

**Azusa Sato and Joan Costa-i-Font**

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Azusa Sato<sup>1</sup>, Joan Costa-i-Font<sup>2</sup>

<sup>1</sup>LSE Health, London School of Economics and Political Science

<sup>2</sup>Department of Social Policy and European Institute, London School of Economics and Political Science

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London WC2A 2AE

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Corresponding Author:

Azusa Sato

LSE Health

London School of Economics and Political Science

Houghton Street

London WC2A 2AE

[a.sato@lse.ac.uk](mailto:a.sato@lse.ac.uk)

## **Abstract**

Why do individuals still use traditional medicines when modern treatments are available? Economic explanations for an individual's use of traditional instead of modern medicines are scarce and often fail to consider explanations beyond the conventional. This paper puts forward an economic explanation for the use of traditional medicine. First, traditional medicines were the default form of health care available in pre-colonial times where industry influence was yet to develop. Hence, both those individuals who exhibit lower incomes and are left out of health insurance coverage are more likely to use traditional medicines. Second, cultural attitudes and ethnic group controls explain variation in utilisation, even among those who have health insurance. Results are suggestive of the validity of cultural interpretations.

*Keywords:* traditional medicines, culture, default, Ghana, health insurance.

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## 1.1 Introduction

The utilisation of traditional medicines and healers<sup>1</sup> (henceforth TM/H and used interchangeably with traditional medicine practitioner, TMP) is widespread in sub Saharan Africa, where up to 80% of the population rely on it for a variety of health needs (WHO 2002:1). Alongside its affordability, accessibility and availability, the acceptability dimension of TM/H has long been recognised (Anyinam, 1987; World Health Organization, 1978). TM/H are claimed to be culturally acceptable because such systems are aligned with historical circumstance, local beliefs and values, to the extent that modern systems are insufficient or unacceptable under certain conditions<sup>2</sup>. Whilst the idea that 'culture' affects medicines utilisation is a standard principle upon which social scientists and researchers base assumptions and form models, the complexity of formally measuring and quantifying 'culture' has until very recently dissuaded scholars from exploring statistically its role in shaping economic behaviour<sup>3</sup>. However, by adopting a sufficiently narrow definition, 'culture' can be modelled and measured (Guiso, Sapienza, & Zingales, 2006). This study explores whether cultural beliefs and attitudes explain utilisation of TM/H using Ghana as a case study, by answering the following questions:

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<sup>1</sup> WHO's definition is: 'the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness' (WHO 2000:1). Healers are argued to provide more holistic services which cater better to patient needs (Stekelenburg et al 2005). A part of this holism is the appreciation that healers immerse themselves in the healing process; ritualistic acts and incantations are often required to realise the full potential of plant medications to different cultures, used in the maintenance of health and in the prevention, diagnosis, improvement or treatment of physical and mental illness'. In this study, herbal medicines and herbalists (spiritual and non-spiritual) are the dominant forms of TM/H.

<sup>2</sup> For example, it is commonly held that some diseases cannot be cured using (van der Geest, 1997) In pre-colonial times, healers were known to have held considerable control over the social conditions of health and although their profession was suppressed during the colonial period (World Health Organization, 2005), the practice today serves to complement modern medicines, as well as remaining influential in its own right owing to its cultural appeal.

<sup>3</sup> Mohr and Rawlings (2011) show how over time discussion of cultural analysis has jumped from theory to method. Accordingly, the sometimes opposing views taken by qualitative and quantitative researchers stretch across a theoretical divide and there are multiple ways to model culture. Traditionally culture was understood as clusters of attitudes, values, norms and beliefs but increasingly, culture is seen as tangible, fungible and measurable.

- a. Do individuals of different ethnic groups hold differing beliefs and attitudes towards TM/H?
- b. Do these characteristics explain variations in the utilisation of TM/H?

Culture is first treated as an exogenous variable, and then regressions are rerun to correct for possible endogeneity. The latter is made possible by instrumenting for culture with the ethnicity of individuals, a variable which is not regarded a decision variable (such characteristics are, on the whole, pre-determined) and hence an acceptable instrument. Findings show culture to be an important element of TM/H utilisation, even when standard controls such as wealth and presence of insurance are taken into account. This paper contributes to the existing literature by using new household level data on TM/H utilisation to connect anthropological perspectives with econometric techniques.

There is no one concrete definition of 'culture'. Indeed, Kroeber et al (1952) outlined over 154 definitions under sub headings of: descriptive, historical, normative, psychological, structural and genetic. The common aspect of most definitions, however, is the recognition that culture embeds learned (and therefore taught) actions universal to particular segments of society, transmitted through common knowledge and ideas. Notions of 'relationality', social recognition and conformity are also emphasised (Rao & Walton, 2004), pointing to the importance of belonging and collective action. Guiso et al (2006, p. 2) and Fernandez (2007, in (Durlauf & Blume, 2008)) define culture as; 'customary beliefs and values that ethnic, religious and social groups transmit fairly unchanged from generation to generation' such that some elements of culture are inherited by an individual. Becker (1996, p. 16) writes; 'individuals have less control of their culture than over other social capital. They cannot alter their ethnicity, race or family history, and only with difficulty can they change their country or religion. Because of the difficulty of changing culture and its low depreciation rate, culture is largely a 'given' to individuals throughout their lifetimes'. Thus, in this study, an individual's ethnic background is used as an instrumental variable to isolate the cultural component of attitudes and beliefs about the use of TM/H. The key assumption is that being of a certain ethnic background is a path dependent phenomenon (David, 2007), hard to change or deviate from especially within a short amount of time (within a generation, for example), a notion which is arguably truer in

locations where mobility and cross fertilization of ideas and actions between ethnic groups are slower to transmit<sup>4</sup>.

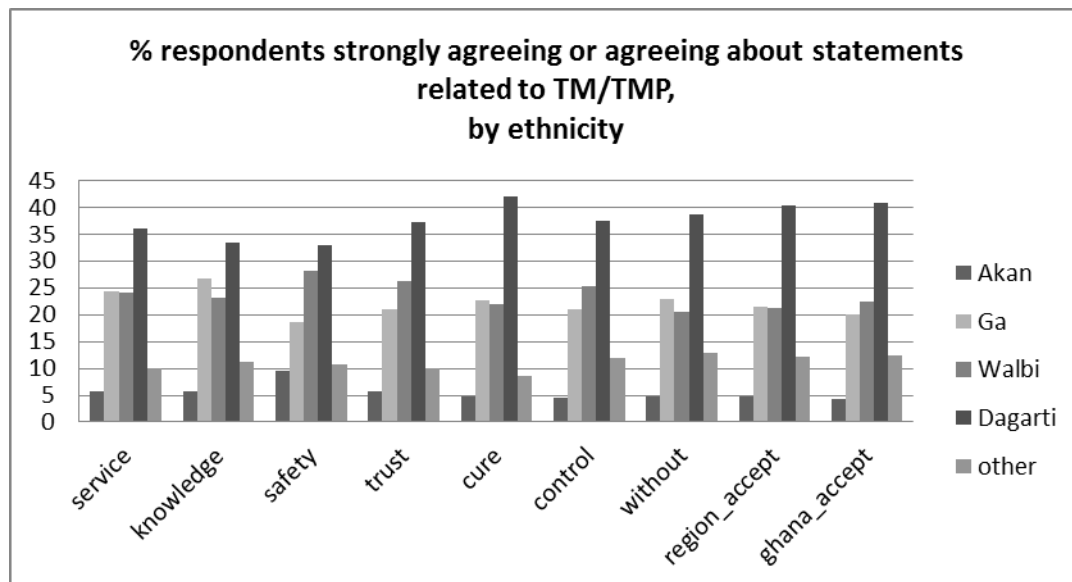
This paper is therefore primarily motivated by empirically examining the effect that different attitudes, primarily held by those of differing ethnicities, have on TM/H use. Marked differences in attitudes across ethnic groups are displayed below in Figure 1, which show frequency distributions (in %) of individuals holding positive views about statements<sup>5</sup> related to TM/H, by ethnicity. Figure 6 presents distributions for four named (Akans, Ga/Dangbes, Walbis, Dagartis) and one residual ('other') ethnic groups' attitudes towards traditional medicines and healers, and suggests that individuals self-identifying themselves as of the Dagarti ethnic group generally find TM/H services to be agreeable; nearly 36% interviewed strongly agree or agree that services provided by the TM/H is good. This is in contrast to only 5.7% of Akans interviewed. This pattern is echoed in all other statements on attitudes and beliefs towards TM/Hs; on all dimensions, Dagartis, over all other ethnic groups, account for the largest proportion of individuals who strongly agree or agree. Walbis and Ga/Dangbes tend to hold similar views, with approximately the same proportion of individuals interviewed from each group strongly agreeing or agreeing about statements on TM/H. Akans appear the most sceptical about TM/H, with the smallest proportion of respondents stating that they strongly agree or agree with statements. However, do these results still hold when a measure of culture is computed as an index, and the use of health care is controlled for with relevant covariates including insurance coverage, socio-economic status and measure of need, other individual characteristics and healer supply variables? How robust are cultural explanations in explaining use of traditional medicines?

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<sup>4</sup> See Guiso et al (2006) for possible reasons on why cultural influences transmit slowly.

<sup>5</sup> Respondents were asked on the level of agreement (strongly agree-strongly disagree on a 5 point Likert Scale) on whether: the quality of service delivered by TH is good; THs are knowledgeable about illnesses that doctors do not know about; TH is trusted; some diseases can only be cured by THs; TM are safer to use than modern medicines; TM provides an increased sense of control and participation in the management of illness; TM can be used without a TH; within the region, they felt THs were well accepted; within Ghana, they felt THs were well accepted

**Figure 1 - attitudes towards TM/H by ethnicity**



The rest of the paper is divided into four main sections. Section two introduces the idea of culture and how theoretical models explain culture to lead to action, and extrapolates on existing economic and anthropological literature on TM/H use, followed by a brief explanation of the existing health system in Ghana. In section three, empirical strategies are outlined. The fourth and fifth sections discuss results and conclusions, respectively.

## **1.2 Background**

### **1.2.1 Culture and Economic Behaviour**

The role of culture as an explanation for economic behaviour is increasingly acknowledged in economics literature (Fernandez, 2007; Fernandez & Fogli, 2006, 2009; Guiso, et al., 2006; Tabellini, 2010) as well as sociological literature on social capital (Putnam 2000). Economic studies use either epidemiological or historical proxies as instrumental variables. The epidemiological approach typically uses data from immigrants or their descendants and compares these to outcomes for natives to verify the relative importance of genetics versus environment. Historical approaches employ indicators from the past to test for today's outcomes, for example, Tabellini (2010) uses literacy rates at the end of the 19<sup>th</sup> century and political institutions from 1600-1850 to proxy for culture, ('attitudes') and finds them to be significantly associated with current per capita GDP. The various pros and



cons of both approaches are to be found in Fernandez (2007). These studies generally show that negative attitudes (e.g. low levels of trust) are associated with poor economic growth, and some go far as to conclude that conformity and obedience to certain cultural traits stunts economic growth (Granato, Inglehart, & Leblang, 1996). Other studies proposing culture – or elements of culture - as central to explaining economic outcomes include Greif (1994) and Knack and Keefer (1997).<sup>6</sup>

To the authors' knowledge there is no study to date which use econometric techniques to test cultural attitudes and beliefs towards traditional medicines and healers from a demand perspective. However, studies demonstrating the assumed direct relationship between ethnicity - as a control variable - and choice of health care provider are abundant. Most of these studies incorporate traditional medicine utilisation as one of a number of choices (versus public and private health care, for example) rather than as a binary variable, and look at need and enabling and predisposing characteristics of the individual to determine the relative importance of included indicators. Works which look at TH utilisation alone cite pragmatic reasons for use based on practical observations or individual and household characteristics (Ademuwagun, 1976; Bernstein, Stibich, & LeBaron, 2002; Ceylan et al., 2009; Flatie, Gedif, Asres, & Gebre-Mariam, 2009; Macfarlane & Alpers, 2009; Peltzer, 2009; Pillay, 1996; Singh, Raidoo, & Harries, 2004; Sydara et al., 2005; Wong, Wong, & Donnan, 1995) and studies which include health beliefs (Mshana, Hampshire, Panter-Brick, & Walker, 2008; Peltzer, 2000; Peltzer, Preez, Ramlagan, & Fomundam, 2008; Pillay, 1996) model these beliefs to be exogenous rather than testing whether ethnicity is the driver of such attitudes and beliefs, in the spirit of Kroeger's (1983) original work, or are largely qualitative (Ae-Ngibise et al., 2010; Tabi, Powell, & Hodnicki, 2006).

