Using Integrated Data to Catalyze Transportation Safety Efforts

NJ Safety and Health Outcomes (NJ-SHO) Data Warehouse

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RESEARCH INSTITUTE

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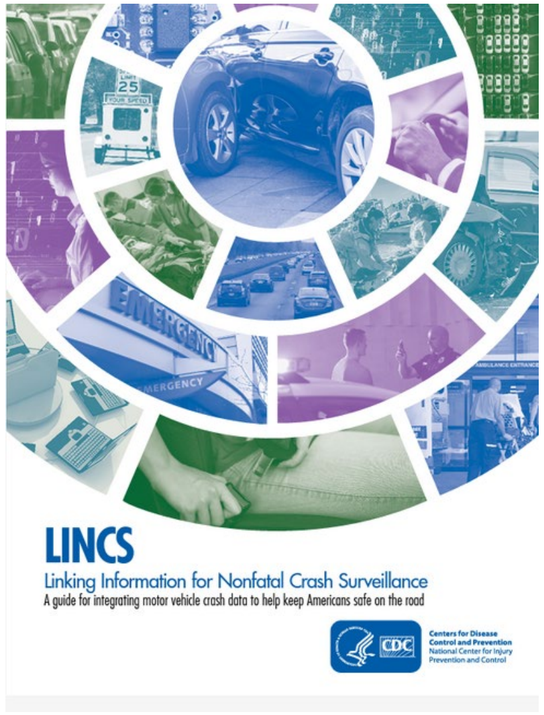
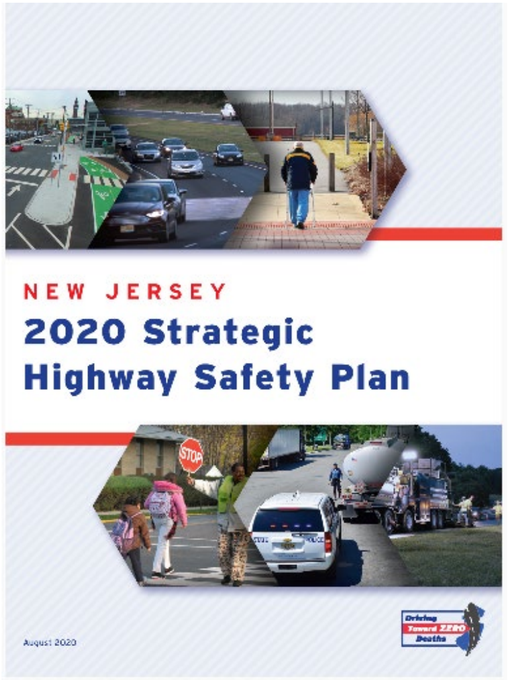
Recent Safety Strategies Emphasize Importance of Data Integration





Vision for Initial Development of NJ-SHO

Data Sources

Innovative Features that Enable Critical Research

Vision for Future & Potential Collaboration

Just before crash → Crash → Just after crash

Time period:

minutes

Licensing history
Prior adverse events
Individual/group factors
Medical conditions

Crash

Injury, disability & mortality
Subsequent crash events
Short- & long-term care

Licensing history
Prior adverse events
Individual/group factors
Medical conditions

→ Crash →

Injury, disability & mortality
Subsequent crash events
Short- & long-term care

Time period:
decades

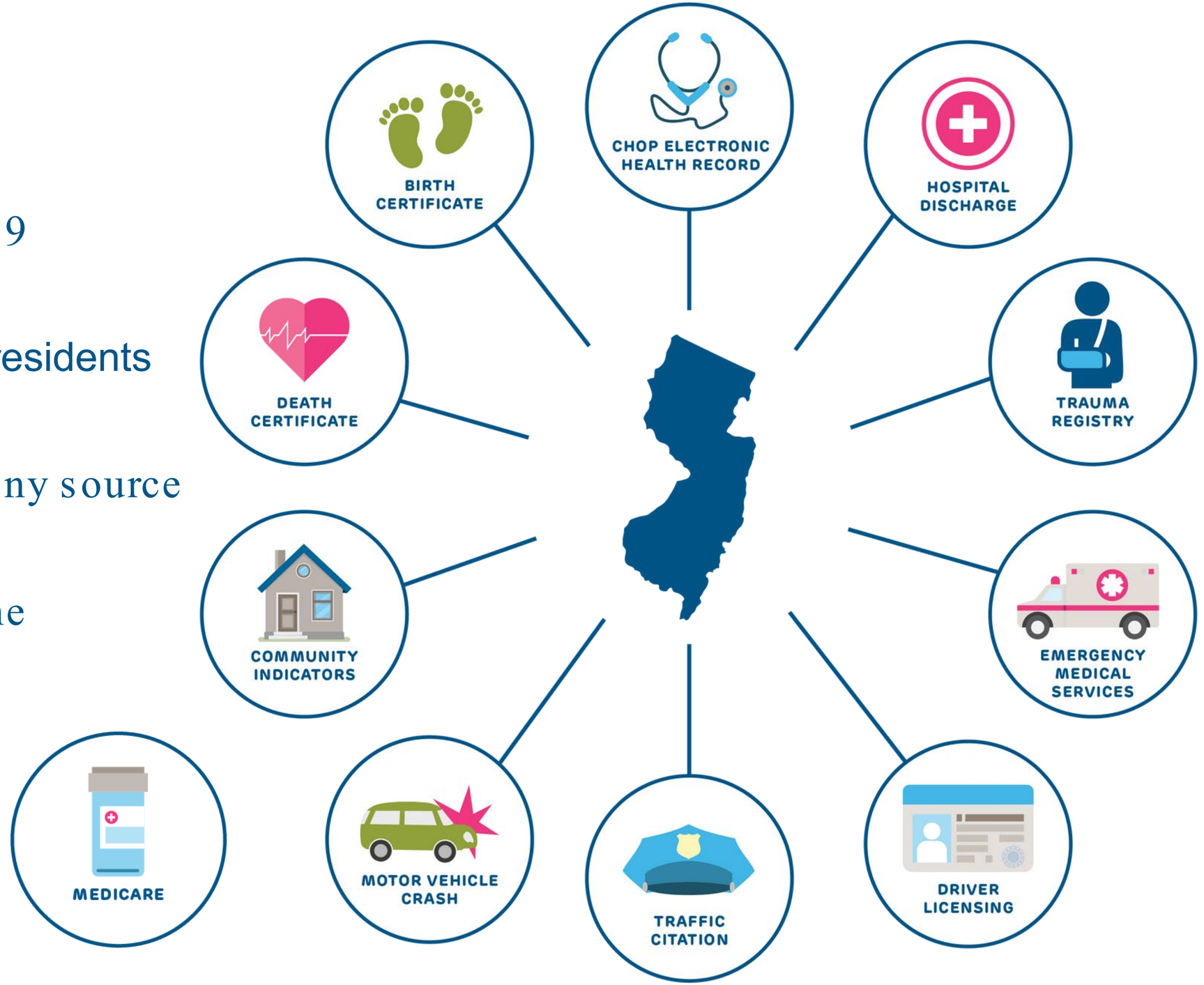
NJ-SHO Warehouse

Currently covers 2004-2019

125M+ records on 24M NJ residents

Individuals who appear in any source

Follows individuals over time



Integrated traffic safety data is critical…

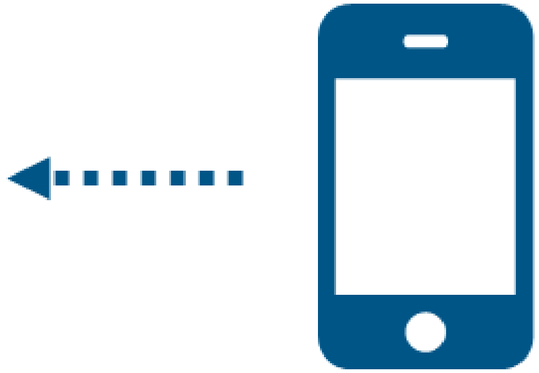
for accurate capture of traffic injuries

NJ Crash Data Misses One-Third of All Crash Injuries

And 59%of Bicyclist Injuries

Lombardi et al., 2022

45+ Research Studies



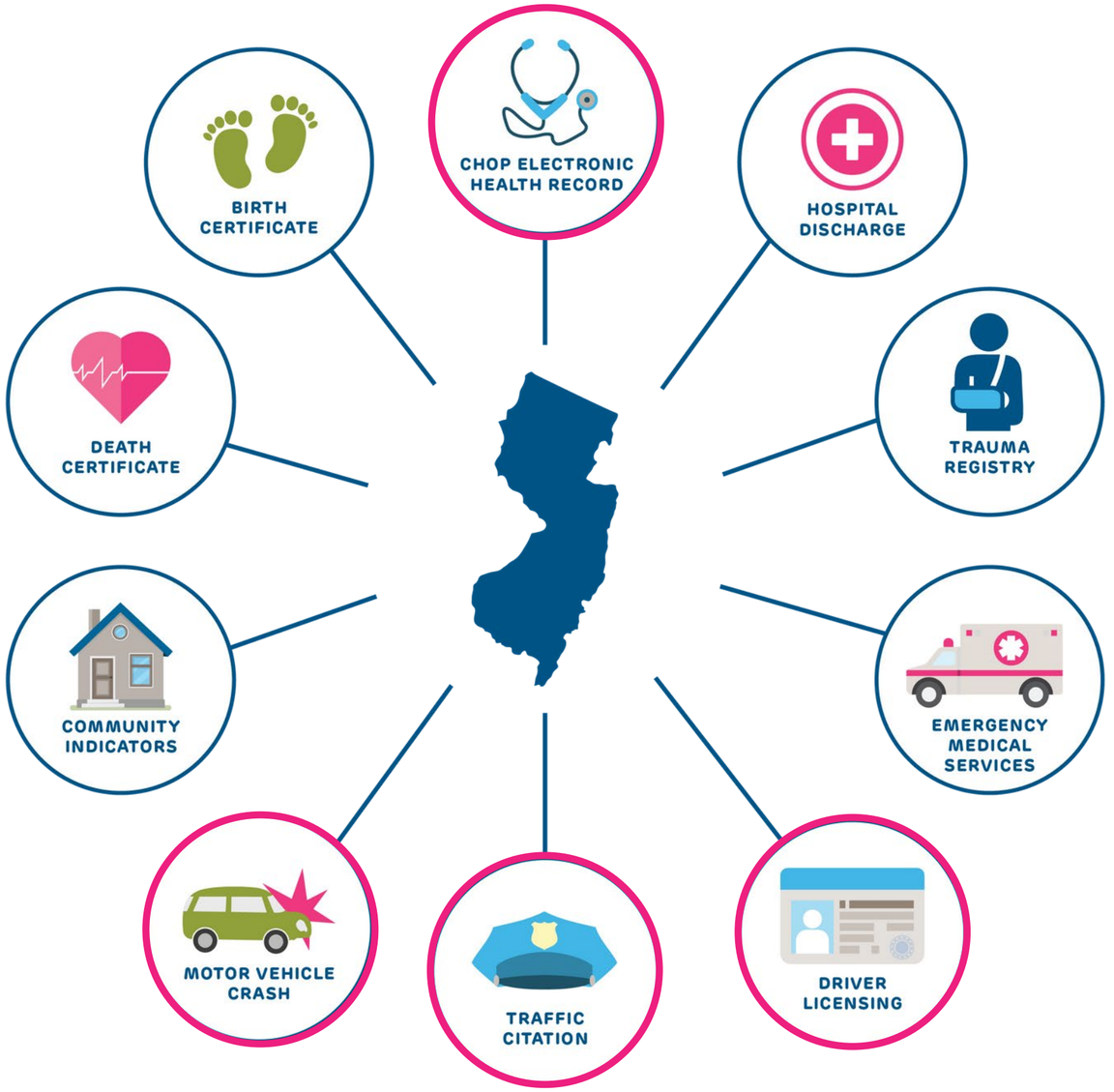
Development of the integrated New Jersey Safety and Health Outcomes (NJ-SHO) data warehouse: catalysing advancements in injury prevention research

