NHTSA

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

Drug and Alcohol Prevalence in Seriously and Fatality Injured Road Users

ICADTS

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NHTSA's Office of Behavioral Safety Research / Dunlap and Associates, Inc.

September 2021

Objective

- Examine prevalence of legal and illegal drugs in drivers and other road users who are seriously- or fatally-injured and present directly to selected Level 1 trauma centers and to morgues.
  - Drivers
  - Passengers
  - Pedestrians
  - Bicyclists
  - Motorcyclists
  - Scooter Riders
- Examine prevalence from months prior to COVID-19, to those months after.
- In Fall 2020 NHTSA began series of special reports examining COVID/Traffic Safety – we now have 4 research reports updating issue.

UMass Memorial Center Worcester, MA

R Adams Cowley Shock Trauma Center Baltimore, MD

Carolinas Medical Center Charlotte, NC

UF Health Trauma One Jacksonville, FL

Ryder Trauma Center Miami, FL

University of Iowa Health Care – Iowa City, IA

UC Davis Health, Sacramento, CA

NHTSA's Drug and Alcohol Prevalence in Seriously and Fatally Injured Road Users

Road Users

- Drivers
- Passengers
- Pedestrians
- Bicyclists
- Motorcyclists
- Scooters

Crash Outcomes

- Serious Injury
- Fatality

Research Partners

- Level 1 Trauma Centers
- Medical Examiners

Blood already collected by medical staff

De-Indentified

Forensic Toxicology Lab

- Testing for ~ 70 drugs
  - over-the-counter
  - prescription
  - illegal

National Institutes of Health

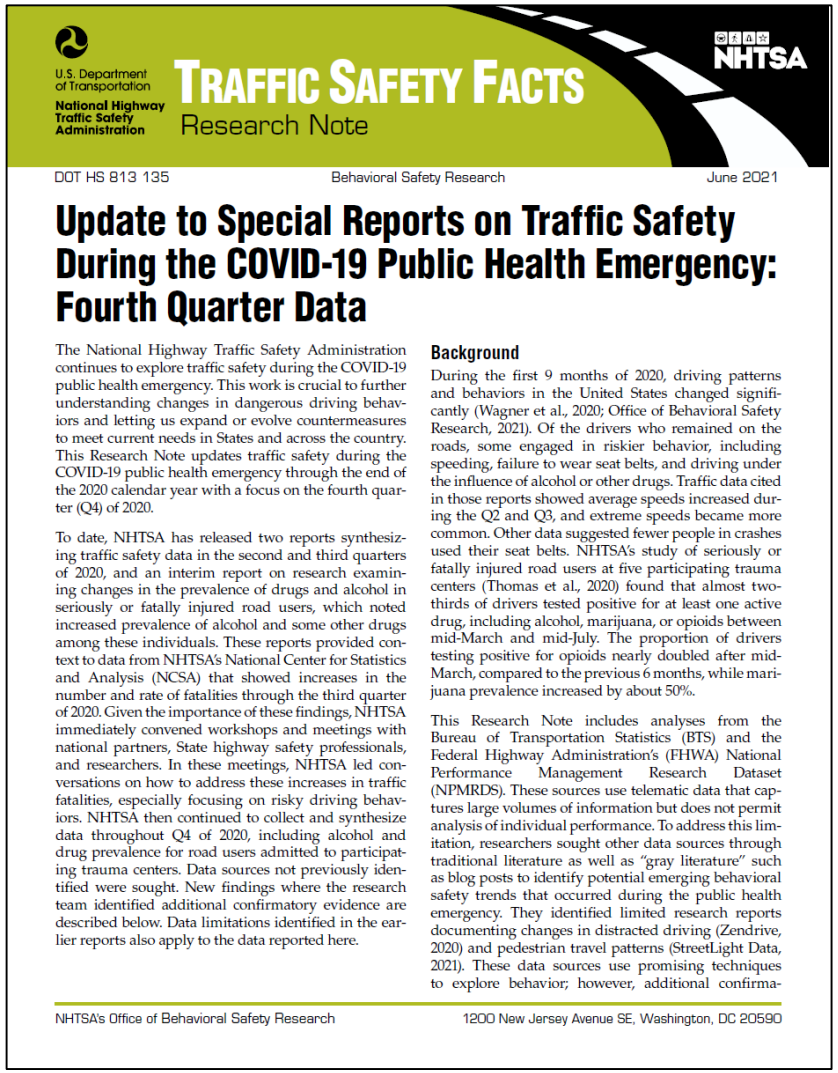
- Testing for Covid-19

Dunlap and Associates, Inc.

