UNIMORE
UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

Dipartimento di Economia Marco Biagi

DEMB Working Paper Series

N. 247

Family Planning and Ethnic Heritage: Evidence from Sub-Saharan Africa

Graziella Bertocchi[1], Arcangelo Dimico[2], Chiara Falco[3]

October 2024

[1] University of Modena and Reggio Emilia, Department of Economics "Marco Biagi", EIEF, CEPR, Dondena, GLO, and IZA
Email: graziella.bertocchi@unimore.it
[2] Queen's University Belfast, GLO, IZA, CEPH, and QUCEH
Email: a.dimico@qub.ac.uk
[3] University of Milan, Department of Environmental Science and Policy
Email: chiara.falco@unimi.it

ISSN: 2281-440X online

Family Planning and Ethnic Heritage: Evidence from Sub-Saharan Africa*

Graziella Bertocchi Arcangelo Dimico Chiara Falco

October 2024

Abstract

Family planning is a critical issue in countries, particularly those in sub-Saharan Africa, where high fertility rates coexist with low contraceptive use alongside adverse perinatal outcomes. Using a combination of ethnographic, ecological, and folklore data, we investigate the role played in this context by postpartum sexual abstinence, an extensively documented practice that, in preindustrial societies, finds its biological justification as a means to safeguard child survival. First, we show that the duration of contemporary postpartum abstinence increases with the duration of ancestral postpartum sex taboos within a woman's ethnic group. Second, postpartum abstinence is de facto pronatalist, as it increases the number of children ever born to a woman. At the same time, it increases the number of children of a woman who have died; lengthens birth intervals though not sufficiently to meet recommended guidelines; and increases neonatal death and child stunting. Exploring the underlying mechanisms reveals that postpartum abstinence is associated with patriarchal cultural norms and that the motivation for its adoption is that it serves as a purification ritual. Overall, our findings question the biological rationale for postpartum abstinence as a means to protect child health, while aligning with anthropological evidence documenting its adoption as a ritual.

*Graziella Bertocchi: University of Modena and Reggio Emilia, EIEF, CEPR, Dondena, GLO, and IZA, graziella.bertocchi@unimore.it; Arcangelo Dimico: Queen's University Belfast, GLO, IZA, CEPH, and QUCEH, a.dimico@qub.ac.uk; Chiara Falco: University of Milan, chiara.falco@unimi.it. We thank David Canning, Giulia La Mattina, Gian Luca Tedeschi, and participants at the Venice Workshop on Gender and Institutions, the Belfast Workshop on Fertility, Health, and Human Capital, the First Exeter Diversity and Human Capital Workshop, and a seminar at the University of Florida, for helpful comments and suggestions. We acknowledge financial support from an Italian University Ministry PRIN 2017 grant.

JEL Classification: J13, I18, N37, O11, D15.

Keywords: Family planning, postpartum abstinence, postpartum sex taboos, contraception, fertility, birth spacing, child health, tuber suitability, folklore, female empowerment, rituals, sub-Saharan Africa.

1 Introduction

Despite its huge decline worldwide, fertility remains very high in sub-Saharan Africa (SSA), where the demographic transition is still in its early stages. At the same time, in SSA, there is substantial potential for improving child health through effective family planning. Hence, fertility control is a crucial concern for households, policymakers, and international organizations operating in the region.

In this paper, we investigate the fundamental factors influencing family planning practices and their impact on fertility, as well as child health. We begin with the hypothesis that fertility and contraceptive practice are deeply rooted in ancestral customs, which can vary significantly across different ethnic groups. Notably, within SSA, the prevalence of "postpartum sex taboos" (PPST), referring to the practice of prohibiting sexual relations between spouses for a specific period following childbirth, has been extensively documented (Murdock, 1967a,b).

In preindustrial societies, PPST find their biological justification as a means to ensure nourishment to the child until it is capable of survival and to protect the mother from the postpartum risks. The motivations behind these practices and their implications, however, are puzzling in several ways. For instance, the duration of these taboos exhibits extreme variability across ethnic groups, ranging from just one week to as long as four years. Moreover, the reproductive intentions behind PPST remain unclear, as they have been described as purification rituals aimed at protecting the child, based on the misconception that sexual intercourse would contaminate the mother's milk (Caldwell and Caldwell, 1977). Even the awareness of their contraceptive effects has been questioned, in light of the widespread practice of "double protection," that is, a combination of abstinence with the use of contraception or the natural absence of menstruations induced by breastfeeding (van de Walle and van de Walle, 1993). A broader underlying issue is whether in SSA contraception of any sort is directed at limiting fertility or if it is de facto pronatalist, as it is traditionally used to optimize child survival through birth spacing, with the ultimate goal of expanding family size rather than containing it.

Our aim is to untangle the above issues and assess how relevant postpartum sexual restrictions still are in the present day, whether they serve as substitutes for modern contraceptive methods, whether they effectively protect child health, and why they are adopted.

Using a combination of ethnographic, ecological, and folklore data, first we show that the duration of contemporary postpartum abstinence (PPA), as recorded by the Demographic and Health Surveys (DHS), increases with the duration of ancestral PPST within a woman's ethnic group. In order to expand the sample size beyond the limited coverage

of PPST information in the Ethnographic Atlas (Murdock, 1967a) (EA), following Cao et al. (2024) we exploit information on languages from Ethnologue 16 (Giuliano and Nunn, 2018). Furthermore, we introduce three proxies for our focal variable. The first proxy is tuber suitability, which is meant to capture the association between long ancestral PPST and ecological factors represented by a low-protein diet based on tubers (Whiting, 1964). The second and third proxies are taken from folklore data (Berezkin, 2015a,b; Michalopoulos and Xue, 2021) and respectively record the recurrence of abstinence and chastity in a people's oral tradition. Using the three proxies confirms the positive association between ancestral PPST and contemporary PPA. These preliminary results obtain after controlling for country fixed effects and a large number of geographical, historical, and individual level variables, and they are robust to more parsimonious and more extended specifications. Some evidence of erosion of ancestral traditions emerges from estimates by cohort, where the association between past and present practices is stronger among older women, though it remains evident among younger women as well. The same association is largely preserved also for women married to men belonging to a different ethnic group. As a falsifications test, we instead find placebo effects of PPST on adoption of contemporary contraceptive methods other than PPA.

Having established a robust association between contemporary practices of PPA and ancestral customs restricting sexuality after childbirth, the second part of the paper explores the implications of this association for various outcomes related to fertility and child health. This is done using two distinct identification strategies.

Concerning fertility outcomes, using the DHS women's dataset we establish causality by relying on 2SLS estimates where—building on previous findings—contemporary PPA is instrumented by tuber suitability. Second stage results reveal that a more prolonged duration of contemporary PPA increases the number of children ever born to a woman and the number of living children, despite an increase also in the number of children who have died. Furthermore, it does reduce the probability of short spacing, defined as birth-to-birth intervals below 24 months, but is not effective in achieving intervals above 36 months, which are closer to recommended guidelines. Overall, we find no evidence that the practice of PPA in the present day induces a restriction in family size, which aligns with the pronatalist view of the role of contraception in SSA. At the same time, it does work as a contraceptive, but due to the insufficient spacing it secures it does not promote child survival.

Next, to dig deeper into the influence of PPA on child health outcomes we turn to the DHS births' dataset and, to achieve identification, we introduce mother fixed effects. This approach leverages differences in the duration of PPA between siblings, effectively neutralizing the influence of latent factors which could bias standard OLS estimates.

For each child, we explore both the impact of sexual abstinence following its birth as well as the impact of preceding sexual abstinence, that is, sexual abstinence after the birth of its older sibling. A beneficial impact is detected only in one dimension, as the probability that a child is alive at the time of the interview increases with the duration of succeeding (but not preceding) abstinence. However, succeeding abstinence also increases the probability of stunting, while preceding abstinence decreases the probability that a child is alive and increases neonatal deaths. Collectively, we detect scant evidence of a beneficial impact of PPA. Thus, our results offer no support for the ethnographic and ecological rationale behind PPA as a means to protect child health.

The final part of the paper explores the mechanisms driving the contemporary adoption of the ancestral custom of postpartum sexual abstinence. First, we show that this practice is associated with patriarchal cultural norms that limit female empowerment in several dimensions. A woman that practices a lengthier PPA is less likely to work for cash and more likely to belong to a polygynous household and accept the notion that beating one's wife is justified. Second, we explore the motivations for abstaining. We start by ruling out the hypothesis that women abstain due to a lack of knowledge or access to other contraceptive methods. Next, we explore the hypothesis that women abstain out of respect of ancestral traditions rooted in superstitions that impose purification rituals after childbirth in order to safeguard the child's health. In African traditional religions, the belief in an otiose high god is complemented by the diffusion of rituals, performed or supervised by human practitioners. Leveraging information from the EA on beliefs in a otiose high god, we show that indeed ancestral preferences about abstinence affect contemporary preferences only in the presence of rituals. It is through the imposition of rituals that ancestral norms were transmitted through generations until the present day. The conclusion that contemporary PPA is adopted for rituals reasons is consistent with the evidence previously produced, according to which it is not effective in containing fertility and protecting child health.

This paper contributes to different streams of the literature. It builds on the ethnographic, anthropological, and demographic literature on PPST initiated by Whiting (1964) and Murdock (1967a,b), which we describe in detail in the next section. Within the economics literature on fertility and family planning, general references include Becker (1960), Galor and Weil (1996), de Silva and Tenreyro (2017), and Doepke et al. (2023). More specifically, we contribute to an expanding stream focused on sub-Saharan African societies, including de la Croix and Gobbi (2022), Maggio et al. (2022), Dupas et al. (2023), Dimico (2024), Gradstein and Ishak (2024), and Vogl (2024). While we investigate the legacy of ethnographic characteristics, in SSA the long-term influence of historical factors on female outcomes has also been examined with reference to the slave

trade: Teso (2019) looks at fertility and female labor force participation, Bertocchi and Dimico (2019) at polygyny and HIV infection, and Corno et al. (2020) at female genital cutting. Furthermore, Canning et al. (2022), Guirkinger and Villar (2022), and Okoye and Pongou (2023) examine the legacy of colonial family planning policies introduced through Christian missions, while Anderson (2018) looks at the link between legal origin and female HIV, and Guarnieri and Rainer (2021) at the one between colonial identity and female empowerment. Another closely related group of papers, including Michalopoulos and Papaioannou (2013), Enke (2019), Bahrami-Rad et al. (2021), Becker (2022), Lowes (2022), Guarnieri and Tur-Prats (2023), Cao et al. (2024), and Fontenay et al. (2024), has explored the legacy of other ethnographic characteristics collected in the EA for a variety of contemporary outcomes, while ecological characteristics are explored among others by Mayshar et al. (2022), Miotto (2023), and again Fontenay et al. (2024). This paper is also connected with Gershman (2015) and Butinda et al. (2023), for their insights on the economic origins and implications of superstition and rituals. More generally, we contribute to the research line on persistence of culture, with specific reference to gender and family economics, including among others Bisin and Verdier (2001), Fernandez and Fogli (2009), and Alesina et al. (2013).

The rest of the paper is organized as follows. Section 2 contains background information about PPST in SSA. Section 3 describes the data. Section 4 explores the correlates of contemporary PPA. Sections 5 and 6 present results concerning fertility and child health, respectively. Section 7 looks at potential underlying mechanisms. Section 8 concludes. An Appendix contains additional tables and figures.

2 Postpartum sex taboos in sub-Saharan Africa

Anthropologists, ethnographers, and demographers have extensively documented the diffusion of PPST within SSA. PPST refer to the custom of refraining from sexual intercourse for a specific period following childbirth. In the following sub-sections, we will document how PPST were investigated in early seminal studies and field research, as well as how they are portrayed in contemporary narratives, including folklore.

2.1 Seminal studies

In preindustrial SSA societies, where the practice is widespread, PPST find their biological justification on at least two grounds: They ensure nourishment for the child until it is capable of survival and protect the mother from postpartum risks such as infection and exhaustion. Even within SSA, the duration of these taboos is subject to extreme

variability across ethnicities, ranging from one or two weeks to as long as three or four years. As an explanation of the observed variation in duration, Whiting (1964) postulates a causal chain stemming from ecological conditions suitable to the cultivation of low-protein crops such as tubers. Diets based primarily on these crops can lead to a high incidence of a protein deficiency, known as "kwashiorkor," which increases the need for prolonged breastfeeding. In this context, long PPST serve to prevent pregnancies during breastfeeding, preserving the protein content of the mother's milk and protecting the child's health. At the same time, these taboos also safeguard the mother from the dangers of closely spaced pregnancies. Through these interrelated channels, they extend the intervals between births, ultimately maximizing the children's survival probabilities.[1]

Examining patterns of correlation within a global sample of 300 societies described in the EA, Murdock (1967b) confirms the validity of two hypotheses explaining differences across societies. The first hypothesis, as the one advanced by Whiting (1964), is based on nutritional considerations and postulates that PPST are shorter in societies that practice animal husbandry and consume milk from domestic animals, as a substitute for mother's milk. The second hypothesis relates to family structure, proposing that PPST are longer in polygynous societies, where the practice reduces the burden of abstinence for married men and is functional to the maintenance of the taboos.

A broader set of correlates of PPST is investigated by Saucier (1972) using a worldwide sample of 172 societies comprised in the EA. The variables found to favor longer durations of PPST are extensive agriculture and supervision of female labor, consistent with Whiting's (1964) emphasis on the prevalence of low-protein crops under such conditions. Significant correlations also emerge for polygyny, as noted by Murdock (1967b), as well as for other customs typically associated with it, such as bride wealth (or sister-exchange), unilineal and localized kin groups, primogeniture, hereditary headmanship, genital mutilation, and segregation of adolescent boys. Thus, the presence of these taboos is more pervasive with a particular type of social organization centered on control of daily life by rigid rules favoring male authority on women, patriarchal authority on the young, and parental authority on children. An association is also reported between PPST and the belief in an otiose high god, defined as a supreme entity who created the universe but refrains from intervening in human life, leaving the governance of daily affairs to intermediaries such as lesser gods, ancestors, and even human practitioners. These practitioners in turn are involved in a variety of ceremonial practices and rituals, in connections with specific aspects of life such as fertility, rain, and healing. Relatedly, Lesthaeghe (1989)

[1]According to Lesthaeghe (1980), there is a similarity between prolonged PPST in SSA and the Western European marriage pattern, as both served as means of limiting fertility. However, in Western Europe, the onset of women's reproductive lives was delayed compared to SSA, leading to shorter birth intervals thereafter.

points out that regions with more prolonged periods of PPA are also the areas where the vast majority of African ritual art has been produced in the forms of masks or fetishes (as opposed to jewelry or weaponry).