Allison E Curry ,[1,2] Melissa R Pfeiffer,[1] Kristina B Metzger,[1] Meghan E Carey,[1,3] Lawrence J Cook[4]

Curry AE, *et al*. *Inj Prev* 2021;**27**:472–478. doi:10.1136/injuryprev-2020-044101

Innovative Feature:
Longitudinal Perspective

Retrospective Cohort Studies Among Young Drivers with Medical Conditions



Ability to drive has great potential to increase independence and mobility for autistic teens…

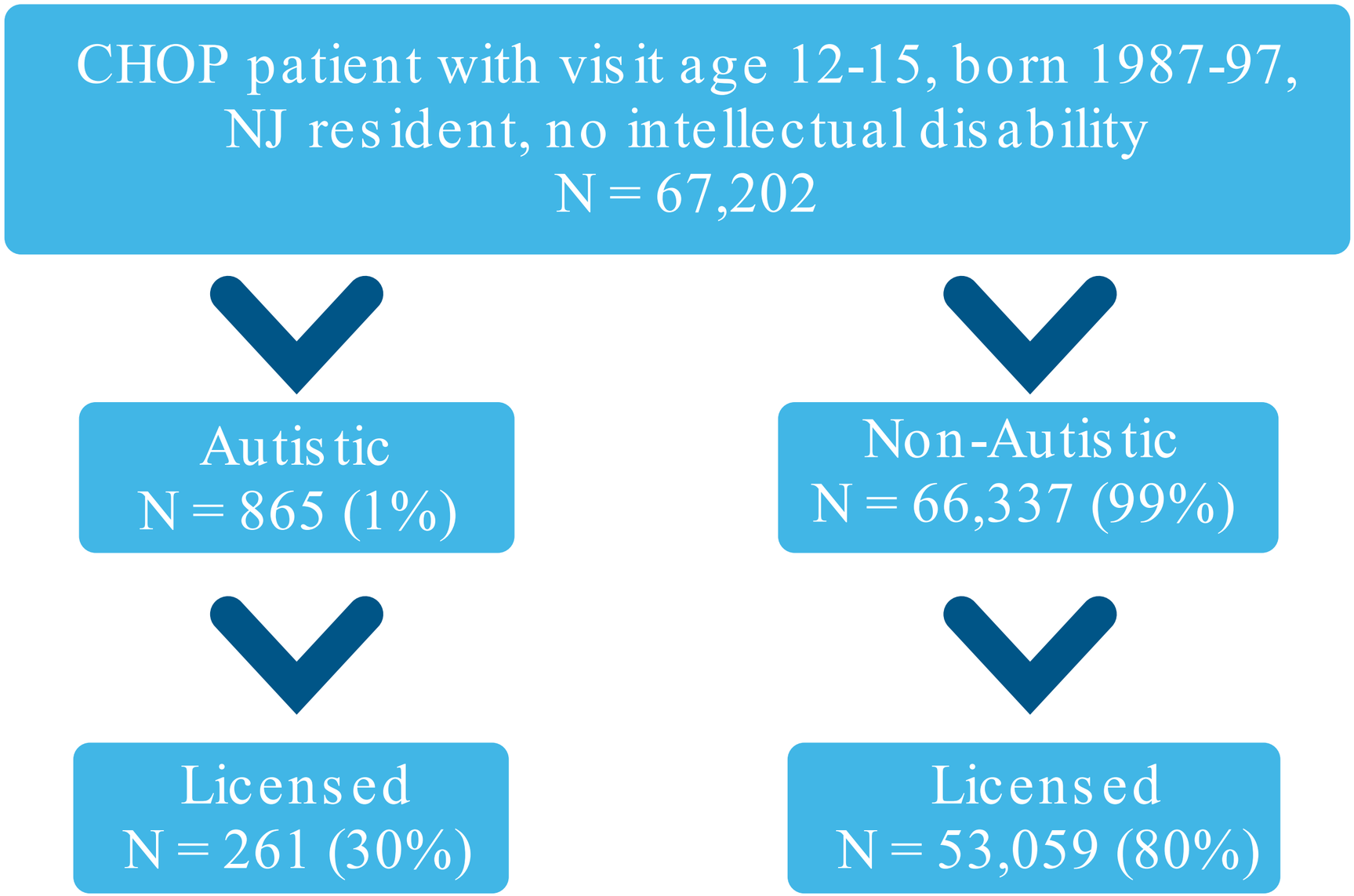
"need for driving is unclear"

"Highly likely that some teens with ASD will become upset with the new experience of learning to drive"

"Highly unlikely to improve the health of those with ASD"

"there is high risk of injury to [study] subjects and others"

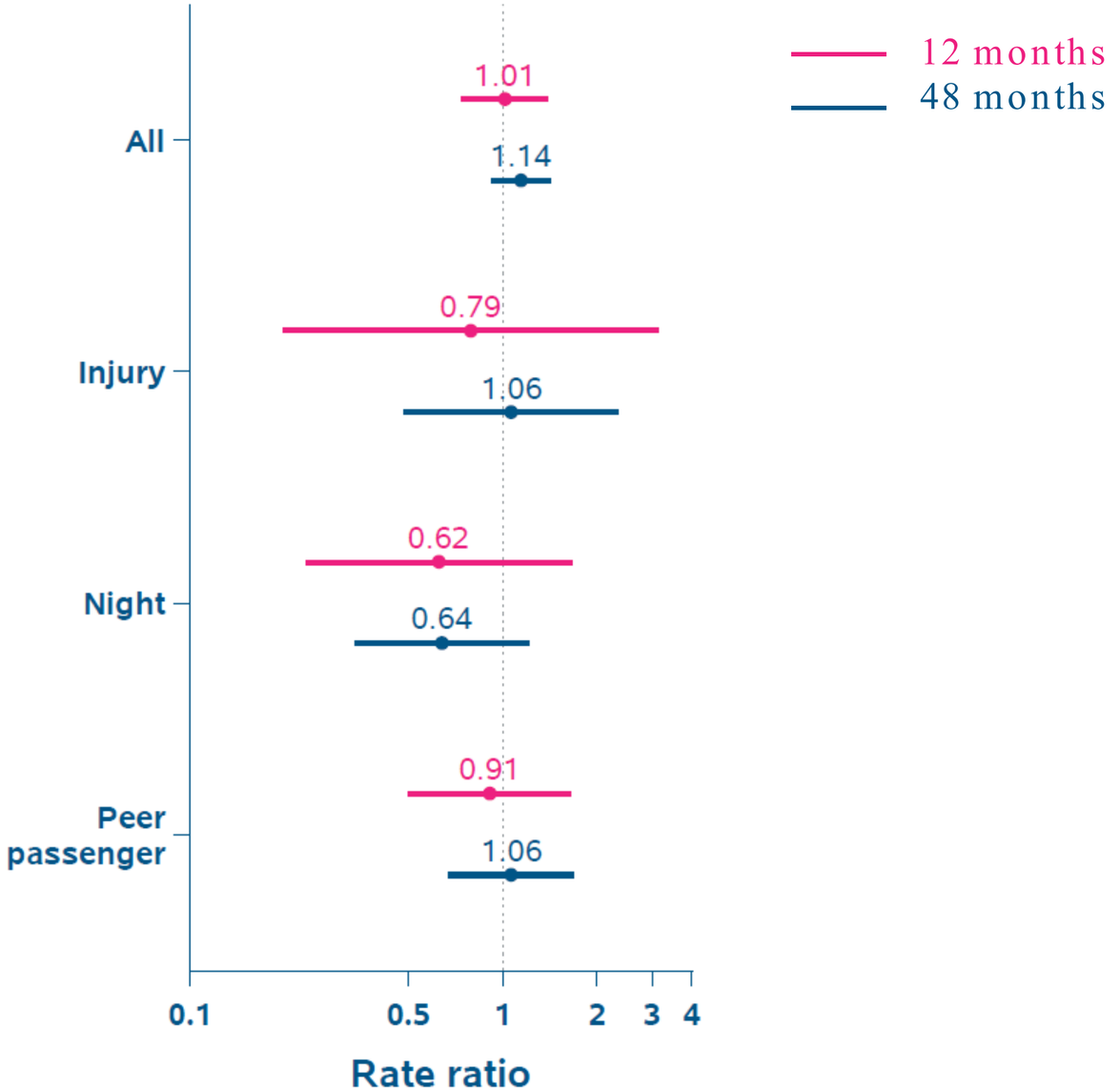
Study Cohort



Curry et al., Autism, 2018; Curry et JAACAP, 2021.

