Rapid decline of female genital circumcision in Egypt: An exploration of pathways

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Abstract

Egypt is currently undergoing dramatic changes, including the traditional practice of female circumcision. Fewer than 40% of Egyptian girls born in the mid-1990s are circumcised by age 13 compared to nearly 90% of girls born in the 1980s, and the proportion continues to decline. What explains this large decrease over such a short time period? Using data from the 2005 and 2008 Egypt Demographic and Health Surveys, we explore the influence of three potential pathways through which popular attitudes toward female circumcision have spread, while accounting for community norms and policy discourse: economic development and SES improvement, social media messages, and women's empowerment. We find little evidence of direct effects of policy changes, but do find that SES predictors significantly affect girls' circumcision risk, even after controlling for unobserved differences across communities. Women's relative empowerment and social media appear to be more important in explaining differences across communities rather than within communities.

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What explains the dramatic decline in of female genital circumcision in Egypt?

Background

Fewer than 40% of Egyptian girls born in the mid-1990s are circumcised by age 13 compared to nearly 90% of girls born in the 1980s, and the proportion continues to decline. What explains this dramatic decrease over such a short time period? Much discussion over this controversial cultural practice has been raised by policymakers, medical practitioners, and activists, initially highlighted in the 1994 International Conference on Population and Economic Development (ICPD) in Cairo. Previous studies have suggested that efforts galvanized after the conference may have contributed to cultural change in Egypt and the overall decline in FGC (Gibaly et al., 2002), including exposure to social media (Suzuki & Meekers, 2008). However, these studies have ignored other facilitators of cultural change that may also have contributed and accelerated the abandonment of FGC among Egyptian families. Notably, SES has generally increased over time as the country has developed, women's education has improved significantly, and the predominately young population is increasingly exposed to Western culture. In the face of the failure of efforts aimed at stamping out FGC in other countries, and even backlash against such efforts in some instances, understanding the Egyptian experience with FGC may not only provide insight into how attitudes toward FGC can be influenced, but also into the larger picture of how cultural change can take permanent root in societies with strong traditional beliefs and practices.

Specific aims

This paper seeks to examine the influence of three theoretical pathways through which popular attitudes toward FGC have spread: (1) general development and higher SES introduce more Western cultural ideals; (2) social media messages target changing popular attitudes; (3) gender dynamics and greater women's empowerment enable women's self-determination. Each of these factors may have independently and/or jointly facilitated the rapid decline of FGC in Egypt. In addition, we consider the mediating role of community norms within these relationships.

Survey data

The data for this research come from two waves of the Demographic and Health Survey conducted in Egypt (EDHS) in 2005 and 2008. Ever-married women aged 15-49 were asked about their experiences with female genital cutting, their attitudes toward the practice in general, their intentions regarding FGM for their daughters, and where they received information about FGM (N_{2005}= 13,233; N_{2008}= 9,518). Our main outcomes of interest are the likelihood that young girls born 1989-2000 are circumcised. The outcome of interest is time to circumcision. The origin is the birth year and data are right censored at the time of the survey because girls who were not yet circumcised are considered lost of follow up. Our main explanatory variables for each of the three hypothesized pathways are detailed as follows:

1. Socioeconomic status is represented by household wealth, mother's education level and her labor force participation. The household wealth index is constructed based on household assets and divided into quintiles. We include dummy variables for the lowest and highest quintile.

2. Social media is measured by an index constructed from mother's answers to questions about where she had heard about FGC issues (e.g. tv, magazine, radio, community meetings/leaders, discussions with friends). Positive responses to each of these types are summed to create an aggregate measure.
3. Women's empowerment is measured in three ways. First, we use the empowerment index created from the empowerment module where women are asked about their relative control over certain types of household decisions (e.g. spending on food). Second, we use the age difference between spouses as an indicator of a woman's relative social position within the household. Third, we create a dummy indicator for having a female head of household.

We include a variety of other control variables to account for other differences in girls' circumcision likelihoods, including mother's year of birth, her circumcision status, age at first marriage, religion, and household head status, the daughter's birth order, and the household's governorate and urban/rural residency statuses. In addition, our models account for unobserved community norms and any birth cohort effects.

Empirical approach

This study employs event history analysis to study the hazard of being cut while accounting for censoring in our data. We begin with descriptive analyses showing the cumulative hazard and failure rate for girls during this time period.

We then use Cox proportional hazard regression models parameterized with age as the time scale to test the pathways described above.

The Cox Proportional hazard equations is

$$h(t) = h0(t) \exp(\beta X)$$

where h0 is the baseline hazard, X is a vector of covariates and β is a vector of regression coefficients we estimated using maximum likelihood procedures as implemented in Stata (StataCorp, 11). The baseline hazard in is extremely flexible and we estimated multiple versions to account for differences by community and birth cohort.