2.2 Early field research

Our knowledge of the practice of PPST has been expanded by field research conducted in various countries since the 1970s. The relationship between PPST and fertility is first examined by Caldwell and Caldwell (1977), focusing on the customs adopted by the Yoruba tribe in Nigeria. Among the Yoruba, weaning typically occurs 18-24 months after birth and is followed by at least six, and up to more than 12, months of abstinence. The resulting inter-pregnancy intervals allows to maximize the duration of lactation, which can last up to four years and is functional to maximize child survival. Failure to avoid sexual relations after a birth is perceived as a lethal threat for the child. A common misconception that reinforces adherence to PPST is the belief that a man's sperm can poison the mother's milk.

Substantial variation in the duration of PPST has been documented in the rest of SSA, even within individual countries, as shaped by ethnic customs (van der Walle and van der Walle, 1993). For example, within Ghana, the Ashanti practice a seclusion period of about three months, while the Bono observe a six-month period. In contrast, the Lowilliof, the Tallensi, and the Ewe enforce taboos lasting up to two or three years. More recent evidence from the late 1990s, focusing on three ethnic groups located in Malawi, also documents persistent inter-ethnic variations in observance (Zulu, 2001). Despite these differences, all ethnic groups share a pervasive belief that a woman's reproductive blood is dangerous to a man's health. Furthermore, the observed patterns of behavior and misconceptions prove to be quite persistence compared to previous decades. Bongaarts (1978) and Bongaarts et al. (1984) provide a framework for analyzing the proximate determinants of fertility, that is, the biological and behavioral factors—such as the diffusion of PPST—that exert a direct influence on it, as opposed to socioeconomic and environmental background factors (such as social, cultural, economic, institutional, psychological, health, and environmental variables) which can affect fertility only indirectly by modifying the proximate determinants.

Whether PPST have been subject to erosion is a subject of debate. Since the 20th century, their gradual disappearance may have resulted from a variety of developments: lslamization in the Sahel, modernization in urban areas, and the availability of dairy products in cattle-raising areas (Schoenmaeckers et al., 1981). This erosion of traditional customs has been suggested as a potential factor contributing to future increase in fertility,

and also deteriorations in maternal and child health (Benefo, 1995). Among urbanized couples interviewed by Caldwell and Caldwell (1987), the postpartum period is referred to as the "fighting period,"[2] and the rejection of extended abstinence, which is perceived as a threat to marital stability, is becoming increasingly common.

Additionally, the evidence universally acknowledges that, in SSA, PPST and any other forms are contraception are traditionally aimed not at limiting family size, but rather at optimizing birth spacing, with the ultimate goal of maximizing the number of living children. The literature also highlights that in SSA, despite the pronatalist nature of birth spacing and the postpartum sexual restrictions, abstinence is not perceived as a spacing mechanism but rather as a purification ritual intended to prevent the contamination of the mother's milk (van der Valle and van der Valle, 1988, 1993). While there is general awareness that abstinence prevents pregnancy, there is widespread unawareness of the contraceptive effects of breastfeeding. Consequently, double protection may occur when sexual abstinence is practiced during the period when lactational amenorrhea, i.e., the breastfeeding-induced absence of menstruation, prevents pregnancy.

Early survey data from the DHS for Kenya, Ghana, and Zimbabwe confirm pervasive unawareness about the contraceptive effects of breastfeeding and, more broadly, about reproductive biology (Brown, 2007). A review of indigenous African contraceptive practices in the same time period is provided by Moroole et al. (2020). Instances of double protection, where contraception use coincides with postpartum non-susceptibility to pregnancy, are also documented. The non-susceptibility period refers to the time after delivery when a woman is not at risk of pregnancy due to postpartum amenorrhea and/or sexual abstinence. Consequently, the length of the non-susceptibility period is defined by whichever condition—amenorrhoea and sexual abstinence—persists longer.[3]

2.3 Contemporary narratives

While early studies on PPST describe customs and practices that have been observed for centuries, contemporary relevance of PPA is also amply accounted for. For instance, Mchome et al. (2020) report findings from a study on cultural beliefs linking PPST to child growth. The study is based on focus group discussions and interviews conducted in a rural setting in Tanzania. The study participants, who are men and women of various

[2]In Bertrand et al. (1983) it is referred to as "separate beds."

[3]Due to the widespread practice of breastfeeding, the Lactational Amenorrhoea Method (LAM) initially received significant attention as a potentially optimal contraceptive method for SSA. When combined with full breastfeeding and limited to the first six months after birth, it has been shown to be as effective as other contraceptives (Kennedy et al., 1989). The DHS classify LAM among modern methods because of its relative complexity. This is the likely reason why it was never widely adopted by significant strata of the population.

ages and ethnicities, strongly believe that the main cause of a child's poor growth is parental violation of PPST. The term "kubemenda" specifically denotes a child's growth faltering as a result of such violation. Several participants perceive postpartum sex as morally unacceptable, referring to it as "a dirty or filthy game" or "stupidity," and believe that the father's sperm and the mother's vaginal excretions can harm a child's growth and pollute the milk. Conception during the lactation period is viewed as a lethal threat to the child's health, and mothers whose babies are growing poorly are stigmatized for breaking sex taboos.[4] The responsibility for maintaining PPA is predominantly attributed to women rather than to men, while polygyny is viewed as a strategy for men to cope with it. Despite some intergenerational differences in adherence—where older women tend to be more observant and critical of the more relaxed attitudes of younger women—these narratives point to a still pervasive role of these customs, which are perceived as crucial for children's well-being.

Similar conclusions are reached by Shabangu and Madiba (2019) from a study on Swazi women's views on PPA. The women perceive it as beneficial for themselves, their children, and their husbands, and they regard it as an important cultural tradition. They are also influenced by myths and misconceptions about the consequences of resuming sexual intercourse too soon. Again, a common misconception being reported is that early resumption hinders the baby's growth and development, as breast milk mixed with sperm is thought to become poisonous to the baby. Likewise, early resumption is believed to harm the partner. For instance, if the woman is still "wet," i.e., having a vaginal discharge, her husband might catch a respiratory illness called "ligola." At the same time, participants also stress the burdens of PPA, with the involved danger that husbands might turn to other women, as well as the perception of the norm as a patriarchal cultural practice which oppresses women.

The relevance of sexual abstinence is also captured by the folkloric tradition, which convey a people's culture as transmitted through oral tradition and rituals. The folklore catalogue compiled by Berezkin (2015a,b) includes several motifs evoking PPST. Alongside themes of abstinence, chastity, and celibacy clearly linked to sexual taboos, the catalogue records motifs warning of dangers associated with sexual contact with a woman. Examples include "a dangerous woman" and several others suggesting the presence of harmful objects in a woman's vagina, such as teeth ("vagina dentata"), piranhas, snakes, scorpions, and mice. Another motif, "long penis after prohibited sex," suggests that, after breaking a sex taboo, "a man's penis becomes so long that he has to carry it

[4] A woman who becomes pregnant while still nursing or who has a baby who grows poorly is reportedly described using negative stereotypes such as "sexual maniac (ana kiranga)," "dirty woman (mwanamke mchafu)," "reckless," "stupid," "too lusty," or "overly jealousy of her husband."

in a basket."

3 Data

3.1 Contemporary data

Our sources of contemporary data are the DHS, nationally representative household surveys that collect information on demographics, fertility, family planning, and maternal and child health in low- and middle-income countries. We focus our investigation on SSA because high fertility and lack of family planning are peculiar characteristics of this area, together with the diffusion and the variation in length of ancestral PPST. Our sample includes 31 countries.[5]

The surveys are conducted at a cluster level, where a cluster consists of about 100 households, from which a predetermined number of households are interviewed. We employ the Individual Women's Data and the Births' Data. The former dataset is derived from the women's questionnaire, which targets women of reproductive (15-49) age, while the latter provides information on every child ever born to the interviewed women.[6]

Since our aim is to analyze the implications of ancestral customs for intra-family decisions, we confine our sample to women who are or have been married or in a stable union, along with their children. From the women's data, we employ the variables described below. The main regressor of interest is the duration of PPA for each woman, measured in months. We exclude births for which women were still abstaining at the time of the interview, as the full PPA period is not observed, leading to issues of censoring of the distribution. As with other questions related to maternity history, the information on PPA pertains to births occurring in the five years preceding the interview. Because PPA is influenced by the a woman's entire fertility history, and its duration tends to decrease with parity,[7] we take the maximum number of months the woman abstained out of the births considered in the analysis.[8] We use the following fertility indicators as outcomes: Total births ever born to a woman, completed fertility (the total number of children ever born to women older than 45), children died (the total number of children of

[5]See dhsprogram.com. Since the number of waves which have been completed is highly uneven across countries, to avoid overweighting we employ for each country the latest available wave. The countries in our sample and the respective survey years are listed in Table A1 in the Appendix.

[6]For robustness checks concerning interethnic marriages, we also use the Men's Data, which cover men aged 15-54.

[7]Parity refers to the number of pregnancies carried by a woman for at least 20 weeks. Martinez-Galiano et al. (2019) show that primiparous women, compared to multiparous, face a higher likelihood of complications during the puerperium, including lactation issues, sexual problems, relationship difficulties, and depression. These factors can delay the resumption of sexual activity.

[8]As we will show, results remain similar taking instead the average number of months for each woman.

a woman who have died), living children (the difference between total births and children died), excess fertility (the difference between the number of living children and the ideal number of children a woman reports), and birth spacing intervals below 24 and above 36 months. We also take information on knowledge and use of contraceptive methods, categorized as: (i) no method; (ii) only folkloric methods (herbs, amulets) or traditional methods (periodic abstinence/rhythm, withdrawal, abstinence); and (iii) modern methods (pill, IUD, injections, diaphragm, condom, sterilization, implants, female condom, foam/jelly, lactational amenorrhea, and emergency contraception). To assess whether a woman practices double protection, we code three binary variables capturing whether a woman is postpartum abstaining in combination with, respectively, (i) using any method, (ii) using modern method, and (iii) being amenorrheic.

Furthermore, from the women's dataset, we collect a number of indicators that capture different dimensions of women's position within the family and society, which can proxy for female empowerment. These include whether a woman belongs to a polygynous household, whether she is in paid employment, and her years of education. From the sub-sample of the interviewed women for which this information is collected, we also construct two additional indicators of female empowerment. The first is a final say index, which reflects whether the woman alone makes decisions on various matters, including her own health care, large household purchases, visits to family or relatives, and how to use her husband's earnings. The second is a beating justified index, based on responses to whether beating one's wife is justified under specific circumstances, namely, if she goes out without informing her husband, neglects the children, argues with him, refuses to have sex, or burns the food. Lastly, we also use socio-demographic characteristics of the respondents, such as age, relationship to the household head, sex of the household head, occurrence of twin births, place of residence (rural vs urban), and religion.

From the births' data, we obtain the duration of PPA in months for each birth, again excluding cases where women are still abstaining at the time of the interview. To be noticed is that this information refers to the months of abstinence following a given birth. For each birth, we also construct the lagged value of the aforementioned variable, which captures the duration of preceding PPA, that is, the duration of abstinence after the birth of the previous child. We assess the impact of sexual abstinence after the birth of a child on child health, as captured by the probability that a child is alive and that it is affected by stunting or severe stunting. The latter two variables represent a relative measure of a child's height-for-age and signal chronic malnutrition. We examine the impact on child health of preceding PPA with a focus on the following outcomes: Child alive, premature birth, birth weight, early neonatal death (within seven days from birth), neonatal death (below age one month), infant death (below age one year), and caesarean

section. For each birth, we use as controls the child's sex, year of birth, and birth order, and the presence of twins.

3.2 Ethnographic data

From the EA, we draw information on ancestral reliance on PPST. The EA is a worldwide database that records ancestral societal characteristics at the ethnicity level. Our key variable of interest is a categorical that indicates the duration of PPST in months (0, up to 1, 2-6, 7-12, 13-24, over 24 months).

Given the limited number of ethnicities for which PPST information is available in the EA, in order to obtain a representative number of ethnicities we follow the methodology introduced by Cao et al. (2024). We start with the current geographical distribution of languages from Ethnologue 16, as provided by Giuliano and Nunn (2018).[9] To obtain information on the languages currently spoken by women within each DHS cluster, we overlay DHS clusters onto the current distribution of languages. Finally, we use data from Giuliano and Nunn (2018) to link languages from the Ethnologue with ethnic characteristics from the EA. This procedure allows us to expand our sample from 22 to 31 countries. As noted by Cao et al. (2024), this methodology works particularly well in SSA, where there is a high diversity of languages and ethnicities, languages usually coincide with ethnicities, and population movements have historically been limited.

This approach offers substantial advantage over two alternative approaches: Merging self-reported ethnicity data from the DHS or mapping DHS clusters onto ancestral ethnic homelands provided by Murdock (1959). A weakness of the first alternative is that for several countries the DHS do not provide self-reported ethnicity, while for many others they only do so for dominant groups. Our approach, on the other hand, allows to obtain a more comprehensive distribution for all countries, although it introduces potential measurement error because there cannot be coexistence of ethnicities within a specific current-language region provided by the Ethnologue. Compared to mapping clusters onto ancestral ethnic homelands, our approach has the advantage of capturing portable ethnic characteristics that persist through migration.

We also control for the following characteristics of ethnic groups, again sourced from the EA: The degree of kinship tightness (defined by a combination of post-marital coresidence, nature of descent, and presence of localized clans), which serves as a measure of social structure; jurisdictional hierarchy, as a proxy for political complexity; the reliance on milking domestic animals and animal husbandry, which could act as potential substi-

[9]The Ethnologue 16 is a database that reports the dominant language for each location worldwide (Gordon, 2009).

tutes for breastfeeding; and the presence of an otiose high god, which complements the diffusion of rituals.

3.3 Ecological data

As previously highlighted, according to Whiting (1964) one motivation for an extended period of sexual abstinence after childbirth is the mother's effort to preserve the nutritional quality of her milk and safeguard the child's health in the context of a low-protein diet. In turn, such protein deficiency is likely to arise from a diet primarily reliant on tubers (Lebot, 2009).[10] To capture the deep ecological factors behind PPST, and at the same time increase the number of ethnicities in the sample, we leverage the association between the cultivation of low-protein tubers and the practice of prolonged PPST by relying on a proxy for a tuber-based diet constructed with data on land suitability from the FAO-GAEZ v4.[11] To capture as closely as possible exogenously-determined factor endowments, we refer to the index of Suitability and Attainable Yield under low-input (i.e., traditional management techniques), rain-fed (i.e., absence of irrigation), and without CO2 fertilization agriculture. We overlay DHS clusters onto the spatial distribution of suitability for cassava, yam, and sweet potato, and then we generate a proxy for a tuber-based diet constructed as the minimum of median land suitability for the three tubers.[12] The suitability index ranges between 0 and 10,000, with 10,000 denoting highly suitable areas. To deal with the skewness of the distribution, we use the logarithmic of 0.01 plus this index for each crop.[13] Thus, tuber suitability is the minimum of the logarithm of (0.01 plus) median land suitability for yam, cassava, and sweet potato.

