An Innovative Approach to Visualize and Monitor Strategic Highway Safety Plan Metrics Across Communities

Allison E. Curry, PhD, MPH & Kristi Metzger, PhD, MPH August 2022







Our Team's Collective Expertise

Front lines of combating local public health issues

Expertise in data linkage, management, & visualization

15 years experience working with traffic safety data

In-house Outreach capabilities and award-winning public-facing websites









Development of an Integrated State-level Traffic Safety Warehouse



Creation of a Data Dashboard that Visualizes and Monitors SHSP Metrics

Critical Need for Data Infrastructure to Advance Traffic Safety



Arrive Alive RG STRATEGIC HIGHWAY SAFETY PLAN





NEW JERSEY



August 2020

2020 Strategic **Highway Safety Plan**



Equitable distribution of countermeasures so effective solutions are prioritized in communities that will benefit most

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Positive driving behaviors as well as improvements in infrastructure, roadway & vehicle design, and system-level factors

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Increased collaboration among traffic safety partners to track improvements in traffic deaths and injuries

Positive driving behaviors as well as improvements in infrastructure, roadway & vehicle design, and system-level factors

Increased emphasis on vulnerable road users (pedestrians, cyclists, micromobility device users)



Allocate

resources and countermeasures appropriately

Locate specific communities in need

NJ Crash Data Misses One-Third of All Crash Injuries





Lombardi et al., 2022





NJ Crash Data Misses One-Third of All Crash Injuries





And 59% of Bicyclist Injuries

41.0%

Lombardi et al., 2022







Development of an Integrated State-level Traffic Safety Warehouse:

The New Jersey Safety and Health Outcomes Data Warehouse (NJ-SHO)

Development began in 2010





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Integrates numerous statewide data sources





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Currently spans 15 year period (2004-2018)

Includes individuals who appear in *any* source

Over 80M records on 22.3M distinct individuals





Data standardized across sources



Data standardized across sources

Each pair of data sources linked independently



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Each pair of data sources linked independently

Validation showed linkage was high-quality



- Data standardized across sources
- Each pair of data sources linked independently
- Validation showed linkage was high-quality
- Organized as relational tables: can count events, track groups, follow individual driver over time



Geocoded addresses for all individuals

Geocoded crash location



Geocoded addresses for all individuals

Geocoded crash location

Race/ethnicity for all licensed divers



Geocoded addresses for all individuals

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Transportation Equity

Geocoded addresses for all individuals

Geocoded crash location

Race/ethnicity for all licensed divers

Vehicle Identification Number: Make/model, Presence of adaptive driver assistance systems



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Integrated crash Injury severity codes



NJ SHSP: "A comprehensive traffic records system should include..."



Crash



Driver



Vehicle



Roadway







To reach our vision of zero fatalities and serious injuries, data must be more uniform, timely, complete, accurate, integrated, and accessible

Virginia's safety information and support data s store, transmit, and provide for the analysis to i processes, and programs.				
Driver & Vehicle (DMV)	Citation (VSP)			
	Adjudication Dep (DOJ)			
and RNS (VDOT)	Injury & EMS (VD			
	Health Equity (op			
Roadway (RNS VDOT)	Supporting, e.g., Information Tech (VITA) & Office of Planning & Invest			





Take a picture for a list of our 40 studies that have already used NJ-SHO data





Review infant and child restraint compliance, enforcement, and education efforts





Review infant and child restraint compliance, enforcement, and education efforts

Priority Strategy 4: Develop and implement programs that provide education and awareness to high risk road users.

Use data and other sources to determine which population groups are choosing not to wear safety belts and determine why, if possible, to inform future education and communication initiatives. [Long Term]



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



61%

77%

0 80 100

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, 2020.

0.00%

100.00%

Creation of a Data Dashboard that Visualizes and Monitors SHSP Metrics

Common goal:

To identify causes of injury and guide prevention strategies



PUBLIC HEALTH

COMMUNITY GROUPS

Create **partnerships** to leverage complementary skills and resources

> DATA AND SURVEILLANCE

ANALYTIC EXPERTISE

LOCAL CONNECTIONS



NIH National Institutes of Health





CENTERS FOR DISEASE CONTROL AND PREVENTION

NJ-SHO Resource Center & Data Dashboard 2022-2025

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Vision:

Encourage data use and data sharing among NJ's diverse groups of stakeholders to reduce injury and support safe transport for all

NJ-SHO: Population-Based Approach

Focus on health and safety of populations, groups, & communities



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Focus on health and safety of populations, groups, & communities

