

# The University of Michigan Depression Center Colloquium Series



*The Colloquium Series is made possible by an educational grant from GlaxoSmithKline.*



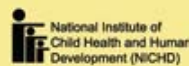
# Complex Systems Approaches to Population Health

University of Michigan  
Ann Arbor, MI • May 30-31, 2007

For more information and registration please visit  
[www.complexityandhealth2007.org](http://www.complexityandhealth2007.org)

Sponsored by  
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Center for Social Epidemiology  
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in collaboration with the  
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of Complex Systems



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# Social Epidemiologic Approaches to the Causes and Consequences of Depression: Do we need to think about depressing environments?

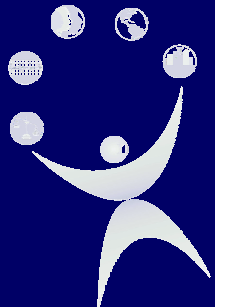
George A. Kaplan, Ph.D.

Thomas Francis Collegiate Professor of Public Health  
Director, Center for Social Epidemiology and Population Health



Center for Social Epidemiology and Population Health

University of Michigan School of Public Health





*And it was so typically brilliant of you to have invited an epidemiologist."*

*W. Hamilton*  
**Social**  
**A**

*Social and Economic Policies*

*Institutions (including medical care)*

*Neighborhoods and Communities*

*Living Conditions*

*Social Relationships*

*Individual Risk Factors*

*Genetic/Constitutional  
Factors*

*Pathophysiologic  
pathways*

*Individual/Population  
Health*

*Environment*

*Lifecourse*

**Does growing old increase the risk for depression**

**Association between depressive symptoms and serum concentrations of homocysteine in men: a population study.**

**Low maximal oxygen uptake is associated with elevated depressive symptoms in middle-aged men.**

**Dietary folate and the risk of depression in Finnish middle-aged men. A prospective follow-up study.**

**Physical activity reduces the risk of subsequent depression for older adults. Are the obese at greater risk for depression?**

**Prospective association between obesity and depression: evidence from the Alameda County Study.**

**Sleep complaints and depression in an aging cohort: A prospective perspective**

**Epidemiologic evidence for the relation between socioeconomic status and depression, obesity, and diabetes.**

**Poverty area residence and changes in depression and perceived health status: evidence from the Alameda County Study**

**Cumulative impact of sustained economic hardship on physical, cognitive, psychological, and social functioning**

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**-Hopelessness and risk of mortality and incidence of myocardial infarction and cancer**

**Hypertension incidence is predicted by high levels of hopelessness in Finnish men**

**Psychosocial predictors of hypertension in men and women**

**Depressive symptoms and increased risk of stroke mortality over a 29-year period**

**Hopelessness and 4-year progression of carotid atherosclerosis. The Kuopio Ischemic Heart Disease Risk Factor Study**

## **CONSEQUENCES**

**Psychological predictors of peptic ulcer incidence in the Alameda County Study**

**Depression/Hopelessness, inflammatory pathways and endothelial function (underway)**

**Psychosocial factors in the natural history of physical activity**

**Depression and early retirement: prospective population based study in middle aged men.**

**Antecedents of frailty over three decades in an older cohort**

**Psychological distress and mortality: evidence from the Alameda County Study**

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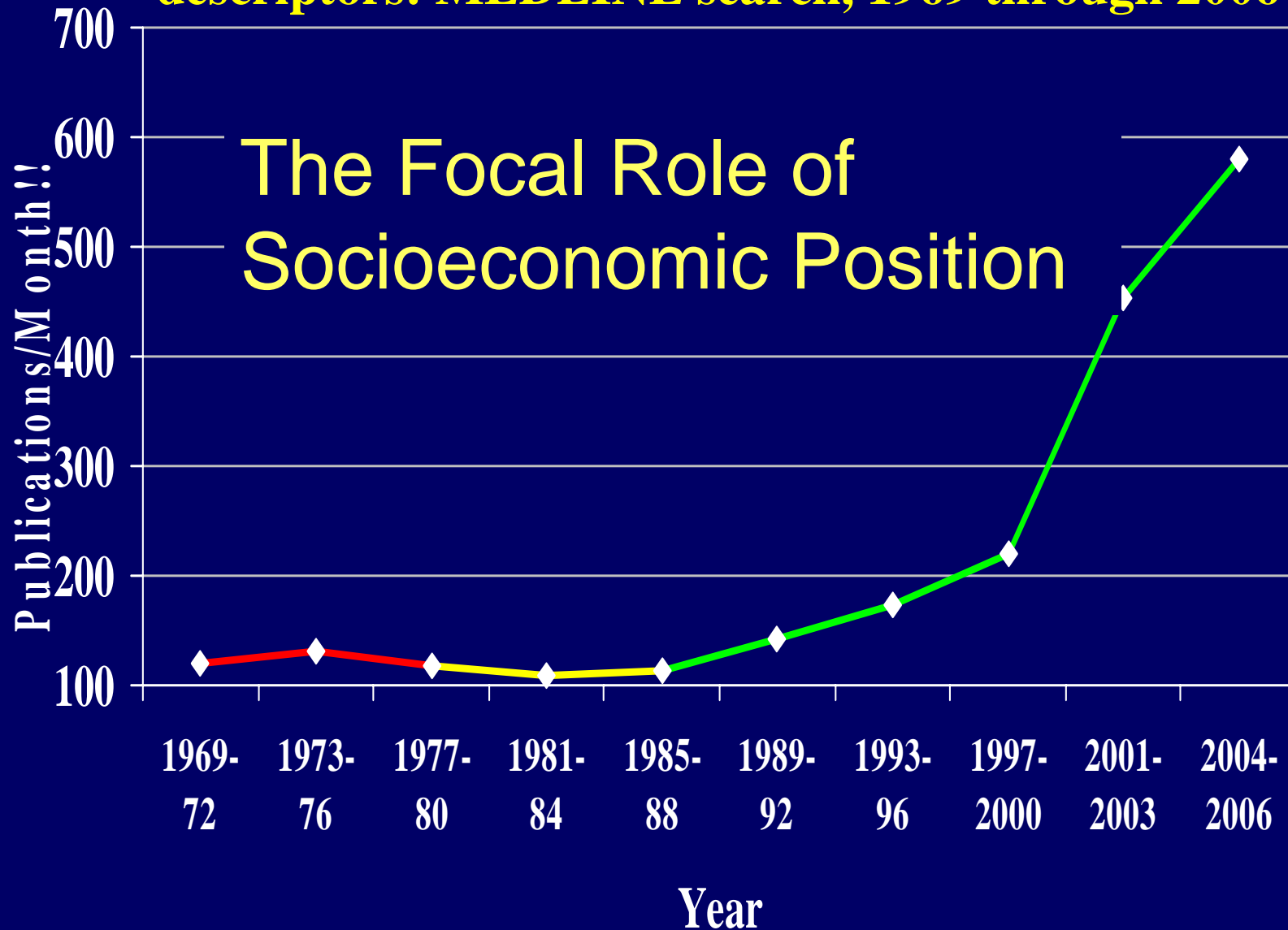
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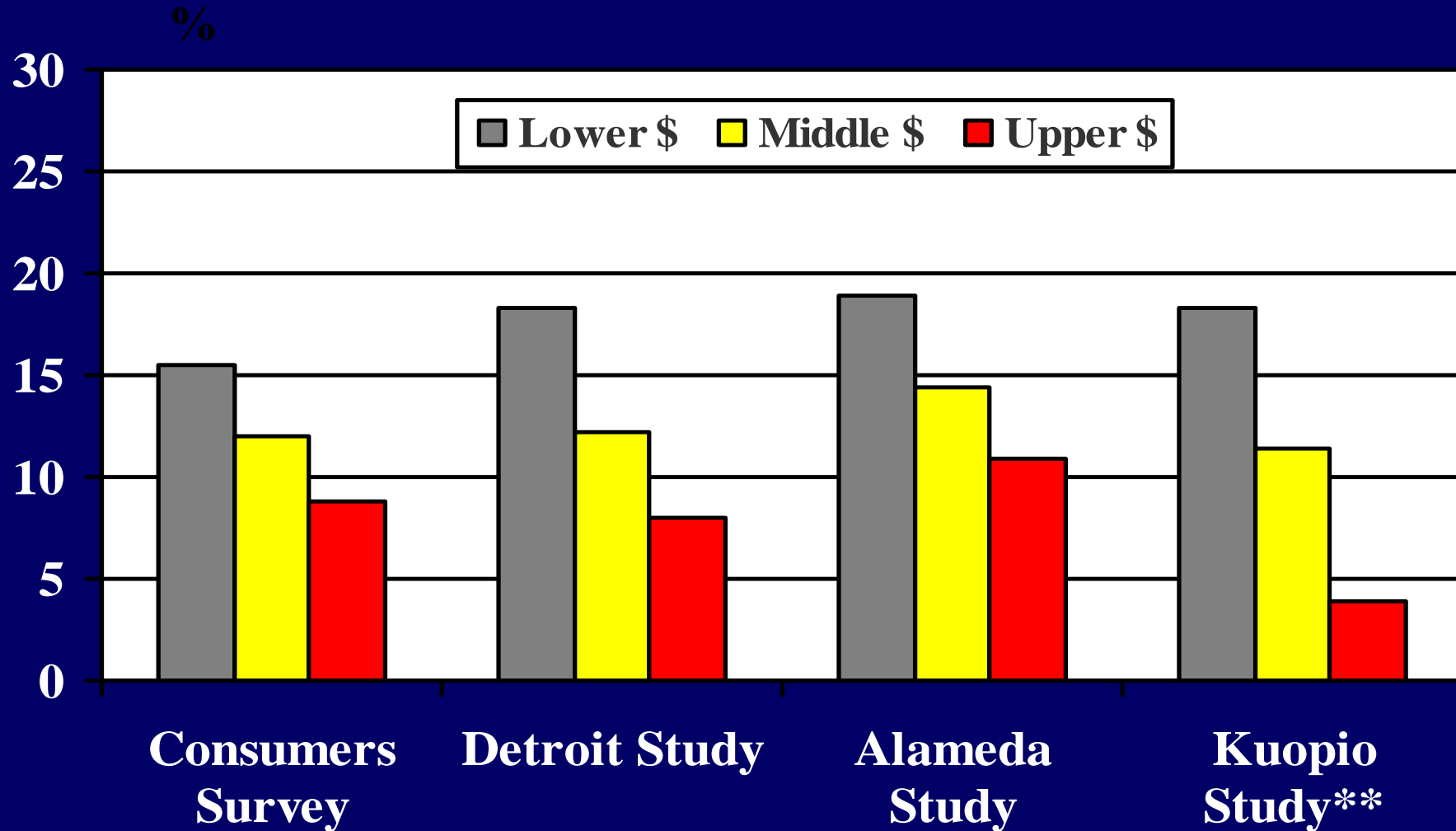
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**Number of publications per month with social class, socioeconomic factors, income or poverty listed as descriptors: MEDLINE search, 1969 through 2006**

