This directory contains data and code that replicates tables and figures for the following paper:

Title: Teenage Driving, Mortality, and Risky Behaviors

Authors: Jason Huh and Julian Reif

One master script runs all of the code. The analysis requires minimal memory and processing resources. It was last run on a Windows 10 Desktop with 32 gigabytes of RAM and an i7-8700 CPU 3.20 GHz processor. The runtime was less than five minutes.

Data availability statement

We certify that the authors of the manuscript have legitimate access and permission to use the data employed in this manuscript. Some of the original data are confidential and cannot be made publicly available. However, aggregated versions of these datasets are included to allow the replicator to reproduce nearly all the tables and figures from the manuscript.

License

Software requirements

Stata version 16 or higher

- Add-on packages are included in **scripts/libraries/stata** and do not need to be installed by user. The names, installation sources, and installation dates of these packages are available in **scripts/libraries/stata/stata.trk**.

Instructions

Executing the master script **run.do** will run the analysis and generate all tables and figures. Before running this script, you must make one edit:

1. Line 18: Define a global macro, **Driving**, that points to the directory containing this README file

For example, that line should look something like the following:

```
global Driving "C:/Users/jdoe/thisfolder"
```

Directory structure

```
driving                          # Project folder
├── data                         #   Read-only (input) data
├── processed                    #   Processed data
├── results                      #   Output files
│   ├── figures                  #     Figures (PDF)
│   ├── intermediate             #     Intermediate results
│   └── tables                   #     Tables (LaTeX)
├── scripts                      #   Code
│   ├── libraries/stata          #     Add-on Stata packages
│   ├── programs                 #     Auxiliary code called by scripts
│   ├── 1_import_data.do
│   ├── 2_clean_data.do
│   ├── 3_combine_data.do
│   ├── 4_analysis.do
│   ├── 5_supporting_analysis.do
│   └── 6_tables.do
└── run.do                       #   Master script
```

Datasets

Add Health

The driving behavior, working, and school leaving outcomes are constructed from a confidential version of the 1995-1996 Add Health surveys (Add Health, 1995-1996). Replicating the original analysis requires access to the full core sample with pseudo-state identifiers. To gain access to these data, follow the directions provided by the Carolina Population Center (CPC) Data Portal at the University of North Carolina at Chapel Hill:

https://data.cpc.unc.edu/projects/2/view

This replication package includes an aggregated version of the Add Health data that are used by the replication code. Those files are located in:

/data/add_health/derived

Fatality Analysis Reporting System

The Fatality Analysis Reporting System (FARS) data are publicly available online (NHTSA, 1983-2014):

https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars

Due to large file size, the FARS data are not included in this replication package. Interested researchers can obtain these data files from the openICPSR repository associated with this study.

Federal Highway Administration

Data on the number of licensed drivers for ages 16-19 during the 1983-2014 time period are publicly available from the Federal Highway Administration (FHWA, 1983-2014). We use page 1 of "Table DL-220 Licensed Drivers, By Sex and Age Group, 1964-2014.pdf" (original file name: "dl220.pdf") downloaded from:

https://www.fhwa.dot.gov/policyinformation/quickfinddata/qfdrivers.cfm

We fixed obvious errors in the reported total counts for age 18 in 2001 and 2007, by comparing these values against the numbers provided separately by sex. Specifically, we changed the total number of licensed drivers aged 18 in 2001 from 2854 to 2754, and the total number of licensed drivers aged 18 in 2007 from 1873 to 2873.

The downloaded file is available as part of this replication package in:

/data/fhwa

FIPS codes

State Federal Information Processing Standard (FIPS) codes are publicly available from the United States Census Bureau (Census, n.d.):

https://www.census.gov/library/reference/code-lists/ansi/ansi-codes-for-states.html

The state FIPS codes are available in a Stata file in:

/data/fips

ICD codes

Complete lists of ICD-9 and ICD-10 codes used to classify the cause of death in the National Vital Statistics data are publicly available online (ICD9Data.com, n.d.; WHO, n.d.).

ICD-9 codes are available from: http://www.icd9data.com/2015/Volume1/default.htm

ICD-10 codes are available from: https://icd.who.int/browse10/2019/en

The codes used in the analysis are listed in a LaTeX table in:

/data/icd_codes

Minimum legal driving age laws

Data on minimum legal driving age (MDA) laws for 1995-2014 are obtained from "gdl_effective_dates.pdf" downloaded from the Insurance Institute for Highway Safety (IIHS, 1995-2014):

http://www.iihs.org/iihs/topics/laws/graduatedlicenseintro?topicName=teenagers

Data on MDA laws for 1983-1994 are hand-collected from databases of state session laws from HeinOnline (HeinOnline, 1983-1994):

https://home.heinonline.org/content/session-laws-library

Anyone with a subscription to HeinOnline can obtain access to these state session laws. The downloaded file from the IIHS, along with the hand-collected data, are available in:

