**African Traditional Healers:
Incentives and Skills in Health Care Delivery**

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Abstract

The benefit of health care comes not just from the *ability* of health care providers to produce health but from their *motivation* to do so as well. The fact that traditional healers in Africa are paid on the basis of health outcomes not services provided changes the incentives they face compared to those of modern health care providers. This paper documents these payment methods in Cameroun and explores the different incentives faced by practitioners in government and church-based facilities as well as traditional healers. To test whether such incentives make a difference in the provision of health care I use a multinomial logit analysis of an original data set from Cameroun on patients' choice of provider and show that patients choose practitioners as if they were aware of the difference in incentives. Thus, though patients cannot perfectly evaluate the quality of health they receive or would have received, they can evaluate expected quality by examining incentives.

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1 Introduction

Traditional healers receive payments for their services in ways that should result in different incentives to provide unobservable quality from those of modern practitioners¹. There are many differences between traditional healers and modern health care providers in rural Africa but this paper focuses on the differences in incentives to exert effort. I propose that the benefits of health care come not just from the *ability* of a health care provider to produce health but from the provider's *motivation* to do so as well. I interviewed the ill about their choices of providers and met with traditional healers to confirm the pattern of charges suggested by the survey and the general literature. I use background information on health care providers to suggest how effort and skill are supplied in the market for health care. These patterns are then confirmed by the data on the behavior of the ill. The results show that patients choose providers as if they were aware of practitioners' motivation to exert effort on behalf of the patient.

The results suggest a radically new way of looking at healers as well as at the demand for health care in developing countries. I suggest that traditional medicine is a particularly appropriate institutional form. By offering medical effort on a contingent-fee basis traditional healers sell medical expertise and effort to their communities in a way modern health facilities (that offer medical care only on a fee-for-service basis) do not.

I quantify the diseases from which people suffer according to three types of resources necessary in treatment — medical effort, patient effort, and medical skill — and show that patients choose practitioners in part because of the needs of their diseases. Traditional healers are visited by people who suffer from conditions that require a combination of medical effort and patient effort. Mission centers (both clinics and hospitals) are visited by people whose conditions require either medical or patient effort, though generally not high levels of both. Government clinics are visited by people whose conditions require

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¹Modern health care implies practitioners who use science-based medicines and follow the conventions of health care practices in the West. The distinction between modern and traditional, though imperfect in urban areas, still holds well in rural areas

neither significant medical effort nor significant patient effort. Hospitals are visited by people whose conditions respond better to skills and services found in hospitals than to those found in clinics. The results suggest that patients evaluate the needs of their conditions and choose a center with the best mix of resources to meet these needs.

This paper has implications beyond the practices of traditional healers and investigates what elements of health care people are willing to pay for. It complements a wider literature addressing rural health care in Africa. It has been debated whether or not it is 'traditional' to pay for health care. Most researchers would now say that it is culturally acceptable to pay for health care (Van Der Geest 1992). The traditional healer is cited as a health service for which Africans have always paid. I ask *how* they are paid, and explore the implications of the differences between the method of these payments and those to modern practitioners. Empirical studies have shown that increasing fees at government-run health centers leads to a drop in attendance (Waddington and Enyimayew 1989). The implication is that people are visiting traditional healers because they are less expensive. Though the poor do visit traditional healers we find that healers are not less expensive and that they are popular even among the wealthy.

Other studies have sought to estimate the parameters of the demand for health care in rural Africa (Gertler and van der Gaag 1990 Dow 1995 Bolduc, Lacroix and Muller 1996), specifically with respect to the income and price elasticity of demand for health. This paper does not produce new estimates of these elasticities. Instead we hope to add to the richness of this line of inquiry by exposing the role that incentives play in the choice of provider.

The paper is organized as follows. Section 2 discusses some of the findings of the interviews with traditional healers. Section 3 shows how the contractual practice of traditional healers affects the quality of care which is available from those practitioners. In section 4 I present data collected in the South-West Province of Cameroun. Section 5 demonstrates that patient choice of health care is rationally influenced by the incentive structure offered in the traditional healer's contract and section 6 concludes.

2 Traditional Healers

A random sample of 800 households in South-West Province of Cameroun suggests that patients who visit traditional healers make different payments depending on the success of treatment. Two types of payments were identified in the survey, those made before and those made after treatment. For patients who were cured of their ailments the average total payment both before and after was 6,545 CFA, whereas those not cured paid 3,338 CFA ($p=0.077$). Payments made after the initial consultation varied even more: 4,990 CFA in successful cases compared to 1,384 CFA in unsuccessful cases ($p=0.047$). For visits to modern practitioners payments are higher in unsuccessful cases, though the difference is not significant². I conclude that patients are paying more for better outcomes and ask if there is some feature of the practice of traditional healers that could lead to this result.

Preliminary research on this question was based on personal observation gained from living in rural Gabon and information contained in several anthropological and medical studies of traditional healers in Zaire (Korse et al. 1989), Burundi (Baerts 1989), South Africa (Edwards 1983), Nigeria (Oyenye and Orubuloye 1985), the Ivory Coast (Lasker 1981), Botswana (Staugård 1985), and Zimbabwe (Gelfand, Mari, Drummond and Ndemera 1985) and general sources (Conco 1972). To confirm the patterns suggested by the literature and the survey of the ill we interviewed traditional healers in three African countries; Cameroun, Tanzania and Ethiopia. Three interviews with healers were conducted in Cameroun, 5 in Tanzania and 7 in Ethiopia³. The observations which we present are based largely on the interviews from Cameroun and Tanzania.

