

**The Local Educational and Regional Economic  
Foundations of Violence:  
A Spatial Analysis of Homicide across  
Mexico's Municipalities**

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What are the origins of violence?

Why does violence occur in Latin America?

What are the spatial dimensions of homicide across Mexico's 2455 municipalities?

**“local schools/regional economy”  
approach to violence reduction**

# Motivation: Why Study Violence?

- Direct harm to health/wellbeing
  - Leading cause of death in U.S. and around the world
  - Major public health concern (CDC 2013; WHO 2002)
- Costs to Democracy
  - Fear and insecurity erode public trust/confidence
  - Low public trust undermines legitimacy of democratic institutions
  - Persistent insecurity → support for authoritarianism (e.g., Central America)
- Costs to Development
  - Constrains business hours, movement of goods and people
  - Increases costs of doing business (Prillaman 2003)
  - 10.5% of GDP in Brazil, 12.3% in Mexico, and >20% of GDP in El Salvador and Colombia (IDB 1999)
  - Direct impact on wellbeing and restrictions on movement affect broader notions of development (health, inequality, education)

# Yet ... Policies Headed in “Wrong” Direction or Neglect Empirical Research

- Persistent or increasing emphasis on punitive, coercive public security models, even militarization
  - Brazil: state police still military model
  - Chile: main police force still military model (Dammert 2006)
  - Colombia: demilitarization recently turned to increasing militarization; little investment in everyday public safety/citizen security
  - El Salvador: shackled demilitarization followed by increasing militarization
  - Mexico: major militarization 2007-2012
    - 2008: prominent crimpro reform all but ignored prevention
    - 2013: major investment in prevention, but no empirical criteria

# New Emphasis in Merida Initiative on “Resilient Communities”

- Implications:
  - What exactly does “resilient” mean?
  - Implicitly acknowledges strengthening reactive security institutions not enough
  - Need proactive, public health model of violence prevention
  - Implicit call for more research on root causes of violence
  - Lack of studies in Mexico
  - At a minimum, need to examine socio-economic sources – income, poverty, inequality, economic activity, education – that presumably build this resilience



