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Belief Systems and Health Behaviors in Guinea-Bissau*

Alexander Coutts, Teresa Molina Millán, and Pedro Vicente

Abstract

Traditional beliefs about the supernatural are widespread in many countries around the world, and are particularly strong in many regions of Sub-Saharan Africa. We discuss the implementation and proposed randomized evaluation of a new type of health campaign which brings together modern and traditional health workers in Guinea-Bissau. In this setting, 63% of our random sample of rural mothers has been to a witchdoctor, and 65% believes that curses have the power to kill. Our campaign innovates in two key ways. First, it aims to shift beliefs and behavior by directly addressing traditional beliefs in an open and respectful way. And second, by including witchdoctors in the campaign, it boosts trust in modern health practices among those with more traditional beliefs.

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1 Introduction

Sub-Saharan Africa (SSA) remains a region where maternal and newborn diseases remain the primary causes of preventable deaths (World Bank, 2013). While resources are scarce, in recent years researchers have collected puzzling evidence about the surprisingly low adoption of preventive health care produces and services in developing countries (Banerjee and Duflo, 2012; Kremer et al., 2019). This result is surprising because in many cases the benefits of purchasing or using preventative measures (e.g. health insurance, immunizations, bed-nets to protect against malaria, de-worming drugs, chlorine to purify water) in some cases outweigh the costs by orders of magnitude. For example, Bleakley (2010) finds that being exposed to malaria during childhood can reduce *lifetime* income by 50%, a figure which dwarfs the costs of sleeping under insecticide treated bed-nets to prevent malaria-causing mosquito bites (Cohen and Dupas, 2010). Despite this, Dupas and Miguel (2017) show that numerous studies have found very steeply decreasing demand for a variety of health products across different contexts.

While income and credit constraints clearly play an important role in explaining part of the puzzle, as (Kremer et al., 2019) note, similar price sensitivity is not found in other contexts such as acute care, which is difficult to rationalize with an argument of households being credit-constrained. Instead two prominent mechanisms have been proposed, which are summarized in both Banerjee and Duflo (2012) and Kremer et al. (2019). The first is that individuals may be time-inconsistent, and disproportionately discount the future benefits of investing in preventative health measures. The second is that individuals may have incorrect beliefs. Such biased beliefs may arise because of a lack of education or information. Yet, if the cause is simply incorrect beliefs, then public health campaigns which provide information should be sufficient to correct beliefs, and subsequently behaviors. However, the evidence on the effectiveness of information campaigns is mixed, as Dupas and Miguel (2017) discuss in detail. Instead, the evidence suggests that there may be an important role played by what Kremer et al. (2019) refer to as incorrect mental models - individuals interpreting "what they see through the wrong causal model or theory" (p. 385).[1]

[1]Health sciences and anthropology research in Africa has also focused on the lack of knowledge/different belief systems as a key impediment to investments in preventive health and optimal health behaviors. Through a mixture of qualitative and quantitative methods, this research has identified traditional beliefs specifically as an important barrier (Maslove et al., 2009; Van Dyk, 2001; Arts et al., 2011). One of the few studies in economics examining the role of traditional beliefs in explaining health behaviors is the paper

Our contribution in this paper is to study the role of "mental models" in the context of traditional beliefs about health in Guinea-Bissau. Guinea-Bissau is a small West-African country, with a with a GDP per capita of 778 USD (current prices, World Bank, 2018), making it among the poorest in Sub-Saharan Africa. It has a relatively high rate of both maternal and under-five child mortality (549 and 9,300 respectively, per 100,000) UNICEF (2015), while 28% suffer from chronic malnutrition (UNICEF, 2014). At the same time Guinea-Bissau has a moderate to high rate of traditional health beliefs. Pew Research Center (2010) find that 39% of a representative sample of individuals hold "high levels" of traditional beliefs, indicating among others, beliefs in reincarnation, witchcraft, and evil spirits; Guinea-Bissau ranks 6 out of 19 Sub-Saharan African countries.[2] As Oosterbaan and da Costa (1995) discusses, cultural beliefs and practices are intricately tied to health behaviors in Guinea-Bissau. In line with this, Pew Research Center (2010) also finds that 56% of those surveyed in Guinea-Bissau report having visited a traditional healer.

To understand the interaction between traditional beliefs and health behavior, and whether such beliefs impede individuals from adopting modern health practices, we propose a randomized impact evaluation of an innovative program which is aimed at reaching and changing health behaviors of individuals with traditional beliefs. We examine an intervention in the form of a new type of health campaign which combines the forces of both modern and traditional health workers, which will be conducted in rural villages in Guinea-Bissau.

In order to study mental models we collect a broad set of subjective expectations data in both surveys, see Delavande et al. (2011). Our focus is primarily on maternal and infant health, and as such our survey involves mothers who have children under five and/or who are currently pregnant. We have a rich set of data, which involves questions on behaviors, beliefs, and traditional practices. These include questions on strength of beliefs in spirits, the ability to cast spells, as well as beliefs in the powers of witchdoctors and traditional healers. An important set of questions contain sets of scenarios involving 10 hypothetical deaths, in which respondents asked to allocate between natural and supernatural causes.

Ashraf et al. (2017). These authors examine the relationship between beliefs and maternal mortality in Zambia, and find that traditional beliefs may inhibit the learning process.

[2]From Pew Research Center (2010): "Questions measure belief in reincarnation, witchcraft, evil spirits, the protective power of sacrifices to spirits or ancestors, juju or shrines, 'evil eye' or curses, and the protective power of spiritual people as well as possession of traditional African sacred objects, participation in traditional ceremonies to honor ancestors, participation in traditional puberty rituals and use of religious healers. Those reporting 6-11 of these attributes are classified as having high levels of traditional African religious beliefs and practices."

This provides us with a measure of intensity of beliefs about the underlying causes of death. We also ask our respondents their perception of the effectiveness of care of both modern health centers and traditional healers. These questions are also asked in the context of how many (out of 10) deaths could have been prevented if the hypothetical individuals had gone to different health facilities.

A large component of our survey is based on health behaviors, both actual behaviors in the past, and anticipated behaviors in the future. For example we ask detailed accounts of behaviors regarding the health of children under 5, as well as regarding maternal health. Beyond this, we ask our respondents their expected behavior for a number of health scenarios which focus on specific symptoms, both for child illnesses as well as for maternal health issues. In all of these questions we collected detailed information about how the respondents perceive the symptoms/illnesses, in terms of the causes of illness. We also ask detailed information about their planned and actual actions in response to bouts of illness or our hypothetical symptom questions.

Our preliminary results are as follows. After early-termination of the baseline survey (COVID19), we have data on 1,303 mothers across 156 villages.[3] Our results suggest that beliefs in witchcraft are widespread and are highly interwoven with beliefs and decisions about health. First, 65% of our respondents strongly believe that people can die because of witchcraft or other spiritual causes. A further 17% believe it may be true, but are not sure. On the other hand, 50% of individuals strongly believe in the supernatural curing power of witch doctors, with a further 24% believing they may have the power to cure.

Regarding behavior, 63% of individuals report having ever been to a witch doctor, with 30% having been in the last 30 days. Unsurprisingly, this behavior is significantly correlated with beliefs.

Overall, while our results are preliminary, they speak to an extremely strong role for traditional beliefs to play in health decisions. In our setting, not only do the majority of mothers believe strongly in witchcraft, but these beliefs are highly correlated with both past and future (stated) health decisions. For example, mothers with strong beliefs in witchcraft, believe that witch doctors are more effective at curing children, and are more likely to state a preference to give birth in the village, rather than at a health center.

[3]Our plan was to have a minimum of 1,600 respondents across 160 villages (10 per village). Households were randomly selected from administrative lists, and in some cases were unavailable on the day selected for the visit. Additionally, in some cases, due to logistical constraints, enumerators were unable to complete all 10 interviews in the same day. These explanations account for why we are missing approximately 1.6 mothers per village.

This document proceeds as follows. We begin with a more detailed discussion of the context, followed by an analysis of our baseline data and preliminary results. We next discuss the proposed campaign, ending with a short discussion.

2 Data and Baseline Results

2.1 Context

Guinea-Bissau is ethnically diverse and religiously diverse, with approximately 40 different ethnic groups (Ferreira, 2004), and a mixture of Muslim, Christian, and traditional (Animist) religions which are not exclusive to the former two. While over 90% of the country can speak Guinea-Bissau Creole (INE, 2009), most ethnic groups have their own language and traditions. Although distinct, ethnic traditions are intertwined with traditional religious beliefs, involving spirits (*irã/iran*) which are connected with nature as well as ancestors. These traditions show commonalities across different ethnic groups, and can co-exist with other religions such as Islam and Christianity. In Guinea-Bissau traditional beliefs and health are intricately related. Witchdoctors are ubiquitous, and are believed to have special powers which connect them to the spirit world – an ability that ordinary citizens do not have (Favarato, 2019).[4]

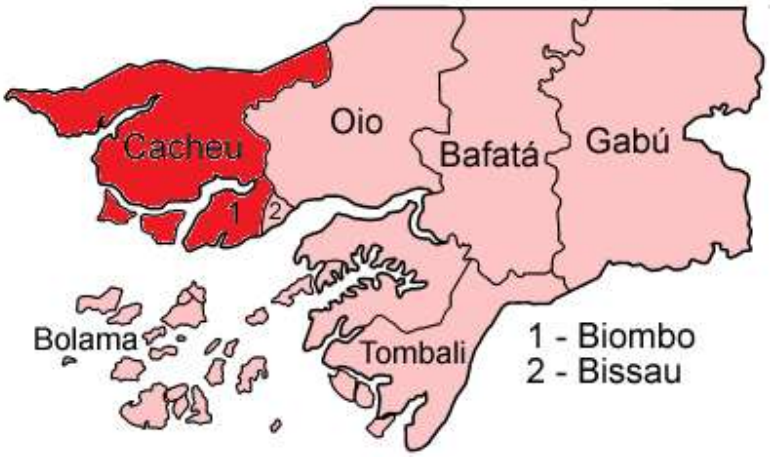
Our project was carried out in the rural regions of Cacheu and Biombo, which rank approximately in the middle of the eight regions of Guinea-Bissau in terms of the Human Development index and are shown in Figure 1.[5] These regions were selected due to the existence of administrative data from our implementing partner, VIDA, an NGO which operates in the country. A total of 160 villages were randomly selected (within administrative sanitary areas), and 10 households per village were further randomly selected from administrative lists.

From October 2019 to March 2020 we simultaneously conducted three baseline surveys using tablets for data collection. The first and main survey is our household survey, which was administered to mothers living in the targeted household who had at least one child under 5, or who are currently pregnant.[6] This main sample is thus representative of young mothers for these regions. This survey involved sections on demographics, general

[4]Witchdoctors are referred to as *Djambakos* or *Mouros*, corresponding to Christian or Muslim customs.
[5]https://globaldatalab.org/shdi/shdi/GNB/?interpolation=0&extrapolation=0&nearest_real=0.
[6]Enumerators were required to first list all mothers meeting the inclusion criteria into a tablet, after which the software randomly selected one of the mothers to interview.

beliefs, maternal care, childhood health, health beliefs, household decision making, and finally consumption and assets. It lasted approximately two hours. We also conducted a witchdoctor survey and a community survey. The community survey was answered by the village leader, and asked questions relating to village infrastructure, beliefs, and village networks. The witchdoctor survey was given to a randomly selected witchdoctor (if one was present in the village), and asked questions relating to demographics, the nature of the witchdoctor's business, and beliefs.

Figure 1: Regions of Guinea-Bissau



Area shaded in red corresponds to project areas.