/data/mda

Mortality

The mortality outcomes are constructed from a confidential version of the 1983-2014 National Vital Statistics (NCHS, 1983-2014). To gain access to these data, follow the directions provided by the National Center for Health Statistics:

https://www.cdc.gov/nchs/nvss/nvss-restricted-data.htm

Replicating the original analysis requires access to two restricted-use variables: (1) state of residence; and (2) month of birth. This replication package includes an aggregated version of the mortality data that are used by the replication code. Those files are located in:

/data/mortality/derived

National Household Travel Survey

Data on the average annual vehicle miles traveled by licensed drivers for ages 16-19 for 1983, 1990, 1995, 2001, 2009, and 2017 are publicly available from the National Household Travel Survey (NHTS, 1983-2017). The analysis employs data from Table 23 of “2017_nhts_summary_travel_trends.pdf” downloaded from:

https://nhts.ornl.gov/publications

The downloaded file is available as part of this replication package in:

/data/nhts

Minimum legal school leaving age laws

Data on the age range for compulsory school attendance for 1994, 1996, 1997, 2000, 2002, 2004, 2006-2010, 2013, and 2014 are constructed using publicly available information from the National Center for Education Statistics (NCES, 1994-2014):

https://nces.ed.gov/programs/digest

The data are available as part of this replication package in:

/data/schoolage

Surveillance, Epidemiology, and End Results population data

The Surveillance, Epidemiology, and End Results (SEER) Program's population data are publicly available online (NCI, 1983-2014):

https://seer.cancer.gov/popdata

Interested researchers can also obtain these data files from the openICPSR repository associated with this study. This replication package includes an aggregated version of the SEER data that are used by the replication code.
Those files are located in:

/data/seer/derived

Descriptions of scripts

run.do is a master script that sets up the environment, creates output folders, and then calls other scripts.

1_import_data.do

This script imports raw datasets and saves them in Stata format. The mortality portion of this script is disabled because the confidential version of the mortality data is not included in this replication package. The FARS portion is also disabled because the FARS data are not included in this replication package.

2_clean_data.do

This script processes and cleans datasets. The mortality portion of this script is disabled because the confidential version of the mortality data is not included in this replication package.

3_combine_data.do

This script combines datasets together to create the files used in the main analysis. The mortality portion of this script is disabled because the confidential version of the mortality data is not included in this replication package. The FARS portion is also disabled because the FARS data are not included in this replication package.

4_analysis.do

This script estimates the regression discontinuity (RD) model and creates RD plots.

5_supporting_analysis.do

This script provides supporting analysis and creates supplemental tables and figures. The FARS portion of this script is disabled because the FARS data are not included in this replication package.

6_tables.do

This script uses the results saved by *4_analysis.do* to create tables.

References

Add Health (1995-1996). National Longitudinal Study of Adolescent to Adult Health [restricted-use version]. https://data.cpc.unc.edu/projects/2/view.

Federal Highway Administration (1983-2014). Highway Statistics Series. https://www.fhwa.dot.gov/policyinformation/quickfinddata/qfdrivers.cfm (accessed April 11, 2019).

HeinOnline (1983-1994). Session Laws Library. https://home.heinonline.org/content/session-laws-library (accessed July 30, 2020).

ICD9Data.com (n.d.). 2015 ICD-9-CM Diagnosis Codes. http://www.icd9data.com/2015/Volume1/default.htm (accessed July 10, 2019).

Insurance Institute for Highway Safety (1995-2014). Effective Dates of Graduated Licensing Laws. http://www.iihs.org/iihs/topics/laws/graduatedlicenseintro?topicName=teenagers (accessed October 8, 2015).

National Cancer Institute (1983-2014). Surveillance, Epidemiology, and End Results (SEER) Program Populations, DCCPS, Surveillance Research Program. https://seer.cancer.gov/popdata (accessed June 28, 2018).

National Center for Education Statistics (1994-2014). Digest of Education Statistics. https://nces.ed.gov/programs/digest (accessed January 13, 2021).

National Center for Health Statistics (1983-2014). National Vital Statistics System, Mortality Data [restricted-use version]. https://www.cdc.gov/nchs/nvss/nvss-restricted-data.htm.

National Highway Traffic Safety Administration (1983-2014). Fatality Analysis Reporting System (FARS). https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars (accessed June 1, 2017).

National Household Travel Survey (1983-2017). Summary of Travel Trends. https://nhts.ornl.gov/publications (accessed December 9, 2020).

United States Census Bureau (n.d.). American National Standards Institute. https://www.census.gov/library/reference/code-lists/ansi/ansi-codes-for-states.html (accessed November 13, 2015).

World Health Organization (n.d.). ICD-10 Version: 2019. https://icd.who.int/browse10/2019/en (accessed July 10, 2019).

