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Changing local customs: Long-run impacts of the earliest campaigns against female genital cutting

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Abstract

This paper investigates the long-run impacts of Christian missionary expansion on the practice of female genital cutting (FGC) in sub-Saharan Africa. The empirical analysis draws on historical data on the locations of early European missions geographically matched with Demographic and Health Survey data on FGC practices of around 410,000 respondents from 42 surveys performed over a 30-year period (1990-2020) in 14 African countries. The results suggest that historical Christian missions have impacted FGC practices today. The benchmark estimates imply that a person living 10 km from a historical mission is 4-6 percentage points less likely to have undergone FGC than someone living 100 km from a mission site. Similarly, having one more mission per 1000 km² in one's ancestral ethnic homeland decreases the probability of having undergone FGC by around 8 percentage points. The effect is robust across a large number of specifications and control variables, both modern and historic. We use ethnographic data on pre-colonial FGC to show that the location of missions was not correlated with the practice of FGC in the local population.

Key words: Female genital cutting; missions; norms; Africa

JEL codes: D71; D91; I15; O55

1 Introduction

The years 1929-1931 mark what has been termed the ‘female circumcision controversy’ in Kenyan history. During this period, Protestant missionaries active in the country engaged London-based parliamentarians and women’s rights organizations to argue in front of the House of Commons that the tradition, which was described as “nothing short of mutilation” (UK Parliament, 1929), should be banned.

The results were not as the missionaries and parliamentarians had hoped. Requirements to denunciate the practice led to large numbers of Kikuyu leaving the mission churches, and

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Kenya's leading anticolonial political organization, the Kikuyu Central Association, mounted a vigorous attack on the church's policies (New York Times, 2010). Local communities responded by opening their own African Independent Churches (AIC) and their own schools (Joshua, 2009). Female circumcision became a nationalist issue, and support for the practice became a focal point for the movement for independence from British rule (Thomas, 2000).

In *Facing Mount Kenya* (1938), Jomo Kenyatta's famous anthropological study of the ethnic group, the future first president of Kenya describes female circumcision as a centuries-old custom perpetuating a spirit of collectivism and national solidarity, and argues that the Kikuyu people viewed the missionaries as 'religious fanatics' who attack the custom to disintegrate their social order and hasten Europeanisation (p. 135). In Kenyatta's words: "No proper Gikuyu (sic) would dream of marrying a girl who has not been circumcised" (Kenyatta, 1938, p. 132).

While the example above illustrates that European missionaries faced difficulties in influencing existing social norms, there is growing evidence that missionary expansion did have an impact on, for example, attitudes towards homosexuals (Ananyev and Poyker, 2021), sexual beliefs and behaviours (Cage and Rueda, 2020), and the practice of polygamy (Fenske, 2015; Kudo, 2017; Becker, 2022).

The aim of this paper is to investigate the long-run impacts of Christian missionary expansion on the practice of female genital cutting (FGC) in sub-Saharan Africa. Specifically, we ask whether people living in areas close to historical Christian missions are less likely to undergo FGC, and if so, what the underlying mechanisms may be. If there is a relationship between historical missions and current FGC, is this an indirect effect of impacts on education and economic development, or is it a direct effect of mission activities on norms?

We geographically match historical data on the locations of early European missions from the map by Roome (1924, geocoded by Nunn, 2010) with Demographic and Health Survey (DHS) data on FGC practices of almost 410,000 respondents from 42 surveys performed between 1990 and 2020 in 14 African countries. To investigate and control for potential selection in the location of missions, we use ethnographic data on FGC in pre-colonial times from Ericksen (1989) - which we link to respondents by their ethnicity or by matching geographically to traditional regions of residence of ethnic groups (ethnic homelands) - and a large set of geographic and ethnic homeland control variables.

The empirical results do indeed indicate that historical Christian missions have had a long-run impact on FGC practices, persisting to this day. The benchmark estimates suggest that, for instance, a person living 10 km from a historical mission is approximately 4 percentage points

less likely to have undergone FGC than someone living 100 km from a mission site. The estimated effect is robust to a number of specifications and control variables. Reassuringly, the estimated effect if anything becomes larger when we take further steps to account for selection. Limiting the sample to respondents living in areas where FGC was practiced in pre-colonial times, a person living 10 km from a historical mission is 6 percentage points less likely to have undergone FGC than someone living 100 km from a mission site.

To investigate the potential mechanisms behind the relationship, we match our data on FGC and missions with granular geo-spatial data on night lights and on the size of urban agglomerations as well as make use of within-survey data on education, religious affiliation and urban residence. Controlling for these possible mechanisms has almost no impact on estimates, arguably suggesting that the effect is indeed driven by an impact of missions on norms, which has then persisted. We also investigate the impact of number of missions in respondents' ancestral ethnic homelands. One more historical mission per 1000 km² in the respondents' ethnic homeland decreases the likelihood of FGC by on average 8 percentage points. Almost half of the respondents live outside of the boundaries of their ancestral ethnic homeland, and when we compare the impact of missions in the ancestral ethnic homeland to that of missions in the geographic ethnic homeland where they currently live, the former dominates –highlighting the role of intergenerational norm transmission within ethnic groups.

