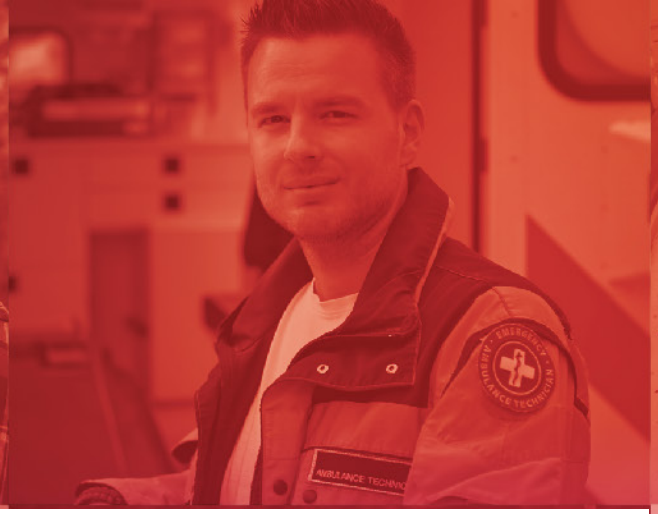
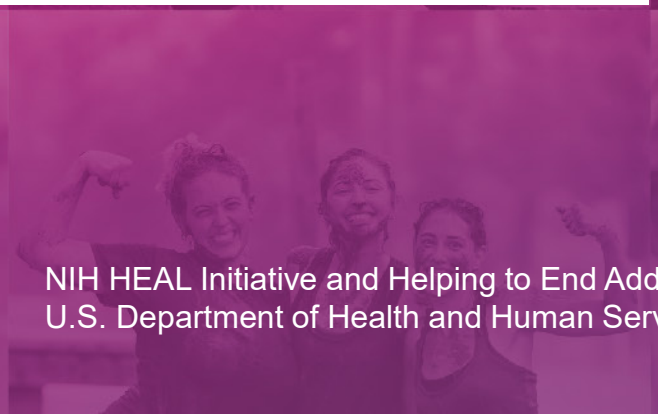
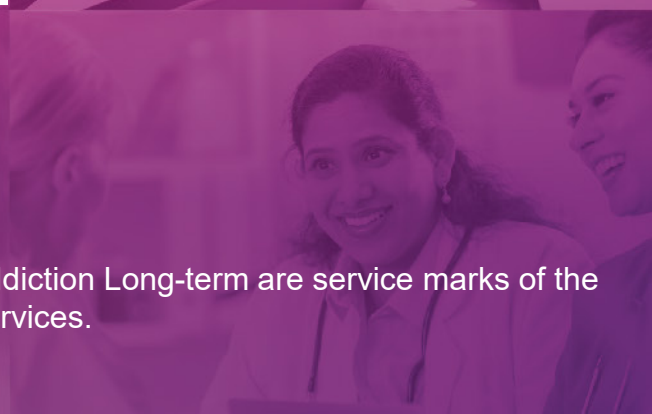




NIH HEAL INITIATIVE

Social determinants of substance use and misuse

9.9.20

Sandro Galea

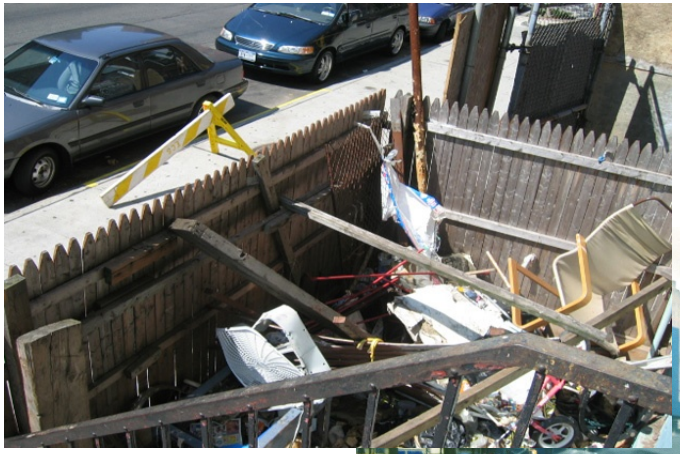




National Institutes of Health
HEAL Initiative

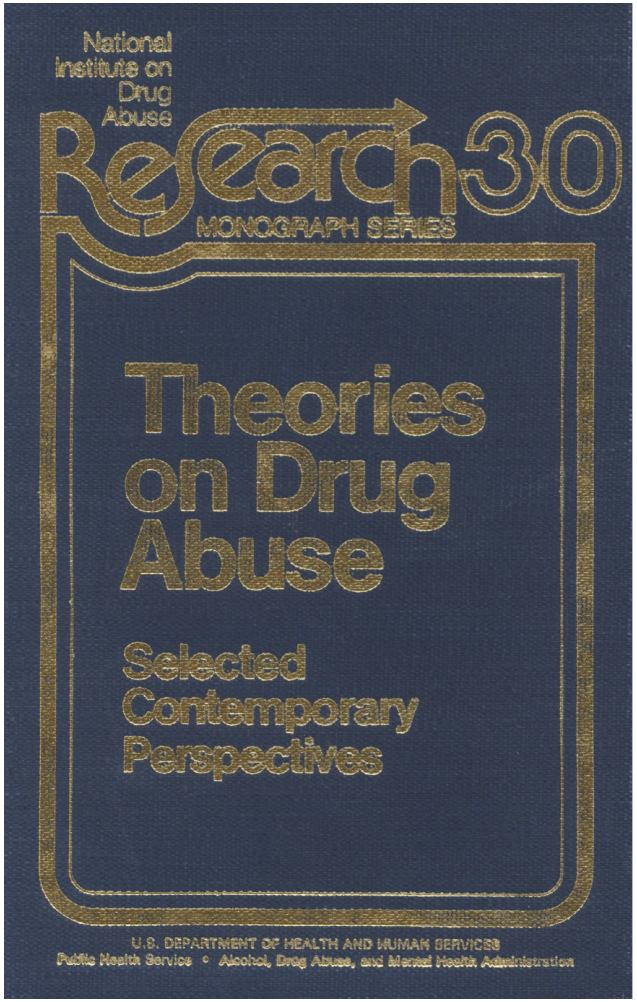
Social = exogenous, related to external factors

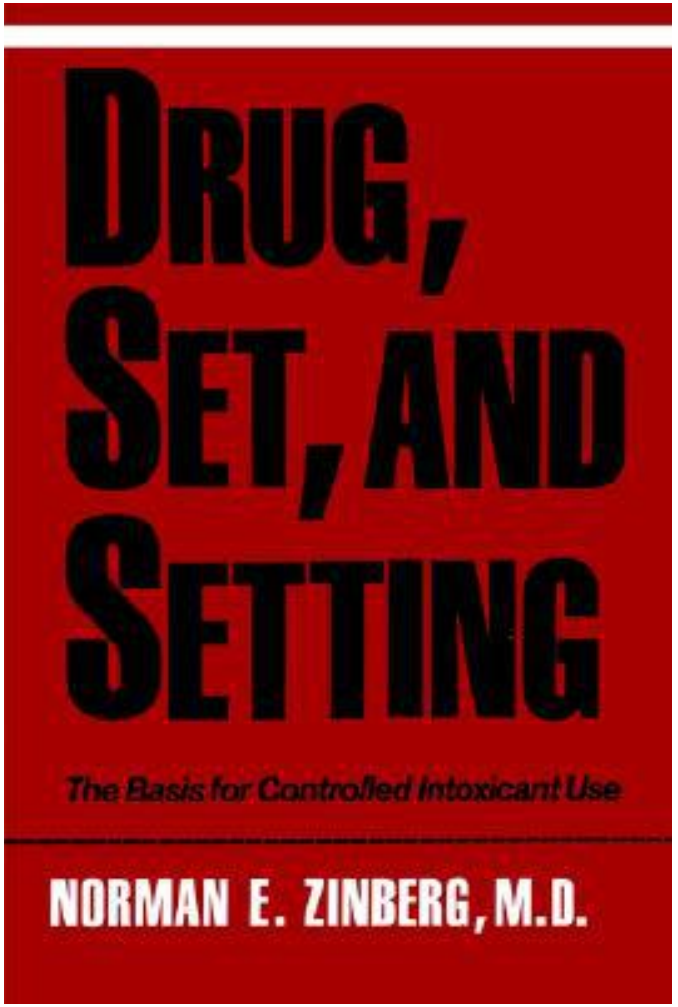
Why might we think that social factors influence substance use?