3.4 Folklore data

Since folkloric tradition, through the transmission of narratives, reflects a people's culture, beliefs, and ancestral practices, the categorization of folklore motifs by Berezkin (2015a,b) naturally complements the data from the EA. Hence, we employ the dataset by Michalopoulos and Xue (2021) which, building on Berezkin's catalogue and using text analysis, quantifies relevant aspects of folklore and classifies motifs into different concepts. The information drawn from oral tradition is then matched to the ethnicities in the EA,

[10]Yam is categorized as a stem tuber, while cassava and sweet potato are considered modified lateral roots, also referred to as root tubers. While some classifications differentiate between these types, our definition of tubers encompasses all of them.

[11]Data are from the Global Agro-Ecological Zones (GAEZ) project of the Food and Agriculture Organization (FAO). See fao.org/gaez.

[12]The minimum can capture more clearly the importance of tubers for nutrition.

[13]Using the mean instead of the median, and whether or not to apply the logarithmic transformation, yields similar results.

after mapping clusters onto Ethnologue regions and then the ethnicities in the EA. From the resulting data set, we select the concept related to abstinence and the motif referring to chastity (titled "Sword of chastity"),[14] which taken together most closely reflect the cultural background behind PPST. Although our focus is specifically on sexual abstinence after a delivery, the above mentioned folklore images pertain to a broader set of behaviors. However, it should be pointed out that, according to anthropologists and demographers (Goody, 1976; Caldwell et al., 1989), SSA has historically placed less emphasis on chastity per se, compared to Eurasia.[15] Hence, in SSA, PPA has arguably been the predominant form of chastity, despite not being explicitly referenced in the catalogue.[16] For defining the concept, we follow Michalopolous and Xue (2021). Hence, we divide the number of motifs related to abstinence by the total number of motifs and then take the logarithm after adding 0.01.[17] The motif is defined as a binary variable for whether chastity is present within an ethnicity.

3.5 Geographical and historical data

We complete the dataset with cluster level geographical variables from Worldclim and Natural Earth,[18] namely temperature, precipitations, altitude, ruggedness, and distance from a city, water, and coast. Again at cluster level, we also include three historical variables capturing the colonial past, namely, distance from colonial explorer routes and colonial railways (from Nunn and Wantchekon (2011)) and distance from colonial missions (from Nunn (2010)).

3.6 Summary statistics

Table A2 collects variable definitions and sources. Table A3 reports descriptive statistics separately for variables in the women's and births' datasets. The average number of months of PPA for each woman is 5.5, well above the 40 days recommended by medical

[14]The description of the motif is as follows: "Sleeping in one bed with a woman, man puts a sharp or thorny object between them as a sign of chastity (sometimes the woman herself puts the sword)."

[15]This characteristic has been attributed to SSA's relatively poor soils, which prevented the development of wealth protection and transmission practices prevailing in Eurasia, such as the emphasis on women's virginity and chastity and the provision of dowries. In contrast, in SSA, the local system of subsistence farming linked wealth accumulation to the acquisition of wives, bride prices, and ultimately children, which resulted in an emphasis on fostering female fertility rather than chastity.

[16]The reason why, beside a concept, we also use a specific motif is that the Michalopoulos and Xue (2021) dataset classifies motifs into concepts using ConceptNet. Consequently, the abstinence related concept, besides abstinence, chastity, celibacy and the like, may also capture motifs related to alcohol and addiction which are not pertinent to the issue at hand. The pairwise correlation between the abstinence concept and the chastity motif is high (0.53) and statistically significant.

[17]In Michalopoulos and Xue (2021), a concept is said to appear in a motif if either the seed word itself or one of the 50 closest terms according to ConceptNet is mentioned in the motif.

[18]See worldclim.org and naturalearthdata.com.

practitioners.[19] The average duration of PPST in the EA corresponds to the range of 13-24 months, which is significantly longer than contemporary PPA practices.[20] Fertility (measured as the average total number of children per woman) is 3.8, while completed fertility (for the over-45) is 6.1. The average number of children who have died is 0.5 per woman. The ideal number of children is 5.5. Birth intervals shorter than 24 months, which correspond to short spacing, are reported by 11 percent of respondents, while 43 percent report intervals longer than 36, close to the World Health Organization (WHO)'s recommendations.[21] 26 percent of respondents belong to polygynous households, 93 percent know modern contraceptive methods, and 46 percent have used a contraceptive method other than PPA. Double protection is considerably diffused, especially in the form of a combination of PPA with amenorrhea, which is reported by 69 percent of respondents.[22] Turning to the births' dataset, 87 percent of the children are currently alive, 30 percent experience stunting, and 11 percent severe stunting. Early neonatal, neonatal, and infant deaths respectively occur in 22, 26, and 59 percent of the deaths.

Figure A1 illustrates the geographical distribution of ancestral PPST duration by ethnicity, while Figure A2 does the same for contemporary PPA by DHS cluster. Figure A3 presents land suitability maps for yam, cassava, and sweet potato in SSA.

4 Correlates of contemporary postpartum abstinence

In this section, we explore the relationship between contemporary PPA and the prevalence of PPST in preindustrial societies. Over a sample of women obtained from the DHS Individual Women's Data, we regress the current duration of PPA on ancestral PPST duration or, alternatively, three variables which proxy for the latter, namely tuber suitability and two folklore variables capturing the abstinence concept and the chastity motif. We estimate the following specification using OLS:

$$PPAbstinence_{i,e,d,c} = \alpha_c + \beta PPSexTaboos_e + X'_{e,d,c}\Gamma + \epsilon_{i,e,d,c} \quad (1)$$

[19] Due to the presence of twin births (5.9 percent of the sample), which double the counting of PPA months, the reported range is 0-71 months. Confining the sample to non-twin births, the range reduces to 0-53 months, with a mean of 6.3 and a standard deviation of 6.1.

[20] The year of birth for the women in the samples spans from 1944 to 2004, covering about 60 years. Dividing the sample into two year-of-births cohorts, each comprising 30 years, shows evidence of erosion, with the number of months of PPA declining from 6.4 in the older cohort to 5.4 in the younger. Statistics by age groups are not reported for brevity.

[21] The WHO (2007) recommends a 24-month birth-to-pregnancy interval, corresponding to an inter-delivery interval of approximately 33 months.

[22] Across subsequent cohorts, differences emerge in multiple dimensions, showing for instance a decrease in the number of ideal children (from 6.2 to 5.4) and in polygyny (from 34 to 24 percent), while the number of years of education increases (from 3.7 to 4.6).

where i indexes women, e ethnic groups, d DHS clusters, and c countries. The dependent variable, $PPAbstinence_{i,e,d,c}$, captures the maximum duration of PPA for a woman in months, excluding the most recent birth if the woman is still abstaining at the time of interview, and is entered in logarithmics (after adding 0.01 to each value). α_c denotes country fixed effects. $X_{e,d,c}$ include cluster level geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from a city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission). Some specification will also include additional individual level and ethnicity level controls. The error $\epsilon_{i,e,d,c}$ is clustered at the language level. The main regressor is $PPSexTaboos_e$, which measures the duration of ancestral sexual abstinence prevailing after delivery in the ethnic group the mother belongs to. As in the EA, it is coded as a categorical taking six values (0, up to 1, 2-6, 7-12, 13-24, and over 24 months). The proxies we will use in place of PPST are tuber suitability, which is meant to capture the association between ancestral PPST and ecological factors represented by a low-protein diet based on tubers, and the abstinence concept and the chastity motif, which reflect an ethnicity's oral tradition. Variable definitions are detailed in the previous section and in Table A2.

Model 1 in Table 1 reports regression results for a specification including country fixed effects, geographical and historical controls, the year of interview, the age group of the woman, her relation to the household head, the sex of household head, and a binary variable for twin births.[23] The coefficient on PPST indicates a significantly positive influence of ancestral customs on contemporary behavior. Specifically, a one-unit increase in PPST—as categorized in the EA—corresponds to an average increase by 5.1 percent in the number of months of PPA, which is roughly equivalent to 10 additional days.

In Model 2 of Table 1 we replace PPST with tuber suitability. As shown in the table, using this proxy allows a considerable increase in the sample size and the number of ethnicities, compared to the model using PPST as a regressor. The coefficient on tuber suitability confirms its positive influence on the dependent variable, and so do those on the folklore variables in Models 3 and 4. Notably, the last model indicates that the duration of abstinence increases by almost 59 percent in societies in which chastity is present in the folkloric tradition. However, the small number of such societies may result in potentially spurious results.

In the rest of this section, we report results from a battery of robustness checks and extensions. To be noticed is that replicating over the births' dataset the analyses from Table 1 for the women's dataset yields similar results (which we do not report for brevity).

[23]Twin births are controlled for due to their more adverse perinatal outcomes and their influence on subsequent family planning. Results are very similar if instead twin births are excluded from the sample.

Table 1: Correlates of the duration of postpartum abstinence

	Postpartum Abstinence			
	(1)	(2)	(3)	(4)
Postpartum Sex Taboos	0.051***			
	(0.018)			
Tuber Suitability		0.019***		
		(0.005)		
Abstinence Concept			0.164***	
			(0.055)	
Chastity Motif				0.587***
				(0.084)
Adj. R^2	0.370	0.317	0.317	0.319
Observations	63277	178460	174641	174641
Clusters	261	1166	1130	1130

Note: OLS estimates. The unit of observation is the woman. Postpartum abstinence captures the duration of postpartum abstinence for a woman in months and is entered in logarithmics (after adding 0.01 to each value). Postpartum sex taboos is a categorical variable capturing the duration of ancestral postpartum sex taboos. Tuber suitability is the minimum of the logarithm of (0.01 plus) median land suitability for yam, cassava, and sweet potato. Abstinence concept is the share of the concept-specific motifs out of all motifs and is entered in logarithmics (after adding 0.01 to each value). Chastity motif is a binary for the occurrence of the motif. All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

In the former case, the unit of observation is a birth rather than a woman, which leads to an inflation in the degrees of freedom. Furthermore, results remain very similar if we drop from the sample the Central African Republic, where the most recent interview wave was collected considerably earlier compared to the other countries in our sample.

In the four panels of Table A4 we begin by presenting more parsimonious specifications for each main regressor from Table 1 (Models 1-3). We start with a baseline specification adding to the main regressor only country fixed effects (Model 1). Next, we add geographical (Model 2) and historical (Model 3) controls. Model 4 coincides with the specification in Table 1. Overall, these models show a stable size of the coefficients on each regressor. The last two models sequentially include additional ethnicity level controls in Model 5 (kinship tightness, jurisdictional hierarchy, animal milking, and animal husbandry)[24] and finally in Model 6 also additional individual level controls (years of

[24]The degree of kinship tightness is defined as an unweighted average of three binary variables for post-marital coresidence, nature of descent, and presence of localized clans. In his definition of kinship tightness over worldwide data, Enke (2019) also includes a fourth indicator for the presence of extended families, but we exclude it since it displays no variation within our SSA sample. Jurisdictional hierarchy is a binary variable for the presence of at least one level of jurisdictional hierarchy beyond the local

education and religion, where the latter is coded as a categorical variable for the main religious affiliations). Even though our results are robust to their inclusion, our preferred specification remains the one in Table 1 (corresponding to Model 4 in Table A4), because the inclusion of ethnicity level controls tends to increase measurement error while the added individual level controls are likely endogenous. Furthermore, adding both sets of controls reduces the number of ethnicities, forcing us to exploit variation across fewer clusters.

As another robustness check, we re-estimate the models in Table 1 replacing the measure of PPA, based on the maximum number of months a woman abstained, with the average number of months for each woman. The results remain very similar, as shown in Table A5.

One potential concern with the evidence presented so far is that the association between ancestral customs and contemporary behavior may be eroding over time, so that it may no longer be present for younger cohorts. In Table A6, we estimate the same models from Table 1 by year of birth cohort, that is, by confining the estimates to women belonging to two groups, each comprising thirty years.[25] The results confirm that the association emerging over the full sample is stronger for older women, documenting an ongoing erosion of traditional behavior regarding the observance of sex taboos among younger women.

As an additional robustness check, we investigate whether interethnic marriage affects our results. To do so, we merge the men's and women's samples and, in Table A7, replicate a version of Table 1 over a sub-sample of women married (or in stable unions) with men from a different ethnic group. Consistent with other studies (e.g., Crespin-Boucaud (2020)), 22.9 percent of the married women in our sample are in interethnic marriages, a share that remains remarkably stable across cohorts. The impact of PPST and its proxies on current abstinence is still present, though somewhat diluted for some, as one would expect given that marrying outside one's ethnic group likely signal weaker adherence to traditional customs. Indeed, these considerations suggest a potential selection issue in the sample of interethnic marriages, with a consequent bias in the estimates, so that in the subsequent analysis we prefer to refer to the full sample.

In principle, ancestral practices restricting sexuality might affect not only contemporary PPA but also contemporary reliance on other contraceptive methods aimed at controlling fertility. In a falsification exercise, we show that this is not the case by re-

community. Reliance on milking domestic animals is a binary variable. Animal husbandry is a categorical capturing the dependence on animal husbandry as a percentage out of the universe of subsistence activities.

[25] A finer classifications, for instance with six cohorts, produces consistent results, even though the number of observations is too small to allow estimation of the coefficient for the first and last cohorts.

gressing on PPST and its proxies a set of four binary variables capturing whether the woman is in any of the following circumstances: (i) has ever used a method; (ii) is currently using any method; (iii) is currently using only folkloric or traditional methods; and (iv) is currently using modern methods.[26] Contrary to what is shown in Table 1 for PPA, now in Table A8 PPST and its three proxies do not increase the probability of any of the four above-described dependent variables, stressing the specificity of the link we uncover between ancestral and contemporary practices related to sexual abstinence.[27]

To conclude, in this section we have documented a robust association between contemporary practices concerning abstinence following the birth of a child and ancestral customs, as captured by the ethnographic variable measuring the duration of sex taboos. We have also established that proxies for the latter, derived from the ecological environment and the folkloric tradition, are equally effective in capturing this association.

