

# Polygynous Family Structure and Child Undernutrition in Africa: Empirical Evidence from Nigeria

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## Outline of The Presentation

**1. Introduction**

**2. Background**

**3. Empirical Methods and Identification Strategy**

**4. Results and discussions**

**5. Conclusions**

## 1. Introduction

- Polygyny remains prevalent in sub-Saharan Africa and its prevalence doesn't change across time (Goodwin, 2013).
- Across the region, one third of currently married women are in polygamous family (DHS).
- There are higher levels of polygyny in the western Africa and much lower frequent in southern and eastern Africa (Westoff, 2003; Jacoby, 1995).
- In some of western Africa countries: Burkina Faso, Benin, Senegal, Guinea and Nigeria, more than one-third percent of children are from polygynous families.
- A lack of substantial gains in reducing undernutrition, may necessitate looking beyond socioeconomic factors to sociocultural dimensions to explain drivers of undernutrition in children

## 2. Structure of Polygynous Family

### Reasons for Polygyny

- The high possibility of losing or having already lost children to death, is a factor in the choice to practice polygamy (Smith-Greenaway and Trinitapoli, 2014; Arthi and Fenske, 2016).
- Other studies (Thornton, 1983; Edlund and Ku, 2011; Dalton and Leung, 2014) have associated polygyny with the post effect of transatlantic slave trades.
- To increase labor supply from multiple wives in agrarian society; man's wealth and power; and first wife's child-rearing capability (Boserup, 1970; Ezeh, 1997; Brown, 1981).
- Preference for sex composition in African countries has shown to have a strong connection to the tendency for men to acquire additional wives (Pande, 2003).
- Some societies have a post-partum sex taboo, which forbids a married woman from sexual activities for up two years after delivery to ensure good lactation and healthy child development (Caldwell and Caldwell, 1987).
- In some cultures, large family size and polygyny is attributed to a higher social ranking (Brown, 1981),

## 2. Structure of Polygynous Family

### Impact of Polygyny

- Some literature suggests that the presence of multiple wives in the household could enhance child welfare (e.g., Nath, Land and Singh 1994; Ahonsi, 1995; Ukwuani, Cornwell and Suchindran, 2002; Akresh et al., 2012).
  - Have the advantage of more frequent care and supervision by adults than those in monogamous families.
  - Delays the resumption of and reduces the frequency of intercourse after childbirth which improves outcomes by improving breastfeeding practices and child spacing
- A large body of research has documented that it has detrimental effects for child growth and survival (e.g., Amey, 2002; Kuate Defo, 1996; Mukherjee and Benson, 2003; Olusanya, 2011; Sellen et al., 2000; Wagner, 2015; Smith-Greenaway and Trinitapoli, 2014).
  - polygyny may be associated with poor child outcomes, specifically increased child mortality.

## 2. Structure of Polygynous Family

### Impact of Polygyny

- Polygyny is also associated with large family size and characterized by many young children from different wives in a short space of time.
  - Children may compete for nutritional and financial resources and parental time
- A polygynous family structure encourages early marriage.
  - Not only do girls who marry young experience higher rates of malnutrition, isolation, and depression, there is also an intergenerational effect on their children (Le Strat, Dubertret and Le Foll 2011; Nour, 2009).
  - Children of young mothers are likely to have lower birth weight, suffer poor nutritional status due to poor physical health outcomes, and experience higher rates of infant mortality (Wachs, 2008).

### 3. Data sources and variable measurements

- The data sources for this study are the 2008 and 2013 Nigeria DHSs.
- The surveys are well suited because they contain both information on the polygyny status of women who are married/living together and child nutritional outcomes.
- The unit of analysis for this study is all children under five years of age. The final sample comprises 16,281 children and 20,764 from the 2008 and the 2013 survey.
- **Outcome variables**
  - Child undernutrition under-five: based child anthropometry
    - Height-for-age z-scores (HAZ),
    - Weight-for-height z-scores (WHZ);
    - Prevalence of stunting and wasting
- **Polygynous family structure**
  - A polygyny dummy that takes on a value of one if a child's mother reports to have co-wives.
  - The number of co-wives, including the child's mother.