Time Frame

- Data Collection began in late 2019
- Staggered start across sites (quantity of pre-COVID data varies by site)
- Trauma centers began halting/reducing data collection as only “essential research” allowed during COVID-19 public health emergency
- In Spring 2020, we revised protocol to allow for SARS-CoV-2 antibody testing by National Institutes of Health; data collection restarted at all sites
- Toxicology results available before and during the public health emergency
- Interim results here cover through December 2020
- Data collection just finished July 2021 - Expect about 7,500 blood samples

Most Recent Update - Through Fourth Quarter of 2020



U.S. Department of Transportation
National Highway Traffic Safety Administration

TRAFFIC SAFETY FACTS
Research Note

NHTSA

DOT HS 813 135 | Behavioral Safety Research | June 2021

Update to Special Reports on Traffic Safety During the COVID-19 Public Health Emergency: Fourth Quarter Data

The National Highway Traffic Safety Administration continues to explore traffic safety during the COVID-19 public health emergency. This work is crucial to further understanding changes in dangerous driving behaviors and letting us expand or evolve countermeasures to meet current needs in States and across the country. This Research Note updates traffic safety during the COVID-19 public health emergency through the end of the 2020 calendar year with a focus on the fourth quarter (Q4) of 2020.

To date, NHTSA has released two reports synthesizing traffic safety data in the second and third quarters of 2020, and an interim report on research examining changes in the prevalence of drugs and alcohol in seriously or fatally injured road users, which noted increased prevalence of alcohol and some other drugs among these individuals. These reports provided context to data from NHTSA's National Center for Statistics and Analysis (NCSA) that showed increases in the number and rate of fatalities through the third quarter of 2020. Given the importance of these findings, NHTSA immediately convened workshops and meetings with national partners, State highway safety professionals, and researchers. In these meetings, NHTSA led conversations on how to address these increases in traffic fatalities, especially focusing on risky driving behaviors. NHTSA then continued to collect and synthesize data throughout Q4 of 2020, including alcohol and drug prevalence for road users admitted to participating trauma centers. Data sources not previously identified were sought. New findings where the research team identified additional confirmatory evidence are described below. Data limitations identified in the earlier reports also apply to the data reported here.

Background

During the first 9 months of 2020, driving patterns and behaviors in the United States changed significantly (Wagner et al., 2020; Office of Behavioral Safety Research, 2021). Of the drivers who remained on the roads, some engaged in riskier behavior, including speeding, failure to wear seat belts, and driving under the influence of alcohol or other drugs. Traffic data cited in those reports showed average speeds increased during the Q2 and Q3, and extreme speeds became more common. Other data suggested fewer people in crashes used their seat belts. NHTSA's study of seriously or fatally injured road users at five participating trauma centers (Thomas et al., 2020) found that almost two-thirds of drivers tested positive for at least one active drug, including alcohol, marijuana, or opioids between mid-March and mid-July. The proportion of drivers testing positive for opioids nearly doubled after mid-March, compared to the previous 6 months, while marijuana prevalence increased by about 50%.

This Research Note includes analyses from the Bureau of Transportation Statistics (BTS) and the Federal Highway Administration's (FHWA) National Performance Management Research Dataset (NPMRDS). These sources use telematic data that captures large volumes of information but does not permit analysis of individual performance. To address this limitation, researchers sought other data sources through traditional literature as well as "gray literature" such as blog posts to identify potential emerging behavioral safety trends that occurred during the public health emergency. They identified limited research reports documenting changes in distracted driving (Zendrive, 2020) and pedestrian travel patterns (StreetLight Data, 2021). These data sources use promising techniques to explore behavior; however, additional confirma-

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Drivers: Positive for Drug Category by Year's Quarter