The interviews were open-ended and focused primarily on the following:

- The procedure for reviewing and accepting a patient.
- The method for obtaining information about the condition presented.

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²Perhaps because unsuccessful cases require continued medication at additional expense.

³I interviewed unadvertised healers who lived in rural areas. This includes a wide variety from herbalists to spirit channelers to religious scribes. Mid-wives who also treated illnesses were included.

- The method and timing of payments for a disease episode.
- The amount of the payment and whether it varies according to disease, characteristics of the patient or the outcome.
- The healer's use of enchantments or spells to encourage timely payment.

2.1 Tanzania and Cameroun

Healers in Tanzania and Cameroun accepted almost all cases presented. Though they were often known for certain specialties, all claimed to have a variety of skills. Among the problems they specifically mentioned treating were stomach problems, irregular menses, infertility, impotence, distended abdomen, swelling in the extremities, migraine headaches, convulsions, eye problems, bone-setting, mental illnesses, sexually transmitted diseases, chest pain, malnutrition and worms.

Though most examinations of patients were much longer and more detailed than those of their modern medical counterparts, few involved physical examination. Most healers said they asked extensive questions about the symptoms in order to gather information. Many said they could form a preliminary diagnosis from interviews with family members who came to ask for help⁴.

Healers often integrated the entire family in the treatment when they thought it was necessary. They did this in three ways: first they would consult family members to learn more about the causes of the disease; second they would use family members integrally in the cure, especially if the patient was returning home; and third they prescribed and proscribed habits for family members as well as for the patient. A healer we interviewed in Tanzania regarded the families of alcoholics as his patients and gave medicine to both the alcoholic and her family. Even when families were not involved, *the treatment regimes of traditional healers required significant participation on the part of the patient*⁵. Many

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⁴See Conco (1972, pg 294), Staugård (1985, pg 74-81).

⁵I did not observe consultations or treatments. This particular information comes from what we were told by the healers and numerous observations by other scholars.

directed patients to fulfill certain sacramental rites, to prepare certain foods or to avoid certain activities⁶.

Healers often asked for an initial payment, which frequently included a symbolic gift like a hen and/or a machete⁷. Cash payments were very common. *The fixed payment often varied according to the problem but not according to the ability of the patient to pay.* In some cases the healers would accept a promise to pay at a later point, but usually they asked for the initial payment up front.

In addition to the initial payment the healer would often negotiate with the patient over a payment to be made in the future. In all cases, *if the treatment did not result in improvement of the condition the patient paid nothing beyond the initial payment.* This was the case even when patients lived with and were cared for and fed by the healer during treatment. Many healers said that *the future payment depended on the degree of success.* Healers in Tanzania and Cameroun did not charge for medicines administered.

Often the final payment was left open, with the expectation that some payment would be made in the future. The healer developed an expectation of what his compensation should be after he saw the result of his treatment. The patient also developed an expectation of the payment and then they bargained to reach a conclusion. This is not an uncommon way to decide compensation for services rendered, especially in Cameroun. Though it might seem that the healer has no power to bargain after he has cured someone, we show later that he bargains from a position of considerable strength.

In some cases no further payment was required and the healers reported that future payments were 'up to the charity of the patient.' I distinguish this from the previous case by the fact that the healers claimed they expected no payment. However, they were also clear that everyone who had been cured made some payment. These were healers who dealt almost exclusively with people from their own larger community. I found that

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⁶See Conco (1972, pg 291-294), Staugård (1985, pg 112,124), Baerts (1989, pg 31-32).

⁷The blood of a hen is used in many medicines as a type of base. The machete was used to cut those herbs that the healer said must be cut with a new knife.

healers with wide reputations who often dealt with patients from outside their community were much more specific about their expectations of payment.

Almost every healer said of the second payment that *they expected less from people who were less able to pay and all healers expected that any large payments would be made at harvest time or in kind*. Many waited years for final payments⁸. There was no indication that healers were quick to declare victory and collect their bills. In one case a healer who specialized in infertility told me that he waited until the child was 7 years old before he considered the mother to have been cured of infertility!

When I asked about the practice of poisoning patients for non-payment many healers were adamant that they never engaged in the practice⁹, though almost all admitted that their ancestors, or specifically parents, had done so. The practice traditionally operated as follows: when a patient refused to pay the healer would either invoke a poison on the patient or revoke the cure. Neither of these actions took place in the presence of the patient. They are considered to be among the strongest forms of magic. This practice invokes near universal fear in rural populations, and most non-healers believed that if they failed to pay they would be poisoned. This is a very useful belief for healers, since they need only wait until the patient eventually falls sick of anything. All healers told us stories of patients leaving without paying and then returning, sometimes years later, begging to be allowed to pay. *That patients believe poisoning is still practiced allows healers to wait until after the treatment to collect payment without fear that the patient will refuse to pay.*

2.2 Ethiopia

The practices of many traditional healers interviewed in Ethiopia were different than those of Cameroun and Tanzania. Most healers specialized in at most 3 or 4 medicines and their corresponding illnesses. They were known popularly as 'the healer who has a

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⁸For examples and discussion of payments see Staugård (1985, pg 103,112,113) , Korse et al. (1989, pg 44-97).

