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Associations between female genital mutilation/cutting and early/child marriage: A multi-country DHS/MICS analysis

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Evidence to
End FGM/C



Research to Help Girls and Women Thrive

ASSOCIATIONS BETWEEN FGM/C
AND EARLY/CHILD MARRIAGE:
A MULTI-COUNTRY
DHS / MICS ANALYSIS

January 2020



ASSOCIATIONS BETWEEN FGM/C AND EARLY/CHILD MARRIAGE: A MULTI-COUNTRY DHS / MICS ANALYSIS

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January 2020

Evidence to End FGM/C: Research to Help Girls and Women Thrive generates evidence to inform and influence investments, policies, and programmes for ending female genital mutilation/cutting in different contexts. Evidence to End FGM/C is led by the Population Council, Nairobi in partnership with the Africa Coordinating Centre for the Abandonment of Female Genital Mutilation/Cutting (ACCAF), Kenya; the Gender and Reproductive Health & Rights Resource Center (GRACE), Sudan; the Global Research and Advocacy Group (GRAG), Senegal; Population Council, Nigeria; Population Council, Egypt; Population Council, Ethiopia; MannionDaniels, Ltd. (MD); Population Reference Bureau (PRB); University of California, San Diego (Dr Gerry Mackie); and University of Washington, Seattle (Prof Bettina Shell-Duncan).



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List of Acronyms

DFID	Department of International Development
DHS	Demographic Health Survey
FGM/C	Female Genital Mutilation/Cutting
ECM	Early/Child Marriage
GBV	Gender-based Violence
HIV	Human Immunodeficiency Virus
ICC	Intra-Cluster Correlation Coefficient
MICS	Multiple Indicator Cluster Survey
NGO	Non-Governmental Organisation
UN	United Nations
UK	United Kingdom
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organisation

Executive Summary

Over the last several decades, global efforts to end female genital mutilation/cutting (FGM/C) have intensified, through the combined efforts of international and non-governmental organisations (NGOs), governments, and religious and civil society groups. Evidence of the wider impacts of FGM/C and interventions for its abandonment is small but emerging. The practice of FGM/C has been frequently linked to a girl's marriageability and is thought to be associated with child marriage, either directly, as a cause of early/child marriage, or vice versa, or indirectly, resulting from common causes. Evidence of the relationships between these two practices, to inform programming and policy for abandonment interventions, is limited at best, however. This study 1) investigates the relationship between FGM/C and early/child marriage; 2) investigates the possible correlates of early/child marriage; 3) compares FGM/C practice across the region; and, 4) examines the correlates for FGM/C.

Methods

Using available literature, a conceptual framework of the direct and indirect plausible associations between the two practices was developed (Figure 1, page 3). This framework informed a secondary analysis of cross-sectional data from the Demographic and Health Surveys and Multiple Indicator Cluster Surveys in 10 sub-Saharan African countries.

Findings

The prevalence of FGM/C was considerably higher than the prevalence of early/child marriage in Burkina Faso, Egypt, Ethiopia, Gambia, and Sierra Leone, while 20 to 24 year old women in Kenya, Nigeria, and Senegal reported a higher proportion of early/child marriage than FGM/C. There were sub-national and ethnic variations in the prevalence of FGM/C and early/child marriage. FGM/C is associated with early/child marriage in every country assessed except Ethiopia, The Gambia, Sudan, and Somaliland. Associations between early/child marriage and FGM/C vary by country, along with predictors for each. In the adjusted analysis, the association between FGM/C and early/child marriage was only significant in Senegal. In the unadjusted model, Senegalese women who were cut were 2.17 times more likely to have experienced early/child marriage than those not cut. The odds of experiencing early/child marriage among cut women compared to uncut women reduced to 1.40 in the adjusted model. Except for Kenya and Sierra Leone, where 17 percent and 15 percent of respondents, respectively, reported FGM/C and early/child marriage at about same time, over 90 percent of respondents in the other countries reported early/child marriage after FGM/C. These results suggest that FGM/C could be a pre-requisite for early/child marriage in most countries.

Discussion

While FGM/C and early/child marriage may be sustained by similar norms, sub-national and ethnic variations and varying trends in the practice call for national mappings to better describe specific factors, for more focused, targeted, and contextualised interventions. Further qualitative research is required to explore why some communities are abandoning one practice while sustaining the other.

Introduction

Background

Female genital mutilation/cutting (FGM/C) and early/child marriage, which is defined as marriage before the age of 18 years (UNFPA 2012), are prevalent in sub-Saharan Africa. The practice of FGM/C has affected an estimated 200 million women in 30 countries, 28 of which are in Africa, and up to 30 million girls are at risk of being cut in the next decade (UNICEF 2016a). In many African countries where national data on FGM/C prevalence are available, early/child marriage is also practised. Thirty countries in sub-Saharan Africa have a child marriage prevalence rate of 30 percent or more (UNFPA 2012). Civil war, poverty, weak legislation and enforcement, harmful traditional practices, gender discrimination, and a lack of alternative opportunities for girls (especially in education) are all postulated as drivers of child marriage (World Vision UK 2013). The shift in FGM/C's execution, from adolescence to childhood (Koski et al 2017), and its potential implications—as a result of FGM/C's association with child marriage—are therefore of interest.

Annually, an estimated 15 million girls marry before the age of 18, and without interventions to stop early/child marriage, the number of girls married before age 18 will rise from the current 720 million to 1.2 billion by 2050 (UNFPA 2014). Child marriage is most common in Asia, Africa, and some Middle Eastern countries. In South Asia, almost half (46%) of girls are married by the age of 18, and the figure is only slightly lower in west and central Africa (41%). By contrast less than five percent of boys marry between 15 and 19 years of age in the two regions (Raj et al 2009). Some countries do not have a minimum marriage age. Furthermore, definitions of childhood vary by country and existing laws, and depend upon culture (World Vision UK 2013). In some countries children are referred to as those younger than 15 years of age, while in others a child is younger than 18 or 21 years. Some texts will refer to child marriage as underage marriage. Child marriages tend to lack consent, and hence some texts refer to it as a forced or arranged marriage (Raja et al 2010, Singh & Vennam 2016). This review employs the term early/child marriage.

Although child marriages may affect both boys and girls, the practice disproportionately endangers the lives of young girls. There is increasing awareness and evidence that child marriage compromises the health and well-being of girls. Poor health outcomes stem from early pregnancy, associated with pregnancy complications and even death (Patton et al 2009), when correlated with a girl's physical immaturity. Other effects of child marriage include greater risk of sexually transmitted infections (STIs, Koski et al 2017) and fewer educational and long-term economic opportunities (Alemu 2006, Avalos et al 2015).

FGM/C and early/child marriage, as social practices, are often influenced and even entrenched by the consolidation of family interests, in maintaining honour, by preserving virginity before marriage, enhancing fidelity within marriage, along with the social integration of the girl and family, in addition to financial security in situations of poverty, with girls from poor families married to ensure their financial security (Boyden et al 2012). As social practices, FGM/C and early/child marriage may operate alone, or in combination or collectively, and at different levels (Mackie and Le Jeune 2009). Over time, several programmatic interventions have sought to reduce the harms associated with FGM/C and early/child marriage, but the effectiveness and impacts of these interventions remain unclear, necessitating the current review of existing evidence. At present, there is remarkably little rigorous research on the relationship between FGM/C and early/child marriage in different contexts. This evidence is needed to not only inform factual understanding of the persistence and shifts in both practices, but necessary elements for transformative actions to accelerate the abandonment of each.

First, a literature review, based upon the *How To Note: Assessing the Strength of Evidence* (DfID 2014) reported on six studies of low to moderate quality evidence, primarily observational and qualitative, with plausible associations between FGM/C and early/child marriage (Karumbi et al 2017). The review criteria stipulated studies of: 1) the association of FGMC and early/child marriage, in any setting (low-, middle-, high income) and 2) common causes for FGM/C and early/child marriage. Studies were not excluded due to design, but studies in a language other than English, and those reporting on the consequences of FGM/C or child marriage alone, were excluded.

Three studies in Somaliland (World Vision UK 2013, 2014) and Ethiopia (Boyden 2013) show direct association between the two practices—with FGM/C transitioning a girl from childhood to “adulthood”, which then leads to child marriage. All included studies report indirect association between the two practices. This is based on the similarity of causes, or underlying drivers, behind each. Such as the need to secure a girl’s financially stable future—circumcised girls are easily married and often fetch a higher bride price—and social cultural norms and beliefs—the need to maintain chastity and virginity among girls and make them more submissive to males. The negative consequences of child marriage and FGM/C are also similar, including maternal and neonatal deaths, birth complications, stigmatisation and social isolation, and domestic or intimate partner abuse, among others.

Objectives of the Statistical Analysis

The literature review sought to answer the question ‘What is the available rigorous evidence on the association between FGM/C and early/child marriage?’ The second phase of this work draws upon the literature review to further strengthen the evidence, by:

1. Using the reviewed evidence and literature of FGM/C and early/child marriage associations to inform statistical analysis with Demographic and Health Survey (DHS) and Multiple Indicator Cluster Survey (MICS) data;
2. Multi-country multivariate analyses of associations between FGM/C and early/child marriage and other possible correlates of early/child marriage by:
 - a. Investigating the relationship between FGM/C and early/child marriage
 - b. Investigating the possible correlates of early/child marriage
 - c. Making comparisons of FGM/C practice across countries, and
 - d. Examining the correlates of FGM/C;
3. Integrating the findings from the literature review and multi-county survey data analyses for a more rigorous and substantive evidence base.

This study utilises the latest DHS or MICS dataset from each country in the *Evidence to End FGM/C* research programme—Egypt, Ethiopia, Kenya, Nigeria, Senegal, Sudan, and Somalia (Somaliland)—with three additional countries—Burkina Faso, The Gambia, and Sierra Leone.

Table 1. Available data for women ages 15 to 49 and 20 to 24, by survey, source, and year

Data Available	DHS/MICS year	Women ages 20 to 24 (n)	Women ages 15 to 49 (n)
Burkina Faso	2010	3,282	16,994
Egypt	2014	3,055	21,762
Ethiopia	2005	2,547	14,739
Gambia	2013	2,094	10,124
Kenya	2014	2,691	14,739
Nigeria	2014	6,757	38,948
Senegal	2014	3,220	15,688
Sierra Leone	2013	2,683	16,658
Somalia [¥] (Somaliland)	2011	1,136	5,778
Sudan [¥]	2014	3,101	17,902

[¥] Data source = MICS

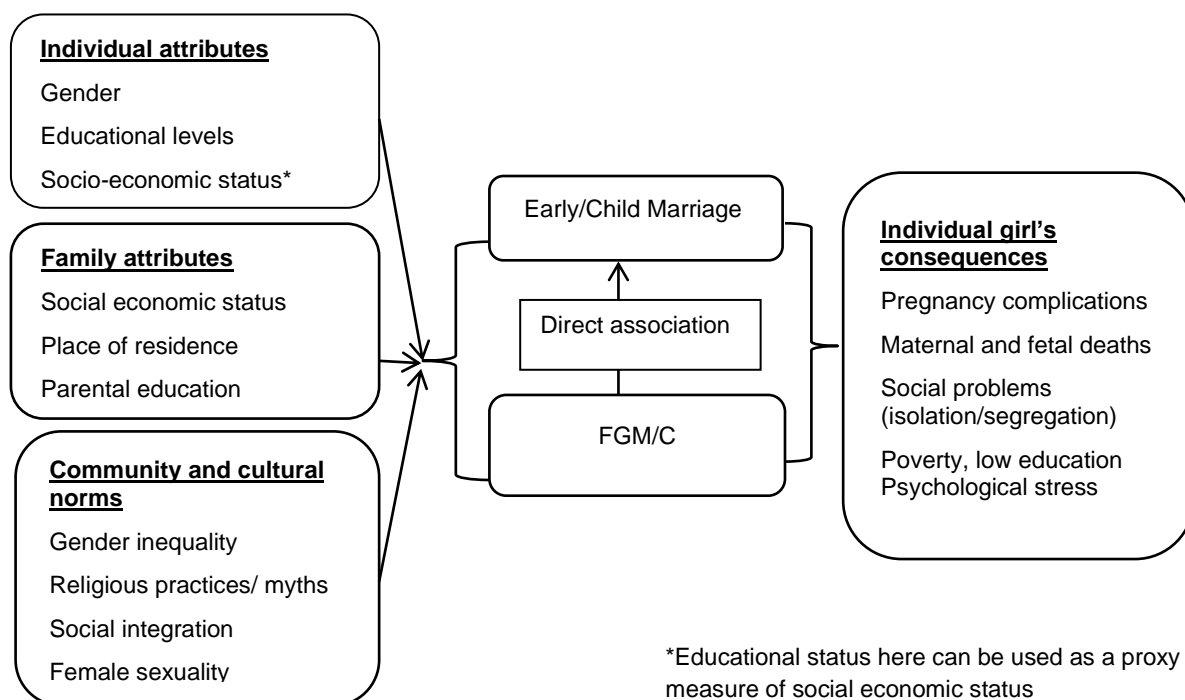
The DHS and MICS *Women's Questionnaires* have a series of questions on FGM/C and early/child marriage practice and attitudes. Female respondents are asked whether female circumcision is practised in their community, whether the respondent herself is circumcised, and if so, about various aspects of her circumcision. Attitudinal questions were also asked about whether and why FGM/C should be continued or discontinued, reasons the practice is beneficial, and whether it is required by religion or community. The main question about early/child marriage for this analysis was the age at which the female respondent entered a union, coded as “yes” for cohabitating, currently married, or ever married before the age of 18, and “no” for those who were never married.

