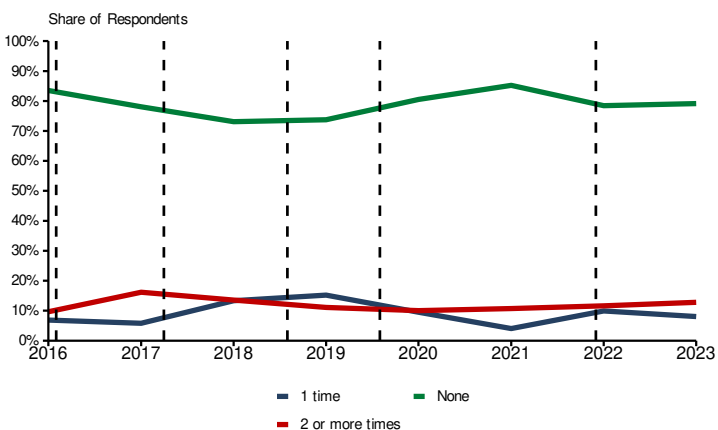
Screen Time (NSCH)



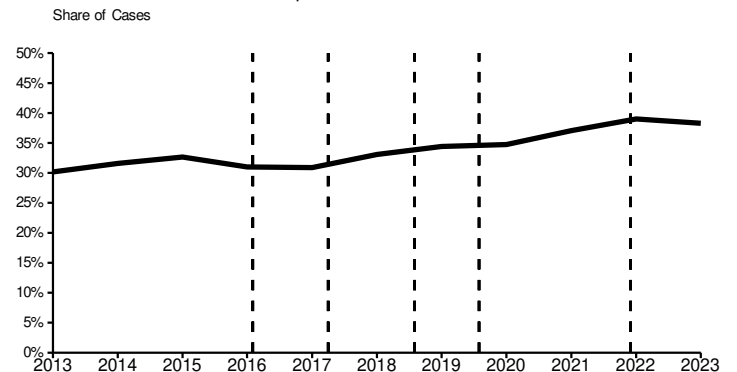
Cares About School Performance (NSCH)

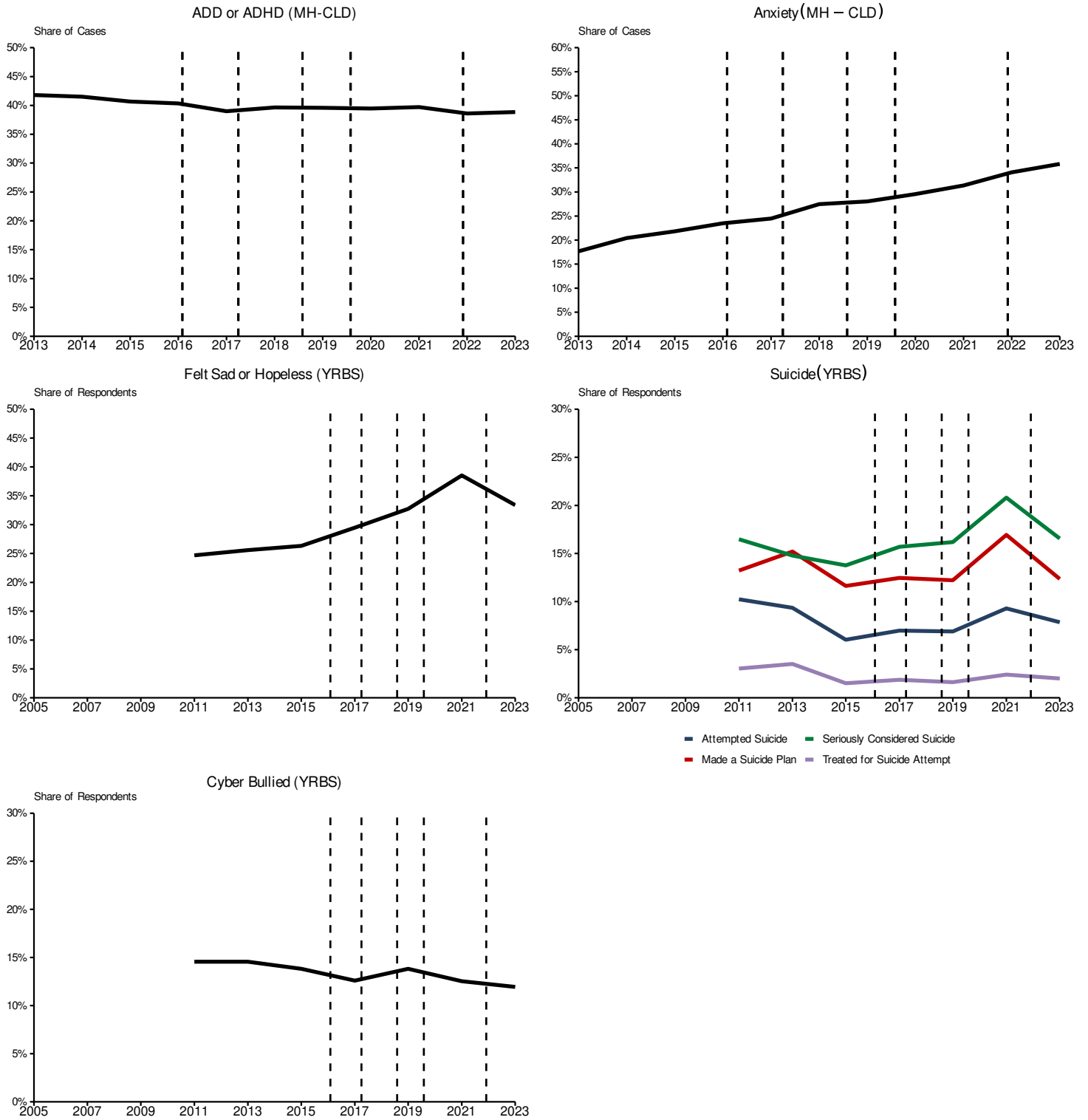


Families Contacted by Schools (NSCH)



Depression(MH – CLD)

