Social Affiliation and the Demand for Health Services: Caste and Child Health in South India *

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July 2005

Abstract

This paper assesses the role of social affiliation, measured by caste, in shaping investments in child health. The special setting that we have chosen for the analysis – tea estates in the South Indian High Range – allows us to control nonparametrically for differences in income, access to health services, and patterns of morbidity across low caste and high caste households. In this controlled setting, low caste households spend more on their children's health than high caste households, reversing the pattern we would expect to find elsewhere in India. Moreover, health expenditures do not vary by gender within either caste group, in contrast once again with the male preference documented throughout the country. A simple (caste) network-based model of household resource allocation is proposed to explain these striking results.

Keywords. Health. Networks. Caste. Gender. Household decisions.
JEL. D13. J12. J24. O12.

*This project could not have been completed without the encouragement and support that we received from Homi Khusrokhan. We thank the management, staff, and workers of Tata Tea, Munnar, for their assistance and gracious hospitality during our extended stays in the tea estates. Binitha Thampi supervised the data collection and, together with Leena Abraham, assisted us in the design of the survey. We are grateful to Sameer Kumta and Sorab Sidhwa for their assistance with the illness classification, and to Andrew Foster for many helpful discussions. Chun-Fang Chiang, Alaka Holla, and Jonathan Stricks provided excellent research assistance. Sarah Williams and Naresh Kumar assisted us with the geo-mapping. Research support from the Mellon Foundation at the University of Pennsylvania, the Harry Frank Guggenheim Foundation, and NICHD grant R01-HD046940 is gratefully acknowledged. We are responsible for any errors that may remain.

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1 Introduction

There is a growing awareness among economists that health is not only an important determinant of individual wellbeing but of macroeconomic growth as well. Consequently, much progress has been made in understanding how access to health services can be improved and, more generally, how the supply of health care can be increased. In contrast, economists have placed less emphasis on researching the demand side of the health market, and in particular, how utilization of health services differs across social groups. This paper aims to fill this gap by exploring health seeking behavior for children in India, and how this behavior differs by caste, one of the most important and enduring social affiliations in the country.

There is a large literature in anthropology, sociology, and public health that seeks to understand how individual and group characteristics affect health seeking behavior. With respect to community effects, numerous studies have uncovered significant differences in health and health care utilization across race, ethnicity, religion, and region. Explanations that have been put forth for these differences include variations in culture, such as health beliefs and practices, discrimination, and government policies by social group (Burgard 2002, Stephenson and Tsui 2002, Basu 1990). Studies that find significant differences in health outcomes by caste are also prominent (Bonu, Rani and Baker 2003, Kabir et al. 2003, Kapoor, Kshatriya and Kapoor 2003); however comprehensive explanations for variation by caste are lacking.

The basic statistical problem that arises with most attempts to identify a role for social affiliation in the demand for health services is that it is difficult to distinguish between the contribution of the social group and the effect of unobserved individual characteristics that are correlated within the social group. For example, suppose that we were to find that high caste households invest more in health than low caste households. One explanation for this difference would be that informal networks organized at the level of the caste group determine the household's access to credit and, more generally shape the household's investment in human capital, including health. Shared historical circumstances might also have given rise to a caste-specific health culture or to a caste-specific pattern of discrimination in the health sector. However, another set of explanations is based on the idea that socioeconomic conditions will typically vary substantially across castes. Low caste households might lack the pecuniary resources to invest in health or be denied access to health due to their socioeconomic circumstances rather than their caste affiliation *per se*. Our primary objective in this paper is to provide empirical support for

the view that social affiliation, conveniently measured by caste in India, directly shapes household health care decisions and to propose a network-based explanation for why investments in health may differ across castes.