	End of 2019 Q4 2019 (N=409)		Begin 2020 / Early COVID Q1 2020 (N=536)		Quarter 2 Q2 2020 (N=404)		Quarter 3 Q3 2020 (N=603)		Quarter 4 Q4 2020 (N=474)	
Drug Category	n	%	n	%	n	%	n	%	n	%
Alcohol	90	22.0	137	25.6	102	25.2	166	27.5	127	26.8
Cannabinoids	78	19.1	118	22.0	133	32.9[A,B]	155	25.7	130	27.4[A]
Stimulants	36	8.8	60	11.2	41	10.1	64	10.6	42	8.9
Sedatives	42	10.3	35	6.5	34	8.4	48	8.0	33	7.0
Opioids	28	6.8	52	9.7	60	14.9[A]	88	14.6[A]	44	9.3
Antidepressants	11	2.7	12	2.2	1	0.2[A]	4	0.7	4	0.8
Over-the-Counter	4	1.0	22	4.1	6	1.5	10	1.7	8	1.7
Other Drugs	7	1.7	9	1.7	3	0.7	17	2.8	10	2.1
At Least 1 Category	211	51.6	292	54.5	260	64.4[A,B]	366	60.7[A]	266	56.1
Multiple Categories	69	16.9	120	22.4	92	22.8	150	24.9[A]	108	22.8

https://rosap.ntl.bts.gov/view/dot/56125

[A] Significantly different ($p < .05$) compared to Q4 2019 period.
[B] Significantly different ($p < .05$) compared to Q1 2020 period.

Motorcyclists: Positive for Drug Category by Quarter

Drug Category	Q4 2019 (N=61)		Q1 2020 (N=111)		Q2 2020 (N=137)		Q3 2020 (N=213)		Q4 2020 (N=125)	
	n	%	n	%	n	%	n	%	n	%
Alcohol	11	18.0	21	18.9	42	30.7	63	29.6	31	24.8
Cannabinoids	14	23.0	30	27.0	50	36.5	61	28.6	35	28.0
Opioids	2	3.3	4	3.6	7	5.1	19	8.9	7	5.6
Stimulants	6	9.8	5	4.5	8	5.8	19	8.9	11	8.8
Sedatives	2	3.3	7	6.3	7	5.1	22	10.3	6	4.8
Antidepressants	0	0.0	0	0.0	1	0.7	3	1.4	1	0.8
Over-the-Counter	0	0.0	1	0.9	0	0.0	0	0.0	0	0.0
Other Drugs	2	3.3	0	0.0	4	2.9	8	3.8	5	4.0
At Least 1 Category	27	44.3	51	45.9	85	62.0	135	63.4[B]	72	57.6
Multiple Categories	7	11.5	15	13.5	28	20.4	49	23.0	18	14.4

[B] Significantly different ($p < .05$) compared to Q1 2020.

https://rosap.ntl.bts.gov/view/dot/56125

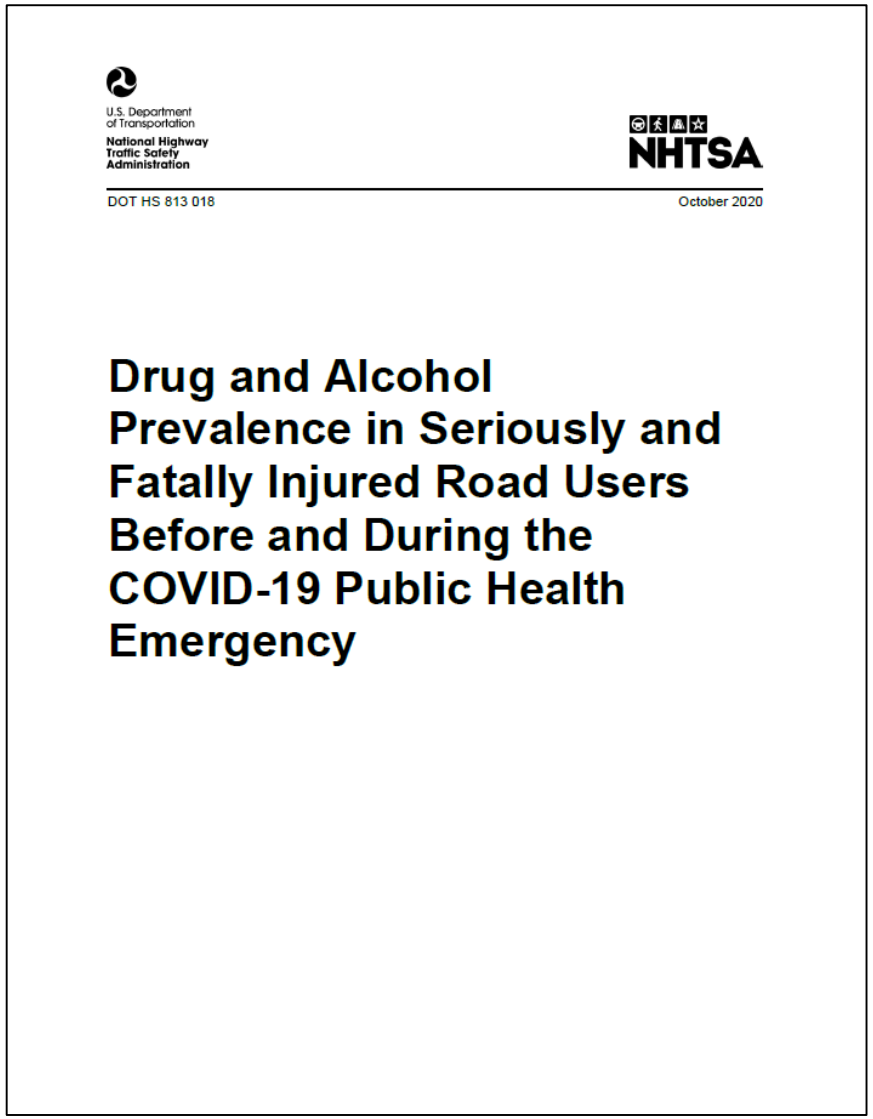
Pedestrians: Positive for Drug Category by Quarter

