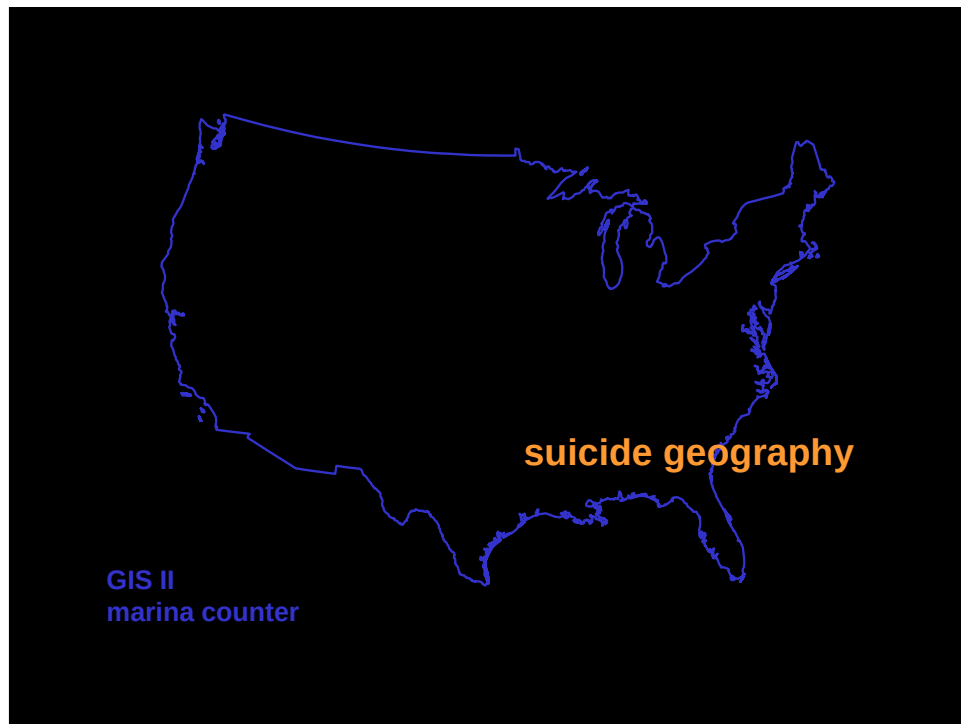




suicide geography ??

what about the whole causal web —

- ❖ social yes
- ❖ cultural yes
- ❖ physical yes
- ❖ economic yes
- ❖ demographic yes
- ❖ psychological yes

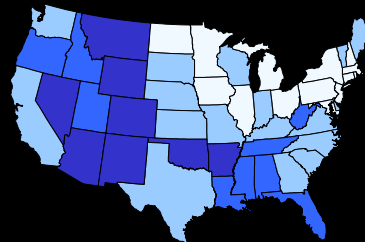
after adjusting for these factors the spatial pattern remains

suicide pattern - white males

variables:

✓ latitude	no
✓ longitude	no
✓ precipitation	no
✓ vegetation	no
✓ elevation	no
✓ sunlight	no
✓ season	no

population density ?



deaths per 100,000 1 2 3 4 quartiles

literature review

Increasing Rural-Urban Gradients in US Suicide Mortality, 1970 - 1997 . Singh & Siahpush, APHA 92(7): 2002

critique –

1. conceptualization	begs question, theoretical
2. literature review	none provided
3. spatial unit	county
4. aggregation	across states rural to urban
5. significance	relative risk 1.05 –2.30, $p < 0.05$
6. conclusions	$\delta_{\text{rural}} = \delta_{\text{social disintegration}}$
7. validation	none provided

USDA classification system appropriate?

0	NY, SF, LA, Seattle, Portland, 29 Palms, Molalla
1	San Juan Islands, St. Helens, Camas
2	Fresno, Carmel, Eugene
3	Redding, Nooksack
4	Walla Walla
5	Bandon
6	Hood River
7	Baker City
8	Stevenson
9	

research question:

Is there an urban-rural gradient in white male suicide rates?

data sources:

CDC - suicide rates; US Census Dept - population statistics

method:

sensitivity analysis - three spatial levels, three age-groups

age-groups:

20 - 64, 65 - 74, 75+

spatial levels:

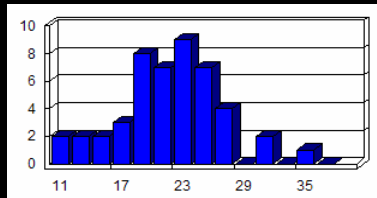
state	48 contiguous
county	Oregon, Wyoming, Pennsylvania
individual	Oregon, Wyoming

hypothesis, distributions, techniques

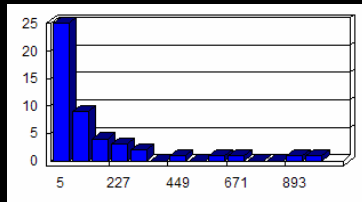
Ho: no urban-rural gradient in male suicide rates $Sr \neq 1 \div \text{density}$

