

Effects of Exposure to Local Homicides on Birthweight in Mexico: Exposure, Selectivity, and Behavioral Responses.

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Abstract. *We examine the effect of local homicides on birth weight. We merge a monthly panel of Mexican births with homicide data at the municipality level. Fixed effects models are used to isolate the effect of exposure to homicides.*

Findings indicate that exposure to homicides does not reduce fertility and induces slight positive socioeconomic selectivity of births. Net of socioeconomic selectivity, exposure to homicides early in the pregnancy increases birth weight and reduces the incidence of low birth weight. The mechanism driving this surprising positive effect appears to be health-enhancing behaviors (particularly, increased use of prenatal care) resulting from exposure to violence. The positive effect of homicide exposure varies across SES. It is strong among low-SES women (but only those living in urban areas) and null among advantaged women. Socioeconomic heterogeneity suggests that behavioral responses to local homicides depend on a combination of heightened vulnerability and access to prenatal care.

Extended Abstract. The intra-uterine period is highly vulnerable to the environment and has consequences for wellbeing over the entire life course (Almond and Currie 2011). But because intrauterine exposures usually occur in tandem, it is difficult to isolate the effect of any specific exposure. Recent studies exploit natural experiments in an attempt to isolate causal factors. Studies have examined the effect of nutritional deficits resulting from famine (Stein et al. 2009, Meng and Qian 2009) or Ramadan fasting (Almond and Mazumder 2011), air pollution resulting from toll plazas (Currie and Walker 2009), and stress emerging from natural disaster (Glynn et al. 2001, Torche 2011), terrorist attack (Eskenazi et al 2009), collective mourning (Catalano and Hartig 2001), or discrimination (Lauderdale 2006).

Aside from perfect laboratory manipulation, ascertaining causal effects is a challenging task. For example, famine induces not only nutritional deficits but also stress; discrimination induces not only stress but loss of economic resources and social networks, and natural disasters may have diverse spillovers. A perfect natural experiment is hard to obtain – social life is, obstinately, more complex than the laboratory – but this recent studies using natural experiments have nonetheless provided valuable insights that move research beyond simple associations.

In order to isolate a causal effect of interest, research using natural experiments exploits events that are unusual and unexpected. This ensures that allocation is “as random” and reduces the risks of selective exposure. For example, the use of an earthquake as an instrument for acute stress is strengthened by the fact that earthquakes come unpredicted and lasts at most a few minutes, so preemptive action is not possible (Torche 2011). The Dutch famine found the population trapped in a particular place due to war-related constraints preventing responses such as outmigration (Lumey et al. 1994).

These events are as close to “allocated as random” as possible in real social life, and allow researchers to focus on the immediate and unmediated effect of exposure. But this strength comes at a cost. These events make it very hard to consider behavioral responses to such exposures, even if complex behavioral responses at the individual and collective levels are expected. These responses likely mediate, reduce, or enhance the effect of exposure. As a result, research that simply ignores them –either by arduously searching for natural experiments that minimize behavioral responses, or by treating such responses as nuisances that need to be “controlled for”— misses an important, constitutive component of the effects of interest.

This study examines the effect of local homicides on birth outcomes including behavioral responses as a constitutive part of the phenomenon examined. Exposure to violence – and to its most extreme form, homicide – is unfortunately prevalent in the lives of many people, particularly the disadvantaged. Much literature exists on the effect of neighborhood-level violence on health and other outcomes (Morenoff 2003, Masi et al. 2007, Harding 2009). A perennial concern in this literature, however, is that of spurious association. Is it the actual violence or unmeasured factors correlated with violence that causes the observed effect? Does exposure to an actual violent act have a direct effect on individuals?

Our strategy to assert causal influences is to exploit change in homicides over time within municipalities in Mexico. In contrast to the neighborhood effects literature, our focus is not the baseline (“permanent”) levels of violence at the local level, but rather on the acute effect of pregnant women’s exposure to an actual homicide in her immediate environment. We create a monthly panel of births by municipality in Mexico from 2008 to 2010, to which we merge a dataset with all homicides for the entire period. By using municipality- and month- fixed effects models, we account for any time-invariant characteristics of municipalities (including the “baseline” level of violence), and by any national-level trends shared across municipalities. Individual-level data for every birth allows us to account for socioeconomic selectivity and heterogeneity of the effects.

Moving beyond most natural experiments, we do not restrict our analysis to the association between exposure to homicides and birth weight. Violence is a social phenomenon which trends over time and which emerges from other trends such as the economic cycle, changes in drug trafficking, among others. As a result, individuals can predict their future exposure to violence and adjust their behavior in multiple ways. Modeling all these potential behavioral responses is a challenging task, but we analyze two central ones – changes in fertility, and behavioral responses to violence once the woman has become pregnant. We also account for the fact that both the effect of violence and the behavioral responses to it may be heterogeneous across the population, and examine such heterogeneity with a focus on socioeconomic advantage.

Our findings indicate that exposure to violence in the two trimesters immediately preceding the (potential) conception does not alter fertility, with little indication that women choose not to conceive when exposed to increased violence. The single exception to unchanged fertility is the most disadvantaged women (those with only primary schooling or less), who appear to reduce their fertility when facing an increase in local homicides.

After the socioeconomic selectivity of women giving birth is accounted for, we obtain the surprising finding that exposure to homicides early in the pregnancy results in better birth outcomes. Women exposed to homicides in the first trimester of gestation have higher mean birth weight and a lower proportion of low birth weight.

The mechanism driving this surprising finding appears to be the behavioral responses of pregnant women: Exposure to violence appears to increase health-enhancing behaviors such as prenatal care utilization, and it is such behaviors that account for improved birth outcomes. This behavioral response and, consequently, the positive effect of homicide exposure on birth weight is markedly heterogeneous. It is strongest among less socioeconomically advantaged women (those with low educational attainment, unmarried, and who lack any type of health insurance) and it fully disappears among the most advantaged. Finally, the positive effect is much more pronounced among urban women. These findings are consistent with the hypothesis that the less advantaged women are more vulnerable to an increase in local homicides, probably due to residential or social proximity to the location of the homicides.

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