Leverage integrated data from multiple sources



NJ-SHO: Population-Based Approach

Focus on health and safety of populations, groups, & communities

Leverage integrated data from multiple sources

Inform practice based on rigorous research



NJ-SHO Resource Center & Data Dashboard 2022-2025







NJ-SHO Resource Center & Data Dashboard 2022-2025







Gather Initial Input from Stakeholders and Partners



Government agencies

Community groups

Researchers, public health

Focus on Strengths of the NJ-SHO Data Warehouse



Characterize Communities of Interest

Where do crashes occur? Urban planning lens

Where do crash-affected individuals live? *Public health lens*



Characterize Communities of Interest

Region County Municipality ZIP code Neighborhood



How to use integrated data to highlight inequities





Strategic Highway Safety Plan Metrics





National Roadway Safety Strategy

United States Department of Transportation | January 2022



NEW JERSEY 2020 Strategic Highway Safety Plan





NJ-SHO Resource Center & Data Dashboard 2022-2025







Develop NJ-SHO Resource Center Website





Home > Research > Research Tools and Data Resources > New Jersey Safety and Health Outcomes Data Warehouse

NEW JERSEY SAFETY AND HEALTH OUTCOMES (NJ-SHO) DATA WAREHOUSE

The New Jersey Safety and Health Outcomes (NJ-SHO) Data Warehouse is being used by CIRP researchers and collaborators to advance safety and health research through novel administrative data linkages. Led by Allison E. Curry, PhD, MPH, 🗗 the research team developed a comprehensive data warehouse that integrates various New Jersey statewide administrative databases.



Research

Child Occupa
Crash Avoida Autonomous
Minds Matte
Teen Driving
Traffic Medio Transportatio

Safe Mobility

Resources



Develop Embedded Data Dashboard

Landing Page Statewide Key Metrics + Communities of Concern









Motor Vehicle Crashes

Pedestrians

Bicyclists



Effective Data Visualizations















Develop Embedded Data Dashboard & Safety Profiles

Landing Page Statewide Key Metrics + Communities of Concern





Community Safety Profiles







About	Who We Are	Social and Economic Conditions	Housing and Neighborhood Conditions	Maternal and Child Health	Healthy Living	Health Care	Health Outcome
Choose your community Choose comparison community Irooklyn 310: Bay Ridge and Dyker Heights Manhattan 108: Upper East Side			Show most favorable rate No				
Choose your con Brooklyn 310: Bay Ri	dge and Dyker Hei	ghts I	Manhattan 108: Upper I	ast Side	No		
Social	dge and Dyker Hei	econc	Manhattan 108: Upper I		N₀		

Living in high-poverty neighborhoods limits healthy options and makes it difficult to access health care and resources that promote health. Access to affordable housing and employment opportunities with fair wages and benefits are also closely associated with good health.

In Bay Ridge and Dyker Heights, 19% of residents live in poverty, compared with 20% of NYC residents.

Access to affordable housing and employment opportunities with fair wages and benefits are also closely associated with good health. Bay Ridge and Dyker Heights's unemployment rate of 8% is similar to the citywide average of 9%.



Many of the factors that affect health happen outside of a doctor's office. This includes access to quality education, jobs and safe spaces to live. Residents in high-poverty neighborhoods often lack these resources.

Sources: Unemployment: U.S. Census Bureau, American Community Survey, 2012-2016; Poverty: American Community Survey Public Use Micro Sample files as augmented by NYC Opportunity, 2012-2016 (community district and NYC), 2016 (borough)



Rent burdened households pay more than 30% of their income for housing and may have difficulty affording food, clothing, transportation and health care. 49% of Bay Ridge and Dyker Heights residents are rent burdened, a rate similar to residents citywide.

Source: U.S. Census Bureau, American Community Survey, 2012-2016

One way to consider the effect of income on health is by comparing death rates among neighborhoods. "Avertable deaths" are those that could have been avoided if each neighborhood had the same death rate as the five wealthiest neighborhoods. Using this measure, **17%** of deaths could have been averted in **Bay Ridge and Dyker Heights.**

Note: Unemployment data may differ from rates presented in other published sources. See the Notes page for more information about data and methodology.







Rent burden (percent of renter-occupied homes)

Source: U.S. Census Bureau, American Community Survey, 2012-2016

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and health care. 49% of Bay Ridge and Dyker Heights residents are rent burdened, a rate similar to residents citywide.

NJ-SHO Resource Center & Data Dashboard 2022-2025







Integrate New Data Sources





Integrate Additional Years of Existing Data Sources



Expand Reach of NJ-SHO Data

- Develop new lines of research
- Find opportunities for collaboration
- Provide analytic support for community organizations
- Support outreach to additional stakeholders
- Empower communities and advocacy groups



Partners

Funding

NJ Motor Vehicle Commission	National Ins ⁻
NJ Department of Transportation	NJ Division
NJ Division of Highway Traffic Safety	Brain Institu
NJ Office of Information Technology	AAA Founda
NJ Department of Health	National Sci
HealthDataViz	Robert Woo
Equitable Cities	State Farm I
	Children's H

- . . .
- American Public Health Association
- **Centers for Disease Control**
- **National Safety Council**

- stitutes of Health
- of Highway Traffic Safety
- ute Alliance of NJ
- lation for Traffic Safety
- cience Foundation
- od Johnson Foundation
- **Insurance Company**
- Hospital of Philadelphia
- **Brown University**

Thank You!

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Take a picture to get more information about NJ-SHO