⁹This practice is what transformed a healer into a witch doctor in the eyes of colonial officers and it is not surprising that many healers would be anxious that we had understood them on this point.

good medicine for such-and-such'. They almost always charged a fixed price for a fixed dose with exceptions only for the extremely poor and their own family members. When I asked if they accepted payment after giving the medicines they almost all said no, that in fact receipt of payment was part of the ceremony of preparation. They did not examine patients except in the case of demon possession.

I interviewed two healers in Ethiopia who used payment schemes similar to those discussed in section 2.1. Both treated a wide variety of diseases, as did the healers interviewed in Cameroun and Tanzania. In the sample, contingent payment schemes were perfectly associated with healers who cured a wide variety of diseases and fixed payment schemes were perfectly associated with healers who specialized in only a few medicines. This suggests that *the skill for which only a fixed payment is made is that of preparing well-known medicines, and the skill for which a contingent payment was made is that of diagnosing diseases.*

3 Incentives to provide effort and the benefit of skill

From the survey of individuals in Cameroun we know that patients paid traditional healers more when they were cured. The sample of interviews with traditional healers confirms the observations of a substantive literature and I feel confident in concluding that, at least in the South West Province of Cameroun, traditional healers use a contingent payment scheme. The goal of this paper is to further confirm this observation by showing that it affects the behavior of patients as theory would predict.

Patients visit a health care provider to benefit from the intervention of health care in the course of an illness. I simplify the intervention of health care into two components; that of effort and that of skill and capacity. Skill and capacity¹⁰ are observable: hospitals have more capacity than clinics, doctors more skill than nurses and clinics more capacity

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¹⁰I group these two ideas together because patients are choosing a combination of skill and capacity when they choose a center. Practitioners (skill) and facilities (capacity) are a package deal.

than traditional healers. Effort cannot be directly observed, but is at least as important as skill and capacity. Being in the best hospital in the world is of no use to a patient if no one will care for her. I advance the idea that it is in the provision of effort that traditional healers are so popular despite the intense competition from modern medicine, which is clearly superior in both skill and capacity¹¹.

Effort in health care is a classic example of hidden action (Arrow 1963 Arrow 1985 Dranove and White 1987). The patient cannot evaluate what the doctor is doing for her sake. People visit doctors because doctors have superior knowledge of diseases and treatments. Even after treatment the patient cannot infer what the doctor did for her sake. A doctor might exert extreme effort and the patient could remain sick or even die, whereas a doctor sometimes does nothing and the patient recovers naturally. The outcome of treatment does teach the patient something about what the doctor probably did, but it does not tell her anything with certainty.

Similarly the practitioner cannot observe the effort that the patient exerts for her own health. This is important for two reasons. First many health improving activities cause disutility that the patient would prefer to avoid by substituting her own effort for medical effort and secondly medical practitioners often need to inform the patient of what she can do for her own health.

Patients can know the benefit to expect from skill and capacity but they cannot directly know what benefit to expect from effort, therefore it is important to examine the incentives of each practitioner to exert effort. When the patient observes that the practitioner has strong incentives to exert effort she will anticipate greater benefit to her health from effort.

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¹¹I assume that clinics are at least as skilled as traditional healers because I wish to show that it is not irrational or incorrect assessment of skill that leads people to choose healers but rational, correct assessment of incentives.

3.1 Medical effort at traditional healers

The contingent payment scheme offered by the traditional healer creates incentives for the practitioner to exert effort. *When payments to the practitioner increase with the success of treatment and effort increases the probability of success then the practitioner has a strong incentive to exert effort.*

Patient effort is also important in a contingent-fee contract. When the patient exerts effort it encourages the practitioner to exert effort because patient effort and medical effort are complementary. For example, if a patient has asthma the doctor can prescribe anti-asthmatics or the patient can quit smoking. But neither course of action is likely to be as effective as doing both at the same time. Quitting smoking increases the benefit that a visit to a doctor will provide. Since a large portion of the healer's payment is received only if he is successful, his chances of being paid will increase if the patient quits smoking. The healer could refuse to accept the case if the patient does not agree to quit. A fee-for-service provider, if anything, will be paid more if the patient will not quit. *When a practitioner benefits from the outcome of treatment he has an incentive to encourage patient effort as well as to exert medical effort.*

3.2 Medical effort at other providers

The above discussion raises two questions. First, why do other providers (either in Africa or in the developed world) not offer health care on a contingent-fee basis? And secondly, given that they do not, must we assume that providers at clinics and hospitals have no economic incentive to provide effort?

A contingent-fee scheme depends on the practitioner's knowing the outcome of the disease. The healer is able to do this because he maintains a cloud of mystery over his practice that encourages people to tell the truth about their condition and he has better local information. If government centers were paid on the basis of outcome, patients would often lie or not return. Traditional medicine is practiced in the context of a very impor-

tant cultural institution that allows patients and practitioners to interact in a mutually beneficial manner.

However modern providers also exist in the context of an institution and it is not true that they have no incentives to provide effort, rather that the nature of their incentives is different.

3.2.1 Penalties for Sub-standard Performance

For practitioners at clinics and hospitals there is a second client, the government or the church establishment – their employer. Here, effort produces both health for the patient and what I call institutional quality. This second output, not the outcome of treatment, is what the employer examines. Records are kept of the various activities that produce health, ranging from weighing patients and recording health histories to clinical tests. The records kept of these activities are observable to the employer. The asymmetry of information that exists between patient and practitioner is based on the patient's ignorance of the practice of medicine. This asymmetry does not exist between the employer and the practitioner.

Important information can be determined from routine examination of these records. If a particular record or collection of records are determined to be in violation of protocols established for each type of presenting condition, the practitioner is punished in accordance with the gravity of the deviation. I will refer to this method of ensuring quality as a penalty-based scheme.

