Organized Religion and Origins of Norms:
Evidence from Africa[*]

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April 5, 2020

Abstract

We argue that organized religion serves as a powerful mechanism of change and subsequent persistence of cultural norms. We use a geo-coded representative survey of African countries and the location of historical Christian missions to estimate a significant and economically meaningful association between proximity to historical missions and anti-gay sentiments today. Using anthropological data on pre-colonial acceptance of homosexual practices among indigenous groups, we show that the establishment of missions, while nonrandom, was exogenous to pre-existing levels of intolerance among local populations. Thus, we argue that our results are indicative of a causal effect of missionary religious conversion. Our study demonstrates that organized religion can facilitate change in norms and values.

Keywords: Missions, Africa, Tolerance, Homosexuals, Religion.
JEL codes: J15, N37, Z1

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1 Introduction

Religion has been shown to be an important determinant of economic development (McCleary and Barro, 2006; Rubin, 2017) and individual-level behaviour (Carvalho, Koyama and Sacks, 2017; Becker and Woessmann, 2018). It has also been demonstrated that followers of different religious doctrines differ in their norms and values (Van Hoorn and Maseland, 2013). However, whether the difference in cultural norms is a result of religious conversion is a difficult empirical question because of the perennial endogeneity problem: people convert for non-idiosyncratic reasons, while norms and beliefs evolve within communities to reflect an underlying social, economic, and political reality (Gershman, 2015; Binzel and Carvalho, 2017; Carvalho, 2019).

Thus, to demonstrate the effect of religious conversion on norms and values one needs to consider a situation when an already-coalesced doctrine is introduced to a population that followed a different set of norms, and that introduction is not driven by differences in preferences of the population targeted for conversion. In this paper, we consider such a context. We explore a potential causal effect of colonial Christian missionary activity on modern anti-LGBT sentiments in Africa. This is a uniquely suitable setting for this question, because — as we can demonstrate — the arrival of early Christian missions was unrelated to pre-colonial acceptance of homosexuality among indigenous groups, and rejection of homosexuality had been already an established norm within Christianity.[1]

We use three sources of data in this paper: (i) locations of the historical missions from Nunn (2010) and Cagé and Rueda (2016), (ii) the spatial data from the sixth Afrobarometer's wave that contains a question about intolerance toward homosexuals (whether a respondent would oppose having homosexuals as neighbors), and, (iii) previously untapped for economic research, data on acceptance of homosexual practices among indigenous groups collected by Murray and Roscoe (1998). First, we measure exposure to historical missions as the minimum distance from missions to a village/town where the respondent lives. Then, using ordinary-least-squares (OLS) specification we estimate the effect of proximity to missions on hostility toward gay persons. In our preferred specification, we estimate that respondents located 100 km closer to a mission are 1.3 percentage points more likely to be intolerant to gay persons than those living farther away from a mission site. To put this number in the context, the distance to a mission varies from 0.1 km to 1400 km. Thus our estimate can plausibly explain 19 percentage point variation in intolerance. Given that the average percentage of respondents who have anti-gay attitudes is 63.8, the effect of missions is substantial.

This estimate can be interpreted causally if the locations of the missions are exogenous to counterfactual levels of intolerance. Given that the locations of the missions were nonrandom (Jedwab, zu Selhausen and Moradi, 2018), causal identification can be challenging. However, we use anthro-

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[1]Historians hypothesize that the Seleucid occupation of Israel made Jews, resisting the foreign rule, hostile to various aspects of the Hellenic culture, one of which was homosexuality (Josef Flavius "The Jewish War", 5:561-562). It transmitted to Judaism, and later directly to Christianity and Islam (through Yemeni Jews). At the same time, the African population did not have pronounced intolerance toward gay persons (Murray and Roscoe, 1998), and the intolerance had appeared with the spread of Christianity and Islam (Tamale, 2014 and Grossman, 2015).

pological data on pre-colonial levels of acceptance of homosexual practices (Murray and Roscoe, 1998) to demonstrate that there is no discernible relationship between pre-colonial acceptance of homosexuality and locations of the missions. We also consider a set of other potential violations of identification assumptions. Specifically, we test if geographical determinants of locations of missions (e.g., terrain ruggedness and proximity to coast) could have influenced modern levels of intolerance directly or indirectly (through economic development, polygyny practices, HIV prevalence, literacy, and etc.).

Our results do not depend on the functional form of the minimum distance-to-mission, hold if we use the number of missions in respondent's vicinity as an alternative measure of exposure to historical missions, and are robust to the alternative measures of the dependent variable. In the baseline specification, we only control for the exogenous geographic factors and the set of country and ethnicity fixed effects. In other specifications, we control for a rich set of individual-level variables (education, various proxies for living conditions, employment) and community-level variables (population density and luminosity from satellite images). Our results are not driven by any single country or a set of countries.

We argue that the most plausible channel of influence of colonial Christian missions on modern anti-gay intolerance is religious conversion. It has been demonstrated by Nunn, 2010 that the missions were effective in promoting Christian faith among the indigenous population. However, the missions also promoted literacy and provided medical care. We contend that it is plausible that it is precisely the spread of religion (not education or medical practices) that influenced modern anti-gay attitudes. We offer two main pieces of evidence: first, our subsample analysis shows that the effect is entirely driven by Christian respondents, and, second, the effect persists if we control for individual-level and community-level potential consequences of missionary activity (education, material conditions, democratic values). It is also worth pointing out that the secular potential consequences of missionary activity most likely lead to more tolerance, not less. Thus these concerns probably attenuate our estimates. We also find that our main estimate remains significant if we exclude Evangelical respondents, or look only at the subsample of Catholic respondents, thus ruling out the possibility that the effect is entirely driven by modern U.S. "megachurches" (though they were important in promoting values of the U.S. Evangelical movement, including rejection of homosexuality).

Norms and values have a profound effect on economic, social, and political outcomes (Zak and Knack, 2001, Algan and Cahuc, 2010, Nunn and Wantchekon, 2011, Alesina and Giuliano 2015, and Mokyr 2016). Therefore, one of the most important questions in social science is where norms and values come from, how they spread, and why they change. The economic literature has established several important historical determinants of current values: pre-industrial economic conditions (Alesina, Giuliano and Nunn, 2013), biased gender ratios (Grosjean and Khattar, 2019), slavery (Nunn, 2008), and ancestral political autonomy (Michalopoulos and Papaioannou, 2013). In this paper, we argue that religion can also serve as a powerful source of change and persistence

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of norms and beliefs.[2]

We also contribute to the growing literature on the origins of the cultural norms (Alesina, Giuliano and Nunn, 2013, Spolaore and Wacziarg, 2013, Fan and Wu, 2016, Xue, 2016, and Becker, 2018). Here, we demonstrate, how colonial institutions and religious doctrine shaped attitudes of the indigenous African population, reverting their attitudes toward homosexuals. Our study is also relevant for the literature on the effect of religion on modern outcomes (Barro and McCleary, 2003; McCleary and Barro, 2006; Campante and Yanagizawa-Drott, 2015) since we argue that religious conversion caused anti-gay norms and that these effects later persisted.

The impact of European settlements on modern political and economic outcomes remains highly contested. While some scholars have posited that those settlements could have had an impact on the institutions (Acemoglu, Johnson and Robinson, 2001 and Woodberry, 2012), there are relatively few studies that document the impact of the European settlements on modern values (Cagé and Rueda, forthcoming is an important study of this topic). Since the values in many ways determine political and economic behavior, our paper is filling this gap. For example, historically African societies demonstrated little to no intolerance toward homosexuals; however, countries of Sub-Saharan Africa now have the harshest anti-LGBT legislation (Amnesty International, 2013), and only 21% of all Afrobarometer's respondents reporting tolerance to the homosexuals. The legacy of the colonial anti-homosexual legislation cannot explain the variation in the hostility against gay persons, and the scholars of the region (e.g., Grossman, 2015) suggest that intolerance is related to the rapid growth of Pentecostal and Evangelical Christian denominations.

Overall, we find that Christian missions' legacy was not always beneficial but also had a very persistent and large effect on intolerance toward gay persons.[3] We contribute to the literature on discrimination (Grossman, 2015, Brodeur and Haddad, 2018, Manning and Masella, 2018, and Aksoy et al., 2019, 2020) by showing the long-term effect of institutions of religious conversion on anti-gay sentiments. We also add to the literature on colonial institutions and persistence in development (Acemoglu, Johnson and Robinson, 2001, Nunn, 2010, Woodberry, 2012, Cagé and Rueda, 2016, Jedwab, zu Selhausen and Moradi, 2018, and Valencia Caicedo, 2019). Here we show negative persistent effects of European colonial institutions on a particularly important aspect of development: tolerance towards homosexuals.

Finally, we also contribute to the growing literature on the long-run determinants of attitudes toward LGBT. In this literature, Baranov, De Haas and Grosjean (2018) show that male-biased gender ratios influenced opposition to same-sex marriage in Australia as well as occupational segregation by gender, while Brodeur and Haddad (2018) argue that in California during the Gold Rush

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[2]Scholars have proposed several explanations of the persistence of norms, such as older generations socializing younger cohorts into the norms of older cohorts (Aghion et al., 2010) and cross-generational stability of environment (Giuliano and Nunn, 2017).

[3]Our study is also relevant to literature on the legacies of Christian missions in Africa. Scholars have argued that the missions had positive effects: promoting democracy (Woodberry, 2012), contributing to printing and written tradition (Cagé and Rueda, 2016), reducing early marriages (Kudo, 2017), improving intergenerational mobility (Alesina et al., 2019). Recently, Cagé and Rueda, forthcoming demonstrated mixed effects of missions on HIV/AIDS instances. We show that missionary activity had negative effects: contributing to intolerance towards homosexuals and possibly influencing the criminalization of homosexuality in many African countries.

high male-to-female ratio caused more tolerant attitudes towards homosexuality. Our paper does not address the issue of biased gender ratios but focuses on religious conversion as a mechanism of the formation of anti-gay attitudes.

The paper proceeds as follows. In Section 2, we provide background about historical and contemporary attitudes toward homosexuals in Sub-Saharan Africa and explains attitudes of Abrahamic religions towards homosexuality. Section 3 introduces our data sources. Section 4 then provides descriptive facts about contemporary attitudes toward gay persons, religion, and cultural norms. Section 5 provides empirical specification, results, and discuss our identifying assumptions. Section 6, in turn, discusses the mechanisms and provides evidence in favour of the spread of Christianity as the main factor. Section 7 concludes.

2   Historical Background

Indigenous groups of Sub-Saharan Africa are documented to have been tolerant to homosexual relationships. Early European scholars and travelers to the region reported many instances of overt homosexuality and cross-dressing among men. Andrew Batell, an English explorer, who had been imprisoned in the 1590s by the Portuguese in the territory of modern Angola, wrote about the practices among the Imbalanga: "*They have men in women's apparel, whom they keep among their wives.*" Later, Sir Richard Burton, researching the Portuguese sources from the 16th century found observations of the instances of male homosexuality among the Kongo tribe (Epprecht, 2006). A more systematic anthropological record confirmed those early observations. Acceptance of homosexual marriages has been documented among the indigenous groups of Southeast Nigeria (Nwoko, 2012) as well as among 40 ethnic groups across Sub-Saharan Africa (Narrain et al., 2018). Summarizing the scholarship on indigenous African homosexuality, Nigerian gay rights activist Bisi Alimi wrote "*If you say being gay is not African, you don't know your history.*"[4]

Traditional Abrahamic religions (Judaism, Christianity, Islam) have been traditionally less accepting of homosexuality. The sacred texts of these religions (The Torah, The Bible, The Qur'an) have passages that in different points in time were interpreted as a prohibition of homosexuality. Specifically, The Code of Holiness (Leviticus 17-26) identifies male homosexuality as a sin punishable by death ("*Do not have sexual relations with a man as one does with a woman; that is detestable.*" (Lev: 18:22)).[5] The Epistle to the Romans in The New Testament has been interpreted as a prohibition of both male and female homosexuality ("*Because of this, God gave them over to shameful lusts. Even their woman exchanged natural sexual relationship for unnatural ones. In the same way the men also abandoned natural relations with women and were inflamed with lust for one another.*" (Romans 1:26-27)).[6] This view is also echoed in the Epistle 1 to Corinthians ("*Or do you not know that wrongdoers*

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[4]The Guardian, Sep 9, 2015. If you say being gay is not African, you don't know your history. www.theguardian.com/commentisfree/2015/sep/09/being-gay-african-history-homosexuality-christianity.