Methods

Design

This study is a secondary analysis of cross-sectional data. The literature review by Karumbi et al informed the variables of analysis for the selected 10 countries' DHS and MICS datasets. Although this analysis was informed by the conceptual framework (Figure 1), it was limited to quantitative aspects, as DHS does not report qualitative data that would help explore community and cultural norms.

Figure 1. Conceptual mapping of causes and consequences of FGM/C and early/child marriage



Data Sources

For the primary analysis, we considered the most recent nationally representative DHS or MICS dataset from each country. Demographic and Health Surveys are a well-established source of reliable population data, with a substantial focus on health, that are national in scope, employing a cross-sectional design with a two-stage stratified random sampling design. Details of the sampling design and data collection procedures for each survey are available in individual country DHS and MICS reports. (Each survey's design, organisation, sample size and sampling design, questionnaires, and implementation can be found at <http://dhsprogram.com/What-We-Do/index.cfm>). The questions of interest focused on socio-demographic factors (woman's age, ethnicity, education, urban or rural residence, religion, and wealth index as measure of socio-economic status), and those in the FGM/C module as well as those related to early/child marriage. (FGM/C module and early/child marriage questions for this analysis are described in Appendix 1.) This analysis focused on the woman's questionnaire, limited to women selected for the FGM/C module who reported ever hearing about FGM/C. Available data from each country are listed in Table 1.

Variables of Interest

The dependent variable of this analysis is early/child marriage, for which prevalence is defined as the percentage of women in the 20 to 24 year age group who were first married or in union (living with a man) before they were age 18 (UNICEF 2016). Early/child marriage was dichotomised into "yes" or "no" for respondents whose age of cohabitation or marriage was documented. Women who were not married were also included in the total population analysed but categorised with no early marriage. Those identified as having an early/child marriage were further categorised to identify the common age group of occurrence: under age 15 or 15 to 17. Similarly, age at first sex was categorised as under 15, 15 to 17, 18 to 24, or older than 25. To explore for the spousal age gap, the difference between the woman's current age and her husband's age at her last birthday

was calculated (husband's age at marriage was not available); it was assumed that the current husband was the one with whom the woman had an early/child marriage. Spousal age differences were then categorised as: younger (by more than 3 years), about same age (about 3 years difference), older by four to 10 years, and older by more than 11 years.

Statistical Analysis

Descriptive analysis

The dependent variable in this analysis is an experience of early/child marriage, defined as the percentage of women in the 20 to 24 year old age group who were married or in a union before the age of 18 years (UNICEF 2016). The prevalence of early/child marriage in the 15 to 19 age group is also reported to represent current practice, although these estimates may be biased, as some women in this group are still at risk of early/child marriage. To represent earlier early/child marriages, estimates for the 25 to 49 age group are also reported.

The primary independent variable of this analysis is FGM/C. Additional independent variables were based on the literature that informed the conceptual mapping (Figure 1) and available variables in the DHS and MICS datasets, such as woman's age, ethnicity, education, region of residence, urban or rural residence, religion, and wealth index, as measures of socio-economic status. FGM/C independent variables are FGM/C type and age at cutting. Independent early/child marriage variables are age at marriage, additional wives (with the same husband), and a woman's rank among several wives. For each independent variable, early/child marriage prevalence is reported.

Regional and ethnic variations, and their associations with early/child marriage and FGM/C, were explored. Each was separately cross-tabulated, by region and ethnicity. Prevalence levels from countries with greatest heterogeneity and homogeneity are reported to illustrate the dynamism in the practice in different settings and groups.

Basic frequencies, cross tabulations, and corresponding numbers of respondents in each category are reported for each country. 'Row' percentages illustrate how early/child marriage varies in each category of independent variables, by country. To ensure nationally representative data, survey weights using weights pre-generated in DHS and MICS datasets were applied using STATA *svy* commands. Because weights are computed for each survey dataset, each country dataset was analysed separately.

Bivariate analysis

The associations between early/child marriage and FGM/C were tested for significance of proportion differences using a chi-square test for association. Proportions with 95 percent confidence intervals (CIs) are reported for each category of FGM/C (cut/uncut). To estimate the magnitude and direction of effect of association, country-specific, univariable hierarchical models were built using the approaches described.

Multivariate analysis

To explore the covariates of early/child marriage and their associations with FGM/C, multilevel logistic models were applied to each country dataset. DHS data have a hierarchical structure, with individuals nested in clusters, then nested in regions. In this analysis, regions constitute the highest (third) level, while regional clusters (primary sampling units) are the second. Data from Somaliland and Sudan MICS surveys have a different data structure and variables. While these models are presented together, MICS data have only two levels, with individuals nested in clusters, and some variables—age at sex, religion, partner's education—missing and thus not computed.

In all analyses, including the bivariate analyses, clustering and hierarchical data were accounted for by including random effects of clusters nested in regions nested in countries. *XTMELOGIT* in Stata version 13 for binary outcomes was used for modelling. Crude and adjusted odds ratios with accompanying 95 percent CIs are reported for each country.

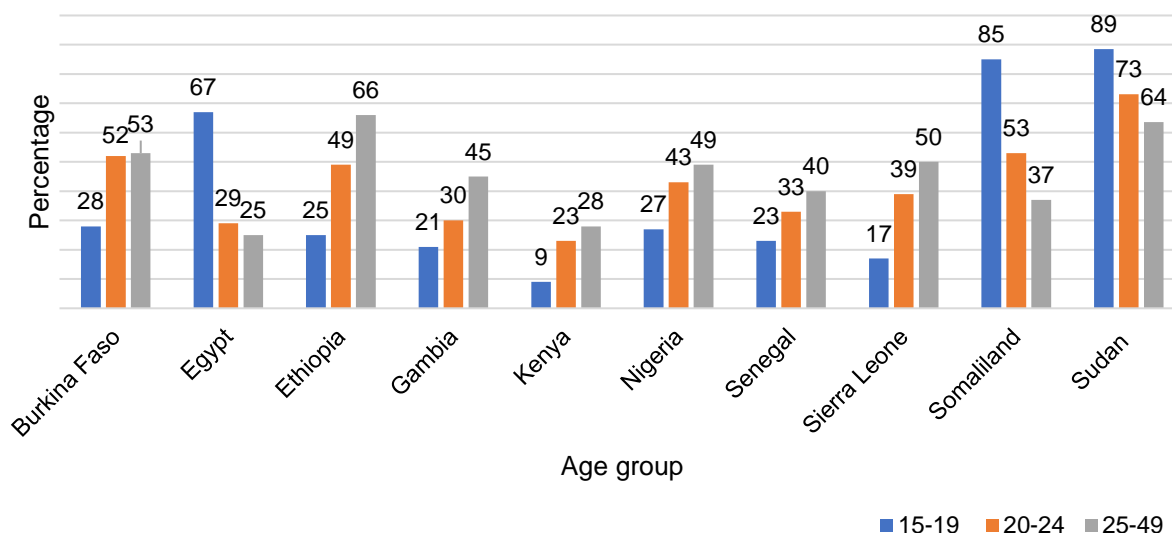
Findings

This section presents the descriptive profile of the data on early/child marriage with key bivariate and multivariate associations, utilising the most recent national DHS and MICS data.

Prevalence of Early/Child Marriage

Although the estimates in the 15 to 19 age group may be biased, as some of those women could still be at risk of early/child marriage, the prevalence of early/child marriage by age group suggests a decline in most countries (Figure 2). The practice seems to be increasing, however, in Egypt, Sudan, and Somaliland.

Figure 2. Prevalence of early/child marriage for women ages 15 to 19, 20 to 24, and 25 to 49



The sample in the Egypt DHS was restricted to ever-married women

Prevalence of early/child marriage and background characteristics

Although prevalence varies by country, within countries various background characteristics and trends are similar for different age groups (15 to 19, 20 to 24, 25 to 49). The results are reported for the 20 to 24 age group as consistent with early/child marriage reporting. Results for the other age groups are briefly described.

Except in Kenya, a greater proportion of women 15 to 19 years of age who reported early/child marriage lived in rural areas. As with trends in the 20 to 24 age group, less educated and poor women have higher rates of early/child marriage. Although the prevalences of FGM/C and early/child marriage may be biased downwards, as many of those girls could still be at risk, there are striking differences between Burkina Faso, Sierra Leone, The Gambia, and Ethiopia, where FGM/C prevalences are higher (Appendix 2).

In the 25 to 49 age cohort, early/child marriage is much higher among rural women with only primary education, or none at all, and highest among women from the lowest wealth quintiles

(poorest and poor), consistently in all countries except Somaliland and Sudan. The prevalence of early/child marriage is consistently higher among women who reported FGM/C (Appendix 3).

Prevalence of early/child marriage among women ages 20 to 24 years

The prevalence of early/child marriage among women ages 20 to 24 years (Table 2) varied greatly by country—with the highest in Sudan (58.3%) and lowest in Kenya (22.9%). It was consistently higher among rural women and Muslims. Most women who reported an early/child marriage had either only a primary education or none at all. This was consistent for all countries. Early/child marriage prevalence decreased with increases in wealth quintile, poorest to richest, except in Ethiopia, where an increase was observed in the richest category. Ethiopia had the highest prevalence of early/child marriage within the richest category (29.9%) while Kenya had the lowest (10.6%). Most 20 to 24 year old women reporting early/child marriage reported being 15 to 17 years of age when first married (Figure 3).