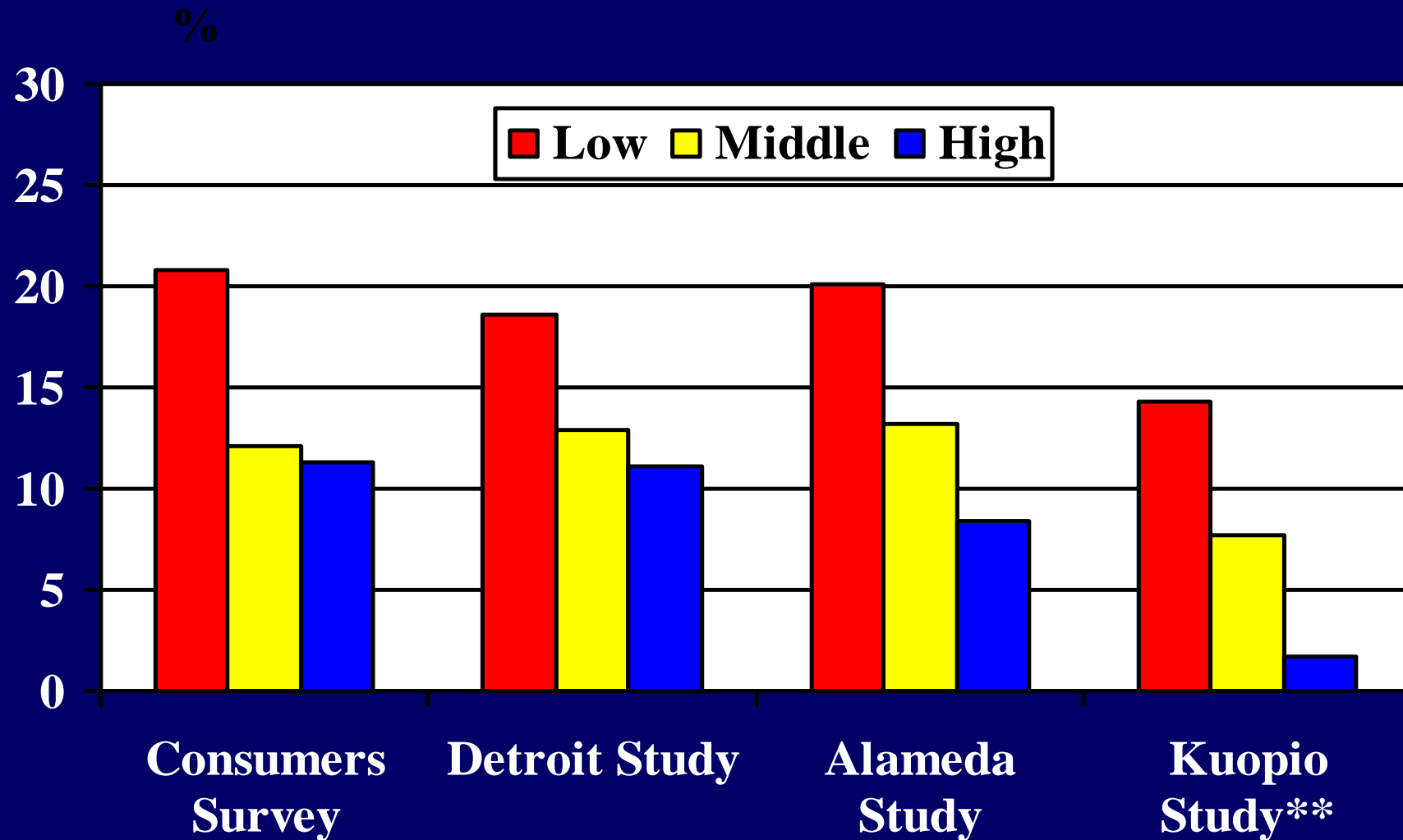


# Prevalence of High Depressive Symptoms by Income Tertiles \*



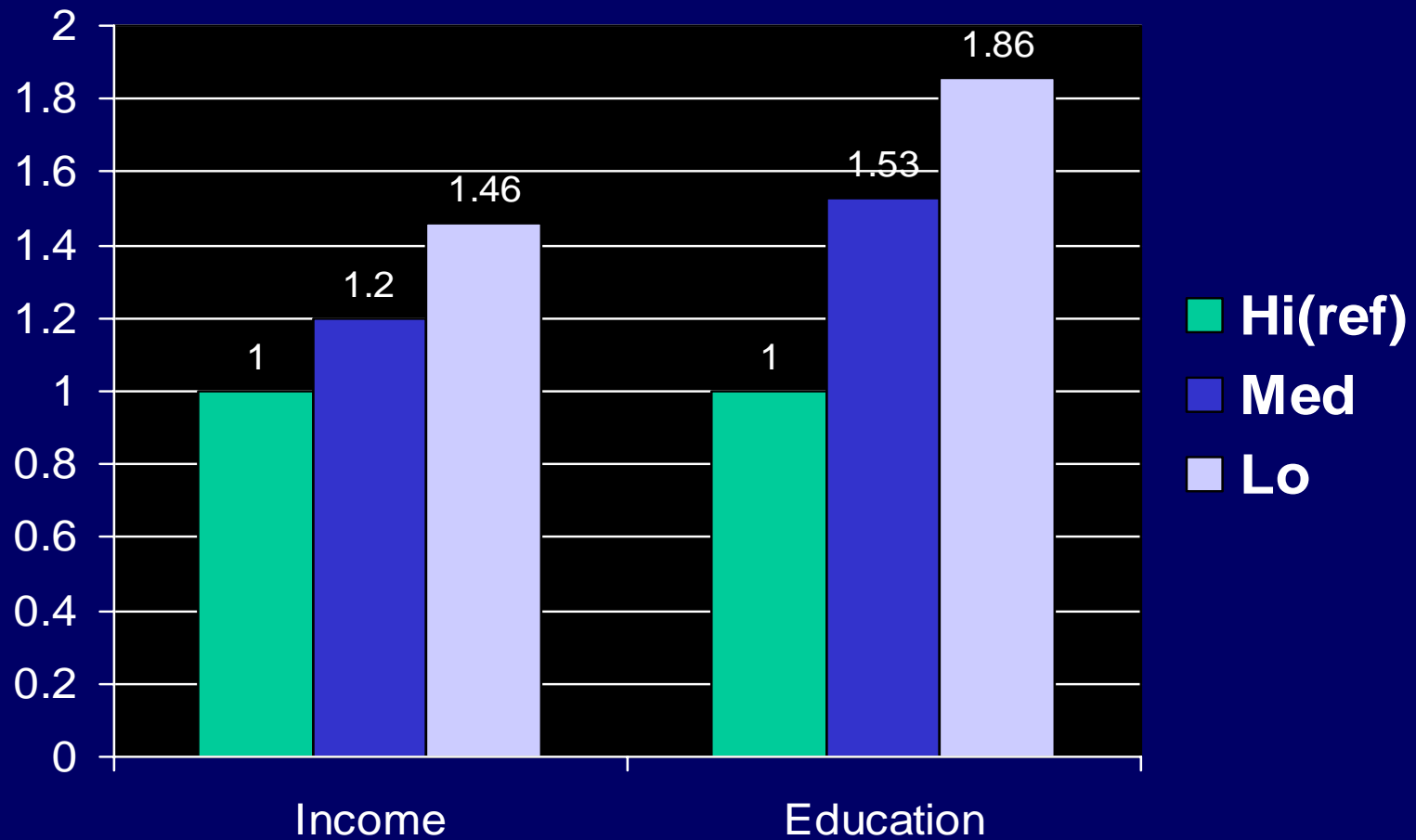
\* Income tertiles defined within each study. \*\* Kuopio data on *hopelessness*.