[5]Quotes from the Bible are given according to the New International Version (NIV) published on Bible Gateway: www.biblegateway.com/.

[6]Some scholars insisted that this particular passage condemns heterosexual individuals who commit homosexual acts, while others argue that those verses are influenced by the Code of Holiness and should be interpreted as an

will not inherit the kingdom of God? Do not be deceived: Neither the sexually immoral nor idolaters nor adulterers nor men who have sex with men." (1 Corinthians 6:9-10)). Qur'an also has verses that have been interpreted as a prohibition of homosexuality (*"Indeed, you approach men with desire, instead of women. Rather, you are a transgressing people."* (Qur'an 7:81)).[7]

These passages from the sacred texts were used later to justify the rejection of homosexual relationships. Influenced by The Bible and early Christian teachings, Roman Christian emperors prescribed the death penalty to those who committed homosexual acts.[8] Intolerance to homosexuals has been inherited by all major Christian denominations. Rejection of homosexual practices is a part of the 1992 Catechism of the Roman Catholic Church.[9] While many Protestant denominations now do accept homosexuality, allow gay clergy, and offer blessings for same-sex marriage, this is a relatively recent phenomenon. Martin Luther called homosexuality "monstrous depravity" (Pelikan, 1958). In 2003, an appointment of an openly gay bishop in New Hampshire caused deep divisions within the Anglican Communion, when the group of conservative American bishops threatened to leave the Episcopal Church.[10] The Protestant community remains divided on the issue of same-sex marriage with some groups accepting it and some groups opposing it.

The earliest Christian communities in Sub-Saharan Africa appeared in Ethiopia in the 4th century. Early missionary work in Sub-Saharan Africa has been done by the Portuguese in the 16th century. Later, with the rise of European trade and colonial expansion, missions from Germany, Belgium, France, and Great Britain appeared on the continent (Zandt, 2011). The main purpose of missions was the religious conversion of indigenous groups to Christianity. The conversion was significantly aided by goods and services offered within the missions — most notably, education and health care (Nunn, 2010). As Nunn et al. (2014) point out, the locations of Christian missions were not random. The most important factors were access to clean water, mild climate, and proximity to European trade routes.

Today, several countries of Sub-Saharan Africa have harsh anti-gay legislation. According to Amnesty International, in Uganda, those found to be involved in a same-sex relationship can face seven years in prison. The Same-Sex Marriage Prohibition Act in Nigeria, signed into law by then-President Goodluck Jonathan in 2014 punishes homosexual meetings and clubs by more than 10 years of prison.[11] Homosexuality is also illegal in Cameroon, Kenya, Tanzania, Zambia, and 24 other countries in Sub-Saharan Africa. These legislations are often supported by rhetoric that juxtaposes protection of "God's design" with the alleged influence of "Western groups."[12] People's

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unambiguous view that homosexuality violated God's order.

  [7]Sahih International Translation. The Quranic Arabic Corpus. http://corpus.quran.com/.

  [8]See, for example, Codex Theodosianus, that requires homosexuals to be subjected to "avenging flames."

  [9]See line 2396. http://www.vatican.va/archive/ENG0015/_P88.HTM.

  [10]See The Guardian, Sep 14, 2003. Anglicans Face Schism Over Gay Row. www.theguardian.com/uk/2003/sep/14/religion.world.

  [11]The Associated Press, "Nigeria president Goodluck Jonathan bans gay meetings," Jan 13, 2014, www.cbc.ca/news/world/nigeria-president-goodluck-jonathan-bans-gay-meetings-1.2495376.

  [12]See, for example, a 2014 speech by President of Uganda: *"It seems the topic of homosexuals was provoked by the arrogant and careless Western groups that are fond of coming into our schools and recruiting young children into homosexuality and lesbianism, just as they carelessly handle other issues concerning Africa."* (Daily Monitor, "President Museveni's full speech at the signing of Anti-Homosexuality bill," Feb 4, 2014, www.monitor.co.ug/News/National/

"religious inclinations" have been cited by Nigerian officials to justify the anti-gay legislation.

The idea that the criminalization of homosexuality by the African governments and anti-gay attitudes by the public are partly caused by Western religious expansion — specifically by the U.S. megachurches — has been proposed by journalists, activists, and scholars. Specifically, Cheney (2012) argues that U.S. Evangelicalism was an important source of influence on the anti-gay legislation in Uganda, and Grossman (2015) shows that the LGBT salience is related to the growth of Pentecostal, Renewalist, and Evangelical communities. It has been also suggested that the humanitarian response of George W. Bush administration to HIV/AIDS problem, that emphasized abstinence and faith-based approach, contributed to the proliferation of anti-gay legislation and attitudes (Anthony, 2018).

In this paper, while we do not disagree with the role of modern U.S. megachurches, we contend that the roots of intolerance towards homosexuals might also lie in the European colonialism of the 19th century and early Catholic and Protestant missions. To the best of our knowledge, ours is the first quantitative study of the long-term effect of European colonial religious missions on anti-gay attitudes.

3   Data

We use several datasets. The individual data on anti-gay attitudes among the population comes from the sixth (2016) wave of the Afrobarometer survey.[13] Each country's survey contains 1,200 to 2,400 respondents and is a representative cross-section of all citizens of voting age. We use this particular wave because out of six waves of Afrobarometer, the question regarding attitude toward gay persons was asked only in this one.

The main variable of interest is intolerance to homosexuals ($Intolerance_i$). We construct it as an indicator variable by using the following question: "... *Would [you] like having people from this group [Homosexuals] as neighbours, dislike it, or not care?*" These are the possible answers: (i) *Strongly dislike*, (ii) *Somewhat dislike*, (iii) *Would not care*, (iv) *Somewhat like*, (v) *Strongly like, or* (v) *Don't know*. If a respondent answered that they strongly dislike having gay neighbours, we assign the value of 1 to the $Intolerance_i$ and 0 otherwise.[14] Approximately 0.07% of all observations are missing and we omit these observations. In addition, 1.41% of the respondents answered "don't know." We consider these observations as zeroes; however, all results hold if we omit them.[15]

We also use a set of additional demographic and socioeconomic variables from Afrobarometer:

e.g., gender, age, religion, ethnicity, education, employment, access to public goods (water, toilet, and electricity), and household assets.

Overall, our sample spans 33 African countries: Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Eswatini (Swaziland), Ivory Coast, Gabon, Ghana, Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Saint Thomas and Prince, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Tunisia, Uganda, Zambia, and Zimbabwe.[16] Following Nunn (2010), we omit from the sample respondents that are not of African descent.

Figure 1: Map of Christian Missions
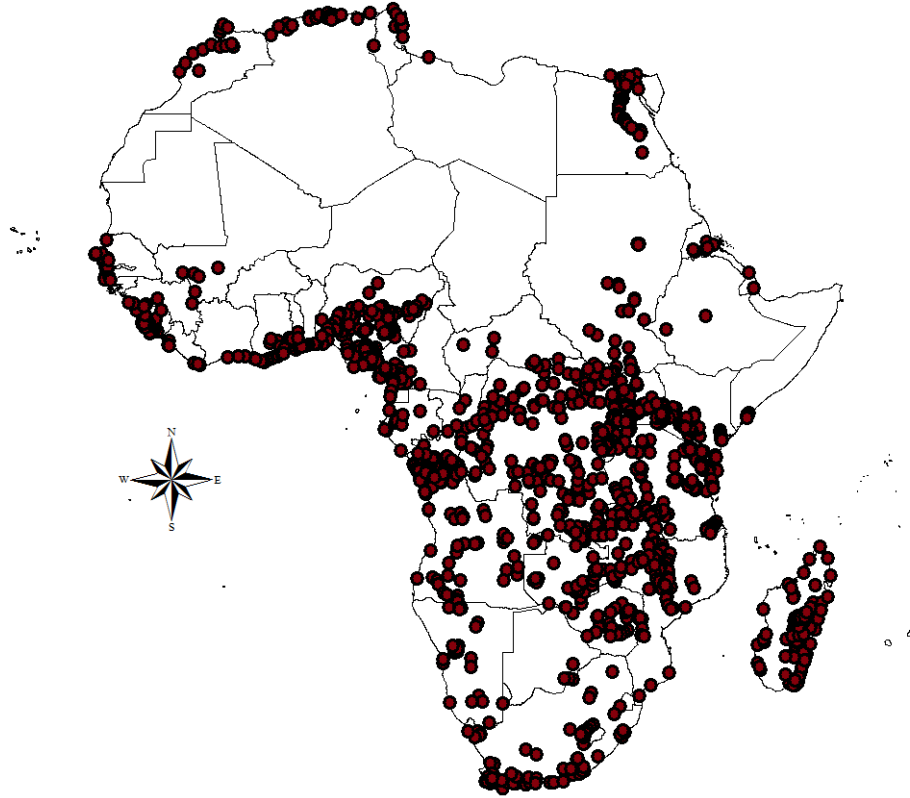
Source: Missions data from Nunn (2010).

Historical mission data comes from Nunn (2010). It contains 1321 mission locations with co-ordinates and the denomination of Christianity they belong to (see Figure 1). This dataset is the most popular in the literature studying effects of European colonization and missions on African institutions and development. The dataset represents an ESRI shapefile that contains latitude and longitude of the historical missions. We compute the minimum distance (in km) between each respondent of the Afrobarometer survey and the nearest mission. To explore the robustness of our estimates, we also compute alternative functional forms of the minimum distance and the num-

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[16]The sixth Afrobarometer's wave has 36 countries; however, the question about the tolerance toward gay persons was not asked in Algeria, Egypt, and Sudan.

ber of missions within a certain radius of the respondent. As missions' data differ in Nunn (2010) and in Cagé and Rueda (2016), for the sake of robustness, we also obtained raw data from Valeria Rueda and estimated our main specification using the explanatory variable calculated from this dataset as well.

We also use ancestral data from Murdock's atlas and terrain data (ruggedness, elevation, crop suitability, night light luminosity, and population density) from Nunn and Puga (2012).

The novel data on the pre-colonial attitudes toward homosexuals are coming from the anthropological study "Boy-wives and female-husbands: Studies in African homosexualities," edited by Murray and Roscoe (1998). This book contains articles describing homosexual cultural norms in various African ethnic groups. In Appendix I "African Groups with Same-sex Patterns" of that book, there is a list of the 56 African ethnic groups that practiced any kind of same-sex relationship. We digitized and harmonized the name of those ethnic groups and matched them with our data.

4   Three Major Descriptive Facts on Intolerance Toward Gay Persons in Africa

Anthropological literature (De Rachewiltz, 1964, Herdt, 1991, and Epprecht, 2008) documents that indigenous populations of Sub-Saharan Africa were not intolerant to homosexuals. Specifically, Murray and Roscoe (1998, p.280) list 56 African ethnic groups with pre-colonial same-sex patterns. In some of those groups, we see a stark reversal of the attitude following European colonization. For example, if we look at one of these groups, Gikuyu/Kikuyu in Kenya, that was accepting same-sex relationship (and even had a term for gay persons, *onek*, that can be translated as "active male"), now 95% of the Afrobarometer respondents of that ethnic groups are Christian and 84.5% of them report a high level of intolerance to homosexuals (according to our baseline measure). Another example is the Pangwe/Pahouian (Fang) ethnic group in Gabon where gay men were caller *a bele nnem e bango* ("he has the heart [aspirations] of boys"). Now 90% of respondents from this ethnic group are Christian and 83% report a high level of intolerance to homosexuals.

