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Poster Session 2 : Fertility Intentions and Behavior

**Fertility Decline and Investment in Children's
Human Capital in Urban Burkina Faso:
What causal relationship?**

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Introduction

- In principle, lower fertility allows couples to invest more in each their children, and particularly in their schooling.
 - Evidence from Western rich countries, Asia and Latin America.
 - This postulate is key rationale of family planning policies in sub-Saharan Africa in an attempt to curb population growth.
- Yet most studies in Africa have found no correlation or even a positive relationship between the number of children in a family and their educational attainment.



Introduction

These mixed results are usually explained by:

- Family solidarity, which reduce pressure on the number of children on family resources.
- Methodological biases uncontrolled in analyses:
 - Unobserved family characteristics.
Ex: Family wealth may lead to both higher fertility and better schooling outcomes.
 - Educational aspirations of parents are not independent of their fertility decisions (Endogeneity) (see Bougma et al. 2013).



Introduction

Goal of this study:

- Assess the impact of family size on children's schooling in Ouagadougou, using a better measure of household budget constraints and taking into account the simultaneity of fertility and schooling decisions.

Research questions:

- Do children with fewer siblings, all else being equal, have a greater probability of going to school and of performing better academically than those born into larger families?
- To what extent can such a statistical association between quality and quantity of children be interpreted as a causal relationship?



Methodology

- **Data from three sources:**
 - *Ouagadougou Health and Demographic Surveillance System* (Ouaga HDSS: www.issp.bf/OPO/) established in 10/2008 in five areas of the city : Kilwin, Tanghin, Nonghin, Nioko 2 et Polesgo.
 - *Demtrend survey*, a retrospective survey conducted in 2012 based on households in the Ouaga HDSS, to provide data on fertility and schooling decisions (2,952 women aged 35-59).
 - *Baseline health survey*, conducted in 2010 to assess health problems of the study population (2,351 individuals aged 15+ covered by in the Ouaga HDSS).



Methodology

- **Schooling variables**

- Number of years of schooling completed by children 23 years or older: 2,117 children.
- Proportion of children 9 years or older who were ever enrolled in primary school: 9,359 children.
- Proportion of children 14 years or older who were ever enrolled in post-primary school: 7,023 children.
- Proportion of children 20 years or older who were ever enrolled in secondary school: 3,599 children.

- **Fertility decline**

- *Number of progeny or of siblings*: all life births to an adult woman in a study household (whether subsequently deceased or not), including those now living elsewhere.



Methodology

- **Control variables**

- Characteristics of children and parents; marital stability; financial and non-monetary support from the kinship network