# Comparative Measure of Violence

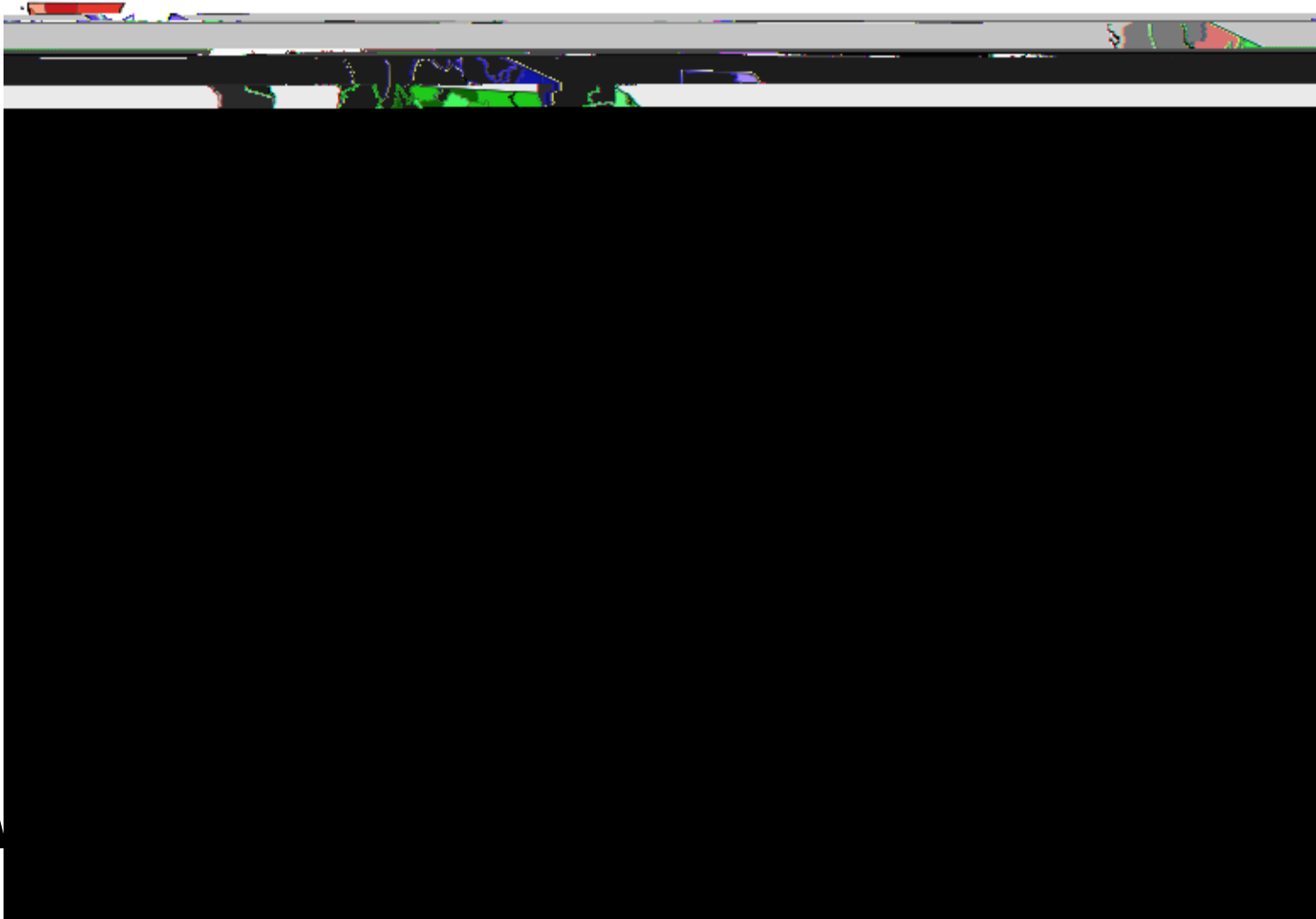
Homicide Rate (usually per 100,000 people; here, per 1,000 at municipal level in Mexico)

Not perfect, but several strengths:

- Available for almost all countries
- Available at subnational level for many countries
- Available longitudinally (over time)
- Other types of crime and violence track trend in homicide rates (Bailey and Dammert 2006; Mainwaring and Scully 2010)
- Also tends to track drug violence in Mexico (Molzahn, Rios and Shirk 2012, 12-13)

# Mexico

## 2455 municipalities (2016 deciles)





# Potential Answers

**Drawing on various literatures:**

Sociology/Criminology

Political Science

Conflict Studies

Spatial processes

**Emphasize socioeconomic factors while controlling for others**

**Emphasize spatial dimensions of violence**

- \* identification of spatial regimes

- \* model spatial processes

That is, controlling for other predictors of violence locally and globally— what is causal role of space?

# Conventional Arguments

Sociology/Criminology

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# Theory 2: What is Causal Role of Space?