Ha: urban-rural gradient in male suicide rates $Sr = 1 \div \text{density}$

distributions – state averages:



suicide rate/100,000



population/sq mile

techniques: exploratory data analysis, correlation, visualization

32,000 suicides in USA 2002

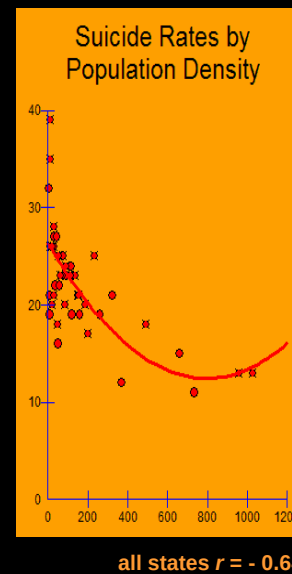
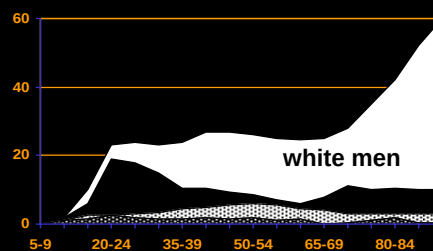
men: 80% of all suicides (92% white)

guns: 54% of young

73% of elderly

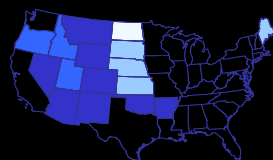
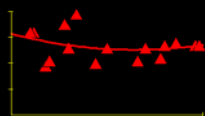
8th leading cause of death for all men

3rd leading cause of death 15-24 men

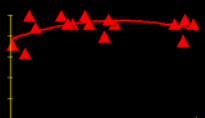


results - state level analysis (population tertiles, suicide quartiles)

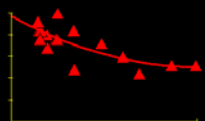
< 50 people/sq mile $r = -0.18$



> 50 < 140 /sq mile $r = +0.20$



> 140 people/sq mile $r = -0.74$
 $p = 0.001$



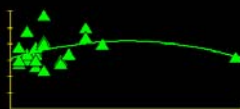
results - county level analysis (tertiles)

Wyoming

1-27/sq mile

$r = +0.07$

low $r = +0.06$
medium $r = -0.29$
high $r = -0.08$

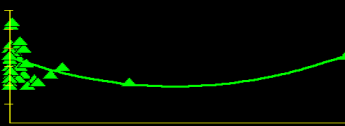


Oregon

1-1,350/sq mile

$r = -0.07$

low $r = +0.44$
medium $r = -0.12$
high $r = +0.14$

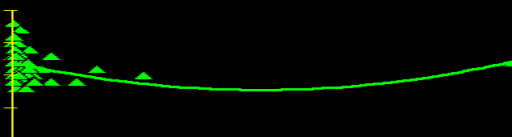


Pennsylvania

11-11,000/sq mile

$r = -0.06$

low $r = -0.08$
medium $r = +0.18$
high $r = +0.14$



results – individual level analysis

Oregon

L. Stevenson, OHSU

period 1 year
data death certificates, medical records
predictors divorced, disabled, ill
demographic no association with SES or occupational level
urban/rural non-significant increase in mid-size towns

Wyoming

R. Pasewark, J Fleer, U of W

period 16 years
data death certificates
trend no time trends by age or density
predictors divorced, widowed, ill
demographic no association with SES, occupational level or
population changes of - 25% to + 115%
urban/rural 3x higher rates in towns/cities than rural areas
rural peak > age 35 rural rates down and urban rates up

conclusions

errors –

conception, measurement, aggregation, analysis, interpretation

results of sensitivity analysis –

no urban-rural gradient in suicide at any scale or any age group

- ⚠ cannot reject the null hypothesis
- ⚠ reject the study

lessons –

take GIS II

confirm biologic / social plausibility

assess potential errors at each stage

explore alternative explanations for results

check validity before publishing

alternative explanations

combination and interaction of other factors

- ❖ migration - recent and historic western trend, rural shift to slower pace, cheaper living, less crowding, “freedom”
- ❖ culture - inter-mountain west more physically oriented, willing and able to take life when it is “not worth living”
- ❖ genetics - Northern European ancestry e.g., Finnish-Ugrian; novelty seeking, alcohol intolerant, pragmatic

sources

articles –

Increasing rural-urban gradient in US suicide (2002),
American Journal of Public Health: 92(7)
Regional variations in suicide rates (1997), MMWR, CDC
Suicide in Oregon (2001) L Stevenson, MPH Thesis OHSU
Suicide in Wyoming (1993) Pasewark RA, Fleer JL, U of WY

data –

USDA, US Census Dept, Centers for Disease Control

maps –

ESRI ArcGIS 9

questions?