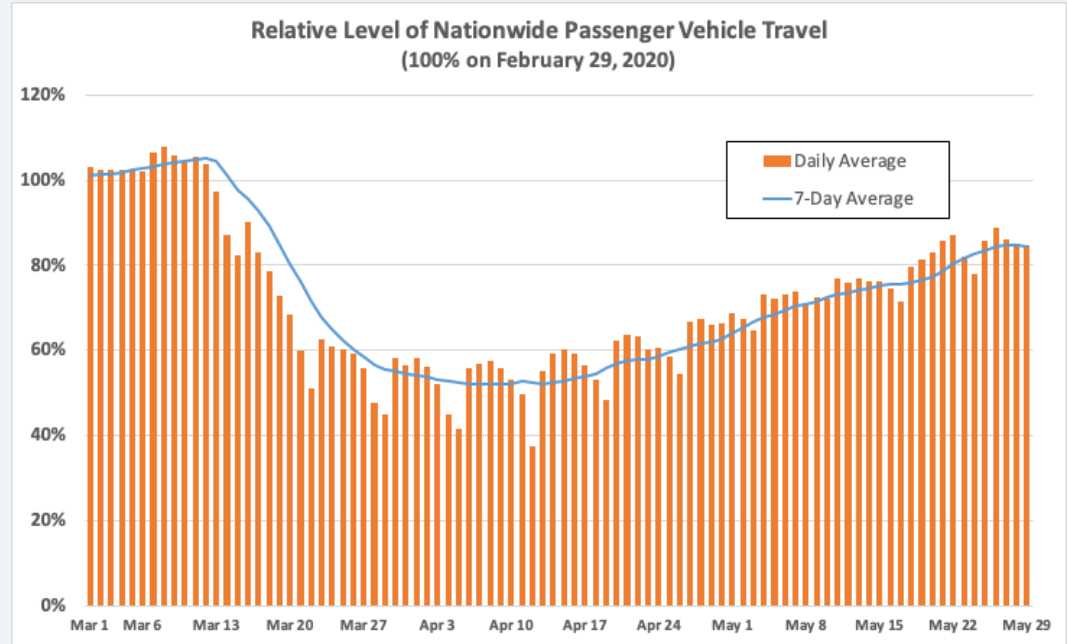


Vehicle Miles Traveled and Traffic Fatalities:

The COVID-19 Natural Experiment



June 17, 2020

Introduction

- What happens to fatalities when New Jersey traffic drops precipitously?
- Does reducing vehicle miles traveled (VMT) achieve Vision Zero (VZ) goals?
- Does measuring fatalities by vehicle miles traveled (VMT) focus efforts on effective safety improvement strategies?

Let's Run the Numbers...

Does Data Change Beliefs?

- Data about fatalities is emotionally loaded, may have prior beliefs
- If the data confirms prior beliefs, it will be accepted
 - Confirmation bias

Why Facts Don't Unify Us

By Tali Sharot and Cass R. Sunstein

- “People with stronger analytic capabilities are more likely to twist data at will than people with low reasoning ability”
 - Unconsciously twist the data to meet prior beliefs
 - Media examples
 - Think of new counter-arguments to strengthen prior beliefs
 - Boomerang effect

COVID-era VMT and NJ Traffic Fatalities

Week	VMT (wk Feb 29 2020 = 100%)	2019	2020	Difference
Mar 21 - 27	-56%	5	10	5
Mar 28 - Ap 3	-63%	6	8	2
Ap 4-10	-61%	7	3	-4
Ap 11-17	-60%	11	7	-4
Ap 18-24	-58%	14	10	-4
Ap 25- May 1	-55%	7	6	-1
May 2 - 8	-47%	13	8	-5
May 9 - 15	-43%	5	10	5
May 16 - 22	-37%	16	14	-2
May 23 - 29	-36%	9	9	0
		93	85	-8