Figure 3. Percent distribution of women ages 20 to 24 who reported early/child marriage, by age at first marriage

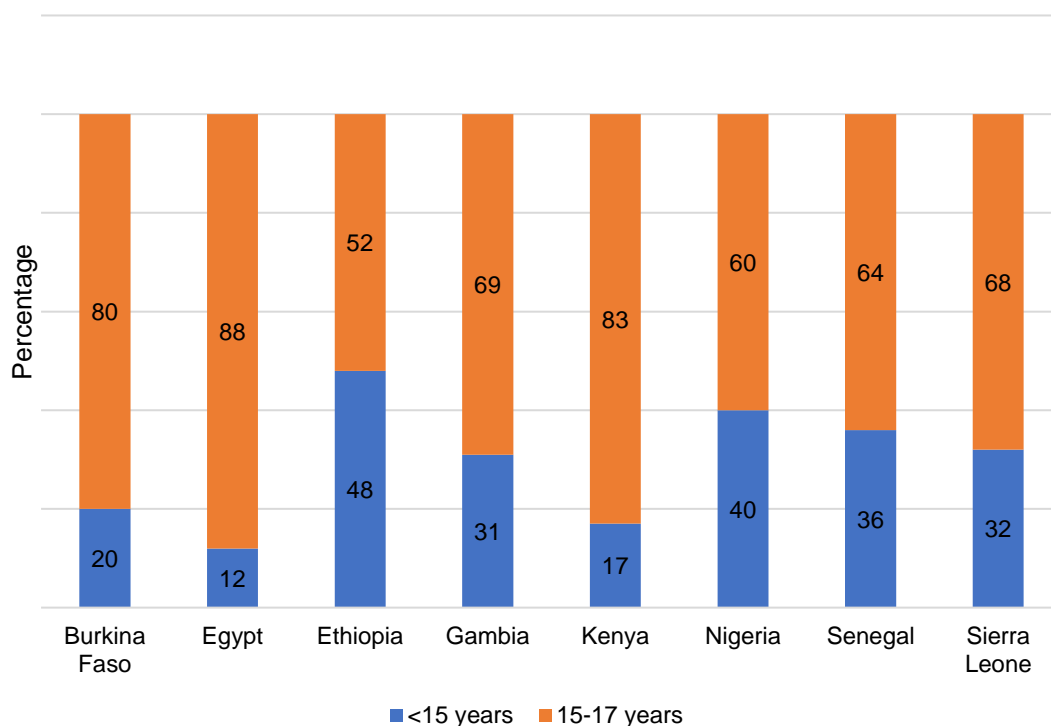


Table 2. Prevalence of early/child marriage among women ages 20 to 24, by background characteristics and country

	Burkina Faso		Egypt		Ethiopia		Gambia		Kenya		Nigeria		Senegal		Sierra Leone		Somaliland		Sudan	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n
Early/Child Marriage																				
Yes	51.7	3,282	28.5	3,055	49.2	2,547	30.3	2,094	22.9	2,691	42.8	6,757	32.9	3,220	38.9	2,683	52.9	511	58.3	1,823
Type of place of residence																				
urban	27.4	1,014	20.7	741	27.2	539	19.8	1,250	15.9	1,297	21.2	2,790	16.9	1,631	23.7	1,145				
rural	62.5	2,269	31	2,314	55.2	2,008	45.8	845	29.4	1,394	58	3,967	49.3	1,589	50.2	1,539				
Religion																				
Christian	39.8	995	11	101	47.1	1,783	3.8	74	21.6	2,472	18.5	3,136	14.2	123	25.2	640				
Muslim	56	2,075	29.1	2,948	53.6	714	31.3	2,015	36.6	160	64	3,547	33.5	3,085	43.5	2,014				
other	65.9	208		5	65	50	n/a	n/a	42.2	59	51	40	76	11	21.1	11				
Missing	51.2	5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	61.7	34	n/a	n/a	29.3	17				
Education																				
no education	63.3	2,202	51.2	351	62.3	1,533	55.1	670	63.6	143	80	2,278	48.1	1,711	56.7	1,087	56.1	376	73.2	632
primary	39.7	526	41.5	199	39.6	573	47.2	244	37.7	1,109	57.8	853	26	722	54	417	48.4	100	61.6	694
secondary	15.6	506	28.2	2,124	17.3	387	15	987	10.1	1,061	18.7	2,958	6.9	702	18.7	1,029	31.5	35	39.3	385
higher	27.9	44	2.1	381	9	53	1.1	193	0.1	378	3.5	668	n/a	85	7.1	150	n/a	n/a	19	112
Don't know	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Wealth index																				
poorest	67.1	451	38	483	61.3	389	42.1	291	44.7	386	82	1,091	65.9	512	57.1	437	73.8	94	67.8	374
poorer	65.1	596	40.4	573	59.5	479	44.2	377	33.8	485	66.6	1,340	46.1	568	50.8	413	55.5	112	69.4	440
middle	61	638	29.4	896	55.6	508	34.9	356	24.2	455	39.2	1,403	32.1	598	49.7	451	59.1	121	54.8	356
richer	54.8	640	20.6	713	52.2	440	31.3	455	15.2	568	25.8	1,477	22.2	717	35.7	580	43.3	97	54.5	421
richest	27.7	958	11.3	391	29.9	731	12.9	616	10.6	797	12.1	1,447	13.2	825	19.2	803	29.2	87	34.2	232

n/a: represents where estimates could not be computed due to very small denominators (<5) or category was included in the dataset

Sub-National and Ethnic Variations in Early/Child Marriage and FGM/C Prevalence

Prevalences in FGM/C and early/child marriage reveal sub-national and ethnic variations. While FGM/C and early/child marriage may be bound by similar social norms, they do not necessarily follow the same trends (Table 3). Kenya's North-Eastern region had the highest prevalence of FGM/C and early/child marriage, at 96.9 percent and 39 percent, respectively. Similar congruent findings are observed for the Maasai and Samburu ethnicities, which have the highest prevalences for both. By contrast, Kenya's Western region had the lowest prevalence of FGM/C (0.7%), but a relatively high prevalence of early/child marriage (27.6%). Similar contrasts were observed among the Luo, Luhya, and Turkana ethnic groups, which have high early/child marriage and low FGM/C prevalences. In Sierra Leone, FGM/C and early/child marriage seem to be uniform, both regionally and within ethnic sub-groups. The Creole ethnic group and Western region are the exception with significantly lower rates.

Table 3. Prevalence of FGM/C and early/child marriage by region and ethnicity in two selected countries among women ages 20 to 24

		Early/Child Marriage		FGM/C		Both FGM/C and Early Marriage		
		%	Number	%	Number	%	Number	
KENYA	Region							
	Coast	23.1	279	5.6	279	62.6	16	
	North Eastern	39.0	42	96.9	42	39.3	40	
	Eastern	20.5	321	18.7	321	33.4	60	
	Central	15.7	273	5.8	273	43.0	16	
	Rift Valley	25.6	762	17.4	762	46.2	132	
	Western	27.6	275	0.7	275	68.1	2	
	Nyanza	31.5	334	30.2	334	25.5	101	
	Nairobi	12.7	405	6.8	405	9.8	27	
		Ethnicity						
		Embu	12.5	38	10.3	38	34.6	4
		Kalenjin	20.1	348	13.1	348	49.0	46
		Kamba	11.5	299	4.0	299	9.1	12
		Kikuyu	18.4	478	2.5	478	36.9	12
		Kisii	18.3	175	76.2	175	17.5	133
		Luhya	21.3	467	1.0	467	29.3	4
		Luo	30.7	309	0.3	309	58.8	1
		Maasai	44.1	58	78.5	58	51.2	45
		Meru	23.9	135	19.6	135	43.3	26
		Mijikenda/ Swahili	27.8	157	0.7	157	38.8	1
		Somali	41.4	49	93.8	49	43.3	46
		Taita/ Taveta	2.6	16	7.0	16	37.7	1
		Turkana	63.0	43	0.7	43		
		Samburu	54.8	16	98.4	16	54.0	15
		Pokomo	54.6	5	.	5	.	
		Iteso	18.6	31	.	31	.	
		Boran	40.2	12	.	12	40.2	12
		Gabbara	38.4	3	.	3	38.4	3
		Kuria	63.9	17	90.0	17	71.0	15
		Orma	80.0	4	.	4	80.0	4
	Mbere	33.8	5	69.0	5	33.6	3	
	Rendille	46.7	2	.	2	46.6	2	
	Other	16.5	24	30.1	24	44.0	7	

		Early/Child Marriage		FGM/C		Both FGM/C and Early Marriage	
		%	Number	%	Number	%	Number
SIERRA LEONE	Region						
	Eastern	46.7	537	90.6	537	49.3	486
	Northern	44.6	985	96.3	985	45.5	948
	Southern	44.8	507	90.2	507	47.1	457
	Western	19.5	655	69.8	655	25.4	458
	Ethnicity						
	Creole	4.3	39	27.6	39	15.5	11
	Fullah	32.2	89	89.9	89	34.6	80
	Kono	43.3	103	84.4	103	50.7	87
	Limba	23.6	166	83.6	166	24.9	139
	Loko	28.6	77	76.8	77	36.0	59
	Mandingo	23.1	70	79.8	70	21.6	56
	Mende	41.1	863	85.3	863	45.6	736
	Sherbro	33.0	72	78.5	72	40.9	56
	Temne	41.1	982	93.8	982	42.8	921
	Koranko	62.6	71	99.7	71	62.8	71
	Other Sierra Leone	43.6	127	89.3	127	47.2	113
	Other foreign	39.1	14	72.0	14	54.3	10
Missing	51.6	9	.	9	51.6	9	

Factors Associated with Early/Child Marriage

Table 4 (on the following page) summarises the proportions of women ages 20 to 24 in each country who reported early/child marriage, by various characteristics. The proportion of women reporting early/child marriage, among those currently married, ranges from 28 percent in Egypt to 70 percent in Ethiopia. At least 50 percent of those who reported sex at first union reported early/child marriage.

Table 4. Percent distribution among women ages 20 to 24 who reported early/child marriage, and age at marriage, first sex, and type of marriage

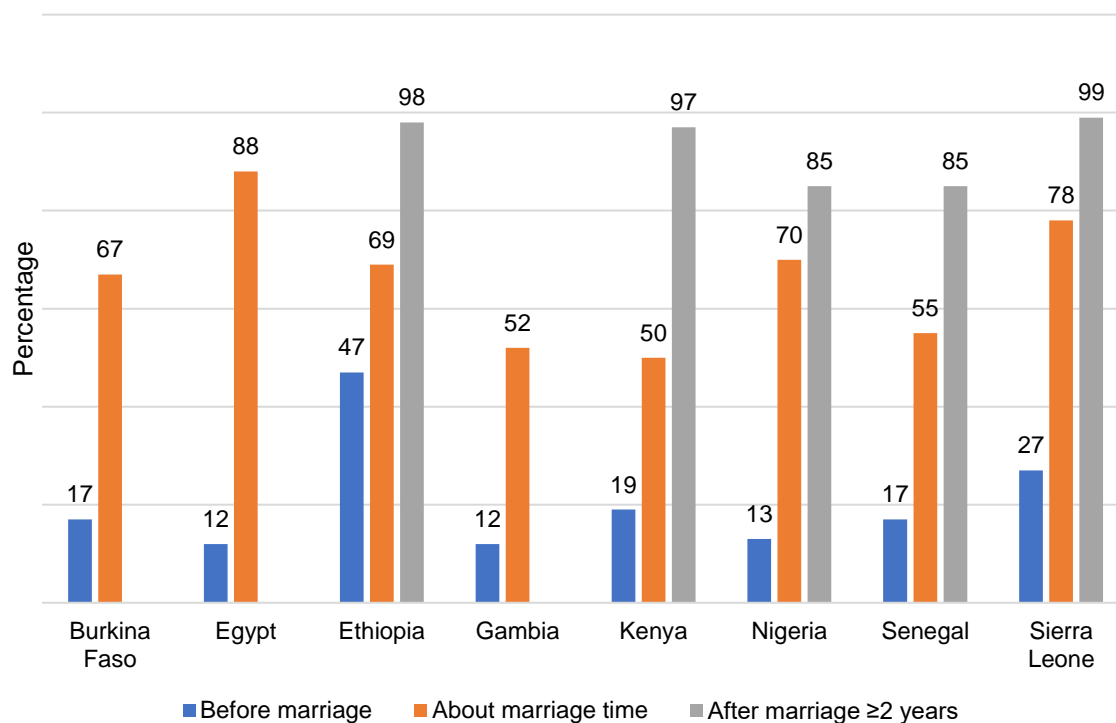
	Burkina Faso		Egypt		Ethiopia		Gambia		Kenya		Nigeria		Sierra Leone		Senegal	
	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number
Early/Child Marriage																
Yes	51.7	3,282	28.5	3,055	49.2	2,547	30.3	2,094	22.9	2,691	42.8	6,757	38.9	2,683	32.9	3,220
Currently or formerly in union																
currently in union	62	2,664	28.2	2,980	70.3	1,574	49.3	1,220	35.9	1,465	64	4,362	62.4	1,570	52.7	1,932
formerly in union	75	58	39.9	75	73.3	202	52.7	64	52.6	175	64.1	159	63.2	103	58.4	69
Other wives																
None	59.8	1,864	28.2	2,980	70.7	1,474	47.7	939	35.7	1,347	58.4	3,238	61	1,159	50.7	1,542
1	66.9	611	39.9	75	57.3	59	57.1	235	41.3	82	80.7	947	65.7	325	60	328
2	68.7	142	n/a	n/a	68.2	23	40.4	36	64.9	5	79.5	114	75.2	48	68.5	54
>=3	67	42	n/a	n/a	n/a	n/a	40.8	6	n/a	n/a	79.2	31	55.8	7	70.2	5
Don't know	n/a	n/a	n/a	n/a	53.7	5	n/a	n/a	n/a	n/a	78	22	75.8	11	n/a	n/a
Wife rank																
1	80.6	148	29.6	9	87.4	21	74.7	47	77.1	15	89.6	286	73.1	96	78.5	83
2	62.4	501	40.7	26	56.4	53	53.6	194	33.5	67	77	710	64.6	248	55.5	257
>=3	70.4	146	n/a	n/a	36.7	9	33.5	35	65.4	6	78.8	94	64.3	35	62.5	46
Don't know	n/a	n/a	n/a	n/a	42.2	6	49.5	4	n/a	n/a	78.5	23	75.8	11	n/a	n/a
Age at first sex																
<15	78.1	92	n/a	n/a	97.1	314	8.9	18	51.1	306	55	246	51.4	354	76.5	150
15-17	55.9	718	n/a	n/a	86.2	389	10.7	92	29.7	823	34.1	934	30.2	1,060	68.4	398
18-24	5.4	540	n/a	n/a	14.9	317	1.3	132	2.5	901	2.9	1,392	6.4	519	9.6	468
At first union	69.8	1,705	28.5	3,055	68.3	828	50.3	1,221	50.9	372	72.6	3,291	74.4	682	53.6	1,166
Total		3,282		3,055		2,547		2,094		2,691		6,757		2,683		3,220