Intuition



Theory


National Institute on Drug Abuse
Research 30
MONOGRAPH SERIES
Theories on Drug Abuse
Selected Contemporary Perspectives
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service • Alcohol, Drug Abuse, and Mental Health Administration


DRUG, SET, AND SETTING
The Basis for Controlled Intoxicant Use
NORMAN E. ZINBERG, M.D.

Evidence

Epidemiologic Reviews
Vol. 26, 2004
Printed in U.S.A.
DOI: 10.1093/epirev/mxh007

The Social Epidemiology of Substance Use

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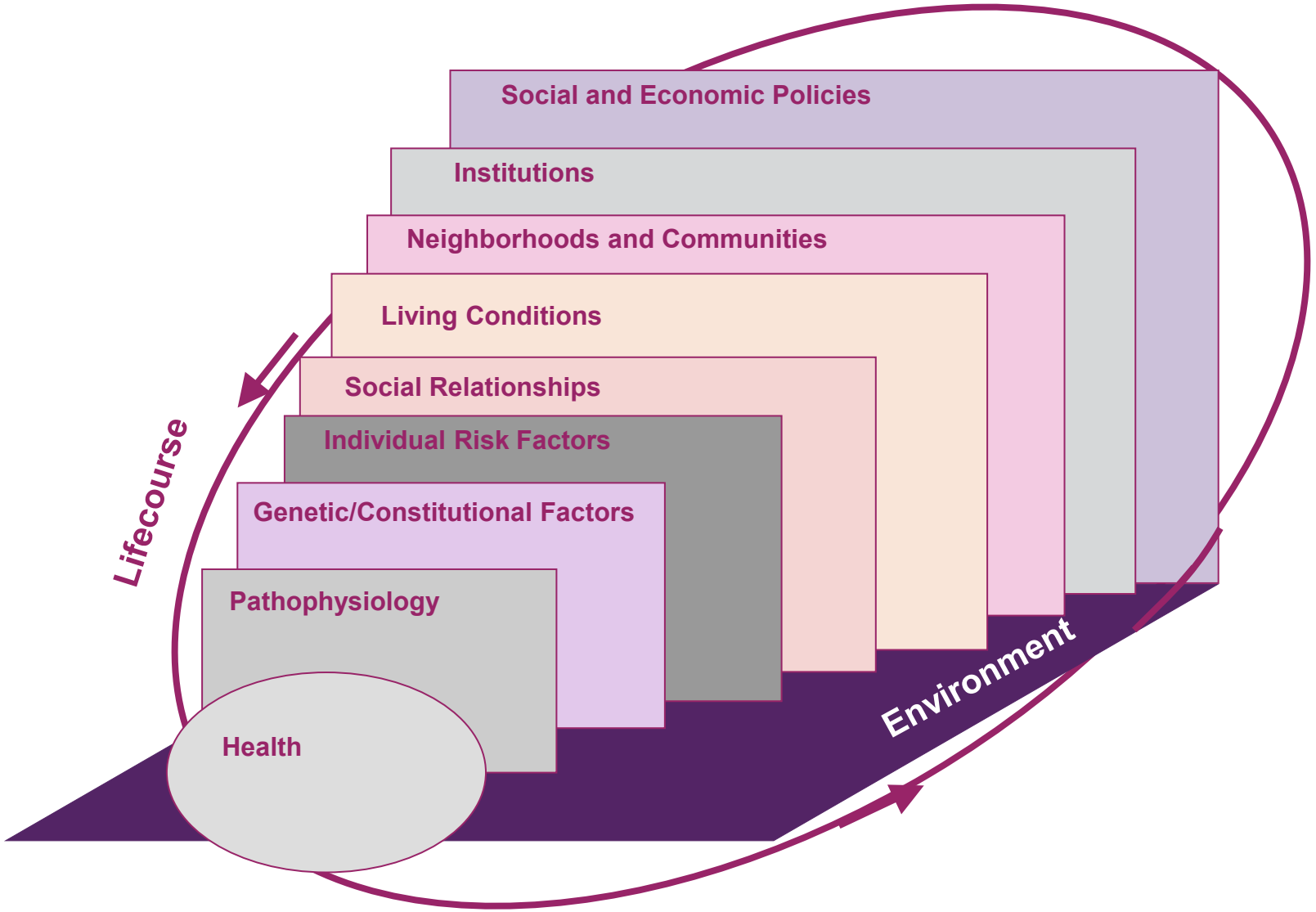
INTRODUCTION

Tobacco, alcohol, and illicit substance

TABLE 1. Key studies that assess the relations between social factors and initiation of substance use

Study, year (reference no.)	Substance	Location	Sample	Conclusions
			Cigarettes and alcohol	
Conwell et al., 2003 (11)	Cigarettes	Brisbane, Australia*	5,427 adolescents (aged 14 years) whose mothers attended an antenatal clinic in Brisbane	Adolescent cigarette smoking was associated with parental smoking, low school achievement, low household income, and low levels of maternal education.
Dawson, 2000 (20)	Alcohol	United States*	42,862 adults (aged ≥18 years) from the National Longitudinal Alcohol Epidemiologic Survey	A positive association was found between percentage of alcoholic relatives and early onset of alcoholism, attributed to earlier initiation of drinking.
Ellickson et al., 2001 (9)	Cigarettes	California and Oregon†	3,056 adolescents recruited from 30 middle and junior high schools and interviewed during junior high (aged 13 years), high school (aged 18 years), and young adulthood (aged 23 years)	Poor grades (OR‡ = 1.20), higher levels of parental education (OR = 1.10), and being young for one's cohort (OR = 1.34) were associated with initiation at adolescence and young adulthood; being part of a nuclear family (OR = 0.70) and minority status were associated with a lower likelihood of initiation.
Ellickson et al., 2004 (18)	Cigarettes	California and Oregon†	6,259 students from 30 middle schools located in urban, suburban, and rural communities and followed from age 13 to age 23 years	Social bonding factors explained the higher rates of early initiation among African Americans relative to Whites; less exposure to pro-smoking social influences accounted for the lower rates of regular smoking at age 18 years for African Americans relative to Whites.
Juon et al., 2002 (10)	Cigarettes	Chicago, Illinois†	952 African Americans beginning in 1966–1967 (first grade), with follow-up in 1975–1976 and 1992–1994	Early initiators were more likely to leave home before age 18 years (OR = 2.92) and to have low levels of parental supervision (OR = 6.62) regarding drug rules.
Kaplan et al., 2001 (12)	Cigarettes	Los Angeles, California*	1,411 Latina women (aged 14–24 years) receiving services from family planning clinics in 1992–1993	Cultural factors, including nontraditional family values (OR = 1.30) and linguistic acculturation (OR = 1.25), influence smoking initiation.
			Illicit drugs	

Organizing perspectives



Kaplan, G. What's wrong with social epidemiology, and how can we make it better? *Epid Rev* 2004; 26: 124-135


Education

Fragile families


Poverty

Unstable housing


Isolation

So, social environment → substance use

What are the challenges that define research and practice?

Methods
Constructs
Concepts

The methods

- Social selection
- Unmeasured confounding
- The role of time

Adolescent Marijuana Use from 2002 to 2008: Higher in States with Medical Marijuana Laws, Cause Still Unclear

MELANIE M. WALL, PHD, ERNEST POH, MS, MAGDALENA CERDÁ, DRPH, KATHERINE M. KEYES, PHD, SANDRO GALEA, MD, DRPH, AND DEBORAH S. HASIN, PHD

PURPOSE: Since 1996, 16 states have legalized marijuana use for medical purposes. The current study provides a scientific assessment of the association of medical marijuana laws (MML) and adolescent marijuana use using national data.