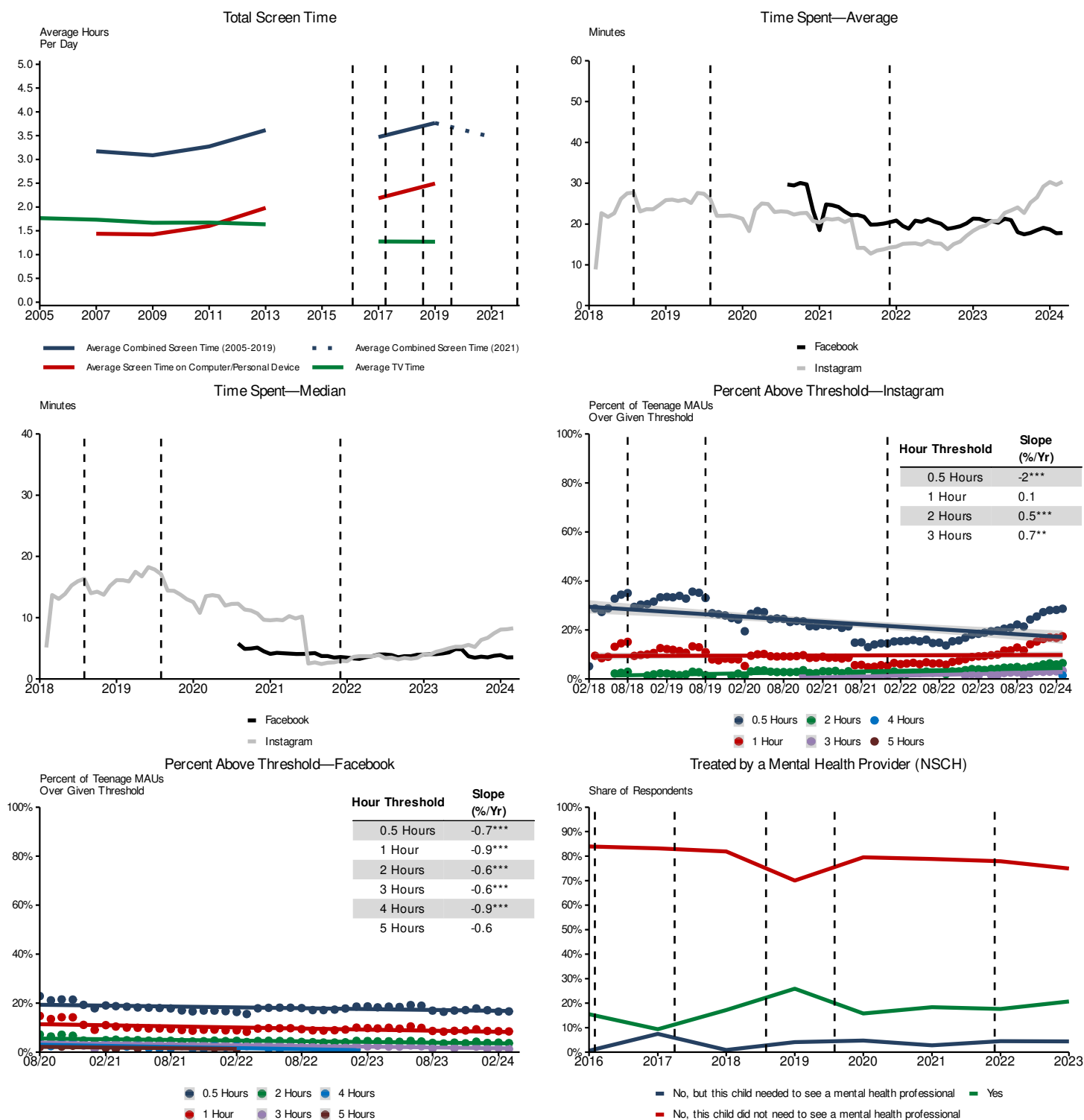




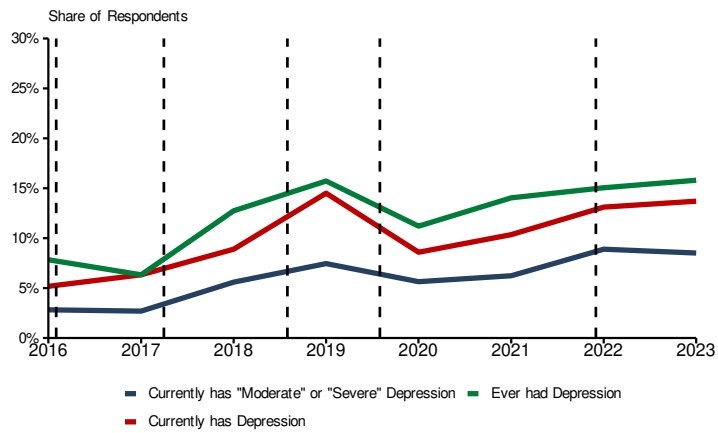
Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

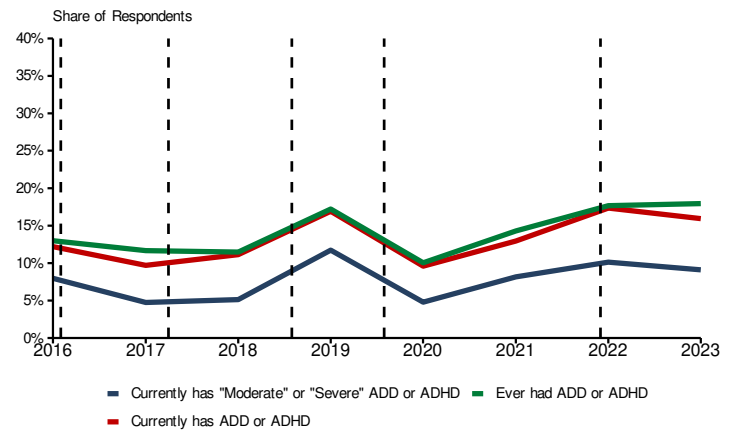
Figure G.18 Wisconsin



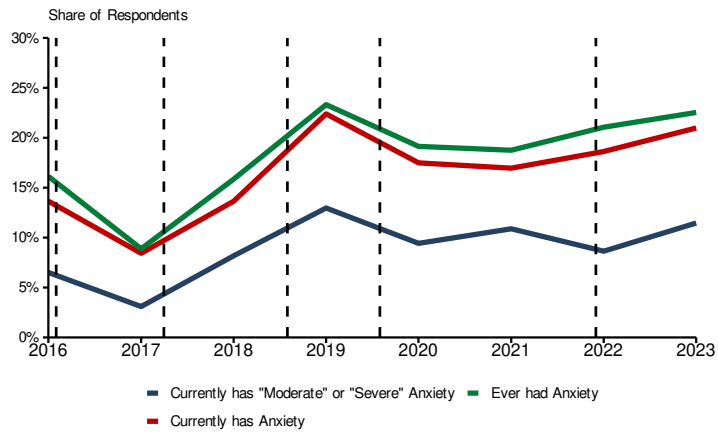
Depression(NSCH)



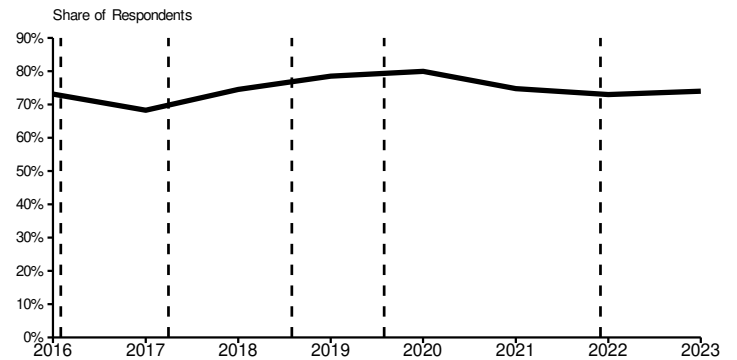
ADD or ADHD (NSCH)



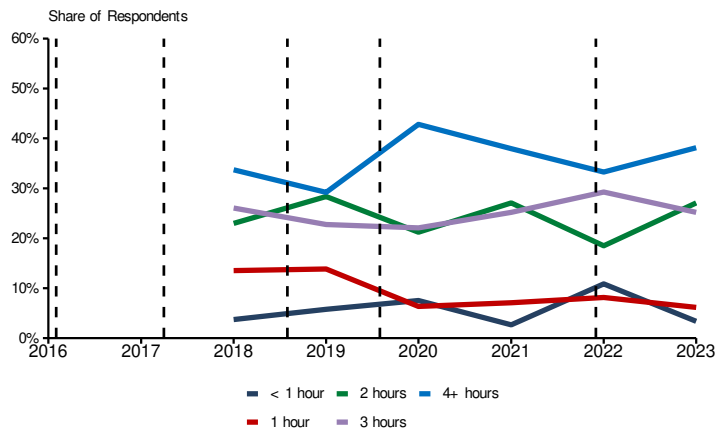
Anxiety(NSCH)



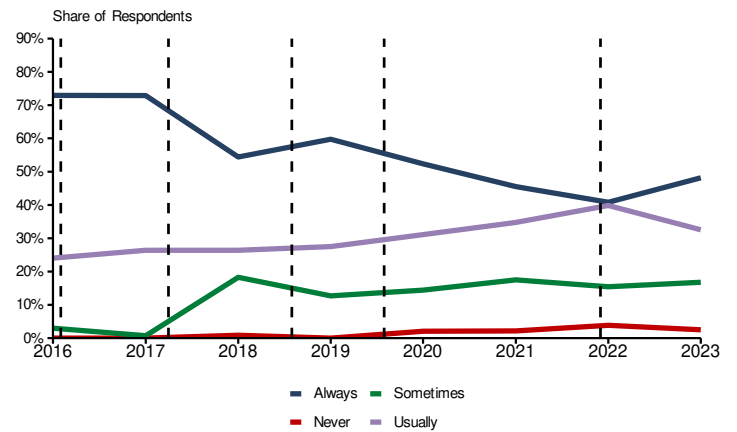
8 or More Hours of Sleep (NSCH)



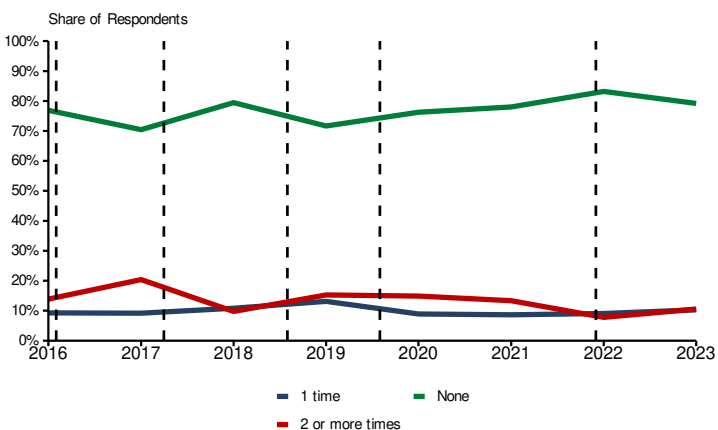
Screen Time (NSCH)