2.2 Summary Statistics

Here we present a brief overview of the baseline data and preliminary relationships of interest which will also serve to motivate the proposed community health campaign. We briefly introduce the sample, through a set of summary statistics shown in Table 1. The median mother in the sample is 28 years old, has three kids, one of whom is under five. The majority of the sample (58%) identifies as Animist, which is not exclusive of other religions. Poverty is high, with 28% reporting being food insecure in the past 30 days. Finally, the health situation is grave, with 35% of interviewed mothers reporting having lost at least one child from pregnancy until age five.

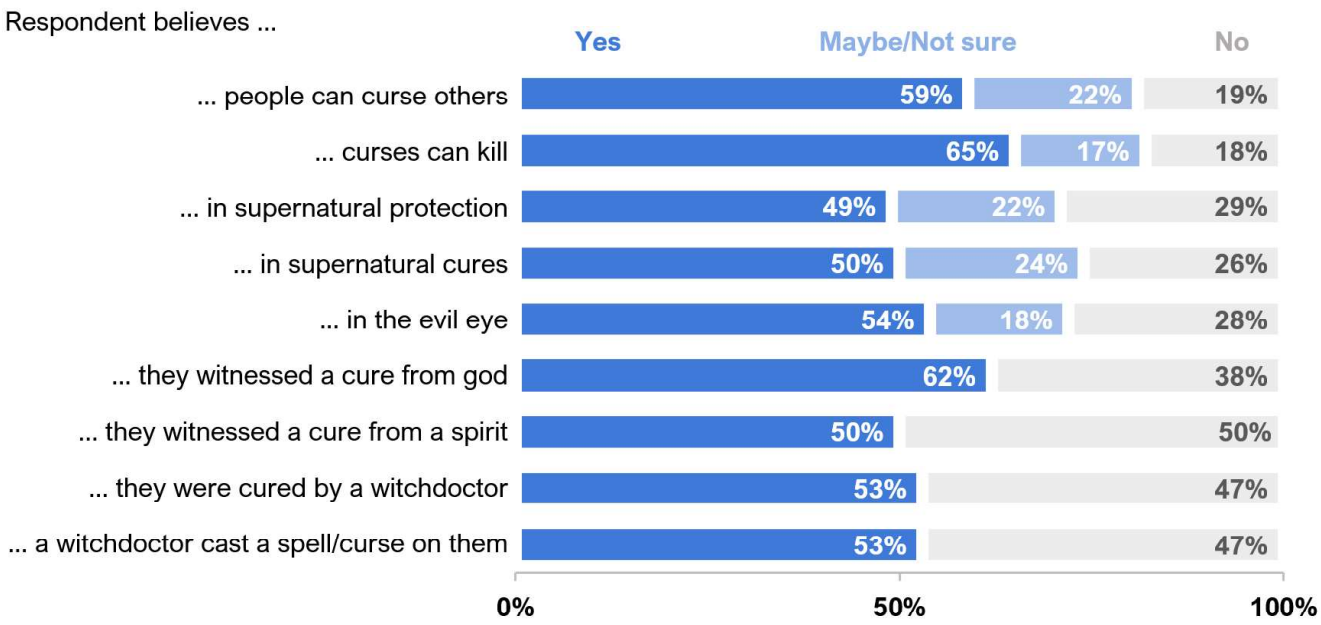
Table 1: Summary Statistics

We next turn to summarize beliefs and knowledge, in Figures 2 and 3.[7] Consistent with our motivation and hypotheses, traditional beliefs are widely held. Starting with Figure 2, one can see results pertaining to various beliefs in the supernatural. Importantly, a large number of responding mothers believe or are uncertain about the power of spells/curses and the supernatural. Relating to health, 74% report they believe to some extent in supernatural cures (with 50% confident and 24% unsure). More specifically on health we overall document that 53% believe that they personally were cured by a witchdoctor, with the same percentage (53%) believing that a witchdoctor has used witchcraft on them.[8]

[7]The number of observations used to calculate the averages in these figures is slightly lower, as these figures were made before the final week of data was added.

[8]Pew Research Center (2010) refers to the evil eye as "the belief that certain people can cast curses or spells that cause harm." They found 39% of respondents in Guinea-Bissau responded yes, likely lower due to a large share of urban respondents.

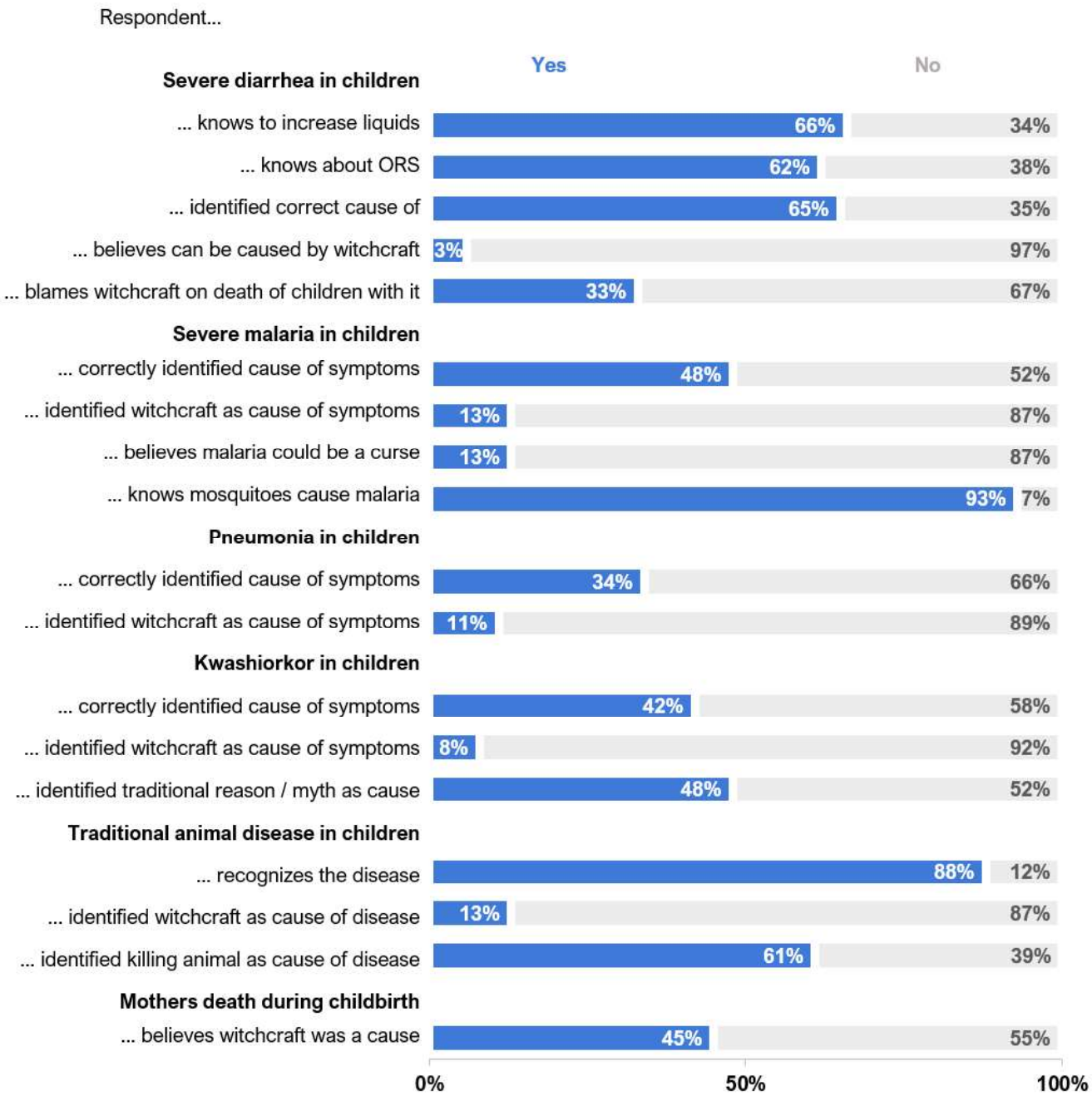
Figure 2: Spiritual Beliefs of Respondents



$N = 1120$. First five questions were asked on a three point scale (yes certainly, maybe/not sure, no) while last four questions were simple yes or no questions.

Figure 3 presents results on health knowledge. These results suggest that health knowledge is far from universal, and that traditional beliefs appear to have an important role. Figure 3 splits knowledge into different illnesses and events, which were given as hypothetical scenarios to mothers about a young child. Regarding diarrhea in children, most mothers know to increase liquids, know about ORS, and were able to identify a potential cause of it. Worryingly, 20% stated it was best to decrease liquids in response to diarrhea (not shown). While only 3% stated diarrhea was caused by witchcraft, when asked to identify a reason for why a child died (after severe chronic diarrhea), 33% stated witchcraft. This highlights one issue, that even when witchcraft is not suspected in mild cases, for extreme events, it may still be blamed.

Figure 3: Health Beliefs and Knowledge of Respondents



$N = 1120$.

Regarding malaria in children, first mothers were presented with symptoms of severe malaria, without reference to the disease itself. Of all mothers, 48% were able to correctly identify presented symptoms as being malaria. However, 13% identified witchcraft as the cause of symptoms. Next, mothers were asked questions about malaria directly by name. Thirteen percent stated malaria could be caused by a curse. Reassuringly, 93% knew that malaria was caused by mosquitoes. This pattern of responses suggests that identifying malaria is a key difficulty faced by mothers, but knowledge about malaria (once it is discovered to be malaria) is high. However, it is concerning that 13% of mothers believed that while mosquitoes caused malaria, the underlying cause may still have been witchcraft.

Turning to Pneumonia and Kwashiorkor (caused by severe protein deficiency), knowledge is relatively low, with 34% and 42% identifying correct causes respectively.[9] A minority of mothers suspect witchcraft in both cases (11% and 8% respectively). Most alarming is that 48% identified a traditional reason or a myth, most commonly "eating sand", but additionally identifying it as a traditional "animal disease". These diseases have names such as "disease of the cat" or "disease of the monkey". The symptoms are related to those of childhood malnutrition. The diseases are thought to be caused by the animal in question, for example, the mother killing a cat, or stepping on a cat. The vast majority of mothers recognized these traditional animal diseases. A minority, 13%, identified witchcraft as the cause, while most (61%) identified the killing of an animal as the cause. Concluding the analysis of these responses, there are clear difficulties with health information, but also misinformation. Most worryingly, malnutrition is confounded with traditional diseases.

While most of these questions pertain to children, we also asked about a situation where a mother died during childbirth, and what could be the cause. A substantial number, 45%, of mothers stated witchcraft as a potential cause.[10]

Taken altogether these responses present a stark picture of health knowledge, and hint at a strong role for traditional beliefs in the supernatural. The pattern of responses also highlights key areas we will target for our intervention. First, the largest problem appears to be misinformation about severe malnutrition. This problem appears to stem from (1) low ability to identify symptoms of severe malnutrition, and (2) mis-identifying symptoms of malnutrition as relating to traditional diseases. Second, many mothers appear to be

[9]Regarding kwashiorkor, correct responses are given for any answer which involves related causes such as contaminated food or water, or intestinal worms. Less than 5% identified malnutrition directly as the cause.

[10]It is also important to note that these answers were not prompted, in other words, the mothers were asked to state causes and our enumerators checked off any that were on the list (adding others as needed).

lacking knowledge about identifying symptoms of potentially serious illnesses and their causes.