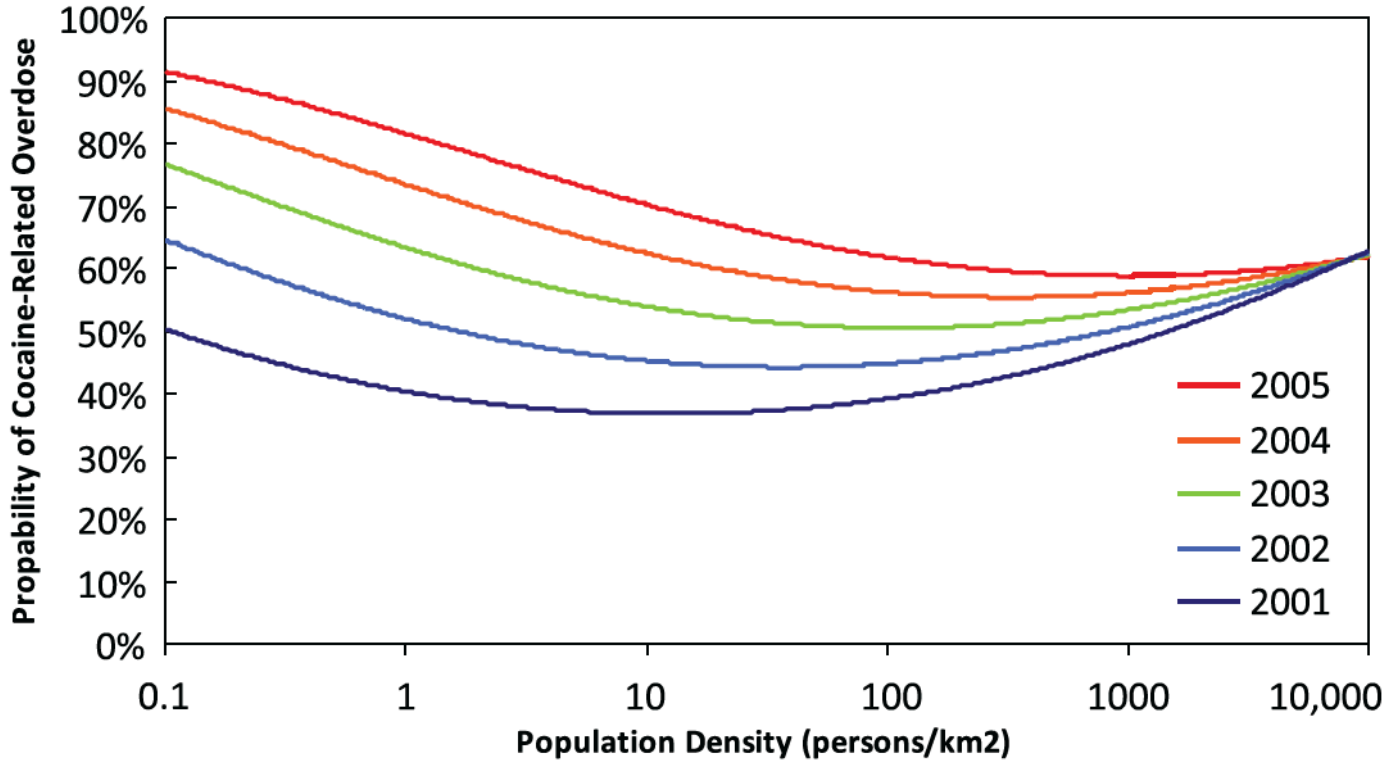
METHOD: State representative survey data on approximately 23,000 12–17 year olds were collected by the National Survey on Drug Use and Health annually from 2002–2008. Yearly state-specific estimates of prevalence of past-month marijuana use and perception of its riskiness were statistically tested for differences between states with and without MML by year and across years.

RESULTS: States with MML had higher average adolescent marijuana use, 8.68% (95% CI: 7.95–9.42) and lower perception of riskiness, during the period 2002–2008 compared to states without MML, 6.94% (95% CI: 6.60–7.28%). In the eight states that passed MML since 2004, in the years prior to MML passage, there was already a higher prevalence of use and lower perceptions of risk in those states compared to states that have not passed MML.

CONCLUSIONS: While the most likely of several possible explanations for higher adolescent marijuana use and lower perceptions of risk in MML states cannot be determined from the current study, results clearly suggest the need for more empirically-based research on this topic.

Ann Epidemiol 2011;21:714–716.

KEY WORDS: Cannabis, Cannabinoids/Therapeutic Use, Legislation, Drug, Marijuana Smoking/Legislation & Jurisprudence, State Government, Adolescent.



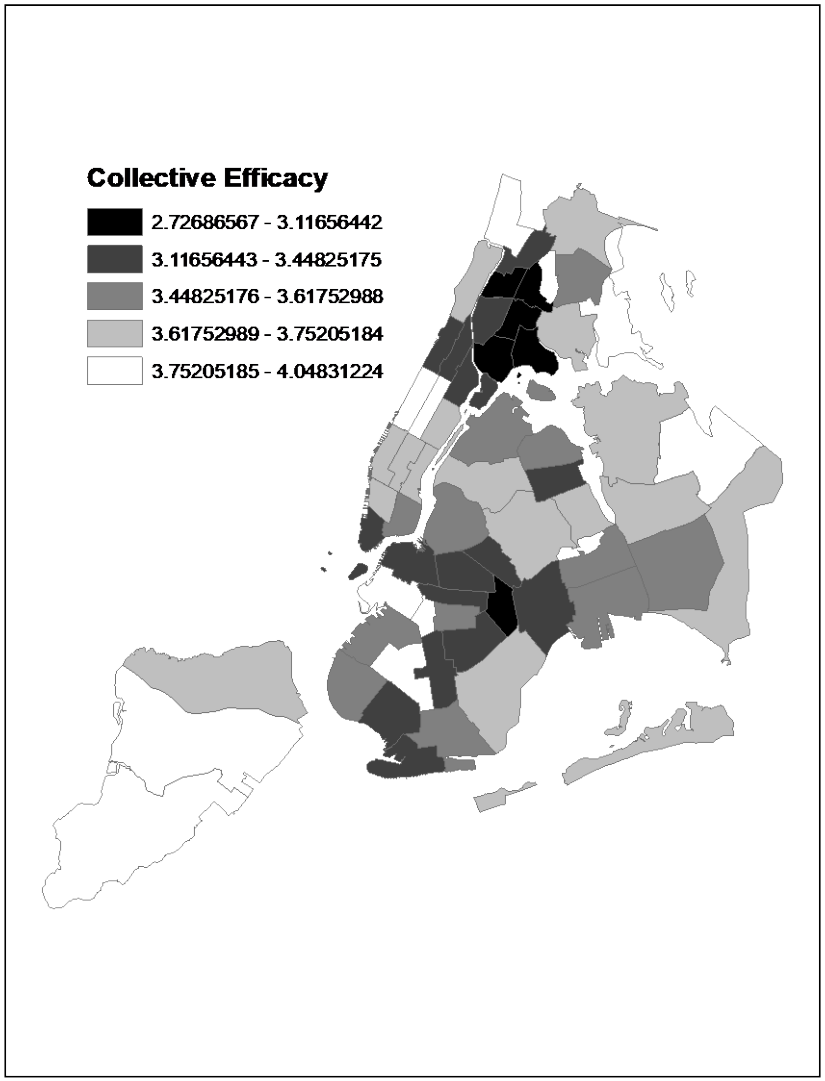
Model: $P(OD_{cocaine}) = \text{logit}(-0.39 + 0.47year - 0.28density - 0.12[year*density] + 0.13density^2)$