The majority of existing studies investigating the role of culture in traditional medicines utilisation are anthropological in nature and advocate its evaluation within a social framework. Classic works all use social constructivist approaches especially in medically pluralistic societies where multiple providers and types of care exist (Anyinam, 1987; Evans-Pritchard, 1937; Kleinman, 1980; Mechanic, 1986; Press, 1978; Rivers, 1924; Stoner,

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<sup>6</sup> For anthropological or sociological approaches looking at culture (specifically, religion) in explaining economic outcomes, see Weber (1930) and Bellah (1985).

1986; Tsey, 1997; Turner, 1968; Twumasi, 1979; A. Young, 1982). Culture is central to anthropological approaches, because individuals are seen to be operating within surroundings in which preconceptions of practically everything related to illness are formed (Winkelman, 2009). Rivers (1924) argues that we must first start with an understanding of how an individual perceives his/her disease before we can understand observed actions. All health seeking behaviour is the result of a process involving identification of causation, followed by aetiology, diagnosis then prognosis. While biomedical diagnoses would consider disease to be caused by, or the result of, biological, physical or chemical abnormalities within the body (informed largely by germ theory and increasingly genetics), anthropological understandings would deem illness to involve more than simply a biomedical explanation, placing the individual within a societal context to recognize conceptualization of illnesses, risk, care seeking behaviour and utilisation to all be fundamentally determined by the cultural environment (Winkelman, 2009). Rivers gives an example whereby he depicts a person falling off a tree. Modern medicine would characterise this as an accident, perhaps owing to a loose branch or carelessness. Traditional explanations would blame a sorcerer or spirit for loosening a branch. In these two scenarios, given that the causation differs, it naturally follows that the appropriate treatment is divergent. Ills within a society can also manifest within an individual, at which point social relations and their responses are crucial (Hevi, 1989). Thus, legitimacy of medicinal products is argued to be given by local communities, institutions, and symbolic values.

Another example of this is given in Haram (1991). Haram argues that the Tswana concept of tuberculosis (TB) differs from that given by biomedicine in that locals believe TB to be caused by infection with 'bad blood' (carried by people in 'special' conditions such as pregnant women, widows, or women who have just given birth) and are transmitted via children born 'in the wrong position' (the child is not born with his head facing upwards p169). The child is then thought to catch a cough, or the symptoms relating to TB. TB is also believed to be caused by sorcery. If such beliefs about TB are not understood or accepted by biomedical professionals, Haram argues, the Tswana are perfectly rational in

not using formal health care services that will, at best, treat symptoms but not the perceived cause.

In yet another example, Bierlich (1999) and Kirby (1997) both demonstrate how Ghanaians ascribe colours to medicines to distinguish their potency, type and use, and to label various stages of illness and differing roles of society. At the start of an illness, the 'white' stage, individual self-help is the dominant recourse. If the situation worsens, the colour 'red' is assigned and society is expected to step in with prescribed and agreed upon interventions. Further, it is believed that some plants are inactive as medicines until complementary rituals, consisting of prayers and libations to ancestors, are carried out.

Anthropologists who research medical pluralism and the cultural influence in utilisation of traditional medicines would thus concur that biomedical explanations are just one of many when individuals evaluate disease and illness (Kleinman, 1980; Rivers, 1924). Such explanations are neither superior nor more valid, but tend to become infused into existing systems. Thus, a process of 'acculturation' occurs in an open, medically pluralistic system (Twumasi, 1979): ideas are assimilated, not displaced; outside knowledge is allowed to penetrate but not necessarily replace. Consequently, modern and traditional systems coexist, but do so whilst retaining distinct characteristics. Even where newer medicines have become available, older, traditional systems will remain important for some because of cultural beliefs, and the speed of acculturation is the key driver of changes in outcome.

The idea that cultural beliefs linger and evolve only slowly therefore seems to be clearly documented. Some argue that even when individuals emigrate, people hold ethnically linked beliefs over their lifetime, supporting the epidemiological approach and emphasising the 'portability' of culture. Owusu-Daaku and Smith (2005) show that Ghanaian women who have moved to the UK uphold Ghanaian perspectives about health and illness whilst adapting to the British health system. Barimah and Teijlingen (2008) study attitudes towards traditional medicines of Ghanaians living in Canada and find that 73% of respondents claimed that they had not changed their views about traditional medicines as a result of emigration. There were no significant differences in results when interviewing individuals who had been abroad for a long or short period of time. Further,

qualitative evidence show strong acts of agency whereby Ghanaians import traditional medicines back to Canada from their homeland in order that supplies do not run out. Ransford et al (2010) highlight the importance of cultural alternatives such as herbal medicines and traditional healers for Mexican immigrants as a result of belief and structural barriers to accessing formal health care in the United States. Sometimes, cultural alternatives were shown to be a coping strategy (ie a preference was held for formal care but were not used for some stated reason) but similarly individuals had considerable command over their health and individuals explicitly chose traditional systems.

However, cultural beliefs are not always the dominant force for explaining utilisation of health facilities. Young and Garro (1994) examine medical choices made in two Mexican villages to find that, despite similar attitudes and beliefs towards traditional and folk medical knowledge, the village with better accessibility (easier transport links and cheaper cost of care) utilised physicians significantly more than the village with poor accessibility. Similarly, only a fifth of people who did not seek physician care stated stronger preferences for traditional care, whilst transport issues explained over half the incidences of non-use. It therefore appears important to evaluate healer supply factors as covariates to the extent possible<sup>7</sup>.

### 1.2.2 Brief structure of the health system in Ghana

The pluralistic health system in Ghana is recognised to be provided by four largely separate but intertwined sectors: public, private not for profit, private for profit and the traditional sector (Ghana Health Service, 1995). This is the typical institutional design of health systems in developing countries (World Health Organization, 2002). Owing to lack of documentation on the traditional sector, it is often difficult to analyse utilisation rates and the extent to which healers operate. However, it is known that there exist a wide variety of

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<sup>7</sup> It is possible that people in the sample are choosing to visit a healer who lives close by, or simply because there are many around the vicinity. Controlling for such supply side factors would also enable us to proxy for healers having similar characteristics as users (i.e. belonging to the same ethnic groups and hold similar cultural attitudes). If it is found that cultural attitudes are still significant in explaining TM/H utilisation, it would seem reasonable to conclude that despite supply and related healer characteristics, individuals value traditional practices for their perceived benefits alone rather than because one culture receives better care because of what healers from their culture have to offer (thus, the utilisation effect is through demand, not supply).

healers. For example, diviners, (spiritual and non-spiritual) herbalists, bonesetters and traditional birth attendants all have different foci and specialise in certain diseases, illnesses or needs. Such systems have long been in place and its evolution is a result of historical circumstance. Before British colonialists ruled Ghana, traditional medicines were the norm and it was only with time that scientific medical practices came to be accepted with the indigenous population:

*‘institutions, then, arise to meet the needs of men, and societal, cultural, and material circumstances determine the nature and type of the institution...the institution of traditional medicine, we must emphasize, emerged from the cultural material of Ghanaian society...human behaviour and, hence, the institutions that organize the behaviour of its members into meaningful patterned activities arise from the culture of the people’ (Twumasi, 1979, pp. 29-30).*

TM/H systems are thus culturally rooted but socially evolving. In line, Anyinam (1987) argues that whilst TM/H largely offers ‘available, accessible, acceptable and adaptable’ services, in recent years the changing landscape of African societies has forced a re-examination of these four dimensions. With an increase in availability of biomedical facilities, it is no longer the case that traditional healers are necessarily the most accessible; similarly, he argues that we should not assume the popularity of healers in light of progressively more acceptable biomedical services.

In 2003, an Act of parliament (Act 650) was passed to assure a National Health Insurance System (NHIS) for all Ghanaians. The stated goal of the NHIS is ‘to ensure equitable universal access for all residents of Ghana to an acceptable quality of essential health services without out-of-pocket payments being required at the point of service use’ (Mensah, Oppong, Bobi-Barimah, Frempong, & Sabi, 2010). The NHIS covers in and outpatient services, oral health eye care, emergencies and maternity care but a list of exclusions also apply. By 2004, the scheme guaranteed cover for around 90%-95% (Mensah, et al., 2010) of the most important medicines upon registration and payment of a fee. Currently (2011) the minimum premium is 7.2Ghc (approximately 2.5 cedi=1 GBP), and the maximum 48Ghc (National Health Insurance Scheme Ghana, 2011) depending on

financial status, determined by the District Health Insurance Committees which classes citizens into four categories of ability to pay: the core poor/indigent; the poor and very poor; middle class; rich and very rich. Exemptions are made for the core poor and indigents (those without income, fixed residence and without support from other persons, dependants and pensioners) and expectant mothers. People working in the formal sector automatically contribute 2.5% of monthly pay to the Social Security and National Insurance Trust (SSNIT).

### **1.3 Methods**

#### **1.3.1 Sampling and data collection**

Data were collected in structured questionnaires with local research assistance. A total of 772 households - consisting of information on 4713 individuals – were surveyed using WHO approved methodology. Specifically, this involved cluster sampling using three reference facilities (public health facilities) in four districts of two regions. The two regions (Greater Accra and Upper West) were purposely chosen for their contrasting characteristics, and districts within included the capital (Accra Metropolitan and Wa), plus two other more rural locations (Dangbe East and Jirapa). Reference facilities were randomly selected, from where household clusters were chosen within three radii: 0.5-5km; 5-10km; 10km+. Research assistants were selected using minimum criteria, which, amongst other things, included minimum undergraduate education, fluency in local dialects and English, and previous fieldwork experience. Final selections were made only after a week of intensive training in the classroom and on the field, for which everyone was paid. Prior to fieldwork, ethical approval was obtained from the ethics board at London School of Economics and the host institution in Ghana, Kwame Nkrumah University of Science and Technology (KNUST) in Kumasi.

In addition to basic socioeconomic and demographic indicators, health needs and utilisation patterns, attitudes and beliefs towards TM/H were courted from a household representative, defined to be someone who makes the main health care decisions of the household, thus has good knowledge of health care expenditures and actions undertaken by all members.

### 1.3.2 Data

A brief summary of data is given here, with fuller details in the Appendix 1. The data comprises 741 individuals with healthcare need, from whom measurements describing socioeconomic background (ethnicity, religion, wealth, insurance, age, sex, education and occupation of head of the household), disease (type and severity), and healer supply characteristics (closeness), urbanity) were collected. The sample consists of Dagartis (34.6%); Ga/Dangbes (28.2%); Walbis (18.1%); Akans (6%) and other groups (13.2%), representing Ewes, Hausas, Dagbanis, Nzemas, Sissales and other unnamed ethnicities. The majority of individuals were classified Christian, (68.6%) followed by Muslim (25.2%) and two smaller groupings, 'no religion' 'other' religions, each consisted of about 3% of the sample. This is in line with the fact that Ghana is a predominantly Christian country, with Islam as the second most popular religion (Ghana Statistical Service, 2008). Wealth was measured as a simple sum of assets<sup>8</sup> with the average household owning 6 out of 14 assets<sup>9</sup>. Households were categorised into three bands of wealth; poor (36.8%), medium (45.6%) and rich (17.5%). 61.8% of individuals had national health insurance coverage, with only a few holding private policies. This is in line with the national average (National Health Insurance Scheme Ghana, 2011). The population sampled was reasonably young; the mean age was 30, and 58.7% were females. Turning to education and occupation 40% of heads of households had no education whatsoever, 31.84% had some primary education and 27.89% had attained junior level schooling. Nearly 35% were farmers/fishermen/manual labourers, with the rest being employed (11.2%), self-employed (28.88%) or retired/unemployed (24.97%). The occupational distribution reflects the predominantly rural nature of Ghana. Disease characteristics indicate that 301 (40.6%) suffered from at least one chronic condition and a third of the sample rated their illnesses as 'serious'. Many households (86.4%) had one TH (defined as a fetish priest, herbalist both non spiritual and spiritual, or a spiritual diviner) within 15 minutes' walking distance. About half the sample lived in an urban area (defined as residing in the regional capitals of Accra Metropolitan and Wa Central). Finally, household characteristics show a

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<sup>8</sup> Electricity, air conditioning, tap with running water, own toilet, TV, fridge, mobile phone, radio, bed, car, tractor, motorbike, bicycle, another property (eg shop, second home)

<sup>9</sup> For discussion on validity of using wealth as a proxy for income, see Bollen et al (2001)

fairly even spread of households located at 0.5-5km, 5-10km 10km+ from a major public health facility, with about a third of the sample in each radius. This variable was used to achieve standard errors adjusted for clustering.

