

Self-Reported Risky Driving in Relation to Changes in Amount of Driving During the COVID-19 Pandemic

February 2022

The number and rate of traffic fatalities in the United States have increased significantly during the COVID-19 pandemic, despite a large reduction in the total number of miles driven on U.S. roads. Increases in crashes involving driver impairment, speeding, and seatbelt non-use have been observed; however, the reasons why such risky driving behaviors and negative traffic safety outcomes increased during the pandemic remain unclear. The current study examines data from a survey of driving behavior among the American public conducted in the fall of 2020, to investigate the relationship between respondents' self-reported risky driving behaviors and changes in how much they drove during the pandemic. While only an estimated 4% of U.S. drivers reported that they increased their driving due to the pandemic, they tended to be younger than those who reported not changing or decreasing how much they drove, and a greater proportion were male. They were also more likely to report engaging in a wide array of risky driving behaviors including distracted driving, speeding, aggressive driving, substance-impaired driving, and seatbelt non-use. Importantly, their higher rates of risky behaviors were not fully explained by their demographic characteristics nor their frequency of driving. Results thus suggest that at least some of the increase in crash rates observed during the COVID 19 pandemic may be attributable to an increase in driving among a small subset of drivers with both higher baseline risk and greater propensity to engage in risky driving behaviors. Although these data do not indicate the reasons why a small subset of drivers increased their driving nor why they are more likely to engage in risky behaviors, they provide some insights into the increased risks on U.S. roads during a period when aggregate metrics of travel showed decreases.

The COVID-19 pandemic and the associated public health orders and economic downturn have had major effects on travel behavior and traffic safety in the United States and beyond. In the early months of the pandemic, the average daily number of driving trips made by U.S. adults decreased by an estimated 42%, rebounded slightly in the months that followed, and eventually leveled off in the second half of 2020 at levels roughly 20% below those observed in the second half of 2019 (Tefft et al., 2021). The Bureau of Transportation Statistics similarly reported a 26% reduction in trips by Americans in 2020 (Bureau of Transportation Statistics, 2021). Similar reductions were observed at the state level as well (Doucette et al., 2021; Li et al., 2021).

The COVID-19 pandemic resulted in a severe economic recession (Hamilton, 2021). A large body of research has found that the number and rate of traffic fatalities typically decrease during major economic recessions (Blower et al., 2020; Longthorne et al., 2010; Maheshri & Winston, 2016). However, in the case of the COVID-19

pandemic, the opposite occurred. A study of traffic safety in the state of Ohio during the first several months of the pandemic found that after sharp initial reductions, the number of crashes, injuries, and deaths on Ohio roads approached prior-year levels by July, despite a sustained reduction in driving (Li et al., 2021). A similar study in the state of Connecticut found that rates of single-vehicle crashes per mile driven approximately doubled early in the pandemic relative to prior years, and rates of fatal single-vehicle crashes per mile driven more than quadrupled (Doucette et al., 2021). Nationally, preliminary data from the National Highway Traffic Safety Administration indicate that approximately 13% more people died on U.S. roads in the second half of 2020 than in the second half of 2019 (National Center for Statistics and Analysis, 2021).

The cause of this increase in traffic fatalities during a time of reduced driving is not fully understood. Several potential explanations have been suggested. Preliminary analyses of motor vehicle crash data have noted that the numbers and proportions of crashes involving driver

impairment, speeding, and non-use of seatbelts have increased (National Center for Statistics and Analysis, 2021; Office of Behavioral Safety Research, 2021; Thomas et al., 2020). The Governors Highway Safety Association (2020) has cited a reduction in traffic law enforcement as another possible contributing factor. While these and other factors may have contributed to the increasing number and rate of traffic fatalities observed in 2020, existing research has not elucidated why such risky driving behaviors and negative traffic safety outcomes increased during the COVID-19 pandemic. The current study seeks to provide some additional insight into this question by examining data from a large annual survey of self-reported driving behavior of the American public conducted in the fall of 2020.

METHODS

The current study examined the association of the frequency of engagement in self-reported risky driving behaviors within the past 30 days and changes in frequency of driving during the COVID-19 pandemic among a sample of U.S. drivers aged 16 years and older who participated in the AAA Foundation's 2020 Traffic Safety Culture Index survey (AAA Foundation for Traffic Safety, 2021). Data were collected between October 23 and November 23, 2020, from a sample of 2,888 licensed drivers who reported having driven in the past 30 days (hereafter referred to as "licensed active drivers").

