



Targets for Reducing Disparities in Road Safety Across Travel Modes and Populations

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Road Safety Targets to Reduce Disparities



- In the US, pedestrians and bicyclists less safe than motor vehicle occupants
- Conducted research to learn whether certain racial/ethnic groups are also less safe
- Goal: develop policy mechanism to reduce disparities: targets

Pedestrians and Bicyclists in the US Less Safe

Annualized fatal injury rates per 100 million person-trips, 1999-2003
United States

Category	Passenger Vehicle	Walk	Bike	Bus	Total
All travelers	9.2 (9.1, 9.4)	13.7 (13.2, 14.2)	21.0 (18.5, 23.2)	0.4 (0.3, 0.5)	10.4 (10.3, 10.6)

Source: Beck LF, Dellinger AM, O'Neil ME. 2007. "Motor Vehicle Crash Injury Rates by Mode of Travel, United States: Using Exposure-Based Methods to Quantify Differences." *American Journal of Epidemiology*, 166(2):212-218.

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Pedestrian: 50% higher
Bicycle: 230% higher

Wisconsin Road Safety Disparities



- Extended Beck, et al. 2007 to include race and ethnicity
- Wisconsin Add-On to the 2001 and 2009 National Household Travel Survey (NHTS)
- Fatality Analysis Reporting System (FARS), 2001-2009
- Wisconsin hospital data, 2001-2009

Inpatient-Treated Injuries in Wisconsin

Inpatient injury rates per 100 million person-trips, 2001-2009, Wisconsin
(White, Black, Hispanic Men only)

Population	Bicyclist	Pedestrian	Motor vehicle occupant
White men	111.3 (91.2, 133.5)	51.9 (45.5, 58.6)	43.9 (40.6, 47.4)
Black men	1,016.2 (779.8, 1,283.5)	123.5 (102.8, 146.0)	102.3 (90.6, 114.8)
Hispanic men	41.5 (28.4, 57.1)	89.0 (55.3, 130.5)	58.6 (51.4, 66.3)

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Statistically significant: White male bicyclists vs motor vehicle occupants (RR=2.5), Black male bicyclist vs motor vehicle occupants. Black and Hispanic bicyclist rates unstable because of small travel diary sample size.

Inpatient-Treated Injuries in Wisconsin

Inpatient injury rates per 100 million person-trips, 2001-2009, Wisconsin
(White, Black, Hispanic Women only)

Population	Bicyclist	Pedestrian	Motor vehicle occupant
White women	56.6 (46.6, 67.6)	35.2 (31.0, 39.8)	33.6 (30.5, 36.8)
Black women	--	158.2 (132.5, 186.2)	69.3 (62.5, 76.4)
Hispanic women	--	30.7 (19.3, 44.7)	19.2 (16.2, 22.4)

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Statistically significant: White female bicyclists vs motor vehicle occupants (RR=1.7), Black female pedestrians vs motor vehicle occupants (RR=2.3).

Policy and Planning Responses

Wisconsin Strategic Highway Safety Plan
2011 – 2013

*Published by the Wisconsin Department of Transportation
Mark Gottlieb, P.E., Secretary*

Wisconsin DOT Traffic Safety Council

- What underlies the differences in travel risk?
- Policies to reduce disparities
- Wisconsin uses data-driven decision making to prioritize funding
- Existing targets e.g., number of crashes at an intersection, seatbelt use

Excess Mortality Approach



- What is the lowest observed fatality or injury rate for a group of travelers?
 - Men and women
 - Travel mode (bike, ped, car)
 - Race and ethnicity
 - Urban and rural

Example Targets: Men as Safe as Women

- Target: Male pedestrians as safe as female pedestrians for each age group with higher injury risk

Age group	No. of injuries, 2001-2009	Injury rate per 100 million trips	Female reference rate	Average annual excess injuries
Ages 0 – 14	339	66.6	33.9	18.5
Ages 15 – 24	263	61.9	38.9	10.9
Ages 25 – 64	630	69.2	39.0	30.5
Ages 65+	158	66.4	93.1	-7.1

Example Targets: Rural as Safe as Urban

- Target: Rural motorists as safe as urban motorists

Urban typology	No. of fatalities, 2001-2009	Fatality rate per 100 million trips	Average annual excess fatalities
Urban focused	2,661	10.1	Referent
Large rural city	633	14.6	21.6
Small rural town	803	18.6	40.1
Isolated rural	1,123	31.7	85.0

Takeaways



- Road safety disparities exist nationally and sub-nationally
- Reducing disparities between groups is one strategy for reducing overall risk of travel
- Road safety targets are a policy mechanism for achieving this

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For details about statistical methods and data:

McAndrews C, Beyer K, Guse CE, Layde P. 2013. "Revisiting Exposure: Fatal and Non-fatal Traffic Injury Risk Across Different Populations of Travelers in Wisconsin, 2001-2009." *Accident Analysis and Prevention*, 60:103-112.