

Son Preference, Maternal Health, and Women's Survival

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Maternal mortality in the developing world

- 10.7 million women died between 1990 and 2015 due to maternal causes
- Most maternal deaths in South Asia and sub-Saharan Africa
- The lifetime risk of maternal death in the developing world is about 32 times higher than the developed region
- Direct causes: severe bleeding, infections, high blood pressure, complications from delivery, and unsafe abortions
- Indirect causes: anemia, HIV, cardiovascular diseases, cancer, diabetes, chronic respiratory diseases
- For every maternal death, 20 other women suffer pregnancy-related illness, infection, injury, other physical and psychological long-term consequences

The role of son preference: Milazzo (2018) for India

Son preference



Fertility behavior



Maternal morbidity and mortality

- Medical research:
 - High fertility → Increased lifetime risk of death due to pregnancy
 - Short spacing → increased risk of maternal mortality and morbidity
- These fertility behaviors are common among women who only have daughters and want to conceive a son (“**son- preferring fertility behavior**”)

Goal of this paper

- If the harmful fertility behaviors that follow the birth of a daughter are indeed partly responsible for the high mortality of Indian women, the decline in survival of women with first-born girls into older ages should not be present in countries with:
 - No (or limited) son preference or
 - Limited risk of maternal mortality
- Son preference → maternal morbidity and mortality *for 74 countries*
- Study the effect of a first-born girl on anemia for a large set of countries
- Shed light on:
 - The determinants of female mortality during the reproductive ages
 - The effects of son preference beyond early ages and before birth

Data

Demographic and Health Surveys (DHS)

- 219 DHS for 74 countries between 1990-2015
- Working sample: 15-49-year-old women who ever gave birth, excluding twins at first-birth

Cross-country data sources:

- World Development Indicators (WDI): maternal mortality and other markers of health, gender-related attitudes, labor force participation, school enrollment
- Alesina et al (2013): Historical variables related to patterns of inheritance and agriculture
- World Value Survey (WVS): Attitudes regarding female employment and leadership

Measure of high son preference

- Consider the coefficients on “first-born girl” in separate regressions for each country-year where the dependent variables (Y_i^s) are:
 - Number of children even born
 - Desire to have more children
 - Currently using contraception
 - Ever had a terminated pregnancy
 - Birth spacing (i.e., number of months between 1st and 2nd child)

$$Y_i^s = \alpha^s + \beta^s FirstBornGirl_i^s + \varepsilon_i^s \quad \forall \text{ survey } s$$

- A survey (s) is classified as “high son preference” if at least three of the five coefficients indicate son preference and are statistically significant