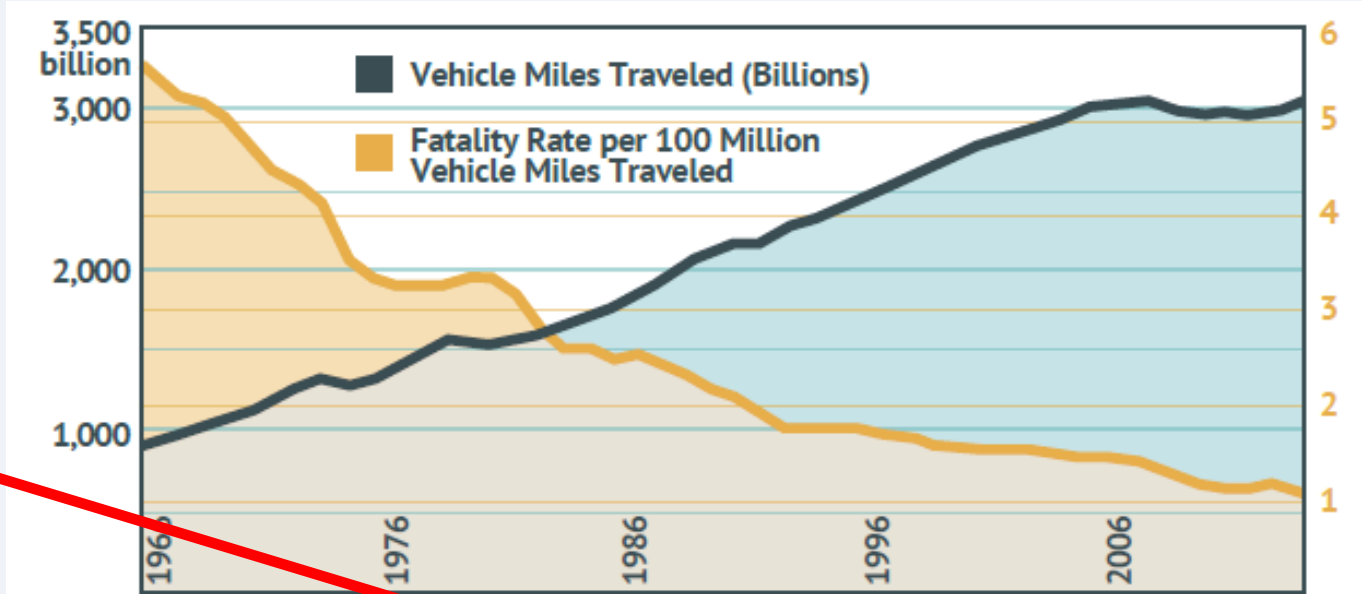


Fatalities Are Not Related To VMT

- VMT dropped
 - 6 weeks dropped 55% - 63%
 - 4 weeks dropped 36% - 47%
- Fatalities varied vs 2019
 - 3 weeks increased
 - 6 weeks decreased
 - 1 week same
 - Net difference about same as 2018 vs 2019

VMT Reduction Not a Vision Zero Strategy

- A lot of VMT reduction yields no fewer fatalities
- See graph for why measuring by VMT is comforting

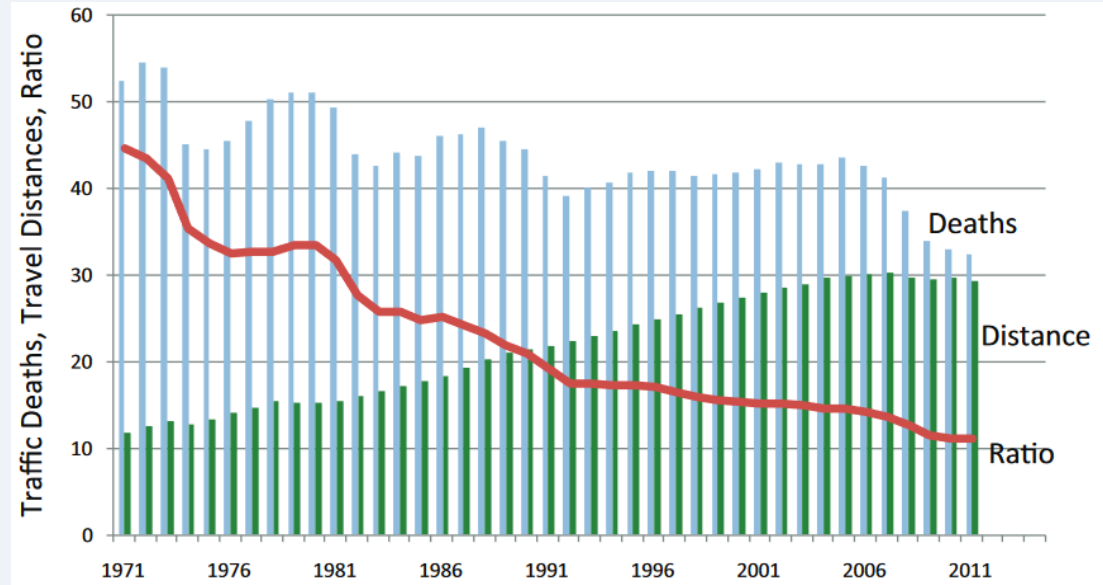


Missing

$$\text{Fatality Rate} = \text{Fatalities} / \text{Vehicle Miles Traveled}$$

Should We Measure Fatalities or Rates?