The current study examined respondents' self-reported frequency of engagement in the following behaviors in the 30 days before survey participation:

- Talking on a hand-held cellphone while driving (hereafter "talking on cellphone")
- Reading a text message or email while driving ("reading text messages")
- Typing a text message or email while driving ("typing text messages")
- Driving ≥ 15 miles per hour (mph) over the speed limit on a freeway ("speeding on freeways")
- Driving ≥ 10 mph over the speed limit on a residential street ("speeding on residential streets")
- Driving through a light that had just turned red when they could have stopped safely ("running red lights")
- Switching lanes quickly and/or very close behind another car ("changing lanes aggressively")

- Driving when they were so tired that they had a hard time keeping their eyes open ("drowsy driving")
- Driving without wearing their seatbelt ("unbelted driving")
- Driving after drinking enough alcohol that they thought their alcohol level might have been over the legal limit ("alcohol-impaired driving")
- Driving within an hour after using marijuana ("driving after using marijuana").

Respondents were asked to report whether they had performed each of these behaviors "regularly," "fairly often," "a few times," "just once," or "never." In the current study responses were dichotomized as any engagement in the behavior in the past 30 days versus none.

Respondents' engagement in each of these behaviors was examined in relation to whether they reported having decreased their driving, not changed how much they drove, or increased their driving due to the COVID-19 pandemic. Analyses controlled for potential confounding due to factors including age, sex, educational attainment, and race and ethnicity. The number of days that each respondent reported driving in a typical 7-day week was also included to account for differences in frequency of driving that might create differences in opportunity to engage in the behaviors of interest. Ratios of the prevalence of each behavior ("prevalence ratios") among drivers who decreased or increased their driving compared with drivers who did not change how much they drove, adjusted for the confounders previously mentioned, were estimated using Poisson regression (Zou, 2004; Chen et al., 2018). The data were weighted to account for each respondent's probability of being invited to participate in the survey and for differences in probability of participating among those who were invited (AAA Foundation for Traffic Safety, 2021). All analyses were performed on the weighted data using Stata version 17.0 (StataCorp LP, College Station, Texas).

RESULTS

Overall, 1,700 respondents (weighted to represent 60% of licensed active drivers in the U.S.) reported having reduced their driving; 1,064 (weighted 36% of licensed active drivers) reported not changing how much they drove; and 124 (weighted 4% of licensed active drivers) reported having increased their driving because of the

COVID-19 pandemic. Table 1 shows the demographic characteristics of these three groups. Those who reported reducing their driving and those who reported no change in their driving were similar in age (median 50 years for both) while those who reported increasing their driving tended to be markedly younger (median 39 years; interquartile range [IQR] 28–51). Males comprised 64% of drivers who increased their driving due to the pandemic, compared with 56% of those who did not change how much they drove and 44% of those who reduced their driving. Education levels differed between groups, but not

in a clear, systematic manner. The proportion of drivers who identified as a race other than non-Hispanic white was greatest among those who reported increasing their driving due to the pandemic and lowest among those who reported having not changed how much they were driving. Drivers who reported decreasing their driving due to the pandemic reported driving the fewest days per week (median 5, IQR 3–6), while those who reported increasing their driving reported driving the most days per week (median 7, IQR 5–7).

Table 1. Characteristics of Drivers Who Reported That They Reduced, Did Not Change, or Increased Their Driving Due to the COVID-19 Pandemic, Sample of 2,888 Licensed Active Drivers Aged 16 Years and Older, United States, October–November 2020.

	Reduced Driving (n=1,700)	No Change (n=1,064)	Increased Driving (n=124)
Age			
Median (interquartile range)	50 (35–63)	50 (32–61)	39 (28–51)
Sex			
Male	44	56	64
Female	56	44	36
Highest Level of Education			
High school or below	28	44	40
Some college	31	32	20
Bachelor’s degree or higher	41	24	40
Race and Ethnicity			
White non-Hispanic	64	75	55
Black non-Hispanic	11	9	11
Hispanic (any race)	16	11	18
Other race or multiple races	9	5	16
Typical Days Driving per Week			
Median (interquartile range)	5 (3–6)	6 (5–7)	7 (5–7)

Note: All values except age and typical days driving per week are column percentages. All values except sample size are based on weighted data.