n/a: represents where estimates could not be computed due to very small denominators (<5) or category was included in the dataset

First sex among women ages 20 to 24 years reporting early/child marriage

To explore whether early sexual debut leads to early marriage, a categorical variable was created to describe the timing of first sex (before marriage, about the time of marriage, two or more years after marriage) and computed the proportion of women reporting early/child marriage for each category (Figure 4). The proportion of women reporting early/child marriage among those who reported first having sex before marriage was highest in Ethiopia (47%) and lowest in Egypt and Gambia (12%). Nearly all women (≥ 97) in Ethiopia, Kenya, and Sierra Leone who reported their sexual debut as two or more years after marriage also reported early/child marriage.

Figure 4. Timing of first sex among women ages 20 to 24 reporting early/child marriage



Early/child marriage among women ages 20 to 24 years, by husband's attributes

Table 5 (following page) presents the percent distribution, by husband's attributes, of women aged 20 to 24 who reported early/child marriage. The proportion of women reporting early/child marriage was higher among those whose husbands had no formal, or only primary, education than among those whose husbands with secondary or higher education. The proportion of women reporting early/child marriage was lower among those whose husbands were about the same age, than among those whose husbands were older than them by three years or more.

Table 5. Percent distribution of women ages 20 to 24 who reported early/child marriage, by husband's attributes

	Burkina Faso		Egypt		Ethiopia		Gambia		Kenya		Nigeria		Senegal		Sierra Leone		Somaliland		Sudan	
	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number
Early/Child Marriage																				
Yes	51.7	3,282	28.5	3,055	49.2	2,547	30.3	2,094	22.9	2,691	42.8	6,757	32.9	3,220	38.9	2,683	52.9	511	58.3	1,823
Husband's education																				
No education	67.2	1,948	44.3	319	75.5	900	59.1	651	67.4	105	82.7	1,754	59.7	1,335	66.6	938				
Primary	54.8	447	38.6	324	66.6	591	48.8	65	47.5	760	66.2	723	44.6	252	68.8	156				
Secondary	44.8	264	27.4	1,981	64.7	249	41.0	418	29.0	561	49.2	1,514	33.8	160	54.7	450				
Higher	24.4	39	14.3	431	51.8	31	22.8	98	8.9	197	37.8	461	28.4	56	41.2	86				
Don't know	54.3	24	n/a	n/a	81.1	5	47.8	51	46.2	11	64.5	69	40.0	198	72.4	44				
Partner's age difference																				
Younger	n/a	n/a	41.3	9	.	5	n/a	n/a	n/a	n/a	n/a	n/a	61.1	26	78.9	6	n/a	n/a	n/a	n/a
About same age	48.4	360	18.2	678	57.9	334	21.6	53	21.0	396	49.0	414	33.1	125	56.0	233	34.0	112	50.9	185
Older 3 -10 yrs	61.0	1,340	28.3	1892	74.3	910	44.2	533	40.7	822	60.8	2,300	45.4	831	61.1	754	55.7	211	57.3	841
Older >=11 yrs	68.6	963	43.7	477	71.2	325	55.8	634	45.2	233	72.3	1,646	61.4	950	66.4	577	58.2	123	60.1	686
Total		3,282		3,055		2,547		2,094		2,691		6,757		3,220		2,683		511		1,823

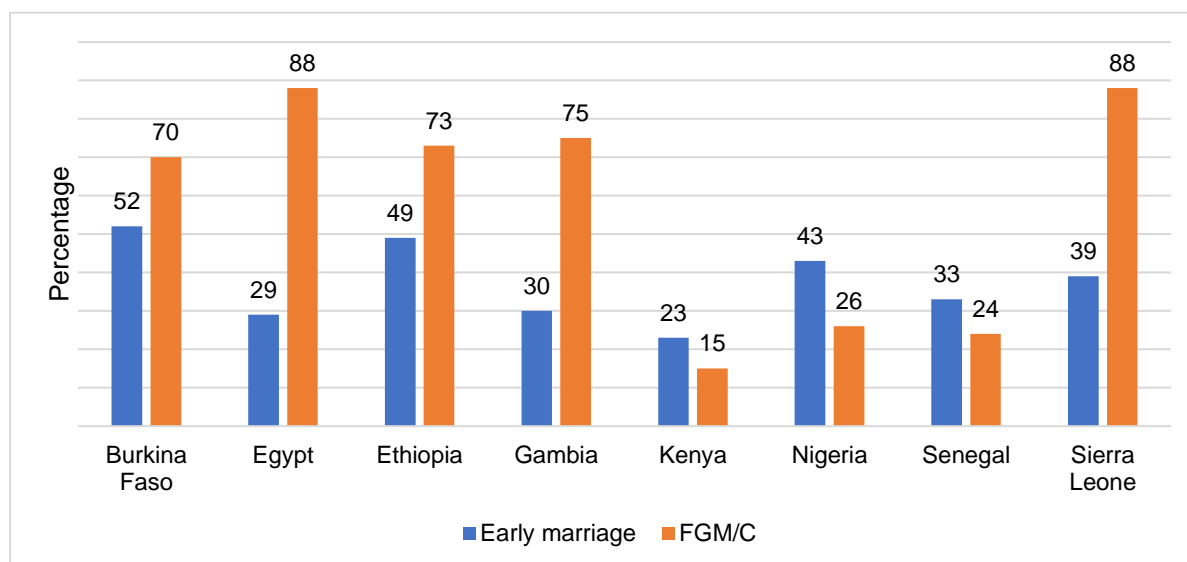
n/a: represents where estimates could not be computed due to very small denominators (<5) or category was included in the dataset

Associations Between FGM/C and Early/Child Marriage

Prevalence rates for early/child marriage and FGM/C in the 20 to 24 age group

Comparisons of FGM/C status and early/child marriage reveal great variations among countries (Figure 5). Prevalence of FGM/C was considerably greater than early/child marriage in Burkina Faso, Egypt, Ethiopia, Gambia, and Sierra Leone. In Kenya, Nigeria, and Senegal, a greater proportion of 20 to 24 year old women reported early/child marriage, compared to FGM/C.

Figure 5. Proportion of women ages 20 to 24 who reported early/child marriage and FGM/C



Prevalence of early/child marriage among cut and uncut women

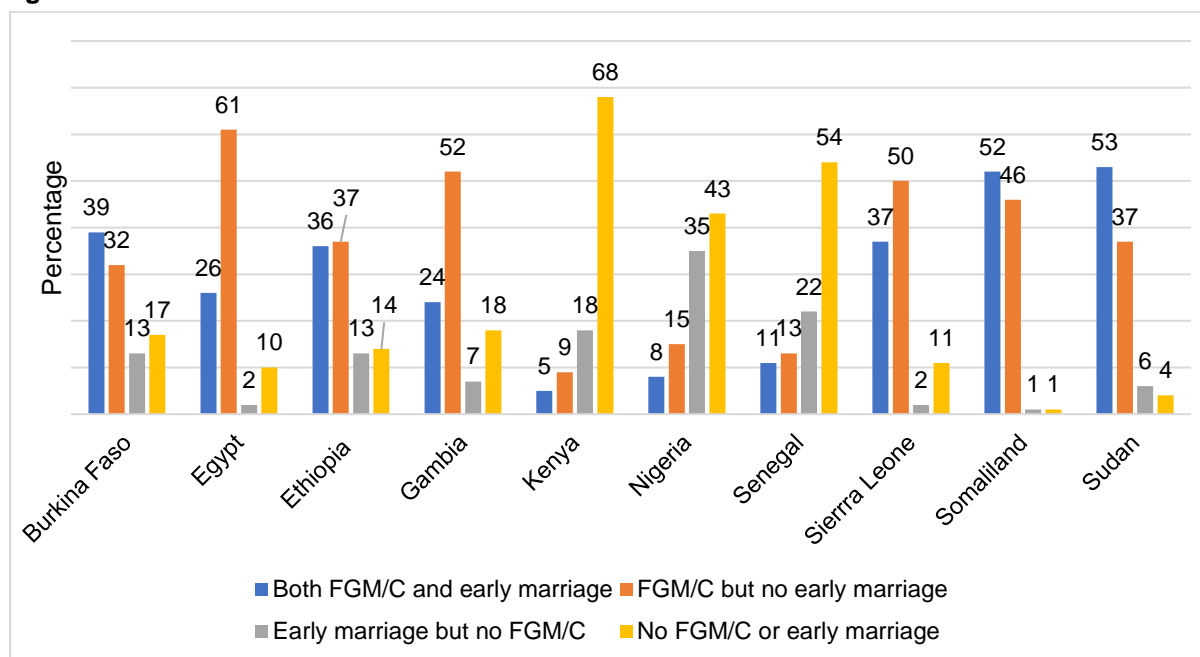
The proportions of women who were cut and had an early/child marriage were highest in Sudan (58.4%) and lowest in Egypt (29.9%). The difference in proportion between cut and uncut women with an early/child marriage was statistically significant in all countries except Ethiopia, Gambia, Somaliland, and Sudan (Table 6).

Table 6. Prevalence of early/child marriage among cut and uncut women ages 20 to 24

FGM/C	Cut	Uncut	Chi value	P Value
Burkina Faso	55.2 [52 - 58]	43.3 [39 - 48]	21.76	<0.001
Egypt	29.9 [28 - 32]	18.7 [14 - 24]	15.21	<0.001
Ethiopia	49.4 [46 - 53]	48.8 [42 - 55]	0.03	0.863
Gambia	31.3 [28 - 35]	27.4 [22 - 33]	1.26	0.262
Kenya	36.4 [31 - 42]	20.6 [18 - 23]	27.8	<0.001
Nigeria	35.0 [31 - 39]	44.8 [42 - 47]	7.19	<0.001
Senegal	46.6 [42 - 51]	28.5 [26 - 31]	47.34	<0.001
Sierra Leone	42.7 [40 - 46]	12.6 [8 - 19]	56.93	<0.001
Somaliland	53.2 [48 - 58]	38.5 [7 - 83]	0.58	0.445
Sudan	58.4 [55 - 62]	57.9 [47 - 69]	0.1	0.934

While over 50 percent of respondents in Kenya and Senegal did not experience either FGM/C or early/child marriage, less than five percent of respondents in Sudan and Somaliland experienced neither FGM/C nor early/child marriage (Table 6). In Somaliland, Sudan, Ethiopia, and Burkina Faso, where the prevalence of women experiencing both FGM/C and early/child marriage was highest, the proportion of women who had experienced FGM/C but not early/child marriage was the second highest sub-group, suggesting FGM/C could be a pre-requisite for early/child marriage (Figure 6).