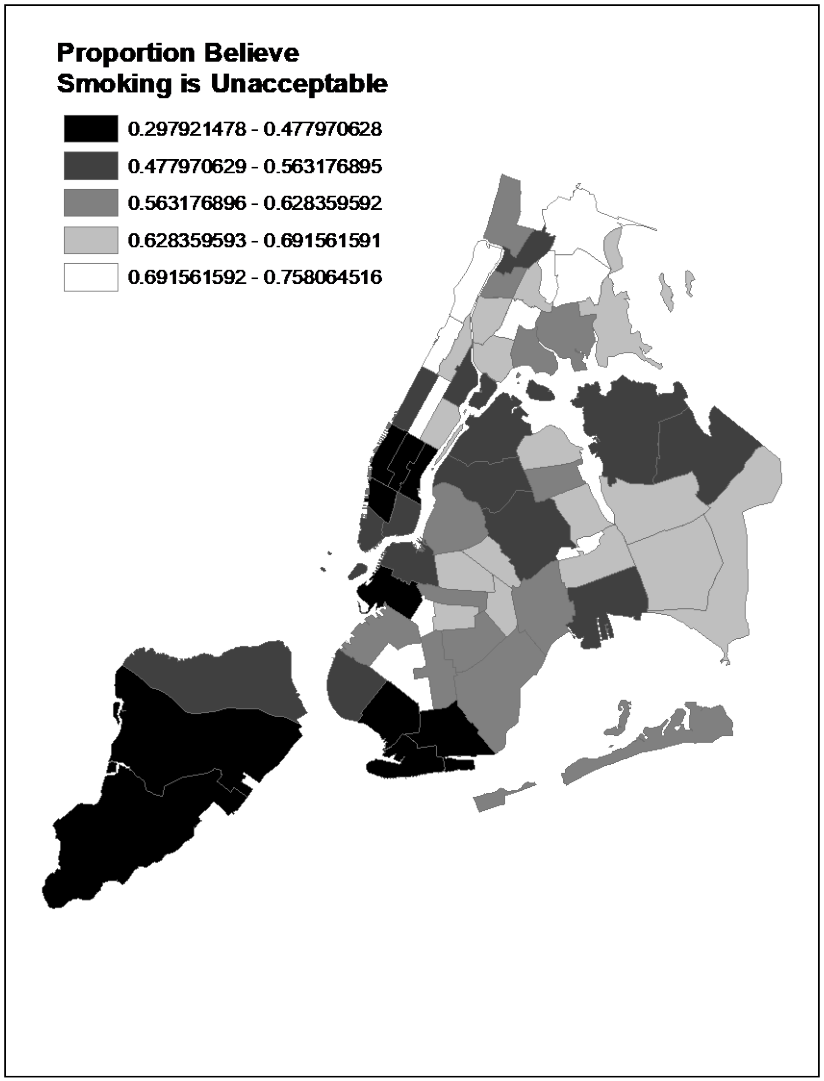
FIGURE 1. Estimated probability of cocaine-related overdose in British Columbia by population density, 2001–2005. Predicted values are derived from a multilevel mixed effects logistic model (shown above), with year of death ($p < .001$), population density of LHA ($p = .278$), an interaction term ($p = .007$), and a quadratic term ($p = .021$) as the explanatory variables of primary interest.

Marshall BDL, Milloy M-J, Wood E, Galea S. Kerr T. Temporal and geographic shifts in urban and non-urban cocaine-related fatal overdoses in British Columbia, Canada. Annals of Epidemiology. 2012;22:198–206. PMID: 22266349. http://dx.doi.org/10.1016/j.annepidem.2011.12.004

The constructs

- Overlap of social variables
- Difficulty defining environment





Karasek D, Ahern J, Galea S. Social norms, collective efficacy, and smoking cessation in urban neighborhoods. American Journal of Public Health. 2012;102(2):343-51. PMID: 22390449. PMCID: PMC3483989. http://dx.doi.org/10.2105/AJPH.2011.300364

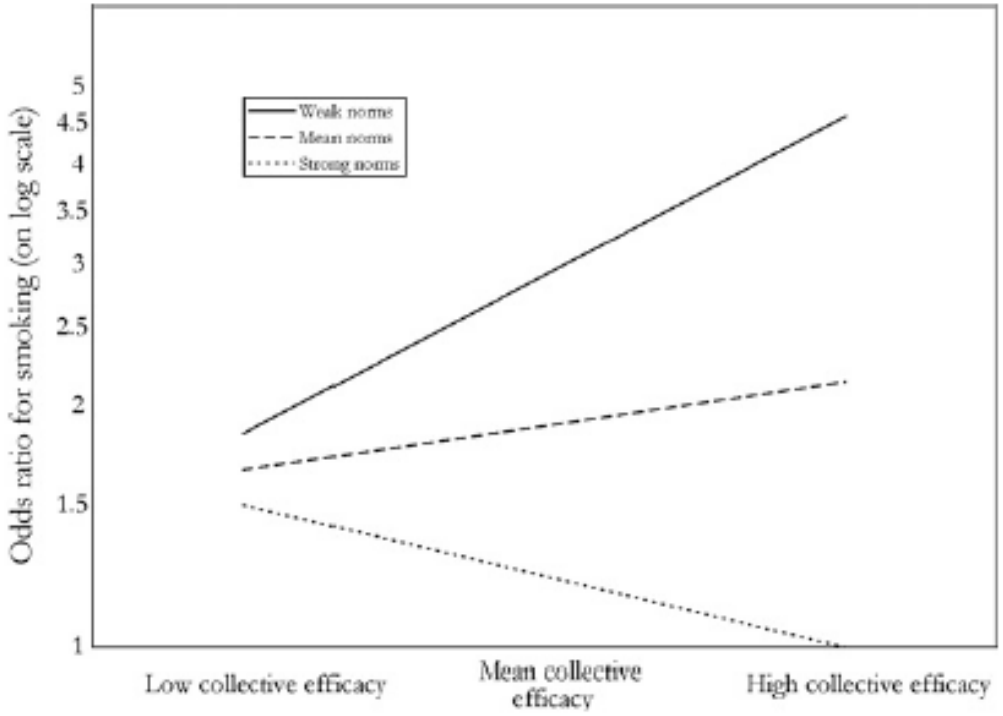
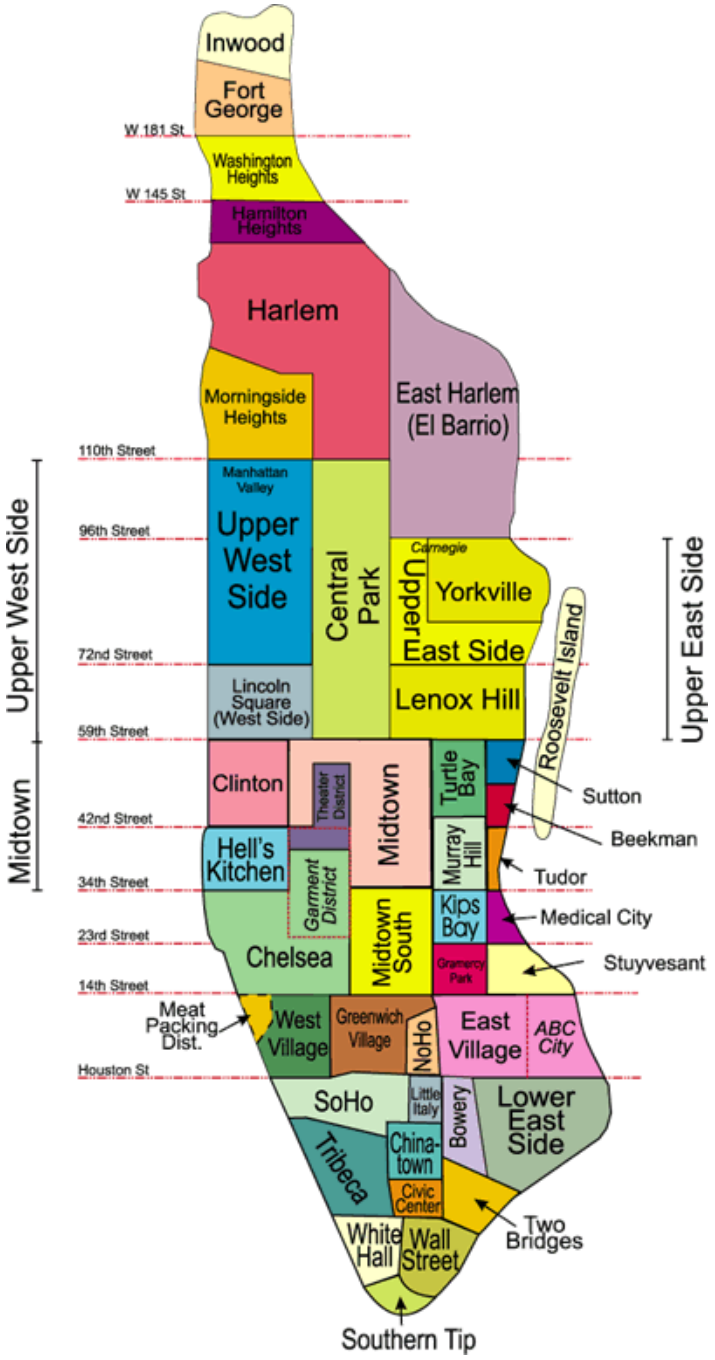