	Q4 2019 (N=106)		Q1 2020 (N=162)		Q2 2020 (N=105)		Q3 2020 (N=172)		Q4 2020 (N=144)	
	n	%	n	%	n	%	n	%	n	%
Alcohol	20	18.9	46	28.4	31	29.5	53	30.8	36	25.0
Cannabinoids	23	21.7	27	16.7	31	29.5	38	22.1	34	23.6
Stimulants	10	9.4	23	14.2	16	15.2	21	12.2	14	9.7
Sedatives	9	8.5	14	8.6	10	9.5	19	11.0	14	9.7
Opioids	9	8.5	10	6.2	13	12.4	23	13.4	25	17.4[B]
Antidepressants	3	2.8	2	1.2	1	1.0	2	1.2	1	0.7
Over-the-Counter	2	1.9	6	3.7	4	3.8	4	2.3	2	1.4
Other Drugs	4	3.8	1	0.6	1	1.0	6	3.5	4	2.8
At Least 1 Category	52	49.1	86	53.1	68	64.8	108	62.8	88	61.1
Multiple Categories	16	15.1	35	21.6	29	27.6	44	25.6	34	23.6

https://rosap.ntl.bts.gov/view/dot/50940

[B] Significantly different ($p < .05$) compared to Q1 2020 period.