Adjusted Rate Ratios

Austic vs. Non-Autistic, 12 and 48 Months Post-Licensure

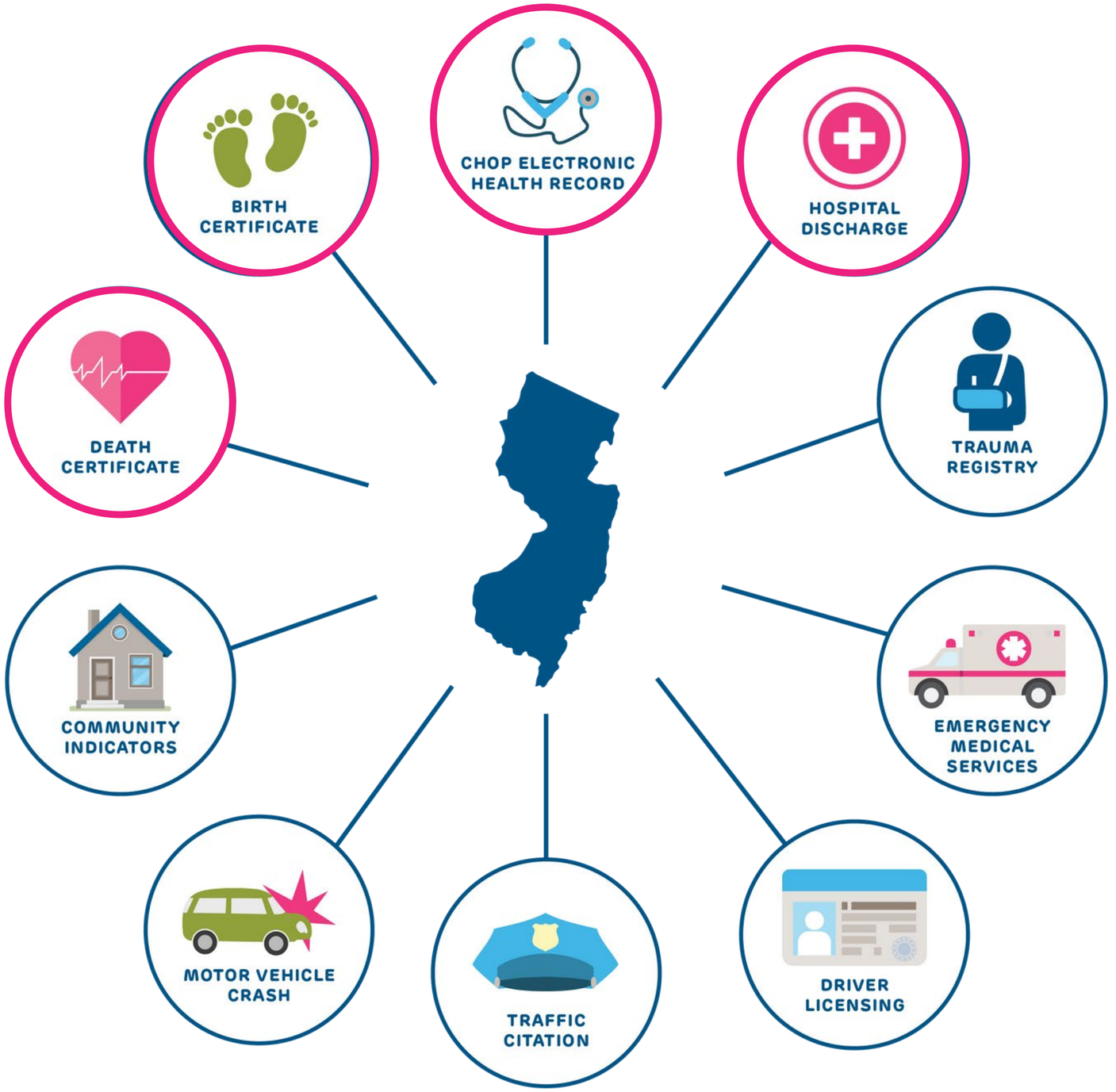


Adjusted for: sex, licensure age, race/ethnicity, insurance payor, DBD, seizure disorder, income density, population density, primary care location, birth year, calendar month

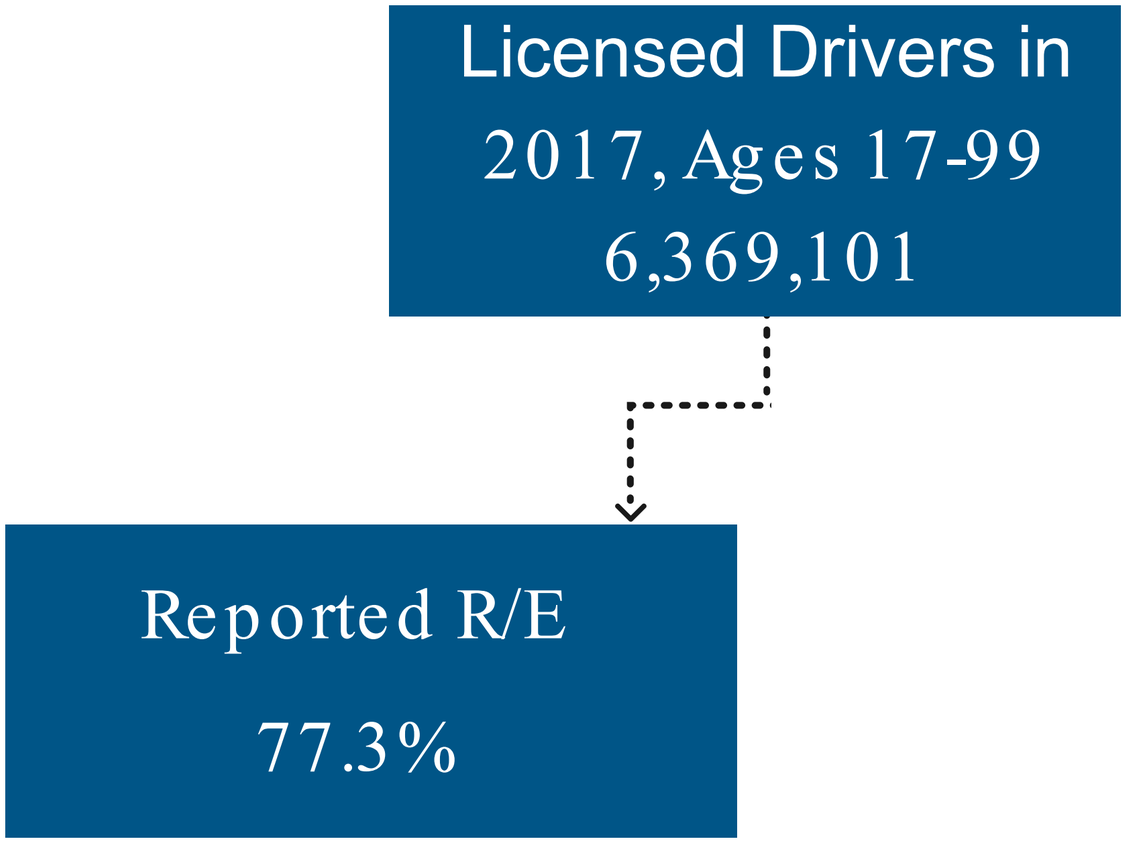
Curry et al., Autism, 2018; Curry et JAACAP, 2021.

Innovative Feature:
Incorporation of Individual and Community-level Equity Data

Race and ethnicity data are not collected in NJ crash or licensing data


BIRTH CERTIFICATE
CHOP ELECTRONIC HEALTH RECORD
HOSPITAL DISCHARGE
DEATH CERTIFICATE
TRAUMA REGISTRY
COMMUNITY INDICATORS
EMERGENCY MEDICAL SERVICES
MOTOR VEHICLE CRASH
TRAFFIC CITATION
DRIVER LICENSING

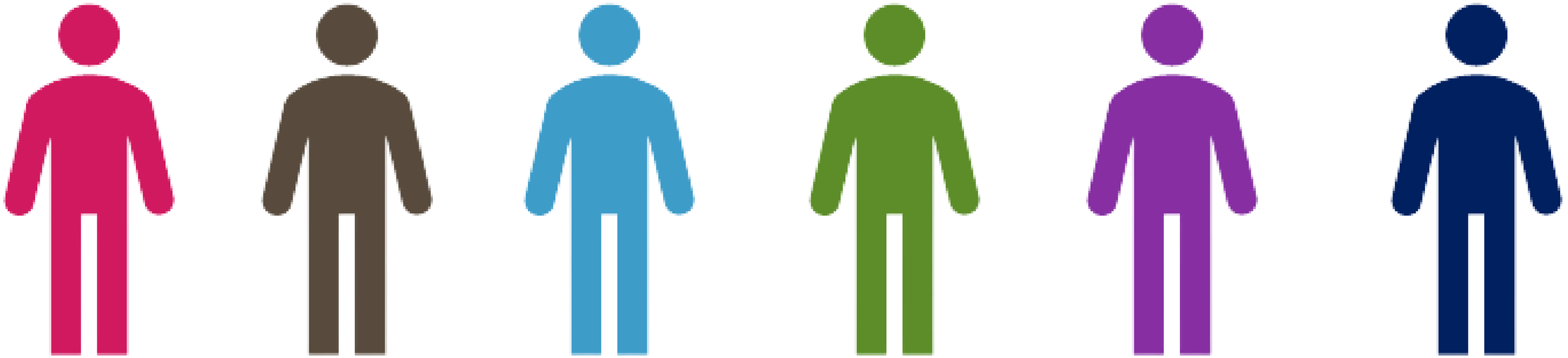
Classifying Race and Ethnicity Among NJ Drivers



Sartin et al., 2021

Bayesian Improved Surname Geocoding: Each Individual is Assigned 6 Probabilities

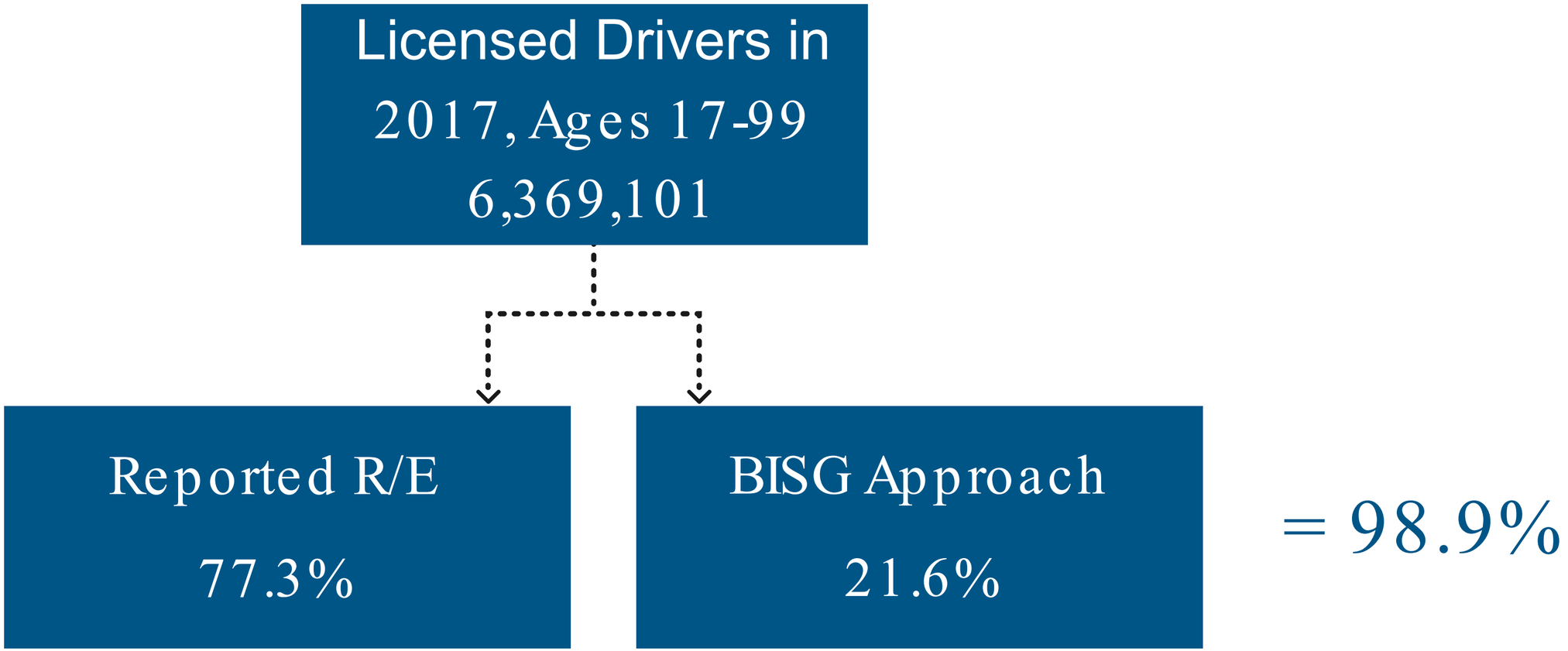
White | Hispanic | Black | Asian/Pacific Islander | Multiracial | American Indian/Alaskan Native



$$P(White) + P(Hisp) + P(Black) + P(API) + P(Multi) + P(AIAN) = 1$$

Sartin et al., 2021

Classifying R/E Among NJ Drivers



Sartin et al., 2021

Race/ethnicity data: not collected in NJ crash or licensing data

Geocoded residential addresses &crash location

Two Ways to Characterize Communities of Interest

Where do crashes occur?