# Prevalence of High Depressive Symptoms by Education\*



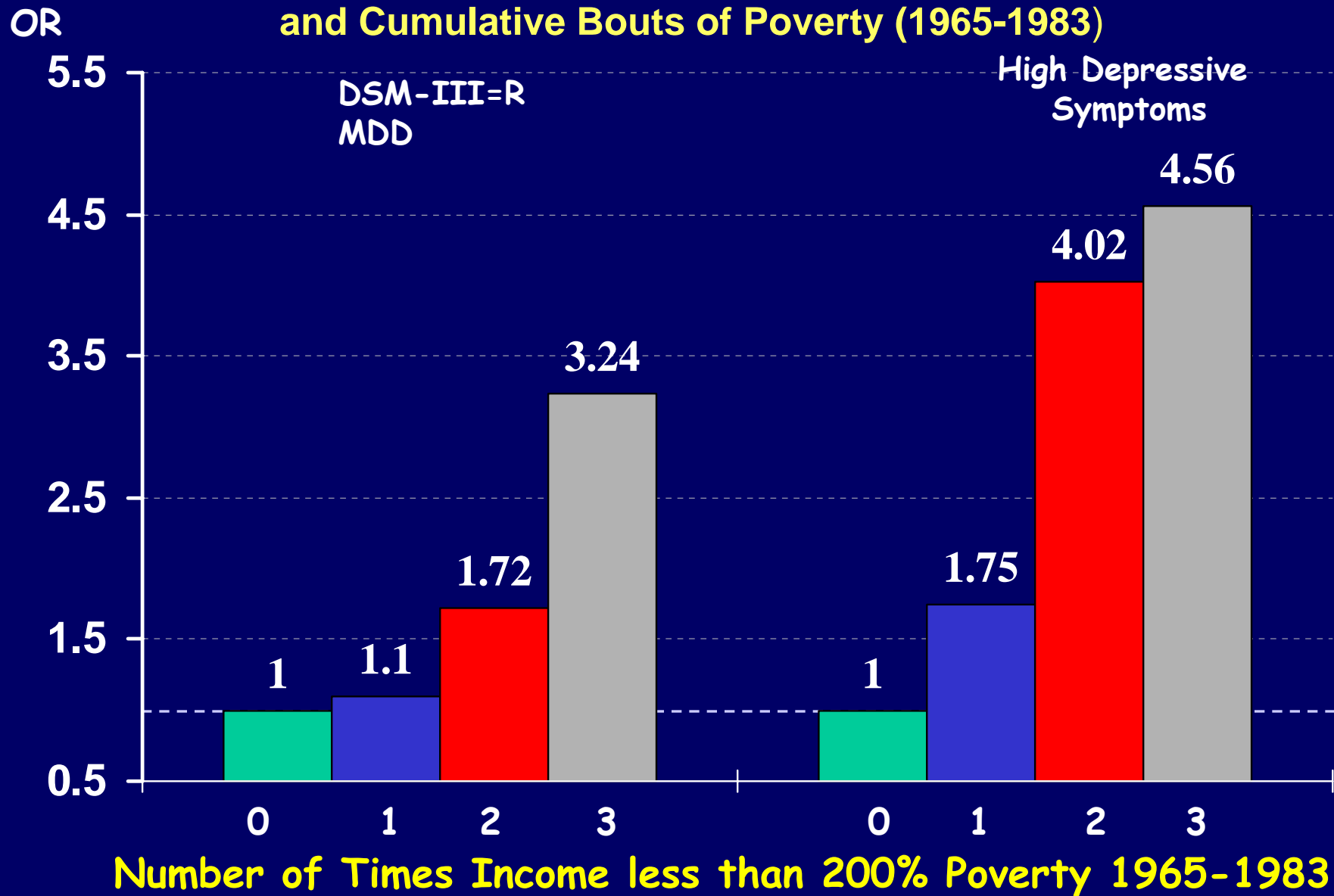
\* Education defined within each study. \*\* Kuopio data on *hopelessness*.

