Maternal Displacements during Pregnancy and the Health of Newborns

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Motivation I

- Wide-ranging consequences of job loss have been documented:
 - Negative effect on both short- and long-term consumption (e.g., Lepage-Saucier, 2016; Gerard and Naritomi, 2020)
 - Less chances of and lower-paid future employment (e.g., Stevens, 1999)
 - Worse health outcomes (e.g., Black et al., 2015)
 - Many negative spillovers on other household members (spouses, children)

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 - Worse health outcomes (e.g., Black et al., 2015)
 - Many negative spillovers on other household members (spouses, children)
- Significant effects of health at birth on educational and/or labor force outcomes (Almond & Currie, 2011)
 - 10% increase in BW increases high school graduation by 1.2%, IQ (of men) by 1.2%, earnings by 0.9%, and height by 0.3% (Black et al., 2007)

 \Rightarrow In-utero exposure to unemployment shocks may entail intergenerational effects for the newborns

Motivation II

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- Del Bono et al. (*JLE*, 2012) find positive effect of maternal 'job interruptions' on fetal growth up to three months before birth (UK, US long. surveys).

Our paper

- We leverage unique population-level administrative data from Brazil linking individual employment spells with the universe of birth records.
- We estimate the effect of maternal dismissals (*without just cause*) during gestation on the health of children at birth.
- We analyse healthcare utilization behaviour (e.g., prenatal care and delivery choices).
- We integrate data on infant mortality, to assess mortality trends post-delivery up to 1 year.
- We focus on the role of partners and unemployment benefits as insurance against unemployment shocks.

Background

Background: Maternal employment and birth outcomes

Job loss differs from other negative shocks in utero. Two possible effects at work:

- 1. Negative effect of job loss on health at birth
 - Income shock with consequences on nutrition and wellbeing
 - Event-induced stress may lead to shorter gestation and more complicated delivery (vast biomedical lit.; Currie and Rossin-Slater, 2013; Koppensteiner and Manacorda, 2016)

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- 2. Positive effect on prenatal environment
 - Relief from work-related strain can help gestation (vast biomedical lit., documented by maternity leave lit. as in Rossin, 2011; Stearns, 2015)

We link administrative sets from the State of Minas Gerais (2011-2014) using individual identifiers:

- 1. Relação Anual de Informações Sociais (RAIS), a employer-employee linked dataset covering the universe of formal workers and firms in Brazil.
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 - Birth weight (BW), BW classifications, gestational lengths, date of conception, other maternal information; birth, parental and hospital identifiers.

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 - Birth weight (BW), BW classifications, gestational lengths, date of conception, other maternal information; birth, parental and hospital identifiers.
- 3. We also merge in the Cadastro Nacional de Estabelecimentos do SUS (CNES, i.e. hospital census) and mortality data.

Identification strategy

Sample selection

We retain:

- 1st birth observed over our sample period no multiple births per mother
- Women employed at least up to conception month no selection into pregnancy
- Women with open-ended private sector contracts no public sector workers
- In case of imperfect match across datasets, only Women linked to births with at least 98% matching score

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 \Rightarrow We have a linked sample of 165,773 births for our estimation (16% of total population of births)

Estimation

- Treatment group: infants whose mother has been dismissed within 10 months starting from conception month ($D_i = 1$)
- Control group: infants whose mother has not been dismissed within 10 months starting from conception month (D_i = 0)

We estimate:

$$y_{imt} = \tau^{ITT} D_i + \mathbf{X}'_i \boldsymbol{\beta} + \boldsymbol{\theta}_t + \nu_m + \epsilon_{imt}$$
(1)

- X_i: maternal and employment characteristics, previous pregnancies information, child sex
- θ_t : month of conception (both running and calendar) FE
- ν_m : municipality of residence FE.