This paper takes advantage of a unique empirical setting to avoid many of the statistical problems discussed above. Our study is situated in 23 tea plantations or "estates" belonging to one company in the South Indian High Range, a mountainous region on the border of the modern Indian states of Tamil Nadu and Kerala. The High Range was virgin forest until it was cleared for tea cultivation by British planters around 1860. Since the local area was uninhabited, labor was imported from the neighboring state of Tamil Nadu. The 23 tea estates are part of the modern state of Kerala today and the workers are the third generation descendants of the original migrants, supplemented by the fresh influx of new arrivals in each generation through marriage.

The low castes in Hindu society were historically relegated to menial occupations and faced severe social discrimination. While the government of India has taken steps to remedy these inequities by subsidizing education and reserving positions in institutions of higher learning and the government for the low castes, a large caste-gap in education and income has been documented in both rural and in urban India today, 50 years after independence. What is unique about the empirical setting that we have chosen is that low caste and high caste workers in the tea estates have the same income and access to the same educational and medical facilities as the high caste workers. Moreover, these unusual opportunities for the low castes have now been in place for three generations. This allows us to control nonparametrically for the two most important confounding effects–differences in income and differences in access to health care facilities–that have undermined previous attempts to identify a role for social affiliation in determining health investments.[1]

The tea company offers heavily subsidized health services to its employees in hospitals located in each estate. More serious health conditions are referred to the company's General Hospital. There is a widespread perception among the workers that the company's facilities, although relatively cheap, are of poor quality. Apart from the company's health facility, the workers can seek treatment from private clinics or a government hospital located in the main town. Other treatment choices include buying medicines directly from the chemist without a prescription, an illegal but common practice

[1]Our strategy in this paper is most closely related to Basu's (1990) study, which compared health seeking behavior between two regional groups residing in the same slum in New Delhi. While she attempted to control for differences in socioeconomic status and access to health services across these groups in her analysis, the additional advantage of the setting that we have chosen is that caste groups have identical incomes and access to the same medical facilities in the relatively isolated tea estates.

in India, or visiting a traditional healer. Use of home remedies is also a common occurrence. Our interest will be in comparing the treatment choices that parents make for their children by caste. We combine the company facility, the local chemist, and treatment at home in a low-cost, low-quality "inside" treatment category. The private clinic, the government hospital, and the traditional healer are combined in an "outside" treatment category. The respondents in our survey were asked to self-report the last illness for each child, leaving us with over 80 medical conditions. These conditions were separated into two broad illness categories: "routine," such as cough and throat infection, headache and fever, and "non-routine," which includes serious conditions such as typhoid and jaundice, and operations. Our analysis finds that while treatment choice for the routine illnesses does not vary by caste, low caste parents are 50% more likely to treat their children outside for the more expensive non-routine illnesses than the high castes. This translates into a substantially greater treatment cost among the low castes for the non-routine conditions.

The explanation for this caste difference in investment in child health that we put forward in the paper is based on the idea that low caste and high caste workers have networks of very different quality at home in rural Tamil Nadu. As a consequence of historical occupational segregation, high castes have higher incomes and are more likely to be engaged in skilled occupations in rural Tamil Nadu (Luke and Munshi 2005). The quality of a network will in general depend on the resources of its members, and so we would expect high caste networks to be of higher quality than low caste networks. While the workers have been in the tea estates for many generations, they continue to be tied closely to their ancestral communities. Many send their children home to study, marry their children to relatives from the origin location, and return to that location when they retire. A household in the tea estates can thus invest its scarce resources in its home network, exchanging loans and transfers with relatives and buying assets at home, or it can invest its resources in the nuclear family, particularly the children's human capital. Everything else being equal, a high caste household in the tea estates with access to a superior home network will be tied more closely to its home community, investing more in the extended family and less in its children's human capital. This explains why high caste households invest less in their children's health and education than low caste households.