In this section, we present several econometric estimations that are consistent with current intolerance to homosexuals being largely explained by current religiosity and not explained by other (geographic or pre-colonial cultural) factors. We use the results of these estimations as descriptive evidence.

Fact One: Intolerance Today is Highly Correlated with Religiosity

We start by showing correlations of self-reported intolerance toward gay persons and demographic and socio-economic controls from the Afrobarometer survey. We estimate the following OLS regression on individual-level data:

$$Intolerance_{i(c)} = \alpha_c + \beta^R \cdot Religion_{i(c)} + X_{i(c)}\Gamma + \varepsilon_{i(c)},$$

where $Intolerance_i$ is a dummy equal to one if a respondent i nested within country c strongly dislikes having homosexual neighbors and 0 otherwise; $Religion_i$ is a matrix of dummies for the religion denominations; $X_{i(c)}$ is a matrix of individual-level controls; and α_c is a set of country fixed effects.

There is compelling evidence of the positive correlation between anti-gay sentiments and Religion (Christianity and Islam) in Africa (e.g., Grossman 2015). Table 1 presents the results. We find evidence that is suggestive of respondents following Abrahamic religion denominations more likely to be intolerant toward gay persons, and that confirms existing results: the coefficient on a respondent being Catholic, Presbyterian, Evangelical, Pentecostal, or Muslim is positive relative to the "no religion" baseline. However, we do not find a significant coefficient for the respondents' following traditional religious beliefs, also consistent with the aforementioned anthropological literature.

Table 1: Contemporary correlates of intolerance

	I	II	III	IV	V	VI
	Dependent variable: Dislike homosexuals					
Catholic	0.014	0.018	0.018	0.021	0.024**	0.021*
	(0.017)	(0.017)	(0.016)	(0.015)	(0.012)	(0.012)
Presbyterian	0.013	0.018	0.021	0.025	0.018	0.023*
	(0.022)	(0.021)	(0.021)	(0.020)	(0.014)	(0.012)
Evangelical	0.037*	0.041**	0.042**	0.044**	0.039**	0.040**
	(0.019)	(0.019)	(0.018)	(0.017)	(0.014)	(0.015)
Pentecostal	0.049**	0.054**	0.055***	0.056***	0.048***	0.047***
	(0.020)	(0.020)	(0.019)	(0.018)	(0.016)	(0.016)
Muslim (Shia and Sunni)	0.148***	0.156***	0.160***	0.161***	0.139***	0.126***
	(0.034)	(0.034)	(0.034)	(0.035)	(0.040)	(0.039)
Traditional beliefs	-0.007	-0.010	-0.011	-0.011	0.002	0.001
	(0.021)	(0.021)	(0.020)	(0.020)	(0.014)	(0.015)
Urban		-0.033***	-0.029**	-0.022**	-0.022**	-0.023***
		(0.011)	(0.011)	(0.011)	(0.008)	(0.008)
Household wealth			-0.003	-0.000	-0.002	-0.002
			(0.003)	(0.002)	(0.002)	(0.002)
Employed			-0.009	-0.005	-0.008	-0.006
			(0.009)	(0.009)	(0.008)	(0.008)
Secondary education				-0.010	-0.004	-0.002
				(0.008)	(0.009)	(0.009)
Demographic controls	✓	✓	✓	✓	✓	✓
Country FEs	✓	✓	✓	✓		
Region FEs					✓	✓
Ethnicity FEs						✓
R-squared	0.263	0.264	0.264	0.266	0.310	0.320
Observations	50,321	50,321	50,321	50,321	50,321	50,321

Note: *(a)* The estimates for the effects of different religions on intolerance toward gay persons is relative to the "no religion." *(b)* All regressions include constant. Demographic controls include gender, age, and age squared. Household wealth is the first principle component of four asset-ownership dummies (car/motorcycle, radio, TV, and mobile phone). *(c)* Regions are nested within countries and country fixed effects are absorbed by region fixed effects in Columns V and VI. *(d)* In parentheses we report standard errors clustered on the country level. 33 clusters. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Being Evangelical and Pentecostal Christian or Shia and Sunni Muslim is associated with higher intolerance throughout all columns. The coefficient for Catholics become significant only when we add administrative region fixed effects in Column V and persists when we control for the ethnicity fixed effects in Column VI. On average, our estimations show that Evangelical respondents are 3.7–4 percentage points more likely to reveal anti-gay attitudes in the survey, and for Catholic respondents, the magnitude is 1.4–2.1 percentage points. The coefficients for Muslim respondents appear to be the largest: being Muslim corresponds to 12.6 percentage points larger probability of disliking having homosexual neighbors conditional on the full set of controls and fixed effects.

Also, we find that the urban population is less likely to report an anti-gay attitude. While in-

come and education are often associated with more inclusive values (Inglehart and Welzel 2005) we do not find any significant correlation between intolerance toward gay persons and these factors.

Overall, aside from the urban status, religion is the only robust non-demographic variable that is consistently positively correlated with the intolerance across various specifications. Consistently with the anthropological literature, only the coefficient for respondents practicing traditional ethnic beliefs exhibits no signs of correlation with the anti-gay sentiments.

Fact Two: Anti-Gay Sentiments are not Predicted by Geographic Characteristics

We showed that religion is among the strongest correlates of the anti-gay sentiments among socio-economic factors. Our next step is to document, that they do not correlate with contemporary or ancestral geographic factors that could affect respondents' cultural norms, economic or institutional development, and at the same time, attitudes toward homosexuals. We estimate the following regression:

$$Intolerance_{i(v,e)} = \alpha_c + \beta^{CG} \cdot ContempGeo_v + \beta^{AG} \cdot AncestralGeo_e + X_{i(v,e)}\Gamma + \varepsilon_{i(v,e)},$$

here, respondents i are nested within locations (villages/towns) v and within ethnic groups e.[17] $ContempGeo_{v(c)}$ defines a matrix of current location-level v geographical controls, and matrix $AncestralGeo_e$ contains a set of ancestral geographical controls for ethnic group e.

Indeed, in Table 2, we find that intolerance does not correlate with current geographical characteristics, such as distance to the capital, and elevation, various measures of crop suitability (Columns I–IV). Ruggedness appears to be insignificant in Column II but marginally significant in Column IV.[18] Thus, geographic factors exhibit little-to-no correlation with the contemporary anti-gay sentiments.

Then, in Columns V–VI, we also find no evidence that intolerance correlates with ancestral geographic characteristics (Murdock, 1967): ancestral latitude (i.e., average latitude for the area where, historically, members of the respondent's i ethnic group e lived), ruggedness, and distance-to-coast. Hence, contemporary anti-gay sentiments also do not correlate with ancestral geography. To conclude, these results are important since even if locations of Christian missions is correlated with the contemporary of ancestral geography, the geography does not correlate (directly, or indirectly through other cultural norms) with contemporary intolerance.

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[17]Here, for clarity we suppress subscripts for a country (c); however, all villages/towns are nested within countries and the same ethnicity can appear in multiple countries.

[18]The significance of the ruggedness's coefficient is not robust and depends on the set of controls. Our results in Section 5 do not depend on the inclusion of ruggedness as a control.

Table 2: Geographic characteristics and current intolerance

	I	II	III	IV	V	VI
	Dependent variable: Dislike homosexuals					
Distance to capital, 100km	-0.0010			-0.0026		
	(0.002)			(0.003)		
Ruggedness		-0.0024		0.0050*		
		(0.002)		(0.003)		
Elevation		0.0000		0.0000		
		(0.000)		(0.000)		
Pearlmillet			0.0003	0.0002		
			(0.000)	(0.000)		
Wet rice			0.0004	0.0005		
			(0.001)	(0.001)		
Wheat			-0.0007	-0.0007		
			(0.001)	(0.001)		
Sorghum			-0.0002	-0.0002		
			(0.001)	(0.001)		
Rye			-0.0001	-0.0003		
			(0.001)	(0.001)		
Foxtail millet			0.0006	0.0007		
			(0.001)	(0.001)		
Barley			0.0008	0.0008		
			(0.001)	(0.002)		
Ancestral latitude					0.0030	0.0024
					(0.002)	(0.002)
Ancestral ruggedness						12.2713
						(12.273)
Ancestral distance to coast, 1000km						-0.00004
						(0.00003)
Country FEs + lat&lon	✓	✓	✓	✓	✓	✓
Ethnicity FEs	✓	✓	✓	✓		
R-squared	0.280	0.280	0.253	0.253	0.258	0.258
Observations	50,337	50,337	20,840	20,840	49,141	49,141

Note: *(a)* All columns include country fixed effects. *(b)* In parentheses we report standard errors clustered on the geographical unit level (village/town). 7,390 clusters. The significance of the coefficients in all columns does not change if we instead double-cluster by location and ethnic group or by country and ethnic group. *** p<0.01, ** p<0.05, * p<0.1

Fact Three: Intolerance is not Predicted by Ancestral Ethnic Characteristics

Here, we test if current self-reported intolerance towards homosexuals correlates with ethnic-specific ancestral characteristics from Murdock (1967). We estimate the following regression:

$$Intolerance_{i(e)} = \alpha_c + \beta^{AC} \cdot AncChar_e + X_i\Gamma + \varepsilon_{i(e)},$$

here, each respondent i is nested within their ethnolinguistic group e that is matched to Murdock's atlas. Matrix $AncChar_e$ defines a set of ancestral characteristics varying on the ethnicity level e.

Table 3 presents our results. Column I show no correlation with pre-industrial economic development. However, we find a positive correlation with the complexity of political hierarchies in Column II; the effect is driven, primarily, by the societies with 3 levels of political hierarchies (Column III). Thus, we find some correlation between political hierarchy and intolerance.

Because Murray and Roscoe (1998) mention the presence of cousin marriages and polygamy as factors that may correlate with the presence of same-sex norms, we include these variables in Column IV. However, we find no correlation between these variables and anti-gay sentiments.[19]

Table 3: Ancestral characteristics and current intolerance

	I	II	III	IV	V	VI	VII
	Dependent variable: Dislike homosexuals						
Anc. economic development	0.0025						-0.0067
	(0.004)						(0.006)
Anc. political hierarchies		0.0163**					0.0079
		(0.007)					(0.007)
1 level			0.0186				
			(0.017)				
2 levels			0.0196				
			(0.018)				
3 levels			0.0589**				
			(0.024)				
4 levels			0.0493				
			(0.042)				
Cousin marriages				0.0056			0.0056
				(0.005)			(0.006)
Polygamy				-0.0101			0.0055
				(0.015)			(0.023)
Moralizing god					0.0786**	-0.0167	0.0683**
					(0.031)	(0.040)	(0.031)
Country FEs	✓	✓	✓	✓	✓	✓	✓
Ruggedness + lat&lon	✓	✓	✓	✓	✓	✓	✓
Sample			All			No religion	All
R-squared	0.242	0.244	0.244	0.251	0.186	0.323	0.190
Observations	47,222	46,933	46,933	43,939	32,717	998	31,177

Note: *(a)* All columns include country fixed effects, ruggedness, and coordinates. *(b)* In Column VI, we estimate the specification for the subsample of respondents that are non-religious. *(c)* In parentheses we report standard errors clustered on the geographical unit level (village/town). 7,390 clusters. *** p<0.01, ** p<0.05, * p<0.1

Column V shows that having moralizing god increases the probability of reporting intolerance to homosexuals by 7.9 percentage points. This correlation is probably explained by the predisposition of ethnic groups with moralizing god to the adoption of Abrahamic religions. Hence, in Column VI, we restrict the sample to the respondents that say that they don't have a religion. The resulting estimate becomes negative and insignificant: suggesting that moralizing god by itself does not correlate with anti-gay sentiments. Finally, we add all variables together in Column VII.