Table 2 shows the weighted percentage of drivers in each group who reported engaging in each behavior of interest at least once in the past 30 days, without adjustment for confounders. For every behavior examined, the percentage of drivers who reported engaging in the behavior at least once was highest among those who increased their driving due to the pandemic. The

prevalence of reported engagement in distracted, drowsy, and unbelted driving behaviors were lowest among drivers who reduced their driving due to the pandemic. The prevalence of reported engagement in aggressive and potentially impaired driving behaviors were similar among those who reduced their driving and those who did not change how much they drove due to the pandemic.

Table 2. Percentage of Drivers Who Reported Engaging in Various Driving Behaviors within the Past 30 Days in Relation to Whether They Reduced, Did Not Change, or Increased Their Driving Due to the COVID-19 Pandemic, Sample of 2,888 Licensed Active Drivers Aged 16 Years and Older, United States, October–November 2020.

	Reduced Driving (n=1,700)	No Change (n=1,064)	Increased Driving (n=124)
Talking on cellphone	34	42	43
Reading text messages	31	36	50
Typing text messages	20	25	40
Speeding on freeways	45	44	65
Speeding on residential streets	35	34	51
Running red lights	25	25	45
Changing lanes aggressively	19	22	43
Drowsy driving	16	19	21
Unbelted driving	9	17	21
Alcohol-impaired driving	5	7	13
Driving after using marijuana	4	4	13

Note: All values are percentages and are based on weighted data.

Table 3 shows the ratios of the adjusted proportions of drivers who reported engaging in each of the behaviors of interest among those who reduced or increased their driving due to the pandemic relative to those who did not change how much they drove. Compared with drivers who reported that they did not change how much they drove due to the pandemic, those who reported reducing their driving were 33% less likely to report having driven without wearing their seatbelt at any time in the past 30 days. They were also slightly more likely to report having sped on freeways. No other comparisons were statistically significant for this group.

In contrast, compared with drivers who did not change how much they drove due to the pandemic, those who increased their driving were 27% more likely to report having read text messages, 38% more likely to have typed text messages, 40% more likely to have sped on freeways and on residential streets, 67% more likely to have run a red light, 86% more likely to have changed lanes aggressively, more than twice as likely to have driven when they believed their blood alcohol concentration might have exceeded the legal limit, and nearly three times as likely to have driven within an hour after using marijuana at least once in the past 30 days.

Table 3. Ratios of Adjusted Proportions of Drivers Who Reported Engaging in Various Driving Behaviors within the Past 30 Days Among Drivers Who Increased or Reduced Their Driving Due to the COVID-19 Pandemic Relative to Drivers Who Did Not Change How Much They Drove, Sample of 2,888 Licensed Active Drivers Aged 16 Years and Older, United States, October–November 2020.

	Reduced Driving vs. No Change		Increased Driving vs. No Change	
	Prevalence Ratio (95% Confidence Interval)			
Talking on cellphone	0.96	(0.84–1.09)	1.00	(0.75–1.33)
Reading text messages	1.07	(0.94–1.23)	1.27	(1.01–1.60)
Typing text messages	1.02	(0.84–1.23)	1.38	(1.01–1.88)
Speeding on freeways	1.13	(1.00–1.26)	1.40	(1.16–1.69)
Speeding on residential streets	1.14	(0.99–1.31)	1.40	(1.08–1.80)
Running red lights	1.08	(0.90–1.30)	1.67	(1.25–2.23)
Changing lanes aggressively	1.10	(0.90–1.33)	1.86	(1.37–2.52)
Drowsy driving	1.03	(0.82–1.29)	1.01	(0.61–1.69)
Alcohol-impaired driving	0.99	(0.68–1.46)	2.09	(1.11–3.92)
Driving after using marijuana	1.13	(0.70–1.83)	2.90	(1.34–6.30)
Driving without wearing seatbelt	0.67	(0.52–0.87)	1.31	(0.80–2.14)