The penalty for deviation varies between the two institutions examined in this paper. Supervisors at government institutions do not have the power to fire, promote or demote personnel. The most severe sanction they possess is relocation, albeit a non-trivial sanction. Church-based supervisors, on the other hand, can fire, promote or demote personnel when justified.

Effort put into institutional quality is also effort put into patient health, which is the exact intent of the protocols. Thus if the institution can force a practitioner to produce

high institutional quality it is also forcing the practitioner to exert medical effort, even though the patient's health is never observed. Effort is provided at government and mission clinics and hospitals because if it were not the employers of the practitioners would punish them. However, this system of incentives to provide effort is very different than that of traditional healers. Because the employer does not observe the outcome of the treatment, the decision of whether or not to punish, or by how much, is independent of the effort of the patient. Therefore *there are no economic incentives for the practitioner to encourage the patient to exert effort for her own health.*

In a separate empirical investigation I sat in on consultations by practitioners at government and mission hospitals and clinics in Tanzania¹². Of 450 consultations observed, in only 71 (16%) did the doctor tell the patient what medicine was being prescribed or what the diagnosis was. In only 29 (6%) did the doctor inform the patient of any activity that she could undertake to increase the chance of recovery or to avoid a similar illness in the future. Of cases in which a dispensing nurse gave the patient drugs requiring that the patient know how or when to take the drug in only 32% did the nurse check to see if the patient had any idea how to do so. These observations confirm that patient effort is not a priority in these organizations.

4 Choosing between practitioners who offer different levels of incentives and skills

For a standard economic good the price at which the good is supplied will directly affect the quantity demanded. Health care is not such a good. Patients are not choosing how much health care to consume but are choosing a practitioner who will provide a level of health care that is not perfectly observable. There are, in the sample, 5 types of practitioners a patient can visit: a traditional healer; a government clinic or hospital; or a mission

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¹²Research was sponsored and carried out by Dr Mpuya under the auspices of the District Medical Office of Iringa, Tanzania with the support of Centro Universitario Aspiranti Medici Missionari.

clinic or hospital. When patients choose a provider they are choosing a level of skill and capacity as well as an institution and a payment scheme. Though patients cannot observe the effort provided, they can evaluate a provider's incentives to exert effort and form an expectation of the effort that would be provided. If incentives come from institutional forms as outlined above, and if patients are aware of the institutions that deliver health care, we should observe distinct patterns of choice between practitioners.

Among the five providers there are three distinct levels of skill and capacity, untrained personnel (traditional healers), trained personnel with limited resources (government clinics and mission clinics) and highly trained personnel with extensive resources (government hospitals and mission hospitals)¹³. There are also two different types of incentives arising from two different contracts; contingent payment and penalty-based. Contingent payment schemes are only used by traditional healers. Penalty-based schemes are used at all four modern providers, with government centers threatening a lower penalty than mission centers and therefore inducing lower amounts of effort. In all there are three distinct levels of incentives to provide effort.

These different combinations of skill and incentives lead people rationally to choose different types of practitioners depending on the disease¹⁴ from which they suffer. When patients suffer from a disease that is very responsive to medical effort they will seek a practitioner who can provide this effort, even if he is more expensive than other providers. For such a disease there can be little room for price competition between a provider who does provide effort and one who does not provide effort since the patient would be doing almost nothing for her health by going to the less expensive provider. If the disease requires high levels of skill and capacity, but does not require high levels of effort, the patient will seek out the least expensive hospital. If the patient suffers from a condition

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¹³Though they are not exactly the same, both types of hospitals and both types of clinics have roughly the same equipment, hire people from the same schools and offer the same opportunities for continuing education. Thus I conclude that with respect to skill and capacity all hospitals are the same and all clinics are the same.

¹⁴I refer to the condition from which the patient suffered before they choose a practitioner as a disease although in fact at that time it is only known as a collection of symptoms.

that she knows is responsive to a widely available medicine she does not need to pay for skill and will therefore seek a provider who is inexpensive. In this way the patient first considers what she knows about her condition and then chooses a provider.

This theory leads us to predict the following regarding the practitioners' and patients' rational reactions to the incentives and skills available from these practitioners. Note that I discuss only relative advantage; a patient is likely to visit a provider with a relative advantage when all other factors are the same. Each patient is located at different distances from all of the centers in question and faces different difficulties in raising cash for travel and fees, and these factors can also play a large role in the choice of provider. The following predictions are empirically tested in section 6.2

A visit to a hospital is at least as beneficial to a patient as a visit to a clinic under the same organization and often better. For some diseases, access to certain drugs or facilities aids recovery: if a bone is broken access to an X-ray makes a difference in expected outcomes. For other diseases such access makes no difference: aspirin given for a headache is as effective given at a clinic as it is at a hospital. Thus for conditions that benefit from the skill of a hospital over a clinic I expect patients to be willing to incur extra costs to visit a hospital. Similarly clinics are at least as effective as untrained providers with respect to skill and capacity.

A patient suffering from a disease that is very responsive to medical effort will seek mission centers because patients know that the level of effort, on average, is higher at mission centers: respiratory conditions (especially in children) indicate very different treatment regimes that can only be properly distinguished by proper in depth examination. However, if a patient has a disease that requires skill and not effort, or simply widely available medicines, the patient will not be willing to incur extra costs for the effort of mission centers: conditions indicative of malaria require medication but are not difficult to diagnose.