We parameterize the model to include child characteristics, mom characteristics and household characteristics. The pathways discussed are embedded in these characteristics. We examine the three pathways with a variety of controls and stratify the baseline hazard with and without community effects. We also stratify the baseline hazard for differences in birth cohort. The key assumption in the Cox model is that of proportional hazards. We test proportional hazards assumptions using Schoenfeld residuals. Given that the sample followed a clustered design, we also cluster all of the standard errors.

Results

The summary statistics (not corrected for sampling weights) for the sample of girls born since 1989 to 2000 from the 2005 and 2008 EDHSs are displayed in Table 1. Girls are about 15 year of age on average. Of those who are circumcised the average age at circumcision is 8 years old, but the median age is 9, and nearly all are circumcised by age 13 if they are circumcised at all. Almost 100% of mothers are circumcised. The average mother first marries at age 18 and her current spouse is 7 years older. Only 18 percent work and just over 50% have no education. Half of mothers have been exposed to at least one type of message about female circumcision. Only 1 percent of households are headed by women.

Initial descriptive analysis shows that FGC in Egypt is indeed declining. Figure 1 plots the cumulative hazard of girls' circumcision by birth cohort. There is a clear trend in the decreased hazard for each birth cohort over time. For girls born in 1993, nearly 80% have been circumcised by age 13. However, the cumulative hazard declines for each subsequent cohort, indicating that fewer girls are getting circumcised at each age.

To further examine the changes by birth cohort, estimated failure rates and the confidence interval are presented in figure 2. The figure shows the general decline in the failure rates, suggesting that no single year stands out amongst the rest in terms of observing a dramatic drop in circumcision risk. Therefore, even though policy changes may have indeed contributed to the overall discussion of FGC practices, no single event appears to have had an independent effect on decreasing FGC. Rather, the policy environment may have influenced the dissemination of cultural change via other channels explored here.

Table 2, column 1 reports our base model of girls' risk for circumcision with age.. Younger mothers are also significantly less likely to circumcise their daughters, also suggesting a change in FGC attitudes among younger generations. However, girls' whose mothers are circumcised have a much higher risk of being circumcised than uncut mothers. SES predictors indicate that circumcision is significantly associated with lower educated mothers and those are do not work. Daughters from households in the poorest quintile have a slightly elevated risk of circumcision compared to daughters from the richest households, but both are significantly less likely to be circumcised compared to middle-wealth households. Higher scores for both social media exposure and women's empowerment are significant associated with lower circumcision hazards.

Results in column 2 augment the base model by changing in the baseline hazard to control for unobserved differences across communities by stratifying by community. Estimates on wealth indicators now show that only those in the highest wealth groups within communities are less likely to circumcise their daughters. Education remains a strong predictor, suggesting that the women's educational status is strongly associated with circumcision even within local communities. Similarly, media exposure significantly lowers girls' circumcision risk, but mother's empowerment score is no longer significant with a point estimate near 1. Parental age difference is now significant, but the point estimate is also near 1 and may be substantively less significant.

While suggestive, the previous two models failed to account for the time trends shown in Figure 2 and also failed the PH tests. In column 3 the models change the baseline hazard again, stratifying it by communities and daughter birth cohort. As shown in Figure 2 these birth cohort effects are very pronounced. With these adjustments, mother's education remains a strong predictor of the hazard of being cut, suggesting that the women's educational status is strongly associated with circumcision even within local communities and accounting for timing of birth. However, media exposure is no longer significantly related to girls' circumcision risk, though the point estimates remain negative. This is our preferred specification because it passes the PH assumption. In this model only the first pathway is supported.

In a final specification, the timing of the births was modeled as a time varying variable within the Cox model. The results are presented in column 4. Here the year birth is highly significant and the point estimates is negative. In this version, we again find strong support for the pathway through education. We also find support for the media exposure pathway, suggesting that this pathway is important, but may be dependant on the timing of the exposure which we can not model here. All in all, we find the strongest evidence for the first pathway.

