

Terrorist violence and newborn health. Estimates for Colombia

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Motivation

I examine the impact of terrorist violence exposure by the mother while pregnant on her newborn baby's birthweight

- ▶ Disparities in health start early in life
- ▶ Shocks and interventions during sensitive periods of child development can have lasting impacts
- ▶ Pregnancy is a key developmental stage (Almond & Currie 2011, Johnson & Schoeni 2011)
- ▶ Wars cause death and destruction but also stress and trauma. What are the health impacts? Are impacts transmitted across generations?

Related literature

- ▶ Evidence from exposure to violence in countries with sustained internal conflict:
 - ▶ Camacho (2008) [Colombia]
 - ▶ Mansour & Rees (2012) [Palestine]
 - ▶ Quintana-Domeque & Ródenas-Serrano (2017) [Spain]
 - ▶ Valente (2015) [Nepal]
- ▶ Scarring vs. selection effects
- ▶ Mechanism: Elevated 'stress hormone' levels in the mother impairs the baby's growth

Context

- ▶ Colombia has one of the longest running internal armed conflicts
- ▶ Struggle for local power, rather than a separatist, religious or ethnic conflict
- ▶ The main guerilla group was FARC (*Revolutionary Armed Forces of Colombia*)
- ▶ Other actors: Other guerrillas, paramilitary groups, State armed forces
- ▶ Heterogeneous violence intensity
 - ▶ Across time (periods of low/high/volatile intensity) ...
 - ▶ ... and space (historic origin, expansion and retreat areas, corridors)

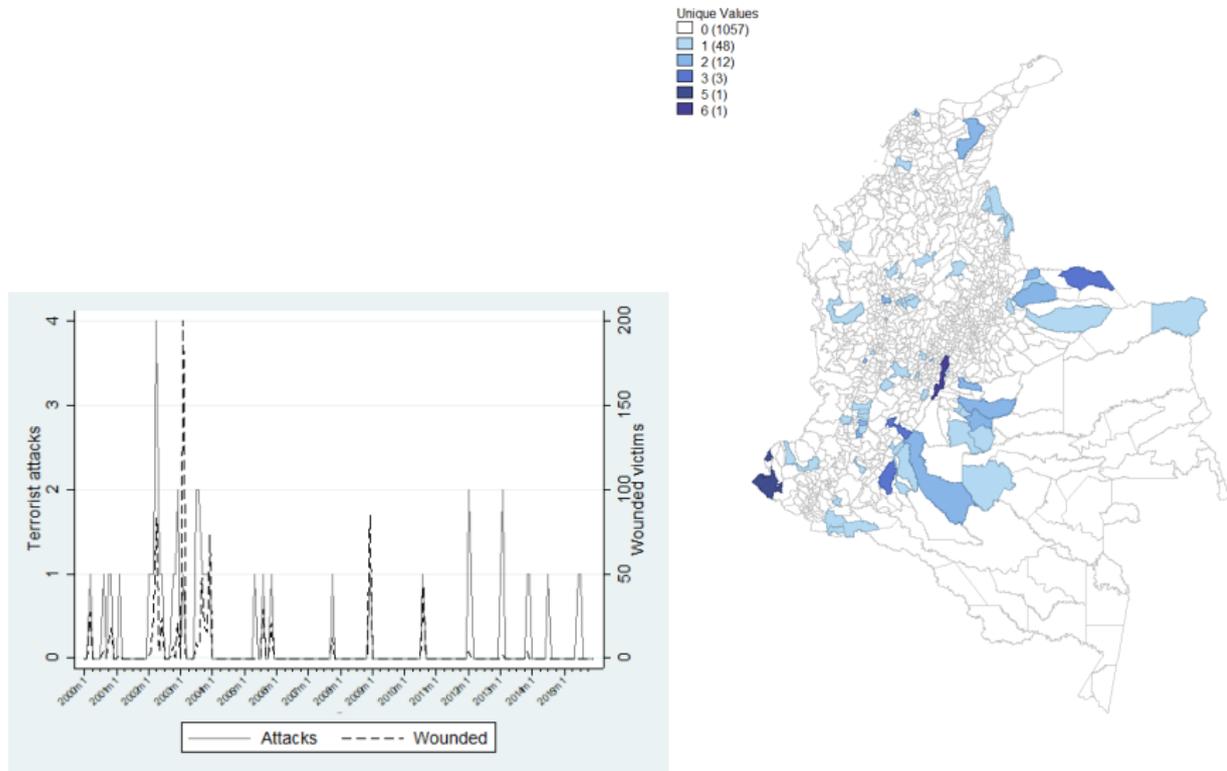


Figure 1: Terrorist violence by month and place of occurrence

Methodology

- ▶ Weight at birth (kg) is a measure of newborn health reflecting cumulative pregnancy conditions

$$\begin{aligned} bweight_{i,m,t} = & \alpha + \delta_1 violence_{m,t-9} + \delta_2 violence_{m,t-6} + \delta_3 violence_{m,t-3} \\ & + \delta_4 previolence_{m,t-36} + \beta_1 X_{i,m,t}^{child} + \beta_2 X_{i,m,t}^{mother} + \beta_3 X_{m,t}^m \\ & + \gamma_{year} + \gamma_{month} + \gamma_m + \epsilon_{i,m,t} \end{aligned}$$

Terrorist Attacks

All (1) indiscriminate attack carried out (2) by armed groups with explosives, (3) against civilian objectives, (4) in public places, with (5) the aim of causing high lethality and devastation upon the civil population.