While there is a rich literature on deep historical determinants of economic development (Nunn 2009; Spolaore and Wacziarg 2013), there is less evidence available on potential channels of transmission. There is, however, a growing literature on the impact of Christian missions on education (Gallego and Woodberry, 2010; Nunn, 2014; Okoye and Pongou, 2014; Wantchekon et al., 2015; Meier zu Selhausen, 2019), and on economic development more broadly (Bengtsson, 2013; Boateng et al, 2020; Alpino and Hammersmark, 2021; Jedwab et al., 2021, 2022). While these studies generally suggest positive effects of missions on education and economic development,⁴ the results concerning the effects of missions on attitudes and norms have been more mixed. Okoye (2021) finds negative effects of missions on trust in Nigeria and identifies the weakening of traditional institutions as a possible mechanism. In contrast, looking at a broader African sample, Woodberry (2012) finds that Protestant missionaries contributed to establishing conditions favourable to liberal democracy, via channels such as education, newspapers, mass printing, religious liberty and voluntary

⁴ Although our focus is on Africa, there are also studies on the effect of Christian missions on education and economic development in places such as China (Bai and Kung, 2015; Chen et al, 2022), India (Calvi et al, 2020), Mexico (Waldinger, 2017) and South America (Valencia Caicedo, 2018).

organizations, etc. Similarly, Cage and Rueda (2016) find a positive effect of Protestant missions with a printing press on trust, newspaper readership, political participation, and education. Nunn (2010) finds that Christian missions had persistent effects on conversion to Christianity, while Ananyev and Poyker (2021) find that missions contribute to anti-gay attitudes among Christians, but not among nonbelievers or followers of other religions.

Several studies have also highlighted a gender aspect of the role of missions. For example, missions have been found to contribute to gender inequality, primarily by restricting education along gender lines (Nunn, 2014; Montgomery, 2017; De Haas and Frankema, 2018). There is also evidence of a relationship between missions on the one hand and sexual or marriage practices on the other. Cage and Rueda (2020) find that the prevalence of HIV is higher in areas closer to historical missionary settlements and that it is the Christians in the sample that drive the results, indicating conversion as a potential channel. Kudo (2017) investigates the effect of a specific Protestant mission, the Livingstonia Mission in Malawi, and finds that women living closer to the location of the mission exhibit among other things a lower rate of polygamy and a higher age at first marriage, as well greater educational investment. Fenske (2015) looks at a wider sample of missions and finds that missionary education led to lower rates of polygamy. Becker (2022) also finds a negative relationship between Christian missions and polygamy, but argues that rather than missions affecting marriage practices, groups that practiced polygamy were less likely to demand missionary education. Therefore, conflicting views between the native population and the Christian missions on matters of norms can impact the effect of missions on outcomes.

Despite historical accounts of missionaries campaigning against FGC in Africa, this is, to the best of our knowledge, the first study investigating the long-run impacts of Christian missionary expansion on the practice of FGC on the continent. As such, it contributes to the literature on the historical role of Christian missions on development in sub-Saharan Africa (Gallego and Woodberry, 2010; Bengtsson, 2013; Nunn, 2014; Okoye and Pongou, 2014; Wantchekon et al., 2015; Meier zu Selhausen, 2019; Boateng et al., 2020; Alpino and Hammersmark, 2021; Jedwab et al., 2021, 2022), and in particular the strand of this literature focusing on the impact on culture, attitudes and norms (Nunn, 2010; Woodberry, 2012; Cage and Rueda, 2016; Ananyev and Poyker, 2021; Okoye, 2021), and on gender inequality (Fenske, 2015; Kudo, 2017; Montgomery, 2017; De Haas and Frankema, 2018; Cage and Rueda, 2020; Becker, 2022). Furthermore, the paper contributes to the literature on the historical origins and persistence of FGC practices (see e.g. Mackie, 1996; Becker, 2019; Corno

et al., 2020) and to the literature on the persistence and transmission of norms more generally (e.g. Bénabou and Tirole, 2006; Tabellini, 2008; Fernández, 2013; Acemoglu and Jackson, 2015, 2017; Becker, 2019; Bursztyn et al., 2020; Alesina et al., 2021).