Government hospitals have a comparative advantage when conditions require high levels of skill but less medical effort: a victim of accident trauma has more need of blood or an IV than she has of correct diagnosis. Government clinics have a comparative advantage

when the required medical effort is low and the additional benefit to visiting a hospital is low: coughs, worms and such conditions require standard medication and are easily diagnosed.

Traditional healers have a comparative advantage for diseases in which both patient and medical effort are required: bone-setting requires the effort of a practitioner to properly set and the effort of patient to allow for the bone to heal properly. Though traditional healers have an incentive to encourage patient effort it is not generally true that they have a relative advantage in diseases for which patient effort is required. Patients have a natural incentive to exert effort when it, by itself, causes them to get better: a dehydrated child is more likely to be cured by the mother's effort than the doctor's and a mother does not need a doctor to pressure her to exert effort to save her child's life. Traditional healers do better when both efforts are required not only because they encourage patient effort but because because they have an incentive to take advantage of the complementarity of the efforts.

Patients with higher incomes receive more effort from traditional healers because the healer can bargain for a higher payment in the case of success and therefore has more incentive to provide medical effort. I assume that bargaining is based on some measure of the benefit of health to the patient. This measure will vary with income — the value of time measured — but it will not vary with wealth.

The contingent payment contract is not better than the fixed payment, penalty-based contract. Each contract has circumstances in which it is superior and situations in which it is inferior. These situations will depend in part on the characteristics of the disease.

5 Data

In order to test this theory of choice between practitioners I examine data collected on patient behavior in the face of illness in Mbonge Sub-Division, in the South-West province of Cameroun. Mbonge sub-division is entirely rural. This area was chosen because of

the presence of a German aid project which insured a consistent, reasonably-priced drug supply in all government health centers and hospitals permitting the claim that factors other than the availability of drugs are driving the patients' choices.

5.1 Household level data

40 villages were randomly chosen and 20 randomly selected households from each village were interviewed. Data were collected on all members of the household. There were 681 illness episodes reported within the month previous to the survey¹⁵ out of 4489 individuals represented. Of these, 548 visited one of the five types of providers I am studying. All reported visits are first contacts. Referrals, second opinions, and follow-up visits are not included in this analysis. Normal pregnancy is not considered an illness episode. Other providers included drug peddlers, pharmacists, neighbors, private hospitals and clinics and parastatal hospitals.

Converting distances to kilometers-on-a-paved-road equivalents¹⁶, villages sampled were an average of 28 km from a government clinic, 51 km from a government hospital, 87 km from a mission clinic and 212 km from a mission hospital. There was one government hospital and one mission clinic within the sample area. 79% of all visits were to a provider who was not the closest provider. Of the visits to clinics and hospitals only 53% were to the closest clinic or hospital. Of visits to hospitals 39% were to hospitals other than the closest hospital.

Table 1 compares patients by their choice of provider. The average reported family income is equivalent to just over 1,500 USD per year. Differences in income are very large across different types of providers, with the wealthiest families and individuals visiting mission centers.

The cost of visiting a clinic or hospital is overwhelmed by the cost of drugs (Table 2).

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¹⁵Illnesses which began earlier, but continued into the recall period were counted.

¹⁶To compensate for vastly different road conditions I use the taxi cost per kilometer to normalize all distances to the distance your taxi fare would take you on the main (paved) road in the sample area.

Traditional healers are not the least expensive providers, and the reported cost is understated because payments were not completed at the time of the survey. The cost of visiting hospitals is overstated since more severe illnesses require more medication, and more severe illnesses are more likely to result in a visit to a hospital than to a clinic.

5.2 Symptom Level Data

In order to develop the model I need quantitative evaluations of disease episodes. I collected information from the respondents on the characteristics of the episode from which they suffered: all of the symptoms they experienced; the self-declared severity of the disease; the number of days sick before seeking care; and the number of those days in which the patient was bedridden. With these characteristics of the disease plus the age and sex of the individual and information about endemic diseases in the area, I formed an impression for each case using basic medical references (Griffith 1985 Strickland, ed 1984 Werner 1977), and ranked it in the following categories:

Responsiveness to Medical Effort The degree to which outcome depends on the effort of the practitioner.

Responsiveness to Patient Effort Is there a critical role for the patient in her treatment?

Responsiveness to skill and capacity There are three levels of skill and capacity which patients can choose between: untrained or informally trained providers, providers at clinics and providers at hospitals. The responsiveness to skill and capacity is always at least as high at higher level facilities as at lower level facilities.

— **Informally trained practitioner** These are people who are in the health care profession and may have practiced for many years, but who never completed a formal medical training program. Their experience can be sizable but it will not be based

on a foundation of western medical training. Common drugs are available to them¹⁷.

This ranking contrasts the benefit of visiting such a provider with doing nothing.

- **Formally trained personnel in a clinic** These practitioners have some formal training and work in a facility which has a basic drug supply, beds, IV equipment and a delivery room but not much more.
- **Highly trained personnel in a hospital** These practitioners have advanced formal training and practice in a hospital with a much greater supply of drugs and equipment for surgery, long term care, etc. General practitioners would also be expected to have reasonable access to the services or advice of specialists.

Extremity of Outcomes What is the possibility for a very bad health outcome given the disease from which the patient suffers? This is a measure of risk.

From the three skill and capacity benefit scores I formed two differences — the difference in responsiveness between untrained practitioners and clinics, and the difference between clinics and hospitals. I expect these differences to be more important in the choice of a provider than the scores themselves.