Balance checks

Main results

Effects on birthweight

Effect of maternal layoff on birthweight

	(1)	(2)	(3)	(4)	(5)	(6)	
	All births		Single I	Single mothers		Couples	
Birthweight	6.588	-1.304	-24.400**	-27.984**	30.059***	18.497***	
	(5.061)	(4.984)	(11.806)	(11.757)	(6.385)	(6.459)	
	3155.253]	[3155.253]	[3146.038]	[3146.038]	[3159.413]	[3159.413]	
Low birthweight	0.001	0.002	0.008*	0.009**	-0.006*	-0.003	
-	(0.003)	(0.003)	(0.005)	(0.004)	(0.003)	(0.003)	
	0.080	0.080]	[0.085]	[0.085]	[0.077]	[0.077]	
Controls		Y		Y		Y	
Observations	165773	165773	55964	55964	104575	104575	
* n < 0.10 $** n < 0.05$ $*** n < 0.01$							

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Effect of maternal layoff on birthweight

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Alternative specs

Robustness checks

Trimester effects

Cellini, Koppensteiner & Menezes

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- Are there divergent health utilization behaviours?
 - No: displaced mothers in both single-mother and couples groups delay their first prenatal visit, reduce total attendance, more likely to deliver in public hospitals and recur less to c-sections.

Effects on infant mortality

	(1)	(2)	(3)			
	All births	Single mothers	Couples			
Early neonatal mortality	0.001	0.002**	-0.000			
(≤7d)	(0.000)	(0.001)	(0.001)			
	[0.003]	[0.003]	[0.003]			
Neonatal mortality	0.001*	0.002**	0.000			
(≤28d)	(0.001)	(0.001)	(0.001)			
	[0.003]	[0.004]	[0.003]			
Perinatal mortality	0.001*	0.003**	-0.000			
(≤22wks)	(0.001)	(0.001)	(0.001)			
	0.004	0.004	0.004			
Infant mortality	0.001*	0.003**	-0.000			
(≤1yr)	(0.001)	(0.001)	(0.001)			
	[0.004]	[0.005]	[0.004]			
Controls	Y	Y	Y			
Observations	165773	55964	104575			
* n < 0.10 ** $n < 0.05$ *** $n < 0.01$						

Effect of maternal layoff on infant mortality

Informal and formal insurance

Partners and self-insurance I

- We make use of information in birth records on degree of presence of fathers (possible providers of informal insurance), using different samples, both for single and non-single mothers
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 - Father declared, not matched to RAIS
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 \Rightarrow Having declared a father is associated with less negative (more positive) outcomes for single-mother (couples) babies

Partners and self-insurance II

- We also estimate heterogeneous effects by maternal income quartiles (as a proxy for buffer resources)
 - The relationship is complex: lower-earnings mean lower absolute income shock, but lower-wage workers likely also more credit constrained.
 - Caveat: Lower earnings also possibly correlated with work conditions.

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 \Rightarrow Higher wage levels are associated with better birth outcomes, earlier first visit and higher attendance, higher take-up of planned c-sections (related to severance pay amount)

- Focus on sample of dismissed pregnant workers.
- Workers in Brazil are eligible to Unemployment Insurance (employer-paid monthly transfers up to 5 months) if worked continuosly for previous 6 months.
- We use job spell information to set up a Regression Discontinuity design for the effect of UI eligibility on birth outcomes of dismissed workers.

UI eligibility

	(1)	(2)	(3)	(4)
	Single	mothers	Со	uples
	Linear	Quadratic	Linear	Quadratic
DEP. VAR.: Birthweight				
UI Eligibility	68.048***	69.449**	-9.322	-6.541
	(25.912)	(29.523)	(49.626)	(50.681)
UI Eligibility \times	-0.040**	-0.040**	0.020	0.020
Monthly wage (R\$ 2014)	(0.018)	(0.018)	(0.049)	(0.049)
Mean	3124.915	3124.915	3188.659	3188.659
DEP. VAR.: Low birthweight				
UI Eligibility	-0.014	-0.017	-0.005	-0.005
	(0.014)	(0.016)	(0.024)	(0.025)
UI Eligibility $ imes$	0.000	0.000	-0.000	-0.000
Monthly wage (R\$ 2014)	(0.000)	(0.000)	(0.000)	(0.000)
Mean	0.091	0.091	0.072	0.072
Controls	Y	Y	Y	Y
Observations	4566	4566	6306	6306

Effect of UI eligibility on birthweight

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- We document unambiguous negative consequences of layoffs on health utilization behaviour.
- Both formal and informal insurance mitigate the negative effect of job loss, pointing to the importance of formal UI for single mothers.
- Estimates also provide indirect evidence on the role of (possibly paid) maternity leave prior to delivery for working mothers.

Thanks.