DISCUSSION

The COVID-19 pandemic has led to major changes in travel in the United States and around the world. However, while the number of miles driven in the United States decreased substantially in 2020 relative to previous years, the number and rate of traffic fatalities increased substantially (National Center for Statistics and Analysis, 2021). Previous studies sought to identify crash scenarios, drivers, victims, and contributing factors that changed in prevalence in 2020 relative to 2019 (National Center for Statistics and Analysis, 2021; Office of Behavioral Safety Research, 2021; Thomas et al., 2020), and found many troubling changes. The mechanisms underlying those changes remained elusive, however. The current study sought to investigate whether the pandemic led to safety-relevant changes in the composition of drivers on the road, and found some suggestive evidence that it may have.

Results indicate that approximately three in five drivers reported that the pandemic led them to reduce how much they drove. These drivers who reduced their driving were generally middle-aged and were disproportionately female, a group with comparatively low risk of fatal crash involvement (Li et al., 1998). Furthermore, results indicate that even after adjustment for demographic characteristics and frequency of driving, drivers who reported having reduced their driving due to the pandemic were significantly less likely than others to drive without wearing their seatbelt. If drivers who reduced their driving in response to the pandemic were disproportionately female, middle-aged, and more likely to wear seatbelts at all times, then a reduction in this group’s contribution to the total driving exposure of the entire population would be expected to lead to an increase in the overall rate of traffic fatalities per mile driven, albeit not in the absolute number of fatalities.

In addition, a small segment of the population—approximately 4% of drivers—reported that the pandemic led them to increase the amount that they drove. These drivers were predominantly younger than those who reduced their driving and those who did not change how much they drove during the pandemic, and a greater proportion of them were male. This suggests, even if only on the basis of demographic patterns, that those who increased their driving were likely higher-risk drivers (Li et al., 1998; Tefft, 2017). Moreover, drivers who reported increasing their driving due to the pandemic were more likely to report engaging in a wide array of risky driving behaviors including distracted driving, speeding, aggressive driving, substance-impaired driving, and driving without wearing a seatbelt, among others. This remained true even after controlling for their demographic characteristics and frequency of driving. If higher-risk drivers accounted for a greater share of total driving exposure during the pandemic than they did previously, this would be expected to result in an increase in the rate of traffic fatalities per mile driven, and possibly also an increase in the absolute number of fatalities.

Other studies have observed increases in the proportion of crashes or crash fatalities that involved speeding, alcohol or drug use, and non-use of seatbelts (Governors Highway Safety Association, 2020; National Center for Statistics and Analysis, 2021; Office of Behavioral Safety Research, 2021; Thomas et al., 2020). However, the mechanisms underlying these increases had not previously been elucidated. The current study suggests that at least some portion of these shifts is attributable to an increase in driving among a subset of drivers who have a propensity to engage in these behaviors. It is possible that drivers who increased the amount that they drove in response to the pandemic might have also increased their own frequency of engagement in these risky driving behaviors. The cross-sectional nature of the current study precludes a definitive determination of whether drivers who increased their driving during the pandemic were already riskier than average, or whether they increased their risky driving behaviors during the pandemic, or both. However, what is clear is that a small subset of the driving population increased their driving during the pandemic, that these drivers were members of demographic groups with higher average risk, and that they were also more likely to engage in risky driving behaviors above and beyond that which is explained by their demographic characteristics.