## 4. Results

### Overview of child undernutrition and polygyny

Variables	Pooled		Year		Family structure		Polygyny families		
	Mean	Std. Dev.	2008	2013	Non-polygyny	Polygyny	Two wives	Three wives	Four wives
			Mean	Mean	Mean	Mean	Mean	Mean	Mean
<b>Panel A: Outcome variables</b>									
Height-for-age z score	-1.46	2.03	-1.57	-1.38	-1.32	-1.76	-1.79	-1.66	-1.59
Child stunting (HAZ<-2), 0/1	0.40	0.49	0.43	0.37	0.36	0.47	0.47	0.44	0.42
Weight-for-age z score	-0.41	1.63	-0.21	-0.56	-0.37	-0.47	-0.48	-0.49	-0.26
Child wasting (WHZ<-2), 0/1	0.15	0.36	0.14	0.16	0.15	0.17	0.17	0.16	0.14
<b>Panel B: Family structure</b>									
Polygynous family, 0/1	0.33	0.47	0.33	0.32					
Number of wives, number	1.42	0.68	1.42	1.41	1.00	2.25			



## 4. Results

### First-stage Results: Polygyny (Indicator variable) is outcome variable

	Pooled		2008		2013	
	(1)	(2)	(3)	(4)	(5)	(6)
Same sex	0.210*** (0.008)	0.089*** (0.006)	0.239*** (0.010)	0.090*** (0.009)	0.233*** (0.009)	0.092*** (0.008)
Mother's educational attainment		-0.025*** (0.001)		-0.026*** (0.002)		-0.027*** (0.001)
Father's educational attainment		-0.002* (0.001)		-0.003** (0.002)		-0.000 (0.001)
Age of mother at first birth		0.014*** (0.001)		0.014*** (0.001)		0.016*** (0.001)
<b>Poorest quintile wealth index (Base)</b>						
Poorer quintile wealth index		0.079*** (0.012)		0.138*** (0.017)		0.033** (0.017)
Middle quintile wealth index		0.102*** (0.014)		0.147*** (0.019)		0.063*** (0.020)
Richer quintile wealth index		0.107*** (0.016)		0.153*** (0.022)		0.070*** (0.021)
Richest quintile wealth index		0.089*** (0.018)		0.120*** (0.026)		0.058** (0.025)
Rural		0.111*** (0.011)		0.098*** (0.016)		0.126*** (0.015)
Muslim		0.205*** (0.009)		0.180*** (0.014)		0.226*** (0.012)

## 4. Results

### First-stage Results: Polygyny (no. wives) is outcome variable

	Pooled		2008		2013	
	(1)	(2)	(3)	(4)	(5)	(6)
Same sex	0.885*** (0.014)	0.164*** (0.009)	1.431*** (0.014)	0.170*** (0.014)	1.414*** (0.013)	0.161*** (0.012)
Mother's educational attainment		-0.019*** (0.002)		-0.022*** (0.003)		-0.017*** (0.002)
Father's educational attainment		0.001 (0.002)		-0.002 (0.002)		0.004* (0.002)
Age of mother at first birth		0.042*** (0.001)		0.044*** (0.002)		0.042*** (0.002)
<b>Poorest quintile wealth index (Base)</b>						
Poorer quintile wealth index		0.223*** (0.019)		0.290*** (0.028)		0.176*** (0.024)
Middle quintile wealth index		0.318*** (0.021)		0.348*** (0.030)		0.297*** (0.031)
Richer quintile wealth index		0.326*** (0.025)		0.373*** (0.040)		0.293*** (0.034)
Richest quintile wealth index		0.272*** (0.029)		0.307*** (0.047)		0.240*** (0.041)
Reads newspaper		-0.105*** (0.014)		-0.115*** (0.023)		-0.101*** (0.019)
Visited family planning agents		-0.049*** (0.017)		-0.003 (0.030)		-0.053*** (0.020)
Rural		0.280*** (0.020)		0.285*** (0.033)		0.277*** (0.025)
Muslim		0.371***		0.325***		0.423***