2 Background

2.1 FGC practices

Female genital cutting is a term that encompasses a wide scope of procedures, classified into four types by the World Health Organization (WHO) (2022). Type I is clitoridectomy, which is the partial or total removal of the clitoris. Type II is excision, where both the clitoris and the labia minora are partially or totally removed. Type III is infibulation, where the vaginal opening is narrowed. This is the most extreme form of FGC and may involve stitching together the labia. Finally, Type IV includes all other harmful, non-medical procedures to the female genitalia. The act of FGC is most commonly performed before the age of 15, often in infancy or early childhood (UNICEF, 2013), and entails a number of long-term health risks such as chronic pain, infections, urinary and menstrual problems, birth complications and dangers to the newborn, anxiety and post-traumatic stress disorder (WHO, 2008).

Exactly when and where FGC originated is unknown, but historical evidence has established that the practice predates both Christianity and Islam.⁵ The original purpose of the practice is similarly uncertain, but there is some indication that FGC was implemented to prevent female slaves from becoming pregnant (Mackie, 1996). More recent theories suggest that FGC has been adopted in settings where mate guarding is challenging and thus the risk for paternity uncertainty is higher, for example in polygamous unions and among pastoralists (Mackie, 1996; Becker, 2019; Corno et al., 2020).

One question is why FGC persists despite the known health risks and lack of physical benefits. While motives vary across groups, the most common explanation is linked to marriage markets, where undergoing FGC is essentially a prerequisite to marriageability in certain settings (Mackie and LeJeune, 2009; Chesnokova and Vaithianathan, 2010; Wagner, 2015; García-Hombrados and Salgado, 2019).⁶ In some cases, FGC is part of important initiation

⁵ Writing in around 500 BCE, Herodotus makes reference to FGC among Phoenicians, Hittites, Ethiopians and Egyptians, and artifacts from around 160 BCE also mention the practice (Schafroth, 2009)

⁶ This attitude was not least apparent in the writings of Kenyatta, quoted in the Introduction of this paper (Kenyatta, 1938, p. 132).

rites or similar ceremonies (Mackie and LeJeune, 2009). FGC is sometimes viewed as a primarily religious, and specifically Muslim, practice. As mentioned above, though, FGC predates Islam and thus did not originate with the religion.⁷ Similarly, ethnicity is often cited as an important cultural variable in explaining the prevalence of FGC. Neither religion nor ethnicity are, however, sufficient to explain the observed variation in FGC practices. Indeed, FGC practices often vary greatly within ethnic and/or religious groups (Mackie and LeJeune, 2009).

Within Africa, there is substantial geographical variation in prevalence and type of FGC practiced. Countries in northern East Africa - Somalia, Egypt and Sudan – have estimated prevalence rates that range between 87 and 98 percent, with much higher rates of infibulation than in other regions (Orchid Project, 2022). Some West African countries – Burkina Faso, the Gambia, Guinea, Liberia, Mali and Sierra Leone – also exhibit high levels of FGC, with estimated prevalence rates ranging from 50 to 97 percent.

2.2 Missions in Africa

The Christian church has a long history in parts of northern Africa and Ethiopia. For a number of centuries, however, its influence did not spread much to the rest of the continent. Starting in the mid-15th century European missionaries, primarily from Portugal but also from Spain, began to establish a presence in West Africa (Sundkler and Steed, 2000). However, efforts to extend missionary activity beyond a limited geographic area were in many cases impeded by high mortality rates due to the disease environment, particularly in the interior of West and Central Africa (Johnson, 1967). The situation changed with the advent of anti-malarial medication in the mid-19th century, which led to increased survival rates among Europeans in Africa. This in turn made missionary activity more viable and facilitated the spread of Christian missionary activity to a greater geographic area (Meier zu Selhausen, 2019).

While missionary activity and colonial rule were closely connected, missionary expansion preceded European colonial rule in many cases. Missions often established along the coast and then moved inland along pre-colonial trade routes, avoiding areas with populations that were particularly hostile (Meier zu Selhausen, 2019). The establishment of colonial rule intensified

⁷ Some authors argue however that the relatively high share of Muslims among those practicing FGC is due to the fact that FGC was more often incorporated into the Muslim faith than was the case with other religions (Carr, 1997; Gordon, 1991).

the rate of missionary expansion, as missionaries were increasingly able to access transportation infrastructure built by colonial powers and to take advantage of the protection provided by colonial rule.

The main focus of missionaries was to convert as many of the local inhabitants to Christianity as possible (Johnson, 1967; Fields, 1982; White, 1996). Often, conversion to Christianity was considered to entail a cultural conversion as well as a religious one, and missionaries' actions were sometimes framed as a war on heathenism. Taken to the extreme, potential converts were removed from their home villages and relocated to the mission to distance them as much as possible from traditional culture and influences (Fields, 1982). Mission schools, which provided attractive education opportunities to potential converts, were also often viewed as a means of spreading Christian and/or Western culture to the native population (Johnson, 1967; Strayer, 1976; White, 1996; Fourier et, 2014; Meier zu Selhausen, 2019).