5 Postpartum abstinence and fertility

In this section, we investigate the impact of PPA and its ancestral correlates on fertility, across several dimensions, with reference to the women's dataset. We estimate the relationship between fertility and contemporary PPA according to the following empirical model, to be estimated with OLS and 2SLS:

$$Fertility_{i,e,d,c} = \alpha_c + \beta PostpartumAbstinence_{i,e,d,c} + X'_{i,e,d}\Gamma + \epsilon_{i,e,d,c} \quad (2)$$

where we keep track of seven fertility indicators: Total births (defined as the total number of children ever born to a woman), completed fertility (the total number of children ever born to a woman older than 45), children died (the total number of children of a woman who have died), living children (the difference between total births and children died), excess fertility (the difference between the number of living children and the ideal number of children), and spacing below 24 and above 36 months (two binary variables for birth intervals below 24 and above 36 months, respectively).[28] The first five variables are entered in logarithmics (after adding 0.01 to each value). As in Equation (1), $PPAbstinence_{i,e,d,c}$ is measured as the maximum duration of PPA for a woman in months, excluding the

[26] Although they restrict information to the time of the interview, we also consider respondents' responses regarding current use, since for current use we have detailed information by type of method, which is missing for the question referring to past use.

[27] A significant—but negative—effect is found for the chastity motif on the probability that a woman is currently using modern methods.

[28] While an impact of sexual abstinence on birth spacing may appear mechanical, the length of birth intervals can be affected by a variety of other factors, both biological (e.g., fetal loss, postpartum amenorrhea) and sociological (e.g., use of contraceptives, duration of breastfeeding, death and sex of the previous child) (Yeakey et al., 2009).

Table 2: Postpartum abstinence and fertility

	(1) Total Births	(2) Compl. Fert.	(3) Childr. Died	(4) Living Childr.	(5) Excess Fert.	(6) Spacing <24 Mo.	(7) Spacing >36 Mo.
Panel A: OLS							
PP Abstinence	0.002	-0.003	-0.009	0.011***	-0.021***	-0.005*	0.002
	(0.002)	(0.004)	(0.008)	(0.003)	(0.007)	(0.003)	(0.003)
Adj. R^2	0.602	0.184	0.150	0.407	0.188	0.072	0.112
Observations	178460	4747	178460	178460	146469	152529	152529
Clusters	1166	727	1166	1166	1165	1166	1166
Panel B: IV							
PP Abstinence	0.159**	0.118*	0.870**	0.110**	-0.046	-0.086***	0.000
	(0.065)	(0.063)	(0.362)	(0.053)	(0.159)	(0.025)	(0.043)
Adj. R^2	-0.116	-0.082	-0.190	-0.019	0.015	-0.084	0.006
KP F test	16.064	19.465	16.064	16.064	17.177	17.687	17.687
Observations	178460	4747	178460	178460	146469	152529	152529
Clusters	1166	727	1166	1166	1165	1166	1166
First Stage	PP Abstinence						
Tuber Suit.	0.019***	0.029***	0.019***	0.019***	0.021***	0.021***	0.021***
	(0.005)	(0.007)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)

Note: OLS estimates in Panel A, 2SLS estimates in Panel B. The unit of observation is the woman. The dependent variables respectively are the total number of children ever born to a woman, the total number of children ever born to a woman older than 45, the total number of children who have died, the total number of living children, and the excess number of children born to a woman, each entered in logarithmics (after adding 0.01 to each value), and two binary variables respectively for birth intervals below 24 and above 36 months. The main regressor, postpartum abstinence, captures the duration of postpartum abstinence for a woman in months and is entered in logarithmics (after adding 0.01 to each value). The instrument, tuber suitability, is the minimum of the logarithm of (0.01 plus) median land suitability for yam, cassava, and sweet potato. All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

most recent birth if the woman is still abstaining at the time of interview, and is entered in logarithmics (after adding 0.01 to each value). The main specification includes country fixed effects, geographical and historical controls, year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. The error $\epsilon_{i,e,d,c}$ is clustered at the language level.

As previously explained in the data section, the duration of PPA is provided by the DHS only for children born within 60 months prior to the interview. The fact that PPA may well be influenced by a woman's entire fertility history might cause endogeneity issues and a severe bias in OLS estimates. Since PPA tends to decrease with parity, we should expect a downward bias, which we address by employing a 2SLS strategy.

Building on the evidence presented in the previous section, according to which longer

PPA is practiced in association with a low-protein diet based on tubers, we employ tuber suitability as an instrument for contemporary PPA and in Panel B we re-estimate Equation (2) with 2SLS. In principle it is possible that a low-protein diet during pregnancy could affect fertility and birth weight, potentially introducing either an upward or downward bias when using the IV, depending on the outcome variable. However, the evidence for these associations is less straightforward than it appears. While animal studies have confirmed a relationship between protein intake and birth weight (Metges, 2001), findings from human observational studies are somewhat inconsistent, with some showing a positive effect (Cuco et al., 2006), others a negative effect (Godfrey et al., 1996), and still others reporting no effect (Halldorsson et al., 2021). The effect on fertility is also contentious, with some studies pointing at a possible positive effect of animal protein on ovulatory infertility (Gaskins and Chavarro, 2018). In Table 2, the first stage coefficients and the Kleibergen-Paap F statistics confirm the validity and strength of the instrument while, as expected, the second stage reveals that in most cases OLS estimates are severely downward biased. In the second stages, a longer duration of contemporary PPA actually increases the number of children. Completed fertility is also positively affected, albeit only at a 10 percent significance level. However, a positive effect is detected also for the number of children who have died. On balance, the net effect on the number of living children remains positive. No effect emerges for excess fertility. Lastly, a longer duration of PPA exerts a negative effect on the likelihood of short spacing (below 24 months), while it does not affect the likelihood of a birth interval of 36 months, which is closer to the WHO recommendations.[29]

Table A9 presents reduced form estimates to explore the link between fertility and ancestral PPST as well as its proxies. To be noticed is that the reduced forms in Panel B, where tuber suitability enters as regressor, correspond to the 2SLS in Table 2 and reassuringly delivers similar results. For all outcomes, the 2SLS results obtained with the tuber suitability instrument are broadly confirmed.

Overall, we find no evidence that the practice of PPA in the present day induces a restriction in family size. This conclusion aligns with the prevailing view among anthropologists and demographers regarding family planning in SSA. Accordingly, in SSA, any form of contraception including PPA is de facto pronatalist, as it is traditionally not directed at containing family size but rather at lengthening intervals between births to ultimately increase the number of children. At the same time, our evidence shows that while longer PPA does reduce the probability of short spacing (below 24 months), it is

[29]The results remain robust to the exclusion of twin births and the Central African Republic from the sample, as well as the use of the average rather than the maximum number of months as a measure of PPA. Tables are omitted for brevity.

Table 3: Postpartum abstinence and child health

	(1) Child Alive	(2) Stunting	(3) Severe Stunting
PP Abstinence	0.023***	0.011**	0.009***
	(0.005)	(0.005)	(0.002)
Adj. R^2	0.135	0.270	0.201
Observations	139542	62903	62903
Clusters	1136	1073	1073

Note: OLS estimates. The unit of observation is the children ever born to a woman. The dependent variables respectively are a binary for child alive and two binary variables respectively for stunting and severe stunting. Postpartum abstinence captures the duration of postpartum abstinence in months after the birth of a child and is entered in logarithmics (after adding 0.01 to each value). Individual level controls include sex, year of birth, birth order, and the occurrence of twin birth. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

insufficient to ensure the WHO-recommended number of between-births months. Thus, in the present day, PPA is not effective in optimizing the length of the birth intervals. This is the likely reason why no beneficial effects are observed in terms of child survival. In the next section, we delve deeper into outcomes related to child health.

6 Postpartum abstinence and child health

In this section, we investigate the impact of PPA on a number of outcomes concerning births and child health, using the births' sample. To achieve causal identification of the effects of PPA, we introduce mother fixed effects into our model. This approach enables us to exploit variations in the duration of PPA between siblings, in such a way to effectively neutralize the influence of latent factors that could otherwise bias the standard OLS estimator. In the worst case scenario, exploiting the variation within mother could cause a downward bias given that spacing decreases with parity. This would be possible if higher parity is associated with worse birth outcomes. To attenuate such a bias we also control for parity. We estimate the following empirical model:

$$Outcome_{j,i} = \alpha_i + \beta PostpartumAbstinence_{j,i} + X'_{j,i}\Gamma + \epsilon_{j,i} \tag{3}$$

where j indexes children, i mothers, and α_i denotes mother fixed effects. $PPAbstinence_{j,i}$ captures the duration of PPA for each child in months, excluding the most recent birth if the woman is still abstaining at the time of interview, and is entered in logarithmics (after adding 0.01 to each value). $X_{j,i}$ include individual level controls that do vary between births from the same mother, namely the child's sex and year of birth, the occurrence of

Table 4: Preceding postpartum abstinence and child health

	(1) Child Alive	(2) Premat. Birth	(3) Birth Weight	(4) Early Neo. Death	(5) Neonatal Death	(6) Infant Death	(7) Caesar. Deliv.
Preceding PPA	-0.010**	-0.003	-0.005	0.045***	0.035**	0.002	-0.001
	(0.005)	(0.003)	(0.003)	(0.017)	(0.016)	(0.007)	(0.002)
Adj. R^2	0.237	0.590	0.550	0.570	0.606	0.283	0.721
Observations	16322	8094	6277	975	977	977	16257
Clusters	817	301	521	229	230	230	816

Note: OLS estimates. The unit of observation is the children ever born to a woman. The dependent variables respectively are binary variables for child alive, premature birth, birth weight, early neonatal death, neonatal death, infant death, caesarean delivery. Preceding postpartum abstinence captures the duration of postpartum abstinence in months after the birth of the previous child and is entered in logarithmics (after adding 0.01 to each value). Individual level controls include sex, year of birth, birth order, and the occurrence of twin birth. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

twin birth, and birth order. The error $\epsilon_{j,i}$ is clustered at the language level.

In Equation (3), the postnatal outcomes of interest are child alive (a binary variable capturing weather a child is alive at the time of interview), stunting, and severe stunting (two binary variables taking value one if the child's height-for-age is respectively two and three standard deviations below the median). Table 3 shows that a longer PPA duration increases the probability that a child is alive, but also increases the probability of stunting and severe stunting.

We also estimate a variant of Equation (3) where the main regressor is replaced by preceding PPA, defined as the duration of PPA prior to the birth of a child. The new regressors is constructed as the lagged value of $PPAbstinence_j$, that is, the duration of PPA after delivery of the previous child. According to the maternal depletion hypothesis, by protecting the health of the mother before and during a new pregnancy, preceding PPA might affect perinatal outcomes such as child alive, premature birth (a binary variable capturing whether a pregnancy lasts less than nine months), birth weight (in grams, entered in logarithmics), early neonatal death (a binary for death within seven days of birth), neonatal death (a binary for death below age one month), infant death (a binary for death at age below or equal one year), and caesarean section (a binary for delivery by caesarean section).[30] Table 4 detects a negative influence of the preceding PPA duration on the probability that a child is alive. Furthermore, it increases the probability of early neonatal and neonatal death. The effect on the remaining outcomes is not statistically

[30]Compared to developed countries, where caesarean sections are provided at much higher rates than recommended by the WHO, in SSA they are provided at low rates, as they remain emergency procedures implemented under adverse conditions. Hence, their reduction as an effect of PPA would unambiguously signal an improvement from the perspective of a child's health (Betray et al., 2016).

significant.[31]

Combining the above results—pointing to an influence of PPA on malnutrition and child mortality—with that in the previous section, where the PPA duration was shown to increase the number of children who died, paints a consistent picture that provides scant support for the ethnographic and ecological motivation for PPA as a means to protect child health.[32] These conclusions may seem to contradict the finding, from the previous section, that PPA helps reducing short birth spacing (below 24 months). Indeed, in all developing countries including SSA, short birth intervals are strongly associated with higher early-age mortality risk, through at least two channels. The maternal depletion hypothesis posits that short intervals prevent full physiological recovery from the previous pregnancy, leading to suboptimal fetal development and higher mortality risk for the child born following the short interval. The sibling competition hypothesis implies that closely spaced children are more likely to compete for the same resources, including breast milk (Molitoris, 2019). The fact that instead we find adverse effects of PPA is explained by the fact that, in our context, its duration is not sufficient to reach the WHO-recommended guidelines on spacing.

7 Mechanisms

In this section, we explore the contexts that may favor the diffusion of PPA and the mechanisms through which it may influence the outcomes of interest. First, we investigate the relationship between the role of women in family and society and the practice of PPA. Second, we explore the motivations behind PPA.

7.1 Patriarchy or female empowerment?

The literature and narratives summarized in Section 2 document a perception of PPA as a patriarchal cultural practice that oppresses women. On the other hand, the same sources also stress the fact that the period of PPA is known as the "fighting period," and that older women sometimes are in charge of protecting women who just gave birth against their husbands' attempts to break the taboos. Whether PPA represent an expression of female agency or the opposite remains an open question. To provide an answer, we look at the relationship between PPA duration and a number of indicators of female empowerment that capture different dimensions of women's position in family and society. The variables we use are: Polygyny (coded as a binary variable for belonging to a

[31] No effect is found on stunting and severe stunting. Results are not reported for brevity.

[32] As in previous sections, results in Tables 3 and 4 are robust to the exclusion of twin births and the Central African Republic from the sample.

Table 5: Postpartum abstinence and female empowerment - 2SLS

	(1) Polygyny	(2) Paid Empl.	(3) Education	(4) Final Say	(5) Beating Justified
PP Abstinence	0.321***	-0.280**	-0.664	0.008	0.176**
	(0.075)	(0.123)	(0.525)	(0.043)	(0.086)
Adj. R^2	-0.728	-0.613	0.049	-0.002	-0.320
KP F Test	15.865	10.180	16.044	5.454	16.192
Observations	164576	125597	178412	35301	177745
Clusters	1166	1122	1166	985	1133
First Stage			PPA Abstinence		
Tuber Suitability	0.019***	0.019***	0.019***	0.017***	0.017**
	(0.005)	(0.006)	(0.005)	(0.007)	(0.005)

Note: 2SLS estimates. The corresponding OLS estimates are in Table A10. The unit of observation is the woman. The dependent variables respectively are a binary for belonging to a polygynous household, a binary for being paid when working, years of education, an autonomy index, and an index for beating one's wife being justified. The main regressor, postpartum abstinence, captures the duration of postpartum abstinence for a woman in months and is entered in logarithmics (after adding 0.01 to each value). The instrument, tuber suitability, is the minimum of the logarithm of (0.01 plus) median land suitability for yam, cassava, and sweet potato. All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

polygynous household), paid employment (a binary for being remunerated when working),[33] education (in years), a final say index (a categorical capturing the extent to which the woman alone makes decisions on a variety of issues including her own health care, large household purchases, visits to family or relatives, and management of her husband's earnings), and a beating justified index capturing whether beating one's wife is justified (coded as the share of positive answers to questions asking whether beating a wife is justified when she goes out without telling the husband, neglects the children, argues with him, refuses to have sex, and burns the food).[34] We expect that greater female empowerment is associated with a lower probability of polygyny, a higher probability of paid employment, more years of education, greater autonomy in decision making, and a lower degree of justification for wife beating. We estimate the influence of PPA on these outcomes using the empirical model in Equation (2).