Focus on spatial processes influencing violence

# Methodological Reasons: Spatial Dependence of Observations

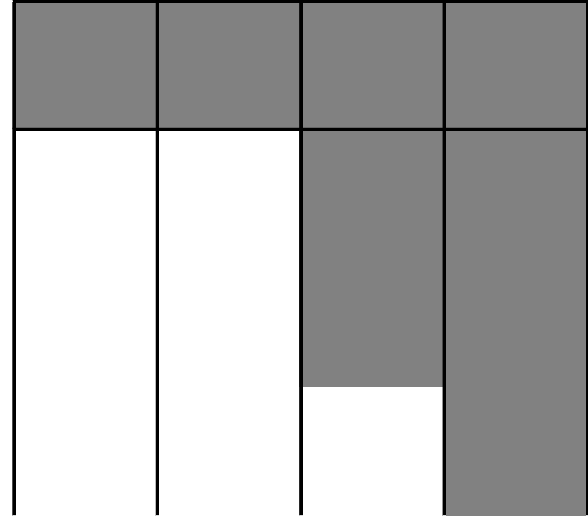
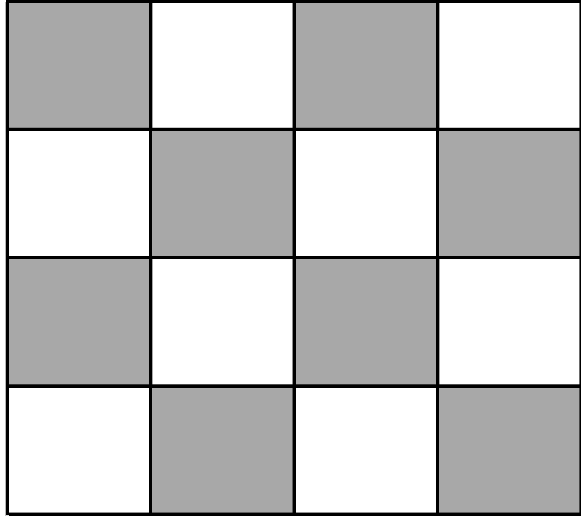
# Theoretical Reasons

## **Spatial Regimes**

Null hypothesis is that homicide is spatially random

**If not random, what are spatial processes shaping homicide?**

# Spatial Relationships





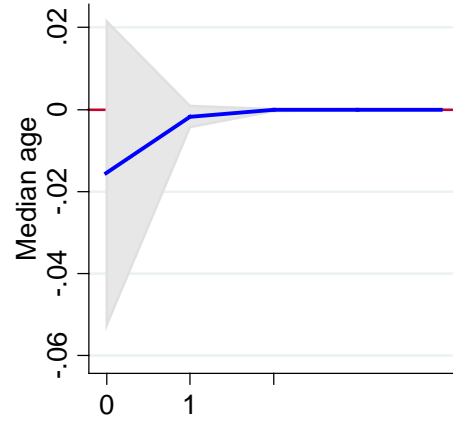
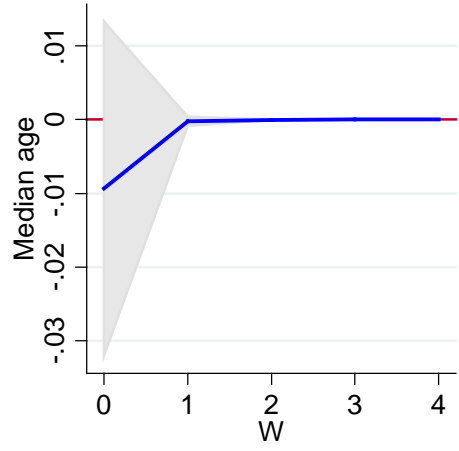
# **Results 1: Exploratory Spatial Analysis**





# **Results 2: Spatial Regressions**





# Conclusions

**Spatial regimes** homicide is not spatially random across Mexico

**Lag effect** homicide rates in one unit affects homicide in other units

\* econometrics do not identify mechanism

**Local effect of education** educational attainment reduces homicide, but only locally

**Social relativity process of PNEA** economic inactivity in neighboring units increases risk of homicide in focal unit

**Uneven terrain** raises risk of homicide, as both direct effect and second order indirect effect

## Policy Implications

Taken together, education and PNEA findings suggest a **“local schools/regional economy”** approach to violence prevention, i.e., to building “resilient communities”

In any case, a regional approach is also in order given:

- crossjurisdictional spatial regimes
- lag effect of homicide itself

Governments and aid agencies should emphasize policies that:

- (1) identify regions of municipalities that are connected in relevant ways, even if straddling state boundaries