Earlier Interim Results



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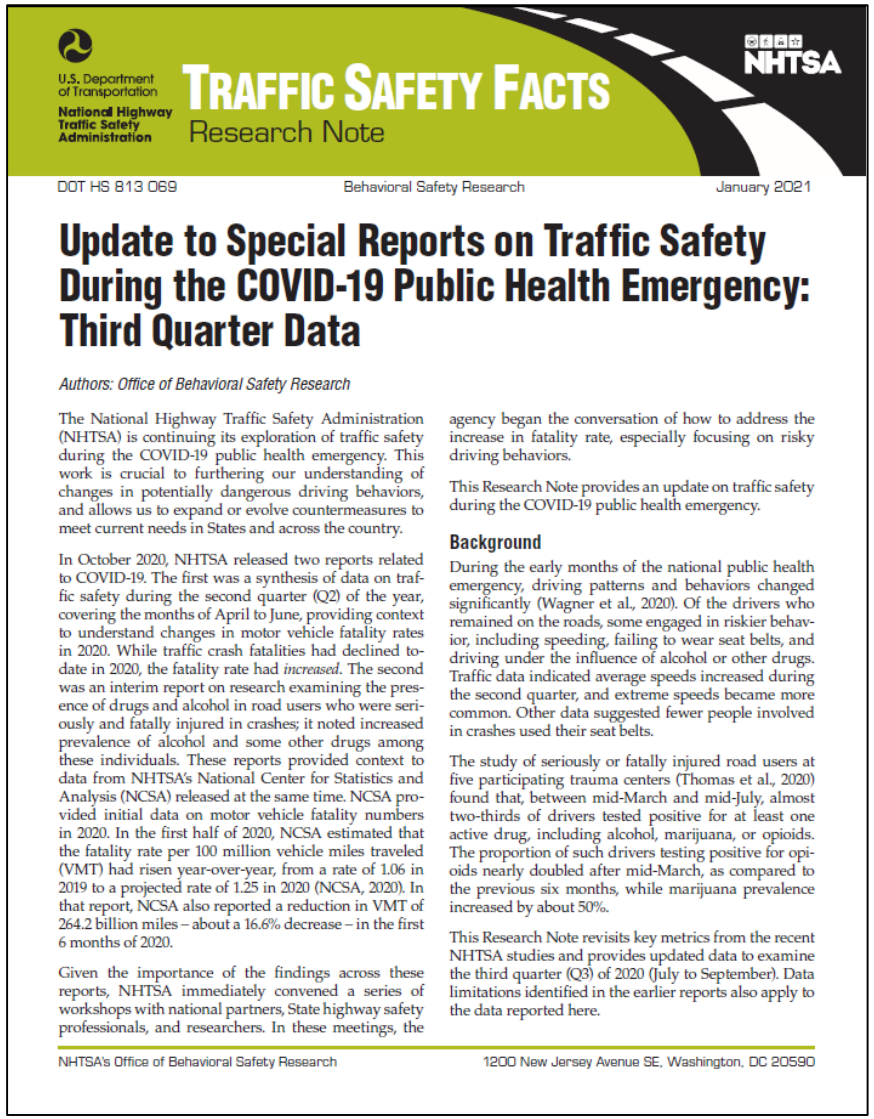
DOT HS 813 018 October 2020

Drug and Alcohol Prevalence in Seriously and Fatally Injured Road Users Before and During the COVID-19 Public Health Emergency



U.S. Department of Transportation
National Highway Traffic Safety Administration

TRAFFIC SAFETY FACTS
Research Note

NHTSA

DOT HS 813 069 Behavioral Safety Research January 2021

Update to Special Reports on Traffic Safety During the COVID-19 Public Health Emergency: Third Quarter Data

Authors: Office of Behavioral Safety Research

The National Highway Traffic Safety Administration (NHTSA) is continuing its exploration of traffic safety during the COVID-19 public health emergency. This work is crucial to furthering our understanding of changes in potentially dangerous driving behaviors, and allows us to expand or evolve countermeasures to meet current needs in States and across the country.

In October 2020, NHTSA released two reports related to COVID-19. The first was a synthesis of data on traffic safety during the second quarter (Q2) of the year, covering the months of April to June, providing context to understand changes in motor vehicle fatality rates in 2020. While traffic crash fatalities had declined to-date in 2020, the fatality rate had *increased*. The second was an interim report on research examining the presence of drugs and alcohol in road users who were seriously and fatally injured in crashes; it noted increased prevalence of alcohol and some other drugs among these individuals. These reports provided context to data from NHTSA's National Center for Statistics and Analysis (NCSA) released at the same time. NCSA provided initial data on motor vehicle fatality numbers in 2020. In the first half of 2020, NCSA estimated that the fatality rate per 100 million vehicle miles traveled (VMT) had risen year-over-year, from a rate of 1.06 in 2019 to a projected rate of 1.25 in 2020 (NCSA, 2020). In that report, NCSA also reported a reduction in VMT of 264.2 billion miles – about a 16.6% decrease – in the first 6 months of 2020.

Given the importance of the findings across these reports, NHTSA immediately convened a series of workshops with national partners, State highway safety professionals, and researchers. In these meetings, the agency began the conversation of how to address the increase in fatality rate, especially focusing on risky driving behaviors.

This Research Note provides an update on traffic safety during the COVID-19 public health emergency.

Background

During the early months of the national public health emergency, driving patterns and behaviors changed significantly (Wagner et al., 2020). Of the drivers who remained on the roads, some engaged in riskier behavior, including speeding, failing to wear seat belts, and driving under the influence of alcohol or other drugs. Traffic data indicated average speeds increased during the second quarter, and extreme speeds became more common. Other data suggested fewer people involved in crashes used their seat belts.

The study of seriously or fatally injured road users at five participating trauma centers (Thomas et al., 2020) found that, between mid-March and mid-July, almost two-thirds of drivers tested positive for at least one active drug, including alcohol, marijuana, or opioids. The proportion of such drivers testing positive for opioids nearly doubled after mid-March, as compared to the previous six months, while marijuana prevalence increased by about 50%.