Adjusted\* Relative Risk of Incident High Levels of Depressive Symptoms  
by Income and Education:  
Alameda County Study: 1965-1974



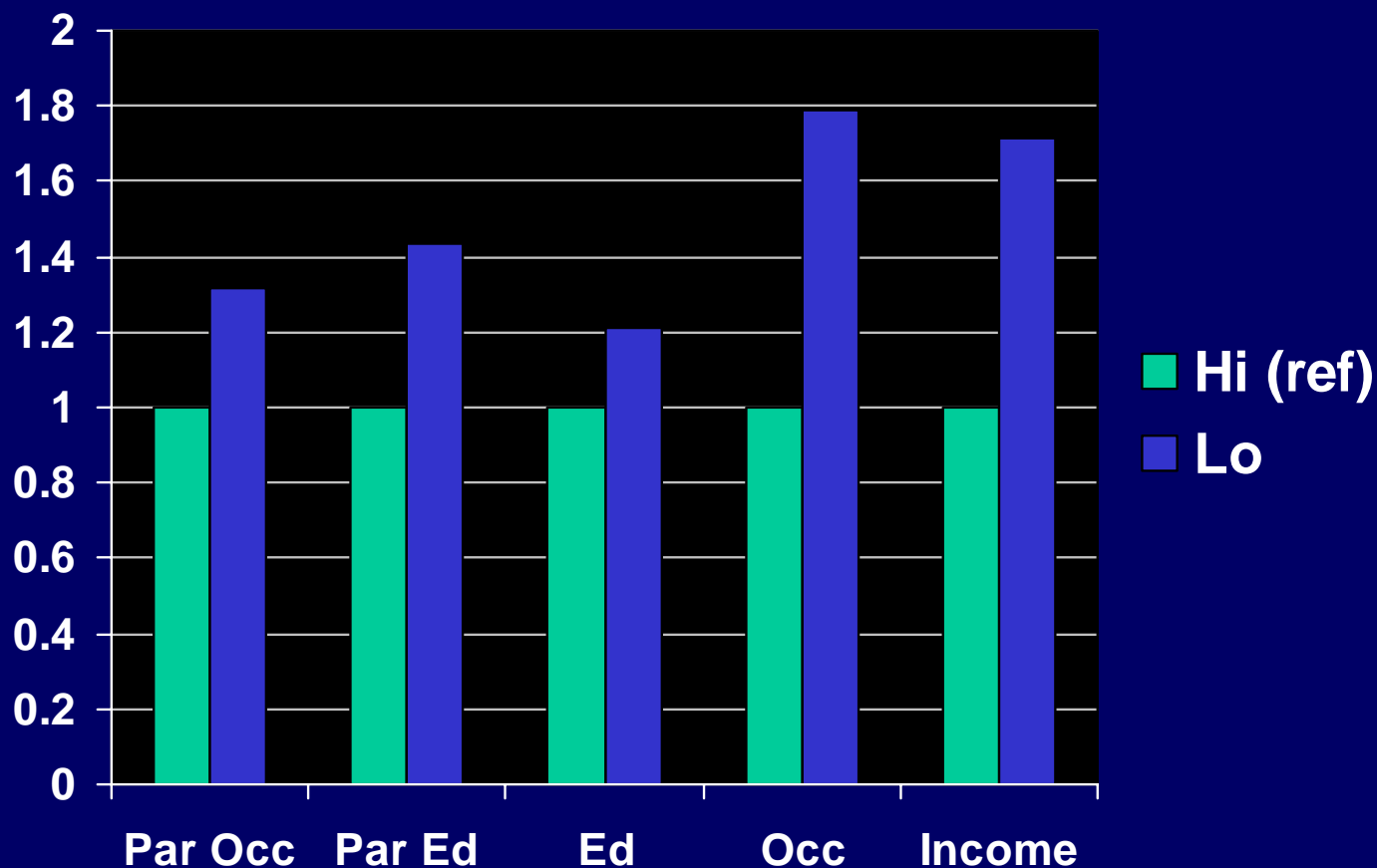
\*Adjusted for age, sex, education, income, ethnicity, health status

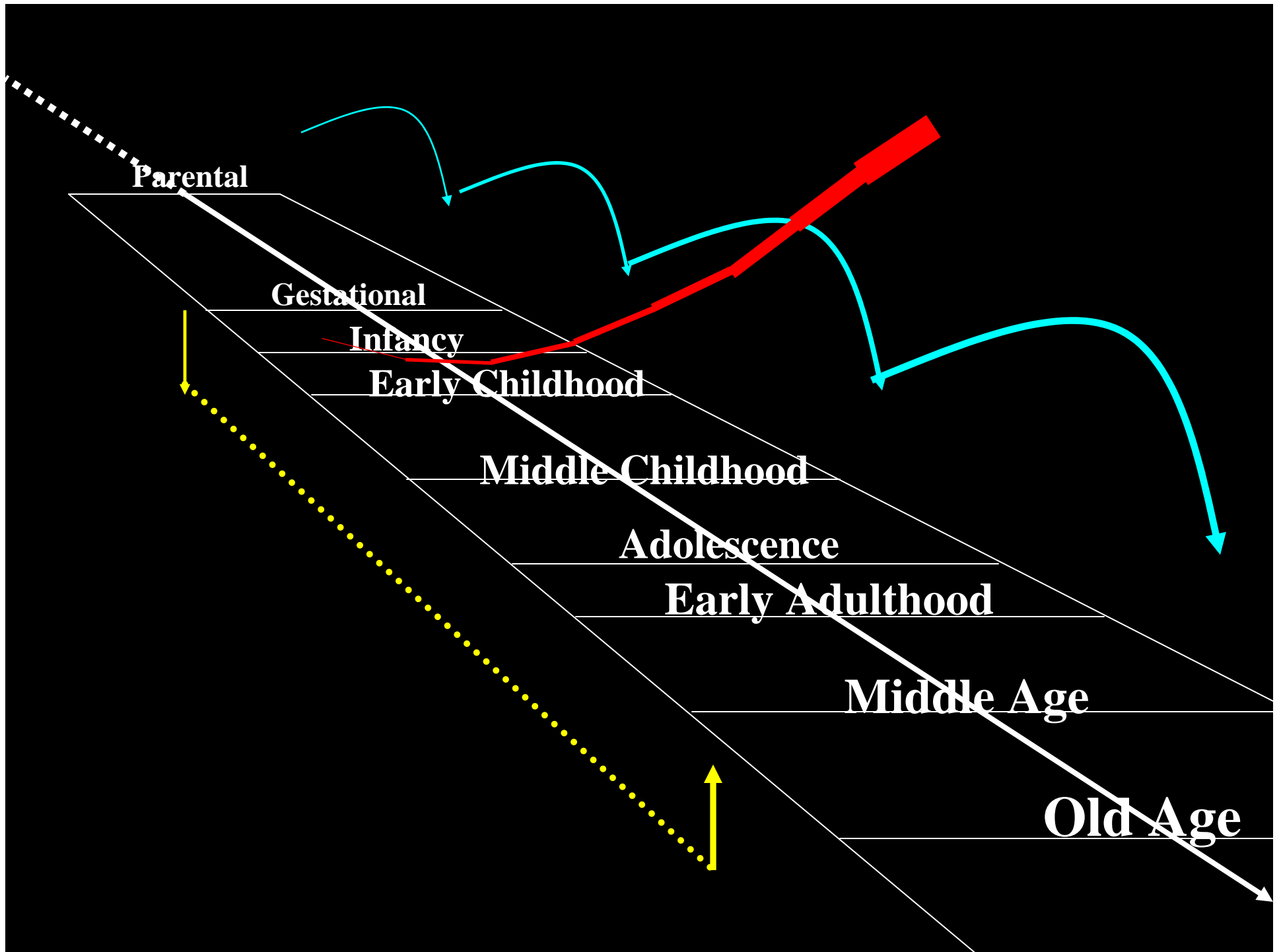
# Association between 1994 Major Depression and High Depressive Symptoms