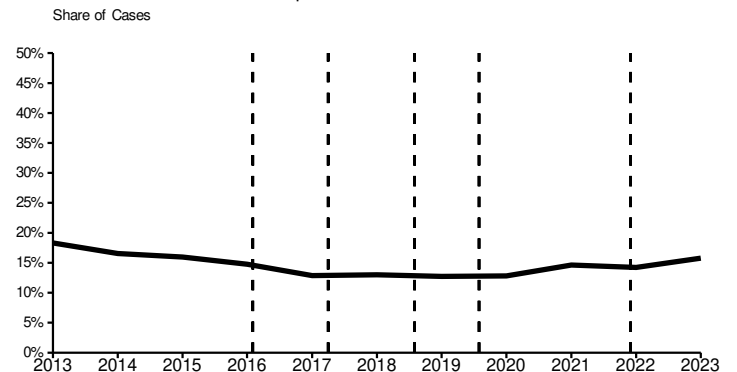
Cares About School Performance (NSCH)

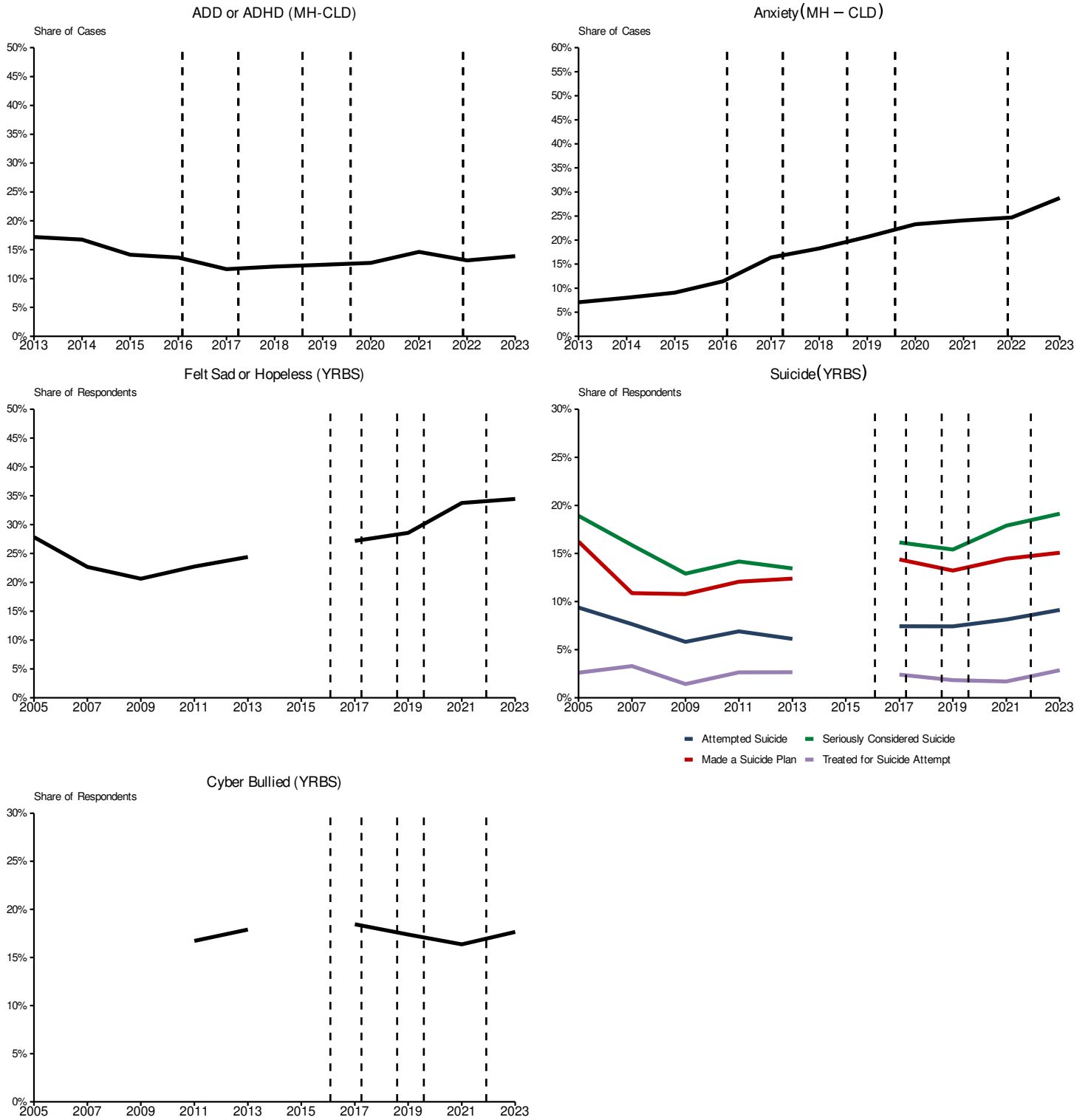


Families Contacted by Schools (NSCH)



Depression(MH – CLD)





Source: META3047MDL-289-00000120–143, 169–193; Cover Letter from Isaac D. Chaput of Covington & Burling LLP, “Re: MDL 3047,” October 10, 2025; Saba Report, Schedules 2.9.3 and 2.10.3; NSCH Data; SAMHSA MH-CLD; APA DSM History; YRBS Data

Note: See Appendices D–F for additional details.

Appendix H: Instagram, LLC. Youth Safety and Privacy Feature Launches

July 2021 – October 2025

Date	Feature	Description of Feature
1. July 2021	Suspicious Adult Restrictions in Discovery	"[Meta] began limiting potentially suspicious adults from finding and following teens in places like Reels, Explore, or 'Suggested for You'."
2. July 2021	Private Account Defaults for Teens	"[Meta] announced default private account settings for U16 users when they sign up for Instagram, as well as notifications encouraging existing teens under 16 to switch to a private account."
3. July 2021	Sensitive Content Control and Default 'Less' Setting for Teens	"[Meta] launched [their] Sensitive Content Control, which allows [users] to decide how much sensitive content shows up in Explore. [Meta] began defaulting all U16 users into the 'Less' setting in Sensitive Content Control on Instagram to make it more difficult for them to come across potentially sensitive content in Search, Explore, and Hashtag Pages, Reels, Feed Recommendations and Suggested Accounts."
4. August 2021	Limits Tool	"[Meta] launched [their] 'Limits' tool, which allows [users] to automatically hide comments and DM requests from [users] who don't follow them, or who only recently followed [them]."
5. December 2021	Take A Break	"[Meta] launched 'Take A Break' to empower [users] to make informed decisions about how they're spending their time."
6. December 2021	Tagging and Remix Restrictions for Teens	"[Meta] began restricting [users] from tagging or mentioning teens that don't follow them, or from including their content in Reels Remixes or Guides when they first join Instagram."
7. February 2022	Your Activity Tool	"[Meta] launched 'Your activity,' which allows [users] to bulk manage their content and interactions, review their history, and download their information."
8. March 2022	VR and Instagram Parental Supervision Tools	"[Meta] introduced VR Parental Supervision Tools on Quest and [Meta] launched Family Center and Parental Supervision Tools on Instagram."
9. March 2022	Favorites and Following Feeds	"[Meta] announced Favorites and Following, two new ways for [users] to choose what they see in their Instagram Feed, including giving [users] the option to see their feeds in chronological order."
10. June 2022	Instagram Supervision Tools Update	"[Meta] updated Parental Supervision Tools on Instagram to include more options for parents."
11. June 2022	Nudges on Instagram Explore	"[Meta] launched new Nudges for teens on Instagram that encourage them to switch to a different topic if they're repeatedly looking at the same type of content on Explore."
12. June 2022	Age Verification via Selfie	"[Meta] introduced new ways to verify [users'] age on Instagram, including privacy-preserving selfie videos."
13. October 2022	DM Kindness Nudges	"[Meta] began nudging [users] to be kind in DM requests, to discourage offensive or inappropriate DMs."
14. November 2022	Prompt to Report After Blocking	"[Meta] began prompting teens to report accounts to [Meta] after they block someone."
15. January 2023	Ad Topic Controls for Teens	"[Meta] began giving teens more ways to manage the types of ads they see on Facebook and Instagram with Ad Topic Controls."
16. January 2023	Quiet Mode	"[Meta] launched Quiet Mode, a feature to help [users] focus and to encourage them to set boundaries with their friends and followers."
17. January 2023	Instagram Recommendation Controls	"[Meta] made updates to give [users] more control over the content they see on Instagram."
18. February 2023	Take It Down Initiative	"[Meta] and NCMEC launch Take It Down, a new tool to help prevent the spread of young [users'] intimate images."
19. June 2023	DM Invite Restrictions	"[Meta] began requiring [users] to send an invite to get their permission to connect in DMs."
20. October 2023	Manual Comment Hiding	"[Meta] gave [users] the option to manually hide comments, to give them even greater control over comments that they may find upsetting or unwelcome, in addition to our Hidden Words tool."
21. November 2023	Lantern Child Safety Collaboration	"[Meta] announced [they] were founding members of Lantern, a program run by the Tech Coalition that enables technology companies to share signals about accounts and behaviors that violate their child safety policies, allowing them to take action across their respective platforms."
22. January 2024	Age-Inappropriate Content Restrictions	"[Meta] began hiding more types of age-inappropriate content for teens on Instagram and Facebook."
23. January 2024	Search Result Restrictions for Sensitive Topics	"[Meta] began hiding more results in Instagram Search related to suicide, self-harm and eating disorders."
24. January 2024	Privacy Settings Nudges	"[Meta] began prompting teens to update their privacy settings on Instagram in a single tap with new notifications."
25. January 2024	Nighttime Nudges for Instagram	"[Meta] launched new nighttime nudges that show up when teens have spent more than 10 minutes on a particular Instagram surface (i.e., Reels or Instagram Direct Message) late at night."