The subsequent section provides an overview by variable according to the dependent variable measuring TM/H use, followed by an exposition of attitudes and beliefs held by users and non-users.

### 1.3.3 Distribution by traditional medicines/healer use

The dependent variable, *tradever*, measures whether an individual used traditional medicines or healers during the course of acute and chronic illness. 231 stated that they had used TM/H (31.17%), the most common sources being self-medication by herbs or the use of non-spiritual herbalists. Most incidences of use were accounted for at the second or third stages of care seeking rather than as a primary choice. Already, then, it is clear that upon experiencing symptoms, it is not the default choice, but a back-up option, to utilise TM/H (Turshen, 2001). This suggests there are other factors other than availability of formal health care facilities that determines TM/H utilisation.

Table 1 shows the distribution of TM/H use by variables as described in section 3.3. Column totals, by variable, are presented for both users and non-users. Statistics show 44.6% of TM/H users were Dagarti, whilst 25% were Ga/Dangbes. The majority of users were Christian (68.8%), followed by Muslim (21.6%). Wealth is a good indicator of use; the poorer tend to use TM/H more than the rich. Both the insured and uninsured display high likelihood of utilising TM/H, suggesting that users' behaviours are not driven solely by a financial rationale. Chronic illness sufferers, and individuals who classify their sickness to be 'serious' appear to have tried TM/H more than non-chronic sufferers and individuals who perceive their illnesses to be less serious. Older individuals and marginally more females than males use TM/H, and the less educated seem to use more than the highly educated. People working on the land and those with labour-intensive work (farmers/fishermen/manual labourers) have larger propensities to use than those with other occupations. Interestingly, individuals who have a TH within 15 minutes' walk are as



likely to use as not use, whilst households located in urban areas are less likely to utilise TM/H than people living in non-urban areas.

**Table 1 - Descriptive Statistics of TM/H use**

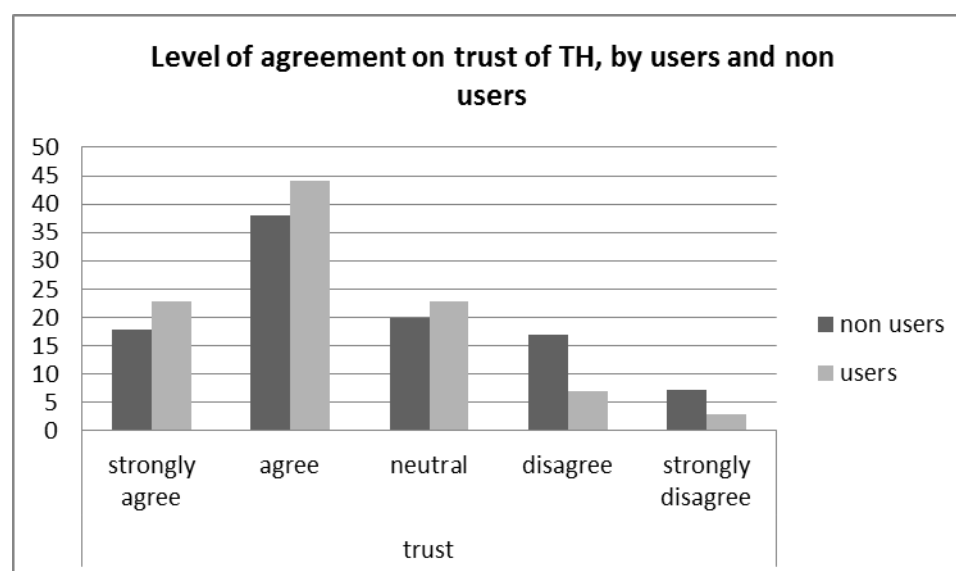
	<b>Tradever</b>	<b>Did not use (%)</b>	<b>Used (%)</b>
ethnicgroup	Akan	5.9	6.1
	Ga.Dang	29.8	24.7
	Other+	15.3	8.7
	Walbi	19.0	16.0
	Dagarti	30.0	44.6
Wealth	Poor	31.4	48.9
	Mid	48.4	38.5
	rich	19.8	12.6
insurance	none	36.9	41.1
	insured	63.1	58.9
gender	male	42.0	39.8
	female	58.0	60.2
religiousgroup	Christian	68.4	68.8
	Muslim	26.9	21.6
	Other	2.9	3.0
	None	1.8	6.5
education	none	36.9	47.8
	primary	31.8	32.0
	junior+	31.4	20.2
occupation	farmer	32.4	40.7
	employed	12.5	8.2
	own business	28.6	29.4
	None (unemployed, student etc)	26.5	21.6
Disease type	not chronic	66.9	42.9
	chronic	33.1	57.1
severity	serious	29.0	35.5
	mid	64.9	61.9

	low	6.1	2.6
tmpclose	does not have TMP within 15 mins walk	13.3	14.2
	has TMP within 15 mins walk	86.7	85.8
urban	not urban location	46.9	55.4
	urban location	53.1	44.6

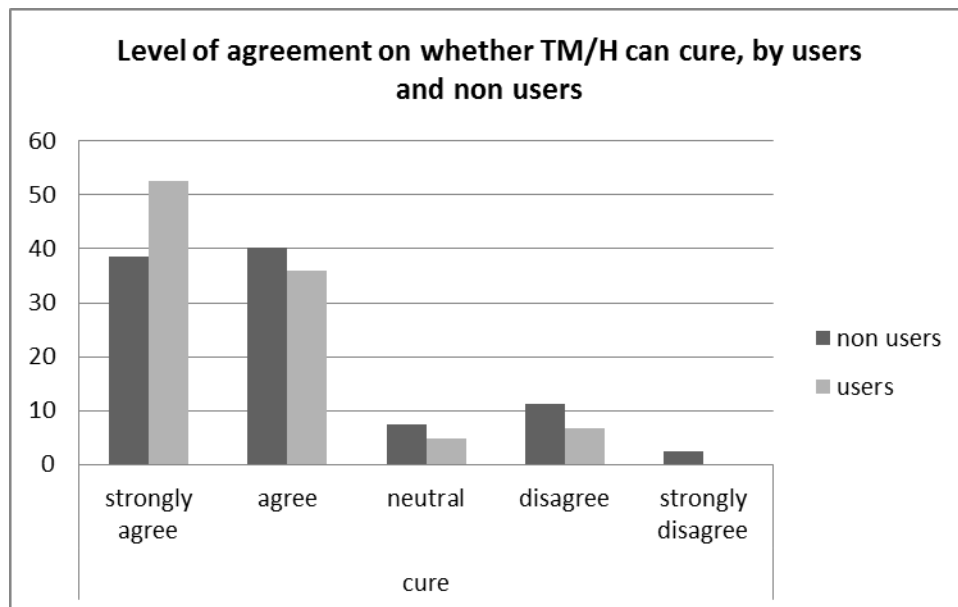
#### 1.3.4 Attitudes and beliefs held by users and non-users

Descriptive statistics of selected attitudes and beliefs held by users and non-users are similarly presented here (full details in Appendix 2). Users generally expressed a stronger level of agreement when asked whether they trusted healers, although even non users were inclined to concur with this question. A larger proportion of non-users compared to users, however, believed that neither TM nor TH could cure illnesses. Over 50% of users strongly agreed that TM/H had powers to cure illnesses, and no one categorised as a user strongly disagreed that TM/H could cure. Traditional practices were generally thought to be well accepted in the regions surveyed.

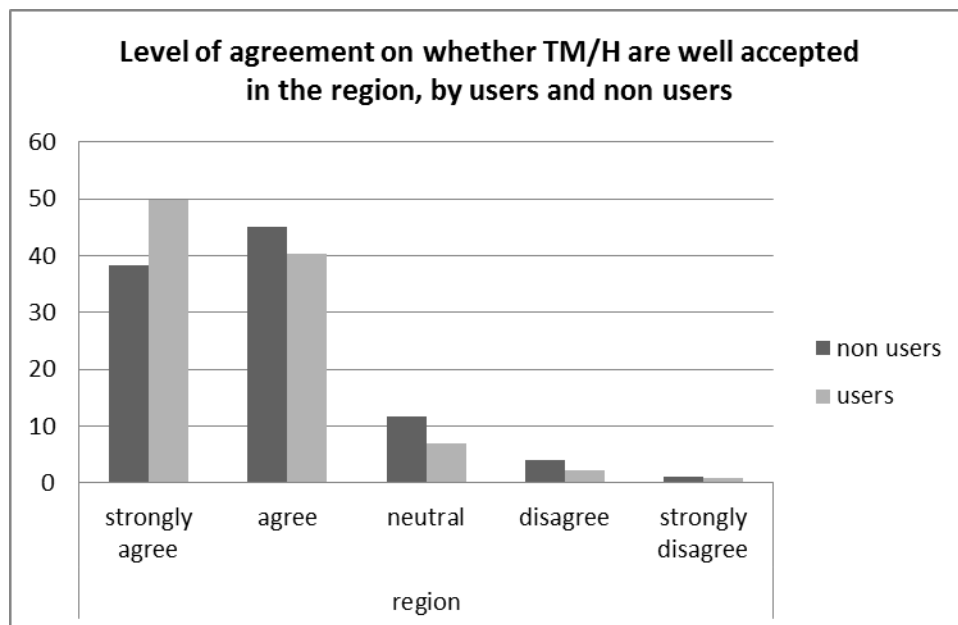
**Figure 2 - Level of trust, by users and non-users**



**Figure 3 - Level of ability to cure, by users and non-users**



**Figure 4 - Level of acceptability, by users and non-users**



### 1.3.5 Model

This study is an attempt to bridge the gap between social science disciplines by exploring the role of cultural explanations and the following demonstrates how this will be achieved. Methods are strongly influenced and therefore closely mirror the work of Guiso et al (2006), Fernandez and Fogli (2006); Arruñada (2010); Tabellini (2010) who all investigate the role of culture on economic outcomes.

Firstly, the direct relationship between ethnicity and TH/M use can be analysed, using probit models and standard maximum likelihood as per previous studies looking at choice of health care provider. This was to allow for binary response for the outcome variable, probability of use of traditional medicines ( $y_i = 1$ ), denoted as 0 if the individual did not use. The probit distribution was chosen over the logit distribution for ease of comparison when applying instrumental variables' probit. The baseline probit and multivariate probit models, respectively, are as follows:

$$P(y_i | \text{need}) = \Phi (X'_i \beta + \varepsilon_i)$$

$$P(y_i | \text{need}) = \Phi (X'_i \beta + Y'_i \gamma + D'_i \delta + S'_i \tau + U_i \omega + \varepsilon_i)$$

Where  $X'$  denotes vector of the main variables of interest (ethnicity),  $Y'$  represents socioeconomic characteristics,  $D'$  represents disease characteristics,  $S'$  represents healer supply characteristics,  $U$  represents urban dummy,  $\varepsilon_i$  represents errors and  $\Phi (.)$  is the standard normal cumulative distribution function.  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\tau$  and  $\omega$  are coefficients to be found. If not all ethnicities are not associated with utilisation, the variable can be used as an instrument for culture, through the instrumental variable (IV) approach:

Three steps are necessary for this to be valid:

- 1) People of a certain ethnicity hold certain cultural attitudes and beliefs: ethnicity shapes attitudes. This was partially shown in the introductory paragraph (figure one).
- 2) In turn, cultural attitudes and beliefs must be associated with outcomes (actual utilisation).