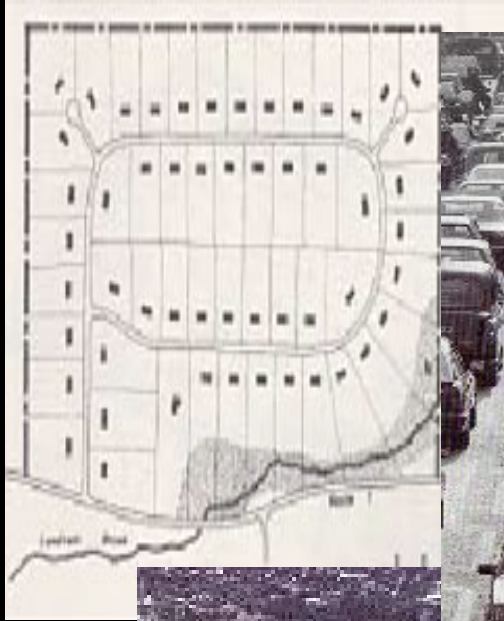


# Adult Hopelessness by Parental & Adult Socioeconomic Position:

## Kuopio Ischemic Heart Disease Risk Factor Study







## **What about Neighborhoods?**

Environmental pollutants

Census data on area SES, car ownership, residential stability, race/ethnicity, population density, racial and economic segregation, etc.

Self-report of environmental problems or social disorder

Neighborhood organizations and activism

Physical properties (walkability, layout, street patterns)

Social capital and collective efficacy

Crime, housing violations

Presence of selected services (e.g. supermarkets and grocery stores, liquor stores, medical care facilities)

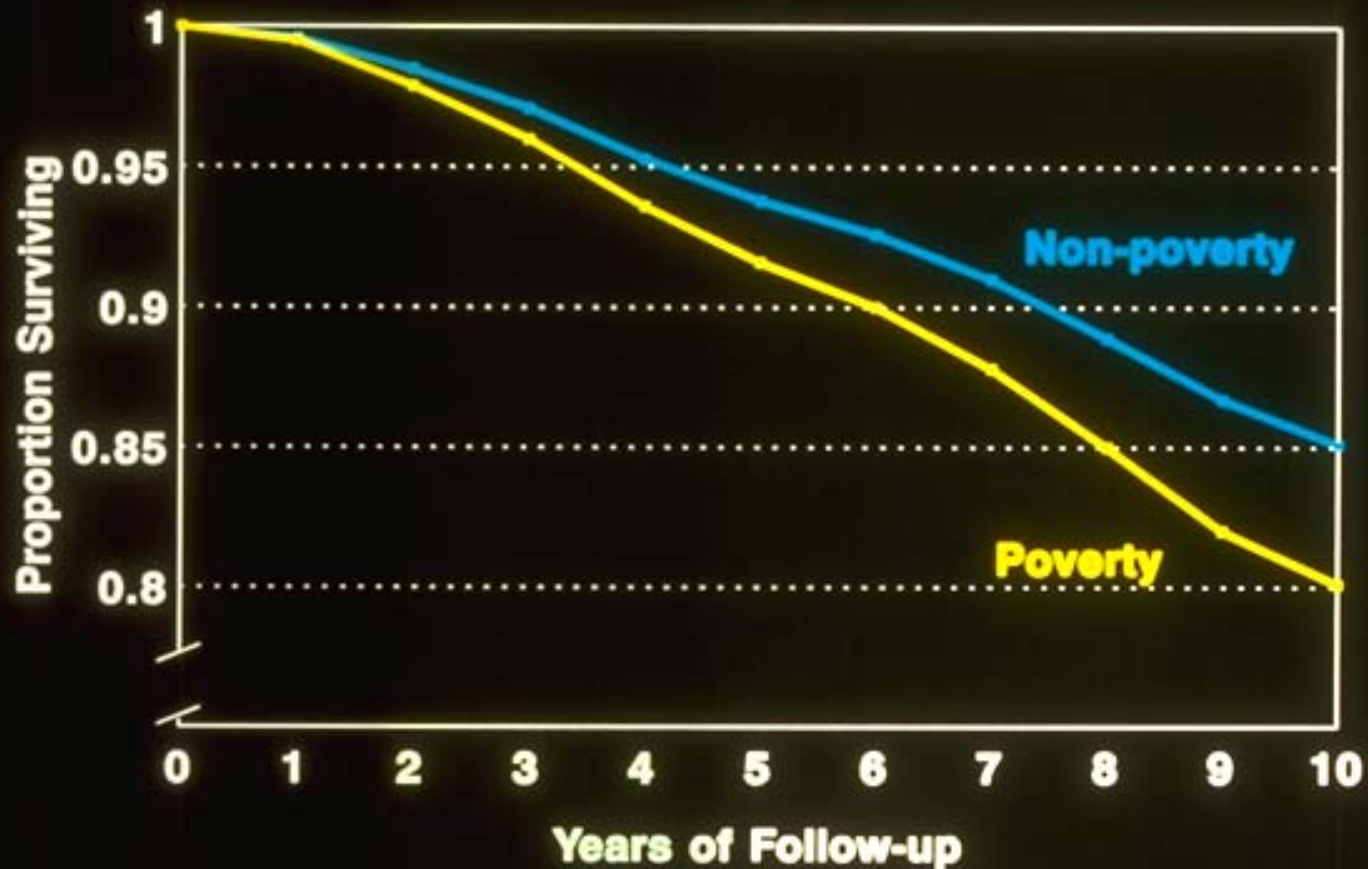
Direct assessment of physical and social aspects of environment

# Poverty Area Characteristics Oakland, CA: 1965

## 41% of the Population:

<b>Unemployed Males</b>	<b>66%</b>
<b>Unemployed Females</b>	<b>61%</b>
<b>General Assistance Recipients</b>	<b>94%</b>
<b>Aid to Families with Dependent Children</b>	<b>85%</b>
<b>Aid to Disabled</b>	<b>73%</b>
<b>Police Workload</b>	<b>65%</b>
<b>TB Cases</b>	<b>68%</b>
<b>Poor Housing</b>	<b>75%</b>
<b>Housing without Private Bath</b>	<b>89%</b>