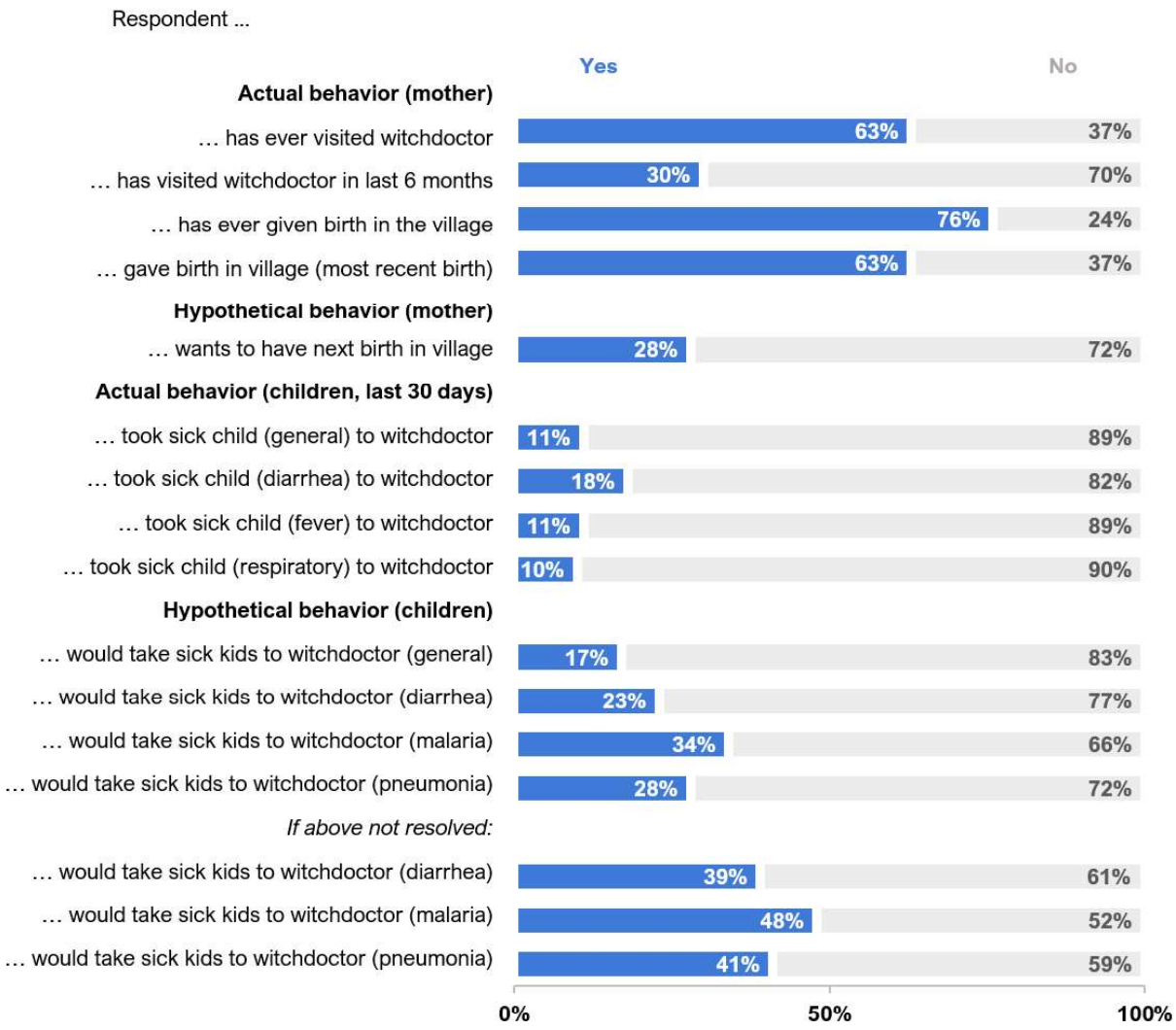
Regarding the problem of misinformation about malnutrition, we also asked mothers if their children under five had swollen abdomens (a sign of moderate to severe malnutrition). Six percent of mothers stated that at least one of their children did have a swollen belly. However, we also asked our enumerators to check the children for distended abdomens. They identified this was true in 23% of children, or approximately four times as often as mothers did. Overall, this suggests that even when symptoms of malnutrition are in plain sight, mothers may be unaware.

We next turn to health behaviors, both actual and hypothetical/intended. Figure 4 shows overall data on health behaviors. Regarding mothers in the sample, 63% have been to a witchdoctor before, with 30% having visited a witchdoctor in the previous six months. Regarding childbirth, the vast majority of mothers have given birth in the village (this is in their own home or a family member's home 99% of the time). Examining the most recent birth, 63% of mothers gave birth in the village. The remainder gave birth in a health center, hospital, or private clinic. Interestingly, when asked where the mother would want to give birth next time, 28% stated in the village. While this is lower, it is still substantial, and suggests that there is still a preference for giving birth at home for many mothers.

Turning to mothers' decisions regarding the health of their young children, we examine the subsample of instances of sick children who reported at least one child sick in the past 30 days. Overall, mothers reported that they had visited a witchdoctor for 11% of the instances of sick children. Examining the cases by type of symptom, this is significantly higher for diarrhea than for other cases, as 18% of sick children with diarrhea were taken to the witchdoctor. Respiratory symptoms and fever resulted in 10% and 11% visiting the witchdoctor, respectively.[11] It is also important to note that 65% of mothers did take their children to a health center or hospital.

[11] It is worth noting that the majority of reported symptoms were fever, representing 87% of 397 cases of illness.

Figure 4: Health Behaviors of Respondents



$N = 1120$, excluding Actual behavior (children, last 30 days), where $N = 397$, and varies from $N = 93$ to 346 for particular illnesses.

Mothers were also asked a set of hypothetical questions. First, they were asked a general question of where they would take their children when sick. Seventeen percent stated they would take them to a witchdoctor. Next, they were also asked a set of scenarios referenced

earlier, regarding severe diarrhea, severe malaria, and pneumonia. In these scenarios, mothers were asked to imagine they had a young child with a set of specific symptoms, and then asked to describe how they would treat the child. Between 23% and 34% of them stated they would first visit a witchdoctor, with the latter being related to severe malaria.[12] We also asked mothers what they would do if the symptoms did not resolve. The final three rows of Figure 4 present the percentage of mothers who stated they would see a witchdoctor for the given symptoms at some point, either initially or after symptoms did not resolve.

Taking stock of these findings, a number of important features are revealed by these responses. First, the majority of mothers give birth at home in the village. Some of this is could be accounted for by constraints (for example distance), although it remains that 28% of mothers state that they want to have their next birth in the village.

Beyond this, just over one-in-ten sick children have been brought to witchdoctors, a figure which nearly doubles when focusing on the case of children with diarrhea. The hypothetical scenarios also offer two related insights. First, it appears that a sizeable minority of mothers are inclined to treat severe symptoms of malaria by first going to a witchdoctor. This is worrying, as it appears that the pattern is that more severe symptoms may be seen as more treatable by witchdoctors. Second, is that when symptoms don't resolve, even mothers who didn't initially state they would bring their children to see a witchdoctor, end up bringing them. Most dramatically, approximately half of all mothers reported that they would eventually end up bringing their child to a witchdoctor because of severe malaria symptoms. While preliminary, these overall responses point to an important focus of the campaign on maternal health. While not presented in the figures, mothers in our sample have had on average two complications in past pregnancies (54% reporting infection, 45% reporting serious fever, and 18% reporting preeclampsia). It is thus important that mothers deliver in good quality modern health facilities. Next, the hypothetical responses suggest that children with severe symptoms are more likely to be brought to witchdoctors, which are precisely the cases which may require more urgent medical attention. Finally, also coming from hypothetical responses, it appears that when children's symptoms are not resolving, mothers are inclined to take them to witchdoctors – even those which had not initially. Before moving to a deeper analysis, we briefly mention how social norms may

[12]The greater percentage for severe malaria compared with fever is intuitive, as the symptoms of severe malaria given were likely significantly more intense on average than the symptoms of fever most children in our sample had.

interact with decisions of where to take one's children when sick. We asked mothers about whether they felt pressure to take their children to witchdoctors when they are sick, either from their partner or from their neighbors. Regarding the partner, 13% of mothers feel a lot of pressure, while 39% feel some pressure. Regarding neighbors, 32% feel a lot of pressure, with a further 38% feeling some pressure. Thus, it appears that there may be strong social pressure to see a witchdoctor, particularly from neighbors.

2.3 Preliminary Analysis

The previous section presented significant evidence of strong traditional beliefs and related health behaviors. In particular, a substantial proportion of mothers believe in spiritual powers to curse or heal, and nearly one-third have seen a witchdoctor in the past 30 days. One in six mothers also expressed a general willingness to take their kids to the witchdoctor when ill, which increased to one in two for specific scenarios. Yet there are two key questions. The first is whether there is a significant positive relationship from beliefs to behavior. In other words, are the mothers with strong traditional beliefs the same ones who are taking their sick children to witchdoctors instead of health centers? The second question is whether this relationship is causal, or could it be driven by other factors. For example, it is plausible that mothers in more isolated rural villages are less likely to have a health center nearby, and hence more likely to go to witchdoctors for their family's health needs. One would also expect more isolated rural villages may have stronger traditional beliefs, which would also lead to a positive association between beliefs and behavior. This second question is critical for our campaign, as it assumes that by shifting beliefs, we can alter mothers' health behaviors.

2.3.1 Correlations of beliefs and behavior

We first set out to examine the first question, taking the responses previous examined in Figure 2 through Figure 4. Belief variables are split into (1) Spiritual beliefs (Figure 2) and (2) Health beliefs (Figure 3), while behavioral variables are split into (a) Mother's decisions, and (b) Decisions about children. The correlational relationships are examined across both belief categories and both behavior categories, and are presented in Tables 9, 10, 11, and 12 in Appendix 6.1. There is overwhelming evidence that beliefs and behavior are strongly positively associated with one another. In fact 82% of all of these relationships

are positive and significant.[13] Given the large set of relationships examined (190 in total), it is not useful to go through every one in detail, but to examine a few informative patterns.

From Table 9, belief in supernatural protection is significantly positively associated with all variables pertaining to mother's behavior, all at the 1% level of significance. Regarding these beliefs, 34% of mothers who do not believe in supernatural protection have ever been to a witchdoctor, while for those that do believe, 79% have been, *over double*. A similar pattern is found regarding mothers who want to give birth in the village: this is true for 15% of mothers who do not believe in supernatural protection, but for 34% of mothers who do believe, again *over double*.[14]

Examining the relationships in Table 10, the belief that curses can kill is also significantly positively associated with all outcomes about taking children to witchdoctors when sick. Specifically, among those who stated they did not believe curses can kill, only 2% took their child to a witchdoctor when their child was sick. However, among those who did believe, 16% of them took their child to a witchdoctor, which is eight times as large. A similar difference is seen for the hypothetical question for illnesses in general, where non-believers stated they would take their kids to a witchdoctor 5% of the time, while for believers this was 22%.

It is also worth noting that one variable in Tables 9 and 10, "witnessed cure from god" is significantly negatively associated with some of the mother's decisions and decisions about taking the child to a witchdoctor. In other words, the type of religious belief appears to be an important determinant of behavior. While not always true, we note that this can be explained by there being an on average negative correlation between the importance of Christianity and Islam, and the importance of traditional religions (e.g. Animism). Consistent with this, "witnessed cure from a spirit" has the opposite relationship with behavior – it is significantly positively related to giving birth in the village, and taking children to a witchdoctor.