Summary statistics for the entire sample are contained in Table 3. Scores of 0 (low) to 10 (high) were used for all scales. Since the analysis is very sensitive to these scores we had 2 doctors and one nurse (all experienced in rural tropical medicine) validate them by independently scoring all the cases using the definitions above. The scoring based on medical references correlated better with the other three than any of the other three correlated with each other. Therefore the analysis is performed with these scores, which are documented in Leonard (1997)¹⁸. The 4 sets of scores were not well correlated on the responsiveness to untrained personnel and trained personnel so we have dropped both of

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¹⁷A list of drugs that are readily available to anyone without prescription was given to the evaluating doctors and nurse. This list includes many drugs that would normally require prescriptions in the West.

¹⁸The data for this survey as well as correlation tables of the scores discussed above are available online at the Inter-university Consortium for Political and Social Research at the University of Michigan.

these from the analysis. I did find that the difference between the responsivenesses for trained personnel and hospital personnel was well correlated and therefore we kept this difference variable.

6 Empirical Analysis

One can imagine a data set in which every patient suffering from a particular type of disease goes to the same practitioner. If we believed that some practitioners could cure a particular disease and others could not, we would expect such a pattern. I do not observe such extreme specialization in the data. For all presenting conditions I observe some people going to one type of provider and others going to another.

It is also possible to imagine a data set in which one type of person always goes to only one type of provider. However I can find no typology of individuals that would explain the patterns of visits observed. In fact I find people from the same family visiting different types of providers when they suffer from different diseases and a few cases in which one individual visited one provider for one disease and another for another disease.

The data shows variation in the choice of provider by disease, individual characteristics and village characteristics (distances to providers). The model that I have presented implicitly assumes that such variation is possible and that all three factors could affect choice. We examine the effect of incentives on choices but do not propose that nothing else affects choice. Though it might be better for your health to visit a mission hospital, if you are particularly far away and a government clinic is very close or the cash is hard to raise, it might not be worth the extra cost or effort.

In the empirical analysis I seek a method that allows for variation in choices across multiple factors and can, by testing the hypotheses, test the validity of the model. If patients are choosing practitioners based on incentives then I should find support for the predictions from section 4. If the contract types I observe exist or came about for other reasons, then patients will choose providers independent of the characteristics of diseases

that I have chosen to examine.

6.1 Multinomial Logit analysis

To fulfill the criteria I chose a multinomial logit analysis in which the dependent variable is the choice of provider (5 categories) using individual, disease and provider characteristics as the independent variables. This is a test of reduced form hypothesis and the results of the multinomial logit are not reliable for further modeling, but they can pick out larger patterns in the choice of provider. See Leonard (1997) for a structural estimation of a model of choice of provider. Table 4 shows the marginal effects of the independent variables on the choice of provider derived from the 4 sets of coefficients of the logit. Each element can be read as the percentage change in the probability of visiting a provider given a one percent change in the variable from its average value.

I use the characteristics of the disease discussed above as well as the variable **product** which is the product of the two responsivenesses to effort. Family wealth is an instrumental variable recovered by regressing the reported total family income on the ownership of various durable goods, animals, the condition of the compound and the principal and secondary activities of all members of the household, and using the predicted income rather than actual income (Leonard 1997). In this way I avoid biases in reported income and the strong correlation, for adult men, between individual reported income and total family income. Personal income is the weekly income reported in 1000's of CFA. I asked heads of households if they thought a close friend or member of the extended family would and could help them if they had a family emergency; a yes answer is recorded in the **friend or relative assistance** variable.

The logic of the individual characteristics is as follows. I want to know if patients who visit traditional healers are less educated, or older than other patients — variables which could reflect different cultural beliefs. Since both of the nearest mission hospitals are of Protestant denominations I am checking to see if patients visit mission centers on the basis of religion. It is also possible that children are treated as if their conditions were less

serious than adults, and that women are not given the same consideration when it comes to expense that men are. I include the category of women who are in a polygamous marriage since it seems reasonable that if there is any discrimination against women, these women would have even less control over resources than single women or monogamous wives.

6.2 Results

The goodness of fit is represented by the prediction results in Table 5. Diagonal elements represent correct predictions. The following is a list of hypotheses and the results.

- *Diseases reported at traditional healers are characterized by high levels of responsiveness to both medical and patient effort because the traditional healer recognizes the complementarity of both efforts.* This was confirmed. Traditional healers have an increased probability of being chosen when both the responsiveness to medical effort and the responsiveness to patient effort are high, but not when either of them is high while the other is low. The change in the probability of visiting a traditional healer from a one percent change in the responsiveness to medical effort (E_m) is -0.021 direct effect plus an indirect effect of $0.009 \cdot E_p$ (where E_p is responsiveness to patient effort). The combination increases the probability of visiting a healer when E_p is greater than 2.3 and decreases that probability when E_p is less than 2.3. More importantly, the higher is E_p the greater the change in the probability of visiting a healer from a one percent change in E_m . Increasing E_p leads to an increase in the probability of visiting a traditional healer when E_m is greater than 3.7.

- *When the responsiveness to medical skill is low, patients will visit the least expensive practitioner who can provide the necessary level of effort. Thus diseases reported at government clinics will have low responsiveness to medical effort and less difference between the responsiveness to skill at hospitals and that of clinics.* Both of these hypotheses were confirmed. Government clinics are visited when the responsiveness to medical effort is low. Note that the combined direct and indirect effect implies that increasing responsiveness to medical effort increases the probability of visiting a government clinic only when E_p is

greater than 12.4, which is well outside of the range of E_p , and therefore increasing E_m always leads to a decrease in the probability of visiting a government clinic.