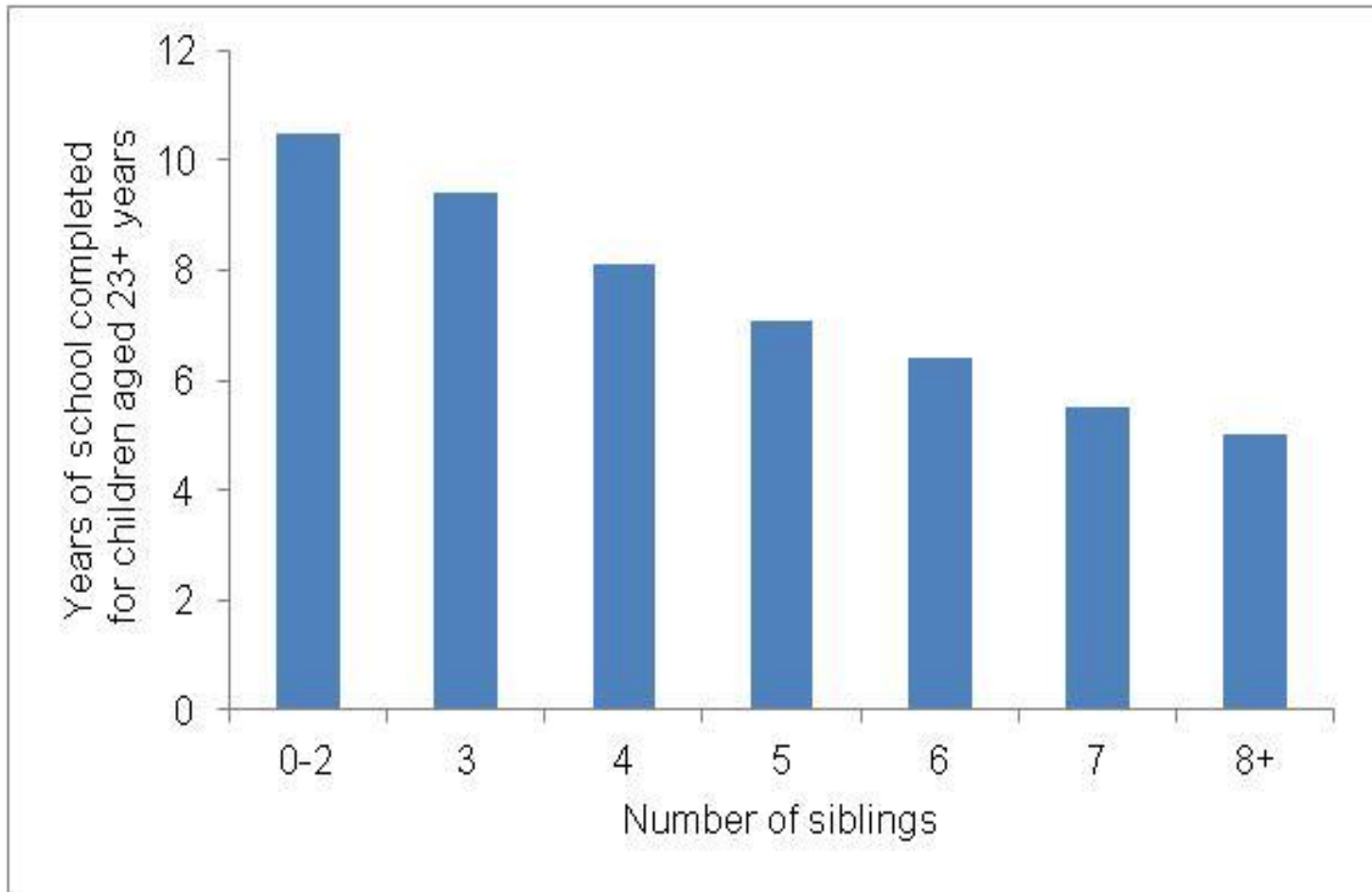
- **Methods of analysis**

- Bivariate analysis
- Multivariate analysis: linear and probit regression models.
- Instrumental variable regressions:
 - To control for the simultaneity between reproductive and schooling decisions (endogeneity)
 - Instrumental variable: secondary infertility of women aged 35-59
- Cluster controls are used to account for unobserved heterogeneity in households.