Urban planning lens

Who do crashes occur to?

Where do crash-affected individuals live?

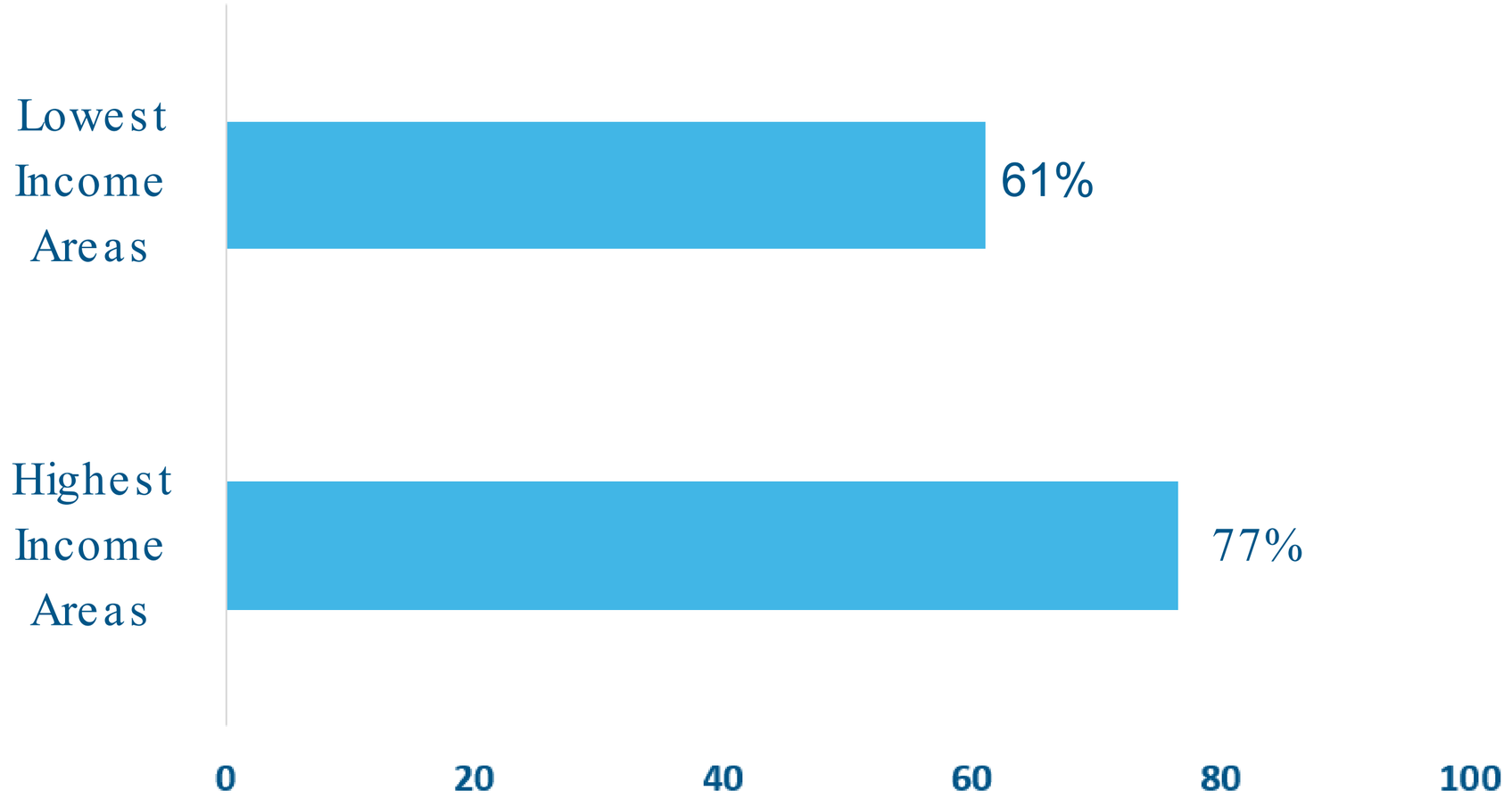
Public health lens

In 2014-2017, a total of 58,781 NJ drivers with children < age 8 were involved in a crash.

Overall, 72% of drivers had all child occupants restrained in CRS

Sartin et al., 2020.

Proportion of Crash-Involved Drivers with All Children Restrained, by Household Median of Community, 2014-2017



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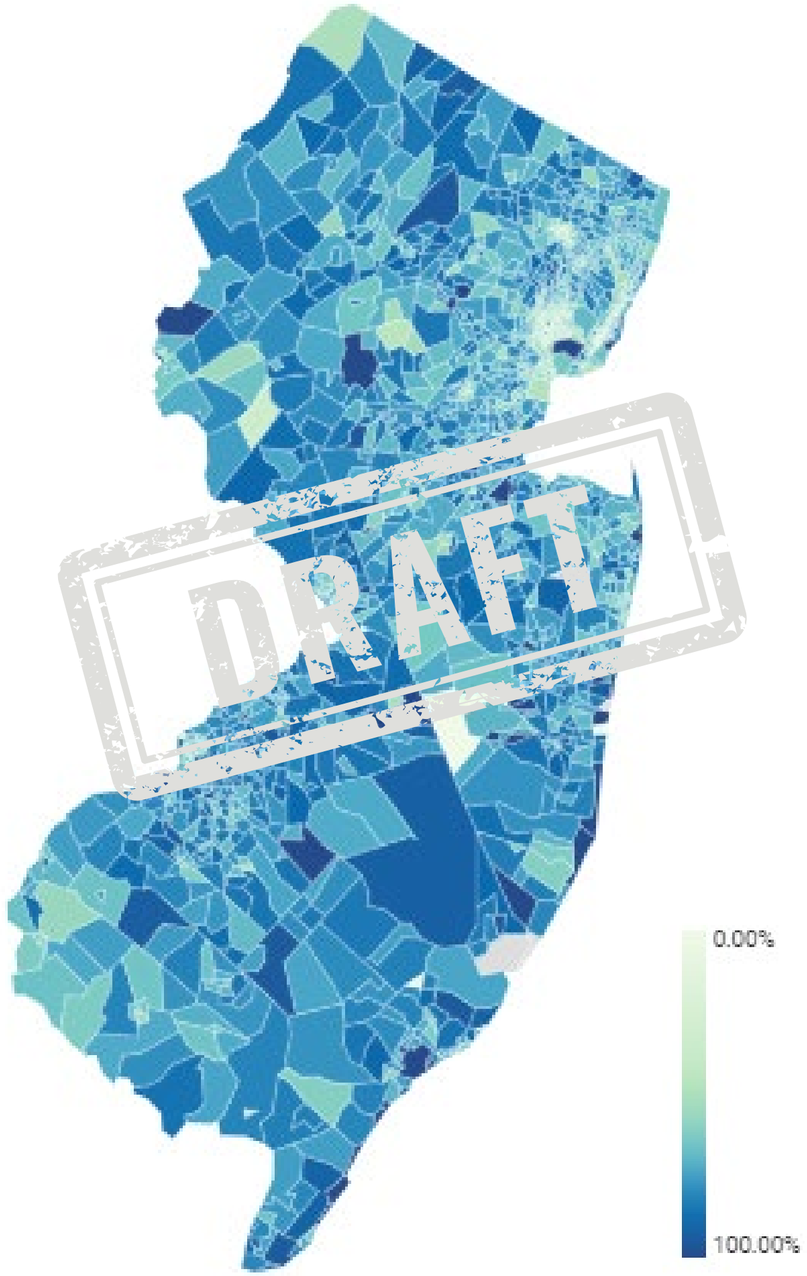
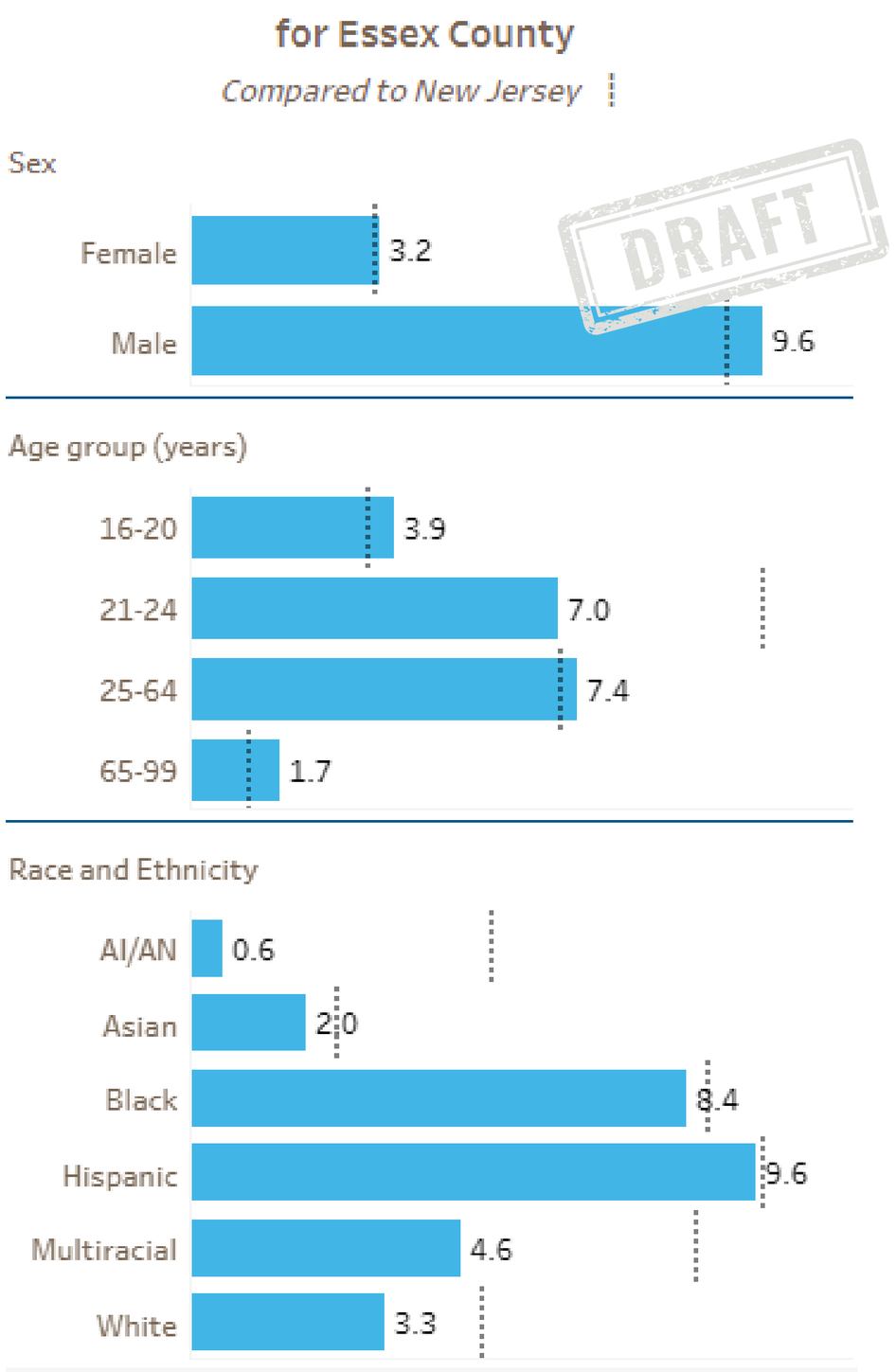