Finally examining Tables 11 and 12, we note two strong relationships (among many). First, a mother who blamed witchcraft on the hypothetical mother killed during childbirth, is significantly more likely to have visited a witchdoctor, and to have given birth in the village (or express a preference for giving birth in the village). In the case of expressing

[13]This becomes 93% if we were to omit two variables: "Witnessed cure from god" and "Traditional explanation kwashiorkor". Yet these can also show valuable relationships, as "Witnessed cure from god" is significantly negatively associated with both giving birth in the village and taking children to a witchdoctor.

[14]This, and the following data is not present in the tables, but is calculated by a simple mean comparison by group.

a preference for giving birth in the village, for those who did not blame witchcraft for the deaths, 20% stated they want to give birth in the village. For those that did blame witchcraft, this increases to 36%. The second relationship is that regarding mothers who stated that the symptoms of pneumonia were caused by witchcraft. These beliefs are significantly associated with both actual and hypothetical behaviors for taking children to the witchdoctor. In particular, mothers who cited witchcraft as a cause of the symptoms of pneumonia actually took their sick child to the witchdoctor 49% of the time. For those that did not cite witchcraft, only 5% of them took their sick child to the witchdoctor. This is a very stark difference of nearly *ten times*.

2.4 Associations between beliefs and behavior (OLS)

We next turn to a more rigorous analysis of the relationship between beliefs and behavior. Critically, while the previous analysis already paints a relatively clear picture that beliefs are related in important ways with behavior, it Is important to examine the extent to which these relationships may be moderated by other factors such as education and poverty. As in the previous section, here we focus on a smaller set of selected relationships, to focus the discussion and highlight key patterns. *It is important to note that these relationships are exploratory, and cannot be interpreted as causal.*

Table 2 presents OLS regressions showing the relationship between the mother's belief in supernatural protection, and (1) whether she has ever visited a witchdoctor, and (2) whether she expresses a preference to have her next birth in the village. The odd columns present regression results controlling for all covariates summarized in Table 1, while the even columns include village fixed effects. From this table one can see that even after controlling for many characteristics including a key measure of poverty (food insecurity) and years of education, belief in supernatural protection is significantly associated with having visited a witchdoctor and with preferring to give birth in the village. Remarkably, this relationship continues to hold after controlling for village fixed effects: which average out all of the effects which are common at the village level, including access to health centers, and health center quality. In other words, comparing two individuals in the same village, one who believes in supernatural protection, the other who does not, the one who believes will be 30.4 percentage points more likely to have visited a witchdoctor, and 8.0 percentage points more likely to want to have her next birth in the village.[15] These

[15]Note that belief in supernatural protection is defined with values (1), (2), or (3), see notes in Table 2.

relationships are significant at the 1%, and 10% level respectively.

Table 2: Beliefs and Mother's Own Behavior

	Visited witchdoctor		Wants birth in village	
	(1)	(2)	(3)	(4)
Belief in supernatural protection	0.163***	0.152***	0.045***	0.040**
	(0.020)	(0.023)	(0.017)	(0.019)
Age	0.005	0.004	−0.001	−0.001
	(0.003)	(0.004)	(0.003)	(0.003)
Years of education	0.004	0.001	−0.017***	−0.009**
	(0.004)	(0.005)	(0.004)	(0.005)
Number of children	0.011	0.001	0.010	0.010
	(0.010)	(0.013)	(0.011)	(0.012)
Number of children < 5	−0.014	−0.002	0.015	0.025
	(0.025)	(0.031)	(0.024)	(0.026)
Currently pregnant	0.065*	0.060	0.087**	0.063
	(0.035)	(0.043)	(0.041)	(0.041)
Num. children < 5 currently sick	0.006	−0.004	0.005	0.001
	(0.024)	(0.027)	(0.024)	(0.026)
Identify as Animist	0.221***	0.234***	0.077**	0.035
	(0.033)	(0.037)	(0.030)	(0.033)
Identify as Muslim	0.112***	0.021	0.096	−0.032
	(0.039)	(0.077)	(0.073)	(0.079)
Identify as Christian	−0.081***	−0.088**	−0.071**	−0.098**
	(0.031)	(0.037)	(0.033)	(0.039)
Food insecure in last 30 days	0.071***	0.060**	0.036	0.011
	(0.024)	(0.028)	(0.033)	(0.037)
Has ever lost a child	0.025	0.038	−0.010	−0.021
	(0.027)	(0.031)	(0.028)	(0.029)
Constant	−0.039		0.176*	
	(0.099)		(0.092)	
Village Fixed Effects		✓		✓
R^2	0.26	0.36	0.09	0.28
Observations	1164	1164	1164	1164

Analysis uses OLS regression. Significantly different from 0 at * 0.1; ** 0.05; *** 0.01. Robust standard errors in parentheses clustered at village level. *Belief in supernatural protection* takes discrete values from 1 to 3: (1) believes not true; (2) uncertain if true or not; (3) believes true. *Visited witchdoctor* and *Wants birth in village* are binary variables coded as 0 or 1. Constant omitted when using fixed effects due to collinearity.

Examining the other variables, education does not appear to impact whether a mother has been to a witchdoctor, but having more education does significantly reduce the preference of the mother to give birth in the village. Whether an individual identifies as an Animist is also positively associated to witchdoctor visits and there is some evidence it is also associated with giving birth in the village, as expected.

Table 3 further examines the relationship between the belief that curses can kill and mothers' decisions about the health of their children. The dependent variables in these OLS regressions are whether the mother actually took her sick child to the witchdoctor (Columns 1 and 2), and whether the mother stated she would hypothetically take her sick children to the witchdoctor in general (Columns 3 and 4). Here the belief that curses can kill is significantly related to what mothers actually did, but this result does not persist after including village fixed effects.[16] However, when examining the hypothetical decisions, which give us more data, this belief is positively associated with taking the child to the witchdoctor, at the 1% level, even with village fixed effects. Examining the other variables in Column 4, as in Table 2, Animism is significantly associated with taking children to the witchdoctor, as is poverty. Interestingly, and potentially worrisome, is that mothers who have lost child before are significantly more likely to take their child to the witchdoctor, as measured by both actual and hypothetical behavior.

[16]It should be noted that because of the significantly lower sample size of mothers with sick children at the time of the survey, there is much less variation at the village level, so power to detect impacts is constrained.

Table 3: Beliefs and Mother's Decisions for Children

	Took child witchdoctor		Would take child...	
	(1)	(2)	(3)	(4)
Belief that curses can kill	0.053***	0.043	0.074***	0.073***
	(0.015)	(0.028)	(0.012)	(0.014)
Age	−0.006**	−0.011**	−0.002	−0.002
	(0.003)	(0.005)	(0.002)	(0.002)
Years of education	0.001	0.008	−0.000	−0.000
	(0.005)	(0.008)	(0.004)	(0.004)
Number of children	−0.005	0.008	0.008	0.008
	(0.010)	(0.017)	(0.007)	(0.009)
Number of children < 5	0.076	0.109	−0.000	0.015
	(0.053)	(0.077)	(0.024)	(0.027)
Currently pregnant	−0.048	−0.005	−0.020	0.027
	(0.046)	(0.078)	(0.033)	(0.042)
Num. children < 5 currently sick	−0.045	−0.042	0.002	0.003
	(0.045)	(0.071)	(0.020)	(0.023)
Identify as Animist	0.103***	0.101	0.153***	0.129***
	(0.039)	(0.071)	(0.023)	(0.028)
Identify as Muslim	0.066	0.020	0.121***	0.123**
	(0.082)	(0.155)	(0.041)	(0.056)
Identify as Christian	0.002	−0.060	0.071**	0.063**
	(0.043)	(0.057)	(0.029)	(0.031)
Food insecure in last 30 days	−0.025	−0.055	0.167***	0.164***
	(0.035)	(0.053)	(0.027)	(0.030)
Has ever lost a child	0.086**	0.149***	0.024	0.044*
	(0.034)	(0.053)	(0.023)	(0.026)
Constant	0.030		−0.174**	
	(0.106)		(0.071)	
Village Fixed Effects		✓		✓
R^2	0.10	0.43	0.11	0.26
Observations	336	336	1165	1165

Analysis uses OLS regression. Significantly different from 0 at * 0.1; ** 0.05; *** 0.01. Robust standard errors in parentheses clustered at village level. Belief that curses can kill takes discrete values from 1 to 3: (1) believes not true; (2) uncertain if true or not; (3) believes true. *Took child witchdoctor* and *Would take child... (to witchdoctor)* are binary variables coded as 0 or 1. Constant omitted when using fixed effects due to collinearity.

Table 4 and Table 5 examine the same dependent variables relating to mothers' own behavior, and mothers' decisions for their children, respectively, but with different belief variables: whether the respondent blamed witchcraft for a hypothetical mother's death, and whether the respondent identified witchcraft as a cause of symptoms presented which corresponded to those of pneumonia. In brief, these belief variables are highly significantly related to behaviors, significant at the 1% (and in one case, 5%) level. Respondents who blamed witchcraft on a mother's death are 12.5 percentage points more likely to have visited a witchdoctor, and 7.5 percentage points more likely to want to give birth in the village, both after controlling for individual characteristics and village fixed effects. Those respondents who identified witchcraft as a cause of the symptoms presented of pneumonia, are significantly more likely to have actually taken their sick child to be treated at a witchdoctor, and are also more likely to report they would do the same in the hypothetical question. The result in Table 5 Column 2 is particularly remarkable – even with limited data on mothers with sick children, it suggest that mothers with strong beliefs about witchcraft and illnesses are 33.5 percentage points more likely to have taken their sick child to the witchdoctor, compared with a mother who did not blame witchcraft in the death scenario.

These overall results cautiously suggest that the associations presented in the earlier section are in fact reflective of a more stronger link. Many of these results suggest that differences in behavior might be explained by differences in their beliefs. This is evidence that these associations cannot be explained by simple differences in the proximity of the village to a health center, or differences in quality of a nearby health center, since these are the same for mothers in the same village. The relationship between traditional beliefs and behavior also survives when we control for important characteristics such as age, education, and poverty.

Table 4: Beliefs and Mother's Own Behavior

	Visited witchdoctor		Wants birth in village	
	(1)	(2)	(3)	(4)
Witchcraft blamed for mother death	0.136***	0.125***	0.114***	0.075**
	(0.027)	(0.031)	(0.030)	(0.033)
Age	0.006*	0.005	−0.000	−0.000
	(0.003)	(0.004)	(0.003)	(0.003)
Years of education	0.001	−0.001	−0.017***	−0.010**
	(0.005)	(0.005)	(0.004)	(0.005)
Number of children	0.005	−0.004	0.007	0.008
	(0.011)	(0.013)	(0.011)	(0.012)
Number of children < 5	−0.006	−0.002	0.020	0.028
	(0.025)	(0.031)	(0.024)	(0.027)
Currently pregnant	0.070*	0.067	0.091**	0.066
	(0.036)	(0.045)	(0.040)	(0.041)
Num. children < 5 currently sick	−0.004	−0.014	0.003	−0.001
	(0.024)	(0.027)	(0.024)	(0.026)
Identify as Animist	0.290***	0.298***	0.078***	0.043
	(0.033)	(0.037)	(0.029)	(0.032)
Identify as Muslim	0.134***	0.042	0.109	−0.019
	(0.044)	(0.082)	(0.069)	(0.078)
Identify as Christian	−0.104***	−0.108***	−0.074**	−0.101***
	(0.032)	(0.038)	(0.031)	(0.038)
Food insecure in last 30 days	0.070***	0.060**	0.027	0.008
	(0.026)	(0.029)	(0.032)	(0.037)
Has ever lost a child	0.019	0.035	−0.015	−0.024
	(0.028)	(0.031)	(0.028)	(0.029)
Constant	0.213**		0.204**	
	(0.092)		(0.083)	
Village Fixed Effects		✓		✓
R^2	0.21	0.33	0.10	0.28
Observations	1165	1165	1165	1165

Analysis uses OLS regression. Significantly different from 0 at * 0.1; ** 0.05; *** 0.01. Robust standard errors in parentheses clustered at village level. Witchcraft blamed for mother death takes binary values of 0 or 1, where 1 indicates witchcraft was stated as a reason for why a (hypothetical) mother died during childbirth. *Visited witchdoctor* and *Wants birth in village* are binary variables coded as 0 or 1. Constant omitted when using fixed effects due to collinearity.