- *Diseases that are highly responsive to either medical effort or patient effort (though not both at the same time) result in visits to mission hospitals and mission clinics.* The former is confirmed by the data and the latter is consistent with the data. Visits to mission hospitals are characterized by high responsiveness to either effort, and visits to mission clinics support but do not confirm this same pattern.

- *Visits to mission hospitals are characterized by diseases with high additional responsiveness to skill at hospitals over clinics, and visits to mission clinics are characterized by low additional responsiveness to skill.* The first was consistent with the data and I found no evidence to support the second. Visits to mission hospitals are characterized by high additional responsiveness to skill at hospitals, but I do not find that visits to mission clinics are characterized by low additional responsiveness to skill, suggesting that patients view mission clinics as hospitals. Almost 30% of all visits to government hospitals (see Table 5) were predicted as visits to mission clinics (35 of 128), implying that there is considerable overlap in the function of these two types of practitioners. The best way to distinguish between visits to these two providers is to look at travel costs, and patient characteristics.

- *Diseases characterized by high responsiveness to patient effort and low responsiveness to medical effort result in visits to government hospitals or clinics depending on the requirements of skill and capacity.* Note that this hypothesis contrasts with the hypothesis listed third in that medical effort is specifically low. This hypothesis was not confirmed by the data. It appears that such diseases are found at mission centers rather than government centers. I might have underestimated the incentive that mission centers have to induce patient effort.

- *Visitors to traditional healers have high income levels and they do not necessarily come from wealthy families.* This was confirmed.

Of nine hypotheses the data confirmed 5, was consistent with 2, provided no evidence to support 2 and rejected none. The two for which no evidence was found concerned

patient perception of the role of mission clinics with respect to skill and patient effort. Considering the difficulty of recreating the conditions that the patient faced when she chose a provider I consider these results to be very exciting. They are particularly strong with respect to the characteristics of diseases reported at traditional healers.

I did not form hypotheses for the other variables but a discussion of some of the findings follows¹⁹. The range of outcomes is correlated with whether or not the condition represents an emergency. In this case patients with emergencies are visiting mission clinics and government hospitals but not traditional healers, government clinics or mission hospitals.

Patients of traditional healers are not less educated, older or poorer than other patients. As individuals they are richer. Visitors to government clinics are poorer, both as individuals and as families, and they are less likely to have a friend or relative who would help them. This implies that government clinics, in the sample area, are providing a service to the poorer members of the population. It does not appear that there is discrimination within families as to who gets to visit which type of provider, at least at government clinics. Women and children are not significantly more likely to visit government clinics when they are sick. This is a very important implication because the standard case-load at government clinics suggests that women and children are more likely to visit these clinics. By including disease characteristics in the analysis I can conclude — for this sample area — that choices which seem to be driven by access to economic resources are really being driven by the requirements of the disease.

Visitors to mission clinics are from wealthier families, are less educated, are more likely to have a friend or relative who will help them, and are younger. Why visitors to both mission clinics and hospitals are less educated than the rest of the population, I cannot say for sure. A more mathematical model of the demand for health care (Grossman 1975) admits the possibility of an individual ability to transform health inputs into health. It is possible that more educated people can transform health care into health better than less

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¹⁹Results of these analyses unrelated to incentives, effort and skill will be addressed in a forthcoming paper by Ndeso Atanga.

educated people, and could therefore consume smaller quantities to the same final effect.

7 Conclusions

This paper examines a feature of traditional healers that is widespread in Africa but little noticed in discussions of health seeking behavior. Though it is a simple and seemingly inconsequential feature of doing business with a traditional healer, theory suggests that payment which is based on outcome could have far reaching consequences. I find that the contingent-fee offered by traditional healers affects the behavior of individuals who are ill. The results offer new insight into the practices of traditional healers and offer a new way of looking at quality and the patient perception of quality in health care.

The practices of traditional healers bring some important insights to the search to overcome problems that face all providers in Africa and even in the developed world. Traditional healers are not just creative botanists or convincing magicians, they provide health care in a manner that is understood and useful in Africa. They are not only used by people who are ignorant of the benefits of modern health care. They are not used more by the poor than by the rich. They have found a niche in the health care market and price changes at government centers and general health education are unlikely to stop people from visiting traditional healers.

This analysis formalizes what many people in the area told us — that where they go depends on the illness that they think they have. Government clinics are the best place (in the sample area) to get simple, inexpensive drugs. I were repeatedly told that if someone thought they had malaria they would go to the cheapest (in terms of price and distance) location where they could get chloroquine, but if they were more concerned about their condition they would very strongly consider all of the other options. The analysis comes to the same conclusions as these informants.

This work begs the question ‘are healers successful at treating patients?’ The data suggests that success rates are similar across providers but I have deliberately not presented

outcomes in this analysis. Different types of practitioners face different patterns of diseases and therefore a comparison of success rates across providers is inaccurate. Answering the above question would require a very detailed study of controlled patients and medically measured outcomes, far beyond the scope of this study.

The data does not permit detailed hypotheses about the differences between mission services and government services. Further work in this area, including comparison between different types of mission services and a solidified link between institutional forms and incentives would be useful in giving more information to policy makers about how to improve government services.