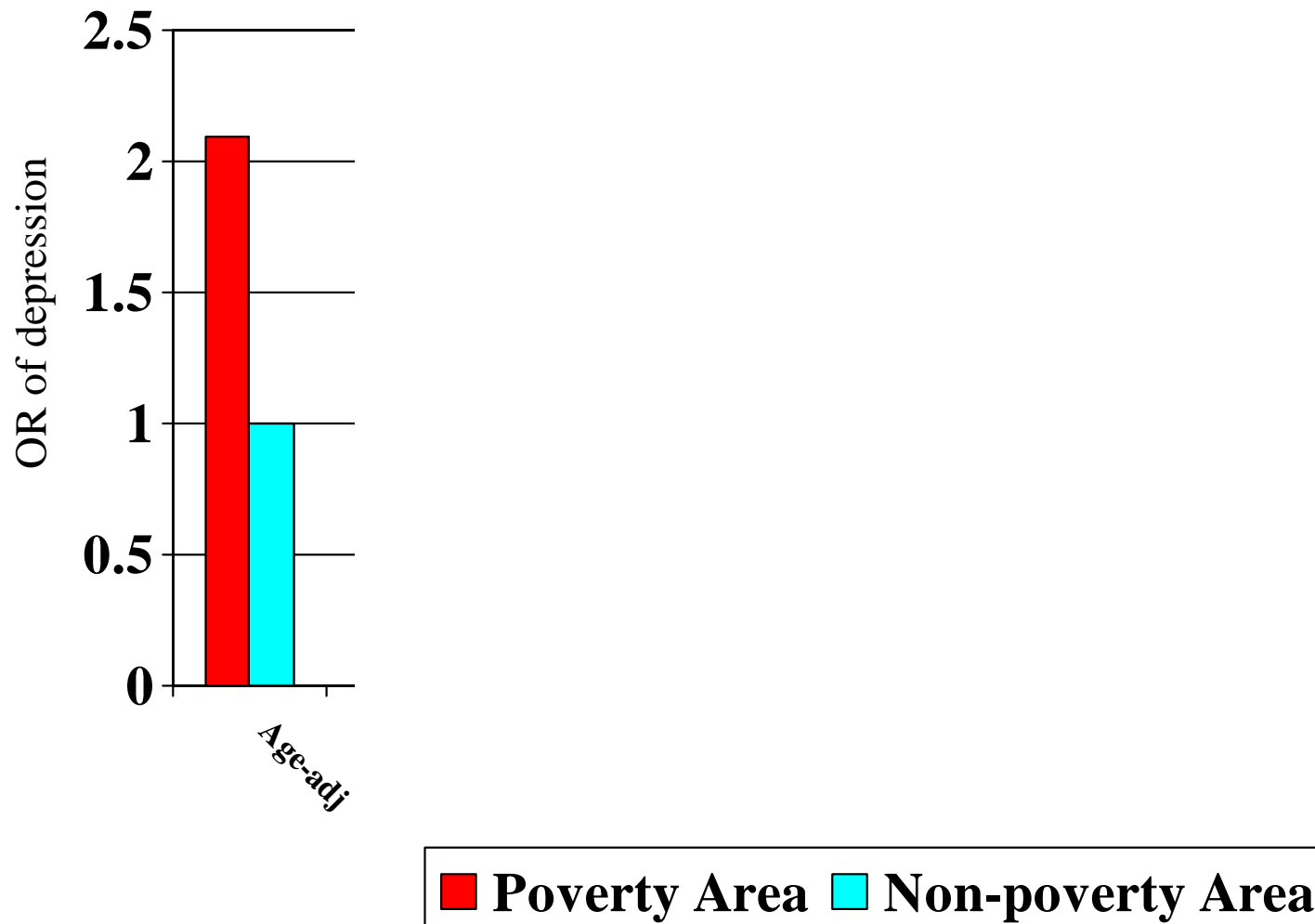
## Age-adjusted Survival by Poverty Area Residence Alameda County Study: 1965-1974, White Females



Survival curve from Cox model, estimated at age=60

Author, year	Area Characteristic	Population, Area	Prev or Incid or Other	Symptoms or Dx	Mutilevel (Y or N)	Result
Yen & Kaplan, 1999	Poverty Area	ACS, 4824 18+ Aggreg. of CT	<b>I</b>	<b>S</b> (CES-D-like)	<b>Y</b> (+/-)	<b>cf Figure</b>
Silver et al., 2002	CT Composite Disadvantage; Residential Mobility; Racial Mix	ECA, 11,686 18-96 CT	<b>P</b>	<b>D</b> (DIS)	<b>Y</b>	OR Disadvantage= 2.3 OR Res Mobility = 2.3
Galea et al., 2005	Measures of internal (6) and external (8) built environment	NYC, 1355 18+, 59 community districts	<b>P</b>	<b>D</b> (NWS)	<b>Y</b>	<b>cf Figure</b>
Kubzansky et al., 2005	% poverty	New Haven EPESE	<b>P</b>	<b>S</b> (CES-D)	<b>Y</b>	Nbhd. Poverty ↑ <b>S</b> Elderly Conc ↓ <b>S</b>
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Galea et al., 2007	Neighborhood SES	NYC, 1570 18+, 59 community districts	<b>I</b>	<b>D</b> (SCID)	<b>Y</b>	Prev lo SES = 19.4% hi SES = 10.5%

# Incident Depression, Alameda County Study, 1965-74



*Yen & Kaplan, IJE 1999*

Author, year	Area Characteristic	Population, Area	Prev or Incid or Other	Symptoms or Dx	Mutilevel (Y or N)	Result
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**Table 3** Multilevel logistic regression models predicting past six month depression\*

Built environment		Estimate	p Value	OR†	Low CI	High CI
<b>Internal</b>	Percentage of housing units experiencing toilet breakdowns	0.0500	0.3603	1.2147	0.8008	1.8423
	Percentage of housing units with some non-functioning kitchen facilities	0.2244	0.0225	1.3851	1.0471	1.8325
	Percentage of housing units experiencing over three heat breakdowns in winter	0.0973	0.0258	1.4275	1.0441	1.9524
	Percentage of housing units needing additional heating in winter	0.0854	0.0004	1.6389	1.2495	2.1497
	Percentage of housing units with a large area of peeling plaster or paint	0.0890	0.0492	1.3600	1.0010	1.8470
<b>External</b>	Percentage of housing units with internal water leakage	0.0278	0.2824	1.1794	0.8729	1.5935
	Percentage of buildings observed to be in dilapidated condition	0.0670	0.4337	1.0937	0.8739	1.3687
	Percentage of buildings observed to be in deteriorating condition	0.0809	0.0215	1.3597	1.0462	1.7670
	Percentage of buildings with any external wall problems	0.0188	0.7778	1.0560	0.7237	1.5405
	Percentage of buildings with any window problems	0.0435	0.5171	1.1290	0.7821	1.6301
	Percentage of buildings with any exterior or interior stairway problems	0.0553	0.2035	1.2683	0.8794	1.8284
	Number of structural fires	0.0017	0.0332	1.3979	1.0199	1.8787
	Percentage of acceptably clean streets	0.0382	0.1092	1.3798	0.9309	2.0469
Percentage of acceptably clean sidewalks	0.0078	0.7976	1.0627	0.6669	1.6933	

\*Model adjusted for neighbourhood income, individual income, age, sex, and race/ethnicity. †Odds ratio for a one standard deviation increase in the percentage of a particular characteristic of the built environment.

