Socioeconomic Disparities in Drug Poisoning Deaths Among US Adults

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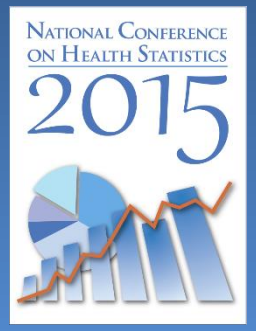
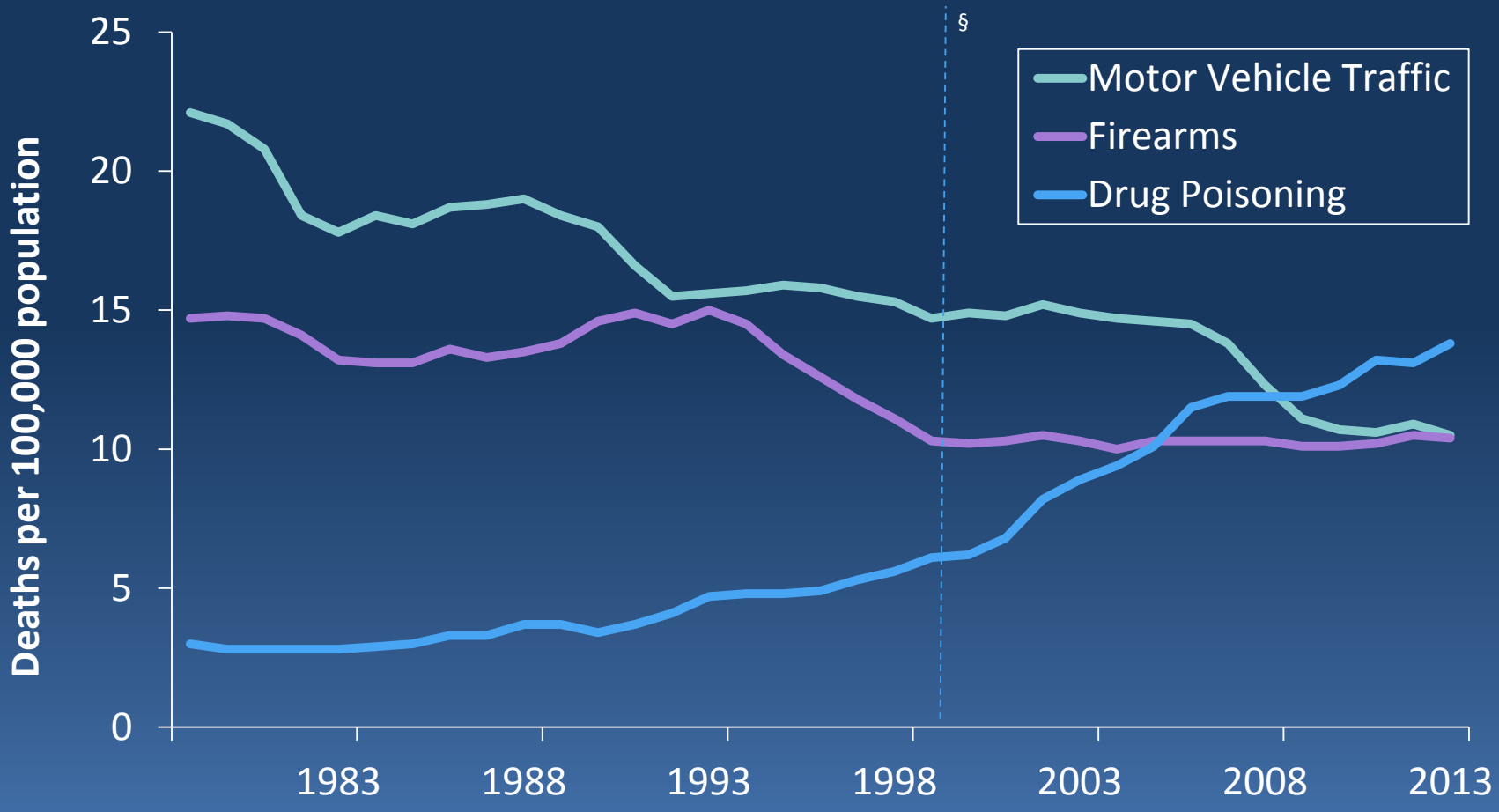


Background

Age-adjusted death rates for three selected causes of injury United States, 1979-2013



§ In 1999, International Classification of Diseases, 10th Revision (ICD-10) replaced the previous revision of the ICD (ICD-9).