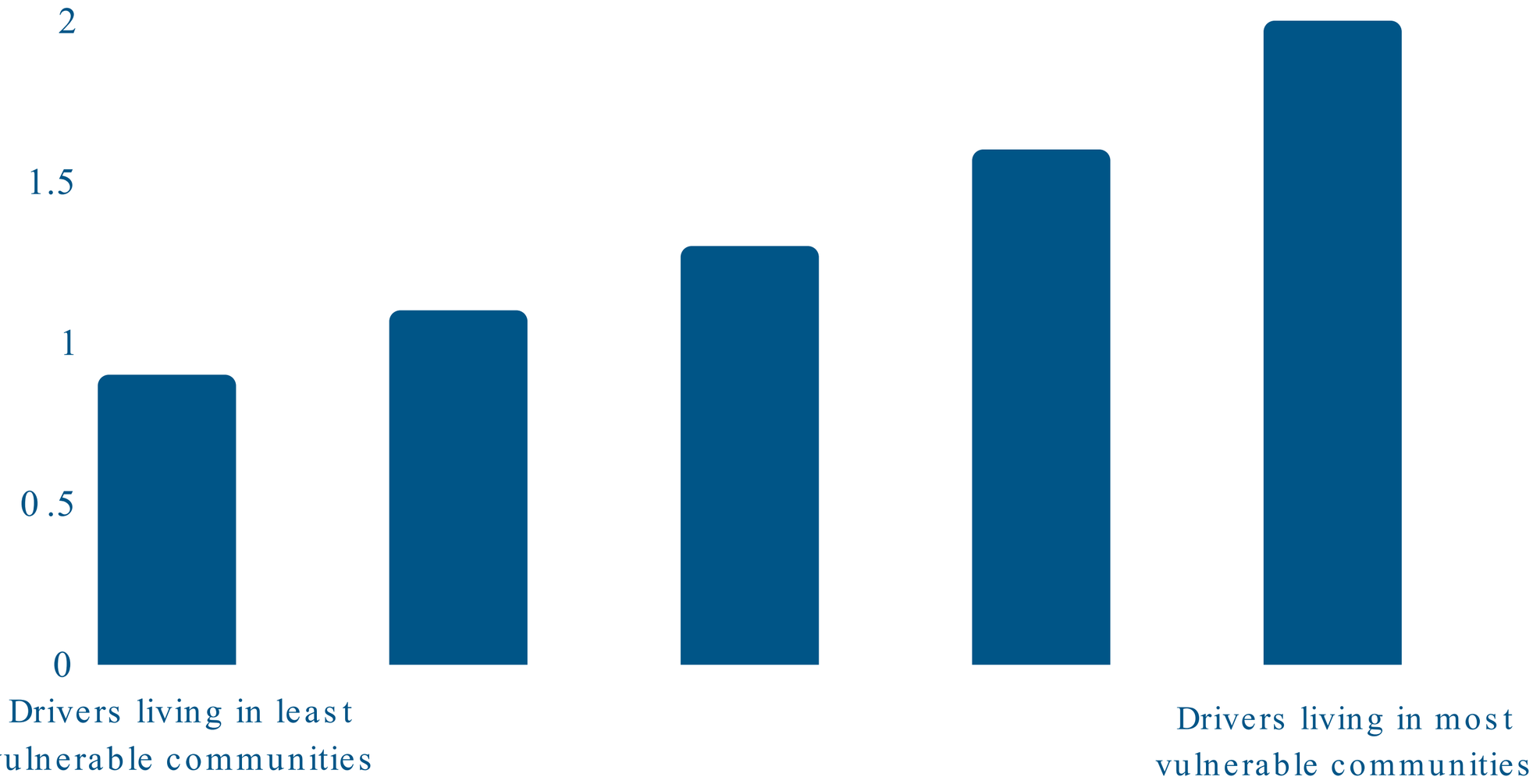
Sartin et al., 2020.

Rates of Alcohol-Involved Driver Crashes
(per 10,000 Licensed Drivers Living in Essex Country)



Disparities Beyond Crashes….

Percent of Unbelted Trips Among NJ Drivers (2010-2017)

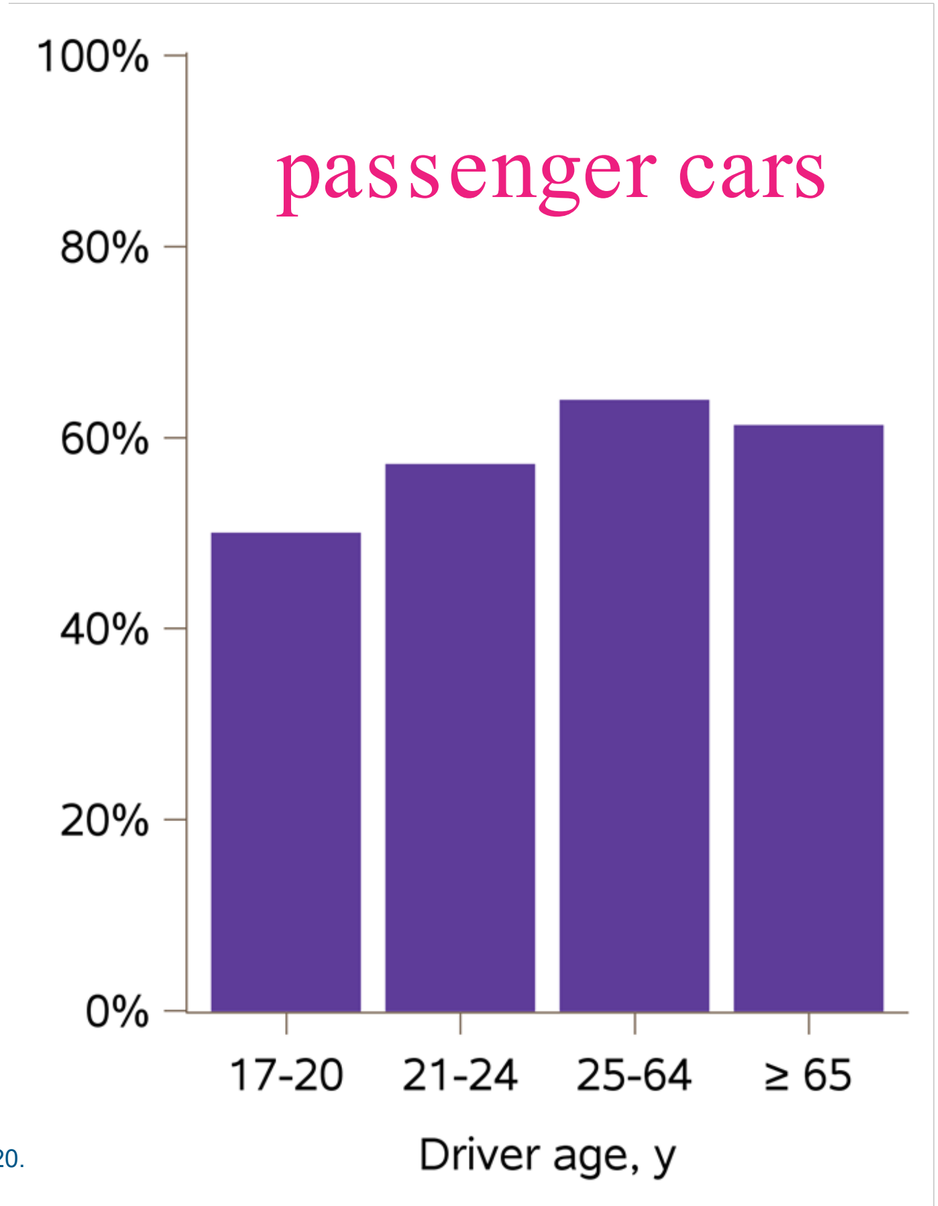


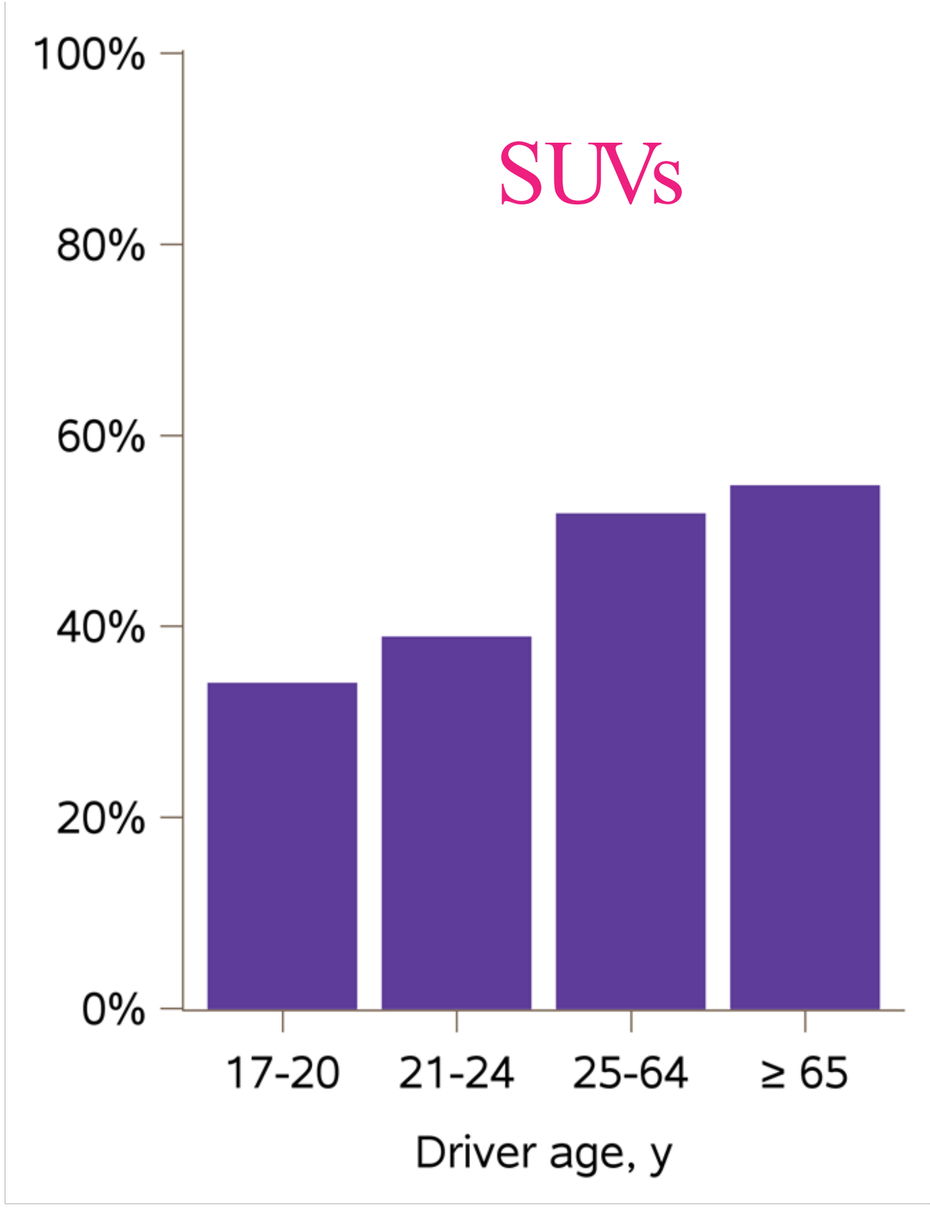
Sartin et al., 2022

Innovative Features:
Detailed Vehicle and Injury Data

Vehicle Identification Number: Make/model, vehicle age, presence of safety features

Vehicles of NJ Younger Drivers Less Likely to Have Side Air Bags





Metzger et al., 2020.