This Research Note revisits key metrics from the recent NHTSA studies and provides updated data to examine the third quarter (Q3) of 2020 (July to September). Data limitations identified in the earlier reports also apply to the data reported here.

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Drivers' BAC Ranges

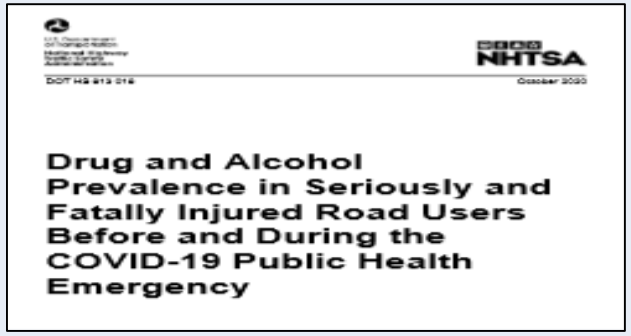
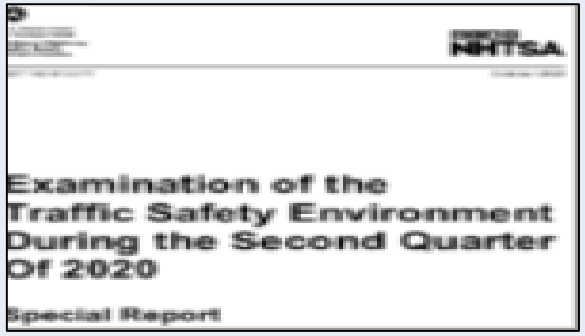
	Before COVID (N= 1,157)			March 17 to July 18 2020 (N=699)			July 19 to September 30 2020		
BAC Range (in g/dL)	n	%	95% CI	n	%	95% CI	n	%	95% CI
.00 (No Alcohol)	905	78.2	[75.8, 80.5]	501	71.7[A]	[68.2, 74.9]	453	70.8[A]	[67.2, 74.2]
.02 - .049	9	0.8	[0.4, 1.4]	14	2.0	[1.2, 3.2]	16	2.5[A]	[1.5, 3.9]
.05 - .079	22	1.9	[1.2, 2.8]	13	1.8	[1.0, 3.1]	7	1.1	[0.5, 2.1]
.08 - .149	64	5.5	[4.3, 7.0]	44	6.3	[4.7, 8.3]	45	7.0	[5.2, 9.2]
.15 +	157	13.6	[11.7, 15.6]	127	18.2[A]	[15.4, 21.2]	119	18.6[A]	[15.7, 21.7]

https://rosap.ntl.bts.gov/view/dot/50940

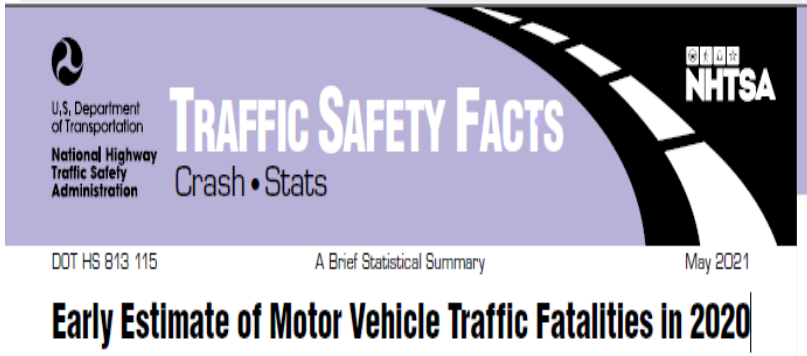
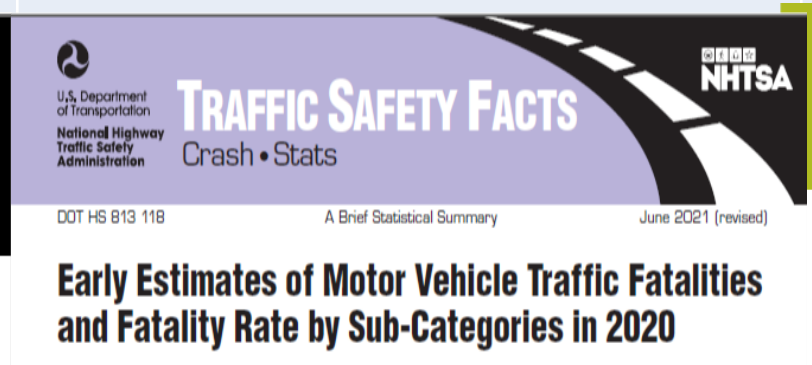
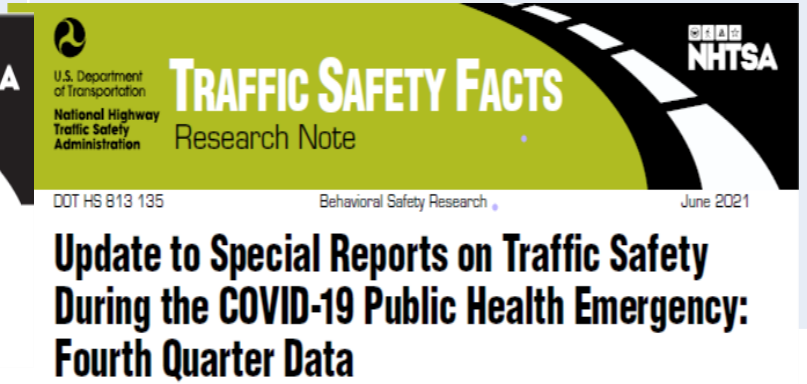
Take-Aways / Limitations