The desire to impose Christian culture led missionaries on a collision course with any aspect of traditional African culture that was deemed to be in conflict with Christian values (Strayer, 1976; Fields, 1982). This in turn undermined efforts to attract new followers to missionary churches and contributed to the establishment of independent African churches. Further, while some colonists supported the general goal of converting Africans to Christianity, arguing in favor of "spiritual colonization" in parallel with political colonization, there was concern that the attack by missionaries on traditional African practices could threaten law and order in the colonies (Fields, 1982). As such, many European missionaries felt compelled to make a choice: remain steadfast in an insistence on full cultural conversion, or to adopt a more flexible attitude. In the end, most missionaries chose some degree of adaptation, allowing at least some forms of traditional practices to be maintained within a Christian framework (Strayer, 1976). However, certain traditions were considered more problematic than others, primarily polygamy, female genital cutting and, to a lesser extent, bride price, and thus faced greater opposition from missionaries (Turner, 1966; Strayer, 1976; Becker, 2022), and there is evidence that Protestant missionaries were more likely than Catholic missionaries to take an absolutist position against FGC (Caldwell et al., 2000).

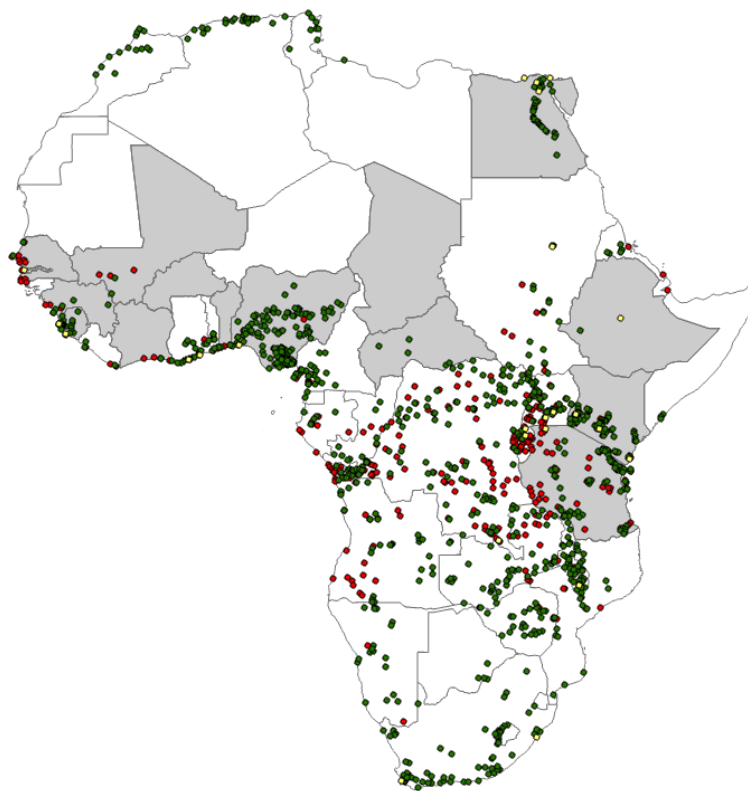
The extent to which missionaries were willing to accommodate a so-called "Africanization" of Christianity varied considerably (Strayer, 1976; Kaplan, 1986; Caldwell et al., 2000). Since European missionaries were in short supply, societies relied on African clergy

to run smaller missions and churches. These clergy members seem to have been more sympathetic to adapting their teachings to accommodate existing customs and practices rather than take a dogmatic hardline (Strayer, 1976). Therefore, the strongest opposition to traditional practices were expected to be found in the main missionary stations where the number of European missionaries was greatest.

3 Data and empirical strategy

To measure the influence of Christian missions on FGC, we use the information found in the map by Roome (1924) on the location of early missions established by Europeans, with geo-codes obtained from Nunn (2010). The data is restricted to foreign missions, i.e., missions focused on the indigenous population rather than the immigrant European population (Nunn, 2014). In total, the resulting data includes information on 1,222 Christian missions: 327 Catholic missions, 871 Protestant missions, and 24 British and Foreign Bible Society (BFBS) missions/depots across the African continent (see Figure 1).

Figure 1: Location of missions, by denomination



Source: Roome (1924). Protestant missions in green, Catholic missions in red, BFBS missions in yellow. Countries in our sample, i.e. those where FGC is practiced and where there is data on FGC practices, in grey. Notably,

though, respondents' nearest mission may be on the other side of a country border, implying that we draw on mission data from neighbouring countries as well.

Jedwab et al. (2022) show that only a small fraction of the total number of missions are included in Atlases, with a clear bias towards early, large, European missions. However, as described above, the historical accounts indicate that campaigns against FGC were primarily by European missionaries, while churches run by native Africans were generally more tolerant of customary practises such as FGC. Hence, for our purpose the early missions run by Europeans are probably the most relevant.