Date	Feature	Description of Feature
26. January 2024	Stricter DM Settings for Teens	"[Meta] announced stricter default message settings for teens under 16 (under 18 in certain countries), meaning only [users] they follow or [users] they're already connected to can message them or add them to group chats."
27. January 2024	Parental Approval for Privacy Changes	"Building on Instagram's existing parental supervision tools, parents using supervision will now be prompted to approve or deny their teen's (under 16) requests to change their default safety and privacy settings to a less strict state – rather than just being notified of the change."
28. February 2024	Expanded Take It Down Availability	"Meta has worked with the National Center for Missing & Exploited Children (NCMEC) to expand Take It Down to more countries and languages, allowing more teens to take back control of their intimate imagery and help protect themselves from scammers. [Meta] also partnered with Thorn to develop updated tips for teens - and parents and teachers - on what to do if they're affected by scammers who seek to exploit their intimate imagery."
29. April 2024	Sextortion Prevention Features	"[Meta is] testing new features to help protect young [users] from sextortion and intimate image abuse."
30. April 2024	Lantern Sextortion Signals	"[Meta] started to share more sextortion-specific signals to Lantern, the platform [Meta] helped establish that allows participating tech companies to share signals about predatory accounts and behaviors."
31. September 2024	Instagram Teen Accounts	"[Meta] launched Instagram Teen Accounts, a new experience for teens, guided by parents."
32. November 2024	Reset Recommendations Tool	"[Meta] began testing a new feature that allows [users], including teens, to reset their content recommendations in Explore, Reels and Feed, if they want to start fresh."
33. March 2025	Instagram School Partnership Program	"[Meta] announced and began to roll out the Instagram School Partnership Program to help address ongoing concerns about online bullying in schools by giving teachers, educators and administrators an easier way to report instances of teen safety issues directly to Meta."
34. April 2025	New Teen Restrictions in Live and Nudity Protection	"[Meta] announced that Instagram Teen Accounts will now include new restrictions for Instagram Live and [Meta's] nudity protection feature."
35. April 2025	New Technology to Enroll More Teens Into Teen Accounts	"As [Meta] continue[s] to roll out additional protections for Teen Accounts, [they] want to ensure eligible teens are enrolled. [Meta] began testing technology to proactively find accounts [they] suspect belong to teens in the US, even if they list an adult birthday, and place them in Teen Accounts settings."
36. June 2025	Nudify App Ad Detection	"[Meta] announced that we're building new technology to detect ads for nudify apps and sharing signals about these apps with other tech companies so they can take action too."
37. July 2025	New Teen Account DM Safety Features	"[Meta] added new safety features to DMs in Teen Accounts to give teens more context about the accounts they're messaging and help them spot potential scammers. Now, teens will see new options to view safety tips and block an account, as well as the month and year the account joined Instagram, all prominently displayed at the top of new chats."
38. July 2025	Stronger Protections for Accounts Featuring Children	"[Meta] strengthened [their] protections for accounts run by adults that primarily feature children. These include adults who regularly share photos and videos of their children, and adults – such as parents or talent managers – who run accounts that represent teens or children under 13."
39. September 2025	Expanded Instagram School Partnership Program	"[Meta] expanded the Instagram School Partnership Program to help educators report safety concerns, like bullying, directly to [Meta] for quicker review and removal."
40. October 2025	New Content Restriction Guidelines	"[Meta] announced that Instagram Teen Accounts will be guided by 13+ movie ratings by default. This means that teens will see content on Instagram that's similar to what they'd see in a movie rated for ages 13+. Teens under 18 will be automatically placed into an updated 13+ setting, and they won't be able to opt out without a parent's permission. And because [Meta] know[s] that all families are different, [Meta is] also introducing a new, stricter setting for parents who prefer a more restrictive experience for their teen."
41. October 2025	AI Safety Controls	"[Meta] announced that [they] will be introducing simple, new ways for parents to turn off their teens' access to one-on-one chats with AI characters, and giving them more insights on how teens are interacting with AI."

Source: "Meta Help Center: Timeline of Tools, Features and Resources to Help Support Teens and Parents," *Meta*, available at <https://www.meta.com/help/policies/809291991003600/>

APPENDIX I PROFITS EARNED ON TEENS FOR THE UDAP STATES

Figure I.1 Mr. Saba's Estimates of Meta's Net Profits Associated with "Affected" Teens and Aged-Up Teens by Time Threshold Across All UDAP States

**Summary of Net Profits,
Millions of Dollars**

State	Instagram Net Profits	Facebook Net Profits	Aggregate Net Profits
California	-\$36.4	-\$23.4	-\$59.7
Colorado	\$6.8	-\$2.6	\$4.1
Connecticut	\$6.2	-\$2.9	\$3.3
Delaware	-\$0.7	-\$1.0	-\$1.7
Illinois	\$17.4	-\$8.5	\$8.9
Indiana	\$8.2	-\$8.3	-\$0.2
Kansas	\$4.7	-\$4.4	\$0.3
Kentucky	\$8.9	-\$7.7	\$1.2
Louisiana	-\$5.2	-\$6.4	-\$11.6
Minnesota	\$10.9	-\$6.1	\$4.8
Nebraska	\$2.9	-\$2.6	\$0.3
New Jersey	\$7.4	-\$8.0	-\$0.6
New York	\$19.5	-\$11.6	\$7.9
North Carolina	\$1.1	-\$12.0	-\$10.9
Pennsylvania	\$17.7	-\$9.8	\$7.9
South Carolina	\$2.5	-\$6.1	-\$3.6
Virginia	\$4.8	-\$8.8	-\$4.0
Wisconsin	\$9.9	-\$5.1	\$4.8
Total	\$86.7	-\$135.2	-\$48.5

California

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$140.1	\$100.0	\$30.5	\$10.5	\$2.6	\$0.6	\$284.3
Teen Profit	-\$65.5	-\$117.4	-\$63.3	-\$48.8	-\$25.4	-\$0.2	-\$320.7
Net Profit	\$74.6	-\$17.4	-\$32.8	-\$38.3	-\$22.8	\$0.4	-\$36.4

Facebook (millions)

Aged-Up Teen Profit	\$29.5	\$16.8	\$5.0	\$3.0	\$0.3	\$0.0	\$54.6
Teen Profit	-\$16.4	-\$26.9	-\$16.2	-\$15.9	-\$2.6	\$0.0	-\$78.0
Net Profit	\$13.1	-\$10.1	-\$11.2	-\$12.9	-\$2.2	\$0.0	-\$23.4