3) Isolate cultural components of attitudes and beliefs by instrumenting with their cultural determinants (ie ethnicity).

IVs use only the part of the variability in culture – a part that is uncorrelated with the omitted variables – to estimate the relationship between culture and TM use (Angrist & Krueger, 2001). IVs therefore solve the omitted variables problem and measurement error issues, to produce consistent<sup>10</sup> and unbiased<sup>11</sup> estimators. Ultimately this means ethnicity may not explicitly belong in a regression and is thus omitted, but is represented by corresponding cultural beliefs and that the only effect on use of traditional medicines is exogenously through culture, not ethnicity per se. By carrying out step three, it is possible to isolate the exogenous variation in culture from the endogenous variation due to unobserved error terms (Guiso, et al., 2006, p. 3). Using IVs thus negates the worry of reverse causality and that culture is potentially endogenous (i.e. that the use of TM/H reinforces the culture of TM/H). The suitability of ethnicity as an instrument is tested using OLS (with culture as dependent variable, ethnicity as independent variable plus all controls - Appendix 3 - and confirmed in the first step regressions (not shown here, available upon request). The instruments must further be uncorrelated with the error term in the output regression, which is tested using the Wald test of exogeneity.

Polychoric principal components analysis (PCA) (Kolenikov and Angeles 2004), is carried out on nine attitudes to form a composite index of culture (Appendix 4). PCA is a statistical technique used to reduce into a few indices (or ‘components’) similarly related variables. From an initial set of attitudes and beliefs, PCA creates uncorrelated indices, where each is a linear weighted combination of the original variables (Vyas & Kumaranayake, 2006). The weights of each component are given by the eigenvectors of the correlation matrix (covariance matrix if data are not standardized) and the variance for each component is given by the eigenvalue of the corresponding eigenvector. Principal components are extracted based on associated eigenvalues being greater than one and the elbow on the

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<sup>10</sup> Estimator converges to the population parameter as the sample size grows (Angrist and Krueger 2001; Wooldridge, 2002)

<sup>11</sup> Estimator does not have the sampling distribution centered on the parameter of interest (Angrist and Krueger 2001, Wooldridge 2002)

screeplot (Appendix 5). Further discussion of PCA is given in Filmer and Pritchett (2001); Kolenikov and Angeles (2004); Moser and Felton (2007) and Njong and Ningaye (2008).

## **1.4 Results**

### **1.4.1 PCA results**

Following polychoric PCA, it was decided to keep the first two components, which both displayed Eigenvalues (variance of components) greater than one and explained 60% of the total variation in data (a screeplot is given in Appendix 5). Items and corresponding factor loadings (correlations between the variable and the component) are presented in Appendix 6 within the component matrix. The top four items loading on the first component were, in decreasing order: trust, cure; service; and region. Accordingly, the loading plot (Appendix 7) shows these dimensions to be grouped together. For the purposes of this paper, only the first extracted principal component will be used in regressions henceforth, as it is only possible to use one at a time with the IV technique.

Table 2 shows the results for a baseline probit model with and without control variables (models I and II respectively). All coefficients are marginal effects, so outputs are given as percentage changes and standard errors are corrected for clustering. These probit models show that ethnic groups (asides from those belonging in ‘other’ groups) are mostly not associated with TM/H utilisation, making it an ideal instrument for culture. In contrast, an individual’s wealth is, as expected, significantly negatively related to TM/H utilisation, with individuals in the middle and rich categories both revealing about 12% less likelihood of ever using TM/H, *ceteris paribus*. Insurance also has a negative effect on utilisation, although the result is not significant. This may be because the effect of wealth overrides the effect of insurance. Older people and females are marginally more likely to utilise but the magnitude on both coefficients is small. Individuals stating that they belong to ‘other’ religious groups are significantly less likely than Christians to use TM/H, whilst those without any religious affiliation are about 20% more likely to use traditional practices<sup>12</sup>.

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<sup>12</sup> When undertaking fieldwork, individuals who were affiliated with any religious denomination (as opposed to atheists) commented on how the use of healers –especially spiritual healers - contradicted their beliefs in

This is in line with findings of Peltzer et al (2008) who show that in South Africa, those with no religion are more likely to use herbs, and Tabi et al (2006), who find some Christian and Muslim interviewees in Ghana believed TM had demonic influences and thus preferred to use modern medicines. The effect of education is mixed, as results show those with a little more than 'no education' have a slightly higher propensity to utilise TM/H, but those with the highest levels of education appear to use less. However, both these results are insignificant, and perhaps reflect the somewhat inconclusive findings of studies looking at associations between education and traditional medicines use (Ceylan, et al., 2009; Kim et al., 2008; Peltzer, et al., 2008; Singh, et al., 2004; Stekelenburg et al., 2005). Some of these studies also suggest that the more educated hold more self-confidence and are inclined to know better how to self-medicate (Okumura, Wakai, & Umenai, 2002), and this may include traditional medicines. An individual whose household head has his/her own business or is not in employment is less likely than households headed by farmers/fishermen/manual labourers to utilize TM/H. This is unsurprising as households living and working in the countryside will tend to have easier access to herbal medicines.

When considering disease characteristics, chronic sufferers have a significantly greater tendency to use TM/H over non-chronic sufferers, perhaps having exhausted alternatives, or to use in conjunction with modern medicines. People with chronic illnesses will additionally seek substitutes if marginal costs – direct or indirect- to obtain constant supplies of modern medicines are large, or if they consult friends and family who encourage self-medication by tried and tested herbal remedies. Individuals with less severe conditions are less likely to use TM/H. This is unexpected, but may be explained by the possibility that individuals conflated severity with duration and thus those with chronic illnesses thought their illnesses to be serious; as the table shows, those with chronic illnesses were more likely than those without to use TM/H, perhaps as an additional remedy to modern medications.

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God because healers were frequently seen to be worshipping minor/lesser known deities, or using spiritual elements in delivery of treatments.

**Table 2 - Probit models**

	I	II	culture as exogenous III
Culture			-0.024*** [0.006]
Ethnicity - Ga/Dang	-0.046 [0.057]	-0.07 [0.060]	-0.064 [0.074]
Ethnicity - other	-0.115*** [0.038]	-0.132*** [0.050]	-0.165** [0.073]
Ethnicity - Walbi	-0.042 [0.080]	-0.05 [0.070]	-0.104* [0.057]
Ethnicity - Dagarti	0.081 [0.065]	0.095 [0.060]	0.052 [0.060]
Wealth - mid		-0.118*** [0.043]	-0.121** [0.048]
Wealth - rich		-0.115*** [0.029]	-0.118** [0.054]
insurance		-0.063 [0.067]	-0.071 [0.074]
age in years		0.003*** [0.001]	0.004*** [0.001]
sex		0.007 [0.031]	-0.004 [0.030]
Religion - Muslim		0.012 [0.062]	0.016 [0.066]
Religion - other		-0.090*** [0.018]	-0.108*** [0.034]
Religion - none		0.196* [0.116]	0.157 [0.137]
Education - junior		0.038* [0.022]	0.035** [0.015]
Education - senior+		-0.005 [0.066]	-0.015 [0.067]
Occupation - employed		0.024 [0.038]	0.03 [0.036]
Occupation - own business		-0.036 [0.046]	-0.023 [0.050]
Occupation - none (unemployed etc)		-0.094** [0.040]	-0.102** [0.047]
chronic		0.195*** [0.043]	0.203*** [0.028]
Severity - mid		-0.018	-0.012



		[0.047]	[0.053]
Severity - low		-0.143***	-0.186***
		[0.052]	[0.053]
tmpclose		0.026	0.017
		[0.070]	[0.070]
urban		0.026	0.032
		[0.064]	[0.069]
Constant			
Observations	741	670	632
Pseudo R-squared	0.019	0.12	0.134
Log pseudolikelihood	-451.066	-374.677	-349.742
Robust standard errors in brackets, clustered by radius			
* significant at 1%; ** significant at 5%; *** significant at 1%			

Supply characteristics show that having a healer close by increases the likelihood of TM/H use. Having one (compared to none) within fifteen minutes' walking distance is conducive to utilisation. There are similar impacts of urbanity, although neither have significant effects.

Model III includes the cultural index as an exogenous factor. Culture is significantly associated with TM/H use: as individuals increase in disagreement about positive statements on TM/H, the probability of utilisation is expected to fall<sup>13</sup>. This result is significant at 1%. Wealth still remains an important predictor, alongside age, being in the 'other' religious category, being slightly educated, being unemployed, suffering from a chronic illness and having a low severity illness.

In summary, these models indicate the suitability of ethnicity as an instrument as it is little associated with utilisation. Further, culture as an exogenous variable is a significant predictor of TM/H use, as well as wealth and disease characteristics.

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<sup>13</sup> The interpretation of principal components is not straight forward and is not interpretable in terms of magnitude

### 1.4.2 The effect of culture as an endogenous variable

To test the effect of culture as an endogenous variable, the next two models use ethnicity as an instrument for culture as measured by a compounded index. First stage outputs are available upon request.

**Table 3 - Culture as endogenous variable**

	5 point scale	insured subset using 5 point scale
	IV	V
Culture	-0.238*** [0.072]	-0.301*** [0.111]
Wealth - mid	-0.334** [0.141]	-0.303 [0.216]
Wealth - rich	-0.304 [0.233]	-0.174 [0.309]
chronic	0.588*** [0.106]	0.769** [0.303]
severity - mid	0.033 [0.099]	0.047 [0.144]
severity - low	-0.613*** [0.094]	-0.693 [0.554]
Insigma	0.244*** [0.046]	0.21** [0.088]
athrho	0.224** [0.097]	0.28 [0.173]
sigma	1.276 [0.059]	1.233 [0.109]
rho	0.22 [0.092]	0.273 [0.160]
Wald test of exogeneity $p > \chi^2$	0.021	0.105
log pseudolikelihood	-1403.88	-820.581
Observations	632	379
clustered, robust standard errors in brackets		
*significant at 10%; ** significant at 5%; *** significant at 1%		
Standard controls are also included but not shown		

In model IV, the full sample is used to estimate the effect of culture on utilisation. Model IV is directly comparable with model III, but a condensed table is presented here for clarity. Whereas model III uses culture directly as an exogenous independent variable evaluated

using probit, model IV interprets culture as endogenous and evaluates it using ivprobit. Again, all results are given as marginal effects. As with model III, culture displays a negative coefficient, thus as individuals state stronger disagreement with 'favourable' statements on TM/H, they are less likely to utilise them. Additionally, wealthier individuals are shown to be less likely to utilise TM/H. For example, being in the mid wealth category (as opposed to poor) reduces the chances of utilisation by 33%. Important socioeconomic variables include age (positive effect) and belonging to the 'other' religious group, but as with model III there are no significant effects of education on utilisation patterns. There also appear to be no influences of employment. More importantly, however, disease characteristics seem to heavily affect utilisation. An individual with chronic illness is estimated to have a 59% more likelihood of utilising TM/H than a non-chronic illness sufferer, whilst someone who has classed their illness as low severity has a 61% less likelihood of use than an individual who has stated high severity. The null hypothesis of exogeneity (indicated by the Wald test) shows that the p value is 0.021, thus  $H_0$  is rejected and it is plausible to conclude that error terms in the probit and the instrumented regression are correlated and therefore instrumenting the endogenous variable was the appropriate decision. The estimated rho coefficient, at 0.24, indicates that there is a positive correlation between the errors in both estimated equations: unmeasured factors making it more likely for culture to be prominent also make it more likely that an individual will utilise TM/H, conditional on other independent variables.