- From data at selected trauma centers of seriously and fatally injured road users, drug and alcohol prevalence is a cause for concern.
  - Drivers, in particular, showed significantly higher drug prevalence during the public health emergency with 64.7% testing positive (at least one category) compared to 50.8% before.
  - Opioid prevalence among drivers more than doubled from Q4 2019 (6.8%) to Q2 2020 (14.9%) and Q3 2020 (14.6)
  - Cannabis (active THC) prevalence increased among drivers and was more prevalent than alcohol during Q2 2020
- The study is measuring prevalence, not impairment or crash risk.
- Data collection was at 5 sites - not chosen for representativeness which limits the generalizability of the findings.

NHTSA Publications

October 2020	October 2020	January 2021
Drug and Alcohol Prevalence in Seriously and Fatally Injured Road Users Before and During the COVID-19 Public Health Emergency	Examination of the Traffic Safety Environment During the Second Quarter of 2020 Special Report	Update to Special Reports on Traffic Safety During the COVID-19 Public Health Emergency: Third Quarter Data: Third Quarter Data
		
https://www.nhtsa.gov/behavioral-research https://rosap.ntl.bts.gov/view/dot/50941	https://www.nhtsa.gov/behavioral-research https://rosap.ntl.bts.gov/view/dot/50940	https://www.nhtsa.gov/behavioral-research https://rosap.ntl.bts.gov/view/dot/50940

NHTSA Publications

May 2021	June 2021	June 2021
Early Estimate of Motor Vehicle Traffic Fatalities in 2020	**Early Estimates of Motor Vehicle Traffic Fatalities and Fatality Rate by Sub-Categories in 2020**	**Update to Special Reports on Traffic Safety During the COVID-19 Public Health Emergency: Fourth Quarter Data, Research Note, Traffic Safety Facts**
		
https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813115	https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813118	https://www.nhtsa.gov/behavioral-research https://rosap.ntl.bts.gov/view/dot/56125

NIH's Research on SARS-CoV-2 Positivity

- To keep our Drug Prevalence study going in Spring 2020, partnered with NIH and share our (de-indentified) blood samples.
  - Testing our samples for SARS-CoV-2.
  - Working on journal article on positivity rate of seriously injured road users.
  - Will then compare results with existing sample they had of
  - Kaitlyn Sadtler, Ph.D.
    Chief, Section for Immuno-Engineering
    National Institute of Biomedical Imaging and Bioengineering
    National Institutes of Health

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Drug and Alcohol Prevalence study -
Dennis Thomas, Principal Investigator
Dunlap and Associates, Inc.

Thomas, F. D., Berning, A., Darrah, J., Graham, L., Blomberg, R., Griggs, C., Crandall, M., Schulman, C., Kozar, R., Neavyn, M., Cunningham, K., Ehsani, J., Fell, J., Whitehill, J., Babu, K., Lai, J., and Rayner, M. (2020, October). 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.