Colorado

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$14.8	\$8.9	\$2.7	\$0.7	\$0.0	\$0.0	\$27.2
Teen Profit	-\$6.3	-\$7.7	-\$4.4	-\$1.6	-\$0.3	\$0.0	-\$20.4
Net Profit	\$8.5	\$1.1	-\$1.7	-\$0.9	-\$0.3	\$0.0	\$6.8

Facebook (millions)

Aged-Up Teen Profit	\$5.5	\$3.8	\$1.0	\$0.6	\$0.1	\$0.1	\$11.1
Teen Profit	-\$3.0	-\$4.6	-\$2.4	-\$2.7	-\$0.8	-\$0.2	-\$13.7
Net Profit	\$2.5	-\$0.8	-\$1.4	-\$2.1	-\$0.7	-\$0.2	-\$2.6

Connecticut

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$11.3	\$7.1	\$2.1	\$0.6	\$0.0	\$0.0	\$21.2
Teen Profit	-\$4.7	-\$5.7	-\$3.2	-\$1.4	\$0.0	\$0.0	-\$15.0
Net Profit	\$6.7	\$1.4	-\$1.1	-\$0.8	\$0.0	\$0.0	\$6.2

Facebook (millions)

Aged-Up Teen Profit	\$2.2	\$1.0	\$0.4	\$0.1	\$0.0	\$0.0	\$3.7
Teen Profit	-\$1.7	-\$2.0	-\$1.5	-\$1.3	-\$0.2	\$0.0	-\$6.6
Net Profit	\$0.5	-\$1.0	-\$1.1	-\$1.1	-\$0.2	\$0.0	-\$2.9

Delaware

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$3.0	\$2.2	\$0.8	\$0.2	\$0.1	\$0.0	\$6.3
Teen Profit	-\$1.4	-\$2.5	-\$1.3	-\$1.1	-\$0.6	-\$0.1	-\$7.0
Net Profit	\$1.6	-\$0.3	-\$0.6	-\$0.8	-\$0.4	-\$0.1	-\$0.7

Facebook (millions)

Aged-Up Teen Profit	\$0.4	\$0.2	\$0.1	\$0.0	\$0.0	\$0.0	\$0.8
Teen Profit	-\$0.4	-\$0.6	-\$0.4	-\$0.4	-\$0.1	\$0.0	-\$1.8
Net Profit	\$0.0	-\$0.3	-\$0.3	-\$0.3	-\$0.1	\$0.0	-\$1.0

Illinois

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$38.6	\$22.4	\$7.2	\$2.0	\$0.0	\$0.0	\$70.2
Teen Profit	-\$15.5	-\$19.2	-\$11.7	-\$5.5	-\$0.9	\$0.0	-\$52.8
Net Profit	\$23.1	\$3.3	-\$4.5	-\$3.5	-\$0.9	\$0.0	\$17.4

Facebook (millions)

Aged-Up Teen Profit	\$11.3	\$7.5	\$1.9	\$1.4	\$0.3	\$0.2	\$22.6
Teen Profit	-\$7.3	-\$9.9	-\$5.7	-\$6.1	-\$1.6	-\$0.4	-\$31.1
Net Profit	\$4.0	-\$2.5	-\$3.8	-\$4.7	-\$1.3	-\$0.2	-\$8.5

Indiana

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$21.1	\$13.2	\$3.8	\$1.6	\$0.2	\$0.0	\$40.1
Teen Profit	-\$8.1	-\$11.2	-\$5.9	-\$5.0	-\$1.7	\$0.0	-\$31.9
Net Profit	\$13.1	\$2.1	-\$2.1	-\$3.4	-\$1.5	\$0.0	\$8.2

Facebook (millions)

Aged-Up Teen Profit	\$4.6	\$3.0	\$0.8	\$0.5	\$0.1	\$0.1	\$9.1
Teen Profit	-\$4.3	-\$5.4	-\$3.0	-\$3.4	-\$1.0	-\$0.3	-\$17.4
Net Profit	\$0.3	-\$2.4	-\$2.2	-\$2.9	-\$0.8	-\$0.2	-\$8.3

Kansas

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$8.0	\$4.5	\$1.5	\$0.3	\$0.0	\$0.0	\$14.3
Teen Profit	-\$3.3	-\$3.4	-\$2.3	-\$0.6	\$0.0	\$0.0	-\$9.5
Net Profit	\$4.7	\$1.0	-\$0.8	-\$0.2	\$0.0	\$0.0	\$4.7

Facebook (millions)

Aged-Up Teen Profit	\$2.2	\$1.4	\$0.3	\$0.3	\$0.0	\$0.0	\$4.2
Teen Profit	-\$2.1	-\$2.7	-\$1.5	-\$1.7	-\$0.6	-\$0.1	-\$8.7
Net Profit	\$0.1	-\$1.3	-\$1.1	-\$1.4	-\$0.6	-\$0.1	-\$4.4

Kentucky

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$14.8	\$9.0	\$2.8	\$1.1	\$0.1	\$0.0	\$27.8
Teen Profit	-\$5.2	-\$6.6	-\$3.8	-\$3.0	-\$0.3	\$0.0	-\$18.9
Net Profit	\$9.7	\$2.4	-\$1.0	-\$1.9	-\$0.3	\$0.0	\$8.9

Facebook (millions)

Aged-Up Teen Profit	\$2.8	\$1.7	\$0.6	\$0.1	\$0.1	\$0.0	\$5.2
Teen Profit	-\$3.2	-\$4.2	-\$1.8	-\$2.1	-\$1.3	-\$0.4	-\$12.9
Net Profit	-\$0.4	-\$2.5	-\$1.2	-\$2.0	-\$1.3	-\$0.4	-\$7.7

Louisiana

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$13.5	\$9.2	\$3.3	\$1.0	\$0.4	\$0.3	\$27.7
Teen Profit	-\$6.0	-\$10.9	-\$6.7	-\$5.1	-\$3.7	-\$0.4	-\$32.9
Net Profit	\$7.5	-\$1.7	-\$3.5	-\$4.1	-\$3.3	-\$0.2	-\$5.2

Facebook (millions)

Aged-Up Teen Profit	\$2.2	\$1.1	\$0.3	\$0.1	\$0.1	\$0.0	\$3.9
Teen Profit	-\$2.8	-\$3.4	-\$2.2	-\$1.7	-\$0.1	\$0.0	-\$10.2
Net Profit	-\$0.6	-\$2.3	-\$1.8	-\$1.6	\$0.0	\$0.0	-\$6.4

Minnesota

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$15.4	\$8.6	\$2.8	\$0.6	\$0.0	\$0.0	\$27.4
Teen Profit	-\$6.0	-\$6.2	-\$3.5	-\$0.7	\$0.0	\$0.0	-\$16.5
Net Profit	\$9.4	\$2.4	-\$0.8	-\$0.2	\$0.0	\$0.0	\$10.9

Facebook (millions)

Aged-Up Teen Profit	\$3.7	\$2.0	\$0.6	\$0.2	\$0.1	\$0.0	\$6.7
Teen Profit	-\$3.0	-\$3.7	-\$2.0	-\$2.5	-\$1.3	-\$0.2	-\$12.7
Net Profit	\$0.7	-\$1.7	-\$1.4	-\$2.3	-\$1.2	-\$0.2	-\$6.1

Nebraska

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$6.0	\$3.3	\$1.1	\$0.3	\$0.0	\$0.0	\$10.7
Teen Profit	-\$2.3	-\$2.6	-\$1.7	-\$0.9	-\$0.3	\$0.0	-\$7.8
Net Profit	\$3.7	\$0.7	-\$0.6	-\$0.6	-\$0.3	\$0.0	\$2.9

Facebook (millions)

Aged-Up Teen Profit	\$1.5	\$0.9	\$0.3	\$0.1	\$0.1	\$0.0	\$2.8
Teen Profit	-\$1.3	-\$1.7	-\$0.9	-\$1.1	-\$0.5	\$0.0	-\$5.4
Net Profit	\$0.3	-\$0.8	-\$0.6	-\$1.0	-\$0.4	\$0.0	-\$2.6