Table 5 shows IV results, while the corresponding OLS are in Table A10. Focusing on the IV given the bias to be expected for the OLS, we find that practicing a lengthier PPA—once instrumented with tuber suitability—causes an increase in the probability

[33]Guarnieri and Rainer (2021) refer to the opportunity to having access to employment and being paid in cash wages as their main indicator of female empowerment.

[34]Similar indexes of autonomy and justification for beating are used by Lowes (2002) and Miotto (2023) to investigate the influence on women's empowerment respectively of matrilinear kinship and the colonial cash crop system.

that the woman belongs to a polygynous household, which we interpret as a signal of a subordinate position. The woman is also less likely to be paid when working, which should reduce her bargaining power. The effect on education is nil,[35] and so is the effect on autonomy in decision making, while we detect an increase in the probability that beating one's wife is justified. Replication of the IV regressions by two birth year cohorts, each comprising thirty years, uncovers that longer PPA is associated with patriarchy particularly for the younger cohort, for whom the coefficient becomes larger and statistically more significant for polygyny, paid employment, and justification of beating (regression results are not reported for brevity). This can be interpreted as evidence of more variation among the younger along the dimensions under consideration, and consequently as a signal of ongoing erosion of observance of ancestral customs.

Taken together, these results suggest that longer PPA is not conducive to female empowerment but rather reflects adherence to patriarchal cultural norms that keep women in a subordinate position, and that this channel is particularly strong among younger cohorts. A by-product of female subordination is that women adhering to PPA may resume sexual activity sooner than they desire because of their partners' pressure and/or out of fear that their partners might seek other women including co-wives (Mekonnen, 2020), with a consequent restriction in birth intervals.

7.2 Postpartum abstinence as a purification ritual

As discussed in Section 2, it has been argued that women rely on PPA as a natural means of contraception in the face of the unavailability of alternative methods, or else because they are unaware of modern methods or even of the contraceptive effect of breastfeeding. Others have held the view that women may abstain after delivery even without being aware of its contraceptive implications, particularly in light of the widespread practice of "double protection" (Brown, 2007). Yet another alternative view is that women are aware of the contraceptive implications of PPA and they choose to abstain. They do so not for fertility control, but rather to adhere to a purification ritual meant to protect the child's and even the husband's health (van der Valle and van der Valle, 1988, 1993; Zulu, 2001). In particular, the perception of PPA as a safeguard against the contamination of the mother's milk is well documented (Caldwell and Caldwell, 1977; Shabangu and Madiba, 2019; Mchome et al., 2020).

To assess the motivations behind practicing PPA, we start by looking at three sets of variables: Knowledge and use of contraceptive methods, and double protection. Concerning knowledge, we code binary variables capturing whether the woman knows (i) no

[35]The result does not change if we replace years of education with a binary variable capturing whether a woman receives any education (40 percent of the sample receive no education).

Table 6: Postpartum abstinence and knowledge of other contraceptives - 2SLS

	(1)	(2)	(3)
		Knowledge of	
	Any Method	Traditional Method	Modern Method
PP Abstinence	0.106**	0.004	0.102**
	(0.050)	(0.006)	(0.051)
Adj. R^2	-0.263	-0.001	-0.222
KP F Test	16.064	16.064	16.064
Observations	178460	178460	178460
Clusters	1166	1166	1166
First Stage		PPA Abstinence	
Tuber Suitability	0.019***	0.019***	0.019***
	(0.005)	(0.005)	(0.005)

Note: 2SLS estimates. The corresponding OLS estimates are in Table A11. The unit of observation is the woman. The dependent variables are binary variables for knowing respectively no method, only folkloric or traditional methods, and modern methods. The main regressor, postpartum abstinence, captures the duration of postpartum abstinence for a woman in months and is entered in logarithmics (after adding 0.01 to each value). The instrument, tuber suitability, is the minimum of the logarithm of (0.01 plus) median land suitability for yam, cassava, and sweet potato. All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

method; (ii) only folkloric or traditional methods; and (iii) modern methods. Use of contraception is captured—as in Section 4—by a set of binary variables indicating whether the woman: (i) ever used a method; (ii) is currently using any method; (iii) is currently using only folkloric or traditional methods; and (iv) is currently using modern methods. To assess whether a woman practices double protection, we code three binary variables capturing whether a woman is currently postpartum abstaining in combination with, respectively, (i) using any method, (ii) using modern methods, and (iii) being amenorrheic.[36] Again, we estimate the influence of PPA on these outcomes using the empirical model in Equation (2).

Table 6 shows that, once PPA duration is instrumented with tuber suitability, it is associated with a higher likelihood that a woman knows other contraceptive methods and even modern methods. However, no effect is detected on the past or current use of other methods (Table 7), which we can interpret as evidence that ancestral restrictive practices only matter today for analogous limitations on sexuality, and not for the adoption of other contraceptives. This result is consistent with the evidence from Section 4 on the

[36]We code the double protection binary variables in such a way that we would obtain identical estimates by confining the sample to women who are currently abstaining and then coding binary variables for currently using any method, using modern methods, and being amenorrheic.

Table 7: Postpartum abstinence and use of other contraceptives - 2SLS

	(1)	(2)	(3)	(4)
	Ever Used	Currently Using		
	Any Method	Any Method	Traditional Method	Modern Method
PP Abstinence	0.071	0.027	-0.018	0.045
	(0.052)	(0.040)	(0.016)	(0.042)
Adj. R^2	-0.011	0.008	-0.007	-0.008
KP F Test	15.758	16.064	16.064	16.064
Observations	75968	178460	178460	178460
Clusters	1133	1166	1166	1166
First Stage		PPA Abstinence		
Tuber Suitability	0.019***	0.019***	0.019***	0.019***
	(0.005)	(0.005)	(0.005)	(0.005)

Note: 2SLS estimates. The corresponding OLS estimates are in Table A12. The unit of observation is the woman. The dependent variables are binary variables respectively for having ever used any method and for currently using any method, only folkloric or traditional methods, and modern methods. The main regressor, postpartum abstinence, captures the duration of postpartum abstinence for a woman in months, and is entered in logarithmics (after adding 0.01 to each value). The instrument, tuber suitability, is the minimum of the logarithm of (0.01 plus) median land suitability for yam, cassava, and sweet potato. All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

absence of an influence of PPST and its proxies on contemporary use of contraceptives other than PPA. Another interpretation could be that women who abstain are not less likely to have access to other contraceptives. The absence of effects of PPA duration on the likelihood of practicing double protection (Table 8) is again evidence of awareness of the implications of abstinence.[37] Heterogeneity analysis by birth year cohort (tables are unreported for brevity) reveal that the association between PPA and knowledge of any method is driven by the younger cohort, while the lack of association with use remains stable across cohorts, and so is the one with double protection.

We interpret the above results as follows. There is no evidence suggesting that women that observe longer PPA lack knowledge of other contraceptive methods. In other words, women who abstain longer do not do so out of ignorance regarding other methods. The lack of effect of PPA on the adoption of double protection further supports the notion that women are aware of the contraceptive implications of abstinence. At the same time, longer PPA does not correlate with any variation in the use of other contraceptive methods. The fact that PPA is not practiced either out of ignorance or unavailability of other contraceptives, and that it is not perceived as a substitute for other contraceptives, does suggest that—as in the narratives we reported—it is instead motivated by ritual

[37]OLS results corresponding to the 2SLS in Tables 6-8 are in Tables A11-13.

Table 8: Postpartum abstinence and double protection - 2SLS

	(1)	(2)	(3)
	Currently Abstaining and		
	Using Any Method	Using Modern Method	Amenorrheic
PP Abstinence	-0.008	-0.023	-0.013
	(0.048)	(0.046)	(0.045)
Adj. R^2	0.002	-0.005	-0.002
KP F Test	17.534	17.323	17.534
Observations	20201	20016	20201
Clusters	1041	1040	1041
First Stage		PPA Abstinence	
Tuber Suitability	0.023***	0.023***	0.023***
	(0.005)	(0.005)	(0.005)

Note: 2SLS estimates. The corresponding OLS estimates are in Table A13. The unit of observation is the woman. The dependent variables are binary variables respectively for currently practicing postpartum abstinence, respectively in combination with using any method, using modern methods, and being amenorrheic. The main regressor, Postpartum Abstinence, captures the duration of postpartum abstinence for a woman in months, and is entered in logarithmics (after adding 0.01 to each value). The instrument, tuber suitability, is the minimum of the logarithm of (0.01 plus) median land suitability for yam, cassava, and sweet potato. All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

reasons, out of respect of ancestral traditions meant to protect child's and husband's health even though they are based on misconceptions.

To corroborate this conclusion, as a final check we investigate whether the presence of PPST in the ethnic tradition correlates with the diffusion of rituals. To measure the latter, we employ the EA variable capturing beliefs in high gods.[38] In traditional African religions, the belief in an otiose high god is complemented by the belief in lesser supernatural powers that are worshiped by performing a variety of rituals, marking important life events (Idowu, 1962; Mbiti, 1990). Rituals are performed or supervised by practitioners such as healers, priests, rainmakers, elders, sorcerers, and witches. Specifically, purification rituals are widespread in connection with death, menstruation, or childbirth. After childbirth, sexual abstinence is required as a purification ritual to avoid spreading impurity to the child and the husband. From the EA categorical variable taking four values (Absent; Otiose; Active, but not supporting morality; and Active, supporting morality), we code a binary variable which takes value one if the high god is believed to be otiose.

Table 9 initially shows a (fully-controlled) model where the diffusion of rituals, prox-

[38]Following Swanson (1960), the EA defines a high god as "a spiritual being who is believed to have created all reality and/or to be its ultimate governor, even if his sole act was to create other spirits who, in turn, created or control the natural world."

Table 9: Postpartum abstinence and rituals

	(1)	(2)	(3)
	Postpartum Abstinence		
Rituals	0.122***	0.071	
	(0.046)	(0.059)	
Postpartum Sex Taboos		0.044**	
		(0.019)	
Rituals*Postpartum Sex Taboos			0.023*
			(0.012)
Adj. R^2	0.329	0.365	0.365
Observations	116183	59197	59197
Clusters	607	224	224

Note: OLS estimates. The unit of observation is the woman. Postpartum abstinence captures the duration of postpartum abstinence for a woman in months and is entered in logarithmics (after adding 0.01 to each value). Rituals is a binary variable capturing the presence of an otiose high god. Postpartum sex taboos is a categorical variable capturing the duration of ancestral postpartum sex taboos. All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

ied by the presence of an otiose high god, exerts a positive influence on the duration of contemporary PPA. In the second model, where we run a horse race between PPST and rituals, the size and significance of the coefficient of the former is reduced (compared to Table 1, Model 1), while rituals retain a positive albeit not significant coefficient. In Model 3, the interaction between PPST and rituals shows a positive and significant coefficient, which we interpret as evidence that ancestral preferences about abstinence affect contemporary preferences only in the presence of rituals that impose such a norm. In other words, it is through rituals that ancestral postpartum practices led to superstitions and taboos that are transmitted through generations and persist to the present day.[39] The fact that PPA is practiced for ritual reasons is consistent with the evidence produced in Sections 5 and 6, according to which contemporary PPA is not effective in containing fertility and protecting child health.

[39]Entering the linear terms beside the interaction, and testing for the joint significance of the three coefficients, shows that they are jointly significant at a 10 percent level (with F(3, 223) = 2.31 and Prob > F = 0.0775). By contrast, in the same model, testing for the joint significance of rituals and PPST shows that they are not jointly significant (with F(2, 223) = 1.95 and Prob > F = 0.1446). Hence, such a model would suffer from multicollinearity and it is appropriate to rely on Model 3, without the linear terms.

8 Conclusion

Family planning is a critical issue in countries, particularly in SSA, where high fertility rates coexist with low contraceptive use alongside adverse perinatal outcomes. Using a combination of ethnographic, ecological, and folklore data, we investigate the role in this context of postpartum sexual abstinence, a practice that has been extensively documented by anthropologists, ethnographers, and demographers and that, in preindustrial societies, finds its biological justification as a means to safeguard child survival. We first show that the duration of contemporary PPA increases with the duration of ancestral PPST within a woman's ethnic group. The same obtains if, to increase the sample size beyond what is allowed by ethnographic references, we replace PPST with proxy measures based on ecological conditions, such as tuber suitability—a proxy for an abstinence-inducing low-protein diet—and the recurrence of abstinence and chastity in the folklore tradition.

Next, we establish the influence of PPA on a number of fertility indicators. We establish causality using a 2SLS strategy exploiting tuber suitability as an instrument for PPA. We show that prolonged contemporary PPA increases the number of a woman's children, suggesting it is not practiced for contraceptive purposes. While it reduces short birth intervals, it does not achieve the WHO-recommended birth spacing guidelines. Furthermore, we probe the impact of PPA on child health using mother fixed effects for identification. We establish that longer PPA increases stunting and neonatal mortality. Overall, we find scant evidence that PPA exerts a beneficial impact on children.

Exploring underlying mechanisms reveals that PPA is associated with patriarchal cultural norms and is adopted as a purification ritual rather than out of ignorance of other contraceptive methods or unawareness of its fertility implications. Our conclusions question the biological rationale for PPST as a means to safeguard child health and align with anthropological evidence that they are adopted out of respect of ancestral tribal traditions.

Our findings confirm the importance of culture and ethnic heritage in shaping contemporary behaviors. Thus, they also provide valuable insights for designing family planning policies tailored to a region still grappling with potentially explosive population growth and adverse child health outcomes.

REFERENCES

Alesina, A., Giuliano, P., and Nunn, N., 2013. On the origins of gender roles: Women and the plough. Quarterly Journal of Economics 128, 469-530.

Anderson, S., 2018. Legal origins and female HIV. American Economic Review 108, 1407-1439.

Bahrami-Rad, D., Becker, A., and Henrich, J., 2021. Tabulated nonsense? Testing the validity of the Ethnographic Atlas. Economics Letters 204, 109880.

Becker, A., 2022. On the origins of restricting women's promiscuity. Review of Economic Studies, forthcoming.

Becker, G.S., 1960. An economic analysis of fertility. In Coale, A.J. (ed.), Demographic and Economic Change in Developed Countries. Princeton: Princeton University Press, 209-240.