To measure our outcome of interest, we use the Demographic and Health Surveys (DHS, 2021), with data on, among other things, the FGC status of respondents, along with GPS-data and covariates. We compile 42 cross-sectional datasets collected in 14 African countries between 1990 and 2020: Benin, Burkina Faso, the Central African Republic, Chad, Cote d'Ivoire, Egypt, Ethiopia, Guinea, Kenya, Mali, Nigeria, Senegal, Sierra Leone, and Tanzania.

Since the FGC data is based on self-reporting, we cannot rule out reporting bias due to social desirability considerations or to the fact that FGC is illegal in many countries. Importantly, however, the DHS enumerators are instructed to use the local term for female circumcision to avoid potentially negative connotations (Demographic and Health Survey, 2016). Furthermore, the potential risk of reporting bias is likely somewhat reduced by the fact that FGC is common in many of the countries included in the data, and by the fact that the respondent herself generally was not the one responsible for making the decision to undergo FGC as a child. There are some studies that measure the extent of reporting bias by comparing prevalence in self-reported data with prevalence from clinical data. Novak (2020) finds that there is some underreporting in Burkina Faso, but that difference was relatively small (93 percent vs 89 percent). Similarly, Elmusharaf et al. (2006) did not find evidence of significant underreporting in Sudan.

To compute the distance to early Christian missions, we use the GPS coordinates to link the DHS data and the Roome (1924) atlas data. In our main estimations, we use the log distance to the nearest mission, which is the most commonly used measure in the literature.⁸ By taking the log of the distance, long distances are discounted, i.e. it matters much more if you live 10 or 20 km from an historical mission than if you live 110 or 120 km away. In robustness estimations we use the number of missions within a 25 km radius around the DHS survey

⁸ GPS coordinates in DHS surveys include a random error of up to 1 km in urban areas and up to 5 km in rural areas to prevent the possibility to identify individuals. This will introduce measurement error, which will bias our estimates downwards.

cluster, which is the measure used by Nunn (2010, 2014), and a binary measure of having any missions within a 25 km radius around the survey cluster.

Moreover, to shed some light on the possible importance of norm transmission across generations, we investigate the relationship between the number of missions per 1000 square kilometers in the ancestral ethnic homeland of the respondent and FGC (Table 4). We link the ethnicity of DHS respondents to pre-colonial ethnic groups described in Murdock (1967) using the LEDA R package (Müller-Crepon et al., 2021).⁹ 44 percent of respondents do not live in their ancestral ethnic homeland and may thus reside in an area with differential exposure to missions. In order to explore the relative importance of persistent FGC norms in the region of residence as compared to in the family or ethnic group, we also run regressions where we include both missions per 1000 km² in the respondent's ancestral ethnic homeland and missions per 1000 km² in the geographic ethnic homeland in which she currently lives.

Missions were not distributed at random across Africa. In particular, historical accounts suggest that accessibility, safety and disease environment mattered for missionary expansion. This is confirmed in a quantitative analysis by Jedwab et al. (2022), who also show that economic potential mattered. Hence, while FGC per se is not likely to have mattered for location of missions, the practice may be correlated with other factors that did. Following standard procedures in the missions-literature, we account for various geographic factors that may have influenced where missionaries settled. In particular, we control for a number of characteristics related to accessibility, economic development and disease environment. All regressions include historical controls measured at the level of the ethnic homeland for slave exports, cultivation of roots and tubers, existence of an empire, mean elevation, mean suitability for agriculture, and presence of a city in 1400 (Michalopoulos and Papaioannou, 2016). We also include control variables for minimum distance to colonial railways, explorer routes, and coastline. Finally, we include (sub-national) region fixed effects.

Our identification rests on the assumption that the location of Christian missions was not influenced by existing pre-colonial FGC practices of the native population. To explore the validity of this assumption we use data from a comprehensive ethnographic effort to map the traditional, pre-colonial, use of FGC in ethnic groups (Ericksen, 1989). This is in the spirit of Ananyev and Poyker (2021) and Fenske (2015), who also control for pre-colonial patterns in their respective outcome variables. Ericksen (1989) provides data on 115 ethnic groups and is

⁹ More details on how we linked ethnicities using the LEDA R-package are provided in Appendix II.

based on all available ethnographic sources, including in local languages, for the set of ‘well-described’ ethnic groups in Roome (1967). Of these groups, 98 have sufficient information to be classified either as practising or not practising FGC. Each of the included ethnic groups belong to a broader cultural cluster of ethnic groups and are meant to be representative of their cultural cluster. To increase sample size, we extrapolate a given group’s pre-colonial FGC classification to other ethnic groups in the same cultural cluster.¹⁰

In Table 1, we test if there is a significant relationship between pre-colonial FGC practices in an ethnic homeland and the number of missions that were subsequently established there.¹¹ Reassuringly, neither the unconditional associations (column 1), or the estimations controlling for country fixed effects (column 2) or region fixed effects (column 3) suggest any statistically significant correlation between pre-colonial FGC practices and the number of missions located in the homelands. Nonetheless, we run all estimations both for the full sample and for a restricted sample consisting only of respondents living in homelands where FGC was practiced in pre-colonial times.