I have identified an important component of quality in health care — effort and incentives to provide effort. Patients are aware of the difference between skill and motivation, and any but the most cursory studies of the supply of health care are quick to point out that motivation, or the lack thereof, is a serious problem. The demand for health care reacts to this deficiency in supply. Visibly improving the incentives that providers face will have a positive effect on the demand for health services.

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Table 1: Individual characteristics by provider type

variable	all	gov clinic	mis clinic	gov hosp	mis hosp	trad heal
observations	609	158	144	131	58	64
age	24	18	21	27	41	28
female(%)	49	48	43	50	50	53
education (years)	2.5	2.3	2.0	2.8	2.27	3.43
patient income (1,000 cfa/year)	141	65	174	104	448	124
family income(1,000 cfa/year)	771	605	958	721	1,143	612

1,000 cfa $\approx$ \$2USD

Table 2: Average prices by health care providers					
	gov clinic	mis clinic	gov hosp	mis hosp	trad healer
total cost	4.486	8.153	27.713	29.569	7.812
drug costs	3.875	7.124	26.530	27.926	(na)
non-drug costs	0.610	1.028	1.182	1.642	(na)
all prices in 1,000 cfa					
1,000 cfa $\approx$ \$2USD					

Table 3: Episode characteristic coding

variable	mean	std err	min	max
Responsiveness(medical) E_m	5.00	2.02	1	9
Responsiveness(patient) E_p	3.96	1.83	1	9
Benefit to untrained B_u	3.08	1.30	0	7
Benefit to clinic B_c	4.03	1.79	0	8
Benefit to hospital B_h	4.73	2.25	0	9
Diff(clinic untrained) $B_c - B_u$	0.96	1.05	0	5
Diff(hospital clinic) $B_h - B_c$	0.70	1.13	0	6
Extremity of outcomes	3.96	2.12	1	10

Table 4: Partial derivatives of probabilities from multinomial logit

variable	trad heal		gov clinic		mis clinic		gov hos		mis hos	
	coef	z-test	coef	z-test	coef	z-test	coef	z-test	coef	z-test
Characteristics of the Disease										
responsiveness(medical) E_m	-0.021	-1.28	-0.062	-2.08 ‡	0.035	1.16	0.014	0.48	0.035	2.27 ‡
responsiveness(patient) E_p	-0.033	-1.75 †	-0.023	-0.69	0.022	0.66	-0.002	-0.06	0.035	1.74 †
product $E_m \cdot E_p$	0.009	2.33 ‡	0.005	0.738	-0.008	-1.15	-0.000	-0.06	-0.005	-1.34
responsiveness, hospital B_h	0.005	0.48	0.002	1.21	-0.010	-0.56	-0.012	-0.63	-0.006	-0.60
diff(clinic/hosp) $B_h - B_c$	-0.012	-0.66	-0.052	-1.66 †	0.035	1.33	0.019	0.74	0.010	0.89
range of outcomes	-0.041	-2.47 ‡	-0.011	0.484	0.009	0.43	0.034	1.58	-0.014	-0.92
Individual Characteristics										
family wealth	-0.002	-0.76	-0.001	-0.22	0.007	2.22 ‡	-0.005	-1.18	0.002	1.44
personal income	0.006	1.95 †	-0.015	-2.02 ‡	0.006	0.910	0.001	0.12	0.003	1.02
years of education	0.004	1.09	0.006	0.83	-0.012	-1.78 †	0.006	0.92	-0.004	-1.17
protestant(yes/no)	0.031	0.98	0.033	0.64	-0.001	-0.02	-0.085	-1.71 †	0.022	0.82
friend or relative, assist	-0.020	-0.70	-0.082	-1.62 †	0.093	1.80 †	-0.003	-0.07	0.011	0.45
polygamous female(yes/no)	-0.094	-0.92	-0.041	-0.27	-0.14	-0.96	0.24	2.1 ‡	0.031	0.58
child(less than 15)	-0.035	-0.74	0.088	1.0	-0.091	-1.02	0.085	1.00	-0.048	-0.95
elder(over 55)	-0.045	-0.91	0.122	1.18	-0.168	-1.74 †	0.112	1.24	-0.021	-0.64
age(natural logarithm)	0.023	1.18	-0.041	-1.27	-0.051	-1.68 †	0.035	1.10	0.034	1.73 †
adult female(yes/no)	-0.048	-1.26	0.001	0.01	-0.031	-0.43	0.085	1.26	-0.008	-0.25
One-way Taxi Travel Costs										
to government clinic	0.105	2.68 ‡	0.078	1.45	-0.075	-1.31	-0.083	-1.47	-0.024	-0.62
to mission clinic	-0.014	-0.38	0.155	2.240 ‡	-0.294	-4.20 ‡	0.068	1.06	0.086	2.27 ‡
to government hospital	0.007	0.24	0.310	5.88 ‡	-0.036	-0.66	-0.282	-5.00 ‡	0.001	0.03
to mission hospital	0.008	0.24	-0.058	-0.91	0.154	2.44 ‡	0.003	0.05	-0.106	-2.84 ‡
‡95% significance										
†90% significance										

Table 5: Prediction success of the multinomial logit

actual	predicted					total	% correct
	tradheal	gov clinic	mis clinic	gov hos	mis hos		
tradheal	19	14	16	10	2	61	31%
gov clinic	10	101	22	13	8	154	66%
mis clinic	3	29	79	19	10	140	56%
gov hospital	4	27	35	56	6	128	44%
mis hospital	4	8	15	12	15	54	28%
total	40	179	167	110	41	537	50%

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