Fig. 1. Odds ratios for the association between neighborhood collective efficacy and smoking, at different levels of neighborhood smoking norms, for the group with no history of smoking prior to living in the current neighborhood (interaction *p*-value < 0.001).
Neighborhoods with low collective efficacy are 1 S.D. below the mean, indicating they have less social cohesion and informal social control. Neighborhoods with high collective efficacy are 1 S.D. above the mean, indicating they have more social cohesion and informal social control. Neighborhoods with weak norms are 1 S.D. below the mean of the percentage who believe it is unacceptable for adults to smoke regularly, meaning norms are more permissive around smoking. Neighborhoods with strong norms are 1 S.D. above the mean of the percentage who believe it is unacceptable for adults to smoke regularly, meaning norms are more anti-smoking.

Ahern J, Galea S, Hubbard A, Syme LS. Neighborhood smoking norms modify the relation between collective efficacy and smoking behavior. Drug and Alcohol Dependence. 2009;100(1-2):138–145. PMID: 19010610. PMCID: PMC2664307. URL: http://dx.doi.org/10.1016/j.drugalcdep.2008.09.012

What is a neighborhood?

- Block group, census tract, or cluster of census tracts
- A community district
- Defined by study participants



The concepts

- Ubiquity
- Defining counterfactuals
- Lifecourse

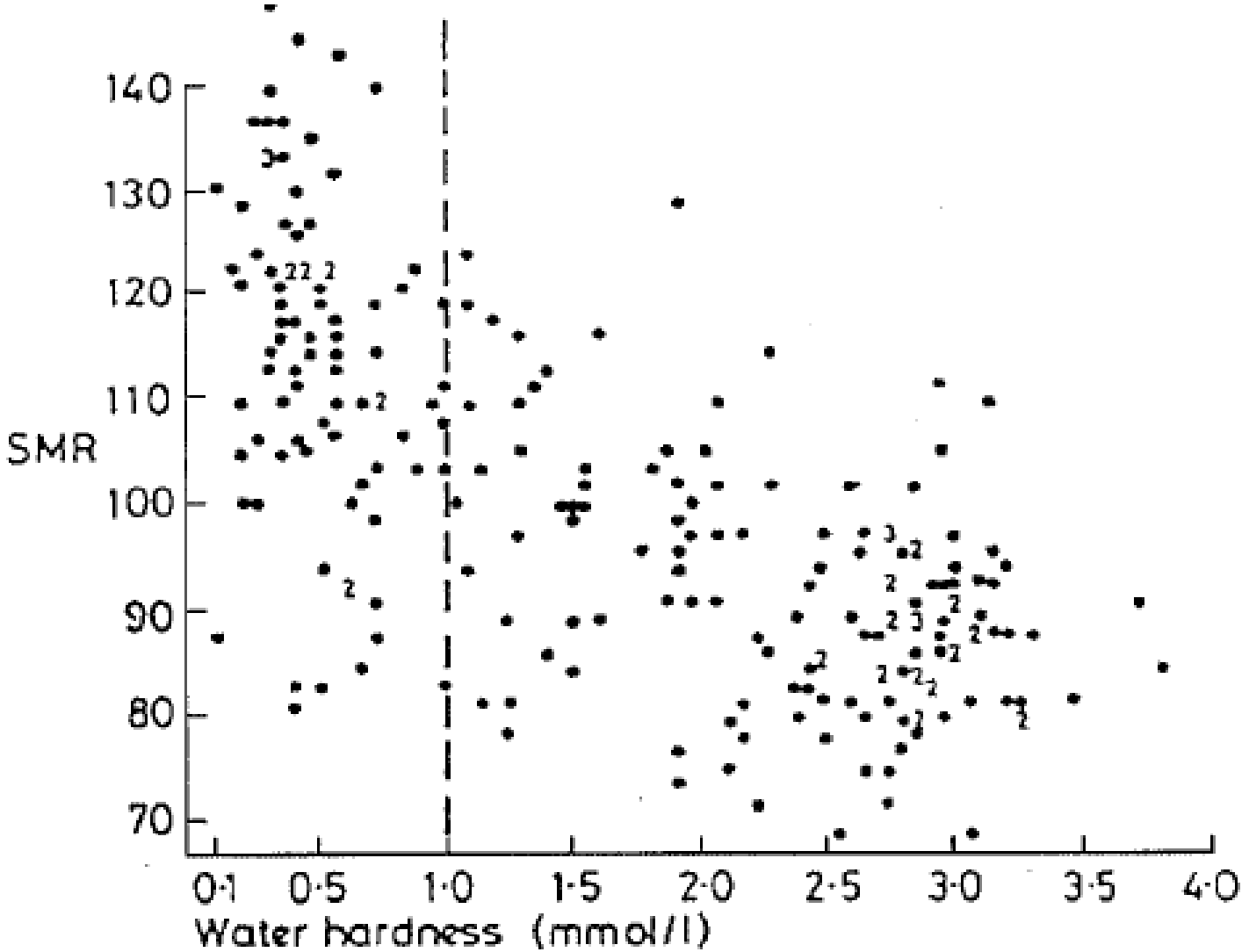
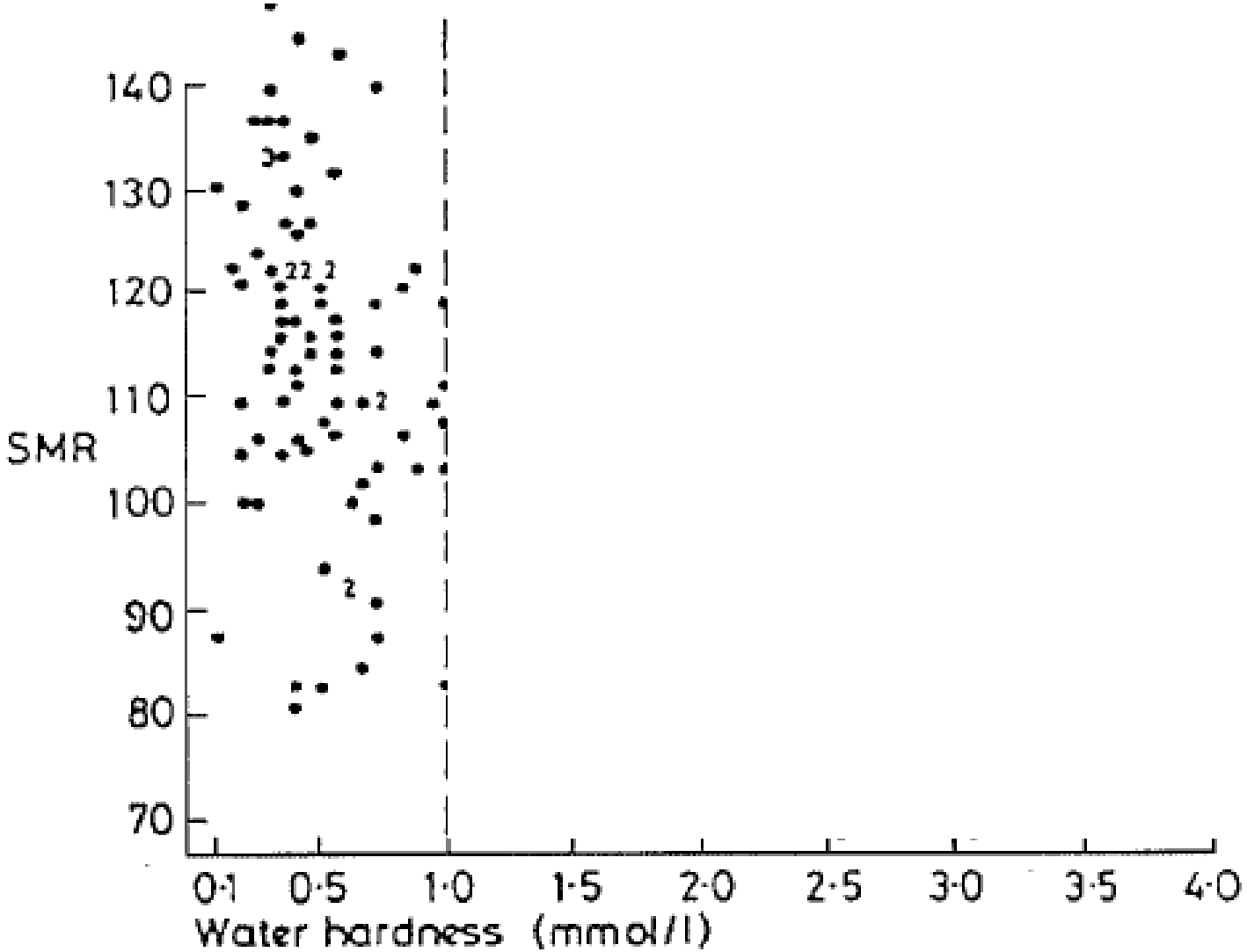