Table 5: Beliefs and Mother's Decisions for Children (b)

	Took child witchdoctor		Would take child...	
	(1)	(2)	(3)	(4)
Identified witchcraft as cause of pneumonia	0.415***	0.342***	0.326***	0.336***
	(0.082)	(0.128)	(0.047)	(0.054)
Age	−0.004	−0.008*	−0.003	−0.002
	(0.003)	(0.004)	(0.002)	(0.002)
Years of education	0.000	0.006	−0.001	−0.002
	(0.004)	(0.007)	(0.003)	(0.004)
Number of children	−0.011	0.001	0.007	0.006
	(0.008)	(0.014)	(0.007)	(0.008)
Number of children < 5	0.076*	0.085	0.017	0.029
	(0.039)	(0.055)	(0.024)	(0.027)
Currently pregnant	−0.038	−0.010	−0.030	0.007
	(0.048)	(0.078)	(0.032)	(0.040)
Num. children < 5 currently sick	−0.014	0.003	−0.004	0.002
	(0.041)	(0.060)	(0.021)	(0.024)
Identify as Animist	0.072**	0.082	0.155***	0.130***
	(0.031)	(0.061)	(0.026)	(0.031)
Identify as Muslim	0.072	0.044	0.102**	0.107**
	(0.062)	(0.109)	(0.043)	(0.047)
Identify as Christian	−0.012	−0.057	0.078***	0.069**
	(0.029)	(0.059)	(0.028)	(0.029)
Food insecure in last 30 days	−0.041	−0.063	0.143***	0.143***
	(0.033)	(0.049)	(0.025)	(0.029)
Has ever lost a child	0.060**	0.104**	0.021	0.034
	(0.028)	(0.049)	(0.023)	(0.026)
Constant	0.091		−0.001	
	(0.096)		(0.067)	
Village Fixed Effects		✓		✓
R^2	0.25	0.50	0.16	0.31
Observations	330	330	1162	1162

Analysis uses OLS regression. Significantly different from 0 at * 0.1; ** 0.05; *** 0.01. Robust standard errors in parentheses clustered at village level. Identified witchcraft as cause of pneumonia takes binary values of 0 or 1, where 1 indicates witchcraft was stated as a reason for why symptoms of pneumonia occurred in a hypothetical child. *Took child witchdoctor* and *Would take child... (to witchdoctor)* are binary variables coded as 0 or 1. Constant omitted when using fixed effects due to collinearity.

Table 6: Beliefs and Mother's Decisions for Children (c)

	Took child witchdoctor		Would take child...	
	(1)	(2)	(3)	(4)
Traditional belief about animal disease	0.058*	0.116**	0.037	0.067**
	(0.035)	(0.057)	(0.027)	(0.030)
Age	−0.006*	−0.010**	−0.002	−0.003
	(0.003)	(0.005)	(0.002)	(0.002)
Years of education	0.001	0.005	−0.002	−0.002
	(0.005)	(0.008)	(0.004)	(0.004)
Number of children	−0.008	−0.002	0.006	0.006
	(0.010)	(0.016)	(0.007)	(0.009)
Number of children < 5	0.063	0.096	−0.001	0.010
	(0.048)	(0.064)	(0.026)	(0.028)
Currently pregnant	−0.033	0.002	−0.026	0.019
	(0.047)	(0.081)	(0.035)	(0.044)
Num. children < 5 currently sick	−0.007	−0.017	0.005	0.002
	(0.045)	(0.069)	(0.022)	(0.025)
Identify as Animist	0.113***	0.100	0.180***	0.155***
	(0.038)	(0.071)	(0.025)	(0.030)
Identify as Muslim	0.174**	0.100	0.130***	0.121**
	(0.087)	(0.187)	(0.044)	(0.061)
Identify as Christian	−0.026	−0.083	0.055*	0.045
	(0.038)	(0.067)	(0.028)	(0.029)
Food insecure in last 30 days	−0.004	−0.049	0.169***	0.162***
	(0.038)	(0.053)	(0.027)	(0.030)
Has ever lost a child	0.076**	0.132**	0.027	0.048*
	(0.033)	(0.054)	(0.023)	(0.027)
Constant	0.097		0.006	
	(0.112)		(0.065)	
Village Fixed Effects		✓		✓
R^2	0.10	0.44	0.10	0.25
Observations	315	315	1127	1127

Analysis uses OLS regression. Significantly different from 0 at * 0.1; ** 0.05; *** 0.01. Robust standard errors in parentheses clustered at village level. Identified witchcraft as cause of pneumonia takes binary values of 0 or 1, where 1 indicates witchcraft was stated as a reason for why symptoms of pneumonia occurred in a hypothetical child. *Took child witchdoctor* and *Would take child... (to witchdoctor)* are binary variables coded as 0 or 1. Constant omitted when using fixed effects due to collinearity.

To conclude this section, we conduct two final analyses. The first is that we examine whether there is in fact a negative association between visiting the witchdoctor and visiting a health center. The second is that we examine whether traditional beliefs can also impact the types of health prevention strategies households use, focusing on the case of malaria. Table 7 shows that mothers who state that they would visit a witchdoctor if their children were ill (in general), are significantly less likely to state that they would also visit a health center (it is possible to state an intention to visit both). This relationship holds at the 5% significance level, including village fixed effects. Thus, it suggests that to some extent, witchdoctors may crowd out, or conflict with, mothers receiving modern medical care.

The second analysis is found in Table 8, which examines the relationship between beliefs about the symptoms of malaria being caused by witchcraft and the use of bed nets (observed by our enumerators) to protect against mosquito bites. Here there is a large and significant negative relationship. After controlling for individual characteristics and village fixed effects, mothers who related witchcraft to the cause of malaria are 14.5 percentage points less likely to be observed having bed nets on all beds in their household. Thus, it appears that traditional beliefs not only affect treatment behaviors after children are ill, but also affect the health prevention strategies before they become ill. This is an extremely important finding, as it would also suggest that our health campaigns can have positive impacts both by changing prevention behaviors and treatment behaviors.

Table 7: Relationship between intentions to visit witchdoctor and health center

	Would take child to health center	
	(1)	(2)
Would take sick kids to witchdoctor (general)	−0.090***	−0.087**
	(0.035)	(0.035)
Age	0.002**	0.001
	(0.001)	(0.001)
Years of education	0.001	0.002
	(0.002)	(0.002)
Number of children	−0.011*	−0.003
	(0.006)	(0.006)
Number of children < 5	0.008	0.000
	(0.015)	(0.015)
Currently pregnant	−0.014	−0.017
	(0.023)	(0.025)
Num. children < 5 currently sick	0.015	0.022*
	(0.012)	(0.013)
Identify as Animist	−0.002	0.001
	(0.012)	(0.014)
Identify as Muslim	0.034	0.033
	(0.022)	(0.028)
Identify as Christian	0.028*	0.027*
	(0.015)	(0.015)
Food insecure in last 30 days	−0.009	−0.005
	(0.015)	(0.018)
Has ever lost a child	0.002	0.011
	(0.013)	(0.014)
Constant	0.907***	
	(0.031)	
Village Fixed Effects		✓
R^2	0.04	0.29
Observations	1165	1165

Analysis uses OLS regression. Significantly different from 0 at * 0.1; ** 0.05; *** 0.01. Robust standard errors in parentheses clustered at village level. Would take sick kids to witchdoctor (general) takes binary values of 0 or 1, where 1 indicates mother stated an intention to visit witchdoctor in the event one of her children was ill. *Would take child to health center* takes binary values of 0 or 1, where 1 indicates mother stated an intention to visit a health center in the event one of her children was ill. Constant omitted when using fixed effects due to collinearity.

Table 8: Relationship between beliefs in witchcraft and use of mosquito net

	Mosquito nets observed	
	(1)	(2)
Identified witchcraft as cause of malaria	-0.166^{***}	-0.145^{***}
	(0.037)	(0.046)
Age	-0.005^{**}	-0.005^{*}
	(0.003)	(0.003)
Years of education	-0.001	-0.003
	(0.004)	(0.004)
Number of children	0.007	0.009
	(0.009)	(0.011)
Number of children < 5	0.042^{*}	0.057^{*}
	(0.025)	(0.029)
Currently pregnant	-0.058	-0.064
	(0.037)	(0.042)
Num. children < 5 currently sick	0.001	-0.001
	(0.021)	(0.026)
Identify as Animist	-0.069^{***}	-0.089^{***}
	(0.026)	(0.027)
Identify as Muslim	0.035	0.026
	(0.040)	(0.064)
Identify as Christian	0.057^{**}	0.046
	(0.027)	(0.037)
Food insecure in last 30 days	0.120^{***}	0.131^{***}
	(0.023)	(0.028)
Has ever lost a child	0.012	0.019
	(0.028)	(0.031)
Constant	0.897^{***}	
	(0.077)	
Village Fixed Effects		✓
R^2	0.08	0.19
Observations	1083	1083

Analysis uses OLS regression. Significantly different from 0 at * 0.1; ** 0.05; *** 0.01. Robust standard errors in parentheses clustered at village level. Identified witchcraft as cause of malaria takes binary values of 0 or 1, where 1 indicates witchcraft was stated as a reason for why symptoms of malaria occurred in a hypothetical child. *Mosquito nets observed* takes binary values of 0 or 1, where 1 indicates enumerator observed mosquito nets on all beds in the respondent's house. Constant omitted when using fixed effects due to collinearity.

2.5 Other subjective expectations measures in the data

Here we briefly highlight other features of our measurements. We additionally asked questions about the intensity of beliefs. A key question of interest involves understanding beliefs about the causes of deaths related to health issues. Specifically, we asked respondents: "Imagine that in your village, 10 mothers have died during or directly following childbirth. These 10 cases are not related. Letting each of these 10 beans represent one of the mothers who died, can you tell me how many of them died because of supernatural causes? And how many died because of natural causes?" We also asked a similar question, but for frequently sick children, between the ages of 1 and 3. In fact in both cases, respondents suggested slightly higher numbers for supernatural causes rather than natural. For the question about mothers this is not significant (4.9 versus 4.8), while for the question about children it is at the 5% level (4.6 versus 4.3).[17]

We find important results which suggest that beliefs are significantly related with behaviors, and that our measures capture well the intensity of beliefs. For example, those that reported seeing a witch doctor attribute a significantly higher number of the 10 deaths to supernatural causes, as opposed to natural causes. We also asked respondents how many of those hypothetical 10 children who died, would still have died if they had gone (1) only to the witch doctor (2) only to the health center (3) to both. Individuals who have been to witch doctors report significantly less children would have died if these children had been to the witch doctor, relative to individuals who have not been to witch doctors (1.82 less, significant at 1%). Similar patterns are observed for individuals who believe that spirits or witchcraft can cause death. Interestingly, the patterns are analogous for individuals estimating how many children would have died if they had gone to the health center: namely that individuals who have seen witch doctors or who believe that witchcraft or spirits can cause death, believe that the health center is less effective at saving lives. These differences are also significant at the 1% level.[18]

[17] The reason these do not add up to 10 is that subjects were encouraged but forced to use all the beans.