Benefo, K.D., 1995. The determinants of the duration of postpartum sexual abstinence in West Africa: A multilevel analysis. Demography 32, 139-157.

Berezkin, Y., 2015a. Folklore and mythology catalogue: Its lay-out and potential for research. The Retrospective Methods Network Newsletter 10, 58-70.

Berezkin, Y., 2015b. Spread of folklore motifs as a proxy for information exchange: Contact zones and borderlines in Eurasia. Trames: Journal of Humanities and Social Sciences 19, 3-13.

Bertocchi, G. and Dimico, A., 2019. The long-term determinants of HIV infection among African women: The slave trade, polygyny, and sexual behavior. Journal of Development Economics 190, 90-105.

Bertrand, J.T., Bertrand, W.E., and Malonga, M., 1983. The use of traditional and modern methods of fertility control in Kinshasa, Zaire. Population Studies 37, 129-136.

Bisin, A. and Verdier, T., 2001. The economics of cultural transmission and the dynamics of preferences. Journal of Economic Theory 97, 298-319.

Bongaarts, J., 1978. A framework for analyzing the proximate determinants of fertility. Population and Development Review 4, 105-132.

Bongaarts, J., Frank, O., and Lesthaeghe, R., 1984. The proximate determinants of fertility in sub-Saharan Africa. Population and Development Review 10, 511-537.

Brown, M., 2007. When ancient meets modern: The relationship between postpartum non-susceptibility and contraception in sub-Saharan Africa. Journal of Biosocial Science 39, 493-515.

Butinda, L.D., Lameke, A.A., Nunn, N., Posch, M., and Sanchez de la Sierra, R., 2023. On the importance of African traditional religion for economic behavior. NBER Working Paper No. 31430.

Caldwell, J.C. and Caldwell, P., 1987, Fertility control as innovation: A report on in-depth interviews in Ibadan, Nigeria. In van de Walle, E. (ed.), The Cultural Roots of African Fertility Regimes. Proceedings of the Ife Conference. lle-Ife: Obafemi Awolowo University and Philadelphia: University of Pennsylvania, 233-251.

Caldwell, J.C. and Caldwell, P., 1977. The role of marital sexual abstinence in determining fertility: A study of the Yoruba of Nigeria. Population Studies 31, 193-217.

Caldwell, J.C., Caldwell, P., and Quiggin, P., 1989. The social context of AIDS in sub-Saharan Africa. Population and Development Review 15, 185-234.

Canning, D., Mabeu, M.C., and Pongou R., 2022. Colonial origins and fertility: Can the market overcome history? Mimeo.

Cao, Y., Enke, B., Falk, A., Giuliano, P., and Nunn, N., 2024. Herding, warfare, and a culture of honor: Global evidence. Mimeo.

Corno, L., La Ferrara, E., and Voena, A., 2020. Female genital cutting and the slave trade. CEPR Discussion Paper No. 15577.

Crespin-Boucaud, J., 2020. Interethnic and interfaith marriages in sub-Saharan Africa. World Development 125, 104668.

Cuco, G., Arija, V., Iranzo, R., Vila, J., Prieto, M.T., and Fernandez-Ballart, J., 2006. Association of maternal protein intake before conception and throughout pregnancy with birth weight. Acta Obstetricia et Gynecologica Scandinavica 85, 413-421.

de la Croix, D. and Gobbi, P.E., 2022. Population homeostasis in sub-Saharan Africa. Economics & Human Biology 45, 101102.

de Silva, T. and Tenreyro, S., 2017. Population control policies and fertility convergence. Journal of Economic Perspectives 31, 205-228.

Dimico, A., 2024. The effect of abortion policies on fertility and human capital in sub-Saharan Africa. Mimeo, Queen's University Belfast.

Doepke, M., Hannusch, A., Kindermann, F., and Tertilt, M., 2023. Chapter 4 - The economics of fertility: A new era. In Lundberg, S. and Voena, A. (eds.), Handbook of the Economics of the Family, Volume 1. Amsterdam: North-Holland, 151-254.

Dupas, P., Falezan, C., Mabeu, M.C., and Rossi, P., 2023. Long-run impacts of forced labor migration on fertility behaviors: Evidence from colonial West Africa. NBER Working Paper No. 31993.

Enke, B., 2019. Kinship systems, cooperation, and the evolution of culture. Quarterly Journal of Economics 134, 953-1019.

Fernandez, R. and Fogli, A., 2009. Culture: An empirical investigation of beliefs, work, and fertility. American Economic Journal: Macroeconomics 1, 146-177.

Fontenay, S., Gobbi, P.E., and Goni, M., 2024. Fertility in sub-Saharan Africa: The role of inheritance. ECARES Working Paper No. 2024-01.

Galor, O. and Weil, D.N., 1996. The gender gap, fertility, and growth. American Economic Review 86, 374-387.

Gaskins, A.J. and Chavarro J.E., 2018. Diet and fertility: a review. American Journal of Obstetrics and Gynecology 218, 379-389.

Gershman, B., 2015. The economic origins of the evil eye belief. Journal of Economic Behavior & Organization 110, 119-144.

Giuliano, P. and Nunn, N., 2018. Ancestral characteristics of modern populations. Economic History of Developing Regions 33, 1-17.

Goody, J., 1976. Production and Reproduction: A Comparative Study of the Domestic Domain. Cambridge: Cambridge University Press.

Godfrey, K., Robinson, S. Barker, D.J., Osmond, C., and Cox, V., 1996. Maternal nutrition in early and late pregnancy in relation to placental and fetal growth. British Medical Journal 312, 410-414.

Gordon, R.G., 2009. Ethnologue: Languages of the World, 16th edition. Dallas: SIL International.

Gradstein, M. and Ishak, P.W., 2024. Mother Africa: The long run effects of income shocks on fertility. Journal of Economic Behavior & Organization 220, 838-849.

Guarnieri, E. and Rainer, H., 2021. Colonialism and female empowerment: A two-sided legacy. Journal of Development Economics 151, 102666.

Guarnieri, E. and Tur-Prats, A., 2023. Cultural distance and conflict-related sexual violence. Quarterly Journal of Economics 138, 1817-1861.

Guirkinger, C. and Villar, P., 2022. Pro-birth policies, missions and fertility: Historical evidence from Congo. DeFiPP Working Paper No. 2022-04.

Halldorsson, T.I., Birgisdottir, B.E., Brantsaeter, A.L., Meltzer, H.M., Haugen, M., Thorsdottir, I., Olafsdottir, A.S., and Olsen, SF., 2021.) Old question revisited: Are high-protein diets safe in pregnancy? Nutrients 13, 440.

Idowu, B., 1962. Olodumare: God in Yoruba Belief. Longman: Ikeja.

Kennedy, K., Rivera, R., and McNeilly, A., 1989. Consensus statement on the use of breastfeeding as a family planning method. Contraception 39, 477–496.

Lebot, V., 2009. Tropical Root and Tuber Crops: Cassava, Sweet Potato, Yams and Aroids. Wallingford: CABI.

Lesthaeghe, R., 1989. Production and reproduction in sub-Saharan Africa: An overview of organizing principles. In Lesthaeghe, R. (ed.), Reproduction and Social Organization in Sub-Saharan Africa. Berkeley: University of California Press, 13-59.

Lesthaeghe, R., 1980. On the social control of human reproduction. Population and Development Review 6, 527-548.

Lowes, S., 2022. Kinship structure and the family: Evidence from the matrilineal belt. NBER Working Paper No. 30509.

Maggio, D., Karra, M., and Canning, D., 2023. Family planning and children's human capital: Experimental evidence from urban Malawi. Mimeo, Cornell University.

Martinez-Galiano, J.M., Hernandez-Martinez, A., Rodriguez-Almagro, J., Delgado-Rodriguez, M., and Gomez-Salgado, J., 2019. Relationship between parity and the problems that appear in the postpartum period. Nature Scientific Reports 9, 11763.

Mayshar, J., Moav, O., and Pascali, L., 2022. The origin of the state: Land productivity or appropriability? Journal of Political Economy 130, 1091-1144.

Mbiti, J., 1990. African Religions and Philosophy. 2nd ed. Portsmouth: Heinemann.

Mchome, Z., Bailey, A., Kessy, F., Darak, S., and Haisma, H., 2020. Postpartum sex taboos and child growth in Tanzania: Implications for child care. Maternal & Child Nutrition 16, e13048.

Mekonnen, B.D., 2020. Factors associated with early resumption of sexual intercourse among women during extended postpartum period in Northwest Ethiopia: A cross sectional study. Contraception and Reproductive Medicine 5, 1-8.

Metges, C.C., 2001. Does dietary protein in early life affect the development of adiposity in mammals? Journal of Nutrition 131, 2062-2066.

Michalopoulos, S. and Papaioannou, E., 2013. Pre-colonial ethnic institutions and contemporary African development. Econometrica 81, 113-152.

Michalopoulos, S. and Xue, M.M., 2021. Folklore. Quarterly Journal of Economics 136, 1993-1204.

Miotto, M., 2023. Colonialism, cash crops and women in Africa. CERGE-EI Working Paper No. 750.

Molitoris, J., Barclay, K., and Kolk, M., 2019. When and where birth spacing matters for child survival: An international comparison using the DHS. Demography 56, 1349-1370.

Moroole, M.A., Materechera, S.S., Otang-Mbeng, W., and Aremu, A.O., 2020. African indigenous contraception: A review. African Journal of Reproductive Health 24, 173-184.

Murdock, G.P., 1967a. Ethnographic Atlas. Pittsburgh: University of Pittsburgh Press.

Murdock, G.P., 1967b. Post-partum sex taboos. Paideuma: Mitteilungen zur Kulturkunde 13, 143-147.

Murdock, G.P., 1959. Africa: Its Peoples and Their Culture History. New York: McGraw-Hill.

Nunn, N., 2010. Religious conversion in colonial Africa. American Economic Review 100, 147-152.

Nunn, N. and Wantchekon, L., 2011. The slave trade and the origins of mistrust in Africa. American Economic Review 101, 3221-3252.

Okoye, D. and Pongou, R., 2023. Missions, fertility transition, and the reversal of fortunes: Evidence from border discontinuities in the Emirates of Nigeria. Journal of Economic Growth 29, 1-75.

Saucier, J.F., 1972. Correlates of the long postpartum taboo: A cross-cultural study. Current Anthropology 13, 238-249.

Schoenmaeckers, R., Shah, I.H., Lesthaeghe, R., and Tambashe, O., 1981. The child-spacing tradition and the postpartum taboo in tropical Africa: Anthropological evidence. In Page, H.J. and Lesthaeghe, R. (eds.), Childspacing in Tropical Africa: Traditions and Change. London: Academic Press, 25-72.

Shabangu, Z. and Madiba, S., 2019. The role of culture in maintaining post-partum sexual abstinence of Swazi women. International Journal of Environmental Research and Public Health 16, 2590.

Swanson, G. ,1960. The Birth of the Gods: The Origin of Primitive Beliefs. Ann Arbor: University of Michigan Press.

Teso, E., 2019. The long-term effect of demographic shocks on the evolution of gender roles: Evidence from the trans-Atlantic slave trade. Journal of the European Economic Association 17, 497-534.

van de Walle, E. and van de Walle, F., 1993. Postpartum sexual abstinence in tropical Africa. In Gray, R., Leridon, H., and Spira, A. (eds), Biomedical and Demographic Determinants of Reproduction. Oxford: Clarendon Press, 446-460.

van de Walle, E. and van de Walle, F., 1988. Birthspacing and abstinence in sub-Saharan Africa. International Family Planning Perspectives 14, 25-26.

Vogl, T., 2024. Fertility decline and educational progress in African women and children. Mimeo, University of California San Diego.

Whiting, J.W.M., 1964. Effects of climate on certain cultural practices. In Goodenough, W.H. (ed.), Explorations in Cultural Anthropology: Essays in Honor of George Peter Murdock. New York: McGraw-Hill, 511-544.

WHO Department of Making Pregnancy Safer, 2007. Report of a WHO Technical Consultation on Birth Spacing. Geneva: WHO.

Yeakey, M.P., Muntifering, C.J., Ramachandran, D.V., Myint, Y., Creanga, A.A., and Tsui, A.O., 2009. How contraceptive use affects birth intervals: Results of a literature review. Studies in Family Planning 40, 205-214.

Zulu, E.M., 2001. Ethnic variations in observance and rationale for postpartum sexual abstinence in Malawi. Demography 38, 467-479.