In order to see the impact of the various covariates given insurance coverage, a sub sample of insured individuals is tested in Table 10 under model V. The variable 'other religion' is predicted perfectly in this case and is therefore dropped from regression. Results show that even for insured individuals, the role of culture is still very important, holding its negatively significant effect. The coefficients on the wealth variables are no longer significant, suggesting that once an individual holds insurance, wealth no longer predicts well the probability of TM/H utilisation. For the insured other determinants of utilisation also differ slightly. For example, having no religion, employment factors and having a chronic illness and urban are significant indicators. Results suggest that these controls, however, do not negate the impact of culture, which stands robust even for the insured.

In summary, models IV and V show that culture is a strong predictor of TM/H utilisation when modelled endogenously, and this holds true even for the insured subset.

#### 1.4.3 Robustness checks – Ordinary PCA and IV extension

Two main robustness checks are carried in this section: firstly by using ordinary PCA, and secondly by running the baseline model on a different set of instruments. The main body of this paper has used polychoric PCA and responses on a 5 point Likert scale to derive the culture variable. In the first part of this section, responses are instead collapsed into two categories (those who responded ‘strongly agree’ or ‘agree’ versus everyone else<sup>14</sup>), analysed using ordinary PCA and regressions rerun on the full sample (model VI) and insured subset (model VII) to test for robustness against models IV and V. Both models VI and VII confirm the results of models IV and V respectively, namely that culture is negatively significant, wealth is a strong predictor in the full sample but not in the insured subset, and that disease characteristics play an important role. Further, the magnitude of many of the variables is similar in size, suggesting that evaluation by ordinary or polychoric PCA largely gives the same output. Wald tests are also significant in both cases.

Secondly, the variability of results according to a different set of instruments is tested. In the main body of the paper, ethnicity is used as instruments for their theoretical and empirical characteristics. It was argued that ethnicity was a slowly changing variable affecting attitudes and beliefs, which in turn affected utilisation. Here, religion is added as an additional instrument, in line with Durlauf and Blume’s (2008) definition of culture as ‘customary beliefs and values that ethnic, religious and social groups transmit fairly unchanged from generation to generation’. Model VIII confirms the importance of culture, wealth and disease characteristics, with variables all exhibiting expected signs and magnitudes. These results, however, are not over-emphasised as neither Wald nor overidentification tests are passed. As such, they serve to indicate that ethnicity, rather than religious group is a stronger instrument and the analysis in this paper is limited to the extent that one deems these IVs appropriate.

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<sup>14</sup> Checks were also run by separating into ‘strongly agree’ and the remainder. Results are very similar and therefore not presented here.

**Table 4 - Robustness checks**

	extention - rel+eth as instruments		
	VI	VII	VIII
Culture	-0.302*** [0.102]	0.343*** [0.129]	-0.162*** [0.025]
Wealth - mid	-0.295** [0.123]	-0.299 [0.208]	-0.395*** [0.146]
Wealth - rich	-0.347* [0.200]	-0.264 [0.267]	-0.405** [0.194]
chronic	0.576*** [0.120]	0.772** [0.325]	0.570*** [0.123]
severity - mid	0.057 [0.078]	0.079 [0.125]	0.012 [0.134]
severity - low	-0.553** [0.226]	-0.653 [0.606]	-0.620** [0.266]
Insigma	0.309*** [0.040]	0.274*** [0.031]	0.244*** [0.046]
athrho	0.354*** [0.137]	0.392* [0.201]	0.121** [0.057]
sigma	0.136 [0.407]	1.315 [0.040]	1.276 [0.059]
rho	0.34 [0.121]	0.373 [0.173]	0.12 [0.056]
Wald test of exogeneity p>chi2	0.01	0.052	0.034**
log pseudolikelihood	1444.398	-844.491	-1407.915
Observations	632	379	632
clustered, robust standard errors in brackets			
*significant at 10%; ** significant at 5%; *** significant at 1%			
Standard controls are included but not shown			

#### 1.4.4 Summary of findings

In summary, the various specifications estimated show that culture has significant effects on TM/H utilisation. This holds true when culture is modelled exogenously (by probit) or endogenously (by ivprobit). Specifically, those indicating stronger disagreement with favourable statements towards TM/H are less inclined to utilise. Significant co-predictors

include wealth and disease characteristics, with the wealthy, individuals with chronic and low severity illnesses all typically displaying less likelihood of utilising TM/H.

Both models III (culture is exogenous) and IV (culture is endogenous) suggest that: “culture is important, but if the wealthy have a choice, they are less likely to use TM/H”. Even if an individual holds insurance, culture is important, although the significance of wealth disappears (model V, which tests only the insured subset). Culture holds its significance when robustness checks through implementation of ordinary PCA and a different set of instruments are run. Overall, cultural and economic explanations therefore appear to play complementary roles in determining medicines utilisation.

In all models the null hypothesis that variables are exogenous was rejected. This suggests that at least some of the variables are not exogenous and thus the corresponding IV method was appropriate to use.

## **1.5 Discussion**

This paper has found empirical evidence to suggest that cultural attitudes and beliefs influence the utilisation of traditional medicines and healers. Our empirical strategy also addresses the problems of endogeneity of attitudes and beliefs: cultural values are here hypothesised to be shaped by an individual’s ethnic background, thus an instrumental variables technique - in which ethnicity served as an instrument for culture (as proxied by attitudes and beliefs towards TM/H) - was employed to test this claim. Findings suggest that culture matters: those holding negative attitudes are less inclined to utilise TM/H. The importance of culture holds even when controlling for other potential drivers of utilisation – socioeconomic variables (insurance, wealth, age, gender, religion, education, and occupation), disease characteristics (severity and type), supply factors (presence of healers) and location (urban). Further, subsamples of the insured were also tested and the strength of culture as a predictor stands. In further sensitivity analysis, ordinary PCA results are compared to polychoric PCA results, and religion is added as an extra instrument. In both cases culture is still found to be an important determinant of utilisation, but it was concluded that ethnicity, rather than religious affiliation, was the key driver of cultural attitudes. This is significant because whilst individual religious affiliation

is somewhat pre-determined, it can still be changed by volition, as has been the recent flourishing of Pentecostal religions in Ghana. On the other hand, ethnicity is pre-destined by ancestors. In many respects this concurs with the original argument that cultural values are path dependent phenomena, so stronger beliefs are likely to be driven by more concrete attributes such as ethnic identity.

These results are in line with numerous anthropological studies which assert the importance of cultural and societal explanations in understanding, identifying and curing illnesses. However, this is the first paper to test this claim using econometric techniques and thus merge both disciplines. Traditional medicines and healers have been in existence long before modern medicines became available, but in societies in which the latter are still out of reach for many, reliance on traditional systems is heavy. The trust in the system remains partly because Ghanaian society is essentially still traditional; a large proportion of the population live in rural areas and ascribe to informal institutions (Lyon, 2000). As such, even as Ghana modernises and the population becomes richer, utilisation of traditional medicines and healers is unlikely to disappear completely because even the rich and insured display cultural preferences for TM/H. In regressions, this was shown by the significant coefficient on culture even whilst controlling for dimensions of economic development such as higher wealth and health insurance. Thus, Twumasi (1979, p. 29) writes; ‘norms are enshrined in tradition. The best way to act is the way the ancestors have ordained; that which is legitimate is that which had been prescribed in the past’.

This study adds impetus to the view that individuals not only use healers because they are poor, uninsured or lack access to modern medicines. Individuals appear to be rationally choosing to utilise according to cultural beliefs and attitudes<sup>15</sup>. The nine amalgamated dimensions of attitudes and beliefs used to proxy for culture suggest that, even after controlling for endogeneity, individuals who agreed more strongly with favourable statements on: healer service; healer knowledge; trust towards healer; TM/H’s ability to cure; perceived safety; control and disease management; usability; and acceptance within

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<sup>15</sup> This is in line with TM/H being relational goods which model individuals as rational beings whose utility arises as a result of jointness of consumption (i.e. that similar others derive utility from utilisation too) (Uhlaner, 1989).

region and country were more likely to utilise TM/H. Each of these dimensions have intuitive explanations towards rationalising an individual's decision, but the top three with the largest loadings (as per the component matrix, Appendix 6) are extrapolated upon here. Firstly, individuals who claimed the highest levels of trust were inclined to utilise TM/H most. Trust is arguably a driving force of strong relationships between patients and healthcare providers in imperfect markets and under asymmetry of information. Trust indicates cooperation, mutual exchange and 'the optimistic acceptance of a vulnerable situation in which the truster believes the trustee will care for the truster's interests' (Hall, Dugan, Zheng, & Mishra, 2001, p. 615). In the case of traditional healer use, trust enables interpersonal (as opposed to formal institutional or organisational) communication between providers and users and facilitates interpersonal bonding. Areas with lower levels of institutional infrastructure and guarantees typically garner less public trust (van der Schee & Groenewegen, 2010) and people are more likely to be reliant on informal systems of care, reinforcing the importance of interpersonal networks. In fact, poor patient-provider relations are found to be a large push factor for the poor to visit private providers in Sri Lanka (Russell, 2005). Further, trust is found to be an important determinant of healthcare provider choice, both public and private, in Cambodia, where characteristics such as honesty, sincerity, confidentiality and gentleness are listed as top reasons for the patient's choice of provider (Vincent & Furnham, 1996).

Secondly, users of TM/H were confident of its ability to cure, a finding supported by a study from Trinidad that shows 87% of herb users perceive herbal medicines to be more efficacious than modern medicines and therefore continue to utilise them (Clement et al., 2007). In TM, however, the conceptualisation of efficacy is not necessarily aligned with that presented in biomedicine (Waldram, 2000). Illness meanings and interpretations differ according to cultural systems, to the extent that within the realm of TM/H elimination of disease is not always the end goal but treatment in itself is valued (Cartwright & Torr, 2005). Ability to cure is therefore a subjective term, defined in terms of the perceptions and interpretations of the individual, which are in turn formed by surroundings and the environment (for a detailed exposition on this, see (Mechanic, 1986; Waldram, 2000). This is true across biomedical systems and traditional systems as well as



within each system. Individuals holding positive views on healers' ability to cure clearly see them as professionals much as believers of modern systems would biomedical doctors.

Thirdly, healers were valued for their good service. 'Service' describes the manner in which knowledge, skills and practices are relayed to and perceived by patients. It may be the case that individuals are impressed by the level of care and attention provided by healers, who typically afford them long consultation times, special treatment such as divination and other services not provided in the modern health care sector (Astin, 1998b)

. One study in Bolivia predicts that healers with extensive family history and anthropogenic activity in traditional medicines practice have greater knowledge about medicinal plants. This finding is robust when controlled for environmental factors and ease of access to modern health care infrastructure (Furnham & Kirkcaldy, 1996). Such knowledge, in turn, is likely to be imparted in a more user-friendly manner when settings are informal and localised.

By using a healer supply side variable, it has also been possible to proxy for locality, and in line, that healers themselves might exhibit similar cultural characteristics to users. This is comparable to Leonard (2003), who argues that healers and users depend on culture for outcome contingent payment systems to be successful, as levels of trust and ability to enforce unwritten contracts is high in small scale communities. In Leonard's model, culture is modelled as a supply variable (ie the healers' characteristics) whereas here, the emphasis is more on users' demand for TM//H. Controlling for disease characteristics also allows the modelling of the possibility that individuals may be choosing healers according to disease type. Specifically, the models here show that chronic illness sufferers and those who rate their illness as less severe, perhaps as a result of normalisation, have a larger likelihood of using TM/H. This is highly suggestive of the fact that individuals with longer lasting illnesses are likely to try as many alternative modes of therapy as possible in the search for a remedy. Such findings complement studies on multiple treatment seeking behaviour and polypharmacy (Astin, 1998a; Singh, et al., 2004) and points to the need for further analysis of utilisation patterns.