While the mechanisms responsible for the observed associations are unclear, other research suggests some possibilities. It is possible that many of the individuals who were willing to travel—and even increase their travel—despite the health risks associated with the pandemic were already more willing than average to take other risks. There is some limited evidence that such factors might be at play. A recent study of young drivers in the state of Alabama found that those with greater prosocial tendencies reduced their driving more than those with lower prosocial tendencies during the pandemic (Stavrinos et al., 2020). Relatedly, several studies have documented the tendency of high-risk behavior to beget other high-risk behaviors (Jørgenrud et al., 2018; Kelley-Baker et al., 2021; Lawton et al., 1997). In the current context, it is possible that incurring the increased health risks associated with increasing travel during the pandemic increased these individuals' willingness to take additional risks, including while driving. Alternatively, risk homeostasis theory (Wilde, 1982) and the related task difficulty homeostasis theory (Fuller, 2005; Fuller et al., 2008) provide additional plausible explanations. With less traffic on the roads during the pandemic (Tefft et al., 2021), drivers' perceptions of the risk and difficulty of the driving task were likely reduced relative to typical pre-pandemic driving situations, enabling them to perform more risk-increasing behaviors while perceiving themselves to be operating within a level of risk (Wilde, 1982) or task difficulty (Fuller, 2005; Fuller et al., 2008) that they find comfortable. Finally, there is also evidence that the prevalence of a number of non-driving-related negative health behaviors increased during the pandemic (Knell et al., 2020; Pollard et al., 2020; Reger et al., 2020; Simone et al., 2021; Yard et al., 2021; Zajacova et al., 2020); it is possible that risky driving behaviors may be part of a constellation of health risk behaviors with shared underlying causes such as stress, anxiety, or depression. The current data do not allow for a rigorous evaluation of these hypotheses; they merely provide some possible mechanisms for the observed pattern of results.

This study has several limitations that should be noted. Although great care was taken to obtain a representative sample of the U.S. population, results could be biased if participants' willingness to participate in the survey was correlated with the survey measures. In particular, results suggest that the pandemic led a small fraction of U.S. drivers to increase how much they drove. Given that this

subset of the population is clearly small and apparently distinctive in its characteristics, it is possible that survey respondents who increased their driving due to the pandemic might not be representative of the subset of the broader population of U.S. drivers who did so, even if the sample as a whole is reasonably representative of the U.S. population. In addition, all survey measures rely on self-report; some risky driving behaviors are likely underreported. However, there is no reason to expect the magnitude or frequency of any such measurement error to vary systematically with whether respondents increased, decreased, or did not change how much they drove due to the COVID-19 pandemic. Finally, the study included 22 statistical comparisons, and no adjustment was made to reduce the false discovery rate associated the larger number of comparisons, thus one or possibly two Type-I errors would be expected. The authors did not wish to sacrifice statistical power in the interest of minimizing the threat of an incidental Type-I error. Even if one were to assume that one or two of the 10 statistically significant differences observed were spurious associations attributable only to chance, the main finding would be essentially unchanged. A small proportion of drivers increased how much they drove due to the pandemic, and these drivers were more likely than average to engage in a wide array of risky driving behaviors.

CONCLUSION

The U.S. experienced large increases in the number and rate of traffic fatalities during the COVID-19 pandemic, despite reductions in driving exposure. In a survey of U.S. drivers conducted in fall 2020, the current study finds that approximately 60% of drivers reported reducing their driving due to the pandemic. They were mostly middle-aged or older and female—a statistically safer-than-average population. A small percentage reported increasing their driving due to the pandemic; they were predominantly younger and male—a statistically higher-risk group. Moreover, those who reported reducing their driving during were the most likely to report never driving without wearing their seatbelt, and those who reported increasing their driving were more likely to report engaging in a wide array of risky driving behaviors. These differences remained even after accounting for differences in demographic characteristics and frequency of driving. While the current study is unable to determine the reasons for these differences, results suggest that the

increase in the number and rate of traffic fatalities may be attributable at least in part to differential changes in driving exposure among segments of the driving population whose safety profile also differs.

REFERENCES

- AAA Foundation for Traffic Safety. (2021). *2020 Traffic Safety Culture Index (Technical Report)*. AAA Foundation for Traffic Safety.
- Blower, D., Flannagan, C., Geedipally, S., Lord, D., & Wunderlich, R. (2020). *Identification of Factors Contributing to the Decline of Traffic Fatalities in the United States from 2008 to 2012*. NCHRP Research Report 928. Transportation Research Board.
- Bureau of Transportation Statistics. (2021, March 16). *After a Year of COVID-19, the View from BTS*. www.bts.gov/data-spotlight/after-year-covid-19-view-bts
- Chen, Q., Qian, L., Shi, J., & Franklin, M. (2018). Comparing performance between log-binomial and robust Poisson regression models for estimating risk ratios under model misspecification. *BMC Medical Research Methodology*, 18:63. doi.org/0.1186/s12874-018-0519-5
- Doucette, M. L., Tucker, A., Auguste, M. E., Watkins, A., Green, C., Pereira, F. E., Borrup, K. T., Shapiro, D., & Lapidus, G. (2021). Initial impact of COVID-19's stay-at-home order on motor vehicle traffic and crash patterns in Connecticut: An interrupted time series analysis. *Injury Prevention*, 27(1), 3–9. doi.org/10.1136/injuryprev-2020-043945
- Fuller, R. (2005). Towards a general theory of driver behaviour. *Accident Analysis & Prevention*, 37(3), 461–472. doi.org/10.1016/j.aap.2004.11.003
- Fuller, R., McHugh, C., & Pender, S. (2008). Task difficulty and risk in the determination of driver behaviour. *European Review of Applied Psychology*, 58(1), 13–21. doi.org/10.1016/j.erap.2005.07.004
- Governors Highway Safety Association. (2020, April 16). *Absent Traffic Jams, Many Drivers Getting More Reckless*. www.ghsa.org/resources/news-releases/coronavirus-reckless-driving20
- Hamilton, J. (2021, July 28). *Dates of U.S. recessions as inferred by GDP-based recession indicator*. FRED, Federal