SOURCE: CDC/NCHS, National Vital Statistics System, Mortality File (NVSS-M).

Chen, LH, Fenelon, A. QuickStats: Death Rates for Three Selected Causes of Injury—National Vital Statistics System, United States, 1979–2012. MMWR November 21, 2014 / 63(46);1095.

Drug poisoning deaths

High risk groups – what we know

- Non-Hispanic white, American Indian, male and middle age

High risk groups – insufficient evidence

- Low socioeconomic status

To our knowledge, the association between socioeconomic status and drug poisoning deaths has not been well studied

Objective

Examine the relationship between socioeconomic status and drug poisoning deaths among US adults

Methods

Data Sources

National Health Interview Survey (NHIS) Linked Mortality Files

- NHIS participants in 1999-2009
  - Probabilistically matched with National Death Index through 2011
  - Aged 25-64 at time of interview
- 90% of adult participants were eligible for linkage. NHIS sampling weights were adjusted to account for ineligibility

More Data Sources

NHIS, 1999-2009

- Cross-sectional household interview survey of civilian, non-institutionalized population
- Source for demographic, geographic and socioeconomic information

National Vital Statistics System, Mortality File, 1999-2011

- Records of all deaths
- Source for cause of death and date of death

Outcome Measure: Drug poisoning death

Drug poisoning deaths identified by ICD10 underlying cause of death codes:

- X40-X44 (Unintentional)
- X60-X64 (Suicide)
- X85 (Homicide)
- Y10-Y14 (Undetermined)

Methods - Analysis

Cox proportional hazards (PH) model

Was used to explore the association between socioeconomic status (education, poverty, employment, health insurance) and drug poisoning deaths

- Control for other risk factors:
  - Sex, race/ethnicity, marital status, metropolitan statistical area (MSA), and region
- Age was used as time scale

Results

Characteristics at the time of interview (NHIS)

Characteristics		All respondents*	Drug poisoning* death
Unweighted N		**459,322**	**425**
Mean age (yrs)		43.3	42.1
Sex (%)	Male	49.0	55.8
	Female	51.0	44.2
Race/ethnicity (%)	Hispanic	12.7	7.4
	NH White	70.0	76.8
	NH Black	11.5	9.6
	NH Other	5.9	6.1
Region (%)	Northeast	18.7	14.5
	Midwest	23.7	20.1
	South	36.8	40.5
	West	20.8	24.9
MSA (%)	Large MSA	49.3	41.1
	Small MSA	32.1	40.3
	Not in MSA	18.6	18.6

* Unweighted distribution
Source: NHIS 1999-2009 linked with mortality through 2011

More characteristics at the time of interview (NHIS)

Characteristics		All respondents*	Drug poisoning* death
Education (%)	Less than high school diploma	13.5	22.8
	High school diploma or GED	28.9	33.8
	Some college	28.4	29.8
	Bachelor's degree or higher	29.2	13.6
Marital status (%)	Married	66.0	46.3
	Widowed/divorced/separated	14.1	26.8
	Never married	13.4	16.0
	Living with partner	6.5	10.9
Poverty level (%)	Below 200%	25.5	47.8
	200% to <400%	30.0	27.3
	400% or more	44.5	24.9
Employment status (%)	Employed	77.0	46.4
	Unemployed	23.0	53.6
Health insurance status (%)	Private	73.1	46.2
	Public	9.6	27.8
	Uninsured	17.3	26.0