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[19]Investigating how various ancestral characteristics correlate with attitudes toward gay persons and the existence of same-sex culture and testing hypotheses proposed in anthropological literature (e.g., Murray and Roscoe 1998) is not in the scope of this paper; however, we find it a fruitful avenue for future research.

Only the coefficient for moralizing god retains predictive power.

Following these findings, in our main specifications, we would need to control for political hierarchy because it may correlate with the economic outcomes rather than religious conversion. However, to be more conservative, we choose to include ethnicity fixed effects in our preferred specification in Section 5.

5 Empirical Specification, Results, and Alternative Explanations

In the previous section, we documented three facts. First, contemporary religiosity (Christianity and Islam) is one of the strongest correlates of the intolerance toward gay persons, while traditional beliefs have no association with anti-gay sentiments. Second, anti-gay sentiments do not correlate with contemporary and ancestral geographical factors. Third, for the exception of political hierarchy, anti-gay sentiments do not correlate with respondents' ethnic group ancestral characteristics. In this section, we present our main specification, discuss assumptions under which our estimates show a causal effect of Christian missions on anti-gay sentiments, and evaluate the plausibility of these assumptions.

5.1 Empirical Specification and Identification

For our main specification, we use the following cross-sectional regressions where the observation is a respondent i nested in village v:

$$Intolerance_{i(v)} = \alpha_c + \beta \cdot Distance_v + X_{i(v)}\Gamma + \lambda_i + \varepsilon_{i(v)}, \tag{1}$$

where $Intolerance_{i(v)}$ is the dummy variable equal to 1 if a respondent would not like her neighbours to be gay, and $Distance_v$ is a "treatment" variable equal to the minimum distance (in 100 km) from respondent i from the location v to the historical mission site. For the baseline specification, we do not add any controls to avoid post-treatment biases; however, we include geographic and socioeconomic pre-treatment controls ($X_{i(v)}$) for robustness. We also include a set of ethnicity (λ_i) and country fixed effects (α_c) Afrobarometer defines coordinates on the village/town level, thus all respondents located in the same village/town will have the same treatment. Thus, as the treatment is on the village level, we cluster standard errors on the village level as well.

The causal identification is based on the assumption that the location of historical missions is (i) not impacted by the historical intolerance toward homosexuals in Africa, and (ii) not impacted by the unobservable factors that made the establishment of the historical mission more likely and affected future intolerance. We address potential violations of these assumptions in Section 5.3.

5.2 Core Results

Panel A of Table 4 reports our main results: respondents living closer to the historical missions are more likely to dislike having gay neighbors. The estimate from Column I suggests that a

respondent living farther away from a mission will be less intolerant than one living next to the mission. This specification includes only country fixed effects; hence, identifying variation is the within-country minimum distance to the mission. We also absorb all institutional factors thus severing the effect of missions on anti-gay sentiments through the national institutions. Columns II–V scrutinize the robustness of this pattern to the inclusion of various controls and fixed effects. Column II introduces contemporary geographic controls (ruggedness, elevation, and coordinates). Column III controls for respondents' exogenous characteristics (gender, age, and age squared). We control for urban status in Column IV. We add respondents' ethnicity fixed effects in Column V.[20] Our estimate holds throughout all columns.[21] These results suggest, that historical missions have a large causal but reduced form effect on the tolerance toward homosexuals, such as people living closer to old missions appear to be less tolerant. The coefficient from the most conservative specification in Column V suggests that a respondent living 100 km farther away from the mission will be 1.3 percentage points less intolerant than one living next to the mission.

Online Appendix Table 2 demonstrates that our results are robust to various functional forms of the main explanatory variable: $\ln\left(Distance_v\right)$ in Column II, $\sqrt{Distance_v}$ in Column III, and quadratic polynomial in Column IV.[22] In case there are several closely located missions, the minimum distance would underestimate the effect of proximity to the mission. Thus we report robustness of our results to the alternative measure of exposure to historical missions: number of missions in the 150 km and 300 km radius (Columns V and VII).[23] Finally, we report results for our baseline measure using distances computed based on the mission data from Cagé and Rueda (2016) (Column VII) and results based on minimum distance to mission in either Cagé and Rueda (2016) or Nunn (2010) (Column VIII). Our results hold across all columns. Hereafter, we use the minimum distance-to-mission measure as the baseline measure.

Our results are robust to alternative ways of measuring intolerance toward gay persons. In Panel B of Table 4, we define the dependent variable as a dummy equal to unity if respondents both "strongly dislikes" and "somewhat dislikes" having gay neighbours. And in Panel C we define it as an ordinal variable running from 0 (strongly like having gay neighbours) to 4 (strongly dislike having gay neighbours). The coefficient of interest appears to be significant in all columns.[24]

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[20]The question about the respondent's ethnicity was not asked in Burundi and Tunisia (in total 4.6% of observations in our sample). We include those observations and also include a dummy equal to one if the ethnicity variable is missing in order not to lose observations. All the estimates remain significant if we omit these countries.

[21]In Online Appendix Table 3, we show the robustness of our baseline results to the alternative ways of computing standard errors. First, we double-cluster standard errors (Cameron, Gelbach and Miller, 2011) by geographical unit and country to address the fact that Afrobarometer surveys (and, thus, our dependent variable) were conducted on the country-level. Second, we also report spatial HAC (Conley, 2010) standard errors with different distance cutoffs to address possible spatial auto-correlation.

[22]We repeat our baseline specification from Column V of Table 4 for comparison. The quadratic term appears to be insignificant. Higher-order polynomials yield similar results.

[23]The results are robust to alternative thresholds.

[24]In the next Sections, we continue to use the measure from Panel A; however, all results hold for both alternative measures as well. Our results also hold if we use alternative weights in Column III of Online Appendix Table 3.

Table 4: Missions and anti-gay sentiments: Core results

	I	II	III	IV	V
Panel A:	Dependent variable: 1(Dislike homosexuals)				
Min. distance-to-mission, 100 km	-0.007**	-0.005*	-0.005*	-0.008***	-0.013***
	(0.0027)	(0.0028)	(0.0028)	(0.0028)	(0.0038)
R-squared	0.256	0.256	0.259	0.260	0.282
Observations	50,337	50,337	50,337	50,337	50,337
Panel B:	Dependent variable: 1(Dislike or somewhat dislike homosexuals)				
Min. distance-to-mission, 100 km	-0.009***	-0.006**	-0.006**	-0.010***	-0.012***
	(0.0026)	(0.0027)	(0.0027)	(0.0027)	(0.0042)
R-squared	0.256	0.256	0.259	0.260	0.282
Observations	50,337	50,337	50,337	50,337	50,337
Panel C:	Dependent variable: Dislike homosexuals (ordinal, from 0 to 4)				
Min. distance-to-mission, 100 km	-0.023***	-0.017**	-0.017**	-0.025***	-0.029***
	(0.0068)	(0.0069)	(0.0068)	(0.0069)	(0.0099)
R-squared	0.230	0.230	0.233	0.235	0.255
Observations	50,337	50,337	50,337	50,337	50,337
Country FEs	✓	✓	✓	✓	✓
Modern geo. controls		✓	✓	✓	✓
Demographic controls			✓	✓	✓
Urban dummy				✓	✓
Ethnicity FEs					✓

Note: *(a)* Each panel reports on results of a one specification, run for each measure of intolerance toward homosexuals separately across all columns. *(b)* The dependent variable in Panel A is a dummy equal to 1 if the respondent answered that he/she strongly or somewhat strongly dislikes having gay neighbours and 0 otherwise. *(c)* The dependent variable in Panel B is a dummy equal to 1 if the respondent answered that he/she strongly dislikes having gay neighbours and 0 otherwise. *(d)* The dependent variable in Panel C is ordinal variable running from 0 (strongly like having gay neighbours) to 4 (strongly dislike having gay neighbours). *(e)* All regressions include constant. Modern geographic controls include ruggedness, elevation, and coordinates. Demographic controls include gender, age, and age squared. We add dummy for missing ethnicity if the question about ethnicity was not asked in that country (Burundi and Tunisia). *(f)* In parentheses we report standard errors clustered on geographical unit (village/town). 7,390 clusters. *** p<0.01, ** p<0.05, * p<0.1

Our results are not driven by a particular subsample of the data. Column II of Online Appendix Table 3 demonstrates the robustness of our results to the omission of the North African countries. Online Appendix Figure 1 reports on the robustness of our preferred estimate in Panel A of Column V to dropping one country at a time. The estimated coefficient always remains significantly different from zero. Dropping Botswana, reduces the coefficient the most, from -0.013 to -0.018. Dropping Cape Verde, increases the coefficient the most, from -0.013 to -0.011.

5.3 Identifying Assumptions

The causal identification in our main results relies on the assumption of the average counterfactual level of intolerance in the places closer to the missions being similar to the places farther from

the missions. While this assumption is ultimately untestable, there are several ways one could evaluate its plausibility by considering a set of potential violations.

Specifically, one needs to consider whether (i) missions were established in places with already high levels of intolerance, (ii) more broadly, ancestral characteristics can drive both the locations of the missions and the propensity to develop intolerance towards homosexuality later for independent reasons, (iii) geographical characteristics of the missions might explain modern intolerance for independent reasons. In the subsequent Sections, we consider in turn each of those potential alternative explanations and argue that they do not drive our main results.

5.3.1 Missions Were *Not* Established in Places With Higher Pre-Colonial Levels of Intolerance

As Murray and Roscoe (1998) document, before the arrival of European colonizers, indigenous groups in Sub-Saharan Africa differed in their attitude to homosexuality. One explanation of the results in Table 4 is that pre-colonial attitudes to homosexuality might influence both the locations of the missions and modern attitudes to homosexuality. Thus, the results in Table 4 could be spurious because of the confounding factor. Fortunately, Murray and Roscoe (1998) also contain information on which indigenous groups practiced open homosexual relationships, and which groups did not. Here, we provide several pieces of evidence to address this concern.

First, we demonstrate in Panel A of Table 5 that pre-colonial acceptance of homosexual practices does not correlate with the anti-gay attitudes today. Column I shows a bivariate correlation which is not statistically significant, while Columns II–IV show the same relationship with different sets of controls. In none of the specifications, we find a statistically significant association between pre-colonial acceptance of homosexual practices and modern anti-gay sentiments.

Secondly, we explore if there is a plausible connection between the location missions and pre-colonial acceptance of homosexual practices. The results of these tests are shown in Panel B of Table 5. In none of the specifications, the connection is statistically significant. This result is consistent with the literature on historical Christian missions that emphasized that the locations of missions were selected for logistical reasons (distance to coast, access to clean water etc.) and not by the traditions of local indigenous groups (Jedwab, zu Selhausen and Moradi 2018). At the same time, missions were not intentionally built around ethnic groups practicing same-sex relationships in order to "correct" ungodly behavior.

Thirdly, in Table 6 we estimate the baseline regression (1) on two different subsamples: Column II presents the estimate on a subsample of individuals belonging to groups with open acceptance of homosexuality in pre-colonial times, and Column III shows the same regression for all the other groups. We find that the coefficients of association between the distance from the nearest mission and modern anti-gay sentiments are similar in both of these subsamples and close to the coefficient in our main regression in Table 4.