Traditional forms of healing (often labelled Complementary and Alternative Medicines, CAM) are increasingly popular in developed countries where modern medicines access is arguably better. This additionally suggests that it is not merely a matter of lack of physical access but that there are stronger attitudinal and belief drivers, which leads people to choose this over modern medicines. It is also suggestive that use of traditional healing methods are not uniformly linear with wealth: less wealthy individuals in Ghana still record frequent TM/H use while more wealthy segments tend to avoid its use, but as countries themselves become richer, the use of 'alternative' forms of healthcare actually increases, possibly as additional, rather than substitutive therapy.

The overall findings of this study indicate that traditional medicines are not un-societal and cultural attitudes and beliefs affect health seeking behaviour. Traditional medicines, from understandings of its efficacy to what it represents to local people, are not a culture-free phenomenon. Its tradition appears to have stood the test of time: utilisation rates are still considerable even when modern medicines have become the dominant practice. Modern medicines has failed to completely displace traditional medicines and a process of 'acculturation' (Twumasi 1979), in which different cultures merge, has occurred. Consequently, modern and traditional systems coexist, but do so whilst retaining distinct characteristics and older, traditional systems will remain important for its users.

Several limitations to this study are outlined. Firstly, the construction of PCA may be sensitive to regional disparities, where some regions are more inclined to hold stronger views on TM/H. Regional differences were accounted for by estimation by clustering rather than dividing the sample, which is somewhat limited in its number of observations. Critics of PCA argue that the method is arbitrary (from the choice of indicators to the number of components retained), but it serves as a summary empirical method where otherwise serial correlation would be problematic. Further, the stability of polychoric PCA results was tested using ordinary PCA and results were reasonably similar. A second limitation is the inability to control for a larger range of supply side factors, in particular, characteristics of healers. Although locality of healers were used as a proxy for this, it would have been advantageous to have more indicators. In this sense, the study is demand, rather than supply focused. In this respect, the study aims to address the paucity in

demand literature on traditional medicines. The third limitation is with regards the instrumentation of culture. IVs would be deemed 'bad' if the instrument itself is strongly correlated with the omitted variables or the error term. Further, 'weak' instruments – those correlated with endogenous variables – can lead to bias. The key assumption for instrument validity is that ethnicity does not directly affect TM/H utilisation. All instruments and models were tested for exogeneity, however, it is arguably very difficult to find appropriate instruments for culture. By modelling merely with probit and ignoring endogeneity, however, the effect of culture is likely overstated. Thus, both sets of results are here presented, and argued that culture, however modelled, is a significant factor. It is further likely that insurance may itself also be endogenous. This claim was tested using automatic enrolment into insurance (as a formal sector worker) as an instrument, and although culture was shown to be a significant predictor of utilisation, results are not presented here as the instrument appears weak.

This study used a common, but not universally accepted definition of culture. Culture is commonly critiqued for being a descriptive notion without theoretical grounding (Kuper, 1999), holding variable meanings to different people, across time and space such that ethnicity might be considered fluid and situational. Consequently, it falls into the trap of being a 'catch-all' concept, categorised under a plethora of definitions (Kroeber, et al., 1952). Segments of grouped populations (Ga, Wala etc) exist under this umbrella term but in reality, nuances abound within these broad terms, resulting in 'intra-community variation' of values, norms and attitudes and consequently behaviour (Pelto & Pelto, 1975). Further, all individuals hold multiple identities and even if somebody has a primary cultural identity, they do not always abide by prescribed norms. Sociologists like Swidler (1986) argue that cultural values are not drivers of action directly, but indirectly so by equipping individuals with 'a 'tool kit' of habits, skills and styles from which people construct 'strategies of action'. Culture is given only an independent causal role, and it is by linking many sub strategies that people are able to organise end goals (Swidler 1986: 273, 277). The upshot is that one cultural system can lead to a large number of outcomes and actions, not necessarily consistent with one another and the call for a holistic approach to medicine would not be appropriate without taking into account different cultural attitudes

held by different ethnicities. This study explicitly assumed that culture influences action via attitudes and beliefs; given different circumstances, one would therefore expect these preferred ends to remain and strategies for attaining them to alter accordingly. If, on the other hand, as Swidler (1986: 277) contends, culture shapes the tools with which people create strategies of action, end values would fade into the background. Bibeau (1997) has similarly argued that actions precede beliefs and just because an individual is seen to act a certain way, it does not preclude him from acting in a seemingly contradictory manner. As such, the paper is limited to proxying by value statements rather than actual behaviour and studies analysing longer time series through generations would allow for causal statements to be made.

The policy implications of these findings are discussed. On a broader level, it is unlikely that traditional medicines and healers will be supplanted simply by increasing access to modern drugs, as individuals do not necessarily see them to be substitutes, owing to the often divergent logic of the two medical systems. How are we to tackle these two different systems to ensure safe and effective medicines utilisation, whilst at the same time taking a culturally sensitive approach? Past and present policy strategies (World Health Organization, 2002) largely advocate 'integration', of somehow placing traditional medicines within a biomedical framework, to bring it in line with acceptable levels of regulation and other formal institutional frameworks. Whilst these ideas have been scripted into policy documents, in practice full integration is a slow process requiring much more mutual understanding and time. As such, integrative policies have largely failed to inspire the biomedical world and further, have sidestepped the demand side of the equation. This study suggests that users are happily using traditional systems without modern influences and will continue to do so. Therefore, it is recommended that policy should further understand the users' perspective in order to be better informed on whether full integration is possible – or even desired. It may be the case that 'co-recognition' is a more appropriate policy goal instead.

Another common approach has been to train and support health workers in order that they take into account broad cultural differences when carrying out work in local communities. Indeed, policymakers have long been aware that biomedical practitioners must engage

with and see through the individual's cultural prism to provide a culturally sensitive services if health programmes are to be successful and not be rejected by the community (Press 1982). UNAIDS (2000) also advocates involvement of TH in increasing access to AIDS care in an attempt to integrate local beliefs and more modern approaches. Such methods are, however, applied without a detailed understanding of cultural attitudes and their drivers. Thus, policymakers and health workers are limited to taking a blanket approach, assuming that all members of certain communities or segments of a population think and therefore act in a set way. This study has shown that an individual's ethnic background is one important factor in the formation of divergent attitudes and beliefs, but it is likely that other drivers of culture can additionally be pinpointed. Whilst policymakers frequently hope that enabling characteristics such as education, employment and alleviation of poverty influence health seeking behaviour (Andersen, 1995), this study suggests that predisposing characteristics might have over-riding effects that can only be changed over time and with considerable difficulty. In recognising this, policymakers might be more inclined to take a different stance on health projects. For example, targeting programs according to ethnic groups or kinship ties may be an effective method of communicating health messages. Additionally, it is certainly possible to take advantage of social systems and strong community networks - which traditional medicine use often proffers - to build momentum and effectively influence health seeking behaviour. In line, taking dimensions of cultural beliefs that matter most to certain ethnicities and amalgamating these with existing modern methods might also provide for more user-friendly and culturally acceptable practices.

## **1.6 Conclusion**

This paper has found some empirical evidence to suggest that cultural norms influence the utilisation of traditional medicines and healers. Cultural values were hypothesised to be shaped by an individual's ethnic background, thus an instrumental variables technique - in which ethnicity served as instruments for culture (as proxied by attitudes and beliefs towards TM/H) - was employed to test this claim. This empirical strategy also addresses the problems of endogeneity of attitudes and beliefs. Findings suggest that culture matters: those holding positive attitudes are more inclined to utilise TM/H. This is in line with

numerous anthropological studies that assert the importance of cultural and societal explanations in understanding, identifying and curing illnesses lending support to the inclusion of cultural aspects within health programmes.

### Bibliography

- Ademuwagun, Z. A. (1976). The challenge of the co-existence of orthodox and traditional medicine in Nigeria. *East Afr Med J*, 53(1), 21-32.
- Ae-Ngibise, K., Cooper, S., Adiibokah, E., Akpalu, B., Lund, C., Doku, V., et al. (2010). 'Whether you like it or not people with mental problems are going to go to them': A qualitative exploration into the widespread use of traditional and faith healers in the provision of mental health care in Ghana. *International Review of Psychiatry*, 22(6), 558-567.
- Andersen, R. (1995). Revisiting the Behavioral-Model and Access to Medical-Care - Does It Matter. *Journal of Health and Social Behavior*, 36(1), 1-10.
- Angrist, J. D., & Krueger, A. B. (2001). Instrumental variables and the search for identification: From supply and demand to natural experiments. *Journal of Economic Perspectives*, 15(4), 69-85.
- Anyinam, C. (1987). Availability, Accessibility, Acceptability, and Adaptability - 4 Attributes of African Ethno-Medicine. *Social Science & Medicine*, 25(7), 803-811.
- Arrunada, B. (2010). Protestants and Catholics: Similar Work Ethic, Different Social Ethic. *Economic Journal*, 120(547), 890-918.
- Astin, J. A. (1998a). Why patients use alternative medicine - Reply. *Jama-Journal of the American Medical Association*, 280(19), 1661-1661.
- Astin, J. A. (1998b). Why patients use alternative medicine - Results of a national study. *Jama-Journal of the American Medical Association*, 279(19), 1548-1553.
- Barimah, K. B., & van Teijlingen, E. R. (2008). The use of Traditional Medicine by Ghanaians in Canada. *Bmc Complementary and Alternative Medicine*, 8, -.
- Becker, G. (1996). Preferences and Values. In G. Becker (Ed.), *Accounting for Taste*. Cambridge: Harvard University Press.

- Bellah, R. (1985). *Tokugawa religion : the cultural roots of modern Japan* (1st Free Press pbk. ed.). New York  
London: Free Press; Collier Macmillan Publishers.
- Bernstein, J. A., Stibich, M. A., & LeBaron, S. (2002). Use of traditional medicine in Mongolia: a survey. *Complementary Therapies in Medicine*, 10(1), 42-45.
- Bibeau, G. (1997). At Work in the Fields of Public Health: The Abuse of Rationality. *Medical Anthropology Quarterly*, 11(2), 246-252.
- Bierlich, B. (1999). Sacrifice, plants, and Western pharmaceuticals: Money and health care in northern Ghana. *Medical Anthropology Quarterly*, 13(3), 316-337.
- Bollen, K. A., Glanville, J. L., & Stecklov, G. (2001). Socioeconomic status and class in studies of fertility and health in developing countries. *Annual Review of Sociology*, 27, 153-185.
- Cartwright, T., & Torr, R. (2005). Making sense of illness: the experiences of users of complementary medicine. *J Health Psychol*, 10(4), 559-572.
- Ceylan, S., Azal, O., Taslipinar, A., Turker, T., Acikel, C. H., & Gulec, M. (2009). Complementary and alternative medicine use among Turkish diabetes patients. *Complementary Therapies in Medicine*, 17(2), 78-83.
- Clement, Y. N., Morton-Gittens, J., Basdeo, L., Blades, A., Francis, M. J., Gomes, N., et al. (2007). Perceived efficacy of herbal remedies by users accessing primary healthcare in Trinidad. *BMC Complement Altern Med*, 7, 4.
- David, P. A. (2007). Path dependence: a foundational concept for historical social science. *Cliometrica*, 1(2), 91-114.
- Durlauf, S. N., & Blume, L. (2008). The new Palgrave dictionary of economics online  
Available from  
<http://gate2.library.lse.ac.uk/login?url=http://www.dictionarofeconomics.com>
- Evans-Pritchard, E. E. (1937). *Witchcraft, oracles and magic among the Azande*. Oxford: Clarendon Press.
- Fernandez, R. (2007). Culture and Economics *The New Palgrave Dictionary of Economics* (second ed.).
- Fernandez, R., & Fogli, A. (2006). Fertility: The role of culture and family experience. *Journal of the European Economic Association*, 4(2-3), 552-561.