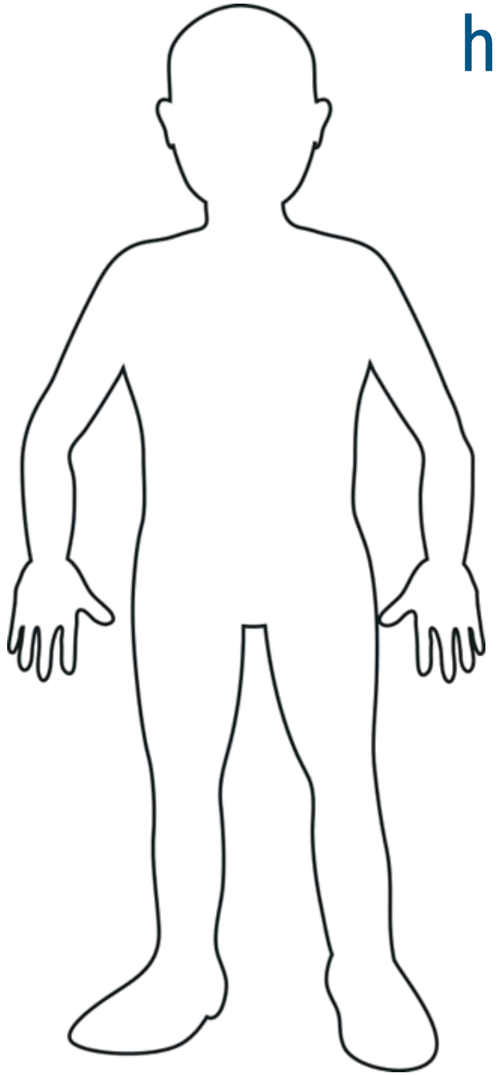
Crash Injury Severity: Mapped ICD-9/10 diagnostic codes to injury severity (AIS, ISS) codes

Serious (AIS 2+) Injuries: Hospitalized Child Passengers in NJ Crashes, 2017

head: 25%

upper extremity: 15%

abdomen: 19%

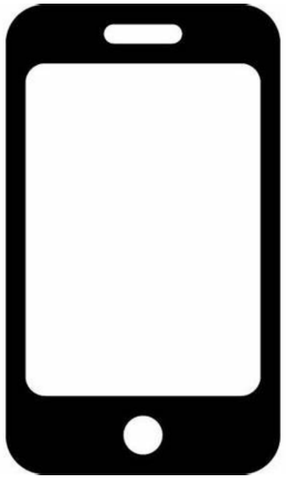


lower extremity: 20%

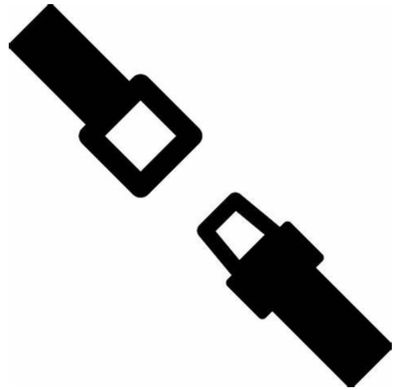
Myers et al., in preparation.

Vision for Future &Potential Collaboration

GDL systems



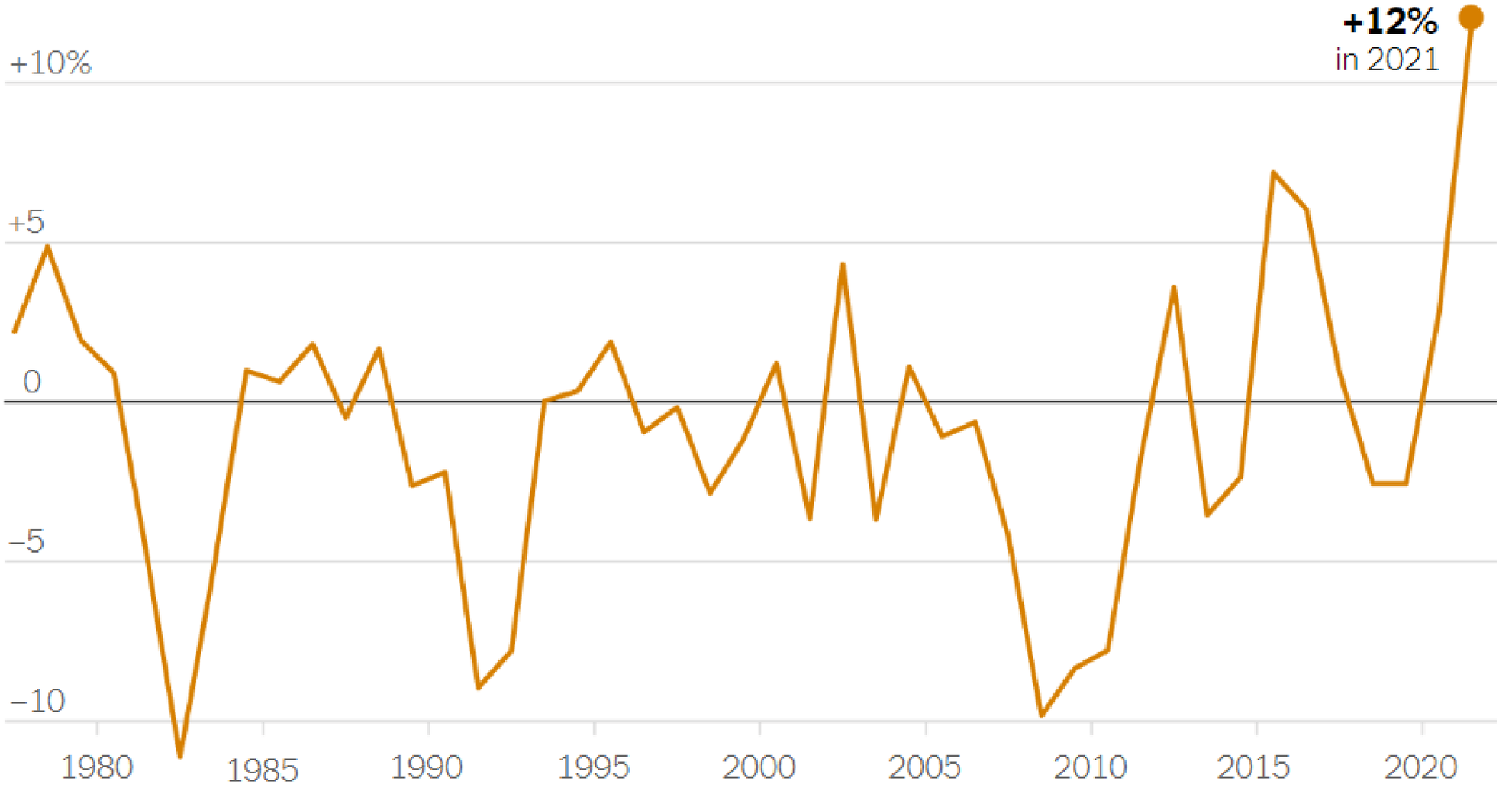
Device bans



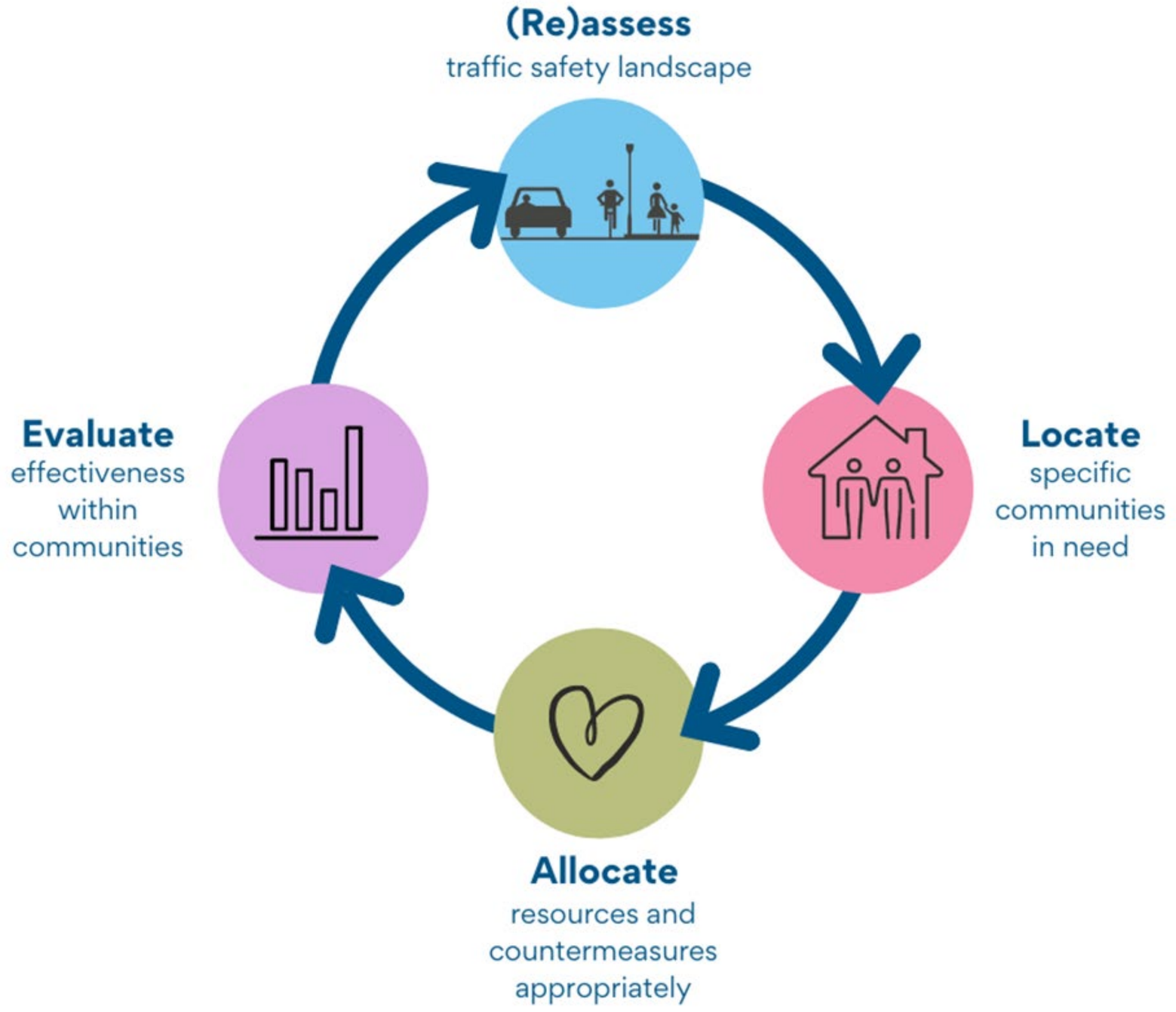
Seat belt laws

U.S. traffic deaths per capita

Annual percent change ending in September of each year



Source: National Highway Safety Administration • By The New York Times


(Re)assess
traffic safety landscape
Locate
specific
communities
in need
Allocate
resources and
countermeasures
appropriately
Evaluate
effectiveness
within
communities