*Unweighted distribution

Source: NHIS 1999-2009 linked with mortality through 2011

Cox proportional hazards ratios (HR) for drug poisoning deaths

Characteristics		Crude HR (95%CI)	Adjusted* HR (95%CI)
Sex	Male	**1.3 (1.1-1.6)**	**1.7(1.4-2.1)**
	Female	1.0	1.0
Race/ethnicity	NH White	**1.8 (1.3-2.5)**	**3.2 (2.2-4.8)**
	NH Black	1.4 (0.9-2.1)	1.5 (0.9-2.4)
	Hispanic	1.0	1.0
Region	Northeast	1.0	1.0
	Midwest	1.1 (0.7-1.6)	1.1 (0.7-1.7)
	South	**1.5 (1.0-2.0)**	1.4 (1.0-2.0)
	West	**1.6 (1.1-2.3)**	**1.6 (1.1-2.4)**
MSA	Large MSA	1.0	1.0
	Small MSA	**1.5 (1.2-1.9)**	1.2 (0.9-1.6)
	Not in MSA	1.2 (0.9-1.6)	0.7 (0.5-1.0)

*Model included: sex, race/ethnicity, region, MSA, marital status, education, poverty level, employment status and health insurance status

Cox proportional hazards ratios (HR) for drug poisoning deaths (2)

Characteristics		Crude HR (95%CI)	Adjusted* HR (95%CI)
Marital status	Married	1.0	1.0
	Widowed/divorced/separated	**2.8 (2.2-3.7)**	**2.1 (1.6-2.8)**
	Never married	**1.8 (1.4-2.4)**	1.4 (1.0-1.8)
	Living with partner	**2.5 (1.7-3.9)**	**2.0 (1.3-3.1)**
Education	Less than high school diploma	**3.7 (2.6-5.3)**	**1.9 (1.2-3.0)**
	High school diploma or GED	**2.5 (1.8-3.5)**	**1.7 (1.1-2.4)**
	Some college	**2.2 (1.5-3.2)**	**1.7 (1.1-2.5)**
	Bachelor's degree or higher	1.0	1.0

*Model included: sex, race/ethnicity, region, MSA, marital status, education, poverty level, employment status and health insurance status

Cox proportional hazards ratios (HR) for drug poisoning deaths (3)

Characteristics		Crude HR (95%CI)	Adjusted HR (95%CI)
Poverty level	Below 200%	**3.6 (2.7-4.8)**	**1.6 (1.1-2.4)**
	200% to < 400%	**1.6 (1.2-2.2)**	1.2 (0.9-1.7)
	400% or more	1.0	1.0
Employment status	Employed	1.0	1.0
	Unemployed	**4.6 (3.7-5.8)**	**3.5 (2.7-4.5)**
Health insurance status	Private	1.0	1.0
	Public	**5.4 (4.2-6.9)**	**1.8 (1.3-2.5)**
	Uninsured	**2.5 (2.0-3.3)**	1.4 (1.0-1.9)

*Model included: sex, race/ethnicity, region, MSA, marital status, education, poverty level, employment status and health insurance status

Discussion & Conclusion

Summary

Demographic and socioeconomic status is associated with drug poisoning deaths

- Male (HR=1.7)
- Non-Hispanic white (HR=3.2)
- Never married (HR=2.2)
- Without college degree
  - <12 years of education (HR=1.9)
  - High school/GED (HR=1.7)
  - Some college (HR=1.7)
- <200% below poverty level (HR=1.6)
- Public health insurance (HR=1.8)
- Unemployment (HR=3.5)

Limitations

Demographic information and socioeconomic status might change during follow-up

- Marital status, education, income/poverty level, employment, health insurance status
- This information was only assessed at the time of interview

Conclusion

This study shows significant association of demographic and socioeconomic status with drug poisoning-related deaths

- The association is attenuated, but remains significant, after controlling for other risk factors

Future research is needed to further explore

- Underlying mechanisms
- Association within subgroups

Resources

Injury Episodes and Circumstances: National Health Interview Survey, 1997-2007
http://www.cdc.gov/nchs/data/series/sr_10/sr10_241.pdf

NHIS: Questionnaires, Datasets, and Related Documentation 1997 to the Present
http://www.cdc.gov/nchs/nhis/quest_data_related_1997_forward.htm

National Vital Statistics System, Mortality Data
http://www.cdc.gov/nchs/deaths.htm

NCHS Data Linked to Mortality Files
http://www.cdc.gov/nchs/data_access/data_linkage/mortality.htm

NCHS Research Data Center (RDC) http://www.cdc.gov/rdc/

Questions?

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For more information on injury data and resources from NCHS, see: www.cdc.gov/nchs/injury.htm