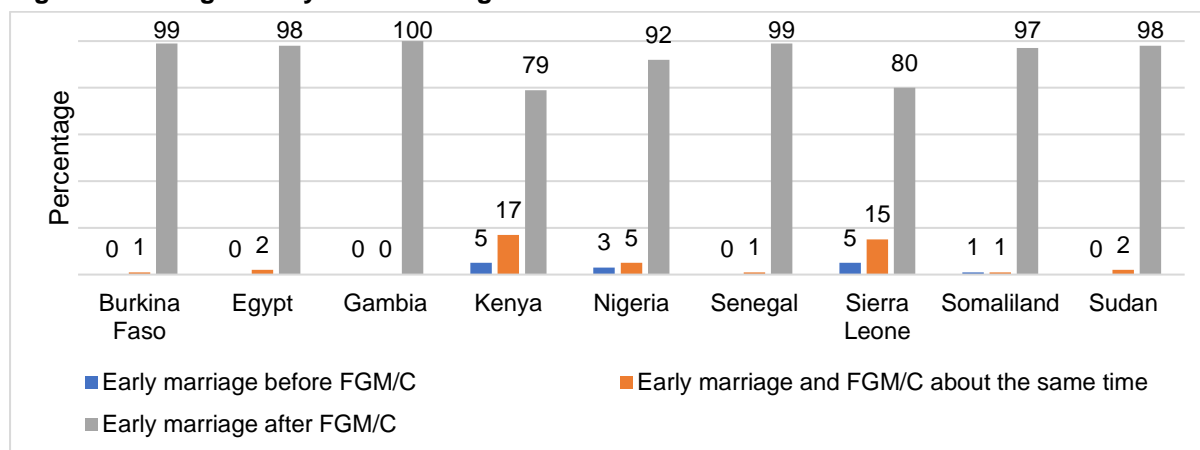
Figure 6. Prevalence of combined status of early/child marriage and FGM/C among women ages 20 to 24



Timing of early/child marriage and FGM/C

In exploring whether FGM/C influences early/child marriage, analysis was limited to women who reported early/child marriage and provided data for their age at marriage as well as age at cutting. Then analysis determined whether early/child marriage occurred prior to FGM/C, about same time (same year, allowing for ± 1 -year due to age rounding), or after FGM/C. Except in Kenya and Sierra Leone, where 17 percent and 15 percent of respondents, respectively, reported FGM/C and early/child marriage at about the same time, over 90 percent of respondents in the other countries reported early/child marriage after FGM/C (Figure 7). These results suggest that FGM/C could be a pre-requisite for early/child marriage in most countries.

Figure 7. Timing of early/child marriage and FGM/C



Crude and Adjusted Estimates for Associations of Early/Child Marriage and FGM/C

At the bivariate level, FGM/C status is significantly associated with early/child marriage in Burkina Faso, Kenya, Senegal, and Sierra Leone (Table 7). In each of these countries, women who were cut were more likely to report early/child marriage.

Table 7. Unadjusted country-specific associations between FGM/C and early/child marriage for women ages 20 to 24

Country	OR (95% CI)	P Value
Burkina Faso	1.69 (1.40-2.04)	<0.001
Egypt	1.31 (1.00-1.72)	0.053
Ethiopia	1.19 (0.95-1.51)	0.134
Gambia	1.09 (0.85-1.40)	0.508
Kenya	2.55 (1.99- 3.27)	<0.001
Nigeria	1.22 (0.98-1.52)	0.074
Senegal	2.17 (1.66-2.85)	<0.001
Sierra Leone	3.84 (2.64-5.59)	<0.001
Sudan	0.75 (0.51-1.09)	0.133
Somaliland	1.84 (0.38-8.85)	0.446

Note: the reference group is women who have not been cut

Table 9 (on the following page) presents the fully adjusted model for each country. (The full bivariate models for each country are presented in Appendix 4). After adjusting for socio-demographic and other early/child marriage covariates, the association between FGM/C status and early/child marriage is only significant in Senegal. Senegalese women ages 20 to 24 who had experienced FGM/C were 1.4 times more likely to report early/child marriage than those who had not been cut. Except for Sierra Leone and Somaliland, a woman's level of education is significantly associated with early/child marriage. There is a notable decrease in odds of early/child marriage with increased education, when compared to respondents with no education. In all countries except Sierra Leone, women whose partners were more than 10 years older were more likely to report early/child marriage than women who are about the same age as their husband or partner. In Burkina Faso, Egypt, Nigeria, Senegal, and Somaliland, the likelihood of early marriage was also significantly lower for women from the richest wealth quintiles, compared to the poorest quintile.

Table 8. Adjusted logistic regression analysis for variables predicting early/child marriage among women ages 20 to 24, by country

Variables	Burkina Faso		Egypt		Ethiopia		Gambia		Kenya	
	AOR (95% CI)	P Value	AOR (95% CI)	P Value	AOR (95% CI)	P Value	AOR (95% CI)	P Value	AOR (95% CI)	P Value
FGM/C										
Not cut	Ref		Ref		Ref		Ref		Ref	
Cut	1.11(0.88 - 1.39)	0.387	0.97(0.73 - 1.29)	0.829	0.91(0.64 - 1.29)	0.597	1.25(0.93 - 1.69)	0.143	0.99(0.72 - 1.36)	0.942
Residence										
Urban	Ref		Ref		Ref		Ref		Ref	
Rural	1.18(0.86 - 1.63)	0.310	0.81(0.58 - 1.14)	0.227	1.38(0.79 - 2.41)	0.257	1.17(0.77 - 1.78)	0.465	0.89(0.65 - 1.23)	0.488
Woman's education*										
No education	Ref		Ref		Ref		Ref		Ref	
Primary	0.82(0.62 - 1.08)	0.157	0.80(0.54 - 1.16)	0.236	0.80(0.54 - 1.18)	0.265	0.91(0.64 - 1.30)	0.616	0.83(0.52 - 1.33)	0.443
Secondary	0.48(0.31 - 0.73)	<0.001	0.44(0.33 - 0.58)	<0.001	0.36(0.21 - 0.62)	<0.001	0.39(0.28 - 0.54)	<0.001	0.34(0.20 - 0.60)	<0.001
Higher	10.91(1.53 - 77.97)	0.017	0.04(0.02 - 0.09)	<0.001	0.39(0.11 - 1.41)	0.149	0.07(0.02 - 0.31)	<0.001		
Religion*										
Christian	Ref		Ref		Ref		Ref		Ref	
Muslim	1.17(0.91 - 1.49)	0.216	3.68(1.88 - 7.21)	<0.001	0.73(0.52 - 1.03)	0.072	0.78(0.13 - 4.80)	0.787	1.26(0.81 - 1.98)	0.305
Other	1.04(0.69 - 1.58)	0.848			3.22(0.85 - 12.25)	0.086			1.11(0.55 - 2.23)	0.771
Don't know	0.74(0.11 - 4.95)	0.754								
Partner's education										
No education	Ref		Ref		Ref		Ref		Ref	
Primary	0.86(0.65 - 1.13)	0.284	1.02(0.71 - 1.45)	0.926	1.06(0.74 - 1.51)	0.748	0.90(0.53 - 1.55)	0.714	1.17(0.72 - 1.89)	0.527
Secondary	0.84(0.57 - 1.24)	0.392	0.78(0.59 - 1.04)	0.094	1.25(0.77 - 2.03)	0.376	0.83(0.60 - 1.15)	0.258	0.79(0.47 - 1.35)	0.390
Higher	0.39(0.12 - 1.31)	0.130	0.66(0.43 - 1.02)	0.060	1.39(0.56 - 3.47)	0.482	0.34(0.19 - 0.62)	<0.001	0.42(0.19 - 0.92)	0.030
Don't know	0.70(0.19 - 2.56)	0.591			0.29(0.03 - 3.05)	0.301	1.09(0.56 - 2.12)	0.8	0.36(0.06 - 2.07)	0.254
Wealth quintile										
Poorest	Ref		Ref		Ref		Ref		Ref	
Poorer	0.83(0.59 - 1.17)	0.282	1.10(0.85 - 1.44)	0.460	1.08(0.68 - 1.72)	0.730	0.86(0.61 - 1.22)	0.404	0.93(0.63 - 1.37)	0.713
Middle	0.79(0.56 - 1.12)	0.188	0.86(0.66 - 1.12)	0.266	1.13(0.71 - 1.80)	0.607	0.87(0.59 - 1.28)	0.475	0.70(0.46 - 1.08)	0.107
Richer	0.72(0.50 - 1.03)	0.068	0.54(0.39 - 0.75)	<0.001	1.02(0.62 - 1.68)	0.935	1.34(0.81 - 2.23)	0.259	0.56(0.35 - 0.90)	0.016
Richest	0.54(0.34 - 0.84)	0.006	0.31(0.20 - 0.48)	<0.001	0.94(0.52 - 1.70)	0.843	0.70(0.39 - 1.26)	0.232	0.59(0.33 - 1.04)	0.068
Partner age difference										
About same age	Ref		Ref		Ref		Ref		Ref	
Older 3 -10 yrs	1.95(1.46 - 2.60)	<0.001	2.00(1.57 - 2.54)	<0.001	1.85(1.32 - 2.57)	<0.001	2.77(1.41 - 5.43)	0.003	2.18(1.58 - 3.00)	<0.001
Older >=11 yrs	2.13(1.54 - 2.95)	<0.001	3.87(2.86 - 5.24)	<0.001	1.81(1.19 - 2.76)	0.006	4.36(2.22 - 8.57)	<0.001	2.54(1.68 - 3.82)	<0.001
Other wives										
None	Ref		Ref		Ref		Ref		Ref	
More than one	0.87(0.68 - 1.11)	0.260	0.65(0.32 - 1.31)	0.225	0.60(0.36 - 1.01)	0.057	1.03(0.76 - 1.41)	0.843	0.61(0.39 - 0.95)	0.028