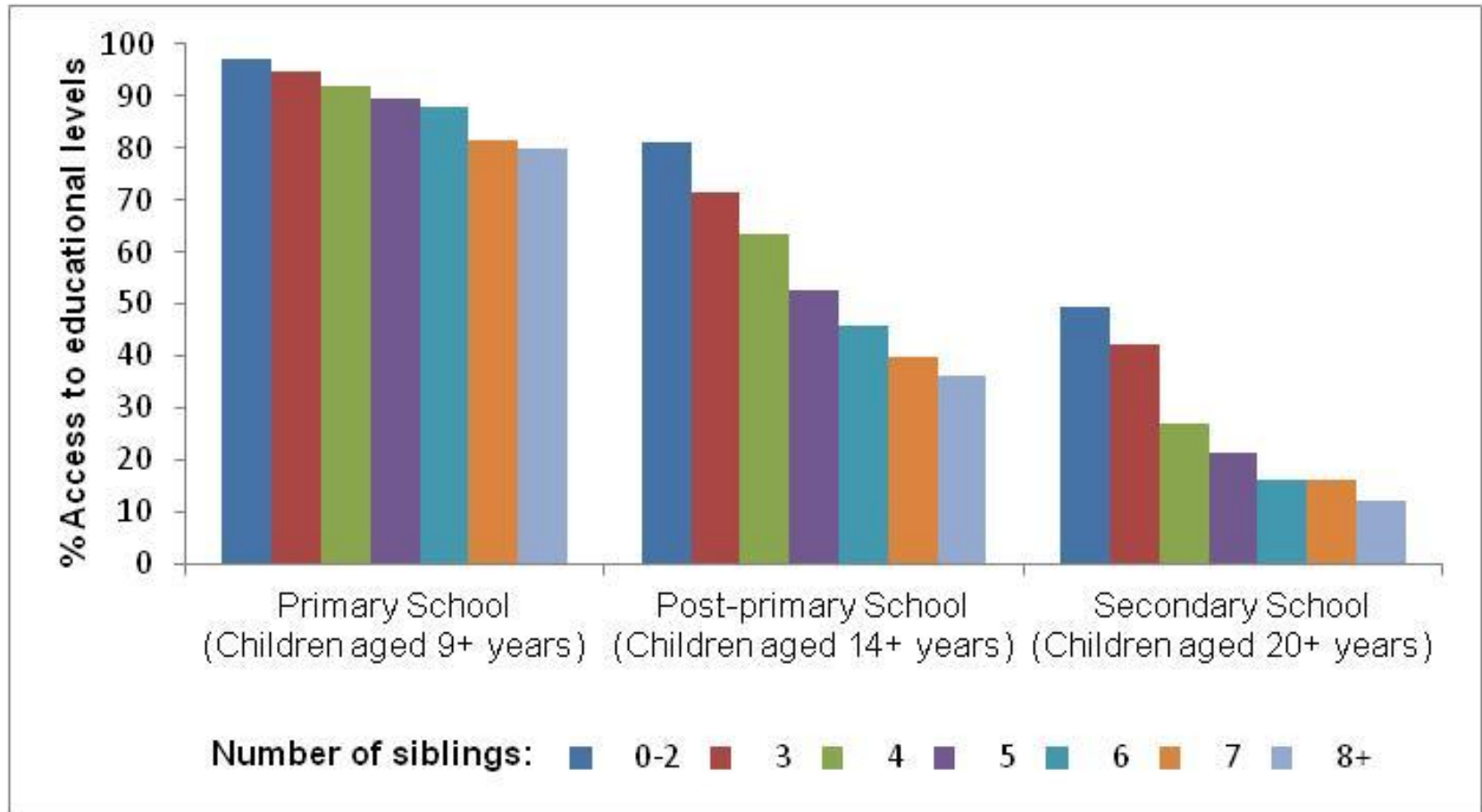
Main results

- Negative association between schooling and sibship size



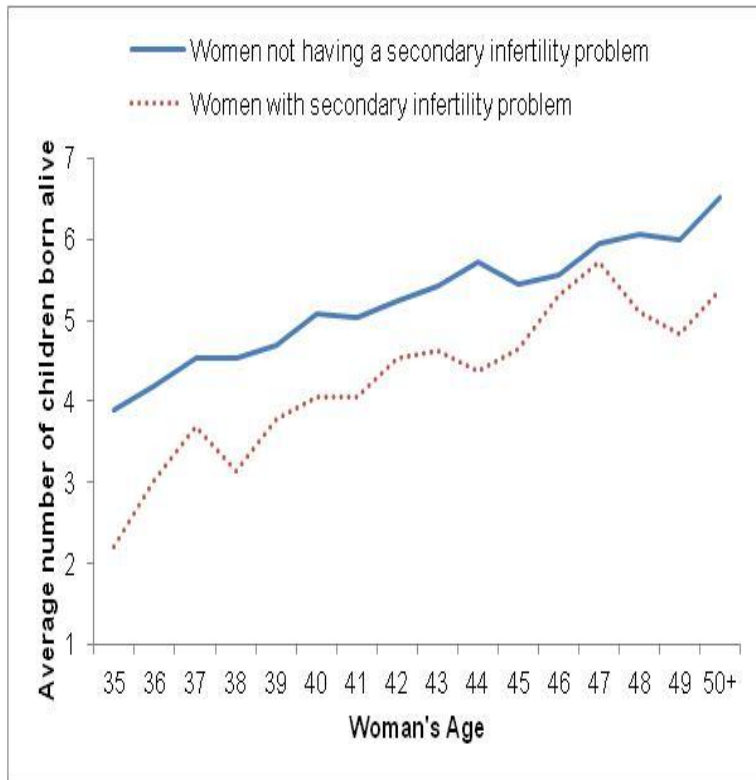
Main results

- Effects of sibship size on schooling attainment increases at higher levels of schooling