While much of the paper is devoted to establishing a link between social affiliation and the demand for health services, we are also interested in studying how health investments in children vary by gender. In contrast with the results from many previous studies (e.g., Kishor 1995, Das Gupta 1987), we find no differences by gender in treatment choice or treatment cost, both for low castes and high

castes, in the tea estates. Households in the tea estates earn substantially more than what they would in their origin locations in Tamil Nadu. In addition, both men and women have access to full-time year-round employment in the tea estates and the women actually earn significantly more than the men. Given the well known propensity for women to invest in their children, particularly the girls, when resources are made available to them, and given the relatively high standard of living in the tea estates, this is precisely the setting in which we might first expect to see gender-equity in this traditional society. Previous results in Luke and Munshi (2005) (henceforth referred to as the "companion paper") indicate that the gender gap in education is narrowing, particularly among the low castes. We conjecture that notions of fairness within the household might be stronger for health investments than for other expenditures, which explains the especially promising results that we obtain in this paper.

The paper is organized in five sections. Section 2 compares households decisions and outcomes by caste in the tea estates, together with a simple conceptual framework that explains these differences. Section 3 describes the health care system in the estates, the incidence of different children's illnesses and their treatment by caste. We will see that differences in treatment by caste match the general discussion in the previous section. Subsequently Section 4 tests these observed caste differences more stringently, including additional checks to rule out alternative explanations for these differences. Section 5 concludes.

2 Caste Differences in the Tea Estates

The data that we use in this paper are obtained from a survey of 4,000 female tea workers that we conducted in 2002-2003. The selected women were drawn randomly from all 23 estates owned by one company, the largest tea manufacturing company in the world, in the South Indian High Range. The survey collected detailed information on the background of the respondent, her husband, and their parents. Information on the schooling and marriage choices made for each of the children, their current residential location, as well as their occupation was collected. The women in our sample range in age from 22 to 58, and some of their children are as old as 45. The schooling and marriage statistics for the children that we report below are based on the children aged 16-45. For the purpose of this paper, however, the most relevant section of the survey deals with the health status and treatment of each child aged 15 and under. Information on the last illness experienced by the child, the treatment choices

that were made, and the cost of the treatment was collected. Supplementing the detailed survey data, we also obtained annual incomes for all female workers and their husbands over the 1997-2001 period from the company's computerized records (see the companion paper for further details on the data collection process).

While the inequities of the Indian caste system are well known, a particularly egregious feature of this system in South India was the institution of agrestic slavery, which condemned the members of certain agricultural sub-castes or *jatis* to a lifetime of servitude. The slave castes went by different names in different areas; in the Tamil-speaking region there were two main slave castes, the Pallars and the Paraiyars (Kumar 1965). Slavery in India was abolished in 1864 and so the emancipation of the slaves coincided with the opening up of the tea estates. Not surprisingly the bulk of the initial migrants to the High Range were (former) slave castes looking for new opportunities, and today two-thirds of the workers on the tea estates continue to belong to these lowest of the low castes. At the same time, structural changes in rural Tamil Nadu brought about by the colonial administration in the nineteenth century displaced many high caste workers from their traditional occupations, leading them to migrate to the tea estates (Kumar 1965). A wide mix of castes consequently is represented in the tea estates today. We classify Pallars and Paraiyars as "low castes" for the analysis in this paper, including all the other castes as "high castes"(see the companion paper for additional justification for this classification).

Our first objective in this section is to establish that economic conditions do not vary by caste in the tea estates but that low castes invest more in human capital, which we first measure by education. We provide an explanation based on differences in network quality for the observed differences in human capital across castes. The results and the discussion in this section are drawn for the most part from the companion paper, which explores differences in schooling, marriage, and residential location across castes in the tea estates. Education and health are, of course, alternative dimensions of human capital. The discussion in this section thus helps motivate the detailed comparison of treatment choice by caste that follows in Section 3 and Section 4.

Women work as pluckers in the tea estates, while men are typically assigned supporting tasks such as weeding, spraying, pruning, and in the estate tea factory. These assigned tasks do not vary by caste, and we see in Table 1, Columns 1-4 that both male and female income are indistinguishable by caste. Next, we compare schooling by caste, both among the workers as well as among their children, in the second row of Table 1. These statistics are computed using all the workers in the sample and children

aged 16-45, respectively. Low castes have significantly higher education than high castes across both generations with only one exception, the boys in Columns 5-6. This striking result reverses the caste pattern that we would expect to find elsewhere in rural and urban India, and we argue below that it is a direct consequence of the special circumstances of the tea estates.