Variables	Burkina Faso		Egypt		Ethiopia		Gambia		Kenya	
	AOR (95% CI)	P Value	AOR (95% CI)	P Value	AOR (95% CI)	P Value	AOR (95% CI)	P Value	AOR (95% CI)	P Value
Age at first sex										
<15	Ref		Ref		Ref		Ref		Ref	
15-17	0.47(0.24 - 0.89)	0.021			0.21(0.08 - 0.54)	0.001	1.40(0.25 - 7.88)	0.701	0.43(0.30 - 0.61)	<0.001
18 - 24	0.02(0.01 - 0.04)	<0.001			0.01(0.00 - 0.02)	<0.001	0.16(0.02 - 1.31)	0.087	0.06(0.03 - 0.10)	<0.001
At first union	0.42(0.22 - 0.79)	0.007			0.06(0.02 - 0.15)	<0.001	2.28(0.48 - 10.92)	0.301	0.53(0.36 - 0.78)	0.001
Variables										
	Nigeria		Senegal		Sierra Leone		Somaliland*		Sudan*	
	AOR (95% CI)	P Value	AOR (95% CI)	P Value	AOR (95% CI)	P Value	AOR (95% CI)	P Value	AOR (95% CI)	P Value
FGM/C										
Not circumcised	Ref		Ref		Ref		Ref		Ref	
Circumcised	1.10(0.87 - 1.40)	0.428	1.40(1.03 - 1.90)	0.030	1.19(0.69 - 2.05)	0.521	2.57(0.22-30.28)	0.454	1.16(0.78-1.73)	0.469
Residence										
Urban	Ref		Ref		Ref					
Rural	1.31(1.03 - 1.67)	0.030	1.08(0.81 - 1.45)	0.601	0.57(0.40 - 0.81)	0.002				
Woman's education*										
No education	Ref		Ref		Ref		Ref		Ref	
Primary	0.98(0.74 - 1.29)	0.890	0.90(0.68 - 1.20)	0.481	1.23(0.89 - 1.70)	0.204	1.11(0.62-2.01)	0.727	0.59(0.44-0.80)	0.001
Secondary	0.49(0.37 - 0.65)	<0.001	0.35(0.23 - 0.53)	<0.001	0.77(0.57 - 1.04)	0.089	0.69(0.23-2.10)	0.519	0.18(0.12-0.26)	<0.001
Higher	0.36(0.19 - 0.69)	0.002			1.17(0.36 - 3.82)	0.793			0.06(0.03-0.12)	<0.001
Religion*										
Christian	Ref		Ref		Ref					
Muslim	1.17(0.88 - 1.55)	0.274	0.69(0.27 - 1.76)	0.437	0.86(0.63 - 1.17)	0.332				
Other	0.99(0.36 - 2.68)	0.982	0.64(0.14 - 2.99)	0.569	0.18(0.03 - 1.14)	0.069				
Don't know	3.15(0.87 - 11.44)	0.082			0.33(0.07 - 1.59)	0.168				
Partner education										
No education	Ref		Ref		Ref					
Primary	0.83(0.62 - 1.11)	0.205	0.84(0.59 - 1.20)	0.348	1.42(0.93 - 2.15)	0.103				
Secondary	0.74(0.56 - 0.98)	0.037	0.70(0.46 - 1.09)	0.117	0.79(0.58 - 1.06)	0.111				
Higher	0.45(0.32 - 0.65)	<0.001	0.61(0.29 - 1.28)	0.190	0.58(0.33 - 1.01)	0.053				
Don't know	0.56(0.28 - 1.12)	0.100	0.61(0.42 - 0.88)	0.009	1.48(0.63 - 3.47)	0.371				
Wealth quintile										
Poorest	Ref		Ref		Ref		Ref		Ref	
Poorer	0.86(0.65 - 1.14)	0.289	0.74(0.55 - 1.00)	0.049	1.00(0.69 - 1.44)	0.992	0.38(0.18-0.80)	0.011	1.42(0.98-2.04)	0.061
Middle	0.69(0.50 - 0.94)	0.020	0.57(0.41 - 0.80)	0.001	1.22(0.84 - 1.77)	0.298	0.42(0.20-0.90)	0.026	0.92(0.62-1.35)	0.658
Richer	0.60(0.42 - 0.86)	0.005	0.48(0.32 - 0.73)	0.001	0.75(0.51 - 1.11)	0.147	0.24(0.11-0.55)	0.001	1.01(0.66-1.55)	0.971
Richest	0.47(0.31 - 0.73)	0.001	0.36(0.22 - 0.58)	<0.001	0.63(0.39 - 1.03)	0.066	0.09(0.03-0.24)	<0.001	0.74(0.43-1.27)	0.274

Variables	Nigeria		Senegal		Sierra Leone		Somaliland*		Sudan*	
	AOR (95% CI)	P Value	AOR (95% CI)	P Value	AOR (95% CI)	P Value	AOR (95% CI)	P Value	AOR (95% CI)	P Value
Partner age difference										
About same age	Ref		Ref		Ref		Ref		Ref	
Older 3 -10 yrs	1.21(0.91 - 1.59)	0.183	1.55(0.99 - 2.40)	0.053	1.20(0.86 - 1.66)	0.288	2.66(1.49-4.74)	0.001	1.90(1.30-2.79)	0.001
Older >=11 yrs	1.55(1.14 - 2.10)	0.005	2.52(1.61 - 3.93)	<0.001	1.34(0.94 - 1.92)	0.109	3.10(1.61-5.98)	0.001	2.19(1.46-3.29)	<0.001
Other wives										
None	Ref		Ref		Ref		Ref		Ref	
More than one	1.15(0.92 - 1.44)	0.229	1.09(0.83 - 1.44)	0.546	1.01(0.76 - 1.35)	0.920	1.41(0.59-3.36)	0.444	1.43(0.96-2.13)	0.077
Age at first sex										
<15	Ref		Ref		Ref					
15-17	0.55(0.37 - 0.83)	0.004	0.57(0.31 - 1.06)	0.077	0.35(0.24 - 0.51)	<0.001				
18 - 24	0.05(0.03 - 0.08)	<0.001	0.03(0.01 - 0.05)	<0.001	0.08(0.05 - 0.14)	<0.001				
At first union	0.59(0.40 - 0.87)	0.008	0.21(0.12 - 0.37)	<0.001	1.00(0.69 - 1.47)	0.988				

¥ Data is based on MICS survey data

In some countries categories with small absolute numbers were collapsed so that the models could converge

Discussion

The most recent DHS and MICS datasets reveal that prevalences of early/child marriage and FGM/C vary greatly by country, among sub-national regions, and between ethnic groups. While national estimates may provide useful representations, they can conceal important variations within each country.

Early/child marriage prevalence according to FGM/C status varies significantly by country. In Burkina Faso, Ethiopia, Somaliland, and Sudan, where the prevalence of women with both FGM/C and early/child marriage is highest, the proportion of women who had undergone FGM/C but not early/child marriage was the second highest sub-group, suggesting that FGM/C could be a prerequisite for early/child marriage. In Egypt, Gambia, and Sierra Leone, however, the proportion of women who had experienced FGM/C, but not early marriage, was the highest sub-group, suggesting that these two practices do not necessarily follow the same trend. Accounting for the hierarchical nature of the data, there is a significant crude association between FGM/C and early marriage in Burkina Faso, Kenya, Senegal, and Sierra Leone. In the multivariate adjusted analysis, the association between FGM/C and early/child marriage is only significant in Senegal. In the unadjusted model, Senegalese women who were cut were 2.17 times more likely to have experienced early/child marriage. The odds of experiencing early/child marriage among cut women, compared to uncut women, reduced to 1.40 in the adjusted model.

Although the association between early/child marriage and FGM/C is not statistically significant in most countries, after adjusting for socio-demographic factors unadjusted associations suggest an increased magnitude of early/child marriage among women who have been cut. This supports findings from qualitative work that suggests FGM/C and early/child marriage are reinforced by similar social norms and often co-exist (Boyden 2013, World Vision UK 2014). Additional work by Diop et al (2008) in Senegal suggests that common factors for FGM/C and early/child marriage include social norms, gender inequality, and socio-economic status.

A recent UNICEF update (2012) of the latest early marriage estimates, in 40 of 100 low- and middle income countries where data are available, suggests stagnating reductions in child marriage. Although estimates for the 15 to 19 age group may be skewed, as some of those women are still at risk for early marriage, this study's findings suggest that early marriage in general appears to be declining. This is similar to reporting in Asia (Plan International and Coram International 2015, Singh and Vennam 2016) as well as Africa, especially in Ethiopia, where much research on early/child marriage and FGM/C (Minna et al 2016) has been done. These findings may indicate that the younger generation is abandoning this harmful practice; they could also indicate possible effects of social change due to advocacy interventions and improved girls' education.

This analysis also emphasises other factors associated with early/child marriage. The multilevel fully adjusted model supports prior research highlighting education as an important determinant of early/child marriage. A significant trend in reduced early/child marriage likelihood was observed with increased education. Another significant factor associated with early/child marriage, after adjusting for other factors, which has been highlighted in the literature (UNFPA 2012), is place of residence. At bivariate level, there is a significant association between area of residence and early/child marriage, with young rural women more likely to report early/child marriage. Urbanisation exposes girls to values favouring marriage postponement, while providing greater geographic distance from community and kinship social control (Boyden 2013). Qualitative work by World Vision UK (2014) indicates that limited economic potential and strong social fabrics are associated with early marriage in rural areas.

Educated young women marry significantly later than less educated girls. These findings are not singular, as Young Lives data analysis shows similar findings in Asia (Singh and Vennam 2016)

and Ethiopia (Erulkar 2010, Minna et al 2016). Education is positively associated with greater decision-making among girls (Boyden 2013). Educational attainment is likely to improve a girl's employability, leading to economic and social empowerment, and improved knowledge of her rights, thus delaying marriage. In some communities in Asia, girls are not considered for roles beyond domestic chores, limiting their educational opportunities and increasing their chances of early marriage, as soon as they are deemed mature enough (Plan International and Coram International 2015). Most women married before the age of 18 reported first living with a man between the ages of 15 and 17. At these ages, most girls have not completed their secondary education and are likely to drop out of school to be married. The converse could be true: that girls who have already left school, due to poverty, resort to marriage. Resulting in the low education levels among those with early marriages. These findings are consistent with the literature from other low- and middle income countries such as Ethiopia (Erulkar 2010) and Bangladesh (Plan International and Coram International 2015). In Bangladesh, a country with an increase in child marriage (UNFPA 2012), secondary education for a girl is seen as more than enough for childrearing, and adds to the dowry. In some Asian communities, the dowry is paid by her family, and younger girls exact lower prices. Hence poor families may take an earliest opportunity to marry a girl not in school; it also eases the economic burden of raising her (Plan International and Coram International 2015).

Girls from well-off families are married significantly later than girls from poor families, raising the possibility that girls could be used as a source of income, especially in communities where dowries are paid (Wadesango et al 2011). The converse could also be true: that marriage is delayed because poor families cannot raise enough dowry for well-off families, who arrange child marriages to secure wealth within a coterie of rich families (Boyden 2013).

As most partners of women who experienced early/child marriage are more than three years older than their wives, issues of power and limited decision-making are likely. Women who are married younger are more likely to believe it is acceptable for a husband to beat his wife and, therefore, suffer domestic violence (Jensen and Thornton 2003). In addition, women who were married young are more likely to suffer untimely widowhood (at an early age) with their children being fatherless at early ages (Tiemoko 2001). Young girls often have limited "say", as some of their husbands are more paternalistic. In addition, most African communities are patriarchal in nature, and younger women are likely to be dis-empowered with consequential limited capacities for making decisions about matters affecting them such as contraception and protected sex, or family expenditures. Significant age differences can put young girls at risk of sexually transmitted infections and unintended pregnancy, as they are likely to be dominated by their partners, with little say in the relationship (Santhya et al 2010). They are also likely to experience marital violence, as reported in India (Raja et al 2010) and Bangladesh (Rahman et al 2014). Most patriarchal societies prefer men to marry younger women, as they are deemed more obedient and submissive (Plan International and Coram International 2015).

Limitations

The potential data limitations of this analytical approach should be considered while interpreting the results. This analysis aimed to explore associations between early/child marriage and FGM/C and was restricted to survey respondents who provided data in the FGM/C module, which is often not administered to every woman. As a result, this analytical approach limits the number of observations for analysis. There are sufficient numbers from each country, however, to estimate prevalence and conduct tests for associations.

Secondly, DHS datasets are cross-sectional, limiting causal inferences and making it impossible to establish early/child marriage and FGM/C event sequences to determine whether FGM/C is a pre-requisite for early/child marriage, or vice versa. DHS respondents are asked to report their current marital status along with the month and year they were first in a union or married. However, in most African societies marital unions are the culmination of multiple stages, and these data do not correlate the dates provided with the precise stages of union.

Finally, a key consideration for multi-level models is the number of units/groups at the higher level as opposed to the individuals within these levels as this tends to under-estimate standard errors and variance components. This does not affect the estimates for the covariates, however. Though there is no consensus for a minimum number of levels, literature suggests 25 groups. Our relatively small number of units at the highest level in some countries (Kenya regions, n=8) suggests that regional random variance estimates may have been under-estimated, and that intra-class correlations need to be interpreted with caution.

Implications

Programmatic Implications

Not all girls who undergo FGM/C are at risk of early marriage, and the risk varies according to region, nation, and ethnic group. Variations in FGM/C practice and dissimilar trends in some countries suggest that some communities could be rejecting the practice while maintaining support for early/child marriage, or vice versa. For example, Kenya's FGM/C prevalence is low, but early/child marriage is relatively common. These factors have significant implications for intervention design and implementation, requiring a pragmatic approach with models that consider context and address the drivers of both practices. There is need for more local data, to explore where these practices may be occurring but are not picked up in national surveys. One potential methodological approach is spatial-temporal models to identify pockets of resistance.

Interventions directly targeting these practices are essential, and may need to be paired with activities promoting socio-economic empowerment, as early/child marriage is strongly associated with rural residence, lack of education, and relative poverty. In some settings where families pay dowries, girls may be viewed as a source of wealth, exchanged for goods, livestock, or money, with cultural, traditional, and religious arguments often used to justify these transactions.