Figure 1 Relation between water quality and cardiovascular mortality in towns of the UK[1]

Rose G. Sick individuals and sick populations. International Journal of Epidemiology. 1985;14:32-38



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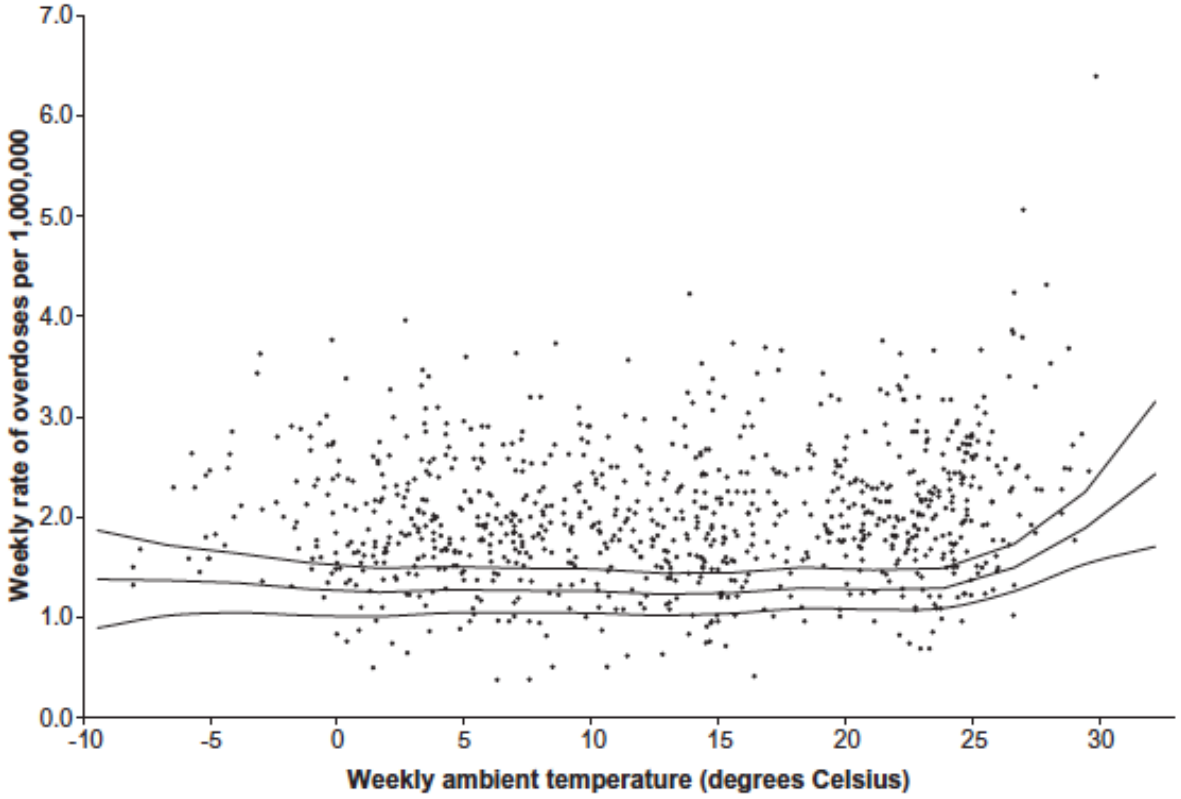


Figure 1 Generalized additive models (GAM) of temperature and drug overdose mortality in New York City, 1990–2006, including all overdoses due to any drug or combination of drugs. The prediction line represents only the effect of temperature on the count of overdose deaths, when all other covariates were held constant. The scatterplot represents the count of overdose deaths based on temperature and other covariates

Bohnert AS, Prescott MR, Vlahov D, Tardiff KJ, Galea S. Ambient temperature and risk of death from accidental drug overdose in New York City, 1990-2006. Addiction. 2010;105(6): 1049-1054. PMID: 20219056. PMCID: PMC2898915. URL: http://dx.doi.org/10.1111/j.1360-0443.2009.02887.x