- ▶ Data until 2012 from the National Centre of Historical Memory's report *Basta Ya! Memories of War and Dignity* and updated manually for January 2013 - March 2016 from CINEP's *Noche y Niebla* on-line database of human rights and political violence events.

Data

Terrorist violence data by municipality and month of occurrence are matched to household survey data:

- ▶ 2005, 2010, 2015 Demographic and Health Surveys (DHS)
- ▶ Live births between December 1999 - March 2016 (pregnancies starting February 1999)
- ▶ Match on the month of pregnancy and the municipality of residence of the mother
 - ▶ Month of pregnancy estimated counting forward from conception date. This accounts for gestation length
 - ▶ Exclude pregnancies from migrant mothers: occurring in a different (unknown) municipality (15%)

Data

- ▶ 49 terrorist attacks between February 1999 - March 2016
- ▶ 6% of municipalities in the sample experienced at least one attack. Only 8 had more than one attack
- ▶ 17 attacks without wounded persons. When there were wounded victims, the mean was 26 and the median was 13 victims
- ▶ 27,150 live births from non-migrant mothers reporting the baby's weight at birth
- ▶ Average birthweight 3.28 kg (boys) and 3.17 kg (girls)
- ▶ 3.28% of pregnancies exposed to a terrorist attack during the pregnancy

Results

Dep var:	bweight (kg)			
	(1)	(2)	(3)	(4)
trim1 (δ_1)	-0.036 (0.022)	-0.156** (0.060)	0.003 (0.118)	-0.320* (0.156)
trim2 (δ_2)	-0.009 (0.060)	0.115 (0.125)	0.126 (0.121)	0.102 (0.188)
trim3(δ_3)	0.016 (0.028)	-0.128 (0.083)	-0.107 (0.102)	-0.167 (0.118)
Mother's education	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.002)	0.004* (0.002)
Mother's education X				
trim1		+ *	-	+ **
trim2		-	-	-
trim3		+	+	+*
Gender sample	all	all	girls	boys
Municipal FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
N	24561	24561	11912	12649

Standard errors clustered by municipality in parentheses

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Results

Scale

- ▶ For boys, increasing number of wounded victims has negative effect on birthweight ($\delta_1 = -0.002^{***}$)
- ▶ But for girls, there is a positive effect of exposure in the second and third trimesters ($\delta_2 = 0.001^{**}$; $\delta_3 = 0.001^{***}$)

Behaviours of mothers during pregnancy

- ▶ Smoking (ns)
- ▶ Drinking alcohol (ns)
- ▶ Prenatal care visits (for baby girls $\delta = -1.595^{***}$; for baby boys ns)

Discussion

- ▶ Exposure to terrorist violence in-utero has large negative impact on birthweight. Larger than previously estimated for Colombia (Camacho 2008)
- ▶ Intergenerational transmission of disadvantage: Smaller effect for more educated mothers, birthweight linked to lower outcomes later in life (Black et al. 2007)
- ▶ Boys more vulnerable to general shocks *in-utero* (Kraemer 2000), and violence shocks (Valente 2015)
- ▶ For boys, scarring effect dominates in early pregnancy
- ▶ But for girls, selection effect dominates in late pregnancy for larger scale shocks
- ▶ Behavioural effects of war and violence (e.g. Voors et al. 2012; Blattman 2009; Moya 2018) may also operate for pregnant mothers

Thank you!

Results: Scale

	Depvar:	bweight		
		(1)	(2)	(3)
trim1(δ_1)		-0.001*** (0.000)	-0.000 (0.000)	-0.002*** (0.000)
trim2(δ_2)		0.001 (0.001)	0.001** (0.000)	0.000 (0.001)
trim3(δ_3)		0.001 (0.001)	0.001*** (0.000)	0.000 (0.001)
Mother's education		0.005*** (0.001)	0.006*** (0.002)	0.005** (0.002)
Mother's education X				
	trim1	+***	-	+***
	trim2	-***	-***	-
	trim3	-	-***	-
Gender sample	all	girls	boys	
Municipal FE	Yes	Yes	Yes	
Time FE	Yes	Yes	Yes	
N	24561	11912	12649	

Standard errors clustered by municipality in parentheses

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Terrorist violence is the number of victims wounded in a terrorist attack