New Jersey

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$31.4	\$20.2	\$5.8	\$2.3	\$0.3	\$0.0	\$59.9
Teen Profit	-\$13.6	-\$19.4	-\$10.0	-\$8.0	-\$1.5	\$0.0	-\$52.6
Net Profit	\$17.8	\$0.8	-\$4.2	-\$5.8	-\$1.2	\$0.0	\$7.4

Facebook (millions)

Aged-Up Teen Profit	\$4.7	\$2.4	\$1.1	\$0.1	\$0.1	\$0.0	\$8.4
Teen Profit	-\$3.5	-\$5.6	-\$3.4	-\$3.5	-\$0.4	\$0.0	-\$16.4
Net Profit	\$1.2	-\$3.2	-\$2.4	-\$3.4	-\$0.3	\$0.0	-\$8.0

New York

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$59.1	\$38.0	\$11.3	\$3.1	\$0.3	\$0.0	\$111.9
Teen Profit	-\$24.6	-\$35.1	-\$20.2	-\$10.1	-\$2.5	\$0.0	-\$92.4
Net Profit	\$34.5	\$2.9	-\$8.8	-\$6.9	-\$2.1	\$0.0	\$19.5

Facebook (millions)

Aged-Up Teen Profit	\$14.8	\$10.8	\$3.2	\$2.1	\$0.4	\$0.1	\$31.4
Teen Profit	-\$8.5	-\$14.7	-\$7.7	-\$8.3	-\$3.5	-\$0.4	-\$43.1
Net Profit	\$6.3	-\$3.8	-\$4.5	-\$6.2	-\$3.1	-\$0.3	-\$11.6

North Carolina

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$35.1	\$23.3	\$7.4	\$2.7	\$0.7	\$0.0	\$69.2
Teen Profit	-\$14.9	-\$24.5	-\$12.6	-\$11.8	-\$4.1	-\$0.2	-\$68.1
Net Profit	\$20.3	-\$1.2	-\$5.2	-\$9.1	-\$3.4	-\$0.2	\$1.1

Facebook (millions)

Aged-Up Teen Profit	\$5.9	\$3.6	\$1.1	\$0.4	\$0.1	\$0.1	\$11.1
Teen Profit	-\$5.3	-\$7.7	-\$4.4	-\$4.7	-\$0.9	\$0.0	-\$23.1
Net Profit	\$0.5	-\$4.2	-\$3.3	-\$4.3	-\$0.8	\$0.1	-\$12.0

Pennsylvania

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$39.6	\$24.7	\$7.8	\$2.8	\$0.7	\$0.2	\$75.7
Teen Profit	-\$14.8	-\$20.4	-\$10.6	-\$9.3	-\$2.8	-\$0.2	-\$58.1
Net Profit	\$24.8	\$4.3	-\$2.9	-\$6.5	-\$2.1	\$0.1	\$17.7

Facebook (millions)

Aged-Up Teen Profit	\$8.1	\$4.9	\$1.3	\$0.7	\$0.4	-\$0.1	\$15.4
Teen Profit	-\$6.5	-\$7.6	-\$4.7	-\$5.1	-\$1.1	-\$0.3	-\$25.2
Net Profit	\$1.7	-\$2.7	-\$3.4	-\$4.4	-\$0.6	-\$0.4	-\$9.8

South Carolina

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$15.2	\$9.9	\$3.0	\$1.1	\$0.2	\$0.0	\$29.4
Teen Profit	-\$6.2	-\$9.5	-\$5.0	-\$4.8	-\$1.4	\$0.0	-\$26.9
Net Profit	\$8.9	\$0.4	-\$2.0	-\$3.6	-\$1.2	\$0.0	\$2.5

Facebook (millions)

Aged-Up Teen Profit	\$3.1	\$1.9	\$0.7	\$0.2	\$0.1	\$0.1	\$6.0
Teen Profit	-\$2.8	-\$4.1	-\$2.2	-\$2.3	-\$0.4	-\$0.2	-\$12.1
Net Profit	\$0.2	-\$2.2	-\$1.6	-\$2.1	-\$0.3	-\$0.1	-\$6.1

Virginia

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$27.1	\$17.5	\$5.7	\$1.7	\$0.7	\$0.2	\$52.9
Teen Profit	-\$11.3	-\$17.1	-\$9.0	-\$7.9	-\$2.7	-\$0.1	-\$48.1
Net Profit	\$15.8	\$0.4	-\$3.3	-\$6.2	-\$2.0	\$0.1	\$4.8

Facebook (millions)

Aged-Up Teen Profit	\$4.8	\$2.6	\$0.9	\$0.2	\$0.2	\$0.0	\$8.7
Teen Profit	-\$4.3	-\$6.0	-\$3.4	-\$3.5	-\$0.3	\$0.0	-\$17.5
Net Profit	\$0.4	-\$3.3	-\$2.5	-\$3.2	-\$0.1	\$0.0	-\$8.8

Wisconsin

	0.5-1 Hour Threshold	1-2 Hour Threshold	2-3 Hours Threshold	3-4 Hours Threshold	4-5 Hours Threshold	5 Hours Threshold	Total Across Thresholds
<i>Instagram (millions)</i>							
Aged-Up Teen Profit	\$15.7	\$8.6	\$2.9	\$0.7	\$0.0	\$0.0	\$27.9
Teen Profit	-\$5.7	-\$6.4	-\$3.8	-\$1.9	-\$0.1	\$0.0	-\$18.0
Net Profit	\$10.0	\$2.2	-\$1.0	-\$1.2	-\$0.1	\$0.0	\$9.9

Facebook (millions)

Aged-Up Teen Profit	\$5.2	\$3.0	\$0.9	\$0.3	\$0.1	\$0.1	\$9.5
Teen Profit	-\$3.6	-\$4.4	-\$2.6	-\$2.6	-\$0.9	-\$0.5	-\$14.6
Net Profit	\$1.6	-\$1.4	-\$1.7	-\$2.3	-\$0.8	-\$0.4	-\$5.1

Source: Saba Report, Schedules 2.8.8, 2.9.1, 2.10.1, 4.1.3

Note: These tables correspond to the charts in Figure 21 in my report, which show the results of my analysis aggregated across all UDAP States. Profits are calculated by summing the aggregate gross profits in Saba's schedules. I present a summary of the net profits for each state across all time spent thresholds for Instagram and Facebook, separately as well as combined.

Figure I.2 Mr. Saba's Gross Profits for "Aged-Up" Teens After Adjusting His Methodology to Not Exclude Months when He Does Not Estimate Any Teen Users in a Given Threshold

California

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2-3 Hours Threshold	\$30.5	\$30.8	0.9%
3-4 Hours Threshold	\$10.5	\$11.2	7.4%
4-5 Hours Threshold	\$2.6	\$1.6	-39.6%
5+ Hours Threshold	\$0.6	\$0.0	-91.7%
Total (2+ Hours)	\$44.2	\$43.6	-1.2%
<i>Facebook</i>			
2-3 Hours Threshold	\$5.0	\$5.7	14.8%
3-4 Hours Threshold	\$3.0	\$1.6	-47.9%
4-5 Hours Threshold	\$0.3	\$0.0	-85.1%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$8.3	\$7.3	-11.8%

Colorado

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2-3 Hours Threshold	\$2.7	\$2.9	3.9%
3-4 Hours Threshold	\$0.7	\$0.5	-25.3%
4-5 Hours Threshold	\$0.0	\$0.0	-83.3%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$3.4	\$3.4	-2.2%
<i>Facebook</i>			
2-3 Hours Threshold	\$1.0	\$1.1	12.6%
3-4 Hours Threshold	\$0.6	\$0.4	-23.3%
4-5 Hours Threshold	\$0.1	\$0.1	2.4%
5+ Hours Threshold	\$0.1	\$0.0	-107.2%
Total (2+ Hours)	\$1.7	\$1.7	-3.3%

Connecticut

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2-3 Hours Threshold	\$2.1	\$2.2	4.4%
3-4 Hours Threshold	\$0.6	\$0.5	-21.2%
4-5 Hours Threshold	\$0.0	\$0.0	-
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$2.7	\$2.7	-1.1%
<i>Facebook</i>			
2-3 Hours Threshold	\$0.4	\$0.3	-8.4%
3-4 Hours Threshold	\$0.1	\$0.1	-34.9%
4-5 Hours Threshold	\$0.0	\$0.0	-22.6%
5+ Hours Threshold	\$0.0	\$0.0	-91.7%
Total (2+ Hours)	\$0.6	\$0.5	-18.8%