Consider a simple world in which parents can invest their scare resources in their extended family networks, located in their ancestral homes in rural Tamil Nadu, or in the nuclear family (and their children's human capital), over their working lives. Subsequently they live off the returns to these investments when they retire. A family in the tea estates that sends loans and other transfers to the members of its network and possibly invests in land and other assets in the ancestral location will presumably receive reciprocal transfers in return when it retires. When the parents invest in their children's human capital, notably education and health, they similarly expect to be supported by their children when they retire.

How would we expect investment decisions to vary by caste? The quality of the extended family network will in general depend on the economic circumstances of its members. The low castes were historically severely disadvantaged, both economically and socially, and these caste disparities persist today, both in rural and in urban India (Ayres and Simon 2003, Deshpande 2002). Thus, we would expect the low caste workers in the tea estates to have access to inferior networks in their ancestral homes than the high caste workers. This implies in turn that the returns to investment in the low caste networks will be lower than the corresponding returns in the high caste networks. Investing in the children's human capital, and education in particular, is a way to exit the network. As a first-order approximation we would expect the returns to education in the open market (the modern economy) to be independent of caste. Since household incomes do not vary by caste, the preceding discussion tells us that low caste households in the tea estates should invest more in human capital and less in the network than high caste households.

The portfolio allocation problem just described is complicated by the fact that the returns to investment in the network will depend on whether the children will marry a relative. Marriage to close relatives is a distinctive feature of the South Indian kinship system, with overlapping extended family networks linking the entire sub-caste or *jati* (Karve 1953, Dumont 1986, Trautman 1981). Marriage ties reduce information and enforcement problems, effectively increasing the returns to investment in the network. Holding marriage choice fixed, we noted above that high caste households will invest more in the network than low caste households. Under reasonable conditions, this implies that the

benefit from marrying the children into the network, and increasing the return on each dollar invested in the network, will be greater among the high castes. Marriage into the network lowers the returns to schooling, since the child is more likely to end up living and working in the ancestral location where opportunities are limited. The greater propensity to marry into the network among the high castes thus lowers the returns to schooling for them, reinforcing caste differences in the trade off between investing in human capital and the network. The net outcome of all of these mutually reinforcing effects is that the high caste children have lower educational attainment than the low caste children in the tea estates, but are more likely to be married to a relative. This prediction, which should hold across generations, matches perfectly with the cross-caste differences in schooling and marriage reported in Table 1.

The basic marriage rule in Hindu society is that no individual can marry outside the endogamous *jati* and we see in Table 1 that both low caste and high caste workers in the tea estates continue to follow this basic rule. There is an increase in out-marriage among the children, consistent with the inter-generational patterns noted elsewhere (Munshi and Rosenzweig 2004), but the generally high level of adherence to the marriage rule is maintained. Moreover, despite having lived in the High Range for multiple generations, households continue to marry their children to relatives at home in rural Tamil Nadu. Once again there is a decline in marriage to close relatives across generations, but the basic patterns continue to be maintained among the married children. The statistics in Table 1 suggest that households in the tea estates continue to be connected to their home communities and that they use marriage ties to compensate for their physical separation from these communities.

Looking across castes, notice that the propensity to marry a relative is much higher among the high castes than the low castes for both generations in Table 1. This result does not follow mechanically from the fact that the low castes are more likely to marry outside their *jati*; indeed the opposite pattern is obtained, presumably due to the continuing stigma associated with marrying into the former slave castes. We believe that these cross-caste marriage patterns are obtained because the low caste workers are distancing their families from their home communities. Consistent with this view, the companion paper shows that the low caste workers are less likely to send their children to school in their ancestral locations, the children are less likely to ultimately settle there, and the parents of the workers are less likely to retire there.