Table 1: Pre-colonial FGC and the location of historical Christian missions

	(1)	(2)	(3)
	Total no. of missions	Total no. of missions	Total no. of missions
Pre-colonial FGC	0.573 (0.746)	0.517 (0.831)	1.039 (1.121)
Mean # missions	2.03	2.03	2.03
Country FEs	No	Yes	No
Region FEs	No	No	Yes
R-squared	0.003	0.110	0.659
Observations	181	181	181

Standard errors in parentheses.

To investigate whether subsequent urbanization and economic development are relevant mechanisms underlying the relationship between missions and FGC, we use GPS coordinates to match our data on missions and FGC with data from the Africapolis database (OECD/SWAC, 2020), which has information about the size of all urban areas in Africa, and with satellite data on night lights from 2013 (Tollefsen et al., 2012, 2015).

Our main explanatory variables capture exposure to historic missions, measured by the log distance to the nearest mission. Our benchmark specification takes the form:

¹⁰ More details on how we coded pre-colonial FGC are provided in Appendix II.

¹¹ In Table A1 in Appendix I, we instead use the number of missions in the ethnic homeland per 1000 km².

$$FGC_status_i = \beta_0 + \beta_1 \log_dist_mission_{ic} + \theta_i + \gamma_{ij} + \delta X_{ih} + \varphi Z_{ic} + \varepsilon_{ichj} \quad (1)$$

where FGC_status_i is a dummy variable equal to one if the respondent has undergone FGC and $\log_dist_mission$ is the log distance in km to the nearest mission. θ_i are age fixed effects, γ_{ij} are birth year-country fixed effects, X_{ih} are homeland controls, Z_{ic} are geographic controls, including sub-national region fixed effects. Since the location of the respondent is defined at the cluster level, we cluster the standard errors at the cluster level. The number of observations vary by country (as seen in Table A2 in Appendix I). We use survey weights which we have adjusted to make the sample representative for the population in the countries studied.¹²

When exploring the impact of missions in respondents' ancestral and geographic ethnic homelands, we replace $\log_dist_mission_{ic}$ with $Missions_ancest_homeland_{ic}$ and $Missions_geo_homeland_{ic}$. In these regressions we cluster the standard errors at the ethnicity level.

For more information on how we define key variables, see Appendix II. Furthermore, Table A3 in Appendix I shows descriptive statistics of all variables used in the main or robustness analysis. 63.4% of women in the sample are cut, and the mean distance to a mission is 116 km.

4 Results

In this section, we present the results of our empirical estimations investigating the long-run impacts of missionary expansion on the practice of FGC in sub-Saharan Africa. We first present our main results on effects of distance to a historic mission, then evaluate the robustness of our findings, and finally, examine potential mechanisms underlying the observed relationship.

4.1 Main results

The empirical results consistently suggest that respondents living closer to historical missions are less likely to have undergone FGC. The estimated parameter in the full sample suggests that a person living 10 km from a historical mission is approximately 4.1 percentage points less likely to have undergone FGC than someone living 100 km from a mission site. Restricting

¹² DHS survey weight are adjusted with $\frac{Country\ population}{(Country\ estimation\ sample / Total\ estimation\ sample) * 10000}$

the sample to respondents living in homelands where FGC was practiced in pre-colonial times, the parameter is larger.

Table 2: The effect of historical Christian missions on respondent’s FGC status.

	(1)	(2)
	Full sample	Pre-FGC=1
Log distance to a mission	0.041*** (0.008)	0.060*** (0.011)
R-squared	0.294	0.289
Observations	409,383	289,606

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include age fixed effects, birth year-country fixed effects, sub-national region fixed effects, historical homeland controls for slave exports, roots and tubers, empire, mean elevation, mean suitability for agriculture, city in 1400, a dummy for a lake, a dummy for a river, and control variables for minimum distance to colonial railways, explorer routes, and coastline.

4.2 Robustness

The results are robust to using alternative measures of exposure to historical missions. Our benchmark indicator – log distance – has the advantage that it does not rely on a specific (and inevitably somewhat arbitrary) cut-off distance to define treatment. That said, one could argue that what should primarily matter for norm formation and behaviour is having missions in the immediate vicinity. Hence, in line with Nunn (2010, 2014), we also run estimations where we measure exposure to historical missions using the number of missions within a 25 km radius around the respondent sample cluster (Table A4). Furthermore, since most of the variation in number of missions within 25 km is driven by the extensive margin, we also run estimations using a binary indicator of having any historical mission within a 25 km radius (Table A5). The main results remain unchanged.