Research Implications

More research on the causal relationship between early/child marriage and FGM/C is needed. The longitudinal Young Lives research study begun in 2002 follows two cohorts of younger and older children recruited between the ages of six and 18 months and seven and eight years in India, Ethiopia, Peru, and Vietnam (Barnett et al 2013). As Young Lives is exploring the causes and consequences of childhood poverty, it provides a strategic dataset with the trajectories of FGM/C and early/child marriage. Using Young Lives data from Ethiopia, Boyden and colleagues examined the underlying drivers of FGM/C and child marriage in different communities and regions. The study reported that FGM/C and early/child marriage have similar drivers and/or reasons for being done. Interestingly, FGM/C is a pre-requisite for marriage in southern Ethiopia's Wolayta community, but not in northern Ethiopia; while rural girls are much more likely to experience the two practices and are more likely to conform to cultural and community norms intended to maintain their sexual morality and purity. It would be useful to assess the underlying reasons why 'culturally similar' communities would stop one practice and not the other (Boyden et al 2012).

Most of these countries are signatories to declarations for ending these harmful practices, and even have enacted prohibitory legislation, but without resultant declines in practice. What, then, is failing? Where declines do occur, they are not as rapid as anticipated. There is need for qualitative studies where interventions have worked, to better understand the dynamics of those changes and, more importantly, how law enforcement approaches have worked to promote abandonment of these practices.

While FGM/C and early/child marriage may be determined by similar norms, local and ethnic variations and differing trends in practice call for mapping their distribution within countries to better describe discrete factors. Qualitative research should explore why some communities are abandoning one practice while sustaining the other. Continued investments in research along with monitoring and evaluation of interventions will be needed to inform better policy development and improve understanding of the causal relations between FGM/C and early/child marriage. An improved understanding of which factors affect abandonment of FGM/C and early/child marriage, and their mechanisms of action, can enable more focused and effective intervention designs.

Policy Implications

Ending both FGM/C and early/child marriage are important Sustainable Development Goal components. Evidence suggests that social change is often affected by multiple factors, and there is a need to better understand the essential elements of this change. Analyses clearly show that 'men, women, and adolescent girls and boys who attended secondary education or completed high school are much more likely to reject practices such as FGM/C and to oppose norms that legitimate domestic violence' (Marcus and Harper 2014). Continuing to improve education access, with necessary legislation to ensure it is compulsory and free, is very likely to prolong the period when girls are unavailable for marriage. For girls who are already married, provision of improved and skills-based employment opportunities may empower them to participate in decision-making processes.

Global, national, and local campaigns for the protection and promotion of the human rights of girls and women call for a common investment in both FGM/C and early/child marriage prevention, and a need for collaborative mechanisms. There is a clear need to strengthen the policy links between FGM/C and early/child marriage, which requires the coordination, for planning and budgeting, of state authorities who translate policy reforms into investments in health, education, employment, work, as well as the law, to not only shift harmful norms but also promote accountability for necessary interventions to end harmful practices. There is still a necessity to harmonise statutory and customary laws to guarantee a sound structural basis for addressing these harmful practices. Laws of criminalisation on their own do not seem to be effective; nevertheless, laws rationalise policies and programmes for interventions. There remains a need to understand what is constraining the effectiveness of legal prohibitions of both practices.

Conclusion

Early/child marriage is still a common practice in most of the 10 countries included in this study, with many women married between the ages of 15 and 17. There are significant national and sub-national variations in FGM/C practice. While apparently declining in most countries, FGM/C seems to be increasing in Somaliland and Sudan. There is a crude association between FGM/C and early/child marriage, although adjusted estimates suggest none. The dynamics in which these two practices occur differ by country, and in some settings where FGM/C is seen to decline and early/child marriage is increasing, and vice versa. Rural, uneducated, and poor women are at a greater risk of early/child marriage, with most married to significantly older men.

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Appendices

Appendix 1. Female Genital Mutilation/Cutting (FGM/C), Early/Child Marriage and Fistula Questions Included in Demographic and Health Surveys (DHS) considered for this analysis

QUESTION WORDING: WOMAN'S QUESTIONNAIRE (15-49) FGM/C; EARLY/CHILD MARRIAGE; FISTULA	DHS*		MICS
	Question #	Variable	Variable
EARLY/CHILD MARRIAGE			
How old were you when you started living with him (husband/partner)	611	v511	WAGEM
Does your husband/partner have other wives and does he live with other women as if married	606		MA3
Including yourself, in total, how many wives or live-in partners does he have	607	v505	
Are you the first. Second, wife? Rank	608	v506	MA4
How old were you when you started living with him (husband/partner)	611	v511	WAGEM
when you got married or lived with a man, was it your choice or was it arranged?	611A		
When you first got married or lived with a man, was the man older than you, younger than you or the same age as you?	611B		
How old were you when you had sexual intercourse for the very first time?	613	v525	
How old was the person you first had sexual intercourse with?	613C		
How old was your husband or partner on his last birth day?	802	v730	MA2
What was the highest level of school he attended: Primary, vocational, secondary, or higher	804	v701	
What is your husband's/partner occupation? That is, what kind of work does he mainly do?	806	v705	
WOMAN'S QUESTIONNAIRE (15-49)			
Have you ever heard about female circumcision?	1301/1302	g100/g101	FG1/FG2
In many communities, girls are introduced to womanhood by participating in some ceremonies and undergoing specific procedures. I want to discuss with you the circumcision of girls. In this community, is female circumcision practiced?			
Are you circumcised (1998, 2003)? Have you yourself ever been circumcised (2008-09; 2014)?	1303	g102	FG3
How old were you when you were circumcised?	1307	g106	FG7
Was any flesh removed from the genital area?	1304	g103	FG4
Was the genital area just nicked without removing any flesh?	1305	g104	FG5
Was your vaginal area sown closed?	1306	g105	FG6
Who performed the circumcision?	1308	g107	FG8
Do you think circumcision should be continued, or should it be discontinued (stopped)?	1317	g119	FG22
Why do you think circumcision should be continued?			
Why do you think circumcision should be discontinued?			
FISTULA			
Have you ever experienced a constant leakage of urine or stool from your vagina during the day and night?	1201	s1201	
Did this problem start after you delivered or had a stillbirth	1203	s1203	
Did this problem start after a normal labour and delivery or after a very difficult labour and delivery?	1204	s1204	

Appendix 2. Prevalence of early/child marriage among women ages 15 to 19, by background characteristics and country

	Burkina Faso		Egypt		Ethiopia		Gambia		Kenya		Nigeria		Senegal		Sierra Leone		Somaliland		Sudan		
	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	
Early/Child Marriage																					
Yes	27.6	3274	67	764	24.6	3266	20.7	2392	9	2717	27.2	7820	22.6	3429	17.4	3878	85.3	137	85.9	772	
Type of place of residence																					
urban	13	1100	59.1	134	9.1	703	13.5	1317	11.4	843	9	3308	12	1683	7.7	1595					
rural	35.1	2173	68.7	630	28.8	2562	29.6	1075	7.9	1873	40.5	4511	32.9	1746	24.2	2283					
Religion																					
Christian	16.6	1052	19.2	16	23.4	2355	1.1	91	8.4	2487	6.5	3624	4.3	149	14.1	902					
Muslim	32.9	2023	68	748	28.3	859	21.4	2298	13.8	205	45.5	4092	23.3	3268	18.5	2959					
other	33.8	195			14.2	52	n/a	n/a	31.2	25	23	67	76.4	12	9.8	14					
Missing	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	35	36	n/a	n/a	n/a	n/a					
Highest educational level																					
no education	40.2	1826	73.1	67	43.9	1308	45.6	566	40.7	62	70.9	2170	39.6	1371	40.5	760	86.5	83	88.2	207	
primary	16.4	701	89.1	106	14.5	1423	25.6	504	12.7	1291	31.6	952	21.4	764	20.5	808	83.9	43	88.5	440	
secondary	7.5	743	62.4	585	4.2	519	8.4	1291	4.2	1283	6.2	4571	5.4	1288	8.8	2299	82.2	11	73.1	120	
higher	n/a	n/a	52.7	7		16		31	1.2	80	1.3	126		5	4.8	12	n/a	n/a	70.7	4	
Don't know	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
Wealth index																					
poorest	38.2	514	82.4	156	33.9	448	29.3	422	17.2	450	63.6	1322	48.8	556	25.1	631	90.2	22	87.3	153	
poorer	40.7	562	60.1	158	34.4	566	21.7	431	9.4	564	43.8	1577	31.6	618	29.2	610	80.8	45	85.6	211	
middle	33.4	564	69.5	218	29.4	627	30.9	490	5.6	643	21.3	1645	14.7	766	21.4	689	95.1	22	87.7	196	
richer	26.3	622	63.7	174	25.2	603	15.2	479	7.3	525	11.5	1658	16.3	740	13.4	873	86.8	28	88.1	124	
richest	12.6	1011	44.6	58	11.6	1022	9.4	569	7.3	535	3.2	1618	10.3	749	6.9	1075	77.5	21	77.2	87	
FGM status																					
Not circumcised	22.4	1365	68.5	95	21.1	1236	17.6	545	7.9	2408	27.5	6242	18.4	2607	4.6	997			85.1	78	
Circumcised	31.4	1909	66.8	669	26.7	2029	21.7	1837	17.3	309	25.8	1197	36.3	822	21.9	2881	85.2	136	86.1	663	
Total		3282		3055		2547		2094		2691		6757		3220		2683		511		1823	

n/a: represents where estimates could not be computed due to very small denominators (<5) or category was included in the dataset

Appendix 3. Prevalence of early/child marriage among women ages 25 to 49, by background characteristics and country

	Burkina Faso		Egypt		Ethiopia		Gambia		Kenya		Nigeria		Senegal		Sierra Leone		Somaliland		Sudan		
	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	%	Number	
Early/Child Marriage																					
Yes	52.5	10421	25.4	17943	65.6	8257	45	5646	28.4	9216	49.1	24372	40.3	9040	50.2	10097	36.7	2897	44.1	9906	
Age in 5-year groups																					
25-29	51.7	2945	21	4753	61.7	2517	36.7	1800	27.4	2931	46.3	7145	36.2	2746	48.4	2843	37.6	822	48.9	2689	
30-34	53.7	2575	23.3	4127	64.3	1808	42.1	1495	29.1	2161	48.8	5467	38	2148	53.3	2287	42.5	653	42.6	2219	
35-39	52.6	1985	25.1	3495	67.4	1602	49.8	1043	27.3	1780	48.3	4718	38.7	1817	49.6	2260	36.6	640	42	2290	
40-44	54	1640	27.8	2864	68.6	1187	54	755	29.2	1292	50.1	3620	49.3	1379	51.4	1362	32.8	527	40.8	1481	
45-49	50.1	1276	33.9	2705	70.8	1143	58.4	554	30.8	1052	55.5	3422	47.7	949	48.8	1344	28	255	43.9	1228	
Type of place of residence																					
Urban	36.8	2479	16.4	6748	48.7	1257	36.9	3124	21.3	3787	32.1	10316	27.7	4424	39.7	3193					
Rural	57.4	7942	30.8	11195	68.7	7000	55	2522	33.4	5429	61.6	14055	52.4	4615	55.1	6904					
Religion																					
Christian	42.5	3035	25.5	17225	66	5610	16.4	243	27.2	8457	27.3	11477	21.4	384	40.4	1985					
Muslim	56.3	6366	21.2	702	65.3	2436	46.3	5398	41	550	69	12510	41.1	8614	52.7	8059					
Other	58.2	989	38.2	12	60.2	210	n/a	n/a	44.8	208	57	262	48.7	42	51.2	28					
Missing	72.6	31	n/a	n/a	n/a	n/a	71.9	5			40.5	122	n/a	n/a	42.3	25					
Highest educational level																					
No education	57.2	8515	45.6	4814	70.1	6430	56.7	3452	49.2	809	75.7	10281	50.8	5997	55.2	7446	37.1	2353	56.7	4220	
Primary	43.2	1087	40.7	1927	62.6	1128	49.2	644	37.7	4935	49.9	4928	25.4	1928	50.5	1106	33.5	388	48.9	3075	
Secondary	18.3	697	17.7	8571	30.9	576	19.8	1220	14.1	2352	23.2	6398	11.9	881	30.1	1205	38.9	156	24.4	1782	
Higher	3.1	120	1.9	2631	20.5	124	7	331	2.7	1120	8.7	2764	1.3	233	11.5	339			4.2	825	
Don't know	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	49.8	5	
Wealth index																					
Poorest	61	2013	43.6	3248	65.5	1592	57.5	1010	45	1400	79.7	4719	64	1517	57.3	2021	39.6	567	58.7	1938	
Poorer	58.6	2013	35.1	3546	72.8	1598	53.6	1045	36.8	1541	67.5	4511	52.8	1620	54.2	2024	36.6	624	53.8	1922	
Middle	56.5	2029	23	3725	66.2	1597	50.9	1069	33	1762	51	4439	41.3	1750	53.5	2000	38.7	613	45.7	1995	
Richer	53.5	2109	19.1	3655	69.4	1603	39.9	1177	25.2	2018	37.1	4857	32.2	2037	51.5	1935	36.9	584	38	1908	
Richest	35.1	2257	9	3769	55.9	1868	28.7	1347	13.4	2495	18.8	5846	20.9	2115	35.5	2116	31.2	508	26.1	2144	
FGM status																					
Not circumcised	47	1711	12.9	1208	67.3	1699	38	1386	26	6853	52.4	16418	35.7	6621	25.1	409	44.1	9	51.9	806	
Circumcised	53.6	8710	26.3	16735	65.2	6558	47.3	4255	35.3	2363	39.8	6990	53	2419	51.3	9688	36.7	2884	43.2	8705	
Total		3274		764		3266		2392		2717		7820		3429		3878		137		772	

n/a-represents where estimates could not be computed due to very small denominators or category was not included in the dataset