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- Is a linear regression adequate to remove most biases in our estimated treatment/control average differences associated with differences in covariates?
 - Generally, yes using Imbens and Rubin's threshold (2015)
 - ► Among single mothers, normalized difference in average covariate values < 0.20
 - Among mothers in couples, displaced women are less likely to have completed HE, have lower monthly wage and tenure at conception

Back

Alternative specifications

Effect of maternal layoff on birthweight (alternative specifications)							
	(1)	(2)	(3)	(4)	(5)	(6)	
	(a) Single mothers						
Birthweight	-27.984**	-29.660**	-30.274**	-29.663**	-30.584***	-30.416**	
0	(11.757)	(12.209)	(11.724)	(12.096)	(11.756)	(11.820)	
	[3146.038]	[3146.038]	[3146.350]	[3145.935]	[3146.203]	[3146.209]	
Low birthweight	0.009**	0.010**	0.009*	0.010**	0.009**	0.009**	
	(0.004)	(0.005)	(0.004)	(0.005)	(0.005)	(0.005)	
	0.085	0.085	0.085	0.085	0.085	[0.085]	
Observations	55964	55964	55883	55810	55726	55725	
			(b) C	ouples			
Birthweight	18.497***	17.689***	17.882***	16.616**	16.660**	16.122**	
	(6.459)	(6.461)	(6.474)	(6.496)	(6.513)	(6.481)	
	[3159.413]	[3159.413]	[3159.605]	[3159.415]	[3159.607]	[3159.601]	
Low birthweight	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	
	[0.077]	[0.077]	[0.077]	[0.077]	[0.077]	[0.077]	
Observations	104575	104575	104480	104512	104416	104414	
Controls	Y	Y	Y	Y	Y	Y	
Running month FE	Y	Y	Y	Y	Y	Y	
Calendar month FE	Y	Y	Y	Y	Y	Y	
Municipality FE	Y	Y	Y	Y	Y	Y	
Municipality-specific trends		Y	Y	Y	Y	Y	
Hospital FE			Y		Y	Y	
Firm municipality FE				Y	Y	Y	
Firm sector FE						Y	



Robustness checks I

	(1)	(2)	(3)	(4)	(5)	(6)
	All b	All births		mothers	Couples	
			(a) Match s	(a) Match score ≥ 0.97		
Rirthweight	5 623	-1.961	-25 717**	-28 823***	27 705***	16 324***
Dirtiweight	(4.642)	(4 553)	(11 241)	(11 019)	(6.030)	(6 127)
	[3155.707]	[3155.707]	[3145.558]	[3145.558]	[3160.423]	[3160.423]
Low birthweight	0.001	0.003	0.009**	0.010**	-0.005	-0.002
	(0.003)	(0.002)	(0.004)	(0.004)	(0.003)	(0.003)
	0.080	0.080	0.086	0.086	0.077	0.077
Controls		Y		Y		Y
Observations	175335	175335	59078	59078	110723	110723
			(b) Match s	score ≥ 0.99		
Birthweight	4.842	-3.903	-26.764**	-31.723**	28.605***	16.572**
0	(5.530)	(5.402)	(13.015)	(13.056)	(6.880)	(6.981)
	[3154.756]	[3154.756]	[3146.975]	[3146.975]	[3158.312]	[3158.312]
Low birthweight	0.001	0.003	0.008*	0.010**	-0.005	-0.002
	(0.003)	(0.003)	(0.005)	(0.005)	(0.003)	(0.003)
	[0.080]	[0.080]	[0.085]	[0.085]	[0.077]	[0.077]
Controls		Y		Ý		Y
Observations	156717	156717	53721	53721	98092	98092

Effect of maternal layoff on birthweight by matching score

Robustness checks II

	(1)	(2)	(3)	(4)				
	Single r	mothers	Couples					
	$\geq 33\%$	$\geq 50\%$	$\geq 33\%$	$\geq 50\%$				
Birthweight	-22.213	-35.805	46.258***	31.904*				
	(21.416)	(30.945)	(11.993)	(17.935)				
	[3147.657]	[3147.794]	[3156.326]	[3155.506]				
Low birthweight	0.004	0.006	-0.014**	-0.017*				
	(0.010)	(0.013)	(0.006)	(0.009)				
	[0.085]	[0.085]	[0.077]	[0.077]				
Controls	Y	Y	Y	Y				
Observations	37630	37038	69820	69056				
* < 0.10 ** < 0.05 *** < 0.01								

Effect of maternal layoff on birthweight using mass layoffs



Trimester effects





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