Figure 1. Age at circumcision cumulative hazard by birth cohort

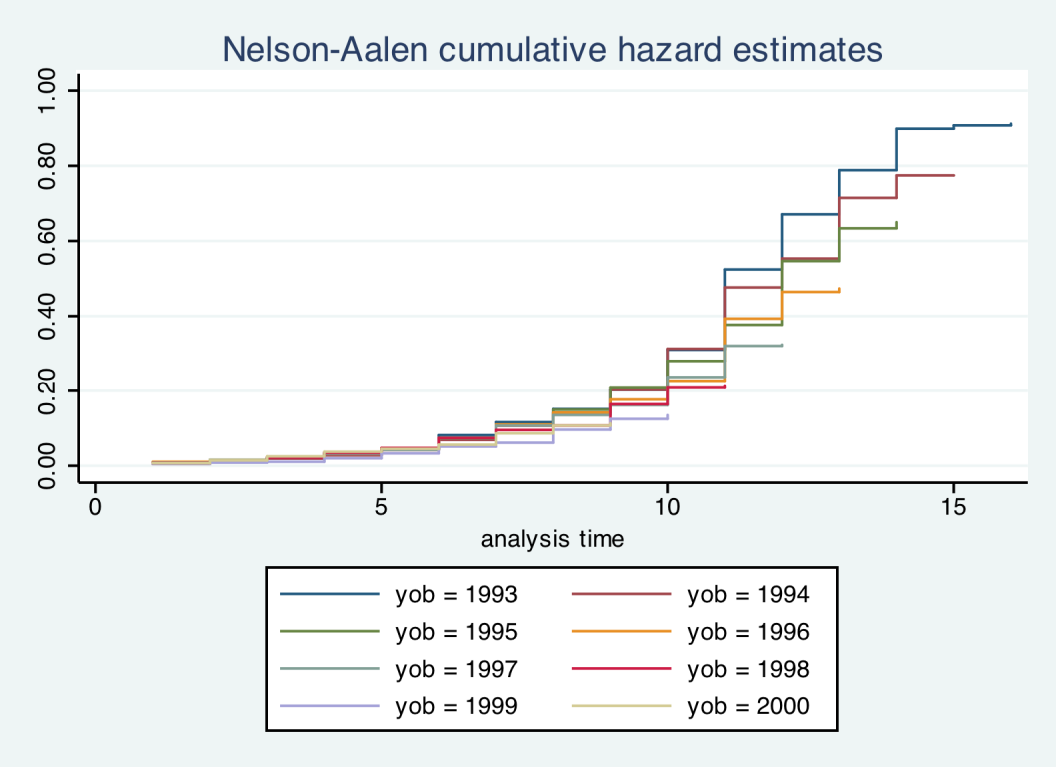

Figure 2. Estimated Failure Rate by birth cohort

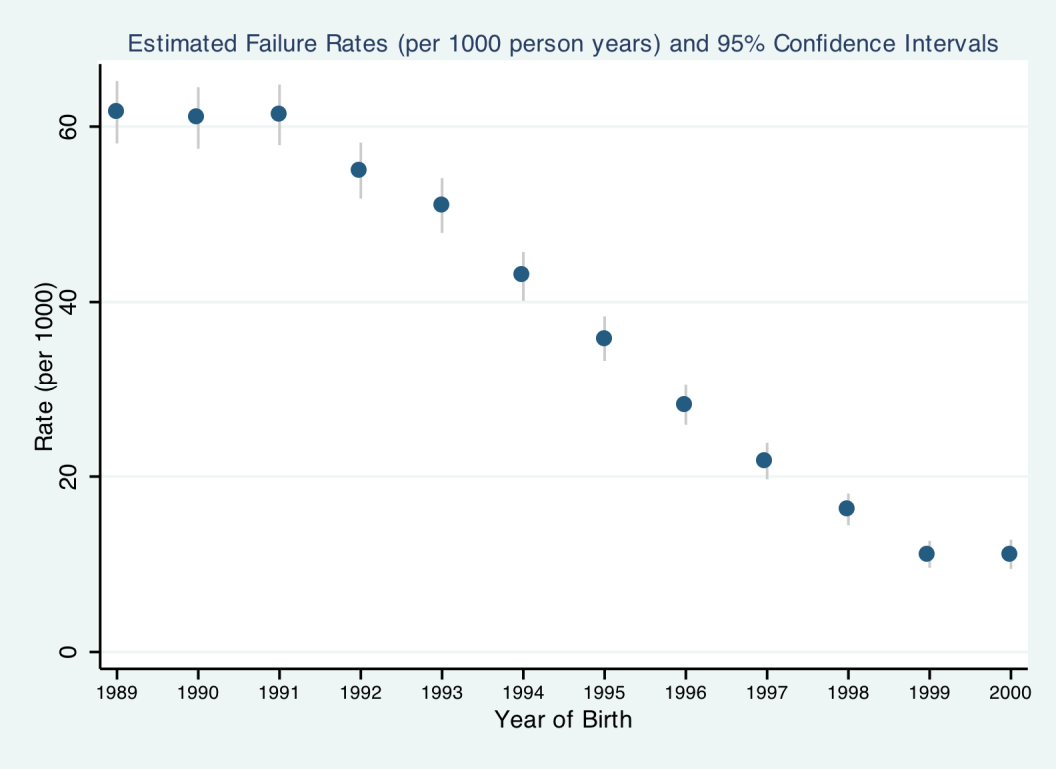

Table 1. Sample summary statistics (N=21,240)