## 4. Results

### OLS and 2SLS Estimates of the Effect of Polygyny on Child HAZ

	Pooled			2008		2013	
	OLS	2SLS		2SLS		2SLS	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Polygyny (No. of wives)	-0.011*** (0.002)	-0.111*** (0.003)	-0.140** (0.062)	-0.110*** (0.002)	-0.127* (0.074)	-0.099*** (0.002)	-0.157** (0.061)
Year dummy (2013)	0.115*** (0.032)	0.182*** (0.047)	0.157*** (0.042)				
<b>Child &amp; parental characteristics</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>
<i>N</i>		37023		16269		20754	

### OLS and 2SLS Estimates of the Effect of Polygyny on Child Stunting

	Pooled			2008		2013	
	OLS	2SLS		2SLS		2SLS	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Polygyny (number of wives)	0.003*** (0.000)	0.030*** (0.001)	0.049*** (0.016)	0.030*** (0.001)	0.059*** (0.021)	0.026*** (0.001)	0.038** (0.015)
Year dummy (2013)	-0.033*** (0.007)	-0.057*** (0.011)	-0.048*** (0.012)				
<b>Child &amp; parental characteristics</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>

## 4. Results

### OLS and 2SLS Estimates of the Effect of Polygyny on Child WHZ and Wasting

	Pooled			2008		2013	
	OLS	2SLS		2SLS		2SLS	
	(1)	(2)	(3)	(4)	(5)	(6)	
<b>Child WHZ</b>							
Polygyny (number of wives)	0.000	-0.014***	-0.004	-0.014***	-0.014	-0.040***	-0.082*
	(0.002)	(0.002)	(0.045)	(0.002)	(0.059)	(0.002)	(0.045)
Year dummy (2013)	-0.367***	-0.363***	-0.366***				
	(0.032)	(0.039)	(0.035)				
<b>Child &amp; parental characteristics</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>
<b>Child Wasting</b>							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Polygyny (number of wives)	0.000	0.010***	0.015	0.010***	0.010	0.011***	0.027**
	(0.000)	(0.000)	(0.010)	(0.000)	(0.013)	(0.000)	(0.011)
Year Dummy	0.027***	0.019**	0.022***				
	(0.007)	(0.008)	(0.008)				
<b>Child &amp; parental characteristics</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>	<b>NO</b>	<b>YES</b>
N		37023		16269		20754	

## 4. Results

### 2SLS Estimates of the Effect of Polygyny on Child Stunting by Urban-rural and Wealth Status

	Urban	Rural	Poor	Middle	Non-Poor
	(1)	(2)	(3)	(4)	(5)
Polygyny (number of wives)	0.040*** (0.014)	0.051*** (0.014)	0.061** (0.025)	0.043*** (0.009)	0.046*** (0.015)
Year Dummy	-0.053*** (0.015)	-0.047*** (0.018)	-0.047* (0.026)	-0.046*** (0.012)	-0.069*** (0.016)
<b>Child &amp; parental characteristics</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>	<b>YES</b>
N	11687	25336	17124	37023	12530

## 5. Conclusions

- The same sex siblings in the first two births increase the probability of polygyny by 10 percent.
- Number of wives is likely to increase by about 13 percent when the first two births have the same sex, and the effect is significant.
- Two stages least squares (2SLS) estimates for polygyny are similar in sign with the OLS estimates
- However, the 2SLS estimates for the key variables are much larger than the OLS estimates
- The 2SLS results indicate that an additional wife decreases the child HAZ by 0.18.
- Prevalence of child stunting increased by 5 percentage points, when an additional wife is added to the family.
- Polygyny has a greater impact for children in rural areas and wealth poorer households.
- Rural HHs may have limited knowledge about food choices, feeding, and health care seeking practices and the poor households have credit constraint to enhance food security and exposure.

Thank you