APPENDIX

Family Planning and Ethnic Heritage:
Evidence from Sub-Saharan Africa

Graziella Bertocchi, Arcangelo Dimico, and Chiara Falco

Table A1: DHS countries, waves, and years of survey

Country Code	Country Name	Wave	Range Years	
AO	Angola	7	2015	2016
BF	Burkina Faso	6	2010	2010
BJ	Benin	7	2017	2018
BU	Burundi	7	2016	2017
CD	Congo, Democratic Republic of	6	2013	2014
CF	Central African Republic	3	1994	1995
CI	Cote d'Ivoire	6	2011	2012
CM	Cameroon	7	2018	2019
ET	Ethiopia	7	2011	2011
GA	Gabon	6	2012	2012
GH	Ghana	6	2014	2014
GM	Gambia	7	2019	2020
GN	Guinea	7	2018	2018
KE	Kenya	6	2014	2014
LB	Lebanon	7	2019	2020
ML	Mali	7	2018	2018
MW	Malawi	7	2015	2016
MZ	Mozambique	6	2011	2011
NG	Nigeria	7	2018	2018
NI	Nicaragua	6	2012	2012
NM	Namibia	6	2013	2013
RW	Rwanda	7	2019	2020
SL	Sierra Leone	7	2019	2019
SN	Senegal	7	2019	2019
TD	Chad	6	2014	2015
TG	Togo	6	2013	2014
TZ	Tanzania, United Republic of	7	2015	2016
UG	Uganda	7	2016	2016
ZA	South Africa	7	2016	2016
ZM	Zambia	6	2013	2014
ZW	Zimbabwe	7	2015	2015

Table A2a: Variable definitions - DHS

Variable	Definition
Postpartum Abstinence	The maximum duration of postpartum abstinence in months, excluding the most recent birth if the woman is still abstaining
Postpartum Abstinence (Alternative Definition)	The average duration of postpartum abstinence in months, excluding the most recent birth if the woman is still abstaining
Age Group	Categorical variable for seven women's age groups
Year of Birth Group	Categorical variable for two year-of-birth groups
Twins	Binary variable for twin birth
Place of Residence	Binary variable for rural vs urban residence
Year of Interview	Year of interview
Education	Number of years of schooling
Religion	Categorical variable for main religious affiliations
Intermarriage	Binary variable for interethnic marriage
Total Births	Total number of chidren ever born to a woman
Completed Fertility	Total number of chidren ever born to a woman over age 45
Children Died	Total number of chidren of a woman who have died
Living Children	Total number of living chidren
Desired Fertility	Ideal number of children
Excess Fertility	Number of living children minus ideal number of children
Spacing Below 24 Months	Binary variable for birth intervals below 24 months
Spacing Above 36 Months	Binary variable for birth intervals above 36 months
Polygyny	Binary variable for belonging to a polygynous household
Final Say	Categorical variable for the degree of autonomy in a woman's decisions on her own health care, large household purchases, visits to family or relatives, and what to do with her husband's earnings
Beating Justified	Share of positive answers to questions asking whether wife's beating is justified when she goes out without telling him, neglects the children, argues with him, refuses to have sex, and burns the food
Know Any Method	Binary variable for a woman knowing any contraceptive method
Know Traditional Method	Binary variable for a woman knowing only a folkloric or traditional contraceptive method
Know Modern Method	Binary variable for a woman knowing a modern contraceptive method

Table A2a (continues): Variable definitions - DHS

Variable	Definition
Ever Used Any Method	Binary variable for a woman having ever used any contraceptive method
Currently Using Any Method	Binary variable for a woman currently using any contraceptive method
Currently Using Modern Method	Binary variable for a woman currently using any contraceptive method
Currently Abstaining and Using Any Method	Binary variable for a woman currently abstaining and using any contraceptive method
Currently Abstaining and Using Modern Method	Binary variable for a woman currently abstaining and using a modern contraceptive method
Currently Abstaining/ Amenorrheic	Binary variable for a woman currently abstaining and being amenorrheic
Year of Birth	Year of a child's birth
Sex	Binary variable for a child's sex
Birth Order	Order of a child's birth
Child Alive	Binary variable for a child being currently alive
Stunting	Binary variable for a child's height-for-age being two deviations below median
Severe Stunting	Binary variable for a child's height-for-age being three deviations below median
Premature Birth	Binary variable for a pregnancy lasting less than nine months
Birth Weight	A child's weight at birth in grams
Early Neonatal Death	Binary variable for a child's death within seven day of birth
Neonatal Death	Binary variable for a child's death below age one month
Infant Death	Binary variable for a child's death at age below or equal one year
Caesarean Delivery	Binary variable for a delivery by caesarean section
Longitude	Geographic coordinate in X-values
Latitude	Geographic coordinate in Y-values
Coast Distance	Distance from coast in kilometers

Table A2b: Variable definitions - Other sources

Variable	Definition	Source
Postpartum Sex Taboos	Categorical variable for duration in months of postpartum sex taboos	Murdock (1967b)
Kinship Tightness	Average of three binary variables for post-marital coresidence, nature of descent, and presence of localized clans	Murdock (1967b)
Jurisditional Hierarchy	Binary variable for at least one level of jurisdictional hierarchy beyond the local community	Murdock (1967b)
Milking	Binary variable for milking domestic animals	Murdock (1967b)
Animal Husbandry	A categorical varable for the dependence on animal husbandry as a percentage of subsistence activities	Murdock (1967b)
Rituals	A binary varable for the presence of an otiose high god	Murdock (1967b)
Abstinence Concept	The logarithm of 0.01 plus the share of the concept-specific motifs out of all motifs in a group's oral tradition	Michalopoulos and Xue (2021)
Chastity Motif	Binary variable for the occurrence of the motif in a group's oral tradition	Michalopoulos and Xue (2021)
Tuber Suitability	The minimum of the median land suitability (in logarithmic form) for yam, cassava, and sweet potato	FAO GAEZ
Water Distance	Distance from water basin in kilometers	Natural Earth
City Distance	Distance from city in kilometers	Natural Earth
Temperature	Average yearly temperature in degrees Celsius	Woldclim
Ruggedness	Maximal elevational difference among neighbouring grid points	Woldclim
Elevation	Elevation above sea level in meters	Woldclim
Precipitation	Average yearly rainfall in millimeters.	Woldclim
Colonial Mission	Distance from colonial mission	Nunn (2010)
Colonial Railway	Distance from colonial railway	Nunn and Wantchekon (2011)
Colonial Explorer	Distance from colonial explorer route	Nunn and Wantchekon (2011)

Table A3a: Descriptive statistics:
Women's sample

	Obs.	Mean	SD	Min	Max
Postpartum Abstinence	184788	5.449	5.353	0.000	71.000
Postpartum Abstinence (Alternative Definition)	184788	5.165	5.148	0.000	71.000
Age Group	321877	3.974	1.733	1.000	7.000
Year of Birth Group	321877	1.824	0.381	1.000	2.000
Twins	300909	0.059	0.236	0.000	1.000
Relation to Head	321875	2.477	2.099	1.000	99.000
Sex of Head	321877	1.227	0.419	1.000	2.000
Place of Residence	321877	1.656	0.475	1.000	2.000
Year of Interview	321877	2015.058	3.702	1994.000	2020.000
Education	321809	4.429	4.571	0.000	25.000
Religion	298467	7.880	3.792	2.000	16.000
Intermarriage	63286	0.229	0.420	0.000	1.000
Total Births	321877	3.779	2.601	0.000	18.000
Completed Fertility	32373	6.147	2.891	0.000	18.000
Desired Fertility	284569	5.549	2.756	0.000	30.000
Excess Fertility	284569	2.271	2.965	-12.000	30.000
Children Died	321877	0.463	0.938	0.000	13.000
Living Children	321877	3.316	2.229	0.000	15.000
Desired Fertility	284569	5.549	2.756	0.000	30.000
Excess Fertility	284569	2.271	2.965	-12.000	30.000
Spacing Below 24 Months	254145	0.109	0.311	0.000	1.000
Spacing Above 36 Months	254145	0.430	0.495	0.000	1.000
Polygyny	264195	0.256	0.436	0.000	1.000
Paid Employment	214926	0.730	0.444	0.000	1.000
Final Say	57195	1.903	0.323	1.000	3.000
Beating Justified	298014	0.280	0.363	0.000	1.000
Know Any Method	321877	0.939	0.240	0.000	1.000
Know Traditional Method	321877	0.007	0.080	0.000	1.000
Know Modern Method	321877	0.932	0.251	0.000	1.000
Ever Used Any Method	307035	0.456	0.498	0.000	1.000
Currently Using Any Method	321877	0.269	0.444	0.000	1.000
Currently Using Traditional Method	321877	0.030	0.171	0.000	1.000
Currently Using Modern Method	321877	0.239	0.426	0.000	1.000
Currently Abstaining and Using Any Method	39697	0.096	0.294	0.000	1.000
Currently Abstaining and Using Modern Method	39122	0.083	0.275	0.000	1.000
Currently Abstaining and Amenorrheic	39697	0.694	0.461	0.000	1.000
Tuber Suitability	314107	5.876	4.660	-4.605	8.959
Longitude	314107	15.293	17.254	-17.475	46.792
Latitude	314107	1.458	10.867	-34.266	21.689
Coast Distance	314107	4.664	3.601	0.000	15.759
Water Distance	314107	0.588	0.698	0.000	7.371
City Distance	314107	0.331	0.301	0.000	2.463

Table A3a (continues): Descriptive statistics:
Women's sample

	Obs.	Mean	SD	Min	Max
Temperature	314107	24.257	3.459	9.900	30.541
Ruggedness	314107	86.580	107.874	0.000	1393.032
Elevation	314107	658.228	587.541	-21.222	3223.733
Precipitation	314107	1171.333	638.297	5.598	4526.000
Colonial Mission	314107	1.134	1.518	0.001	11.937
Colonial Railway	314107	3.059	2.584	0.000	13.231
Colonial Explorer	314107	1.441	1.607	0.000	8.541
Postpartum Sex Taboos	111617	4.554	1.361	1.000	6.000
Kinship Tightness	321877	0.836	0.161	0.000	1.000
Jurisditional Hierarchy	295751	0.814	0.389	0.000	1.000
Milking	299206	1.549	0.498	1.000	2.000
Husbandry	311275	2.374	1.862	0.000	9.000
Otiose High God	202015	0.578	0.494	0.000	1.000
Abstinence Concept	306258	-4.523	0.268	-4.605	-3.316
Chastity Motif	306258	0.012	0.109	0.000	1.000

Table A3b: Descriptive statistics:
Births' sample

	Obs.	Mean	SD	Min	Max
Postpartum Abstinence	260770	4.789	4.942	0.000	71.000
Preceding Postpartum Abstinence	76481	3.963	4.106	0.000	60.000
Year of Birth	1079029	2003.981	8.276	1958.000	2020.000
Sex	1079029	1.493	0.500	1.000	2.000
Twins	1079029	0.034	0.181	0.000	1.000
Birth Order	1079029	3.171	2.130	1.000	18.000
Child Alive	1079029	0.871	0.336	0.000	1.000
Stunting	141977	0.301	0.459	0.000	1.000
Severe Stunting	141977	0.112	0.315	0.000	1.000
Premature Birth	156023	0.047	0.212	0.000	1.000
Birth Weight	145688	3211.922	705.996	500.000	8500.000
Early Neonatal Death	139436	0.222	0.415	0.000	1.000
Neonatal Death	139683	0.263	0.441	0.000	1.000
Infant Death	139683	0.593	0.491	0.000	1.000
Caesarean Delivery	268914	0.044	0.206	0.000	1.000

Table A4: Correlates of the duration of postpartum abstinence - Variants

	Postpartum Abstinence					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A						
PP Sex Taboos	0.060*	0.055***	0.049***	0.051***	0.067***	0.078***
	(0.031)	(0.020)	(0.018)	(0.018)	(0.023)	(0.028)
Adj. R^2	0.356	0.365	0.366	0.370	0.372	0.382
Observations	63622	63279	63279	63277	63195	56458
Clusters	261	261	261	261	257	225
Panel B						
Tuber Suitability	0.021***	0.014***	0.019***	0.019***	0.016***	0.016***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Adj. R^2	0.303	0.311	0.313	0.317	0.324	0.332
Observations	178462	178462	178462	178460	168356	154237
Clusters	1166	1166	1166	1166	1079	981
Panel C						
Abstinence Concept	0.257***	0.163***	0.160***	0.164***	0.108**	0.089*
	(0.074)	(0.054)	(0.054)	(0.055)	(0.050)	(0.049)
Adj. R^2	0.304	0.313	0.314	0.317	0.324	0.332
Observations	175796	174641	174641	174641	165482	151372
Clusters	1130	1130	1130	1130	1058	960
Panel D						
Chastity Motif	0.588***	0.474***	0.555***	0.587***	0.457***	0.453***
	(0.088)	(0.090)	(0.093)	(0.084)	(0.085)	(0.091)
Adj. R^2	0.304	0.313	0.315	0.319	0.325	0.333
Observations	175796	174641	174641	174641	165482	151372
Clusters	1130	1130	1130	1130	1058	960

Note: OLS estimates. The unit of observation is the woman. Postpartum abstinence captures the duration of postpartum abstinence for a woman in months and is entered in logarithmics (after adding 0.01 to each value). Postpartum sex taboos is a categorical variable capturing the duration of ancestral postpartum sex taboos. Tuber suitability is the minimum of the logarithm of (0.01 plus) median land suitability for yam, cassava, and sweet potato. Abstinence concept is the share of the concept-specific motifs out of all motifs and is entered in logarithmics (after adding 0.01 to each value). Chastity motif is a binary for the occurrence of the motif. Models 1 include country fixed effects. Models 2 add geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast). Models 3 add historical controls (distance from explorer routes, colonial railways, and colonial mission). Models 4 add year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Models 5 add other ethnicity level controls (kinship tightness, jurisdictional hierarchy, animal milking, and animal husbandry). Models 6 add other individual level controls (years of education, urban vs rural residence, and religion). Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

Table A5: Correlates of the duration of postpartum abstinence (alternative definition)

	Postpartum Abstinence (Alternative Definition)			
	(1)	(2)	(3)	(4)
Postpartum Sex Taboos	0.054***			
	(0.018)			
Tuber Suitability		0.019***		
		(0.005)		
Abstinence Concept			0.157***	
			(0.054)	
Chastity Motif				0.581***
				(0.085)
Adj. R^2	0.384	0.328	0.328	0.329
Observations	63277	178460	174641	174641
Clusters	261	1166	1130	1130

Note: OLS estimates. The unit of observation is the woman. Postpartum abstinence captures the average duration of postpartum abstinence for a woman in months and is entered in logarithmics (after adding 0.01 to each value). Postpartum sex taboos is a categorical variable capturing duration of ancestral postpartum sex taboos. Tuber suitability is the minimum of the logarithm of (0.01 plus) median land suitability for yam, cassava, and sweet potato. Abstinence concept is the share of the concept-specific motifs out of all motifs and is entered in logarithmics (after adding 0.01 to each value). Chastity motif is a binary for the occurrence of the motif. All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

Table A6: Correlates of the duration of postpartum abstinence - By cohort

	Postpartum Abstinence	
	(1)	(2)
	Old	Young
Panel A		
Postpartum Sex Taboos	0.109***	0.047**
	(0.022)	(0.018)
Adj. R^2	0.362	0.371
Observations	3861	59415
Clusters	200	258
Panel B		
Tuber Suitability	0.029***	0.018***
	(0.007)	(0.005)
Adj. R^2	0.323	0.316
Observations	12523	165937
Clusters	920	1155
Panel C		
Abstinence Concept	0.330***	0.155***
	(0.069)	(0.054)
Adj. R^2	0.323	0.316
Observations	12246	162395
Clusters	892	1119
Panel D		
Chastity Motif	0.779***	0.576***
	(0.107)	(0.085)
Adj. R^2	0.323	0.318
Observations	12246	162395
Clusters	892	1119

Note: OLS estimates. The unit of observation is the woman. Postpartum abstinence captures the duration of postpartum abstinence for a woman in months and is entered in logarithmics (after adding 0.01 to each value). Postpartum sex taboos is a categorical variable capturing duration of ancestral postpartum sex taboos. Tuber suitability is the minimum of the logarithm of (0.01 plus) median land suitability for yam, cassava, and sweet potato. Abstinence concept is the share of the concept-specific motifs out of all motifs and is entered in logarithmics (after adding 0.01 to each value). Chastity motif is a binary for the occurrence of the motif. All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

Table A7: Correlates of the duration of postpartum abstinence - Intermarriages

	Postpartum Abstinence			
	(1)	(2)	(3)	(4)
Postpartum Sex Taboos	0.072***			
	(0.022)			
Tuber Suitability		0.018***		
		(0.007)		
Abstinence Concept			0.105	
			(0.074)	
Chastity Motif				0.568***
				(0.136)
Adj. R^2	0.172	0.161	0.164	0.165
Observations	3616	9318	8612	8612
Clusters	152	701	683	683