Since previous studies have shown that the practice of FGC is by no means perfectly related to attitudes towards the same (Congdon Fors et al., 2021), we also run estimations where we instead focus on respondents’ attitudes towards FGC (Table A6). More specifically, we use a dummy indicating if the respondent reports support for the continuation of the practice of FGC as dependent variable. Closeness to historical missions is indeed associated with less favourable attitudes towards FGC.

Considering that historical accounts suggest that Catholic and Protestant missions differed in their approach towards the abolition of FGC, with Catholic missions often being less steadfast and sometimes allowing modifications rather than total abolition of the practice, it is interesting to explore heterogeneity by denomination of the mission. We do this in Appendix

III. In summary, the results are inconclusive with regard to differences in effects between missions of the two denominations.

4.3 Mechanisms

In our benchmark setup we include only control variables that can be judged as reasonably exogenous with respect to missionary expansion. That is, we do not control for variables that are themselves likely to be affected by exposure to historical missions. However, to get a picture of the mechanisms underlying the observed results, we here include explanatory factors that have previously been suggested to be affected by missions, and that could in turn exert an influence on FGC practices. In Table 3, we explore how the estimated effect of missions reacts to the inclusion of possible mechanism candidates.

We first add dummy variables for whether the respondent is Christian or Muslim. Christian missions have been linked to increased conversions to Christianity (Nunn, 2010).¹³ As mentioned in the introduction, there is also evidence that historical Christian missions have had a positive effect on schooling in the exposed areas. Therefore, we add the respondent's level of education. Next, since Christian missions have been linked to urbanization and economic growth, we add variables measuring, first, urbanity using the urban dummy provided in the survey and data on the population size of cities (measured in 100 000 inhabitants) and, second, satellite night light data.

The coefficients of the potential mediators are in line with expectations: Christians are less likely and Muslims more likely to practice FGC, respondents with higher levels of education are less likely to practice FGC, as are respondent in urban and wealthier areas, as measured by night light data.¹⁴ The parameter on distance to any mission shrinks when we control for the respondents' level of education or night light intensity, but is not affected by the inclusion of the respondent's religious affiliation or urbanization. When all potential mediators are entered simultaneously the coefficient is reduced by about 20 percent, but remains statistically significant at the one percent level.¹⁵

¹³ Since the Tanzanian data does not include religion, regressions with religious affiliation do not include observations from Tanzania.

¹⁴ Accounting for urban residency, however, those living in larger cities are not less likely to be cut.

¹⁵ The importance of these channels would be under-estimated if they are measured with more error than the missions. However, since at least the individual level variables and urbanity should be measured with relatively high precision, we argue that this is unlikely to be the case. We could also underestimate the investigated channels if they, conditional on missions and the full set of control variables, are positively (negatively) correlated with an

Table 3: The effect of historical Christian missions on respondent's FGC status, some potential pathways.

	(1)	(2)	(3)	(4)	(5)
Panel A: Full sample					
Log distance to mission	0.040*** (0.008)	0.029*** (0.008)	0.040*** (0.009)	0.034*** (0.008)	0.032*** (0.009)
Christian	-0.119*** (0.038)				-0.077** (0.031)
Muslim	0.115*** (0.044)				0.136*** (0.038)
Some or completed primary		-0.123*** (0.020)			-0.091*** (0.019)
Some or completed secondary school		-0.211*** (0.021)			-0.169*** (0.020)
More than secondary school		-0.299*** (0.023)			-0.249*** (0.021)
Urban residence			-0.093*** (0.014)		-0.043*** (0.014)
City population			0.001*** (0.000)		0.002*** (0.000)
Night light				-0.331*** (0.042)	-0.310*** (0.045)
R-squared	0.297	0.315	0.301	0.303	0.327
Observations	380,974	409,374	409,383	409,383	380,965
Panel B: In areas where FGC was practised in pre-colonial times					
Log distance mission	0.061*** (0.011)	0.047*** (0.010)	0.051*** (0.011)	0.055*** (0.011)	0.045*** (0.011)
Christian	-0.172*** (0.046)				-0.117*** (0.036)
Muslim	0.093* (0.055)				0.114** (0.046)
Some or completed primary		-0.161*** (0.024)			-0.126*** (0.022)
Some or completed secondary school		-0.271*** (0.025)			-0.225*** (0.023)
More than secondary school		-0.353*** (0.027)			-0.298*** (0.024)
Urban residence			-0.103*** (0.017)		-0.055*** (0.016)
City population			0.000 (0.000)		0.001** (0.000)
Night light				-0.324*** (0.048)	-0.235*** (0.052)
R-squared	0.293	0.318	0.295	0.298	0.326
Observations	271,087	289,599	289,606	289,606	271,080

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include age fixed effects, birth year-country fixed effects, region fixed effects, historical homeland controls for slave exports, roots and tubers, empire, mean elevation, mean suitability for agriculture, city in 1400, a dummy for a lake, a dummy for a river, and control variables for minimum distance to colonial railways, explorer routes, and coastline.

omitted variable which is negatively (positively) correlated with FGC. Given our large number of geographic controls and the fact that we observe no systematic relationship between where FGC was practised in pre-colonial times and where missions were established, we do not believe this is a major concern.