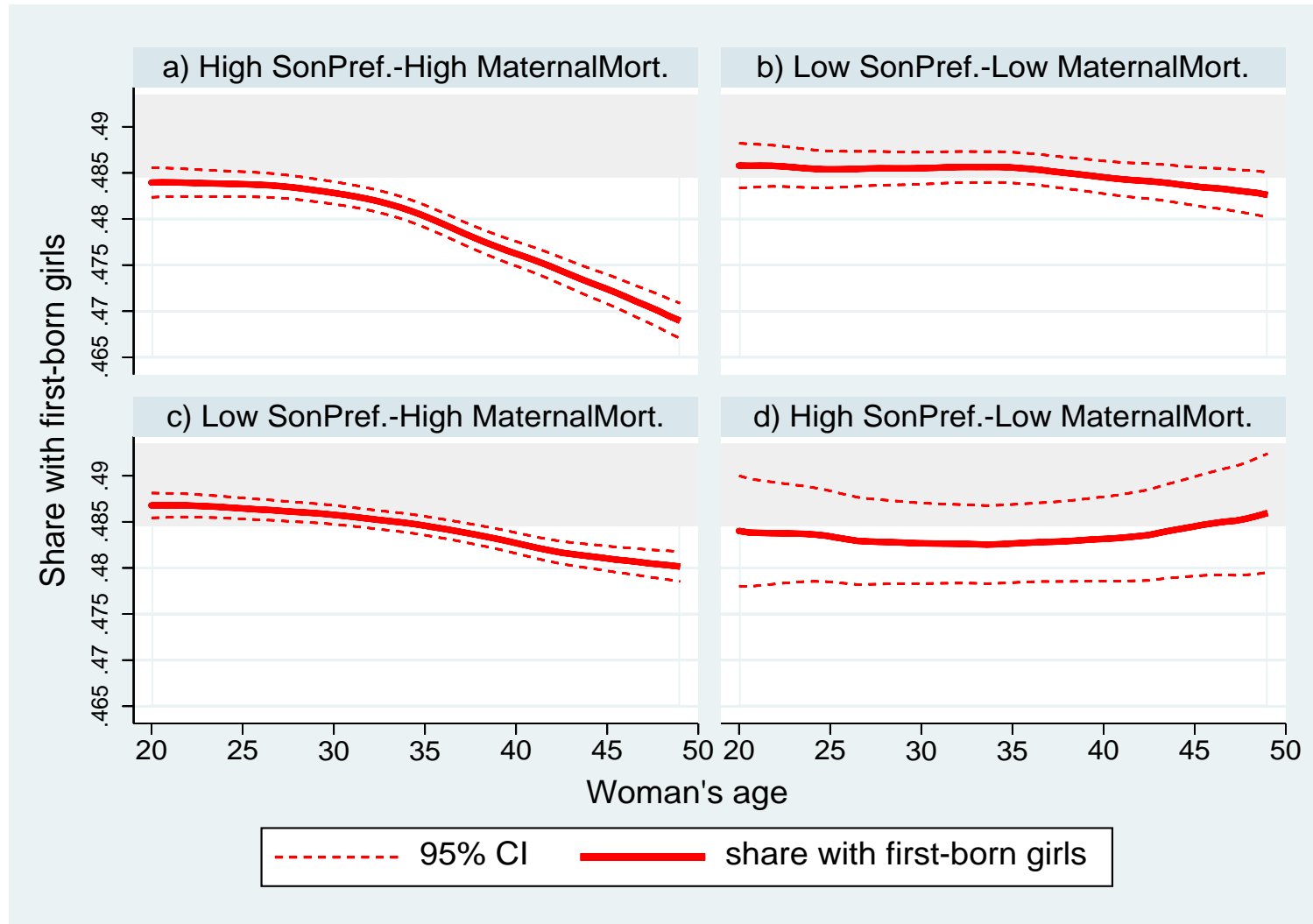
Measure of high maternal mortality

- =1 if lifetime risk of maternal death is greater than or equal to the *median* of lifetime risk of maternal death for all developing countries covered in the WDI database

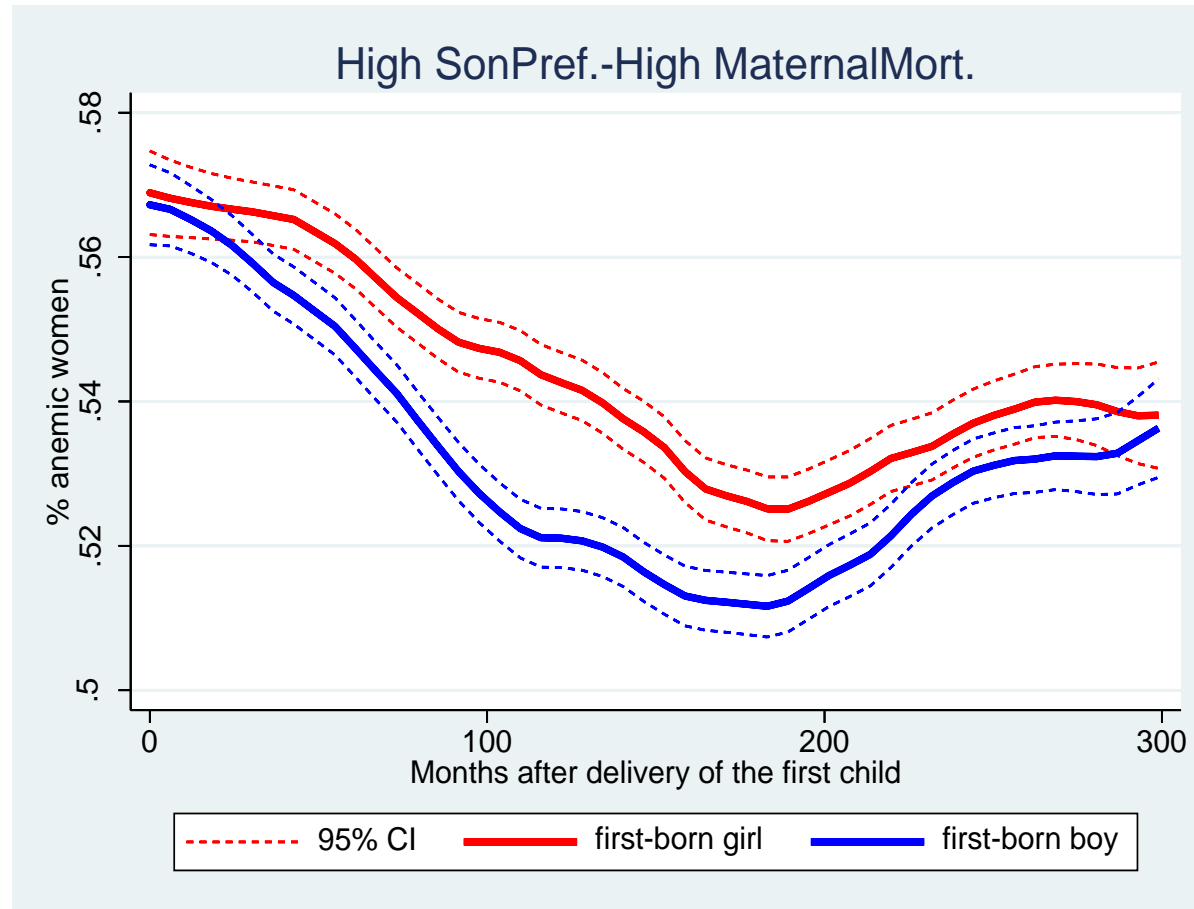
Four groups by the degree of son preference and maternal mortality risk