		Mean	SD
	Daughter characteristics		
	Age	11.25	3.66
	Age at circumcision	8.32	3.60
	First born	0.262	0.440
	Second born	0.236	0.425
	Third born	0.183	0.387
	Fourth born & higher	0.319	0.466
	Mother characteristics		
	Year of birth	1969.50	6.12
	Circumcised	0.960	0.196
Path 3	Husband age difference	7.171	4.965
	Age at first marriage	18.68	3.96
Path 1	Works	0.224	0.417
Path 1	No education	0.424	0.494
Path 1	Incomplete primary	0.163	0.370
Path 1	Complete primary	0.342	0.475
Path 1	Complete secondary	0.070	0.255
Path 2	Media exposure index	0.984	0.702
Path 3	Empowerment index	2.89	1.26
	Household characteristics		
Path 3	Female household head	0.011	0.102
Path 1	Lowest wealth quintile	0.259	0.438
Path1	Highest wealth quintile	0.177	0.381
	Upper governorates	0.143	0.350
	Lower Egypt urban	0.084	0.277
	Lower Egypt rural	0.234	0.423
	Upper Egypt urban	0.123	0.329
	Upper Egypt rural	0.360	0.480
	Frontier governorates	0.056	0.230

Table 2. Cox proportional hazard model of girls' age to circumcision.

		(1)	(2)	(3)	(4)
Daughter characteristics					
	Birth Order (omitted fourth-born+)				
	First born	1.40587***	1.40990***	0.99293	0.81878***
		[0.06]	[0.063]	[0.091]	[0.042]
	Second born	1.37054***	1.39822***	1.14249	0.92482
		[0.052]	[0.057]	[0.089]	[0.041]
	Third born	1.22266***	1.21317***	1.046	0.93825
		[0.041]	[0.043]	[0.07]	[0.034]
Mother characteristics					
	Year of birth	0.95205***	0.96023***	0.98925	1.00865
		[0.003]	[0.004]	[0.007]	[0.005]
	Circumcised	21.05221***	5.39202***	4.28329***	5.32987***
		[6.448]	[1.62]	[1.459]	[1.594]
P3	Husband age difference	1.00598**	0.99526	0.99345	0.99428
		[0.003]	[0.003]	[0.005]	[0.003]
	Age at first marriage	0.96292***	0.94787***	0.96473***	0.98643**
		[0.005]	[0.005]	[0.009]	[0.006]
P1	Works	0.74441***	0.93058	0.89994	0.92305
		[0.028]	[0.039]	[0.062]	[0.038]
P1	Education (omitted Complete Secondary)				
	No education	1.56090***	1.45848***	1.49997***	1.41868***
		[0.151]	[0.156]	[0.228]	[0.150]
	Incomplete primary	1.50590***	1.43949***	1.55033***	1.39521***
		[0.149]	[0.154]	[0.242]	[0.149]
	Complete primary	1.44501***	1.27158**	1.39808**	1.25953**
		[0.13]	[0.127]	[0.193]	[0.124]
P2	Media exposure index	0.93212***	0.90371***	0.94509	0.91004***
		[0.021]	[0.021]	[0.036]	[0.021]
P3	Empowerment index	0.95528***	1.00911	0.99806	1.00982
		[0.012]	[0.012]	[0.019]	[0.012]
Household characteristics					
P3	Female household head	0.96774	1.04611	1.01058	0.98375
		[0.107]	[0.123]	[0.21]	[0.121]
	Wealth (omitted Q2-Q4)				
P1	Lowest wealth quintile	0.76343***	0.95308	0.92821	0.96366
		[0.03]	[0.036]	[0.057]	[0.037]
P1	Highest wealth quintile	0.71897***	0.87051**	0.86538	0.86770**
		[0.044]	[0.056]	[0.093]	[0.057]
Time Varying Birth Cohort					0.94570***
					[0.003]
Governorates FE in model		YES	N/A	N/A	N/A
Community in Baseline Hazard		NO	YES	YES	YES
Birth Cohort Modeled as Time Varying		NO	NO	NO	YES
Birth Cohort in Baseline Hazard		NO	NO	YES	NO
PASS PH Assumptions		NO	NO	YES	YES
Observations		21240	21240	21240	21240

Robust and clustered SE in parentheses *** p<0.01, ** p<0.05