Delaware

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$0.8	\$0.7	-1.6%
3–4 Hours Threshold	\$0.2	\$0.3	21.2%
4–5 Hours Threshold	\$0.1	\$0.1	-28.1%
5+ Hours Threshold	\$0.0	\$0.0	-69.3%
Total (2+ Hours)	\$1.1	\$1.1	-1.8%
<i>Facebook</i>			
2–3 Hours Threshold	\$0.1	\$0.1	-5.6%
3–4 Hours Threshold	\$0.0	\$0.0	-11.9%
4–5 Hours Threshold	\$0.0	\$0.0	-73%
5+ Hours Threshold	\$0.0	\$0.0	-91.7%
Total (2+ Hours)	\$0.1	\$0.1	-14.1%

Illinois

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$7.2	\$7.6	5.5%
3–4 Hours Threshold	\$2.0	\$1.5	-26.4%
4–5 Hours Threshold	\$0.0	\$0.0	-
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$9.2	\$9.1	-1.6%
<i>Facebook</i>			
2–3 Hours Threshold	\$1.9	\$2.2	17.4%
3–4 Hours Threshold	\$1.4	\$0.9	-37%
4–5 Hours Threshold	\$0.3	\$0.4	45.6%
5+ Hours Threshold	\$0.2	\$0.0	-76.8%
Total (2+ Hours)	\$3.8	\$3.6	-6%

Indiana

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$3.8	\$4.2	11.2%
3–4 Hours Threshold	\$1.6	\$1.3	-21.1%
4–5 Hours Threshold	\$0.2	\$0.1	-57%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$5.7	\$5.6	-1%
<i>Facebook</i>			
2–3 Hours Threshold	\$0.8	\$0.9	8.2%
3–4 Hours Threshold	\$0.5	\$0.3	-38.8%
4–5 Hours Threshold	\$0.1	\$0.1	15.3%
5+ Hours Threshold	\$0.1	\$0.0	-85.4%
Total (2+ Hours)	\$1.5	\$1.3	-11%

Kansas

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$1.5	\$1.5	-0.4%
3–4 Hours Threshold	\$0.3	\$0.3	-12.4%
4–5 Hours Threshold	\$0.0	\$0.0	-
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$1.8	\$1.8	-2.6%
<i>Facebook</i>			
2–3 Hours Threshold	\$0.3	\$0.4	12.9%
3–4 Hours Threshold	\$0.3	\$0.2	-46.8%
4–5 Hours Threshold	\$0.0	\$0.1	958.9%
5+ Hours Threshold	\$0.0	\$0.0	-93%
Total (2+ Hours)	\$0.7	\$0.6	-13.2%

Kentucky

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$2.8	\$3.0	6.7%
3–4 Hours Threshold	\$1.1	\$0.9	-15.9%
4–5 Hours Threshold	\$0.1	\$0.0	-68.3%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$4.0	\$3.9	-1.1%
<i>Facebook</i>			
2–3 Hours Threshold	\$0.6	\$0.5	-12.2%
3–4 Hours Threshold	\$0.1	\$0.1	22.6%
4–5 Hours Threshold	\$0.1	\$0.0	-108.5%
5+ Hours Threshold	\$0.0	\$0.0	-50.4%
Total (2+ Hours)	\$0.7	\$0.6	-12.9%

Louisiana

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$3.3	\$3.2	-1.2%
3–4 Hours Threshold	\$1.0	\$1.2	20.3%
4–5 Hours Threshold	\$0.4	\$0.4	-7%
5+ Hours Threshold	\$0.3	\$0.1	-77.3%
Total (2+ Hours)	\$5.0	\$4.9	-1.3%
<i>Facebook</i>			
2–3 Hours Threshold	\$0.3	\$0.3	-2.4%
3–4 Hours Threshold	\$0.1	\$0.1	-10.9%
4–5 Hours Threshold	\$0.1	\$0.0	-73.9%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$0.5	\$0.5	-14.5%

Minnesota

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$2.8	\$2.7	-0.9%
3–4 Hours Threshold	\$0.6	\$0.5	-12%
4–5 Hours Threshold	\$0.0	\$0.0	-
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$3.3	\$3.2	-2.9%
<i>Facebook</i>			
2–3 Hours Threshold	\$0.6	\$0.6	-8.5%
3–4 Hours Threshold	\$0.2	\$0.2	1.4%
4–5 Hours Threshold	\$0.1	\$0.0	-65.8%
5+ Hours Threshold	\$0.0	\$0.0	-129.9%
Total (2+ Hours)	\$1.0	\$0.8	-14.4%

Nebraska

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$1.1	\$1.2	4.3%
3–4 Hours Threshold	\$0.3	\$0.3	-23.4%
4–5 Hours Threshold	\$0.0	\$0.0	-75%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$1.5	\$1.4	-2.3%
<i>Facebook</i>			
2–3 Hours Threshold	\$0.3	\$0.2	-12.6%
3–4 Hours Threshold	\$0.1	\$0.1	15%
4–5 Hours Threshold	\$0.1	\$0.0	-55%
5+ Hours Threshold	\$0.0	\$0.0	-77.8%
Total (2+ Hours)	\$0.4	\$0.4	-13.2%

New Jersey

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$5.8	\$6.2	7%
3–4 Hours Threshold	\$2.3	\$1.9	-16.7%
4–5 Hours Threshold	\$0.3	\$0.2	-41.4%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$8.3	\$8.2	-1.1%
<i>Facebook</i>			
2–3 Hours Threshold	\$1.1	\$0.9	-19.4%
3–4 Hours Threshold	\$0.1	\$0.2	78%
4–5 Hours Threshold	\$0.1	\$0.0	-60.4%
5+ Hours Threshold	\$0.0	\$0.0	-91.7%
Total (2+ Hours)	\$1.4	\$1.1	-16.5%

New York

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$11.3	\$12.0	5.8%
3–4 Hours Threshold	\$3.1	\$2.7	-15.4%
4–5 Hours Threshold	\$0.3	\$0.0	-91.7%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$14.8	\$14.7	-0.9%
<i>Facebook</i>			
2–3 Hours Threshold	\$3.2	\$3.4	6.2%
3–4 Hours Threshold	\$2.1	\$1.8	-16.2%
4–5 Hours Threshold	\$0.4	\$0.4	-0.9%
5+ Hours Threshold	\$0.1	\$0.0	-107.6%
Total (2+ Hours)	\$5.9	\$5.6	-4.5%

North Carolina

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$7.4	\$7.4	0.5%
3–4 Hours Threshold	\$2.7	\$3.0	9.4%
4–5 Hours Threshold	\$0.7	\$0.3	-57.5%
5+ Hours Threshold	\$0.0	\$0.0	-91.7%
Total (2+ Hours)	\$10.8	\$10.7	-1.3%
<i>Facebook</i>			
2–3 Hours Threshold	\$1.1	\$1.0	-4.3%
3–4 Hours Threshold	\$0.4	\$0.3	-17.2%
4–5 Hours Threshold	\$0.1	\$0.1	35.3%
5+ Hours Threshold	\$0.1	\$0.0	-84.5%
Total (2+ Hours)	\$1.7	\$1.5	-11.3%

Pennsylvania

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$7.8	\$7.8	0.1%
3–4 Hours Threshold	\$2.8	\$3.1	11.9%
4–5 Hours Threshold	\$0.7	\$0.4	-40.8%
5+ Hours Threshold	\$0.2	\$0.0	-83.3%
Total (2+ Hours)	\$11.5	\$11.3	-1.2%
<i>Facebook</i>			
2–3 Hours Threshold	\$1.3	\$1.4	10.5%
3–4 Hours Threshold	\$0.7	\$0.5	-28%
4–5 Hours Threshold	\$0.4	\$0.2	-54.6%
5+ Hours Threshold	-\$0.1	\$0.0	-74%
Total (2+ Hours)	\$2.4	\$2.1	-11.1%

South Carolina

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$3.0	\$3.1	4.9%
3–4 Hours Threshold	\$1.1	\$1.1	-6.2%
4–5 Hours Threshold	\$0.2	\$0.1	-59.9%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$4.3	\$4.2	-1%
<i>Facebook</i>			
2–3 Hours Threshold	\$0.7	\$0.6	-6.1%
3–4 Hours Threshold	\$0.2	\$0.2	-11.7%
4–5 Hours Threshold	\$0.1	\$0.1	-16%
5+ Hours Threshold	\$0.1	\$0.1	-26.9%
Total (2+ Hours)	\$1.0	\$0.9	-9.7%