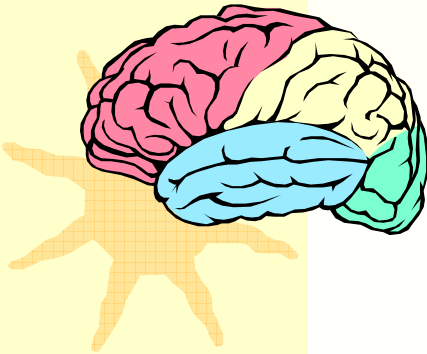
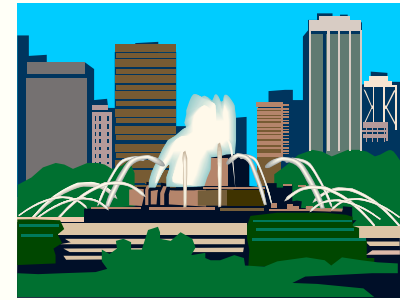
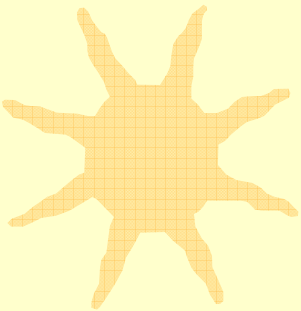
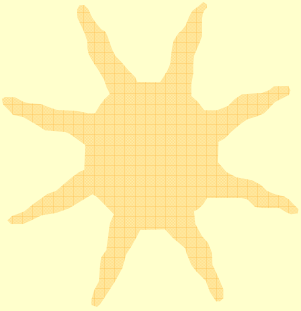
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- **Appears to be growing evidence that residential characteristics are associated with both depressive symptoms and major depression**
- **Many conceptual and methodological issues**
  - **selection/mobility?**
  - **disentangling what it is about areas that is depressogenic?**
  - **is it the residential areas or the broader “niches” that people occupy?**
  - **interaction with individual factors that increase susceptibility?**
  - **where does “stress” fit in?**
  - **are there implications for practice?**

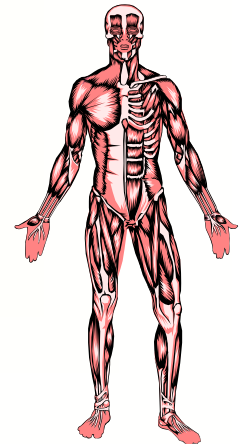


# *The Chicago Community Adult Health Study (CCAHS)*

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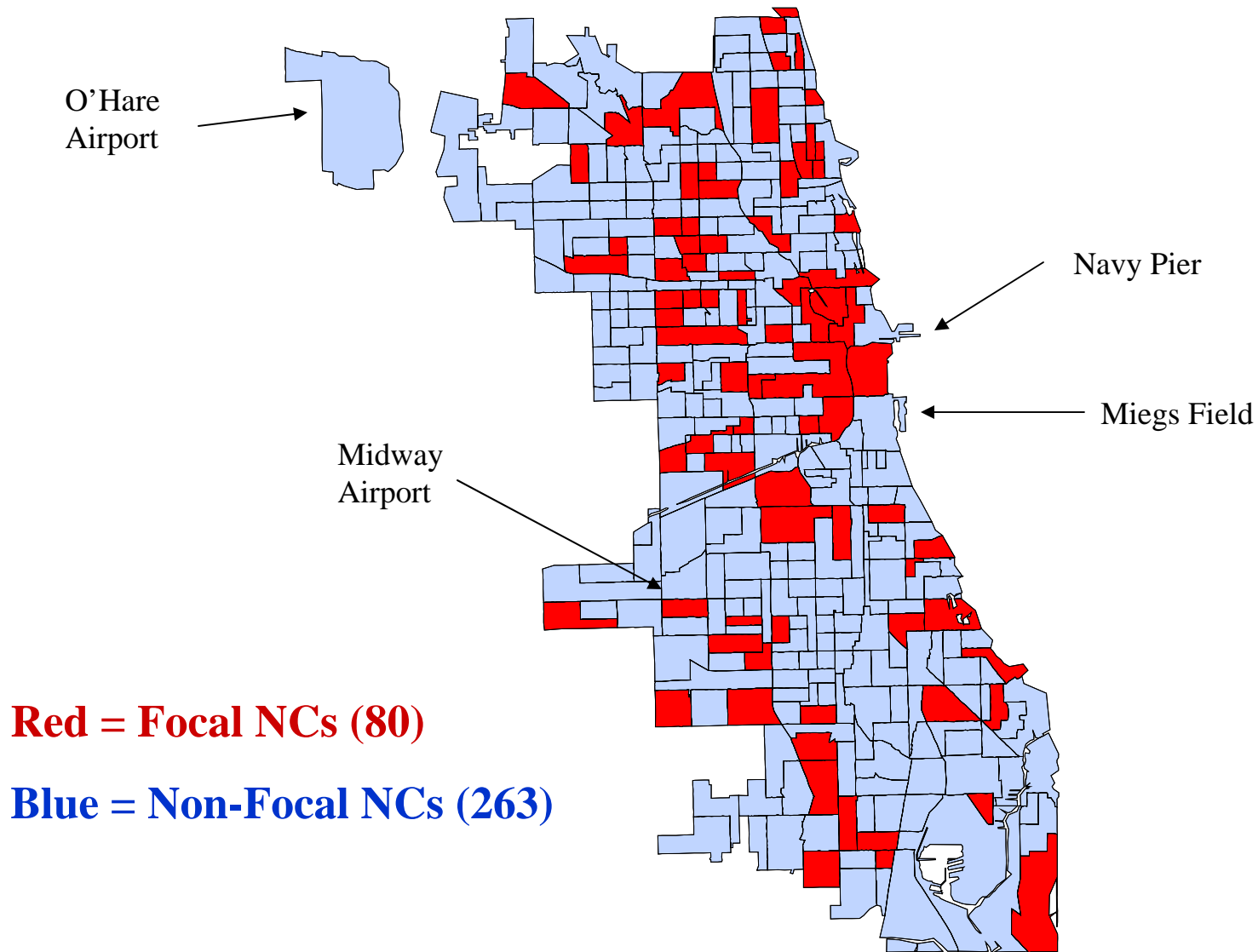


*Michigan Interdisciplinary Center on  
Social Inequality, Mind & Body*



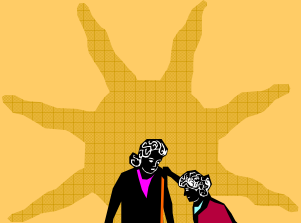
# Chicago Community Adult Health Study

## Neighborhood Clusters





# *Components of CCAHS*



**1. Interview**



**2. Physical Measurements**



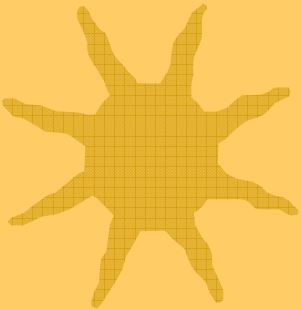
**3. Systematic Social Observation  
(SSO)**