[18] Regarding the question on children who have visited both the health center and witch doctor, there are no significant differences by beliefs or previous witchdoctor visits.

3 Preliminary Workshops to Inform Final Campaign Design

3.1 Overview

To better inform the design of the health campaign, we ran a series of eight workshops over two weeks in February 2020, with a total of 27 health workers from both the traditional and modern health sectors. Each workshop was conducted independently with small groups, typically five workers, mixing both traditional and modern health practitioners. While there were always new participants in every workshop, previous participants which were particularly helpful were invited back to participate in one or two more workshops.

The background of participants was mixed, with the majority working outside of the capital of Bissau, and most of those working in rural areas. There were nine traditional health practitioners in total, seven of whom were witchdoctors, and two who were herbal specialists. There were 18 modern health practitioners, the majority of whom were nurses (who work in rural health centers), but also included doctors, mid-wives, nutritionists, and community health agents.

All meetings followed a light script to help introduce the project, and the purpose for convening the workshop. The script involved a set of introductions, followed by a series of discussion topics which were introduced by the moderator. These topics were initially informed by the baseline survey, but evolved over the course of the eight workshops. The set of initial topics focused on (1) the general campaign idea of joining traditional and modern health practitioners; (2) infant and early childhood health; and (3) maternal care.[19]

3.1.1 The merits of modern and traditional health practitioners working together

A key concern going into the workshops was the willingness of modern and traditional health practitioners to work together, and the eventual effectiveness of such a joint effort through the information campaign. Overwhelmingly, the participants expressed favorable opinions of this possibility. During discussions it became apparent that there was common ground between the two sides. Namely, all traditional healers believed that modern medicine had an important role to play, for a number of diseases such as malaria, for child-

[19] We also discussed the idea of whether traditional beliefs are only relevant in villages which are located far from health centers. Resoundingly, our participants believed that these beliefs affected nearly all villages in rural areas, although to varying degrees.

birth, and for receiving vaccinations.[20] Additionally, most of the modern health workers sympathized with the traditional health practitioners; in fact, some shared certain beliefs about illnesses which had traditional origins.[21] Only in one case did an invited participant refuse to participate in the workshop (a witchdoctor).[22] One concern that was raised in one meeting was the competition between traditional and modern health sectors in villages, and that the campaign could be seen as an effort to take away paying clients from traditional health practitioners. To solve this, it was emphasized to ensure that traditional health practitioners in the village feel that they are included and respected in the campaign. Beyond this, it was noted that traditional health practitioners also care about the health outcomes of their clients. Bad outcomes also reflect poorly on their methods. Finally, the majority of participants agreed that two health practitioners would be sufficient, but that the campaign should be repeated for maximum impact.[23]

3.1.2 Infant and early childhood health

Turning next to the health of children, nearly all traditional medical practitioners participating agreed that neonatal health was the domain of modern medicine. However, there are some symptoms in children, for example convulsions (which could be caused by severe malaria or tetanus), which could be associated with more spiritual causes. Beyond this, the discussion became more nuanced regarding traditional diseases. Nearly all modern practitioners were aware of the traditional diseases which affect children which related to various animals (typically cats, dogs, or monkeys) and confirmed that these diseases are nearly always related to malnutrition. They also confirmed that knowledge in rural villages about these diseases being related to malnutrition were low. From the side of traditional medical practitioners, some, but not all, were aware of the link with malnutrition. All were able to provide us detailed explanations of traditional reasons for "catching" these

[20] All witchdoctors said they regularly forward patients they suspect they cannot treat to health centers. One specifically said that for nearly all patients, he requested they go to the health center first, and only return if the problem persisted.

[21] Based on our experience with modern health workers, we expect that many believe in a number of traditional diseases and cures, but are less comfortable in sharing these beliefs with their colleagues. For example, among our own enumerator team (which consists of trained nurses) heated debates have arisen about these topics.

[22] We cannot say for sure whether this person refused because of the presence of modern health workers, or because they had mis-understood the invitation (they appeared to be expecting a commercial transaction).

[23] It was also mentioned that the traditional health practitioner of the campaign should be of the same ethnicity of the majority of villagers, which will allow for greater trust.

illnesses, which typically included interactions between the parents and various animals (either during pregnancy or afterwards) or included sexual relations of the mother during pregnancy or during breastfeeding. But in fact, all accepted in the discussion that malnutrition likely plays a role in these diseases, and expressed a willingness to impart this knowledge to others. In understanding their openness, it is important to note that all our participants expressed willingness to do their part to help improve the health of children in the villages.[24]

Regarding implications for our campaign, both traditional and modern health participants emphasized the role that the traditional side can play in conveying general knowledge about the role that malnutrition plays in these traditional animal diseases. They emphasized that because these diseases were associated with traditional causes, information would be more credible if coming from a witchdoctor, than if it came from a nurse. The modern practitioners additionally highlighted the important role to be played of providing specific information about symptoms of malnutrition, how to recognize them, and how to treat them. Traditional practitioners can play a supporting role, by affirming their status and stating the importance of working together in order to make sure mothers are doing the most they can for their children. Finally, as part of the broader information campaign, it is worth re-emphasizing how convulsions may be symptoms of illnesses such as severe malaria, which require immediate treatment at a modern health facility.

3.1.3 Maternal care

The second major topic of the workshops related to maternal care, including prenatal, delivery, and postnatal periods. All participants agreed upon the importance of pre- and post-natal health check-ups being conducted at the health center, as well as the importance of giving birth at a health center, due to potential complications that can result during delivery.[25] Modern health practitioners stated that not only were births in the village a large problem, but additionally that many mothers do not come for pre- and post-

[24] We do not want to be naïve and suggest that our participating traditional medical practitioners would turn their own clients away and send them to the health center. But they indicated a strong willingness to help out and educate people in rural villages, where of course we must note their clients do not live. However further discussions have lead us to believe that those of our participating traditional practitioners who were unaware of the link between malnutrition and traditional animal diseases may not stop treating clients, but will likely use this information to suggest complementary treatments at the health center, and potentially educate their clients about the possible malnutrition link.

[25] Witchdoctors and traditional healers do not typically play any role regarding childbirth. Their services are only requested when there are health problems.

natal check-ups. Traditional health practitioners specifically offered useful insights about why so many women choose to give birth in the village, rather than at a health center. Part of this has to do with superstition. They stated that many villagers believe that if strangers enter the room during delivery, witchcraft can occur which takes away the life of the baby. These superstitions can also affect the pregnant mother, particularly if she is unmarried (and has not undergone a protective ceremony that comes with marriage). For this reason, unmarried women may avoid unnecessary contact with strangers, which can prevent them from attending pre-natal check-ups.[26] One key problem identified was that pregnant mothers commonly rely on herbal healers to treat symptoms such as swollen feet or headaches. The herbs used can be potent, and sometimes healers give incorrect doses which can provoke spontaneous abortions or can result in congenital deformities.[27] In addition, the symptoms of the mother may be the result of a more serious problem requiring modern medical care.

These facts led to discussions with a number of insights which are useful to fine-tune the campaign. First, it was agreed that an indirect approach would be better than a direct approach: i.e. it was recommended not to directly state that witchcraft cannot steal the life of the baby, but to emphasize concretely all of the risks from complications that could lead to the baby (or mother) dying during pregnancy if delivery occurred in the village. Then, even if mothers were afraid of witchcraft, they would need to think about all the other risks to their child by giving birth in the village. Next it was discussed that traditional medical practitioners should emphasize that the health center is a safe and secure place to give birth.[28] That it is not a place to find witchcraft, but a place where mothers and their babies will receive the best care.[29] As for childhood diseases, the participants agreed that a witchdoctor emphasizing the security and safety would send a credible signal to villagers

[26]Many participants also noted many logistical reasons why mothers may choose to give birth in the village and not attend pre-natal check-ups, such as the distance to health centers, or a lack of knowledge that pre-natal check–ups are free of charge.

[27]Herbal healers are rumored to be able to give particular dosages to intentionally provoke abortion, which is illegal in Guinea-Bissau. The fact that these consequences were often mentioned leads us to believe some cases of "incorrect dosages" may in fact be intentional attempts to terminate the pregnancy.

[28]Ideally this would be backed up with a personal anecdote, such as a witchdoctor who has given birth at a health center or who has a partner that gave birth in a health center.

[29]The idea of dispelling the myth that health centers are dangerous because many mothers/children die there was also discussed. This myth arises because of the correlation (extreme cases are always sent to the hospital/health center, and these extreme cases often have negative outcomes). For now it was decided this topic might be too complex to introduce along with the other components of the campaign, though we are open to its inclusion.

that the health center is a safe place to give birth. Finally, regarding herbal remedies, it was decided that the issue should be tackled in two ways. First, providing information about symptoms during pregnancy which require modern medical attention. And second, to emphasize the risk to the baby which may come from taking herbal remedies due to incorrect doses. Regarding the second part, it was suggested that mothers should discuss these remedies at pre-natal check-ups, so that a trained nurse can assess whether the remedy is safe or not.

3.1.4 Conclusions of workshops

The workshops led to extremely valuable insights and pragmatic solutions for components of the health campaign. First, it was unanimously agreed upon that a campaign combining both traditional and modern elements was feasible and would likely be successful. To do so, traditional healers in the village should feel included in the campaign, and feel respected. Next, it was concluded that it was important to use the significant knowledge of the modern health practitioners, combined with the credibility of traditional health practitioners to weigh in on issues affected by traditional beliefs. Regarding malnutrition and traditional diseases, traditional health practitioners should discuss the role of malnutrition as being a common source of the symptoms of these illnesses. Specific information about malnutrition can be provided by modern health practitioners. Regarding maternal care, traditional practitioners should emphasize the safety and security of giving birth in health centers. Again, knowledge about complications, their signs, and how to treat them will be discussed in more depth by modern practitioners. Both practitioners will emphasize the importance of pre- and post-natal check-ups for diverse reasons.

4 Health Campaigns and Evaluation

4.1 Design of Health Campaigns

The health campaigns which we plan to evaluate are modified versions of public health campaigns which have been operated by our implementing partner VIDA, a local NGO. In these campaigns, VIDA manages teams of unpaid community health workers which are expected to act as liaisons between community members and local health centers, treating uncomplicated illnesses, and additionally running information campaigns on “essential family practices” which relate to key hygiene and health practices for families.

The campaigns we will evaluate are modified versions of these programs, with three key differences. The first is in terms of intensity – health workers will be monitored as they deliver the programs, to ensure that they deliver the programs in their intended format, for the intended duration.[30] The second is the key innovation, of including traditional medical practitioners (witchdoctors) to help deliver the information content. And the third difference involves the scope of information - by including, and allowing for, a discussion of traditional health beliefs.

The campaign has a half day duration, and is to be run by two health practitioners: one traditional and one modern. It is to be delivered to all rural villages randomly selected according to the impact evaluation in the program area, with the two practitioners visiting two villages per workday. Based on feedback, both practitioners will be of the same ethnic background of the villagers they will visit. The teams impart medical knowledge (following the earlier campaigns of VIDA), but also discuss how traditional beliefs could create obstacles to good health. Feedback from piloting these campaigns has suggested that the added presence of the traditional medical practitioner is highly effective for two reasons. First, it helps to legitimize the message of adhering to modern health practices, leading to greater trust in the campaign. And second, it creates a more open environment for discussing issues relating to traditional illnesses, which may otherwise not be discussed.