Appendix 4. Bivariate analyses of associations between background variables and early/child marriage for women ages 20 to 24, by country

Variable	Burkina Faso		Egypt		Ethiopia		Gambia		Kenya	
	OR (95% CI)	P Value	OR (95% CI)	P Value	OR (95% CI)	P Value	OR (95% CI)	P Value	OR (95% CI)	P Value
FGM/C										
Not circumcised	ref		ref		ref		ref		ref	
Circumcised	1.69(1.40-2.04)	<0.001	1.31(1.00-1.72)	0.053	1.19(0.95-1.51)	0.134	1.09(0.85-1.40)	0.508	2.55(1.99-3.27)	<0.001
Residence										
Urban	ref		ref		ref		ref		ref	
Rural	3.56(2.88-4.39)	<0.001	1.62(1.04-2.54)	0.035	3.51(2.65-4.66)	<0.001	1.89(1.41-2.54)	<0.001	1.77(1.41-2.23)	<0.001
Woman education*										
No education	ref		ref		ref		ref		ref	
Primary	0.51(0.41-0.63)	<0.001	0.79(0.55-1.14)	0.204	0.58(0.46-0.73)	<0.001	0.74(0.55-0.99)	0.044	0.37(0.27-0.51)	<0.001
Secondary	0.11(0.08-0.14)	<0.001	0.39(0.31-0.50)	<0.001	0.17(0.12-0.22)	<0.001	0.17(0.13-0.22)	<0.001	0.04(0.03-0.07)	<0.001
Higher	0.28(0.11-0.70)	0.007	0.03(0.01-0.06)	<0.001	0.05(0.02-0.12)	<0.001	0.02(0.00-0.06)	<0.001		
Religion*										
Christian	ref		ref		ref		ref		ref	
Muslim	1.75(1.44-2.12)	<0.001	3.80(1.97-7.31)	<0.001	1.33(1.03-1.72)	0.031	3.81(1.31-11.11)	0.014	3.18(2.18-4.62)	<0.001
Other	2.43(1.65-3.58)	<0.001			2.35(1.08-5.08)	0.03			3.25(1.80-5.86)	<0.001
Don't know	0.87(0.16-4.63)	0.867								
Partner education										
No education	ref		ref		ref		ref		ref	
Primary	0.62(0.49-0.78)	<0.001	0.82(0.59-1.16)	0.266	0.89(0.68-1.17)	0.389	0.73(0.44-1.19)	0.204	0.48(0.34-0.68)	<0.001
Secondary	0.39(0.29-0.51)	<0.001	0.48(0.37-0.63)	<0.001	0.63(0.46-0.85)	0.003	0.57(0.44-0.75)	<0.001	0.23(0.16-0.33)	<0.001
Higher	0.21(0.08-0.54)	0.001	0.20(0.14-0.30)	<0.001	0.38(0.20-0.72)	0.003	0.21(0.12-0.36)	<0.001	0.07(0.04-0.13)	<0.001
Don't know	0.85(0.34-2.15)	0.739			1.17(0.28-4.96)	0.827	0.76(0.44-1.32)	0.33	0.37(0.12-1.16)	0.09
Wealth quintiles										
Poorest	ref		ref		ref		ref		ref	
Poorer	0.95(0.71-1.27)	0.717	1.08(0.83-1.39)	0.571	0.98(0.70-1.37)	0.891	0.84(0.63-1.13)	0.26	0.54(0.41-0.71)	<0.001
Middle	0.88(0.66-1.18)	0.387	0.74(0.58-0.96)	0.022	0.93(0.66-1.31)	0.684	0.67(0.49-0.93)	0.016	0.34(0.25-0.46)	<0.001
Richer	0.75(0.56-1.00)	0.052	0.41(0.31-0.55)	<0.001	0.90(0.63-1.29)	0.565	0.74(0.52-1.05)	0.093	0.21(0.15-0.29)	<0.001
Richest	0.24(0.18-0.33)	0	0.19(0.13-0.27)	<0.001	0.36(0.26-0.50)	<0.001	0.28(0.18-0.43)	<0.001	0.14(0.10-0.19)	<0.001
Partner age difference										
About same age	ref		ref		ref		ref		ref	
Older 3 -10 yrs	1.93(1.49-2.51)	<0.001	1.79(1.41-2.26)	<0.001	1.95(1.45-2.62)	<0.001	3.12(1.67-5.83)	<0.001	2.55(1.90-3.43)	<0.001
Older >=11 yrs	2.48(1.88-3.27)	<0.001	3.48(2.60-4.67)	<0.001	1.95(1.35-2.81)	<0.001	4.85(2.61-9.03)	<0.001	3.63(2.52-5.22)	<0.001
Other wives										
None	ref		ref		ref		ref		ref	
More than one	1.33(1.09-1.61)	0.005	1.55(0.79-3.03)	0.201	0.73(0.46-1.16)	0.19	1.32(1.01-1.74)	0.043	1.18(0.79-1.75)	0.41
Age at first sex										
<15	ref				ref		ref		ref	
15-17	0.33(0.19-0.59)	<0.001			0.25(0.14-0.46)	<0.001	1.20(0.29-4.88)	0.803	0.38(0.28-0.51)	<0.001
18-24	0.01(0.01-0.02)	<0.001			0.01(0.01-0.02)	<0.001	0.11(0.02-0.72)	0.021	0.03(0.01-0.04)	<0.001
At first union	0.60(0.34-1.07)	0.082			0.13(0.07-0.22)	<0.001	5.47(1.53-19.62)	0.009	1.04(0.76-1.44)	0.789

Variable	Nigeria		Senegal		Sierra Leone		Somaliland [‡]		Sudan [‡]	
	OR (95% CI)	P Value	OR (95% CI)	P Value	OR (95% CI)	P Value	OR (95% CI)	P Value	OR (95% CI)	P Value
FGM/C										
Not circumcised	ref		ref		ref		ref		ref	
Circumcised	1.22(0.98-1.52)	0.074	2.17(1.66-2.85)	<0.001	3.84(2.64-5.59)	<0.001	1.84(0.38-8.85)	0.446	0.75(0.51-1.09)	0.133
Residence										
Urban	ref		ref		ref					
Rural	3.66(2.94-4.55)	<0.001	3.40(2.72-4.25)	<0.001	2.41(1.89-3.06)	<0.001				
Woman education*										
No education	ref		ref		ref		ref		ref	
Primary	0.58(0.47-0.72)	<0.001	0.51(0.41-0.63)	<0.001	0.86(0.67-1.11)	0.248	0.72(0.45-1.17)	0.188	0.61(0.47-0.79)	<0.001
Secondary	0.12(0.10-0.15)	<0.001	0.08(0.06-0.11)	<0.001	0.19(0.15-0.23)	<0.001	0.34(0.15-0.76)	0.009	0.18(0.13-0.25)	<0.001
Higher	0.02(0.01-0.03)	<0.001			0.07(0.03-0.16)	<0.001			0.06(0.03-0.11)	<0.001
Religion*										
Christian	ref		ref		Ref					
Muslim	3.13(2.47-3.98)	<0.001	3.04(1.61-5.74)	0.001	1.85(1.47-2.33)	<0.001				
Other	2.63(1.14-6.10)	0.023	6.13(1.57-23.83)	0.009	0.48(0.09-2.59)	0.393				
Don't know	3.46(1.41-8.48)	0.007			1.59(0.41-6.16)	0.501				
Partner education										
No education	ref		ref		ref					
Primary	0.68(0.53-0.87)	0.002	0.66(0.49-0.90)	0.008	1.11(0.76-1.64)	0.585				
Secondary	0.38(0.31-0.47)	<0.001	0.39(0.27-0.55)	<0.001	0.61(0.48-0.78)	<0.001				
Higher	0.18(0.14-0.23)	<0.001	0.25(0.13-0.45)	<0.001	0.38(0.24-0.60)	<0.001				
Don't know	0.50(0.28-0.91)	0.022	0.50(0.36-0.69)	<0.001	1.16(0.56-2.42)	0.685				
Wealth quintiles										
Poorest	ref		ref		ref		ref		ref	
Poorer	0.69(0.54-0.87)	0.002	0.57(0.44-0.72)	<0.001	0.86(0.64-1.17)	0.34	0.42(0.22-0.82)	0.011	1.26(0.91-1.74)	0.167
Middle	0.37(0.29-0.48)	<0.001	0.35(0.27-0.45)	<0.001	0.86(0.64-1.15)	0.304	0.51(0.26-0.98)	0.044	0.64(0.46-0.91)	0.011
Richer	0.24(0.18-0.32)	<0.001	0.19(0.14-0.26)	<0.001	0.47(0.35-0.62)	<0.001	0.24(0.12-0.49)	<0.001	0.49(0.34-0.70)	<0.001
Richest	0.10(0.07-0.14)	<0.001	0.13(0.09-0.19)	<0.001	0.25(0.18-0.36)	<0.001	0.12(0.06-0.26)	<0.001	0.22(0.14-0.33)	<0.001
Partner age difference										
About same age	ref		ref		ref		ref		ref	
Older 3 -10 yrs	1.30(1.01-1.69)	0.043	1.68(1.13-2.50)	0.011	1.28(0.94-1.73)	0.118	2.75(1.57-4.81)	<0.001	1.65(1.14-2.37)	0.007
Older >=11 yrs	1.74(1.32-2.29)	<0.001	3.08(2.07-4.59)	<0.001	1.48(1.08-2.04)	0.016	3.16(1.69-5.90)	<0.001	1.87(1.28-2.74)	0.001
Other wives										
None	ref		ref		ref		ref		ref	
More than one	1.72(1.41-2.09)	<0.001	1.56(1.23-1.98)	<0.001	1.21(0.93-1.56)	0.152	1.75(0.77-3.94)	0.179	2.01(1.41-2.85)	<0.001
Age at first sex										
<15	ref		ref		ref					
15-17	0.38(0.28-0.53)	<0.001	0.53(0.33-0.83)	0.006	0.40(0.31-0.53)	<0.001				
18-24	0.02(0.01-0.03)	<0.001	0.02(0.01-0.04)	<0.001	0.07(0.04-0.11)	<0.001				
At first union	1.17(0.86-1.60)	0.324	0.32(0.21-0.49)	<0.001	2.99(2.20-4.07)	<0.001				

[‡] Data are based on MICS survey data;

* In some countries categories with small ute numbers were collapsed so that the models could converge