Reserve Bank of St. Louis. fred.stlouisfed.org/series/JHDUSRGPBR

Jørgenrud, B., Bogstrand, S. T., Furuhaugen, H., Jamt, R. E. G., Vindenes, V., & Gjerde, H. (2018). Association between speeding and use of alcohol and medicinal and illegal drugs and involvement in road traffic crashes among motor vehicle drivers. *Traffic Injury Prevention*, 19(8), 779–785. doi.org/10.1080/15389588.2018.1518577

Kelley-Baker, T., Villavicencio, L., Arnold, L. S., Benson, A. J., Anorve, V., & Tefft, B. C. (2021). Risky Driving Behaviors of Drivers Who Use Alcohol and Cannabis. *Transportation Research Record*, 2675(5), 339–344. doi.org/10.1177/0361198121989727

Knell, G., Robertson, M. C., Dooley, E. E., Burford, K., & Mendez, K. S. (2020). Health behavior changes during COVID-19 pandemic and subsequent “Stay-at-Home” orders. *International Journal of Environmental Research and Public Health*, 17(17), 6268. doi.org/10.3390/ijerph17176268

Lawton, R., Parker, D., Stradling, S. G., & Manstead, A. S. R. (1997). Predicting road traffic accidents: The role of social deviance and violations. *British Journal of Psychology*, 88(2), 249–262. doi.org/10.1111/j.2044-8295.1997.tb02633.x

Li, G., Baker, S. P., Langlois, J. A., & Kelen, G. D. (1998). Are female drivers safer? An application of the decomposition method. *Epidemiology (Cambridge, Mass.)*, 9(4), 379–384. doi.org/10.1097/00001648-199807000-00006

Li, L., Neuroth, L. M., Valachovic, E., Schwebel, D. C., & Zhu, M. (2021). Association between changes in social distancing policies in Ohio and traffic volume and injuries, January through July 2020. *JAMA*, 325(10), 1003. doi.org/10.1001/jama.2020.25770

Longthorne, A., Subramanian, R., & Chen, C.-L. (2010). *An analysis of the significant decline in motor vehicle traffic fatalities in 2008* (DOT HS 811 346). National Highway Traffic Safety Administration.

Maheshri, V., & Winston, C. (2016). Did the Great Recession keep bad drivers off the road? *Journal of Risk and Uncertainty*, 52(3), 255–280. doi.org/10.1007/s11166-016-9239-6

National Center for Statistics and Analysis. (2021). *Early Estimates of Motor Vehicle Traffic Fatalities and Fatality*

Rate by Sub-Categories in 2020 (Crash•Stats Brief Statistical Summary DOT HS 813 118). National Highway Traffic Safety Administration.

Office of Behavioral Safety Research. (2021). *Update to Special Reports on Traffic Safety During the COVID-19 Public Health Emergency: Third Quarter Data* (Research Note DOT HS 813 069). National Highway Traffic Safety Administration.