Apart from differences across households by caste, we are also interested in differences by gender within households by caste. Schooling increases sharply across generations for both males and females

in Table 1, but notice that the gender-gap is almost closed for the low caste children. Up to this point we have assumed that preferences within the household are perfectly aligned. But mothers in a traditional society take almost complete responsibility for child care and therefore we might expect mothers to be more concerned with their children's welfare than fathers. A selfish father would care only about the returns from investment in the extended family network versus investment in the children, whereas the altruistic mother would internalize the cost to the children from marrying into the network and subsequently settling in the ancestral location. The extreme poverty among the low castes, and the slave castes in particular, has been accompanied by a culture characterized by high levels of domestic violence and male alcohol abuse (Kapadia 1995, Kooiman 1989, Geetha 2002). Women suffer disproportionately in this culture and it is easy to see why the low castes female workers in the tea estates might want to use their influence within the household to distance themselves and their children, particularly the girls, from the home network.

Both men and women work in the tea estates, and the women actually earn 15% more than the men on average. The companion paper shows that conditional on total household income, an exogenous increase in low caste female income increases the educational attainment of the children and lowers the probability that they will be married to a relative. In contrast, female income has no effect on these household decisions among the high castes. Under the usual assumption that a relative increase in female income moves the household to a point on the Pareto frontier that the woman prefers, this result implies that male and female preferences are aligned (to a first-order approximation) among the high castes, whereas low caste women independently move their families away from the network, reinforcing the cross-caste differences based on underlying variation in network quality that we discussed above. Moreover, we find that the effect of low caste female income on schooling is concentrated among the girls, matching the caste-gender patterns in Table 1 and coinciding once again with the preceding discussion.

The results that we report in Table 1 distinguish castes by their level of schooling. But what predictions can we make about investments in health by caste? When parents shift resources from the extended family to the nuclear family, they expect that they will depend on their children to a greater degree in the future. Transfers from the children will only be obtained if they are productive and healthy; investments in education and health will be complementary in this case and the caste-gap in schooling that we obtained in Table 1 should follow through for health as well. The additional complication when predicting caste-differences in health investment is that the extended family networks

are most effective in smoothing consumption and covering contingencies, such as illness and marriage, for their members (Munshi and Rosenzweig 2005). A high caste household in the tea estates will consequently have access to superior health insurance and this must be weighed against the greater incentive among the the low castes to invest in their children's health. We will see below that the second effect dominates in practice, and that the low caste households end up investing more in both health and education in the tea estates.

When it comes to investment by gender, within each caste group, patterns of behavior do begin to diverge for health and education. Although girls receive less schooling than boys in both castes, we see no such differences by gender in health expenditures. It is possible that notions of fairness in intra-household resource allocation are first applied to health expenditures in a developing economy.

3 Health in the Tea Estates

3.1 Access to Health Care

The tea estates are covered by the Plantations Labour Act of 1951, which stipulates that the owners of all the plantations in the country must provide drinking water, sanitation, medical facilities, primary education, and housing to the workers and their families. The level of healthcare and education to be provided by the employers was left to the discretion of each state government.

The communist party came to power in Kerala in 1954 and has ruled the state, with brief spells out of power, since that time. The protection of workers' rights was one of the important planks upon which the communist government was voted into power (Baak 1997), and not surprisingly it set strict standards of implementation of the Plantations Act. The workers in our estates receive free housing and health services, day-care is available in each estate, and the workers' children are schooled free of cost through grade four.

The health care system includes a small hospital in each estate and a company General Hospital located close to the main town. Each estate hospital is equipped with facilities for minor operations, including childbirth, and is staffed by trained doctors and nurses. The General Hospital has an Intensive Care Unit and multiple operation theaters. It is staffed by internists and specialists in all major medical areas. The health system places strong emphasis on maternal and child health care, including prenatal care, close monitoring of high-risk pregnancies and births, family planning, and child immunization and nutrition programs.[2] All these facilities, including the medicines that may be

[2]The high quality of health services is reflected in positive health outcomes. For example, the infant mortality rate in

prescribed, are available free of cost to all the workers and their children (up to age 18). Other relatives are also permitted to use the medical facilities, but they must pay for consultation and medication.

