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# **Response to Economic Shock: Impacts of Rurality and Economic Recession on County-level Suicides in the U.S.**

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## Introduction

- In his pioneering work on suicide, Durkheim (1897) recognized the impact of economic shocks on suicide rates. Since then, much research has supported the idea that suicides increase as a result of negative economic factors
- Most recent literature finds suicide rates to be higher in rural areas. However, the use of suicide rates in rural areas may be misleading.
- Little research examines the impacts of rurality and economic shock together. It is hypothesized that suicide numbers vary differently in rural and urban areas in response to recession

## A Note on Rurality

Many rural typologies already exist, and several of these were incorporated into the original model. However, model results varied substantially depending on the typology used. The current model incorporates components of these typologies (percent urban, distance to metro area) rather than the typologies themselves.

## Data

County-level:

- National mortality (1990-2010), National Center for Health Statistics
- Employment (1990-2010), Bureau of Labor Statistics
- Demographic (1990-2010), U.S. Census Bureau
- Poverty (1993, 1995-2010), U.S. Census Bureau

## Model

A negative binomial regression was used. The base model is:

$$S_{i,t} = \beta_0 + \beta_1 T + \theta rural_{i,t} + \beta_2 rural_{i,t} T + \beta_3 rec_t + \beta_4 rural_{i,t} Rec_t + \Omega X_{i,t} + \varepsilon_{i,t}$$

- **S**: total number of suicides
- **T**: time trend
- **rural**: vector of rurality measures (population, percent urban, distance to metropolitan area)
- **ruralT**: interaction between rurality and time trend
- **rec**: recession dummy
- **ruralRec**: interaction between rurality and recession
- **X**: vector of demographic, economic, and regional control variables

## Results

- Suicide numbers follow an increasing trend over time
- The number of suicides increase as population increases (not surprising)
- However, even after accounting for population, urban areas appear to have higher numbers of suicides
- All regional dummies were significant. One that particularly stands out in terms of magnitude is the Mountain West region
- Numbers of male suicides appear to be more strongly impacted more by economic factors
- Numbers of female suicides appear to be more strongly impacted more by rurality

## Results, cont.: Marginal Effects of Key Explanatory Variables on Suicide Numbers

	Total	Male	Female
Time trend	1.352***	1.067***	2.704***
Population (log)	1.033***	1.024***	1.067***
% Urban	0.131**	0.044	0.616***
Distance to MSA	0.006	0.007	-0.022**
% Urban*T	-0.005***	-0.003	-0.015***
Recession	-2.115	-2.427	-0.712
%Urban*Rec	0.039*	0.046**	0.011
Unemployment Rate	1.068***	1.040***	1.170***
Poverty Rate	0.854***	0.989***	0.544***
% Child (0-5)	-2.021***	-1.495***	-4.312***
% Elderly (65+)	0.689***	0.842***	0.138
NE New England	-16.159***	-17.113***	-19.121***
NE Mid Atlantic	-20.797***	-19.178***	-29.061***
MW East North Central	-7.048***	-6.977***	-8.691***
S South Atlantic	13.383***	9.223***	25.547***
S East South Central	13.596***	10.410***	22.620***
S West South Central	18.039***	14.775***	31.027***
W Mountain	62.138***	58.095***	78.046***
W Pacific	20.469***	17.347***	30.880***

\*p<.1, \*\*p<.05, \*\*\*p<.01

## Conclusions

- Use of total numbers, rather than rates, may be more appropriate when looking at suicides in areas with low populations.
- While race and ethnicity effects (not shown) are similar for males and females, other factors impact males and females very differently. As such, it is important to examine male/female suicide numbers separately.