Results: Behaviours

Dep var:	Smoke (n)			Drink (n)			Antenatal care (n)		
	(2)	(3)	(4)	(6)	(7)	(8)	(10)	(11)	(12)
preg(δ)	0.167 (0.233)	0.044 (0.168)	0.299 (0.507)	0.071 (0.120)	0.127 (0.169)	0.037 (0.157)	-0.891* (0.423)	-1.595*** (0.401)	-0.134 (0.702)
Mother's education	-0.015*** (0.003)	-0.016*** (0.003)	-0.015*** (0.003)	-0.018*** (0.005)	-0.021*** (0.006)	-0.017** (0.006)	0.196*** (0.012)	0.198*** (0.016)	0.196*** (0.013)
Mother's education X preg	-	-	-	-	-	+	+	+	-
Gender sample	all	girls	boys	all	girls	boys	all	girls	boys
Municipal FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	28127	13727	14400	28127	13727	14400	27768	13550	14218

Standard errors clustered by municipality in parentheses

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Robustness & Additional Results

- ▶ Mothers in municipality m (migration) ▶
 - ▶ Into the municipality: excluded from the sample
 - ▶ Out of the municipality: excluding high IDP expulsion municipalities ($\delta_1 = -0.156^*$)
- ▶ Children born alive ▶
 - ▶ Positive but insignificant effect on miscarriages and stillbirths
- ▶ Concurrent shock
 - ▶ With department unemployment and participation rate ($\delta_1 = -0.157^*$)
 - ▶ With department trend FE ($\theta_{td} = \gamma_t * \gamma_d$) ($\delta_1 = -0.155^{**}$)
- ▶ With terrorist attacks before conception ($\delta_1 = -0.157^{**}$; δ_0 ns) or after birth ($\delta_1 = -0.162^{**}$; δ_4 ns)
- ▶ Terrorist attacks in neighbouring municipalities ($\delta_1 = -0.025$)

Additional Results

	Dep var: Miscarriages & Stillbirths		
	(1)	(2)	(3)
trim1	0.955 (0.310)	2.851 (2.111)	1.296 (1.238)
Mother's education	1.031** (0.010)	1.032*** (0.010)	
Mother's education X trim1		-	
Municipal FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
Mother FE			Yes
N	11910	11910	1688

Standard errors clustered by municipality in parentheses

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Table reports odds ratios



Additional Results

Model:	A	B	C	D	E	F
	(1)	(2)	(3)	(4)	(5)	(6)
trim1	-0.156*	-0.157*	-0.155**	-0.157**	-0.162**	0.025
	(0.060)	(0.076)	(0.060)	(0.060)	(0.060)	(0.073)
trim2	0.115	0.036	0.117	0.119	0.114	0.103
	(0.126)	(0.073)	(0.125)	(0.125)	(0.126)	(0.084)
trim3	-0.130	-0.035	-0.125	-0.118	-0.130	-0.172
	(0.088)	(0.067)	(0.083)	(0.082)	(0.082)	(0.088)
trim0 / trim4				-0.121	-0.001	
				(0.068)	(0.082)	
Mother's education	0.004***	0.005**	0.005***	0.005***	0.005***	0.005***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Mother's education X						
trim1	+	+	+	+	+	-
trim2	-	-	-	-	-	-
trim3	+	+	+	+	+	+
trim0 / trim4				+	-	
Gender sample	all	all	all	all	all	all
Municipal FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Department trend			Yes			
N	23216	18219	24561	24561	24561	24561

Standard errors clustered by municipality in parentheses

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

A. Excluding municipalities with high IDP expulsion rate

B. Including department unemployment and employment participation rates

C. Including department trends FE

D. Including terrorist attacks occurring in the trimester before conception (trim 0)

E. Including terrorist attacks occurring in the trimester after pregnancy (trim 4)

F. Including attacks in neighbouring municipalities

HIV/AIDS vulnerability and labour migration in India, Bangladesh, and Nepal (*Comment*)

By: C. Canelas, M. Niño-Zarazúa, S. Parvianen and F. Samuels

- ▶ Examines the impact of the EMPHASIS programme on HIV/AIDS knowledge and risky sexual behaviour of Bangladeshi and Nepali migrant workers in India
- ▶ Valuable to strengthen the evidence on the impact of interventions for vulnerable populations
- ▶ Important question on whether information and knowledge can lead to improvements in health

- ▶ The intervention:
 - ▶ Who gets what, where, and when?
 - ▶ Which aspects of the intervention could be driving results?
 - ▶ How are intervention sites selected, what do these look like?
 - ▶ Contamination. i.e. can information be shared from T/C migrants or is it made widespread?
- ▶ The method:
 - ▶ Original data, but needs detailed description
 - ▶ What is the meaning of 'before'/'after'? (survey 2010/11 and 2014 and programme 2009 to 2014). If true before/after for both groups could use DiD-PSM
 - ▶ Matching separately for migrants at source/destination and for Bangladeshi/Nepali
- ▶ The results:
 - ▶ Magnitude and economic importance. How much do these things matter for HIV/AIDS infection rates?
 - ▶ Heterogeneity by gender, age, cycle of migration (new vs recurrent migrants), etc.