Virginia

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$5.7	\$5.7	0.4%
3–4 Hours Threshold	\$1.7	\$2.1	25.5%
4–5 Hours Threshold	\$0.7	\$0.3	-52.1%
5+ Hours Threshold	\$0.2	\$0.0	-91.7%
Total (2+ Hours)	\$8.3	\$8.2	-1.3%
<i>Facebook</i>			
2–3 Hours Threshold	\$0.9	\$0.8	-8.5%
3–4 Hours Threshold	\$0.2	\$0.2	-4.2%
4–5 Hours Threshold	\$0.2	\$0.1	-67.6%
5+ Hours Threshold	\$0.0	\$0.0	-83.3%
Total (2+ Hours)	\$1.3	\$1.1	-17%

Wisconsin

	Gross Profits Claimed By Mr. Saba	Adjusted Gross Profits	Percent Change
<i>Instagram</i>			
2–3 Hours Threshold	\$2.9	\$2.8	-2.7%
3–4 Hours Threshold	\$0.7	\$0.6	-16.8%
4–5 Hours Threshold	\$0.0	\$0.0	-
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$3.5	\$3.3	-5.4%
<i>Facebook</i>			
2–3 Hours Threshold	\$0.9	\$0.8	-5.4%
3–4 Hours Threshold	\$0.3	\$0.3	-1.9%
4–5 Hours Threshold	\$0.1	\$0.1	-11.8%
5+ Hours Threshold	\$0.1	\$0.0	-71.5%
Total (2+ Hours)	\$1.4	\$1.3	-8.2%

Source: Saba Report, Schedules 4.1.3, 4.2.1, 4.2.2, 4.2.4, 4.3.1, 4.3.2, 4.3.4

Note: These tables correspond to the charts in Figure 22 in my report, which show the results of my analysis aggregated across all UDAP States. Gross Profits by Mr. Saba are pulled from Schedule 4.1.3. Gross Profits adjusted for average method substitute zero for months previously shown to have MAU counts that were not able to be interpolated. Percent change in profits is calculated as adjusted profits minus Saba's profits, divided by Saba's profits.

Figure I.3 Mr. Saba's Instagram Gross Profits for "Aged-Up" Teens After Adjusting His Methodology to Use Predicted Age Instead of Stated Age to Estimate 17-Year-Old Cohorts

California

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2-3 Hours Threshold	\$30.5	\$27.8	-8.8%
3-4 Hours Threshold	\$10.5	\$9.5	-8.7%
4-5 Hours Threshold	\$2.6	\$2.4	-8.3%
5+ Hours Threshold	\$0.6	\$0.5	-9.8%
Total (2+ Hours)	\$44.2	\$40.3	-8.8%

Colorado

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2-3 Hours Threshold	\$2.7	\$2.6	-6.8%
3-4 Hours Threshold	\$0.7	\$0.6	-6.8%
4-5 Hours Threshold	\$0.0	\$0.0	0%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$3.4	\$3.2	-6.8%

Connecticut

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2-3 Hours Threshold	\$2.1	\$2.0	-6.9%
3-4 Hours Threshold	\$0.6	\$0.5	-6.7%
4-5 Hours Threshold	\$0.0	\$0.0	-
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$2.7	\$2.5	-6.9%

Delaware

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2-3 Hours Threshold	\$0.8	\$0.7	-10.9%
3-4 Hours Threshold	\$0.2	\$0.2	-11.5%
4-5 Hours Threshold	\$0.1	\$0.1	-12.6%
5+ Hours Threshold	\$0.0	\$0.0	-13.6%
Total (2+ Hours)	\$1.1	\$1.0	-11.3%

Illinois

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$7.2	\$6.6	-7.7%
3–4 Hours Threshold	\$2.0	\$1.9	-7.3%
4–5 Hours Threshold	\$0.0	\$0.0	-
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$9.2	\$8.5	-7.6%

Indiana

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$3.8	\$3.5	-8%
3–4 Hours Threshold	\$1.6	\$1.5	-7.2%
4–5 Hours Threshold	\$0.2	\$0.2	-6.2%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$5.7	\$5.3	-7.7%

Kansas

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$1.5	\$1.4	-6.8%
3–4 Hours Threshold	\$0.3	\$0.3	-7.5%
4–5 Hours Threshold	\$0.0	\$0.0	-
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$1.8	\$1.7	-6.9%

Kentucky

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$2.8	\$2.6	-8%
3–4 Hours Threshold	\$1.1	\$1.0	-7.4%
4–5 Hours Threshold	\$0.1	\$0.1	-6.5%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$4.0	\$3.6	-7.8%

Louisiana

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$3.3	\$2.9	-11.6%
3–4 Hours Threshold	\$1.0	\$0.9	-12.2%
4–5 Hours Threshold	\$0.4	\$0.3	-14.7%
5+ Hours Threshold	\$0.3	\$0.2	-16.3%
Total (2+ Hours)	\$5.0	\$4.4	-12.3%

Minnesota

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$2.8	\$2.6	-6.9%
3–4 Hours Threshold	\$0.6	\$0.5	-7.8%
4–5 Hours Threshold	\$0.0	\$0.0	-
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$3.3	\$3.1	-7%

Nebraska

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$1.1	\$1.0	-7.5%
3–4 Hours Threshold	\$0.3	\$0.3	-7%
4–5 Hours Threshold	\$0.0	\$0.0	0%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$1.5	\$1.3	-7.4%

New Jersey

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$5.8	\$5.2	-9.3%
3–4 Hours Threshold	\$2.3	\$2.1	-9.8%
4–5 Hours Threshold	\$0.3	\$0.3	-11%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$8.3	\$7.5	-9.5%

New York

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$11.3	\$10.3	-9%
3–4 Hours Threshold	\$3.1	\$2.9	-9%
4–5 Hours Threshold	\$0.3	\$0.3	-9.4%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$14.8	\$13.5	-9%

North Carolina

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$7.4	\$6.7	-8.8%
3–4 Hours Threshold	\$2.7	\$2.5	-8.6%
4–5 Hours Threshold	\$0.7	\$0.7	-9.6%
5+ Hours Threshold	\$0.0	\$0.0	0%
Total (2+ Hours)	\$10.8	\$9.9	-8.8%

Pennsylvania

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$7.8	\$7.2	-7.7%
3–4 Hours Threshold	\$2.8	\$2.6	-7.2%
4–5 Hours Threshold	\$0.7	\$0.6	-6.3%
5+ Hours Threshold	\$0.2	\$0.2	-6.4%
Total (2+ Hours)	\$11.5	\$10.6	-7.5%

South Carolina

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$3.0	\$2.7	-9.9%
3–4 Hours Threshold	\$1.1	\$1.0	-10.8%
4–5 Hours Threshold	\$0.2	\$0.2	-13.5%
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$4.3	\$3.8	-10.3%

Virginia

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$5.7	\$5.2	-8.5%
3–4 Hours Threshold	\$1.7	\$1.6	-8.2%
4–5 Hours Threshold	\$0.7	\$0.6	-8.7%
5+ Hours Threshold	\$0.2	\$0.2	-8.9%
Total (2+ Hours)	\$8.3	\$7.6	-8.5%

Wisconsin

	Gross Profits By Mr. Saba	Gross Profits Adjusted For 17-Year-Old Rate	Percent Change in Profits
2–3 Hours Threshold	\$2.9	\$2.7	-7.3%
3–4 Hours Threshold	\$0.7	\$0.6	-7.4%
4–5 Hours Threshold	\$0.0	\$0.0	-
5+ Hours Threshold	\$0.0	\$0.0	-
Total (2+ Hours)	\$3.5	\$3.3	-7.3%

Source: Saba Report, Schedules 4.1.3, 4.2.1, 4.2.2, 4.2.4

Note: These tables correspond to the charts in Figure 23 in my report, which show the results of my analysis aggregated across all UDAP States. Gross Profits by Mr. Saba are pulled from Schedule 4.1.3. Gross Profits adjusted for 17-year-old rate use the threshold user information for Schedule 4.2.1 and the 17-year-old rate information from Schedule 4.2.4 to use 2022 predicted age information instead of 2021 stated age information. Percent change in profits is calculated as adjusted profits minus Saba's profits, divided by Saba's profits.