1) High SonPref & High Mortality Risk	2) Low SonPref & Low Mortality Risk
33% of the sample (predominantly S. Asia)	17% of the sample (mostly Latin America, Philippines, South Africa, others)
3) Low SonPref & High Mortality Risk	4) High SonPref & Low Mortality Risk
47.5% of the sample (predominately SSA)	2.6% of the sample (Egypt, Jordan, Kyrgyz Republic, Turkey)

Share of women with a first-born girl, by degree of son preference and risk of maternal death



Anemia patterns by time since delivery



→ NO differential incidence of anemia in the other 3 country-year groups

Imbalance in sex ratio

- Summarize the decreasing share of women with first-born girls at the country-year-level
- Generate an indicator called “*imbalance*”, which is =1 if the coefficient on age in:

$$\text{First born Girl}_{ia}^s = \alpha_a^s + \beta_a^s \text{age}_i + \mu_i^s \quad \forall \text{ survey } s$$

is **negative** and **significant** (for any of the age group 15-49, 20-49, 25-49, or 30-49), and the share of women with first-girls in the 30-49 age group is **below the biological range** i.e. 0.485, else 0

Economic correlates of imbalance

Dependent var.= Imbalance=1 if negative slope						
Panel A: Economic Variables						
% urban	-0.386***					
	(0.137)					
Women's mean edu in years		-0.021**				
		(0.009)				
Ratio of female and male primary enrolment			-0.592***			
			(0.211)			
Ratio of female and male secondary enrolment				-0.300**		
				(0.149)		
Ratio of female and male labor force participation					-0.186	
					(0.129)	
Share of female ownership of firms						-0.003
						(0.002)
Observations	219	218	179	127	219	203
R-squared	0.032	0.029	0.039	0.038	0.016	0.024

Note: imbalance=1 if the share of women with first born girl is decreasing with age. All regressions control for average share of women with first born girl in age 15-19 years old. Clustered standard errors at country level in parentheses.*** p<0.01, ** p<0.05, * p<0.1.

Health correlates of imbalance

Dependent var.= Imbalance=1 if negative slope					
Panel B: Health Variables					
% high skilled birth	-0.132***				
	(0.043)				
Ratio of female and male mortality		0.227			
		(0.162)			
Ratio of female and male life expectancy			-1.678*		
			(0.894)		
% anemic				0.827**	
				(0.344)	
% severe or moderate anemic					1.718**
					(0.829)
Observations	164	219	219	93	93
R-squared	0.027	0.009	0.025	0.103	0.086

Note: imbalance=1 if the share of women with first born girl is decreasing with age. All regressions control for average share of women with first born girl in age 15-19 years old. Clustered standard errors at country level in parentheses.*** p<0.01, ** p<0.05, * p<0.1.

Cultural correlates of imbalance

Dependent var.= Imbalance=1 if negative slope						
Panel C: Cultural variables						
% want more boys than girls	0.976**					
	(0.387)					
Mean age at first marriage		-0.036**				
		(0.015)				
Mean age at first birth			-0.013			
			(0.018)			
Beating is justified				0.003**		
				(0.002)		
Men have more right to job when jobs scarce					0.141	
					(0.148)	
Men make better political leader						0.003
						(0.084)
Observations	189	219	219	92	57	54
R-squared	0.052	0.026	0.003	0.045	0.015	0.005

Note: imbalance=1 if the share of women with first born girl is decreasing with age. All regressions control for average share of women with first born girl in age 15-19 years old. Clustered standard errors at country level in parentheses.*** p<0.01, ** p<0.05, * p<0.1.