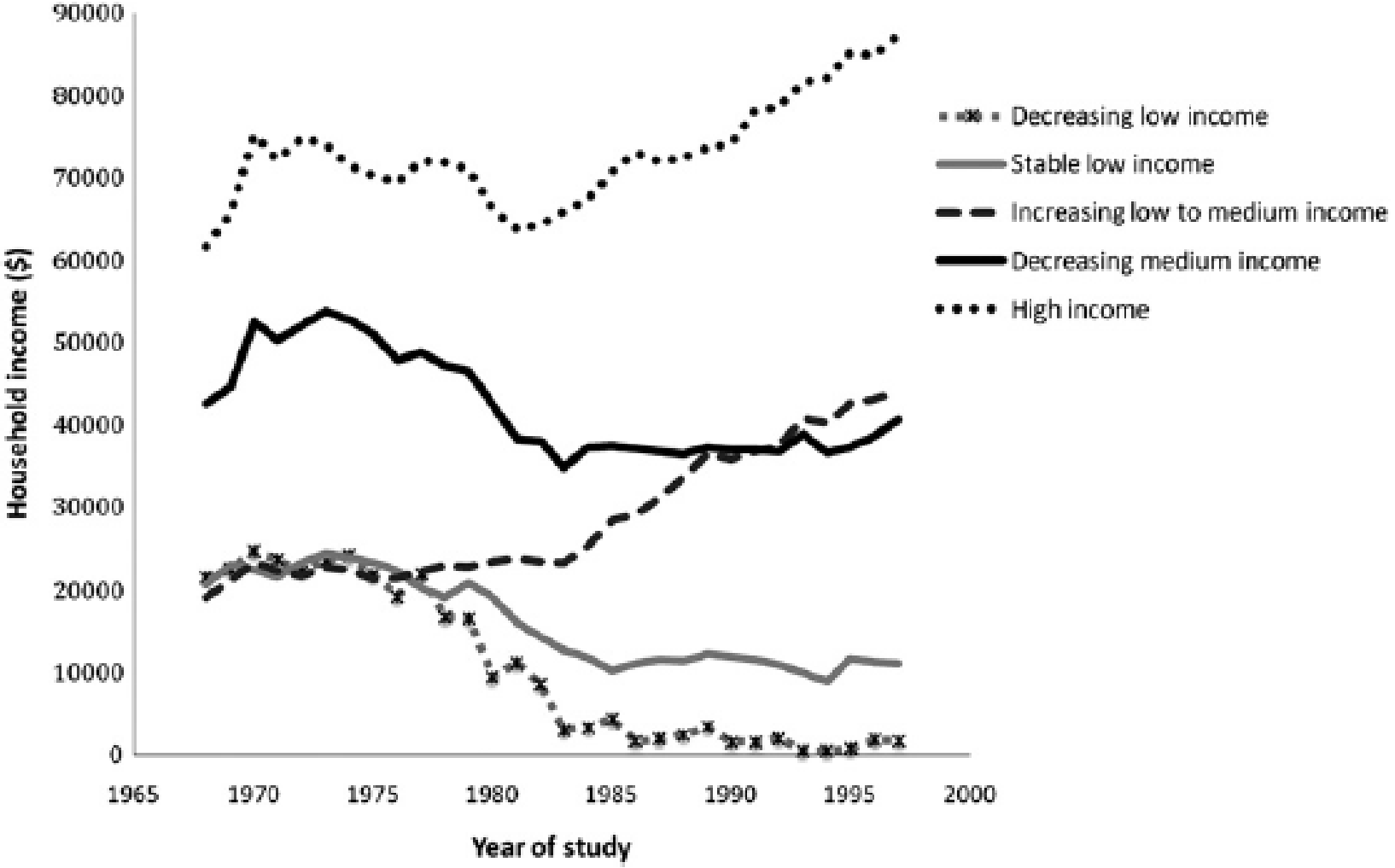


Fig. 1. Estimated household income trajectories, 1968–1997, for PSID respondents aged 30–44 in 1997.

Cerda M, Johnson-Lawrence VJ, Galea S. Lifetime income patterns and alcohol consumption: Investigating the association between long- and short-term income trajectories and drinking. Social Science and Medicine. 2011;73:1178-1185.

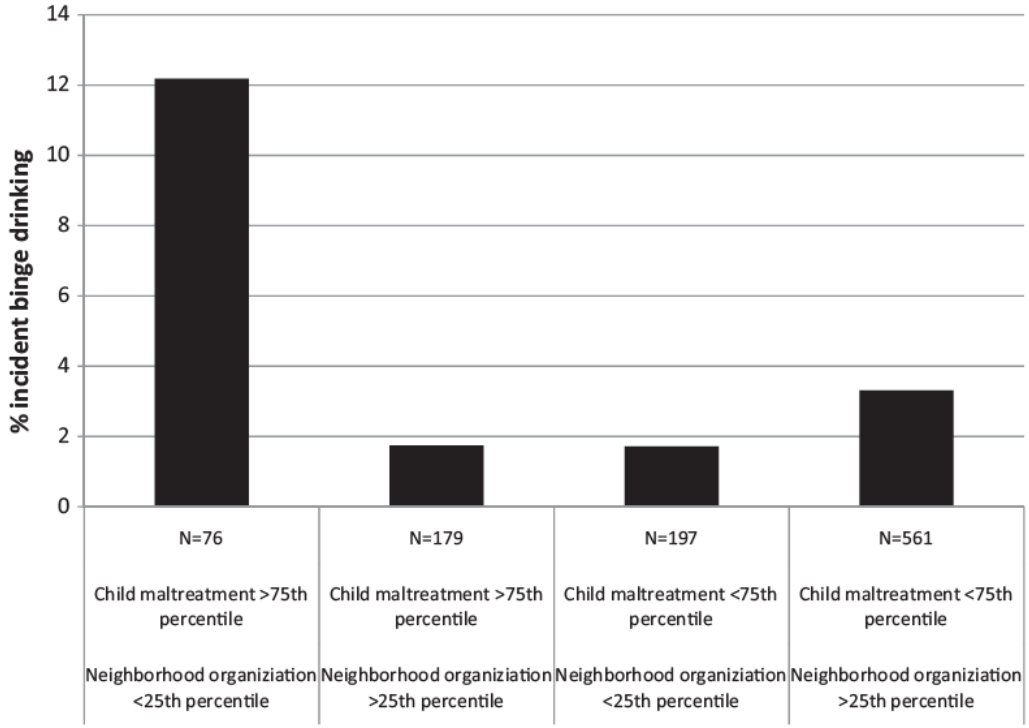


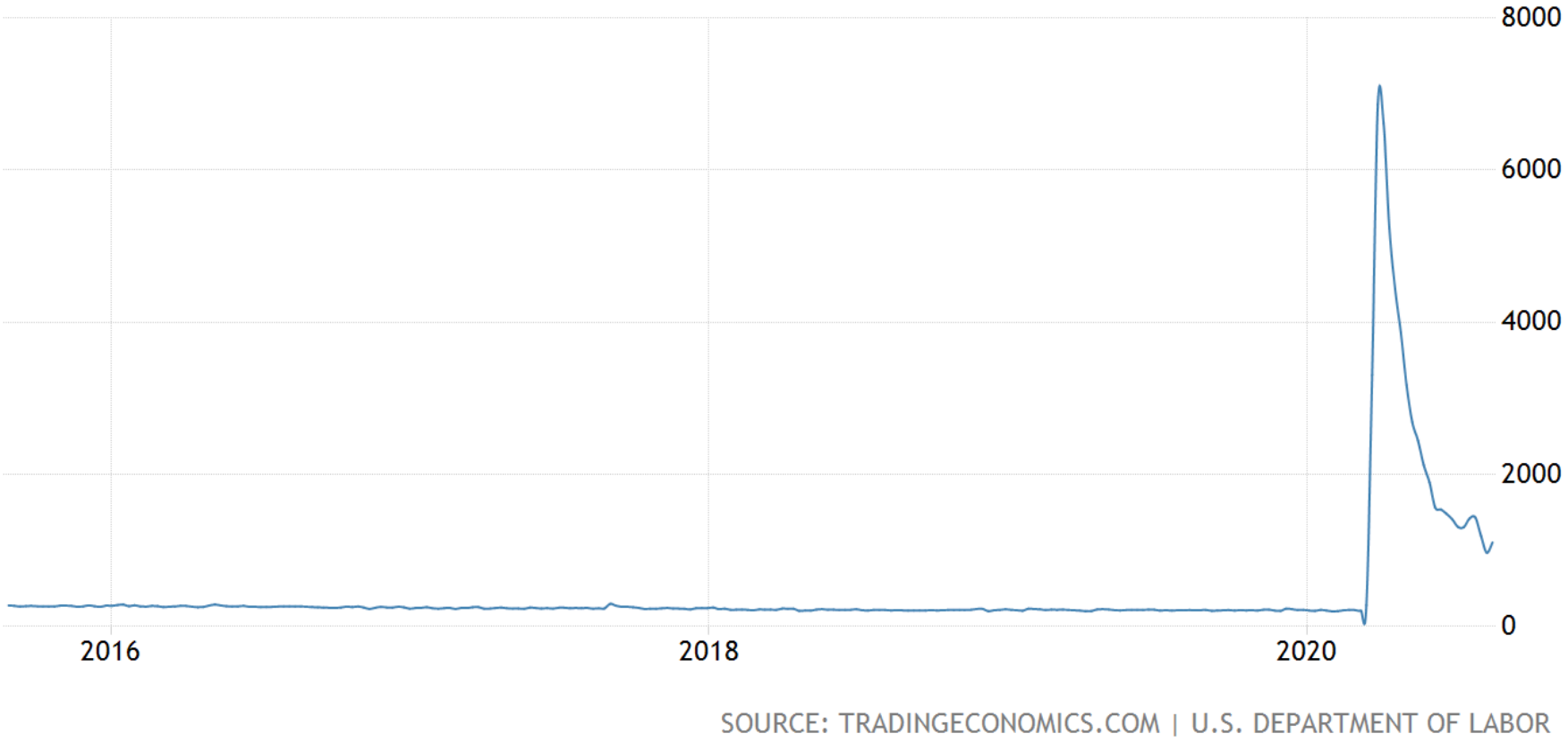
Fig. 1. Incidence of binge drinking at Wave 2 among those low versus high on neighborhood physical disorder and childhood maltreatment exposure among those with no binge drinking at baseline in a prospective community sample of individuals in Detroit, Michigan ($N = 1013$).