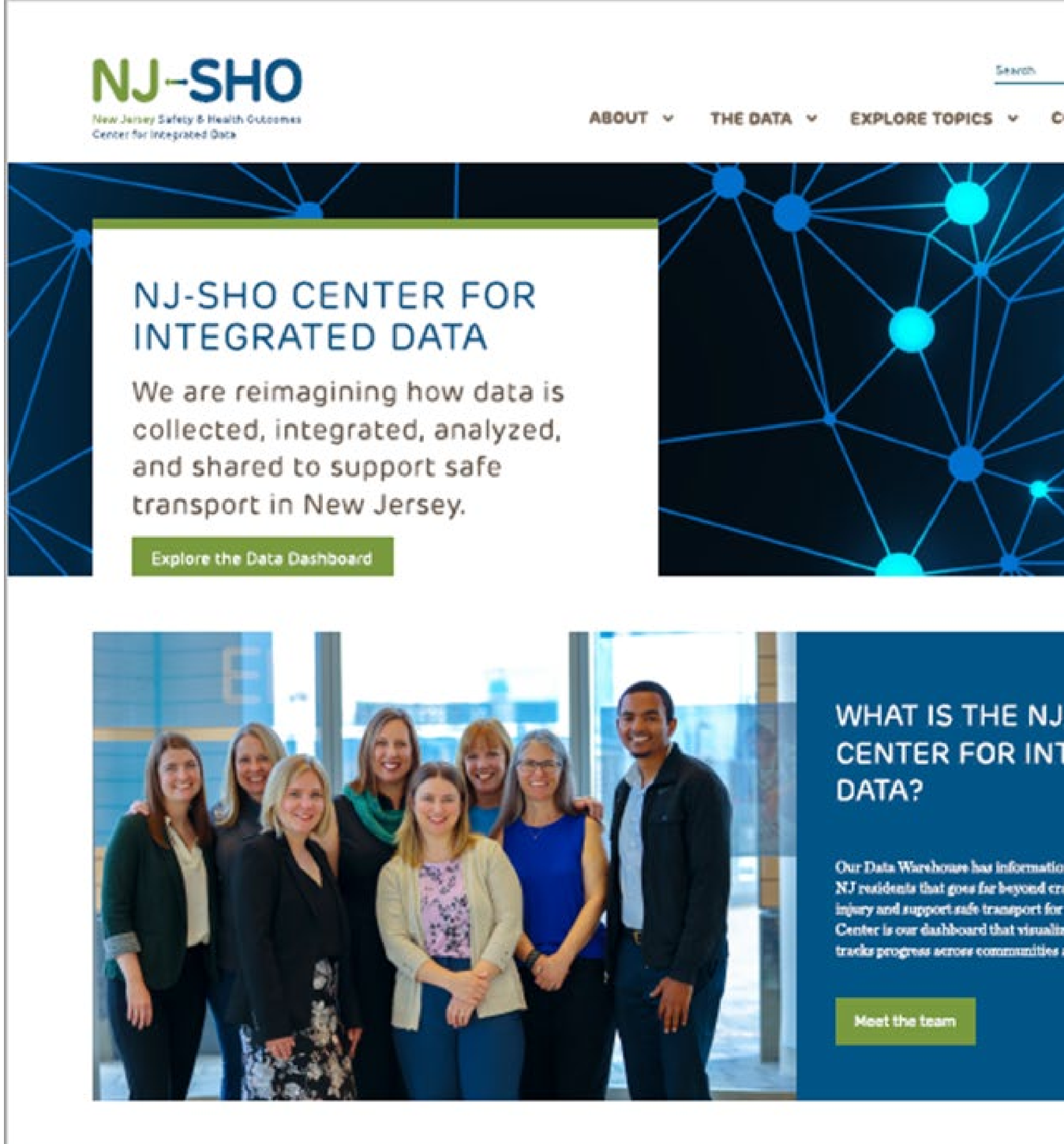
Integrated traffic safety data is critical…

but out of reach of many professionals!

Coming in Summer 2024

NJ-SHO

New Jersey Safety & Health Outcomes
Center for Integrated Data



Overview | Community Safety Profiles | Safety Topics

Traffic Safety | Road Users | Behaviors | Maps | Drivers | Young Drivers | Older Drivers | Pedestrians | Bicyclists | Equity

New Jersey Community Safety Profile

Drivers, Pedestrians, and Bicyclists in crashes by county

NJ-SHO
New Jersey Safety & Health Outcomes Center for Integrated Data

Atlantic County 2019 Drivers in All Crashes

This Community Safety Profile focuses on the experience of road users involved in crashes. Data include sex and race and ethnicity, age and county of residence at the time of the crash, and outcome from the crash. For more information, see LINK.

Choose Selections to Customize Report

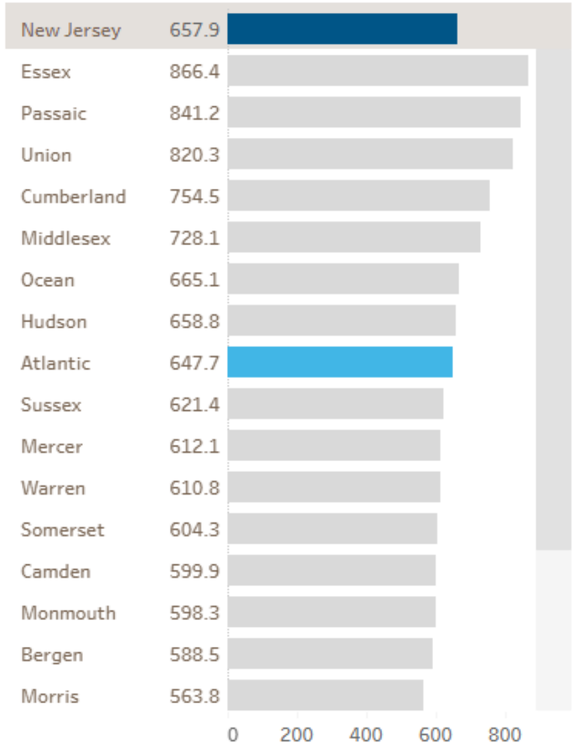
Road User: Drivers
County of Residence: Atlantic
Year(s): 2019 – 2019
Crash Category: All Crashes

Note: Injury data are only available 2016-2019

Rates by County

Table or Map View: Table
Sort Options: Highest to Lowest

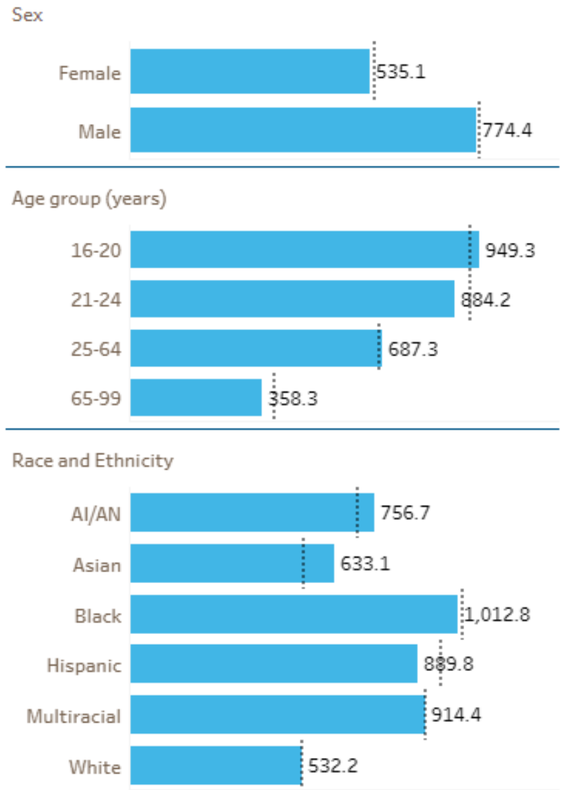
Rate per 10,000 Licensed Drivers



Rates by Demographics

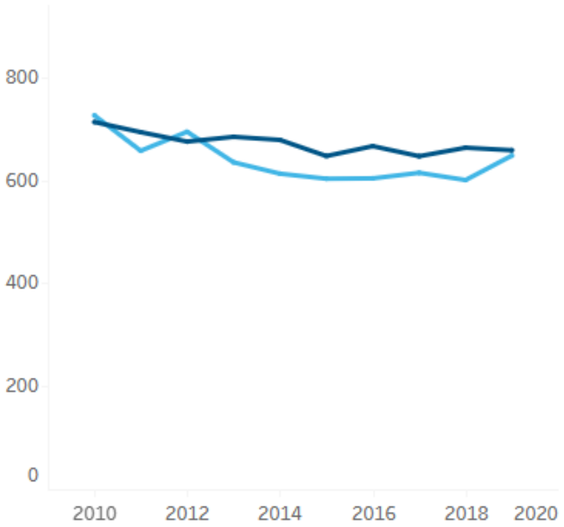
for Atlantic County

Compared to New Jersey



Rates over Time

Drivers in All Crashes, 2010 to 2019



This information is from the NJ-SHO Data Warehouse, which integrates data on traffic safety with other sources of health data in New Jersey. The focus is on individuals living in New Jersey who are involved in crashes – who they are, where they live, and their experience as a road user – rather than the crash itself. We present rates of crash involvement which allow for easier comparison among groups. All rates are calculated as the number of drivers in crashes per 10,000 licensed drivers. For more information about these data, see LINK TO WEBSITE.