Pollard, M. S., Tucker, J. S., & Green, H. D. (2020). Changes in adult alcohol use and consequences during the COVID-19 pandemic in the US. *JAMA Network Open*, 3(9), e2022942. doi.org/10.1001/jamanetworkopen.2020.22942

Reger, M. A., Stanley, I. H., & Joiner, T. E. (2020). Suicide mortality and coronavirus disease 2019—A perfect storm? *JAMA Psychiatry*, 77(11), 1093. doi.org/10.1001/jamapsychiatry.2020.1060

Simone, M., Emery, R. L., Hazzard, V. M., Eisenberg, M. E., Larson, N., & Neumark-Sztainer, D. (2021). Disordered eating in a population-based sample of young adults during the COVID-19 outbreak. *International Journal of Eating Disorders*, 54(7), 1189–1201. doi.org/10.1002/eat.23505

Stavrinos, D., McManus, B., Mrug, S., He, H., Gresham, B., Albright, M. G., Svancara, A. M., Whittington, C., Underhill, A., & White, D. M. (2020). Adolescent driving behavior before and during restrictions related to COVID-19. *Accident Analysis & Prevention*, 144, 105686. doi.org/10.1016/j.aap.2020.105686

Tefft, B. C. (2017). *Rates of Motor Vehicle Crashes, Injuries, and Deaths in Relation to Driver Age, United States, 2014–2015* [Research Brief]. AAA Foundation for Traffic Safety.

Tefft, B. C., Añorve, V., Kim, W., & Kelley-Baker, T. (2021). *Travel in the United States Before and During the COVID-19 Pandemic* [Research Brief]. AAA Foundation for Traffic Safety.

Thomas, F. D., Berning, A., Darrach, J., Graham, L., Blomberg, R. D., Griggs, C., Crandall, M., Schulman, C., Kozar, R., Neavyn, M., Cunningham, K., Ehsani, J., Fell, J., Whitehill, J., Babu, K., Lai, J., & Rayner, M. (2020). *Drug and Alcohol Prevalence in Seriously and Fatally Injured Road Users Before and During the COVID-19 Public Health Emergency* (DOT HS 813 018). National Highway Traffic Safety Administration.

Wilde, G. J. S. (1982). Critical Issues in Risk Homeostasis Theory. *Risk Analysis*, 2(4), 249–258. doi.org/10.1111/j.1539-6924.1982.tb01389.x

Yard, E., Radhakrishnan, L., Ballesteros, M. F., Sheppard, M., Gates, A., Stein, Z., Hartnett, K., Kite-Powell, A., Rodgers, L., Adjemian, J., Ehlman, D. C., Holland, K., Idaikkadar, N., Ivey-Stephenson, A., Martinez, P., Law, R., & Stone, D. M. (2021). Emergency department visits for suspected suicide attempts among persons aged 12–25 years before and during the COVID-19 pandemic—United States, January 2019–May 2021. *Morbidity and Mortality Weekly Report*, 70(24), 888–894. doi.org/10.15585/mmwr.mm7024e1

Zajacova, A., Jehn, A., Stackhouse, M., Denice, P., & Ramos, H. (2020). Changes in health behaviours during early COVID-19 and socio-demographic disparities: A cross-sectional analysis. *Canadian Journal of Public Health / Revue Canadienne de Santé Publique*, 111(6), 953–962. doi.org/10.17269/s41997-020-00434-y

Zou, G. (2004). A modified Poisson regression approach to prospective studies with binary data. *American Journal of Epidemiology*, 159(7), 702–706. doi.org/10.1093/aje/kwh090

About the AAA Foundation for Traffic Safety

The AAA Foundation for Traffic Safety is a 501(c)(3) nonprofit, publicly supported charitable research and education organization. It was founded in 1947 by the American Automobile Association to conduct research to address growing highway safety issues. The organization's mission is to identify traffic safety problems, foster research that seeks solutions, and disseminate information and educational materials. AAA Foundation funding comes from voluntary, tax-deductible contributions from motor clubs associated with the American Automobile Association and the Canadian Automobile Association, individual AAA club members, insurance companies and other individuals or groups.

SUGGESTED CITATION

Tefft, B. C., Villavicencio, L., Benson, A., Arnold, L. S., Kim, W., Añorve, V., Horrey, W. J. (2022). *Self-Reported Risky Driving in Relation to Amount of Driving During the COVID-19 Pandemic* (Research Brief). Washington, D.C.: AAA Foundation for Traffic Safety.

© 2022, AAA Foundation for Traffic Safety