- Fernandez, R., & Fogli, A. (2009). Culture: An Empirical Investigation of Beliefs, Work, and Fertility. *American Economic Journal-Macroeconomics*, 1(1), 146-177.
- Filmer, D., & Pritchett, L. H. (2001). Estimating wealth effects without expenditure data - Or tears: An application to educational enrollments in states of India. *Demography*, 38(1), 115-132.
- Flatie, T., Gedif, T., Asres, K., & Gebre-Mariam, T. (2009). Ethnomedical survey of Berta ethnic group Assosa Zone, Benishangul-Gumuz regional state, mid-west Ethiopia. *J Ethnobiol Ethnomed*, 5, 14.
- Furnham, A., & Kirkcaldy, B. (1996). The health beliefs and behaviours of orthodox and complementary medicine clients. *British Journal of Clinical Psychology*, 35, 49-61.
- Ghana Health Service. (1995). *Ghana Medium Term Health Strategy*. Accra: Ministry of Health.
- Ghana Statistical Service. (2008). Ghana Statistics. from <http://www.statsghana.gov.gh>
- Granato, J., Inglehart, R., & Leblang, D. (1996). The effect of cultural values on economic development: Theory, hypotheses, and some empirical tests. *American Journal of Political Science*, 40(3), 607-631.
- Greif, A. (1994). Cultural Beliefs and the Organization of Society - a Historical and Theoretical Reflection on Collectivist and Individualist Societies. *Journal of Political Economy*, 102(5), 912-950.
- Guiso, L., Sapienza, P., & Zingales, L. (2006). Does culture affect economic outcomes? *Journal of Economic Perspectives*, 20(2), 23-48.
- Hall, M. A., Dugan, E., Zheng, B., & Mishra, A. K. (2001). Trust in physicians and medical institutions: what is it, can it be measured, and does it matter? *Milbank Q*, 79(4), 613-639, v.
- Haram, L. (1991). Tswana Medicine in Interaction with Biomedicine. *Social Science & Medicine*, 33(2), 167-175.
- Hevi, J. (1989). In Ghana, Conflict and Complementarity. *Hastings Center Report*, 19(4), S5-S7.
- Kim, M. J., Lee, S. D., Kim, R. B., Kong, Y. H., Sohn, W. S., Ki, S. S., et al. (2008). Use of complementary and alternative medicine by Korean patients with Parkinson's disease. *Clinical Neurology and Neurosurgery*, 111, 156-160.



- Kirby, J. P. (1997). White, red and black: Colour classification and illness management in Northern Ghana. *Social Science & Medicine*, 44(2), 215-230.
- Kleinman, A. (1980). *Patients and healers in the context of culture : an exploration of the border land between anthropology, medicine, and psychiatry*. Berkeley ; London: University of California Press.
- Knack, S., & Keefer, P. (1997). Does social capital have an economic payoff? A cross-country investigation. *Quarterly Journal of Economics*, 112(4), 1251-1288.
- Kolenikov, B. D., & Angeles, G. (2004). *The Use of Discrete Data in Principal Component Analysis: Theory, Simulations, and Applications to Socioeconomic Indices*. Carolina Population Center, UNC.
- Kroeber, A. L., Kluckhohn, C. K. M., & Peabody Museum of Archaeology and Ethnology. (1952). *Culture : a critical review of concepts and definitions*. Cambridge, Mass.,.
- Kroeger, A. (1983). Anthropological and socio-medical health care research in developing countries. *Social Science & Medicine*, 17(3), 147-161.
- Kuper, A. (1999). *Culture : the anthropologists' account*. Cambridge, Mass: Harvard University Press.
- Leonard, K. (2003). African traditional healers and outcome-contingent contracts in health care. *Journal of Development Economics*, 71(1), 1-22.
- Lyon, F. (2000). Trust, networks and norms: The creation of social capital in agricultural economies in Ghana. *World Development*, 28(4), 663-681.
- Macfarlane, J. E., & Alpers, M. (2009). Treatment-seeking behaviour among the Nasioi people of Bougainville: choosing between traditional and western medicine. *Ethnicity & Health*, 14(2), 147-168.
- Mechanic, D. (1986). The Concept of Illness Behavior - Culture, Situation and Personal Predisposition. *Psychological Medicine*, 16(1), 1-7.
- Mensah, J., Oppong, J. R., Bobi-Barimah, K., Frempong, G., & Sabi, W. (2010). *An evaluation of the Ghana national health insurance scheme in the context of the health MDGs*.
- Mohr, J., & Rawlings, C. (2011). Four ways to measure culture: social science, hermeneutics, and the cultural turn. In J. Alexander, R. Jacobs & P. Smith (Eds.), *Oxford Handbook of Cultural Sociology*. Oxford: OUP.

- Moser, C., & Felton, A. (2007). The Construction of an Asset Index Measuring Asset Accumulation in Ecuador. Brookings Institution.
- Mshana, G., Hampshire, K., Panter-Brick, C., & Walker, R. (2008). Urban-rural contrasts in explanatory models and treatment-seeking behaviours for stroke in Tanzania. *J Biosoc Sci*, 40(1), 35-52.
- National Health Insurance Scheme Ghana. (2011). National Health Insurance Scheme webpage. Retrieved 2011, from <http://www.nhis.gov.gh/?CategoryID=159&ArticleID=91>
- Njong, A. M., & Ningaye, P. (2008). Characterizing weights in the measurement of multidimensional poverty: An application of data-driven approaches to Cameroonian data.
- Okumura, J., Wakai, S., & Umenai, T. (2002). Drug utilisation and self-medication in rural communities in Vietnam. *Social Science & Medicine*, 54(12), 1875-1886.
- Owusu-Daaku, T. K., & Smith, F. (2005). Health-seeking behaviour: perspectives of Ghanaian women in London and Kumasi. *International Journal of Pharmacy Practice*, 13(1), 72-76.
- Pelto, P., & Pelto, G. (1975). Intra-cultural diversity: some theoretical issues. *American Ethnologist*, 2(1), 1-18.
- Peltzer, K. (2000). Community Perceptions of biomedical health care in a rural area in the northern province south Africa Health SA *Gesondheid*, 5(1).
- Peltzer, K. (2009). Utilization and Practice of Traditional/Complementary/Alternative Medicine (Tm/Cam) in South Africa. *African Journal of Traditional Complementary and Alternative Medicines*, 6(2), 175-185.
- Peltzer, K., Preez, N. F. D., Ramlagan, S., & Fomundam, H. (2008). Use of traditional complementary and alternative medicine for HIV patients in KwaZulu-Natal, South Africa. *BMC Public Health*, 8, -.
- Pillay, B. J. (1996). A model of help-seeking behaviour for urban blacks. *South African Journal of Psychology-Suid-Afrikaanse Tydskrif Vir Sielkunde*, 26(1), 4-9.
- Press, I. (1978). Urban Folk Medicine - Functional Overview. *American Anthropologist*, 80(1), 71-84.

- Ransford, H. E., Carrillo, F. R., & Rivera, Y. (2010). Health Care-Seeking among Latino Immigrants: Blocked Access, Use of Traditional Medicine, and the Role of Religion. *Journal of Health Care for the Poor and Underserved*, 21(3), 862-878.
- Rao, V., & Walton, M. (2004). *Culture and public action*. Stanford, Calif.: Stanford University Press : Stanford Social Sciences.
- Rivers, W. H. R. (1924). *Medicine, magic and religion*. London: Kegan Paul, Trench, Trubner.
- Russell, S. (2005). Treatment-seeking behaviour in urban Sri Lanka: trusting the state, trusting private providers. *Social Science & Medicine*, 61(7), 1396-1407.
- Singh, V., Raidoo, D. M., & Harries, C. S. (2004). The prevalence, patterns of usage and people's attitude towards complementary and alternative medicine (CAM) among the Indian community in Chatsworth, South Africa. *BMC Complement Altern Med*, 4, 3.
- Stekelenburg, J., Jager, B. E., Kolk, P. R., Westen, E. H. M. N., van der Kwaak, A., & Wolffers, I. N. (2005). Health care seeking behaviour and utilisation of traditional healers in Kalabo, Zambia. *Health Policy*, 71(1), 67-81.
- Stoner, B. P. (1986). Understanding medical systems: traditional, modern, and syncretic health care alternatives in medically pluralistic societies. *Medical Anthropology Quarterly*, 17(2), 44-48.
- Swidler, A. (1986). Culture in Action - Symbols and Strategies. *American Sociological Review*, 51(2), 273-286.
- Sydara, K., Gneunphonsavath, S., Wahlstrom, R., Freudenthal, S., Houamboun, K., Tomson, G., et al. (2005). Use of traditional medicine in Lao PDR. *Complementary Therapies in Medicine*, 13(3), 199-205.
- Tabellini, G. (2010). Culture and Institutions: Economic Development in the Regions of Europe. *Journal of the European Economic Association*, 8(4), 677-716.
- Tabi, M. M., Powell, M., & Hodnicki, D. (2006). Use of traditional healers and modern medicine in Ghana. *International Nursing Review*, 53(1), 52-58.
- Tsey, K. (1997). Traditional medicine in contemporary Ghana: A public policy analysis. *Social Science & Medicine*, 45(7), 1065-1074.
- Turner, V. W. (1968). *The drums of affliction : a study of religious processes among the Ndembu of Zambia*. Oxford: Clarendon Press and International African Institute.

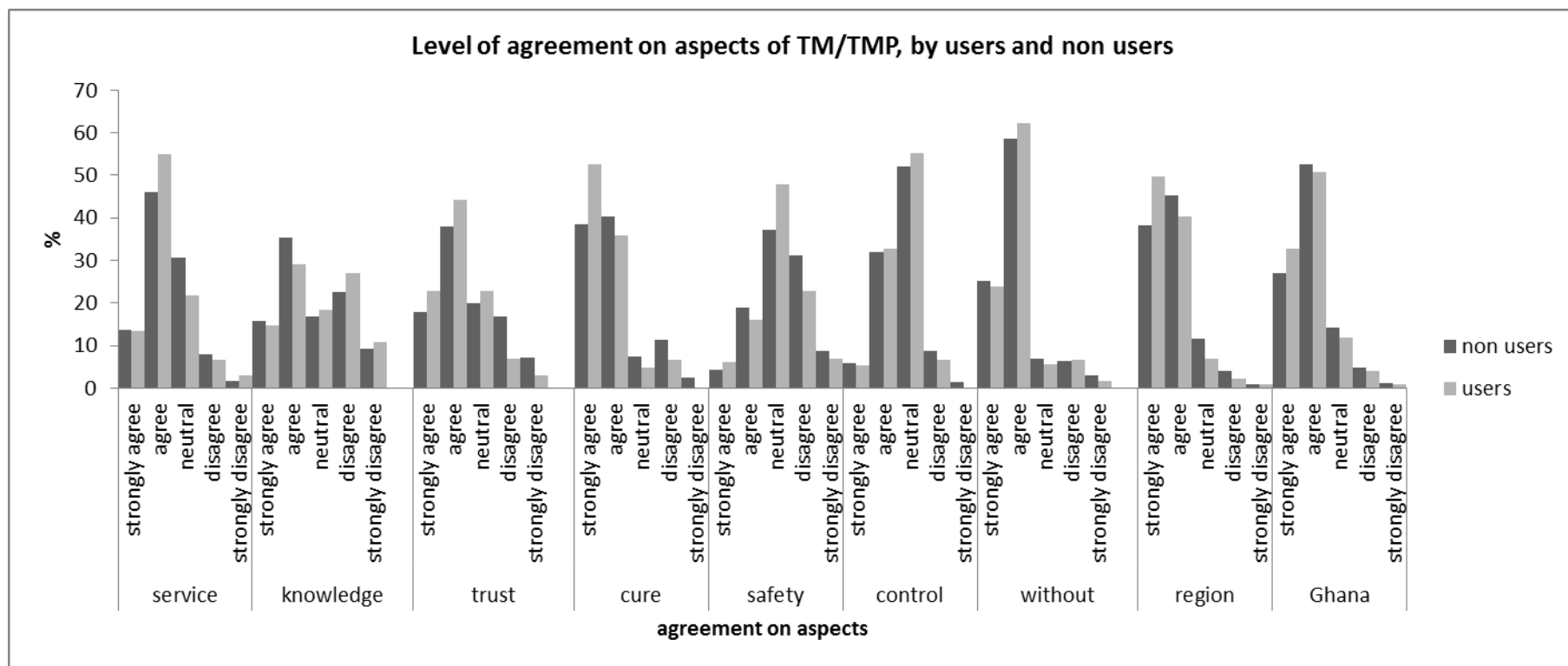
- Turshen, M. (2001). Doctors and the state: The struggle for professional control in Zimbabwe. *Journal of Public Health Policy*, 22(3), 371-373.
- Twumasi, P. A. (1979). A social history of the Ghanaian pluralistic medical system. *Soc Sci Med Med Anthropol*, 13B(4), 349-356.
- Uhlener, C. J. (1989). Relational Goods and Participation - Incorporating Sociability into a Theory of Rational Action. *Public Choice*, 62(3), 253-285.
- UNAIDS. (2000). *Collaboration with traditional healers in HIV/AIDS prevention and care in sub-Saharan Africa. A literature review*. Geneva.
- van der Geest, S. (1997). Is there a role for traditional medicine in basic health services in Africa? A plea for a community perspective. *Tropical Medicine & International Health*, 2(9), 903-911.
- van der Schee, E., & Groenewegen, P. P. (2010). Determinants of public trust in complementary and alternative medicine. *BMC Public Health*, 10.
- Vincent, C., & Furnham, A. (1996). Why do patients turn to complementary medicine? An empirical study. *British Journal of Clinical Psychology*, 35, 37-48.
- Vyas, S., & Kumaranayake, L. (2006). Constructing socio-economic status indices: how to use principal components analysis. *Health Policy and Planning*, 21(6), 459-468.
- Waldram, J. B. (2000). The efficacy of traditional medicine: Current theoretical and methodological issues. *Medical Anthropology Quarterly*, 14(4), 603-625.
- Weber, M. (1930). *The Protestant ethic and the spirit of capitalism*. London: Allen and Unwin.
- Winkelman, M. (2009). *Culture and health : applying medical anthropology* (1st ed.). San Francisco: Jossey-Bass.
- Wong, T. W., Wong, S. L., & Donnan, S. P. (1995). Prevalence and determinants of the use of traditional Chinese medicine in Hong Kong. *Asia Pac J Public Health*, 8(3), 167-170.
- Wooldridge, J. M. (2002). *Econometric analysis of cross section and panel data*. Cambridge, Mass.: MIT Press.
- World Health Organization. (1978). *The Promotion and Development of Traditional Medicine: Report of a WHO Meeting*: World Health Organization.
- World Health Organization. (2002). *WHO traditional medicines strategy 2002-2005*. Geneva: WHO.