Table 5: Ancestral homosexual practices do not correlate with anti-gay attitudes today and with distance to missions

	I	II	III	IV	V	VI
Panel A:	Dependent variable: Dislike homosexuals					
Ancestral norms allowed same-sex relations	0.056	0.057	0.057	0.079	0.063	0.080
	(0.0470)	(0.0460)	(0.0460)	(0.0596)	(0.0509)	(0.0609)
Modern geo. controls		✓	✓	✓	✓	✓
Ancestral geo. controls			✓			✓
Moralizing god				✓		✓
Ancestral marital norms					✓	✓
R-squared	0.236	0.236	0.236	0.168	0.222	0.168
Observations	50,337	50,337	49,141	32,717	43,939	31,191
Panel B:	Dependent variable: Min. distance-to-mission, 100 km					
Ancestral norms allowed same-sex relations	-0.770	-0.760	-0.760	-1.018	-0.837	-1.046
	(0.6003)	(0.5791)	(0.5791)	(0.7568)	(0.6402)	(0.7734)
Modern geo. controls		✓	✓	✓	✓	✓
Ancestral geo. controls			✓			✓
Moralizing god				✓		✓
Ancestral marital norms					✓	✓
R-squared	0.729	0.730	0.724	0.691	0.716	0.677
Observations	50,337	50,337	49,141	32,717	43,939	31,191

Note: *(a)* Each panel reports on results of a one specification, run for different dependent variables separately across all columns. *(b)* The dependent variable in Panel A is a dummy equal to 1 if the respondent answered that he/she strongly or somewhat strongly dislikes having gay neighbours and 0 otherwise. *(c)* The dependent variable in Panel B is the minimum distance (in 100 km) from respondent i to a historical mission. *(c)* All columns include constant. Modern geographic controls include ruggedness, elevation, and coordinates. Ancestral geographic controls include ancestral ethnic group's distance-to-coast, average ancestral ruggedness, and ancestral coordinates. Moralizing god is a dummy equal to one if respondent's ethnic group's ancestors had a high god present, active, and specifically supportive of human morality. Ancestral marital norms controls includes dummy for presence of preference for cousin marriages and polygamy. *(d)* Number of observations is decreasing because some control variables from Murdock (1967) are missing for some ethnic groups. All results hold if we add these observations with dummies for a missing observation. *(e)* In parentheses we report standard errors clustered on the geographical unit level (village/town). *** p<0.01, ** p<0.05, * p<0.1

In Column IV, we introduce the interaction term $\beta^H \cdot Distance_v \cdot 1 \,(\text{Same-sex culture})_e$; however, we do not find any heterogeneous effect of missions on ethnic groups with same-sex culture. Hence, it reinforces our conclusion that missions were not specifically targeting ethnic groups that exhibit tolerance to same-sex relationships.

To isolate the differential effect of missions, aside from adding the interaction between $\beta \cdot Distance_v$ and the dummy for pre-treatment same-sex culture, in Column V, we replace $\beta \cdot Distance_v$ with $\beta^{NH} \cdot Distance_v \cdot 1 \,(\text{No same-sex culture})_e$, so that our specification mirrors a split-sample estimation strategy in which the core estimation (1) would be run separately for respondents with and without same-sex culture, but at the same time imposes a common set of coefficients on other

controls unrelated to ancestral attitudes to gay persons.[25] Both coefficients appear to be negative and significant and while the coefficient for the effect of the mission proximity on ethnic groups with same-sex culture is larger in absolute value, the difference between the two coefficients is not significant (p-value=0.308).

Overall, we conclude, that (i) historical missions were not placed near ethnic groups that had some form of same-sex relationship and (ii) there is no differential effect of missions on respondents with different ancestral attitudes toward homosexuals.

Table 6: Ancestral homosexual practices: Subsample analysis

	I	II	III	IV	V
	Dependent variable: Dislike homosexuals				
Sample	Baseline (all)	Had same-sex culture	No same-sex culture	All	
Min. distance-to-mission, 100km	-0.0132***	-0.018**	-0.011***	-0.011**	
	(0.0038)	(0.0086)	(0.0043)	(0.0043)	
Min. distance-to-mission, 100km x w same-sex culture				-0.009	
				(0.0090)	
Min. distance-to-mission, 100 km x Eth. groups w same-sex culture					-0.020**
					(0.0082)
Eth. Groups w/o same-sex cuture					-0.011**
					(0.0043)
Δ, p-value					[0.3080]
R-squared	0.282	0.232	0.287	0.286	0.286
Observations	50,337	9,338	40,999	50,307	50,307

Note: *(a)* In all columns, we take the most demanding specification from the baseline results, i.e., Column V in Panel A of Table 4. *(b)* In Column II, we estimate the specification for the subsample of respondents whose ethnic groups allowed same-sex relationships. *(c)* In Column III, we estimate the specification for the subsample of respondents whose ethnic groups did not explicitly allowed same-sex relationships. *(c)* Column IV adds interaction term $\beta^H \cdot Distance_v \cdot 1$ (Same-sex culture)$_e$. *(d)* Column V reports on specification (1) but replaces $\beta \cdot Distance_v$ with $\beta^H \cdot Distance_v \cdot 1$ (Same-sex culture)$_e$ and $\beta^{NH} \cdot Distance_v \cdot 1$ (No same-sex culture)$_e$. *(e)* Dummy for the same-sex culture is absorbed by ethnicity fixed effects. *(f)* Δ, p-value is the p-value for the difference between $\widehat{\beta}^H$ and $\widehat{\beta}^{NH}$. *(g)* In parentheses we report standard errors clustered on the geographical unit level (village/town). *** p<0.01, ** p<0.05, * p<0.1

5.3.2 Indigenous Societal Characteristics *Do Not* Explain Both Location of Missions and Current Anti-Gay Sentiments

One can also conjecture that some characteristics of specific indigenous groups targeted for religious conversion made it easier for them to develop anti-gay sentiments later. In this Section, we offer several arguments to address this concern.

To show that historical missions' locations are not correlated with ancestral characteristics that might influence current anti-gay attitudes, we estimate the following specification:

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[25]The dummy for the same-sex culture is absorbed by the ethnicity fixed effects.

$$1(Mission)_{i(v)} = \alpha + \beta^{AC} \cdot AncChar_e + X_{i(e,v)}\Gamma + \varepsilon_{i(e,v)},$$

where dependent variable $1(Mission)_{i(v)}$ is an indicator variable equal to 1 if there is a mission within 150 km radius from the respondent, and $AncChar_e$ is a matrix of ancestral characteristics that may be important for the location of a mission.

Online Appendix Table 4 shows that having a mission in a 150 km radius from the respondent does not correlate with ancestral characteristics, such as distance to coast, ruggedness, latitude, cousin marriages, polygamy, or moralizing god. Ancestral geographic factors may correlate with mission location and with the future economic development of the region that may correlate with intolerance, e.g., urbanization. We choose cousin marriages and polygamy because of Murray and Roscoe (1998) list these factors as correlates of having same-sex relationships. Moralizing god may be an important characteristic if missions were placed in locations where people had a higher propensity to adopt Christianity.

The only significant correlate of the location of the missions is the ancestral distance to the coast and contemporary ruggedness. These findings are in line with Jedwab, zu Selhausen and Moradi (2018) suggesting that accessibility and economic factors (i.e., distance to the coast) were determining locations of missions rather than the ancestral characteristics of the local tribes. Our results do not change if ruggedness and ancestral distance to coast are included in the regressions.

To conclude, the locations of historical missions do not correlate with respondents' ethnic group ancestral characteristics.

5.3.3 The Geographical Features of Missions' Location *Did Not* Make it Easier to Develop Intolerance to Homosexuality Later

Locations of missions were undoubtedly influenced by geography. Specifically, as documented by Jedwab, zu Selhausen and Moradi (2018), missions were more likely to be located closer to the coast. And coastal cities are likely to have a high concentration of gay couples (Black et al., 2002). One plausible alternative explanation for our results in Table 4 is that the same geographical characteristics that influenced locations of missions also influenced modern anti-gay sentiments.

We provide several pieces of evidence to alleviate this concern. As Online Appendix Table 4 demonstrates, some geographical features are associated with the locations of the missions (historical distance to the coastline). As demonstrated in Table 2, the historical distance to the coastline is not correlated with the current level of anti-gay sentiments, but ruggedness is. Dimico (2014) theorizes that rugged terrain mattered for the location of missions because it provided protection from military raids for the groups that have been selected by the missionaries for religious conversion. Also, according to Nunn and Puga (2012), rugged terrain hindered economic activity, and as long as lower levels of economic activity lead to less inclusive values (Inglehart and Welzel, 2005), ruggedness could have a causal impact on the current level of intolerance through economic

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development channel.

Our results in Table 4 include an extensive set of geographic controls (including terrain ruggedness, elevation, latitude, and longitude). As a robustness check, in Online Appendix Table 5, we offer additional estimations that control for contemporary and geographic factors. Our results hold if we include ancestral groups' distance to the coast and other ancestral geographic characteristics, distance to the capital, crop suitability controls, ancestral dependence on various crops, and fixed effects for ethnic groups that lived in current respondents' locations in pre-industrial times (from Murdock, 1967).[26] The inclusion of these controls does not change the result.[27] Thus, while it is possible that Christian missions were established in places that could have made gradual development of anti-gay sentiments, these potential confounding factors are unlikely to influence our main result.

A specific causal pathway through which geography could possibly matter for the missions and for current anti-gay sentiments is through its impact on number HIV/AIDS cases. Many countries of Sub-Saharan Africa suffered severely from the HIV/AIDS epidemic in the 1990s. It has been demonstrated that the HIV/AIDS prevalence might increase intolerance towards gay people because, among heterosexuals, HIV/AIDS is associated with homosexuality and bisexuality (Herek and Capitanio, 1999), Thus, if the geographical determinants of the location of religious missions overlapped with the determinants of HIV/AIDS cases, then the estimates of the effects of missions on anti-gay sentiments might be spurious. There are at least two causal pathways that might lead to spurious results: the first one operates through current poverty, and the second one operates through polygamy.

Scenario 1: Ruggedness and Poverty Missions were more likely to be located in the areas with rugged terrain that provided protections form raids (Dimico, 2014). The rugged terrain is a "mixed blessing" since it also hinders economic development (Nunn and Puga, 2012), and low-development areas were prone to have more HIV/AIDS cases (Whiteside, 2002). Thus, a correlation between distance to missions and anti-gay sentiments could be spurious if this potential explanation is not adjusted for. In Table 4, we control for terrain ruggedness thus taking into account this explanation. In addition, in Online Appendix Table 6, we add controls for individual socio-economic status, and in Columns II and III of Online Appendix Table 7, we add controls for proxies for contemporary economic development (luminosity from satellite images and population density). The main result does not change.

Scenario 2: Slave Trade and Polygyny Missions were also more likely to appear near the coast. Distance to coast influenced the prevalence of slave trade, and legacies of the slave trade influ-

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[26]I.e., here we match location of each respondent to the ethnic group locations using shapefile from Geo-referencing of ethnic groups (GREG, Atlas Narodov Mira, 1964).

[27]Because the purpose of Online Appendix Table 5 is to show how inclusion of important ancestral characteristics affects the point-estimate of interest, in Columns I–V of, we do not include ethnicity fixed effects for them not to absorb ancestral characteristics. Column VI includes both fixed effects of the respondent and fixed effects of the ethnic groups that lived historically in those locations.

enced modern outcomes (Nunn, 2008; Nunn and Wantchekon, 2011). One of the outcomes that are relevant for HIV/AIDS is the practice of polygyny (one man having several wives). Bertocchi and Dimico, 2019 demonstrated that this practice was more likely to emerge in the areas that suffered demographic shock due to the slave trade. In Column II of Online Appendix Table 5 we control for historical distance to coast, and our results still hold. Additionally, in Columns VI–VII of Online Appendix Table 7, we split the sample into high-polygyny groups and low-polygyny groups and find that the main coefficient is the same for both groups.[28]

Other Scenarios   It is certainly possible that those two scenarios do not exhaust the possibility of potentially unobserved determinants of missionary activity also influencing the HIV/AIDS prevalence, and HIV/AIDS prevalence influencing the anti-gay sentiments. However, all those scenarios involve HIV/AIDS prevalence being on a back-door path between missionary activity and anti-gay sentiments. In Columns IV–V of Online Appendix Table 7 we show that our results hold in countries that had a high prevalence of HIV/AIDS as well as countries with a low-level of HIV/AIDS (though the point estimates are higher for countries with high HIV/AIDS).