Lists of exhibits

Figure	Source script	Line number	Output file	Notes
Figure 1a	4_analysis.do	164	rd_license_male_female.pdf	
Figure 1b	4_analysis.do	171	rd_vmd150_male_female.pdf	
Figure 1c	4_analysis.do	274	rd_any_male_female.pdf	
Figure 1d	4_analysis.do	280	rd_mva_male_female.pdf	
Figure 2a	4_analysis.do	258	rd_sa_poisoning_female.pdf	
Figure 2b	4_analysis.do	258	rd_sa_poisoning_subst_female.pdf	
Figure 2c	4_analysis.do	258	rd_sa_poisoning_gas_female.pdf	
Figure 3a	4_analysis.do	258	rd_sa_poisoning_male.pdf	
Figure 3b	4_analysis.do	258	rd_sa_poisoning_subst_male.pdf	
Figure 3c	4_analysis.do	258	rd_sa_poisoning_gas_male.pdf	
Figure 4a	4_analysis.do	351	yearbins_cod_mva_male.pdf	
Figure 4b	4_analysis.do	351	yearbins_cod_sa_poisoning_male.pdf	
Figure 4c	4_analysis.do	351	yearbins_cod_mva_female.pdf	
Figure 4d	4_analysis.do	351	yearbins_cod_sa_poisoning_female.pdf	
Figure A.1a	4_analysis.do	149	rd_vehiclemiles_150.pdf	
Figure A.1b	4_analysis.do	149	rd_vehiclemiles_265.pdf	
Figure A.2a	4_analysis.do	245	rd_any_ext_int_male.pdf	
Figure A.2b	4_analysis.do	245	rd_any_ext_int_female.pdf	
Figure A.3a	4_analysis.do	258	rd_sa_drowning_male.pdf	
Figure A.3b	4_analysis.do	258	rd_sa_drowning_female.pdf	
Figure A.4a	4_analysis.do	258	rd_extother_male.pdf	
Figure A.4b	4_analysis.do	258	rd_extother_female.pdf	
Figure A.5a	4_analysis.do	149	rd_work4weeks.pdf	
Figure A.5b	4_analysis.do	149	rd_notenrolled.pdf	
Figure A.6a	-	-	subgroup_birmonth_mva.pdf	Not available

Figure	Source script	Line number	Output file	Notes
Figure A.6b	-	-	subgroup_birmonth_rel_mva.pdf	Not available
Figure A.7a	-	-	subgroup_birmonth_sa_poisoning_female.pdf	Not available
Figure A.7b	-	-	subgroup_birmonth_rel_sa_poisoning_female.pdf	Not available
Figure A.8a	5_supporting_analysis.do	242	placebo_cod_mva_none.pdf	
Figure A.8b	5_supporting_analysis.do	248	placebo_cod_sa_poisoning_none.pdf	
Figure A.8c	5_supporting_analysis.do	242	placebo_cod_mva_male.pdf	
Figure A.8d	5_supporting_analysis.do	242	placebo_cod_mva_female.pdf	
Figure A.8e	5_supporting_analysis.do	248	placebo_cod_sa_poisoning_male.pdf	
Figure A.8f	5_supporting_analysis.do	248	placebo_cod_sa_poisoning_female.pdf	
Figure B.1	5_supporting_analysis.do	166	appendix_license_trends_ages1619.pdf	
Figure B.2	5_supporting_analysis.do	299	appendix_vmt_trends_ages1619.pdf	
Figure B.3a	5_supporting_analysis.do	129	appendix_mort_trends_male.pdf	
Figure B.3b	5_supporting_analysis.do	135	appendix_mort_trends_female.pdf	
Figure B.4a	5_supporting_analysis.do	143	appendix_mort_trends_poisoning.pdf	
Figure B.4b	5_supporting_analysis.do	143	appendix_mort_trends_firearm.pdf	
Figure B.4c	5_supporting_analysis.do	143	appendix_mort_trends_drowning.pdf	
Figure B.4d	5_supporting_analysis.do	143	appendix_mort_trends_other.pdf	

Table	Source script	Line number	Output file	Notes
Table 1	6_tables.do	356	rd_mortality.tex	
Table A.1	6_tables.do	455	rd_mortality_sa_female.tex	
Table A.2	6_tables.do	579	rd_subgroup_mda_mva.tex	
Table A.3	6_tables.do	579	rd_subgroup_mda_sa_poisoning.tex	
Table A.4	-	-	rd_subgroup_license.tex	Not available
Table A.5	-	-	rd_subgroup_vmd.tex	Not available
Table A.6	-	-	rd_subgroup_mva.tex	Not available
Table A.7	-	-	rd_subgroup_sa_poisoning.tex	Not available
Table A.8	-	-	rd_subgroup_birmonth_mva.tex	Not available
Table A.9	-	-	rd_subgroup_birmonth_sa_poisoning_female.tex	Not available
Table A.10	6_tables.do	706	rd_mortality_altbws.tex	
Table A.11	6_tables.do	808	rd_mortality_polys.tex	
Table A.12	6_tables.do	927	rd_mortality_ols.tex	
Table B.1	6_tables.do	30	appendix_data_mda.tex	
Table B.2	6_tables.do	31	appendix_data_icd_codes.tex	
Table B.3	6_tables.do	231	appendix_data_mortality.tex	
Table B.4	6_tables.do	29	appendix_data_addhealth.tex	