If historical missions affect current FGC via an impact on norms in the local areas, a further question is what explains the persistence of these norms? To shed some light on the possible role of norm transmission in ethnic groups across generations, we next investigate the relationship between the number of missions per 1000 km² in the ancestral ethnic homeland of the respondent and FGC (Table 4). Again, we run the estimation on the full sample as well as on a restricted sub-sample, in this setup focusing on respondents whose ancestors practiced FGC in pre-colonial times (rather than on respondents living in areas where FGC was practised). As we can only include respondents with a known ethnicity that could be matched to ethnic homelands the sample size is reduced by almost half.¹⁶ In the full sample, one more mission per 1000 km² in the respondent’s ancestral ethnic homeland reduces the probability that respondents have undergone FGC by around 8 percentage points. In the sample of respondents whose ancestors’ practised FGC, which should better account for selection, the corresponding effect size is larger, suggesting that one more mission gives a 12 percentage point lower probability of having undergone FGC.

To further investigate the possible role of norm transmission in ethnic groups across generations, in columns 2 and 4 we include both missions per km² in the respondent’s ancestral ethnic homeland and in the geographic ethnic homeland in which she currently lives. The estimated parameters suggest that missions in the ancestral ethnic homeland are more important than missions in the geographic homeland, in line with intergenerational norm transmission in the family or ethnic group.

Table 4: The effect of the number of missions in the respondent’s ethnic homeland (per 1000 km²)

	Full sample		Pre-FGC=1	
	(1)	(2)	(3)	(4)
Missions in ancestral homeland	-0.077** (0.034)	-0.063** (0.028)	-0.120*** (0.025)	-0.104*** (0.027)
Missions in geographic homeland		-0.034 (0.045)		-0.047* (0.028)
R-squared	0.353	0.353	0.298	0.298
Observations	230,913	230,913	145,500	145,500

Clustered standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All regressions include age fixed effects, birth year-country fixed effects, sub-national region fixed effects, historical homeland controls for slave exports, roots and tubers, empire, mean elevation, mean suitability for agriculture, city in 1400, a dummy for a lake, a dummy for a river, and control variables for minimum distance to colonial railways, explorer routes, and coastline.

¹⁶ We lose all observations from Egypt, the Central African Republic and Tanzania since ethnicity was not collected in surveys from these countries. We also lose all observations of women from smaller ethnic groups having been grouped into “other” during data collection.

5 Conclusions

Historical accounts suggest that Christian missionaries from Europe campaigned against FGC, a tradition they perceived to be in conflict with Christian values, and that these campaigns faced considerable resistance among the people practicing FGC.

Despite reports of limited short-run success of these campaigns, we find statistically significant long-run impacts of early Christian missions on the probability that women in sub-Saharan Africa have undergone the procedure today.

Results from empirical estimations drawing on historical data on the locations of early European missions geographically matched with Demographic and Health Survey data on FGC practices of around 410,000 respondents from 42 surveys performed between 1990 and 2020 in 14 African countries, consistently suggest that respondents who live closer to an historical mission are less likely to have undergone FGC. The effect is robust to the inclusion of a broad range of geographic controls (including sub-national region fixed effects) and ethnic homeland characteristics, as well as to alternative measures of exposure to missions and FGC practices. We use ethnographic data on pre-colonial FGC in ethnic homelands and show that mission location was not correlated with the pre-colonial practice of FGC. Nonetheless, we demonstrate that the effect remains if we restrict the sample to respondents living in areas where FGC was practiced in pre-colonial times. Indeed, the effect in this sample is larger, which is what we would expect without any selection bias, since there is presumably greater scope for reduction in this sub-population.

With respect to potential mechanisms, the results suggest that the effect of historical missions on current FGC practices may to some extent work via education and economic development. This is in line with earlier literature emphasizing the role of missions for women's education. Notably, however, even when including all potential mediators jointly (religious affiliation in addition to measures of education and economic development), most of the association between missions and FGC remains, arguably suggesting a direct effect of mission activities on norms.

To further investigate the possible role of intergenerational transmission of norms on FGC practices, we estimate the effect of missions in respondents' ancestral ethnic homelands. The results suggest lower probabilities of FGC among respondents if there were more missions in their ancestral ethnic homelands. Indeed, the impact of mission in the respondents' ethnic

homeland seemingly dominates that of missions in the current region of residence, highlighting the role of intergenerational norm transmission within ethnic groups.

In sum, we find that respondents who live closer to an historical mission are less likely to have undergone FGC. The relationship is particularly strong among respondents living in areas where FGC was practiced in pre-colonial times or whose own ethnic ancestors practiced FGC.

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