Counterfactual missions   Finally, in the vein of Dell and Olken (2020) we conduct the following placebo test: we create 500 maps of randomly generated missions, conditional on parameters important for their location (Jedwab, zu Selhausen and Moradi 2018); i.e., we generate the same number of missions as we have in our 33 countries 500 times and compute minimum distance-to-counterfactual missions for each respondent in our data.[29] Online Appendix Figure 2 compares our true point-estimate to the distribution of point-estimates obtained using minimum distances with counterfactual missions. The true coefficient has by far the largest magnitude. This permutation test shows that the distance to the missions is of specific importance for current anti-gay sentiments as compared to other locations that have the same geographical features as the missions but lack the missions themselves.

5.4   Potential Spuriousness Because of Spatial Autocorrelation

Kelly (2019) shows that in the studies of the persistence of outcomes if the explanatory variable and the outcome both exhibit a high degree of spatial autocorrelation then the p-value for the statistical tests might be biased downwards, and thus lead to spurious conclusions. This issue is not remedied by traditional methods such as Conley's standard errors that we report in Online Appendix Table 3. To explore whether our results suffer from this issue we implement a test suggested by Kelly (2019) for African data: creating a set of Monte-Carlo simulations with

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[28]We computed country-level shares of polygamous households and HIV rates using data from the Demographic and Health Survey: https://dhsprogram.com/data/.

[29]First, we estimate the probability of having a mission in a grid cell using geographic controls (latitude and longitude, ruggedness, elevation, and distance-to-coast). Then, we estimate the propensity score and randomly place missions in cells among the top 15% of the cells that are the most similar to the cells with the actual missions.

randomly-generated spatially-autocorrelated noise instead of our explanatory variable. We simulate three different scenarios of spatial autocorrelations: from moderate to substantial.[30] Panels A–C of Online Appendix Figure 3 present those scenarios visually on the grid.

Online Appendix Figure 4 shows the result of this placebo exercise: the distribution of p-values from the simulations along with the p-value that we observe in our baseline regression in Column V of Panel A of Table 4 (0.006). In Panel A (moderate spatial autocorrelation) and B (mid-range spatial autocorrelation), our p-value is the smallest of all the Monte-Carlo iterations. In Panel C (substantial spatial autocorrelation) only 4 (out of 500) p-values are lower than our true p-value of 0.006.

Thus, given that we use conventional significance reporting thresholds, our results are unlikely to be spurious because of spatial autocorrelation.

6 Religious Conversion by Missions is the Most Plausible Mechanism

In the previous section, we find that proximity to Christian missions is strongly associated with current anti-gay sentiments and argue that this association is indicative of the causal effect. Our interpretation of these results is that the missions influenced the religious conversion of the local indigenous population and the religious norms. In this Section, we provide suggestive evidence, that the spread of Christianity is the most likely channel through which historical missions affect contemporary attitudes toward homosexuals.

Table 7: The effect of missions goes through Christians respondents only

	I	II	III	IV	V	VI
	Dependent variable: Dislike homosexuals					
Sample	Baseline (all)	No religion	Traditional beliefs	Muslim	Non-Christian	Christian
Min. distance-to-mission, 100km	-0.0132***	0.014	-0.031	-0.003	-0.001	-0.013***
	(0.0038)	(0.0156)	(0.0302)	(0.0047)	(0.0045)	(0.0046)
R-squared	0.282	0.393	0.282	0.223	0.304	0.273
Observations	50,337	1,675	796	13,197	17,590	32,671

Note: *(a)* In all columns, we take the most demanding specification from the baseline results, i.e., Column V in Panel A of Table 4. *(b)* In Column II, we estimate the specification for the subsample of respondents that consider themselves not religious. *(c)* In Column III, we estimate the specification for the subsample of respondents whose religion is "traditional beliefs." *(d)* In Column IV, we estimate the specification for the subsample of respondents whose religion is any denomination of Islam. *(e)* In Column V, we estimate the specification for the subsample of respondents that are non-religious or whose religion is not a Christianity. *(f)* In Column V, we estimate the specification for the subsample of respondents whose religion is any denomination of Christianity. *(g)* In parentheses we report standard errors clustered on the geographical unit level (village/town). *** $p<0.01$, ** $p<0.05$, * $p<0.1$

To substantiate the aforementioned conclusion we perform several additional pieces of analysis. First, in Table 7 we perform the same regressions as in Table 4 using only nonreligious indi-

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[30]Specifically, we follow Kelly (2019) in using the Matérn process. The kernel parameters are $\kappa = 1$(exponential falloff) and range values are 10, 20, and 30 (those are the values that are recommended by Kelly (2019, p.18) for African data).

viduals (Column II). We do not find a statistically significant relationship between distance to the missions and anti-gay sentiments (if so, the coefficient even changes its sign). In Column III we also find no effect of missions on the subsample of respondents following traditional beliefs. In Column IV we estimate equation 1 on the subsample of Muslim respondents. While Islam also prohibits homosexual behaviour, if the effect of missions works through the spread of Christianity, we expect no effect on Muslim respondents. The resulting estimate is, indeed, very close to zero and insignificant. The coefficient remains insignificant when we combine all non-Christian respondents in Column V. Finally, in Column VI we include only respondents following any Christian denomination. The estimate is close to our baseline estimate and is highly significant. These results are consistent with the missions influencing current anti-gay attitudes through the mechanism of religious attainment.

Secondly, missions have been demonstrated to improve literacy (Carpenter, 1960; Dimico, 2014) and change political beliefs (Woodberry, 2012). Those things might have an impact on anti-gay sentiments that are not mediated by religion. In Online Appendix Table 6, we control for those outcomes: educational attainment, urbanization, belief that democracy is the best form of government. Technically, those are "post-treatment" controls that are to be avoided if we are interested in the effects of missions, but we include them here to show that the non-religion channels do not explain away the effect of missions on anti-gay sentiments. Our results are robust to the inclusion of grid-level light intensity, population density, household assets, public goods dummies (access to electricity, type of toilet, and access to water), employment status, education dummies, and pro-democracy beliefs.

It is also worth pointing out that all the potential alternative channels have been shown to improve tolerance.[31] In our estimations, we find the negative overall effects of missions on intolerance, so the alternative channels are likely to attenuate our estimates.[32]

In Online Appendix Table 8 we provide an additional test for whether the potential "modernizing" effect of missions can render our main results spurious: a separate estimation of the coefficients on the distance to the nearest mission for urban and rural respondents. Column I reports our baseline estimate (taken from Column V of Table 4) where we only control for urban fixed effects. In Column II, we replace $\beta \cdot Distance_v$ with $\beta^U \cdot Distance_v \cdot 1(\text{Urban})_i$ and $\beta^R \cdot Distance_v \cdot 1(\text{Rural})_i$. Thus, we test if the effect of proximity to the historical mission is significantly different from zero separately for rural and urban respondents. Both coefficients appear to be negative and statistically significant. In Column III we estimate the same specification, but with two separate sets of ethnicity fixed effects that are specific to respondentâs urban/rural status, so that this specification mirrors a split-sample estimation strategy in which the core estimation (1) would be run sepa-

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[31]Both urbanization and education are associated with lower-level of out-group biases. Specifically, Berge et al. (2020) report no significant co-ethnic bias among residents of Nairobi, Kenya, except for those who lived in Nairobi for less than ten years. Economic modernization, in general, is associated with more inclusive values (Inglehart and Welzel 2005).

[32]Another explanation, unrelated to religion, might be that missions helped spread conservative values that were not necessarily related to any religious doctrine. In an attempt to test this explanation with Afrobarometer, we regress the acceptance of female leaders on the distance to the missions and find no discernible effect (Online Appendix Table 9).

rately for rural and urban respondents, but at the same time imposes a common set of coefficients on other controls unrelated to urban status. While the significance of the β^R is lower, both coefficients are significant and negative. The coefficients do not statistically differ from each other, with a p-value of 0.16.

Table 8: Missions and anti-gay sentiments: heterogeneous effects by denomination

	I	II	III	IV	V	VI	VII	VIII
	Dependent variable: Dislike homosexuals							
Sample	Christian	No Evalengelical	Only Catholic	Only non-Catholic	Christian		All	
Min. distance-to-mission, 100km	-0.013***	-0.012**	-0.012*	-0.013**				
	(0.0046)	(0.0046)	(0.0068)	(0.0064)				
Min. distance to Catholic mission, 100km					-0.008***		-0.006**	
					(0.0028)		(0.0024)	
Min. distance to Protestant mission, 100km						-0.012***		-0.007**
						(0.0043)		(0.0030)
R-squared	0.273	0.278	0.297	0.273	0.273	0.273	0.281	0.281
Observations	32,671	31,063	10,504	22,110	32,671	32,671	50,329	50,329

Note: *(a)* In all columns, we take the most demanding specification from the baseline results, i.e., Column V in Panel A of Table 4. *(b)* Column II replicates Column VI of Table 7; i.e., we estimate the specification for the subsample of respondents whose religion is any denomination of Christianity. *(c)* In Column II, we estimate the specification for the subsample of Christian respondents that do not identify themselves as Evangelical. *(d)* In Column III, we estimate the specification for the subsample of Catholic respondents. *(e)* In Column IV, we estimate the specification for the subsample of non-Catholic respondents. *(f)* Columns V–VIII report on specification (1) but replaces minimum distance to *any* mission ($\beta \cdot Distance_v$) with $\beta^C \cdot$ min distance to Catholic mission$_v$ and $\beta^C \cdot$ min. distance to Protestant mission$_v$. *(g)* In Columns V–VI, we estimate the specification for the subsample of respondents whose religion is any denomination of Christianity. *(h)* In parentheses we report standard errors clustered on the geographical unit level (village/town). *** p<0.01, ** p<0.05, * p<0.1

Another plausible mechanism is *modern* religious conversion. As demonstrated by Grossman (2015), U.S. Evangelical religious organizations ("megachurches") had a profound presence in Africa. If their presence was influenced by the same geographical characteristics that influenced the locations of colonial Christian missions, then the effect estimated in Table 4 would be spurious, To alleviate this concern, we perform two exercises in Table 6. First, Column II excludes Evangelical protestants (only 3.0% of our total sample or 4.9% of Christian sample) from our sample to demonstrate that the effect is not driven by the Evangelicals. We also perform a stronger test by excluding all non-Catholic denominations in Column III. Since conversion to Catholicism is unlikely to result from the activities of U.S. Evangelical Churches, the statistically significant effect we get once non-Catholics are excluded might alleviate the concerns. Column IV reports coefficient for the subsample of non-Catholic Christian respondents. These results suggest no difference on the effects on Catholic and non-Catholic population. Finally, Columns V–VIII also check whether Catholic and Protestant historical missions had differential effects on anti-gay sentiments. We find approximately similar effects for Catholic and Protestant missions.[33]

Overall, while the Christian missions certainly influenced not only religion but an array of

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[33]While the difference between the effects of Catholic and Protestant missions is statistically insignificant, the point-estimate is slightly larger for the Protestant missions (Column VI). This is in line with Cagé and Rueda (forthcoming) who find that Catholic missions were less successful at converting, especially in former French colonies.

other outcomes (literacy, political beliefs, etc.), when it comes to anti-gay sentiments as an outcome, religious conversion is the most plausible mechanism.

7   Discussion and Conclusion

In this paper, we argue that religion can serve as a powerful mechanism for change and transmission of norms and attitudes. Specifically, we document that religious conversion by Christian missions in Africa caused anti-gay norms and that these attitudes later persisted.

Using geo-coded Afrobarometer data, we demonstrate that negative attitudes towards homosexuals are positively associates with a distance to colonial Christian mission sites. We explore the plausible violations of the identifying assumptions: geographical fundamentals determining both the locations of the missions and anti-gay attitudes, pre-colonial anti-gay attitudes being correlated with the locations of the missions, and others. We conclude that those alternative explanations do not seem to drive our results. We argue that the most plausible mechanism of the impact of Christian missions on anti-gay attitudes today is religious conversion since the effect only exists in the subsample of Christian respondents, and does not change once both individual-level and aggregate-level variables that also could be potentially influenced by missionary activity (literacy, poverty, etc.) are included in the regression.