Keyes KM, McLaughlin KA, Koenen KC, Goldmann E, Uddin M, Galea S. Child maltreatment increases sensitivity to adverse social contexts: Neighborhood disorganization and incident binge drinking in Detroit. Drug and Alcohol Dependence. 2012;122(1-2):77-85. PMID: 21981990. PMCID: PMC3288803. http://dx.doi.org/10.1016/j.drugalcdep.2011.09.01

The opportunities of the moment

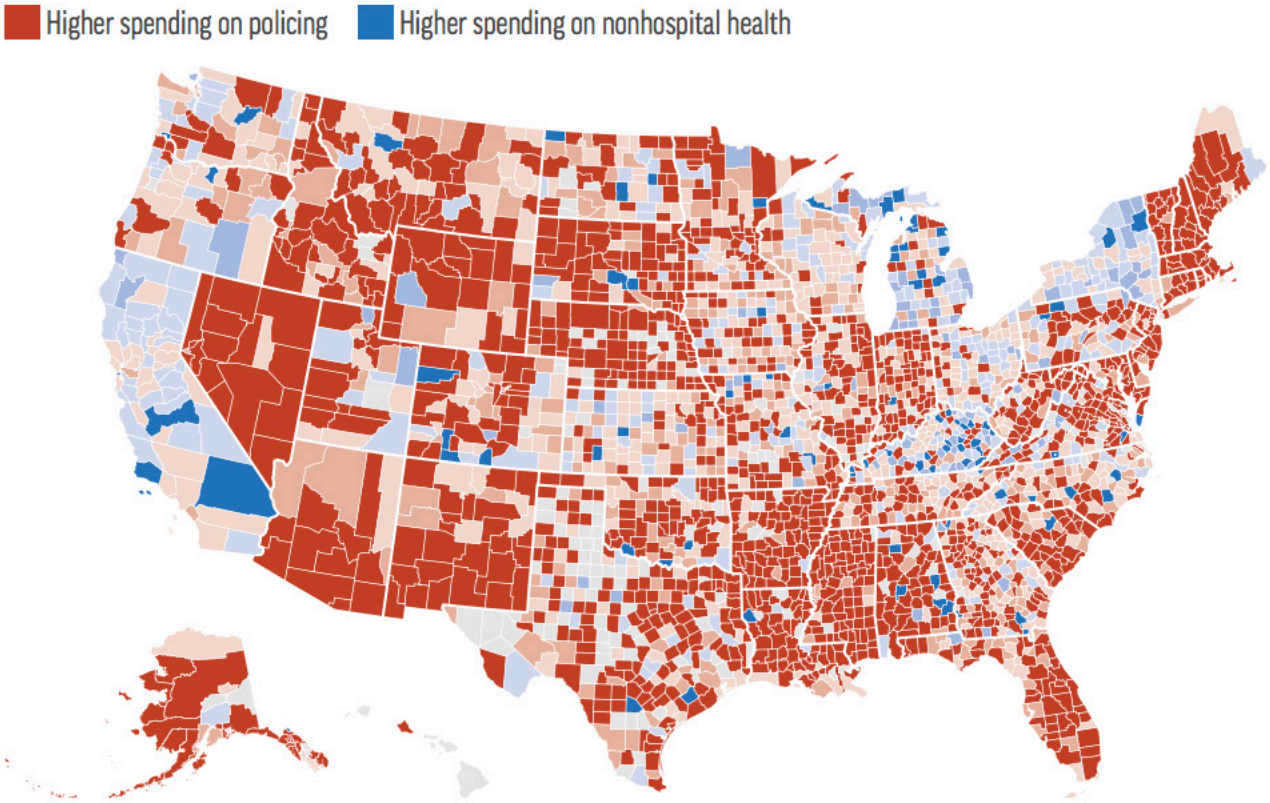
https://www.pri.org/programs/world/number-lockdowns-grows-countries-try-counter-coronavirus

US weekly unemployment claims



https://tradingeconomics.com/united-states/jobless-claims

Most local governments spend more on policing than health



Spending for all local governments within each county. Nonhospital health includes public health, behavioral health, medical transportation and other nonhospital health-related spending. It does not include Medicaid spending. Gray counties had no data available.
Source: State Health Expenditure Dataset project analysis of "Annual Survey of State and Local Government Finances" 2017 data / Graphic: Hannah Recht/KHN, Francois Duckett/AP

KHN AP

https://khn.org/news/us-public-health-system-underfunded-under-threat-faces-more-cuts-amid-covid-pandemic/

The ineluctability of social determinants

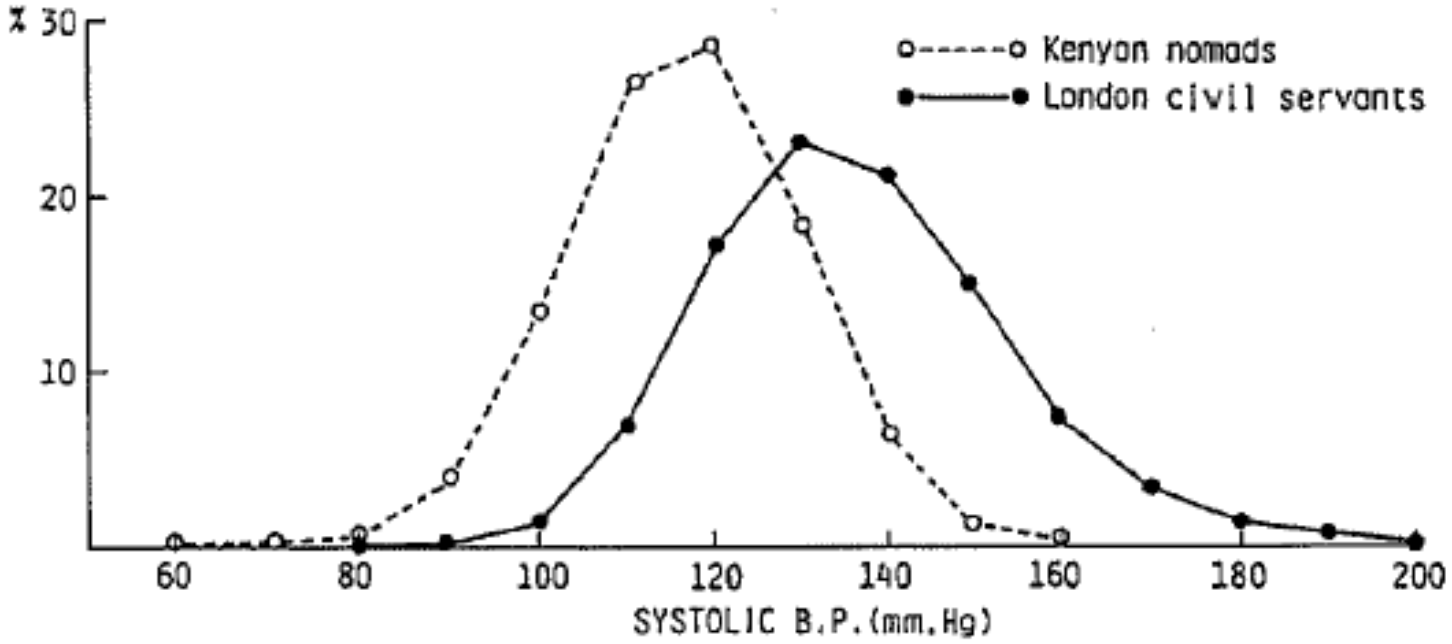


Figure 2 Distributions of systolic blood pressure in middle-aged men in two populations[2,3]

Rose G. Sick individuals and sick populations. International Journal of Epidemiology. 1985;14:32-38

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