- What is better?
 - fewer deaths
 - lower death rate
- Lies, Damn Lies and Statistics
 - Rates obfuscate
 - VMT moves the rate OPPOSITE because it is the denominator



It *looks* safer when people drive more

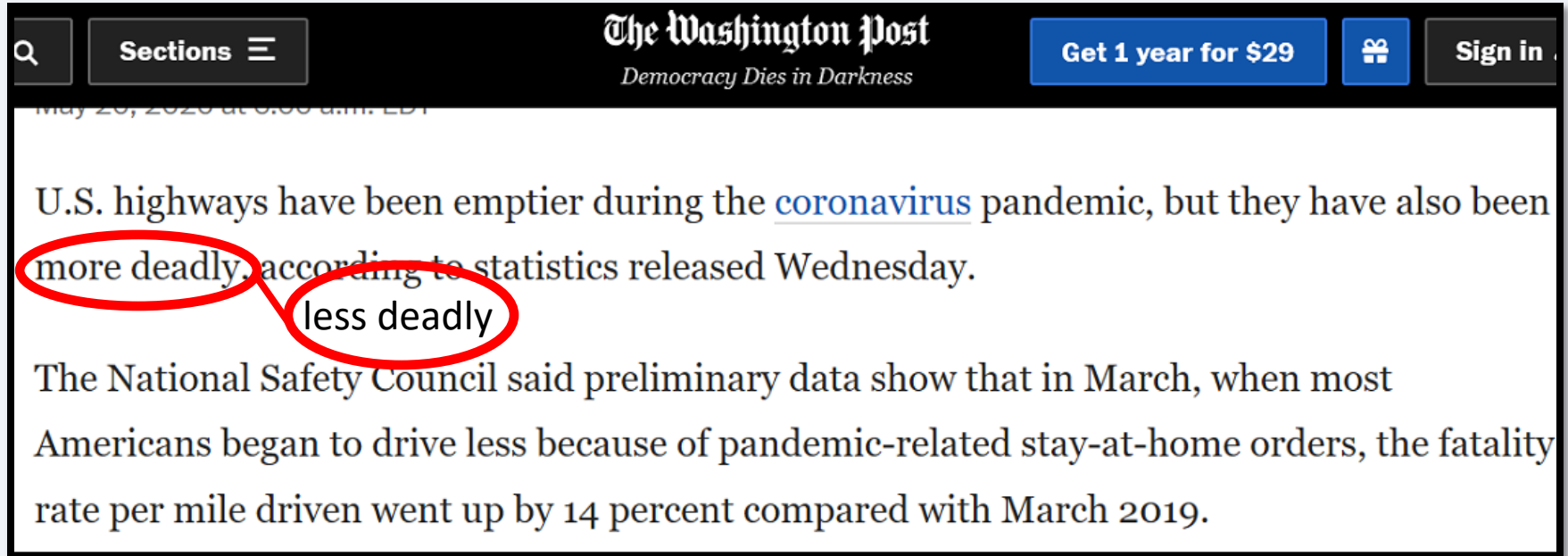
National Safety Council Flunks Statistics

- *Because* not Despite
- Denominator – fewer drivers causes the rate to go up *by definition*



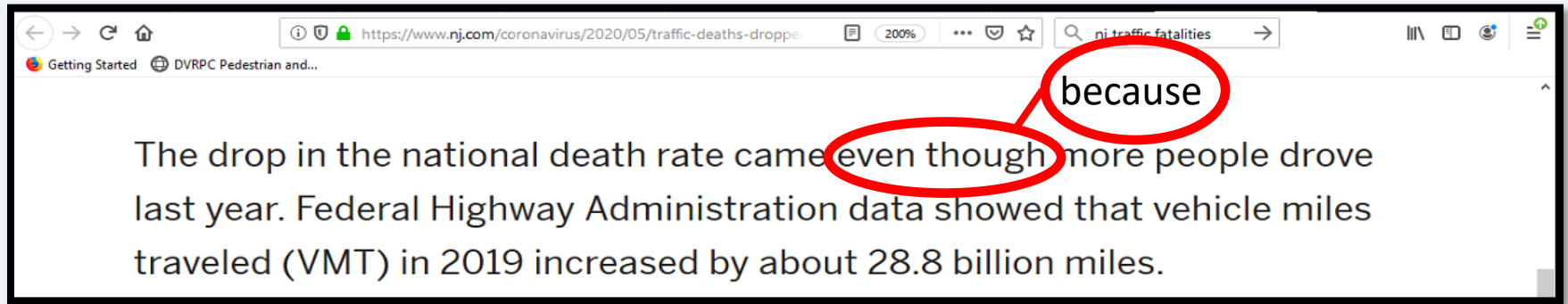
<https://www.safetyandhealthmagazine.com/articles/19903-despite-fewer-drivers-on-the-road-motor-vehicle-death-rate-up-14-in-march-nsc>