Our setting — Christian missionary activity and anti-gay attitudes in Africa — is chosen mainly for the data-availability considerations (geo-coded Afrobarometer survey and Murray and Roscoe's treatise documenting pre-colonial acceptance of homosexual practices). Thus our analysis is necessarily limited to one religion and one set of attitudes. However, we find it plausible that these results might be generalizable to other religions (specifically, the ones prescribing a tight moral code, like Islam and Judaism) and other norms and values.

We have also left out of the discussion the potential impact of norms and values on public policy. Online Appendix A presents correlations between the number of Christian missions and criminalization of homosexuality in African countries, but this evidence is only suggestive.

It is also not our contention that Christian activity is the only important determinant of anti-gay attitudes. It has been documented that the activity of U.S. megachurches (Grossman, 2015) and the abstinence-only response to the HIV epidemic (Anthony, 2018) also contributed to the intolerance. We leave deeper explorations of these issues to further research.

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Online Appendix

to

"Religious Conversion and Origin of Norms:

Evidence from Africa"

Online Appendix A   Presence of Historical Missions and Contemporary Anti-Gay Legislation

African anti-gay legislation is correlated with the number of historical missions. To show that historical missions in a country correlate with the country's same-sex-related legislation we estimate the following regression:

$$AntiGayLaws_c = \alpha + \beta \cdot \ln\left(\#missions_c\right) + \varepsilon_c,$$

where $AntiGayLaws_c$ is a dependent variable that is equal to (i) a dummy equal to one if a country c allows homosexual behavior, and zero otherwise; (ii) variable that is equal to one if a country has criminal punishment for homosexuality, equal to two if it imposes the death sentence for a same-sex relationship, and equal to zero if there is no criminal punishment. We coded same-sex related legislation from Amnesty International (2013). The explanatory variable is the log of the total number of missions summed within post-colonial country borders.

Online Appendix Table 1 reports how the total number of historical missions in a country correlates with the country's same-sex-related legislation. Column I demonstrates that it negatively correlates with the indicator variable for having laws allowing the same-sex activity. Column II shows that it positively correlates with a dummy for the same-sex activity to be punishable by law.

Table Online Appendix Table 1: Missions and anti-gay legislation

	I	II
	Dependent variable:	
	Laws allowing same-sex activity	Punished by law
Log missions	-0.145**	0.112**
	(0.064)	(0.049)
R-squared	0.157	0.077
Observations	36	53

Note: *(a)* All regressions include constant. *(b)* In parentheses we report robust standard errors *** p<0.01, ** p<0.05, * p<0.1

Online Appendix B Additional Robustness and Sensitivity Checks

Figure Online Appendix Figure 1: Robustness to an omission of a country

Coefficients for min. distance-to-mission
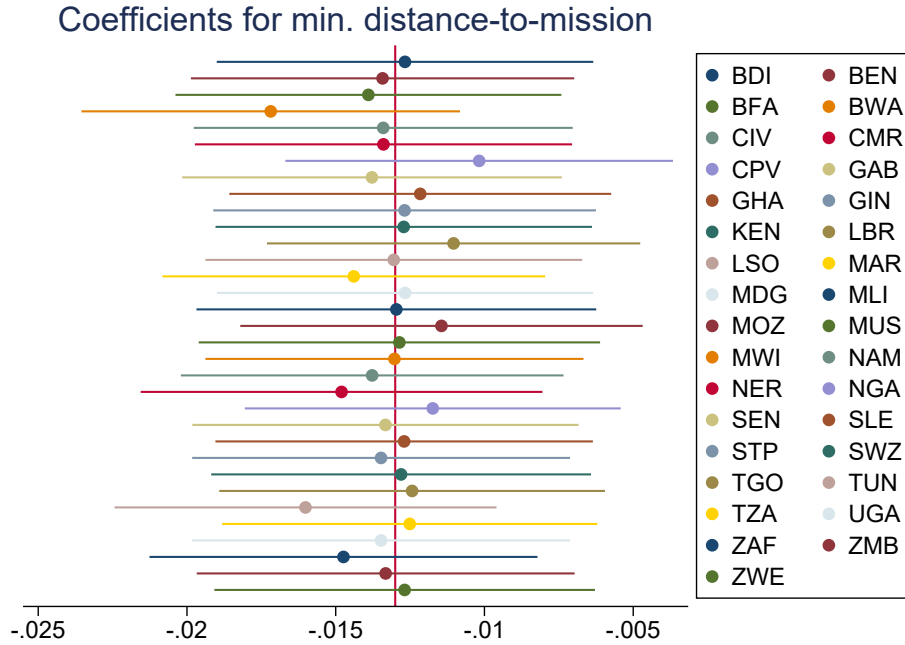
Note: *(a)* This figure reports on the results of estimating equation (1). The red vertical line is the point-estimate of $\widehat{\beta}$. We then report the point-estimates and confidence bands that result from re-estimating equation (1) but dropping one country at a time (in alphabetical order, omit Burundi (BDI), then Benin (BEN), and etc.), as indicated in the legend.

Figure Online Appendix Figure 2: The effect of the counterfactual missions
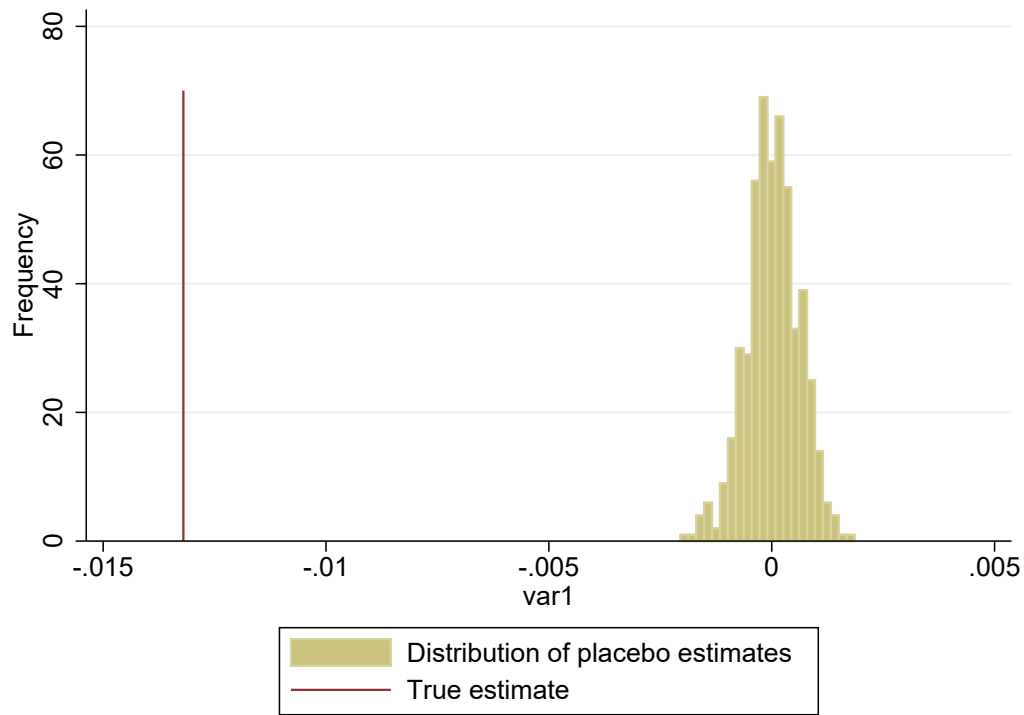
*Note*: *(a)* In this Figure, we take the most demanding specification from the baseline results, i.e., Column V in Panel A of Table 4. *(b)* This Figure shows estimated coefficients using 500 placebo locations for missions. All counterfactual estimates are smaller in magnitude then the true estimate. *(c)* The red vertical line is the true point-estimate of $\widehat{\beta}$.

Figure Online Appendix Figure 3: Spatial autocorrelation heatmaps for placebo tests
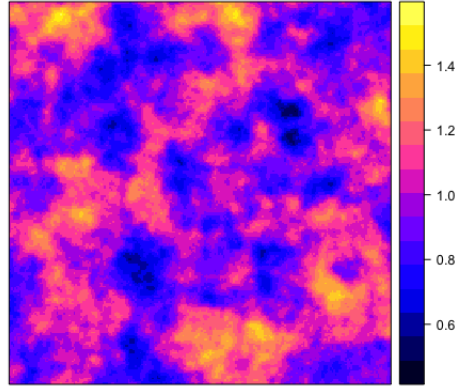
Panel A: Moderate Spatial Autocorrelation for Placebo Tests

Panel B: Mid-Range Spatial Autocorrelation for Placebo Tests
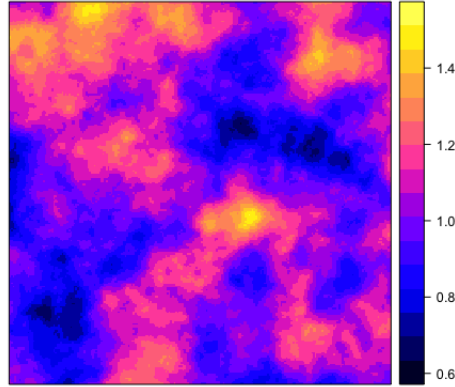
Panel C: Substantial Spatial Autocorrelation for Placebo Tests

Note: (a) Panels A, B, and C show one Monte Carlo iteration of spatially-autocorrelated noise we consider for the placebo estimates. *(b)* We use a generative variogram model of Matérn class, with $\kappa = 1$ and anisotropic major range parameters of 10, 20, and 30 to simulate a spatially autocorrelated noise on a grid 225 × 225. We used `vgm` function from R package `gstat` (Pebesma and Graeler 2013) to generate the noise and package `sp` (Pebesma and Bivand 2005) to plot it.

Figure Online Appendix Figure 4: P-value histograms for spatial autocorrelation placebo tests
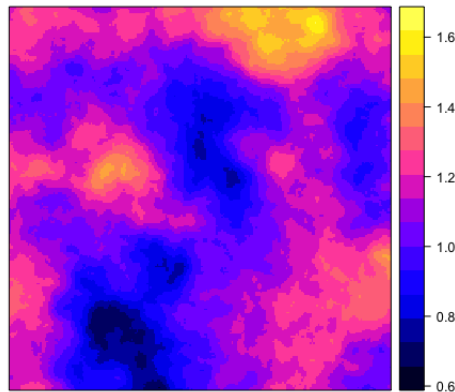
Panel A: Moderate Spatial Autocorrelation for Placebo Tests