Note: OLS estimates. The unit of observation is the woman. Postpartum abstinence captures the duration of postpartum abstinence for a woman in months and is entered in logarithmics (after adding 0.01 to each value). Postpartum sex taboos is a categorical variable capturing the duration of ancestral postpartum sex taboos. Tuber suitability is the minimum of the logarithm of (0.01 plus) median land suitability for yam, cassava, and sweet potato. Abstinence concept is the share of the concept-specific motifs out of all motifs and is entered in logarithmics (after adding 0.01 to each value). Chastity motif is a binary for the occurrence of the motif. All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

Table A8: Use of other contraceptive methods

	(1)	(2)	(3)	(4)
	Ever Used	Currently Using		
	Any Method	Any Method	Tradit. Method	Modern Method
Panel A:				
PP Sex Taboos	-0.006	-0.012	-0.002	-0.010
	(0.012)	(0.010)	(0.002)	(0.009)
Adj. R^2	0.239	0.176	0.019	0.170
Observations	101588	103823	103823	103823
Clusters	252	269	269	269
Panel B				
Tuber Suitability	0.002	0.001	-0.000	0.001
	(0.001)	(0.001)	(0.000)	(0.001)
Adj. R^2	0.263	0.176	0.033	0.183
Observations	279408	289209	289209	289209
Clusters	1133	1203	1203	1203
Panel C				
Abstinence Concept	0.001	0.002	0.012	-0.010
	(0.022)	(0.016)	(0.012)	(0.010)
Adj. R^2	0.261	0.175	0.033	0.181
Observations	273434	283211	283211	283211
Clusters	1098	1167	1167	1167
Panel D				
Chastity Motif	-0.027	-0.005	-0.014***	0.009
	(0.025)	(0.019)	(0.005)	(0.016)
Adj. R^2	0.261	0.175	0.033	0.181
Observations	273434	283211	283211	283211
Clusters	1098	1167	1167	1167

Note: OLS estimates. The unit of observation is the woman. The dependent variables are binary variables respectively for having ever used any method and for currently using any method, only folkloric or traditional methods, and modern methods. Postpartum sex taboos is a categorical variable capturing the duration of ancestral postpartum sex taboos. Tuber suitability is the minimum of the logarithm of (0.01 plus) median land suitability for yam, cassava, and sweet potato. Abstinence concept is the share of the concept-specific motifs out of all motifs and is entered in logarithmics (after adding 0.01 to each value). Chastity motif is a binary for the occurrence of the motif. All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

Table A9: Postpartum abstinence and fertility - Reduced forms

	(1) Total Births	(2) Compl. Fert.	(3) Childr. Died	(4) Living Childr.	(5) Excess Fert.	(6) Spacing <24 Mo.	(7) Spacing >36 Mo.
Panel A							
PP Sex Taboos	-0.001	0.007	-0.022	0.001	-0.013	-0.007***	0.011*
	(0.008)	(0.011)	(0.030)	(0.008)	(0.032)	(0.003)	(0.007)
Adj. R^2	0.514	0.194	0.163	0.294	0.185	0.052	0.105
Observations	103823	11540	103823	103823	77237	88047	88047
Clusters	269	258	269	269	261	269	269
Panel B							
Tuber Suitability	0.003***	0.003**	0.017***	0.001	0.000	-0.001***	-0.000
	(0.001)	(0.001)	(0.004)	(0.001)	(0.003)	(0.000)	(0.001)
Adj. R^2	0.520	0.186	0.150	0.300	0.166	0.059	0.102
Observations	289209	30422	289209	289209	220751	244438	244438
Clusters	1203	1138	1203	1203	1166	1203	1203
Panel C							
Abstinence Concept	0.021	0.025	0.163**	0.002	-0.005	0.005	-0.030
	(0.014)	(0.023)	(0.079)	(0.012)	(0.066)	(0.013)	(0.023)
Adj. R^2	0.519	0.185	0.151	0.300	0.167	0.058	0.102
Observations	283211	29837	283211	283211	215803	239344	239344
Clusters	1167	1102	1167	1167	1130	1167	1167
Panel D							
Chastity Motif	0.034	0.012	0.476***	-0.029	-0.088	-0.030***	-0.000
	(0.027)	(0.047)	(0.162)	(0.023)	(0.070)	(0.009)	(0.021)
Adj. R^2	0.519	0.185	0.151	0.300	0.167	0.058	0.101
Observations	283211	29837	283211	283211	215803	239344	239344
Clusters	1167	1102	1167	1167	1130	1167	1167

Note: OLS estimates. The unit of observation is the woman. The dependent variables respectively are the total number of children ever born to a woman, the total number of children ever born to a woman older than 45, the total number of children who have died, the total number of living children, and the excess number of children born to a woman, each entered in logarithmics (after adding 0.01 to each value), and two binary variables respectively for birth intervals below 24 and above 36 months. Postpartum abstinence captures the duration of postpartum abstinence for a woman in months and is entered in logarithmics (after adding 0.01 to each value).Postpartum sex taboos is a categorical variable capturing the duration of ancestral postpartum sex taboos. Tuber suitability is the minimum of the logarithm of (0.01 plus) median land suitability for yam, cassava, and sweet potato. Abstinence concept is the share of the concept-specific motifs out of all motifs and is entered in logarithmics (after adding 0.01 to each value). Chastity motif is a binary for the occurrence of the motif. All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

Table A10: Postpartum abstinence and female empowerment - OLS

	(1) Polygyny	(2) Paid Empl.	(3) Education	(4) Final Say	(5) Beating Justified
PP Abstinence	0.008***	-0.003	0.050*	-0.000	0.001
	(0.002)	(0.003)	(0.026)	(0.001)	(0.013)
Adj. R^2	0.127	0.167	0.390	0.107	0.158
Observations	164576	125597	178412	35301	177745
Clusters	1166	1122	1166	985	1133

Note: OLS estimates. The corresponding 2SLS estimates are in Table 5. The unit of observation is the woman. The dependent variables respectively are a binary for belonging to a polygynous household, a binary for being paid when working, years of education, an autonomy index, and an index for beating one's wife being justified. The main regressor, postpartum abstinence, captures the duration of postpartum abstinence for a woman in months and is entered in logarithmics (after adding 0.01 to each value). All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

Table A11: Postpartum abstinence and knowledge of other contraceptives - OLS

	(1)	(2)	(3)
	Knowledge of		
	Any Method	Traditional Method	Modern Method
PP Abstinence	0.004**	0.0004*	0.003**
	(0.001)	(0.000)	(0.001)
Adj. R^2	0.208	0.021	0.210
Observations	178460	178460	178460
Clusters	1166	1166	1166

Note: OLS estimates. The corresponding 2SLS estimates are in Table 6. The unit of observation is the woman. The dependent variables are binary variables for knowing respectively no method, only folkloric or traditional methods, and modern methods. The main regressor, postpartum abstinence, captures the duration of postpartum abstinence for a woman in months and is entered in logarithmics (after adding 0.01 to each value). All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

Table A12: Postpartum abstinence and use of other contraceptives - OLS

	(1)	(2)	(3)	(4)
	Ever Used	Currently Using		
	Any Method	Any Method	Traditional Method	Modern Method
PP Abstinence	-0.006***	-0.004**	0.000	-0.005***
	(0.002)	(0.002)	(0.001)	(0.002)
Adj. R^2	0.278	0.197	0.040	0.207
Observations	175968	178460	178460	178460
Clusters	1133	1166	1166	1166

Note: OLS estimates. The corresponding 2SLS estimates are in Table 7. The unit of observation is the woman. The dependent variables are binary variables respectively for having ever used any method and for currently using any method, only folkloric or traditional methods, and modern methods. The main regressor, postpartum abstinence, captures the duration of postpartum abstinence for a woman in months, and is entered in logarithmics (after adding 0.01 to each value). All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

Table A13: Postpartum abstinence and double protection - OLS

	(1)	(2)	(3)
	Currently Abstaining and		
	Using Any Method	Using Modern Method	Amenorrheic
PP Abstinence	-0.003	-0.003*	-0.002
	(0.002)	(0.002)	(0.004)
Adj. R^2	0.066	0.074	0.038
Observations	20201	20016	20201
Clusters	1041	1040	1041

Note: OLS estimates. The corresponding 2SLS estimates are in Table 8. The unit of observation is the woman. The dependent variables are binary variables respectively for currently practicing postpartum abstinence, respectively in combination with using any method, using modern methods, and being amenorrheic. The main regressor, Postpartum Abstinence, captures the duration of postpartum abstinence for a woman in months, and is entered in logarithmics (after adding 0.01 to each value). All models include country fixed effects, geographical controls (latitude, longitude, temperature, precipitations, altitude, ruggedness, and distance from city, water, and coast), historical controls (distance from explorer routes, colonial railways, and colonial mission), year of interview, age group, relation to household head, sex of household head, rural vs urban residence, and a binary variable for twin births. Robust standard errors adjusted for clustering at the language level: *** p<0.01, ** p<0.05, * p<0.1.

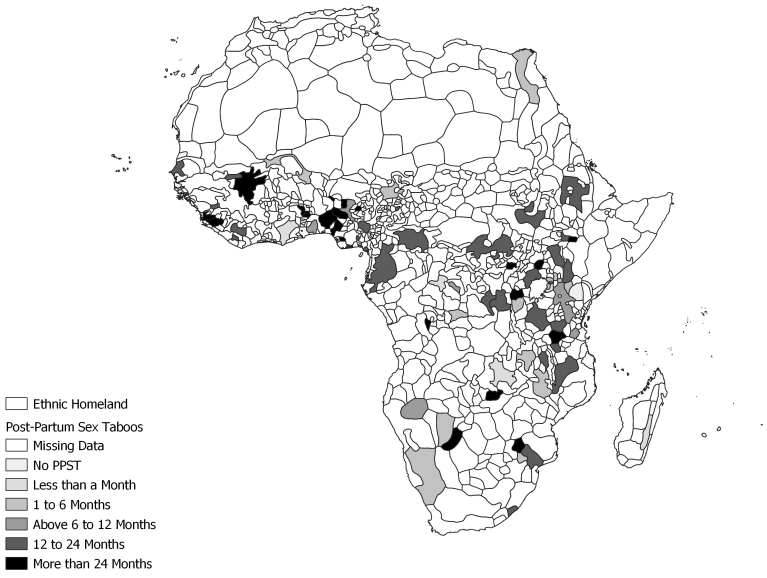


Figure A1: The duration of ancestral postpartum sex taboos by ethnicity

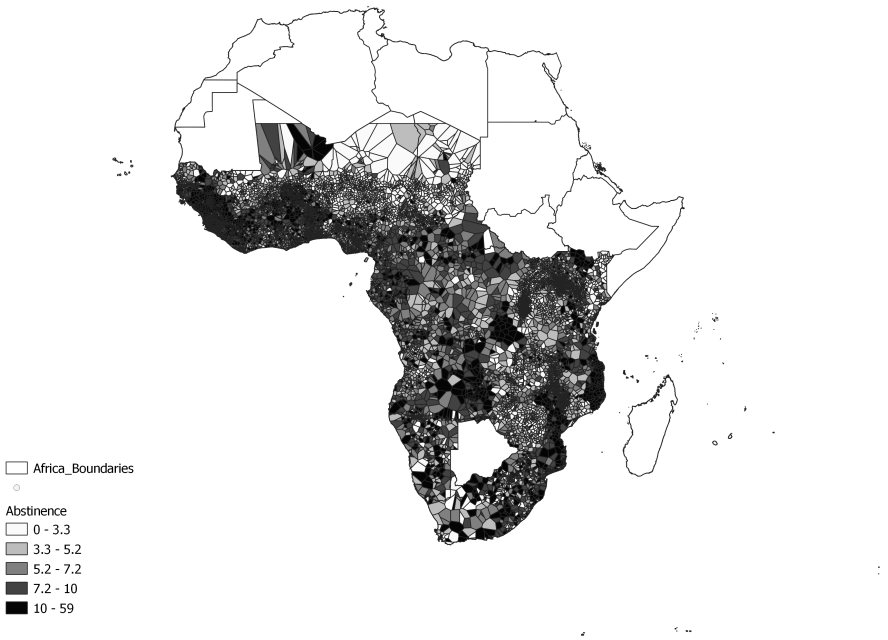
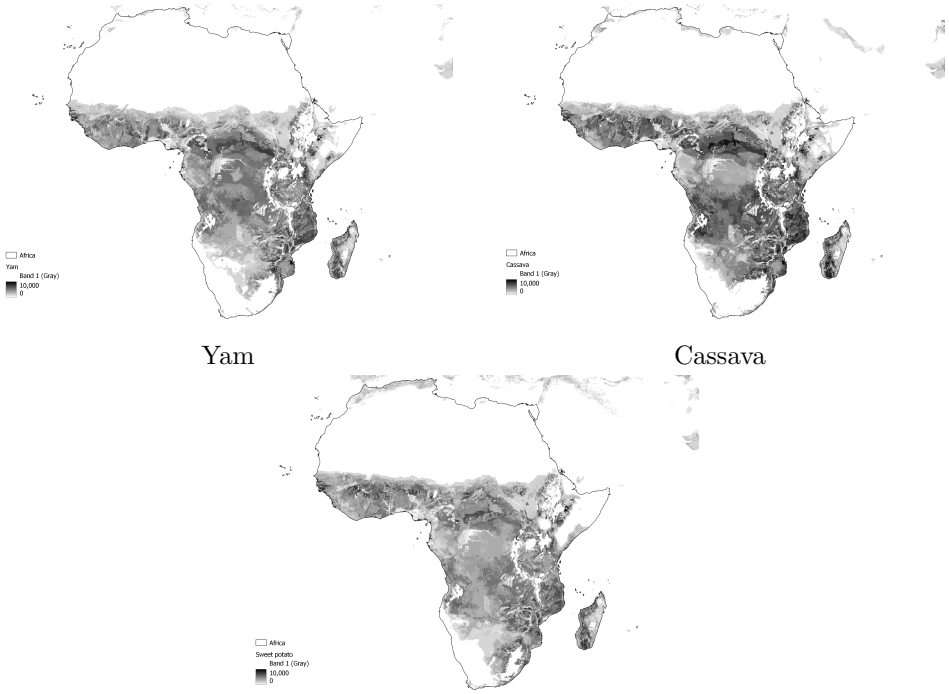


Figure A2: The duration of contemporary postpartum abstinence by DHS cluster



Yam Cassava

Sweet Potato

Figure A3: Land suitability for main tubers