Select Year

2010 - 2019

Select Road User

Driver

Pedestrian

Bicyclist

Select County

Select Crash Type

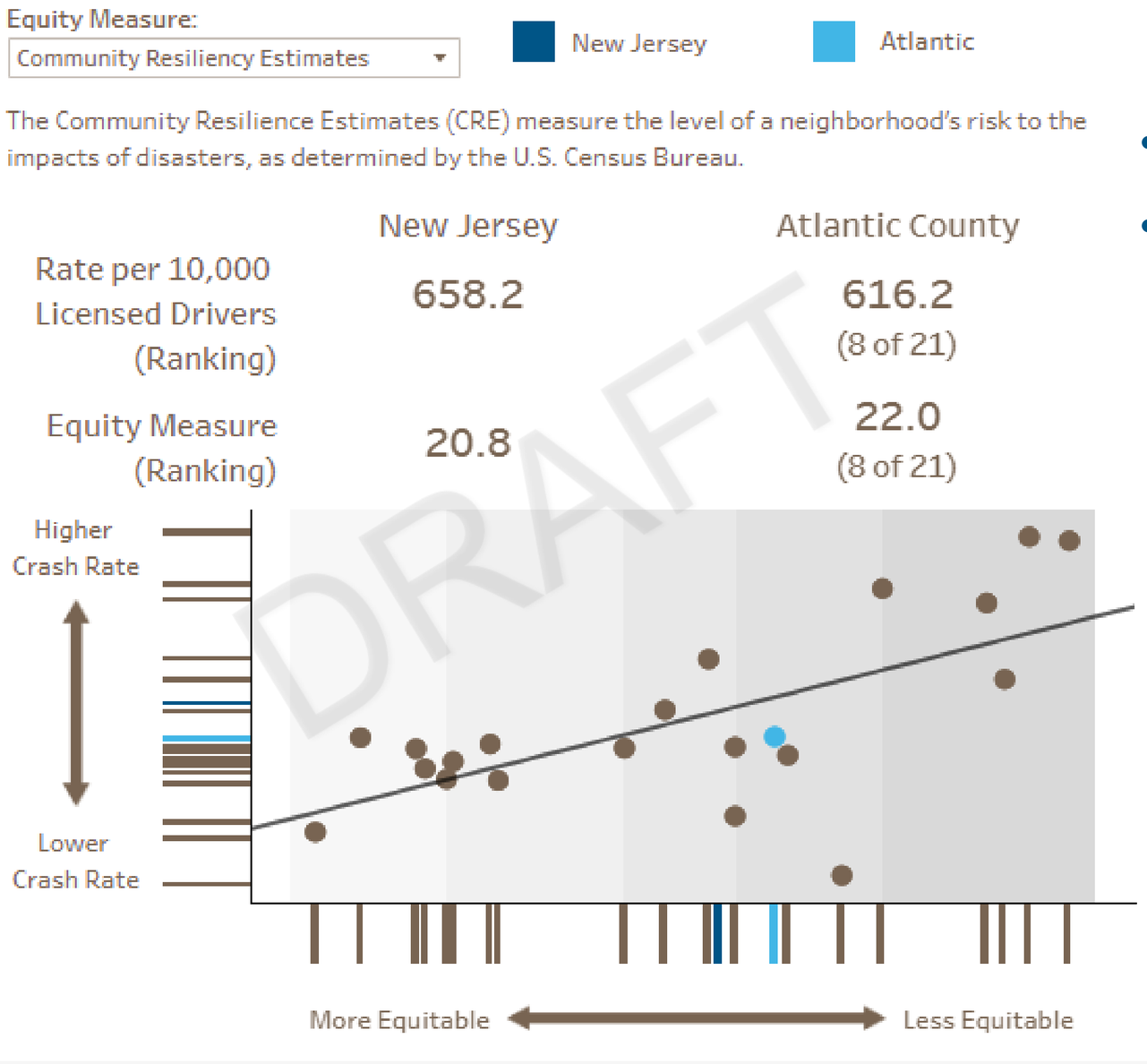
Crashes

Injury crashes

Fatal crashes

Community Resiliance Estimates

- Indicator of community vulnerability
- Uses data from American Community Survey



Measures:

Proportion of residents within a community

living with 3+ risk factors

(e.g., no internet, no health coverage)

https://www.census.gov/library/stories/2022/01/measuring-community-resilience-equitably.html

NJ-SHO is Primed for Research Collaboration!

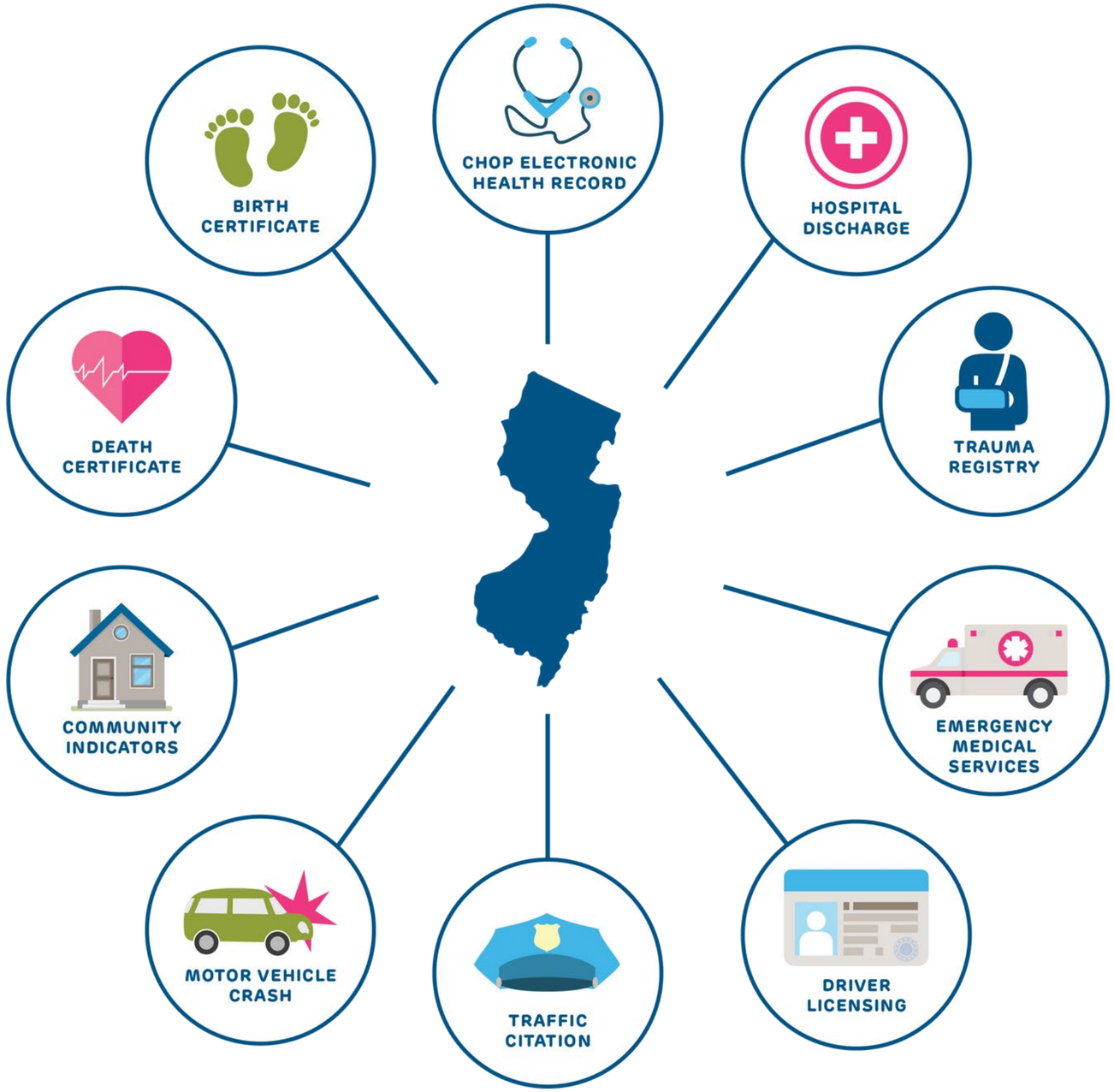
Vulnerable road users

Spatial distribution of crashes

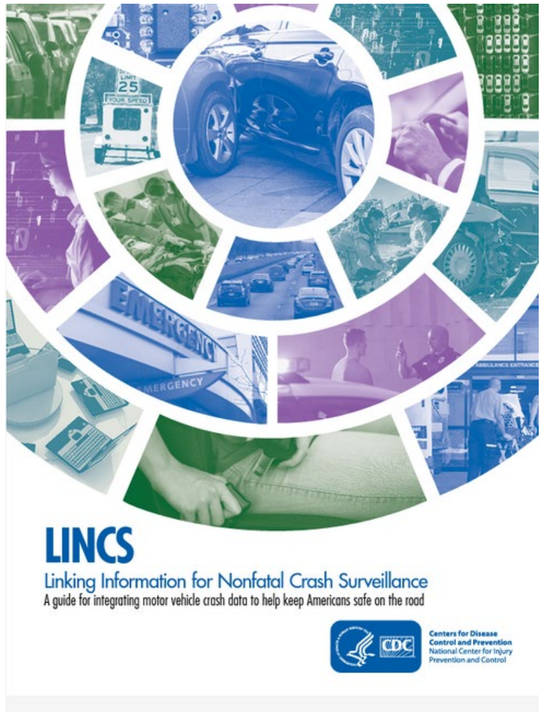
Link between crash characteristics & Injury

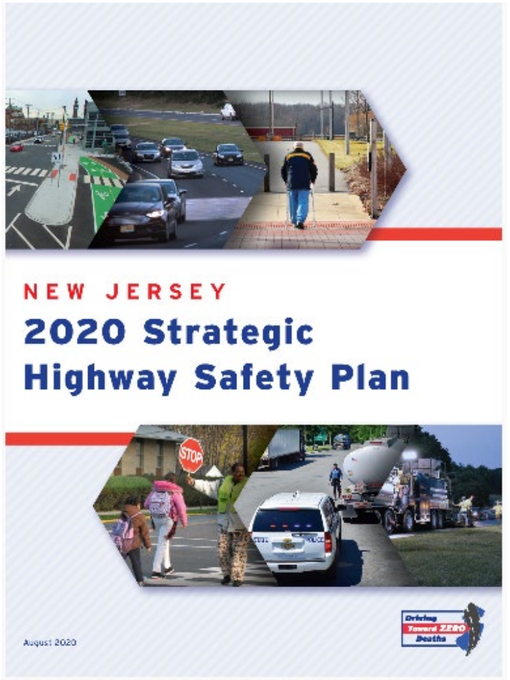
Post-crash care (EMS data)

Effect of COVID



Recent Safety Strategies Call For Improved Collaboration between Partners





Academia

Research Capacity

Academia

Research

Capacity

Government

Data

Academia

Research

Capacity

Government

Data

Small Business

Expertise/Connections

Academia

Research

Capacity

Organizations

Connections/On Ground

Efforts

Government

Data

Small Business

Expertise/Connections

Funding

National Institutes of Health

NJ Division of Highway Traffic Safety

American Public Health Association/ Centers for Disease Control

National Safety Council

Brain Institute Alliance of NJ

AAA Foundation for Traffic Safety

National Science Foundation

Robert Wood Johnson Foundation

State Farm Insurance Company

Children's Hospital of Philadelphia

Brown University

Thank You!

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Take a picture to get more information about NJ-SHO