- World Health Organization. (2005). *Global atlas of Traditional, complementary and alternative medicine*: WHO.
- Young, A. (1982). The Anthropologies of Illness and Sickness. *Annual Review of Anthropology*, 11, 257-285.
- Young, J. C., & Garro, L. C. (1994). *Medical choice in a Mexican village*. Prospect Heights, Ill.: Waveland Press.

## Appendix 1 - Summary of variables

	N	mean	p50	sd	variance	min	max
tradever	741	0.3117409	0	0.4635175	0.2148485	0	1
religiousgroup	741	1.408907	1	0.7043314	0.4960827	1	4
ethnicgroup	741	3.470985	4	1.364921	1.863008	1	5
severity	741	1.739541	2	0.5411842	0.2928803	1	3
wealth	741	1.807018	2	.7122514	.507302	1	3
age	739	30.51466	27	23.3806	546.6525	0.1666667	110
gender	741	0.5870445	1	0.4926975	0.2427508	0	1
chronic	741	0.4062078	0	0.491456	0.241529	0	1
Education	735	0.8761905	1	0.8168302	0.6672116	0	2
Occupation	741	2.438596	3	1.202731	1.446562	1	4
insurance	741	0.6180837	1	0.4861844	0.2363752	0	1
tmpclose	676	0.8639053	1	0.343143	0.1177471	0	1
tmpservicegd	723	2.352697	2	0.8815296	0.7770945	1	5
tmpknowledge	726	2.786501	3	1.240638	1.539183	1	5
tmptrust	741	2.468286	2	1.127365	1.270952	1	5
tmpcure	732	1.88388	2	1.012325	1.024801	1	5
tmpsafety	728	3.167582	3	0.9795396	0.9594979	1	5
tmpcontrol	713	2.664797	3	0.7447253	0.5546157	1	5
tmptmwithout	736	2.023098	2	0.894889	0.8008263	1	5
tmpregion	740	1.778378	2	0.8320817	0.69236	1	5
tmpghana	738	1.9729	2	0.8395402	0.7048277	1	5
urban	741	0.5047233	1	0.5003154	0.2503155	0	1

## Appendix 2 - attitudes towards TM/TMP, by users and non users



### Appendix 3 - association between ethnicity and culture

Dept var: PC		OLS
Ethnicity	Ga/Dang	0.942**
		[0.208]
	other	0.625**
		[0.084]
	Walbi	-1.306*
		[0.385]
	Dagarti	-0.877**
		[0.165]
Wealth	mid	0.052
		[0.120]
	rich	0.175
		[0.116]
Insurance	insurance	0.031
		[0.131]
Age	age in years	-0.006
		[0.003]
Sex	sex	0.27
		[0.128]
Religion	Muslim	-0.193
		[0.231]
	other	-0.769
		[0.272]
	none	-0.088
		[0.072]
Education	junior	-0.226**
		[0.031]
	senior+	0.037
		[0.057]
Occupation	employed	-0.208
		[0.164]
	own business	-0.215
		[0.075]
	none (unemployed etc)	0.121
		[0.126]
Chronic	chronic	0.306***
		[0.022]
Severity	mid	0.331**
		[0.067]



	low	0.025 [0.047]
Healer supply	tmpclose	-0.015 [0.198]
Urbanity	urban	-0.291** [0.058]
Constant		6.951*** [0.384]
Observations		632
R-squared		0.401
Robust standard errors in brackets, clustered by radius		
* significant at 1%; ** significant at 5%; *** significant at 1%		

#### Appendix 4 – Variables used for culture index

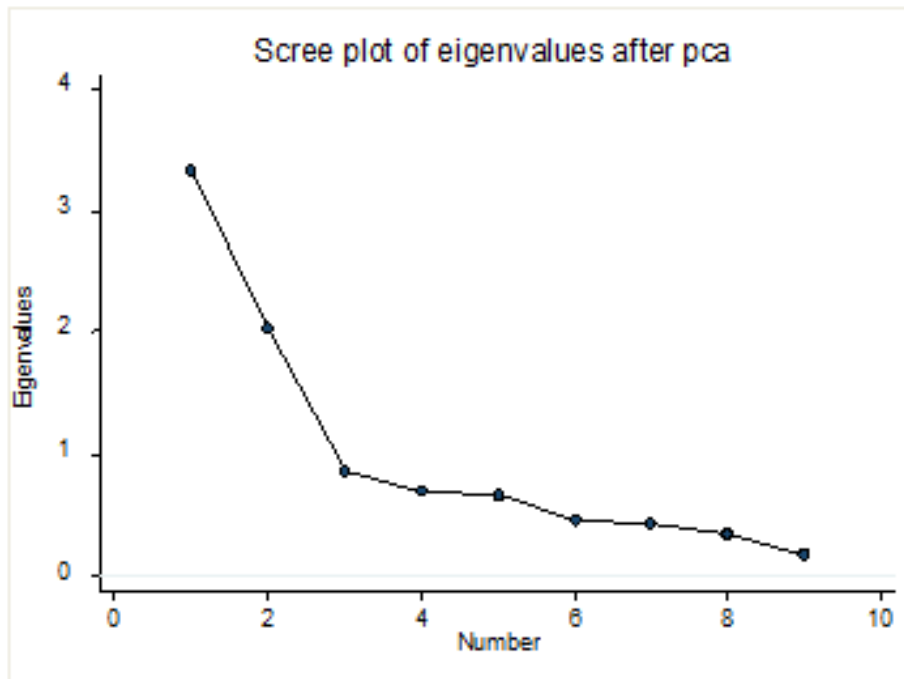
	Variable name	survey q. do you strongly agree, agree, feel neutral, disagree, or strongly disagree with the following statement:
index	culture	built with the score of the first principal component from variables 1-9
1	tmpservicegd	the TMP gives good service
2	tmpknowledge	the TMP has good knowledge about topics the doctors do not know about
3	tmptrust	I trust TMPs
4	tmpcure	some diseases can only be cured by TMPs
5	tmpsafety	the TM are safer than orthodox meds
6	tmpcontrol	TMs and TMPs provide increased sense of control and participation in management of disease
7	tmpwithout	TMs can be used without a TMP (usability)
8	tmpregion	TMPs are well accepted in this region
9	tmpghana	TMPs are well accepted in Ghana

coded for the variable to decrease with agreement

(1:strongly agree; 2: agree; 3: neutral; 4: disagree; 5:strongly disagree)

culture is a PC proxy for attitudes and beliefs towards TMPs

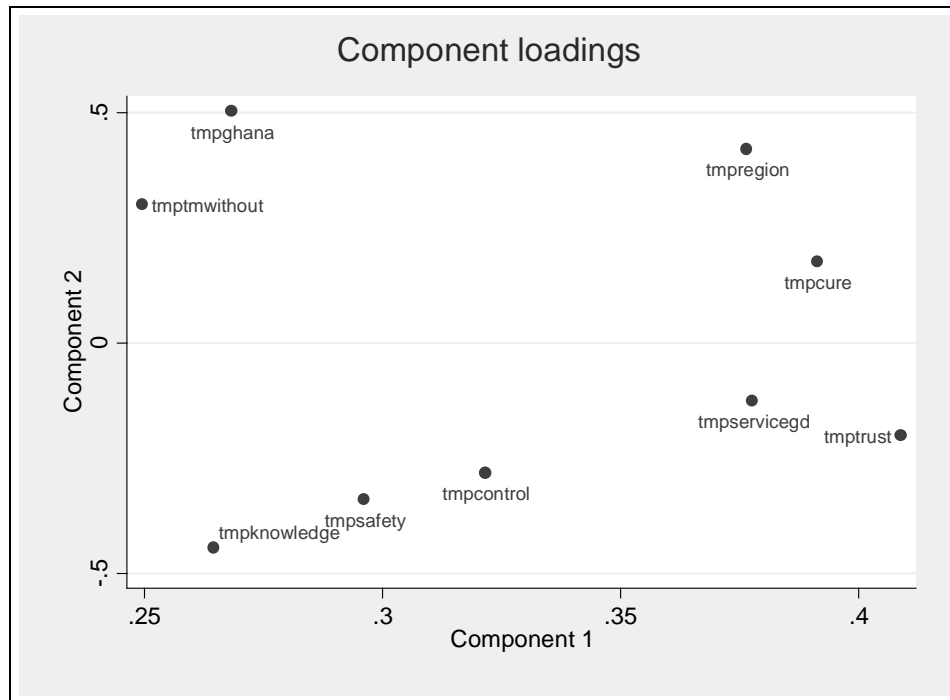
## Appendix 5 - screeplot



## Appendix 6 - component matrix

PCs (Eigenvectors)			
Variables	comp1	comp2	unexplained
<b>tmpservicegd</b>	0.3777	-0.1256	0.4932
tmpknowledge	0.2646	-0.4442	0.367
<b>tmpcure</b>	0.3913	0.2	0.427
tmpsafety	0.2961	-0.3	0.4744
tmpcontrol	0.3216	-0.2813	0.4952
tmptmwithout	0.2495	0.3004	0.6098
tmpregion	0.3765	0.4	0.1676
tmpghana	0.2682	0.5	0.2468
<b>tmptrust</b>	0.4089	-0.2	0.3622

## Appendix 7- loading plot



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**For further information on this or any of the  
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Naho Ollason  
Managing Editor  
LSE Health  
The London School of Economics and Political Science  
Houghton Street  
London WC2A 2AE

Tel: + 44 (0)20 7955 3733  
Fax: + 44 (0)20 7955 6090  
Email: [n.ollason@lse.ac.uk](mailto:n.ollason@lse.ac.uk)  
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