Historical correlates of imbalance

Dependent var.= Imbalance=1 if negative slope					
Panel D: Historical Variables					
Aboriginal plow use	0.128*				
	(0.075)				
Matrilocality		-0.192**			
		(0.080)			
Patrilocality			0.116*		
			(0.068)		
Share of ancestors with extended family				0.156*	
				(0.081)	
Share of ancestors with nuclear family					-0.105
					(0.074)
Observations	218	218	218	218	218
R-squared	0.026	0.008	0.015	0.022	0.011

Note: imbalance=1 if the share of women with first born girl is decreasing with age. All regressions control for average share of women with first born girl in age 15-19 years old.

Clustered standard errors at country level in parentheses.*** p<0.01, ** p<0.05, * p<0.1.

Joint role of son preference and risk of maternal mortality

$$Imbalance_s = \alpha + \delta(High\ SP * High\ MM)_s + \beta_1 High\ SP_s + \beta_2 High\ MM_s + \pi SR15/19_s + \varepsilon_s$$

- *High SP_s*: =1 if country-year shows high son preference
- *High MM_s*: =1 if country-year shows high risk of maternal mortality
- *SR15/19* : share of women with a first-born girl in the age group 15-19 years

Joint role of son preference and risk of maternal mortality

	(1)	(2)	(3)	(4)	(5)
Dep. var.= Imbalance=1 if negative slope					
High Son Preference	0.241*		-0.105**	-0.147**	-0.136
	(0.130)		(0.046)	(0.072)	(0.091)
High Risk of Maternal Mortality		0.074	0.017	-0.007	0.033
		(0.055)	(0.056)	(0.071)	(0.064)
High Son Pref*High M.Mortality			0.511***	0.494**	0.553**
			(0.162)	(0.195)	(0.210)
Region Fixed Effect	N	N	N	Y	N
Survey Year Fixed Effect	N	N	N	N	Y
Observations	219	219	219	219	219
R-squared	0.048	0.009	0.104	0.131	0.186

Note: All regressions control for average share of women aged 15-19 with a first-born girl. Robust standard errors clustered at the country level in parentheses.*** p<0.01, ** p<0.05, * p<0.1.

Effect of a first-born girl on anemia

$$Anemic_{is} = \alpha + \beta First\ born\ girl_{is} + X_{is} + \tau + \varepsilon_{is}$$

- X_{is} : age in years, urban, height, indicator for completing at least 1 year of education
- τ : Survey-year dummies
- Randomness of the sex of the first-born child (Das Gupta 1987; Bhat and Zavier 2007; Dahl and Moretti 2008; Bhalotra and Cochrane, 2010; Jha et al. 2011; Rosenblum 2013; Heath and Tan 2016; Anukriti et al. 2016; Milazzo 2018)

Effect of a first-born girl on anemia

Country-year group: High SonPref & High Mortality Risk				
Dep. Var.:	<i>=1 if anemic</i>			
	(1)	(2)	(3)	(4)
Years since delivery:	all	<5	<10	<15
First-born daughter	0.010*** (0.002)	0.007 (0.005)	0.012*** (0.003)	0.014*** (0.003)
Respondent's height in cm	-0.003*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)	-0.003*** (0.000)
Observations	629215	126216	246986	363417
R-sq	0.013	0.022	0.018	0.017
Y-Mean	0.533	0.560	0.546	0.536

Note: Other controls include dummy for urban, age at first birth, age, indicator variable if women has positive years of education, and survey year dummy. Robust standard error in parenthesis. *** p<0.01, ** p<0.05, * p<0.1.

→ An effect on anemia is **ONLY found in places with both high son preference AND high mortality risk**

Conclusions

- Results suggest that having a first-born girl worsens the incidence of anemia in places where:
 - Son preference **and**
 - Risk of Maternal Mortality
 - Are **both high**
- This corroborates suggestive evidence of higher mortality of women with a first-born girl in these contexts
- The interaction between cultural norms and general health conditions matters
- Measure of imbalance in sex ratio for women with first-born girls at the country-year level correlates with socio-economic indicators of adverse outcomes for (and attitudes towards) women

Thank you!