Washington Post Quotes Blindly

A screenshot of a Washington Post article. The page header includes the search icon, 'Sections' menu, 'The Washington Post' logo with the tagline 'Democracy Dies in Darkness', a 'Get 1 year for \$29' button, a gift icon, and a 'Sign in' button. The article text reads: 'U.S. highways have been emptier during the coronavirus pandemic, but they have also been more deadly, according to statistics released Wednesday.' The words 'more deadly' and 'less deadly' are circled in red. Below this, the text continues: 'The National Safety Council said preliminary data show that in March, when most Americans began to drive less because of pandemic-related stay-at-home orders, the fatality rate per mile driven went up by 14 percent compared with March 2019.'

<https://www.washingtonpost.com/transportation/2020/05/20/us-roadways-more-lethal-during-pandemic-lockdown-national-safety-council-data-shows/>

NJ.COM Fails in the Opposite Direction



<https://www.nj.com/coronavirus/2020/05/traffic-deaths-dropped-in-the-us-and-nj-for-three-years-what-are-we-doing-right.html>

What Does it Mean?

- No relationship between VMT and fatalities
- Vision Zero goals will not be met by reducing VMT
- Should measure absolute number of fatalities
 - not a confusing / misleading rate

The Fallacy of Interpreting Deaths and Driving Distances

Donald A. Redelmeier, MD, FRCPC, MSHSR, FACP

QUESTIONS?

Table 1 Alternative Statistics for Motor Vehicle Fatality Risk

Metric for Gauging Risk	Year 1971	Year 2011	Relative Ratio
National perspectives			
Deaths per 10 million vehicle miles	45	11	25%
Deaths per million population	254	104	41%
Deaths per million vehicles	452	126	28%
Deaths per thousand miles of roadway	14	8	57%
Deaths per day	144	89	62%
International perspectives			
Deaths relative to United Kingdom	7	17	249%
Deaths relative to Canada	9	16	171%
Deaths relative to Germany	2	8	324%
Deaths relative to France	3	8	275%
Deaths relative to Sweden	43	101	234%

NJ State Police Fatalities Report

STATE POLICE NJ					
FATAL ACCIDENT INVESTIGATION UNIT					
YEAR TO DATE - STATEWIDE FATAL CRASH STATISTICS FOR MARCH 26, 2020					
FATAL CRASHES		FATALITIES			
2020	-	108	2020	-	113
2019	-	104	2019	-	116
2018	-	100	2018	-	110
FATALITIES FROM 2019 TO 2020				-3	
PERCENTAGE CHANGE 2019 TO 2020				-2.6%	
FATALITIES FROM 2018 TO 2019				6	
PERCENTAGE CHANGE 2018 TO 2019				5.5%	
VICTIM CLASSIFICATION					
	2018	2019	2020		
DRIVER	46	49	53		
PASSENGER	21	21	12		
PEDALCYCLIST	2	0	4		
PEDESTRIAN	41	46	44		
TOTAL	110	116	113		

STATE POLICE NJ					
FATAL ACCIDENT INVESTIGATION UNIT					
YEAR TO DATE - STATEWIDE FATAL CRASH STATISTICS FOR JUNE 15, 2020					
FATAL CRASHES		FATALITIES			
2020	-	200	2020	-	217
2019	-	212	2019	-	226
2018	-	219	2018	-	239
FATALITIES FROM 2019 TO 2020				-9	
PERCENTAGE CHANGE 2019 TO 2020				-4.0%	
FATALITIES FROM 2018 TO 2019				-13	
PERCENTAGE CHANGE 2018 TO 2019				-5.4%	
VICTIM CLASSIFICATION					
	2018	2019	2020		
DRIVER	124	114	103		
PASSENGER	40	33	35		
PEDALCYCLIST	7	4	7		
PEDESTRIAN	68	75	72		
TOTAL	239	226	217		

Methodology

- Traffic fatalities from New Jersey State Police daily report
- New Jersey VMT from INRIX, compared to week Feb 29 2020
- Reference timeline
 - March 16 - many schools move to remote learning
 - March 21 - NJ Governor's stay-home order
 - April 7 - close state and county parks
 - April 8 - close non-essential construction
 - April 29 - re-open state parks and golf courses
 - May 13 - resume non-essential construction
 - June 9 - lifts stay-home order