The content of the campaign follows closely the two key focus areas we identified in the baseline survey and refined in the workshops: (1) maternal health, and (2) infant and early childhood health. The campaign starts with a formal meeting with the village committee to explain the program and receive permission to run the activity. This is followed by presenting the medical practitioners to the community, by briefly introducing each of them, as well as introducing the campaign, and its primary objectives.

The topic of maternal health begins with the traditional medical practitioner, who will introduce themselves and their background to the community. This is followed by a discussion of pregnancy, the potential risks of herbal treatments, the importance of pre- and post-natal check-ups, the safety and security of giving birth at a health center, and a discussion of tradition and science. Next, the modern health practitioner introduces themselves and their work, and reinforces the earlier discussions, with a focus on providing specific details of pre- and post-natal check-ups, and examples of potential pregnancy

[30]Because the existing programs rely on unpaid community health workers, many do not deliver these campaigns according to the prescribed format - if they deliver them at all. Further, there are not a sufficient number of agents to do these campaigns in all villages.

complications. This discussion is grounded in essential family practices of the existing campaigns.

The second topic of infant and early childhood health follows the same order as the first, with the traditional medical practitioner outlining the relationship between traditional diseases and modern medical knowledge, giving examples of specific traditional diseases and their relationship to malnutrition and hygiene. This is followed by the modern health practitioner who provides more specific details, and who follows a set of essential family practices to guide the discussion. The campaign ends with an opportunity for questions, before thanking all participants. These campaigns will be run in selected villages four times in total, once per month. Repeated visits will repeat and reinforce key elements of the program, but will also build a more comprehensive program which introducing new material. A sample half-day program is included in Appendix 6.2, along with an illustration of the essential family health practices in Appendix 6.3.

4.2 Impact Evaluation

To evaluate the health campaign we will conduct an RCT with the 160 villages in our original sample. These villages will be randomly allocated into three groups: Control; Treatment 1; and Treatment 2. Treatment 2 corresponds to our main health campaign, outlined in Subsection 4.1. Treatment 1 will correspond to a conventional information campaign, which follows the best practices of current information campaigns, but does not involve a traditional medical practitioner, nor does it reference to traditional beliefs. By evaluating the main campaign in Treatment 2 relative to both a control group, and a standard campaign, we will be able to estimate the overall impact of the campaign, as well as the differential impact beyond a standard health intervention.

Rather than one modern and one traditional medical practitioner, Treatment 1 will involve two modern health practitioners. Additionally, to enable us to identify the presence of traditional beliefs as the mechanism driving any differences between Treatments 1 and 2, Treatment 1 will be matched as closely as possible to Treatment 2 in terms of information and content. In particular, any additional information content on traditional diseases will be replaced by a similar component on modern health knowledge.

As Guinea-Bissau has a relatively high population density, we will use a cluster randomized design which uses baseline information about village networks in order to mitigate potential information spillovers across treatment groups. Further, in order to ensure

comparability across the treatment groups, we will use stratified randomization to ensure balance on ethnicity, beliefs, religion, education, and poverty measures.

The primary outcomes of key interest fall into two categories: (1) beliefs, and (2) behaviors. Given we have a large set of measures of strength of spiritual beliefs and health knowledge, we will examine pre-specified indices of these variables. While beliefs is a key measure of anticipated impact, we also hypothesize that these beliefs will affect behavioral change. We are particularly interested in terms of investments in preventive health such as giving birth in a health center, and in treatment, such as taking a sick child to a health center.

5 Concluding Discussion

The described health campaigns modify existing health information campaigns run by VIDA, but further build on detailed analysis of our baseline survey, and on workshops conducted which brought together small groups of modern and traditional health practitioners for this purpose. The final campaign innovates beyond typical programs which try to present information that either ignores traditional beliefs or repudiates them in a way that antagonizes the community. By instead integrating traditional beliefs in health campaigns our intervention will make gradual but real progress in increasing health knowledge, shifting behavior towards the modern health sector, and reducing maternal and child deaths and morbidity.

Overall, we anticipate that this campaign will have positive impacts on health behaviors, leading to lower mortality and morbidity. Careful analysis of the baseline data suggests that traditional beliefs are a key determinant of mothers' decisions, from taking their sick children to the witchdoctor rather than the health center, to giving birth in the village. Not only do we expect positive impacts, but these campaigns also have immense potential to be scaled up, if the impact evaluation suggests positive results. The program resembles many community health programs in terms of informational content and logistics, with the key difference being involvement of traditional health practitioners and addressing traditional beliefs directly.

6 Appendix

6.1 Correlation Analysis

Table 9: Correlation between Spiritual Beliefs and Mother's Behavior

	(1)	(2)	(3)	(4)	(5)
People can curse others	0.178***	0.160***	0.050***	0.028	0.063***
	(0.018)	(0.014)	(0.017)	(0.022)	(0.016)
Curses can kill	0.197***	0.128***	0.049***	0.039*	0.057***
	(0.018)	(0.015)	(0.017)	(0.022)	(0.015)
Supernatural protection	0.231***	0.162***	0.081***	0.073***	0.088***
	(0.017)	(0.013)	(0.016)	(0.019)	(0.015)
Supernatural cures	0.238***	0.165***	0.066***	0.044**	0.076***
	(0.016)	(0.013)	(0.016)	(0.020)	(0.016)
Evil eye	0.141***	0.131***	0.058***	0.020	0.084***
	(0.016)	(0.014)	(0.015)	(0.019)	(0.014)
Witnessed cure from god	−0.013	0.014	−0.072**	−0.070*	−0.033
	(0.030)	(0.031)	(0.028)	(0.037)	(0.026)
Witnessed cure from a spirit	0.378***	0.307***	0.074***	0.039	0.117***
	(0.027)	(0.025)	(0.026)	(0.034)	(0.027)
Cured by witchdoctor	0.396***	0.283***	0.105***	0.031	0.130***
	(0.029)	(0.025)	(0.027)	(0.037)	(0.025)
Witchdoctor cast a spell on them	0.330***	0.270***	0.067***	0.043	0.107***
	(0.027)	(0.023)	(0.025)	(0.035)	(0.027)
Average Observations	1233	1233	1214	809	1233

Pairwise regressions of independent variables (rows) on dependent variables (columns). No additional controls added. Dependent variables:
(1) Mother has ever visited witchdoctor.
(2) Mother has visited witchdoctor in last 6 months.
(3) Mother has ever given birth in the village.
(4) Mother gave birth in village (most recent birth).
(5) Mother wants to have next birth in village.
Significantly different from 0 at * 0.1; ** 0.05; *** 0.01. Robust standard errors clustered at village level in parentheses.

Table 10: Correlation between Spiritual Beliefs and Decisions about Children

	(1)	(2)	(3)	(4)	(5)
People can curse others	0.061***	0.103***	0.082***	0.132***	0.114***
	(0.017)	(0.011)	(0.014)	(0.016)	(0.014)
Curses can kill	0.067***	0.095***	0.088***	0.121***	0.129***
	(0.015)	(0.011)	(0.012)	(0.016)	(0.013)
Supernatural protection	0.059***	0.126***	0.092***	0.158***	0.139***
	(0.016)	(0.011)	(0.013)	(0.014)	(0.012)
Supernatural cures	0.059***	0.130***	0.098***	0.148***	0.138***
	(0.016)	(0.012)	(0.013)	(0.015)	(0.012)
Evil eye	0.029*	0.045***	0.027*	0.074***	0.049***
	(0.016)	(0.015)	(0.014)	(0.016)	(0.014)
Witnessed cure from god	−0.098**	−0.032	−0.102***	−0.110***	−0.100***
	(0.042)	(0.025)	(0.023)	(0.027)	(0.030)
Witnessed cure from a spirit	0.080***	0.120***	0.110***	0.157***	0.159***
	(0.031)	(0.020)	(0.024)	(0.024)	(0.024)
Cured by witchdoctor	0.135***	0.129***	0.135***	0.236***	0.227***
	(0.028)	(0.023)	(0.024)	(0.027)	(0.025)
Witchdoctor cast a spell on them	0.131***	0.146***	0.138***	0.218***	0.226***
	(0.029)	(0.022)	(0.024)	(0.027)	(0.026)
Average Observations	341	1231	1233	1233	1233

Pairwise regressions of independent variables (rows) on dependent variables (columns). No additional controls added. Dependent variables:
(1) Took sick child to witchdoctor.
(2) Would take child to witchdoctor (general, hypothetical).
(3) Would take child to witchdoctor (diarrhea, hypothetical).
(4) Would take child to witchdoctor (malaria, hypothetical).
(5) Would take child to witchdoctor (pneumonia, hypothetical).
Significantly different from 0 at * 0.1; ** 0.05; *** 0.01. Robust standard errors clustered at village level in parentheses.

Table 11: Correlation between Health Beliefs and Mother's Behavior

	(1)	(2)	(3)	(4)	(5)
Witchcraft caused severe diarrhea	0.303***	0.277***	0.165***	−0.014	0.270***
	(0.047)	(0.081)	(0.045)	(0.100)	(0.088)
Witchcraft blamed for child death	0.230***	0.276***	0.137***	0.096**	0.134***
	(0.026)	(0.029)	(0.025)	(0.039)	(0.029)
Witchcraft caused severe malaria	0.308***	0.260***	0.182***	0.145***	0.269***
	(0.028)	(0.041)	(0.027)	(0.046)	(0.045)
Malaria could be curse	0.129***	0.198***	0.059***	0.042	0.119***
	(0.022)	(0.028)	(0.022)	(0.031)	(0.030)
Witchcraft caused pneumonia	0.340***	0.285***	0.163***	0.070	0.248***
	(0.026)	(0.046)	(0.029)	(0.054)	(0.048)
Witchcraft caused kwashiorkor	0.247***	0.295***	0.122***	0.060	0.137**
	(0.043)	(0.059)	(0.041)	(0.074)	(0.060)
Traditional explanation kwashiorkor	0.006	0.042	0.015	−0.033	−0.002
	(0.031)	(0.029)	(0.031)	(0.038)	(0.035)
Witchcraft caused animal disease	0.205***	0.175***	0.129***	0.158***	0.215***
	(0.034)	(0.044)	(0.030)	(0.044)	(0.051)
Traditional explanation animal disease	0.121***	0.137***	0.082**	0.076*	0.076**
	(0.037)	(0.033)	(0.038)	(0.044)	(0.030)
Witchcraft blamed for mother death	0.241***	0.302***	0.129***	0.107***	0.150***
	(0.026)	(0.026)	(0.026)	(0.037)	(0.029)
Average Observations	1183	1183	1165	778	1183

Pairwise regressions of independent variables (rows) on dependent variables (columns). No additional controls added. Dependent variables:
(1) Mother has ever visited witchdoctor.
(2) Mother has visited witchdoctor in last 6 months.
(3) Mother has ever given birth in the village.
(4) Mother gave birth in village (most recent birth).
(5) Mother wants to have next birth in village.
Significantly different from 0 at * 0.1; ** 0.05; *** 0.01. Robust standard errors clustered at village level in parentheses.