**4. Letter Drop**

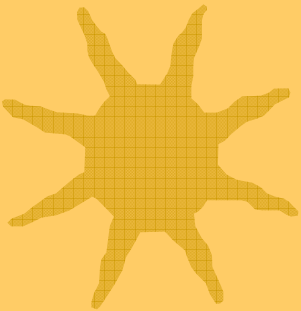


**5. Biomedical Supplement**





# *Components of CCAHS*



1. **Demographics and SEP**
2. **Physical Health and Health-care Utilization**
3. **Community Structure and Function**
4. **Personality and Psychosocial Measures**
5. **Behaviors and Activities**
6. **Social relationships and Support**
7. **Mental Health**
8. **Employment, work (paid and unpaid)**
9. **Early life and anthropometric measures**
10. **Life Events**
11. **Memory and Cognition**
12. **Chronic Stress**

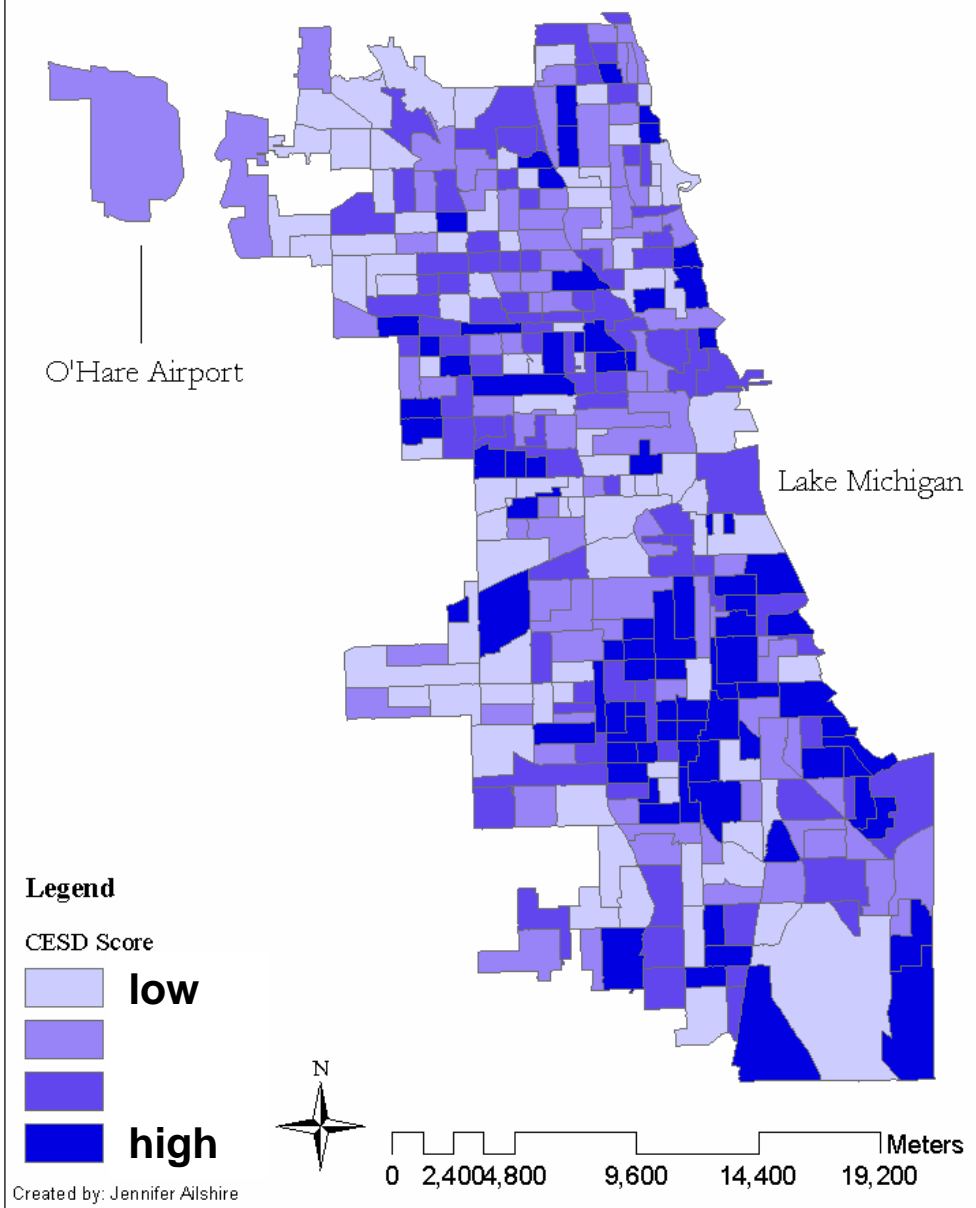


## *(G) Mental Health*

- ★ **Depression (CIDI)**
- ★ **Anxiety**
- ★ **Depressive symptoms (CES-D )**
- ★ **Drug dependence**



# Depression in the City of Chicago Mean Score on CESD Scale by Neighborhood Cluster

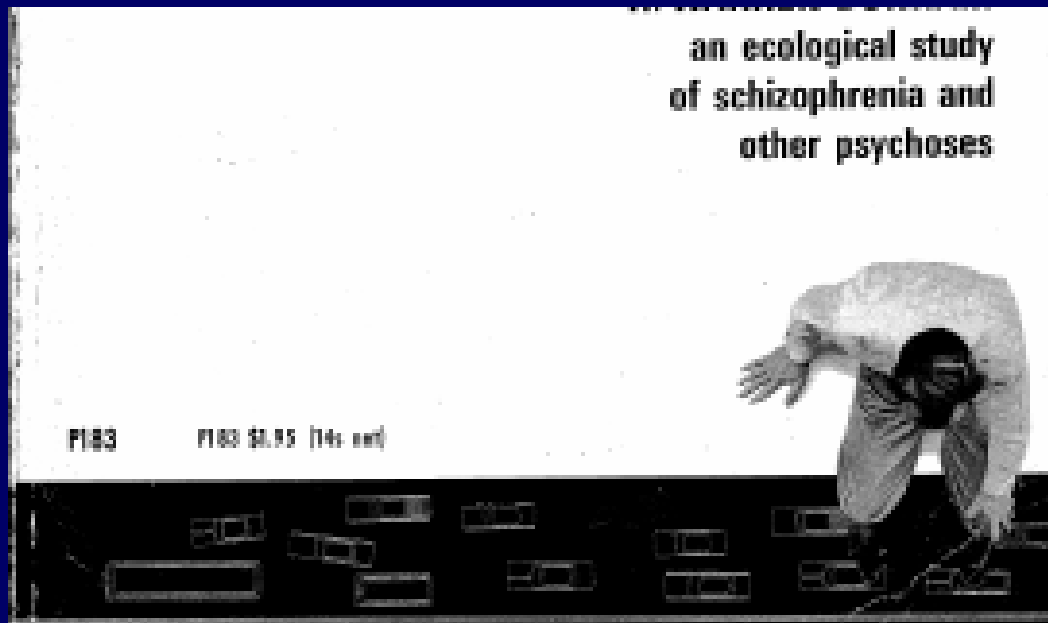


# mental disorders in urban

“this is like déjà vu, all over again”

—

attributed to Yogi Berra



University of  
Chicago  
Press, 1939