Panel B: Mid-Range Spatial Autocorrelation for Placebo Tests

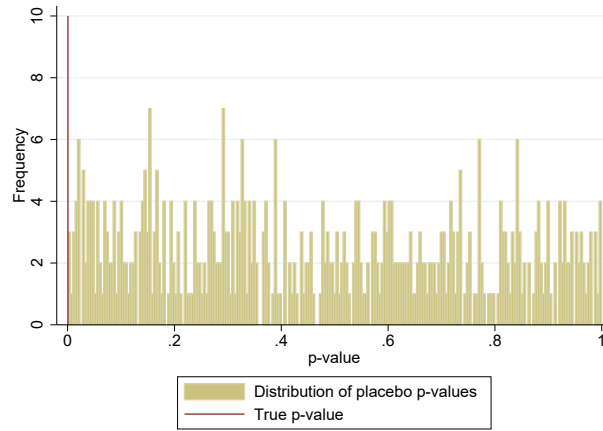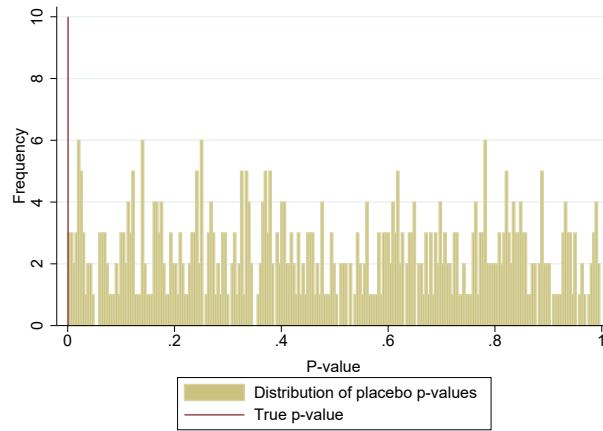Panel C: Substantial Spatial Autocorrelation for Placebo Tests
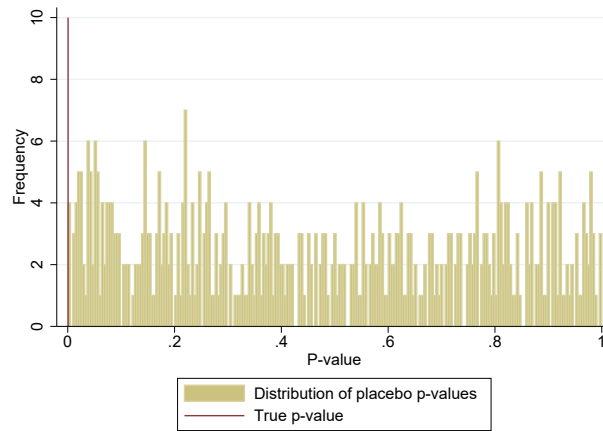
Note (a) On each of the 500 Monte-Carlo simulations, to create a placebo "explanatory" variable, we generate spatially-autocorrelated noise on a grid 225×225 and map it on our dataset. Then we run our most demanding specification (Column V in Panel A of Table 4) substituting our main explanatory variable, distance to the nearest mission, by the noise. *(b)* In Panels A, B, and C, we plot the p-values from each of the Monte-Carlo iterations along with the observed p-value from our main regression (vertical red line). We repeat the procedure for three values of anisotropic ranges: 10, 20, and 30 (proposed in Kelly 2019).

Table Online Appendix Table 2: Robustness of the main explanatory variable to various functional forms

	I	II	III	IV	V	VI	VII	VIII
	Dependent variable: 1(Dislike homosexuals)							
Min. distance-to-mission, 100 km	-0.0132***			-0.0113**				
	(0.0038)			(0.0055)				
Log Min. distance-to-mission		-0.0060**						
		(0.0025)						
Sqrt Min. distance-to-mission			-0.0026***					
			(0.0008)					
Min. distance-to-mission^2				-0.0002				
				(0.0005)				
# missions in 150km radius					0.0351***			
					(0.0110)			
# missions in 300km radius						0.0456***		
						(0.0112)		
Min. distance-to-mission, 100 km (from Cagé & Rueda)							-0.0108***	
							(0.0036)	
Min. distance-to-mission, 100 km (from Nunn and Cagé & Rueda)								-0.0157***
								(0.0040)
R-squared	0.282	0.282	0.282	0.282	0.282	0.282	0.282	0.282
Observations	50,337	50,337	50,337	50,337	50,337	50,337	50,337	50,337

Note: *(a)* In all columns, we take the most demanding specification from the baseline results, i.e., Column V in Panel A of Table 4. *(b)* In parentheses we report standard errors clustered on the geographical unit level (village/town). 7,390 clusters. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table Online Appendix Table 3: Additional robustness checks

	I	II	III	IV	V	VI
	Baseline (all)	Only Sub-Saharan Africa	Multi-country sampling weights	Double-clustered by location and country	Spatial HAC (300 km cutoff)	Spatial HAC (150 km cutoff)
			Dependent variable: Dislike homosexuals			
Min. distance-to-mission, 100km	-0.013***	-0.017***	-0.013***	-0.013*	-0.013**	-0.013***
	(0.0038)	(0.0040)	(0.0045)	(0.0069)	(0.0056)	(0.0051)
Religion FEs						
Multi-country sampling weights			✓			
R-squared	0.282	0.294	0.281	0.282	0.282	0.282
Observations	50,337	47,937	50,337	50,337	50,337	50,337

Note: (*a*) In all columns, we take the most demanding specification from the baseline results, i.e., Column V in Panel A of Table 4. (*b*) In Column II, we estimate the specification for the subsample of Sub-Saharan countries, thus omitting all Maghrebian countries. (*c*) In Column III, we use Afrobarometer multi-country weights. (*d*) Columns IV–VI are only different from Column I in the way how standard errors are computed. In Columns I–III in parentheses we report standard errors clustered on the geographical unit (village/town). In Column IV we double-cluster (Cameron, Gelbach and Miller, 2011) standard errors by the geographical unit (7,390 clusters) and country (33 clusters). In Columns V and VI, we estimate spatial HAC errors (Conley, 2010) with different cutoffs. *** p¡0.01, ** p¡0.05, * p¡0.1

Table Online Appendix Table 4: Ancestral homosexual practices: robustness to ethnicity-specific ancestral norms

	I	II	III	IV	V	VI
	Dependent variable: 1(mission in 150km radius)					
Ancestral distance to coast, km	-0.0004***					
	(0.0001)					
Ancestral ruggedness		20.3097				
		(34.216)				
Ancestral latitude			-0.0088			
			(0.007)			
Cousin marriages				0.0143		0.0459
				(0.020)		(0.030)
Polygamy				-0.0228		-0.0856
				(0.029)		(0.058)
Moralizing god					0.0072	-0.0313
					(0.074)	(0.080)
Ruggedness + lat&lon	✓	✓	✓	✓	✓	✓
R-squared	0.57	0.534	0.537	0.558	0.539	0.556
Observations	49,141	49,141	49,141	43,939	32,717	31,191

Note: *(a)* In this Table, the dependent variable is a dummy equal to 1, if there was a historical mission within 150 km radius from the respondent, and zero otherwise. *(b)* All columns include constant, country fixed effects, ruggedness, elevation, and controls for latitude and longitude. *(c)* In parentheses we report standard errors clustered on the geographical unit level (village/town). *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table Online Appendix Table 5: Ancestral homosexual practices: Robustness to additional socio-economic and geographic controls

	I	II	III	IV	V	VI
	Dependent variable: Dislike homosexuals					
Min. distance-to-mission, 100km	-0.006*	-0.006*	-0.007**	-0.007**	-0.007*	-0.011***
	(0.0034)	(0.0034)	(0.0034)	(0.0034)	(0.0036)	(0.0041)
Min. distance-to-capital	✓				✓	✓
Ancestral geo. controls		✓			✓	
Ancestral dependence on cereals			✓		✓	
Ancestral agricultural intensivity				✓	✓	
Respondent's ethnicity FEs						✓
Location ethnicity FEs						✓
R-squared	0.283	0.283	0.267	0.267	0.268	0.297
Observations	48,981	49,133	47,219	47,219	47,067	48,981

Note: *(a)* In all columns, we take specification with ethnicity fixed effects from the baseline results, i.e., Column VI in Panel A of Table 4. *(b)* Ancestral geographic controls include ancestral ethnic group's distance-to-coast, average ancestral ruggedness, and ancestral coordinates. *(c)* Ancestral controls are absorbed when ethnic group fixed effects are included in Column VI. *(d)* In parentheses we report standard errors clustered on the geographical unit level (village/town). *** p<0.01, ** p<0.05, * p<0.1

Table Online Appendix Table 6: Robustness to socio-economic characteristics of respondents

	I	II	III	IV	V	VI	VII	VIII
	Dependent variable: Dislike homosexuals							
Min. distance-to-mission, 100km	-0.0132***	-0.013***	-0.013***	-0.014***	-0.015***	-0.015***	-0.013***	-0.016***
	(0.0038)	(0.0038)	(0.0038)	(0.0038)	(0.0038)	(0.0039)	(0.0038)	(0.0038)
Good living conditions		-0.015***						-0.008*
		(0.0045)						(0.0048)
Support for democracy			0.002					0.006
			(0.0043)					(0.0043)
Household assets FEs				✓				✓
Public goods FEs					✓			✓
Education FEs						✓		✓
Employment FEs							✓	✓
R-squared	0.282	0.282	0.282	0.282	0.285	0.284	0.282	0.287
Observations	50,337	50,337	50,337	50,337	50,337	50,337	50,337	50,337

Note: *(a)* In all columns, we take the most demanding specification from the baseline results, i.e., Column VII in Panel A of Table 4. *(b)* Household assets include dummies for the ownership of radio, car/motorcycle, TV, and mobile phone. Public goods fixed effect include dummies for electricity, toilet type, and water access. *(c)* In parentheses we report standard errors clustered on the geographical unit level (village/town). *** p<0.01, ** p<0.05, * p<0.1

Table Online Appendix Table 7: Additional alternative explanations: poverty, HIV, and polygyny

	I	II	III	IV	V	VI	VII
			Dependent variable: Dislike homosexuals				
Sample		Baseline (all)		HIV>1.5%	HIV≤1.5%	Share of polygamous hh. > 32%	Share of polygamous hh ≤ 32%
Min. distance-to-mission 100km	-0.0132***	-0.017***	-0.014***	-0.017***	-0.010**	-0.011**	-0.017**
	(0.0038)	(0.0039)	(0.0039)	(0.0065)	(0.0049)	(0.0047)	(0.0069)
Night light luminosity		-0.001***					
		(0.0002)					
Log population density			-0.001				
			(0.0011)				
R-squared	0.282	0.283	0.282	0.264	0.323	0.231	0.330
Observations	50,337	50,337	50,337	35,937	14,400	27,551	22,786

Note: *(a)* In all columns, we take the most demanding specification from the baseline results, i.e., Column VII in Panel A of Table 4. *(b)* In Columns IV and V, we estimate the specification for the subsample of countries where HIV rate is above and below the mean of countries in our sample. *(c)* In Columns VI and VI, we estimate the specification for the subsample of countries where share of polygamous households is above and below the mean of countries in our sample. *(d)* In parentheses we report standard errors clustered on the geographical unit level (village/town). *** p<0.01, ** p<0.05, * p<0.1

Table Online Appendix Table 8: No (statistically significant) differential effects on rural and urban respondents

	I	II	III
	Dependent variable: Dislike homosexuals		
Min. distance-to-mission, 100km	-0.013***		
	(0.0038)		
Min. distance-to-mission, 100km		-0.016***	-0.025***
x urban		(0.0047)	(0.0068)
Min. distance-to-mission, 100km		-0.012***	-0.008*
x rural		(0.0039)	(0.0045)
Ethnicity and urban FEs	✓	✓	
Ethnicity x urban FEs			✓
R-squared	0.282	0.282	0.290
Observations	50,337	50,337	50,337

Note: *(a)* In all columns, we take the most demanding specification from the baseline results, i.e., Column VII in Panel A of Table 4. *(b)* Columns II and III report on the specification (1) but replaces $\beta \cdot Distance_{cm}$ with $\beta^U \cdot Distance_{cm} \cdot 1\,(\text{Urban})$ and $\beta^R \cdot Distance_{cm} \cdot 1\,(\text{Rural})$. *(c)* Column III includes set of ethnicity fixed effects interacted with urban dummy instead of a set of ethnicity fixed effects and an urban dummy in Columns I–II. *(d)* In parentheses we report standard errors clustered on the geographical unit level (village/town). *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table Online Appendix Table 9: Gender Norms

	I	II
	Dependent variable:	
	Women are OK as leaders	Women are OK as leaders (alt.)
Min. distance-to-mission, 100km	0.0023	-0.0015
	(0.0027)	(0.0035)
R-squared	0.068	0.055
Observations	50,337	50,337

Note: *(a)* In all columns, we take the most demanding specification from the baseline results, i.e., Column VII in Panel A of Table 4. *(b)* In Column I the dependent variable is a dummy equal to 1, if the respondent strongly believe that women can be a leader. In Column II the dependent variable is a dummy equal to 1, if the respondent strongly believe or somewhat believe that women can be a leader. *(c)* In parentheses we report standard errors clustered on the geographical unit level (village/town). *** $p<0.01$, ** $p<0.05$, * $p<0.1$