Table 12: Correlation between Health Beliefs and Decisions about Children

	(1)	(2)	(3)	(4)	(5)
Witchcraft caused severe diarrhea	0.288*	0.191**	0.383***	0.362***	0.361***
	(0.173)	(0.077)	(0.074)	(0.071)	(0.074)
Witchcraft blamed for child death	0.226***	0.239***	0.177***	0.240***	0.245***
	(0.047)	(0.024)	(0.030)	(0.031)	(0.026)
Witchcraft caused severe malaria	0.224***	0.312***	0.297***	0.618***	0.457***
	(0.064)	(0.040)	(0.043)	(0.030)	(0.040)
Malaria could be curse	0.146***	0.129***	0.110***	0.079***	0.134***
	(0.042)	(0.030)	(0.031)	(0.030)	(0.033)
Witchcraft caused pneumonia	0.398***	0.372***	0.396***	0.492***	0.691***
	(0.088)	(0.042)	(0.046)	(0.036)	(0.032)
Witchcraft caused kwashiorkor	0.349***	0.474***	0.498***	0.474***	0.543***
	(0.083)	(0.058)	(0.054)	(0.055)	(0.052)
Traditional explanation kwashiorkor	−0.015	−0.007	−0.054**	0.030	−0.048
	(0.040)	(0.026)	(0.026)	(0.033)	(0.030)
Witchcraft caused animal disease	0.355***	0.203***	0.282***	0.311***	0.354***
	(0.072)	(0.044)	(0.050)	(0.048)	(0.043)
Traditional explanation animal disease	−0.006	0.058*	0.061*	0.102***	0.115***
	(0.037)	(0.035)	(0.032)	(0.037)	(0.032)
Witchcraft blamed for mother death	0.139***	0.217***	0.172***	0.264***	0.264***
	(0.034)	(0.023)	(0.023)	(0.030)	(0.025)
Average Observations	324	1181	1183	1183	1183

Pairwise regressions of independent variables (rows) on dependent variables (columns). No additional controls added. Dependent variables:
(1) Took sick child to witchdoctor.
(2) Would take child to witchdoctor (general, hypothetical).
(3) Would take child to witchdoctor (diarrhea, hypothetical).
(4) Would take child to witchdoctor (malaria, hypothetical).
(5) Would take child to witchdoctor (pneumonia, hypothetical).
Significantly different from 0 at * 0.1; ** 0.05; *** 0.01. Robust standard errors clustered at village level in parentheses.

6.2 Health Campaign Sample Program

SUMMARY GUIDE FOR INFORMATION CAMPAIGN
PROJECT: "HEALTH AND TRADITIONAL BELIEFS IN GUINEA-BISSAU"
NOVAFRICA Research Center
2020

Responsible	Objective	Methods utilized	Resources
Committee	Introducing the activity	Explain who we are to the village committee	
		Information campaign with the objective of reducing infant and maternal mortality and morbidity	
		Discuss alternative solutions for traditional explanations of illnesses or cause of death.	
Both medical practitioners	Project introduction	Brief introductions: - Traditional medical practitioner - Modern medical practitioner Thank the participants	
		- We are visiting villages in Cacheu and Biombo where we speak with mothers, village committees, traditional medical practitioners, and the general community. - Traditional beliefs are an important part of daily life, and shape how we view the cause of illnesses and deaths in the village. - There have been great advancements in science and modern medicine in the last few decades which have given us a better understanding about health and illnesses. - Nowadays we have the capability of diagnosing and treating illnesses that before we were not able to. - Traditions are important, but we must recognize that modern medicine has advanced over the years, and we must use all the tools available to save lives of our mothers and children.	
	General objectives of the activity	- Share habits and health practices that have been identified by modern medicine as proven ways to promote well-being and reduce the chance of serious illnesses. - Offer scientific explanations for causes of death or illnesses that are associated with traditional reasons.	
		Djumbai (traditional community meeting with open discussion) to share knowledge about: - Most common health problems and illnesses in the villages - The best ways to avoid these health problems - The best ways to treat these health problems Focusing specifically on problems that affect mothers during pregnancy and children under 5.	
		It is important that everyone is present, but especially: - Household heads: responsible for guaranteeing the health of their families - Traditional medical practitioners: who deal daily with problems of health in the village - Mothers with young children: who care about the healh and well being of their children - Pregnant women, or those who plan to become pregnant: to learn about how to ensure a safe and healthy birth	
Both medical practitioners	Final Objective	- Provide more information about the techniques of modern medicine in identifying certain health problems and illnesses. - We have a tendency to resort to supernatural explanations for events or illnesses that we can't explain, but this changes over time. - The advancement of medicine has come to show that traditional explanations didn't always correspond to the truth. For example in the case of malaria or cholera. - With better modern health explanations for illnesses and health problems that happen in the village, comes better knowledge about how to prevent these problems. - Sometimes, being located in a village which is isolated means that new information doesn't always arrive. - We're here to share the best information we have, in order to help interpret some events and health problems that affect your village, and in some cases offer alternative explanations to traditional explanations which may not always correspond to reality.	
Traditional medical practitioner	Introductions	Practitioner presents themselves and provides a short description of their work. Topic 1: Pregnancy care	
	Pre-and post-natal checkups	- Pregnancy is not an illness, but a condition which requires sensitivity, and effort from the mother to ensure a healthy birth - Traditional medicine is not very suitable for pregnancy care. Discuss limitations and dangers of some herbal treatments. - As a traditional medical practitioner, we care about guaranteeing the health and well-being of the population, particularly pregnant mothers and their babies. - Modern medicine is now well prepared to accompany the mother during pregnancy, in a safe and secure way which prioritizes the health of the mother and baby. - Pre-and post-natal checkups at a health center are one of the most important things a mother can do for the health of her baby. They allow for the detection of problems or complications, before they become serious. These very same complications, that can often be treated, are the same ones that we would have given a supernatural explanation to if something terrible happened, like if the baby or mother died.	
	Birth	- Discuss the benefits of giving birth at a health center. No matter where one gives birth, there are always risks, this is a fact of life. But the health center is a safe and secure place for the mother and the baby. It has the best conditions to handle complications which may occur. - Modern medicine uses trained nurses and modern equipment which are designed to give the best chance of success to a healthy and hygienic birth.	
	Tradition and science	- We have a tendency to explain maternal and infant deaths as mandjidura, uss, or simply as tradition. - Modern medicine can offer some alternative explanations and even solutions for how to help avoid these deaths. - It is important to try and understand for any potential health problem which arises, whether there exists a modern health solution. - With regards to modern medicine, it is also important to be patient and follow the treatment instructions of trained nurses, otherwise the treatment might not work.	
Traditional medical practitioner	Conclusion of traditional medical practitioner discussion	Pregnant women and new-born babies are more fragile than typical adults. They need and deserve special care, which should always include the care of a modern health center with trained staff. I will now ask my colleague to speak more about this.	
Modern health practitioner	Introductions	Practitioner presents themselves and provides a short description of their work. Continuation of topic 1: Pregnancy care	

Responsible	Objective	Methods utilized	Resources
	EFP 15	- Explain importance of pregnant women attending pre- and post-natal checkups, and the timing of these checkups. - Explain that all checkups and treatments are free for mothers and their children under 5. - Explain what is done during the different types of pre-and post-natal checkups. - Explain importance of going immediately to a health center when you feel that something isn't right, with examples. - Give specific examples of complications that can appear during pregnancy, and why they can occur. - Explain how each of these are treated in the health center.	Pre-natal checkup card Illustration of complications
Both medical practitioners	Conclusion of topic 1	Address any further questions or concerns that might have been raised during presentation.	
Traditional medical practitioner	Introductions	Topic 2: Infant and early childhood health	
	The relationship between animal diseases and modern medicine	- Traditionally, there exists many illnesses (cat, monkey) that catch children and leave them with strange symptoms which change their appearances. Many times these illnesses can result in death. - With the advancement of modern medicine, we've discovered that are some scientific explanations for some of these symptoms, and the staff at health centers are trained for how to recognize and treat them.	
	Example 1	- A skinny baby has sunken eyes, and weak hair: it is said that an animal "caught" the baby, e.g. a monkey. - Modern medicine has discovered that these very same symptoms are actually signs of malnutrition, resulting from the food and diet that the baby is receiving. For example, if the baby is only eating rice, or rice with a little soup, it is probably not getting all the nutrients and proteins that it needs. It might need to eat more meat, fish, nuts, and vegetables.	Photo illustration
	Example 2	- It is said that when a mother meets the gaze of a lizard, her child will have the "lizard disease", and will not be able to gain weight, and grow as it should. But this child might also have not received its vaccinations, and it might be suffering from a disease which can be treated with modern medicine.	
	Example 3	- The father beat a dog, and now the baby is with an upset stomach and frequent diarrhea. But this could be because the baby has ingested water that wasn't treated, or ate something that wasn't prepared taking all hygienic cautions.	
	Example 4	- The child has a swollen belly and looks like its been eating too much. We say that perhaps the baby has been eating sand. But actually the baby is not eating too much, and modern medicine has discovered that a swollen belly can result from not getting enough proteins and nutrients. The health center knows how to treat a child with this condition.	Photo illustration
	Conclusion of topic 2	- We have a tendency to mix up symptoms of malnutrition or modern diseases with those of animal diseases. In reality these signs are very serious for the health of your child. - It is important to guarantee that when these signs appear, your child is seen by a trained nurse. - Modern medicine has treatments for these symptoms. - I will now ask my colleague to speak more about this.	
Modern health practitioner	EFP 12/13	- The importance of completing all vaccines until the child is 11 months. - The importance of following the growth of the child and weighing the child using the Infant Health Card. - Discuss specific diseases that can occur if the child doesn't get vaccinated.	Infant Health Card
Modern health practitioner	EFP 1/2	- Explain that mothers should breastfeed **exclusively** until 6 months. At least eight times per day, including at night. - Discuss tips and the right form of breastfeeding. - Describe the nutrition guide with feeding suggestions for 6-9 months, 10-24 months, and > 24 months. Show and explain nutrition wheel.	Breastfeeding guide Nutrition wheel
	EFP 5/6/7	- Explain the importance of hand hygiene and related practices, especially for critical moments. - Explain the importance of treating and handling water. - Explain the importance of good latrine hygiene.	
Both medical practitioners	Conclusion of topic 2	- All of these measures will help prevent your child from getting sick: having diarrhea, fever, vomiting, as well as being malnourished. - Highlight the importance of taking children to the health center at the minimum warning sign of malnutrition. Explain what are the main warning signs and when they need to take the child to the health center. - Address any further questions or concerns that might have been raised during presentation.	
Both medical practitioners	Closing remarks	Thank all of the participants. Announce next meeting if applicable	

6.3 Essential Family Practices

N°	Essential Family Practice
EFP1	The mother feeds her baby through exclusive breastfeeding until the sixth month and sobminister vitamine A (monodose) 45 days after birth
EFP2	The mother introduces adequate complementary food starting with 6 months and continues with breastfeeding until the 24th month after birth
EFP3	The mother must regularly weight her child until the 5th year of age
EFP4	Children between 0 and 59 months and all pregnant women sleep under a bednet
EFP5	The members of the family wash their hands with soap and water after having used the toilet, before preparing food and before feeding the child
EFP6	Families use latrines to eliminate excrements with higene (feces, diapers of the children, etc.)
EFP7	Families treat potable water with ammoniac or clorium tabs
EFP8	The members of the family know the practices to prevent tubercolosis (TPI - Preventive Treatment with Isoniazida following) and HIV/AIDS. Treatment Observed Directly at the Community level (TOD-C)
EFP9	The mother gives SRO/zinc to the child in case of diarrhoea
EFP10	The family gives Coartem (ACT) to the child for simple malaria
EFP11	The family give Amoxiciclina to the child with cough/flu/pneumonia
EFP12	The mother ensures the essencial cares to the recently born
EFP13	The mother brings her child to get proper and complete vaccination until the 11th month
EFP14	The mother gives vitamine A to her child starting from the 6th month and de-worm her starting from the 12th month
EFP15	The pregnant woman goes through the 4 CPN(second dose of the anti-tetanus vaccine and the 2 doses of TPI) before giving birth
EFP16	The family recognizes alert signals of the recently born and of sick children, the obstetric risks and seek for preventive treatment

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