Main results

- Validity of women's unanticipated infertility as an instrumental variable: relevance and exogeneity conditions



Some indicators of health status	Women and her husband are victims of involuntary secondary infertility		Women and her husband are not victims of involuntary secondary infertility	
	Mean	95% CI	Mean	95% CI
Childhood self-rated health	1.95	1.69 - 2.21	2.12	2.02 - 2.22
Long-standing health problems in adulthood	0.35	0.13 - 0.57	0.42	0.32 - 0.52
Adulthood self-rated health	2.55	2.22 - 2.88	2.51	2.36 - 2.66
Obesity (Body Mass Index ≥ 30)	0.23	0.03 - 0.44	0.22	0.14 - 0.31
N	32	-	173	-



Main results

- Negative causal relationship between declining fertility and children's schooling

	Years of School Completed (linear)	Access to Primary School (dichotomous)		Access to Post-Primary School (dichotomous)		Access to Secondary School (dichotomous)	
	Coef. (Std.Err.)	Coef. (Std.Err.)	dy/dx (Std.Err.)	Coef. (Std.Err.)	dy/dx (Std.Err.)	Coef. (Std.Err.)	dy/dx (Std.Err.)
Number of Siblings, treated as exogenous	-0.547*** (0.073)	-0.122*** (0.018)	-0.018*** (0.003)	-0.137*** (0.015)	-0.045*** (0.005)	-0.128*** (0.021)	-0.034*** (0.005)
Number of Siblings, instrumented	-0.971* (0.392)	0.087 (0.081)	0.013 (0.013)	-0.052 (0.072)	-0.017 (0.024)	-0.214* (0.096)	-0.056* (0.025)
<i>F(IV first stage)</i>	25.04***	–	–	–	–	–	–
<i>Sample size</i>	2,117	9,359	–	7,023	–	3,599	–
*** p<.001; ** p<.01; * p<.05; † p<.10							



Conclusions

- In sharp contrast to most prior studies on sub-Saharan Africa, we find a net negative effect of sibship size on the level of schooling achieved by children – an effect that grows stronger as one progresses through the educational system.
- In the past,
 - Fertility was little subject to individual control.
 - Fertility was highly valued within a context of extended families, collective care for descendants by all adults in a lineage (via child fostering...), polygamy, and early marriage of women.
 - Wealthier families were better able both to educate their children and have more surviving offspring → positive correlation between the number of children living in a household and their schooling.



Conclusions

Evolving context of life in urban Africa

- Expansion of family planning programs, substantial improvements of women's education especially in cities, and a perception that schooling is essential to children's success, leading to an environment that favors fertility control.
- Expansion of educational systems, particularly the relatively expensive private schooling services available in urban centers.
- Erosion of family solidarity (see Boursin (2007) for the case of Ouagadougou).
- Decrease in public assistance for schooling: suppression of scholarships.



Conclusions

- In this new context,
 - The care of children, including their schooling, falls increasingly to households and biological parents.
 - Quality-quantity strategies that were formerly obscured are now becoming more pronounced and visible, thereby overpowering the previous null or positive correlation observed between fertility and schooling.
- The Ouaga HDSS study population, on which our analysis is based, is not representative of the city of Ouagadougou, but rather of zoned and spontaneous settlements in its periphery. That said, those neighborhoods are similar to parts of many African cities.



Conclusions

- The causal effects of fertility on child schooling found here provide evidence that Africa is increasingly resembling the contexts of Asia and Latin America in the early stages of their fertility transitions:
 - Lower fertility promotes greater investments in child schooling within households.
 - This reinforces the positive age structure effects of fertility decline (fewer young dependents) and thus the demographic dividend.