The health facilities provided by the company are superior, at least on paper, to the facilities available in the local government hospital or private clinics. However, there is a widespread perception among the workers that cuts across caste lines that the company medical staff are indifferent to their medical problems and that the overall quality of service is lacking. Such apathy might be a commonly shared misconception among the workers or it may be a valid criticism that arises because the medical staff have little incentive to put effort into their treatment. For our purpose it does not matter whether the difference in quality between the company's facilities and the outside facilities is factual. What is important for our purpose is that there is a perceived difference in quality between these facilities that is shared across workers. The workers must choose between low-cost, low-quality company service and higher-cost, higher-quality outside health service. Everything else being equal, a family that invests more in its children's health should be more likely to send them outside the estate medical system for treatment and consequently spend more money on that treatment.

3.2 Illness Incidence and Type

The survey collected detailed information on the health and treatment of all the respondents' children aged 15 and under. The respondent was asked to report the last illness that each child suffered from. The identity of the health care provider first chosen to treat that illness, with the accompanying cost (including transport, medicine, etc.), was next obtained. For those cases in which subsequent treatment was sought elsewhere, information on the identity of the second provider and the cost of treatment was also obtained.

One concern with the analysis reported below is that different caste groups might self-report the incidence of ill-health or the type of illness differently. The survey elicited information on *when* the last illness occurred, which allows us to assess whether the frequency of (reported) illness varies by caste. As can be seen in Table 2 the distribution of the timing of this last illness is almost identical for low caste and high caste children. Moreover, almost all the children were treated for this illness, suggesting that the reported illnesses are sufficiently severe and that their severity does not vary by caste. The discussion that follows will look more closely at the types of illnesses reported, by caste.

the tea estates was 19 in 1999-2000 (Tata Tea 2000), versus 48 in Tamil Nadu and 68 for the entire country in 1998-1999 (IIPS 2000).

A total of 84 illness types were reported by the respondents. After consulting with physicians based in India, these illnesses were aggregated into 13 categories (with sample prevalence in parentheses): **1.** cough and throat infection (14%); **2.** headache and fever (52%); **3.** injury and accident (7%); **4.** ear, nose, and throat (5%); **5.** gastrointestinal (6%); **6.** respiratory (3%); **7.** typhoid and jaundice (1%); **8.** childhood disease, including measles, mumps, and chicken pox (2%); **9.** fits (epilepsy) (1%); **10.** tumors and operations (2%); **11.** pain (4%); **12.** skin conditions (2%); and **13.** chronic conditions (1%). The first four categories were further classified as "routine" illnesses (78%), while the remaining nine categories were classified as "non-routine" illnesses (22%). The basic idea behind this distinction is that the non-routine illnesses are less common, potentially serious, and more difficult to treat, and later we will see that a second treatment is much more likely to be sought for these illnesses. Not surprisingly, treatment costs are also higher for the non-routine illnesses. If there is a difference in treatment choice by caste, we expect that it will show up most strongly for the non-routine illnesses, which is what we will see below.

We saw in Table 2 that the frequency of illness does not vary by caste. However, when we compare treatment choices by caste, separately for routine and non-routine illnesses, we must also assume implicitly that the classification of these diseases does not vary systematically by caste. Suppose, for example, that low caste and high caste parents classify conditions differently but treat them the same. Then observed differences in treatment by caste for a given illness type (routine or non-routine) will be entirely spurious. Alternatively, suppose that the type of illness varies across broad caste groups. In that case, we could easily imagine that the caste group in which a greater fraction of the children are afflicted with expensive non-routine illnesses will spend less at the margin on those illnesses since household incomes do not vary by caste.

To rule out these confounding effects, we proceed to verify that the type of illness does not vary by caste in Table 3. This table reports the mean for various child, household, and network characteristics, separately for routine and non-routine illnesses. For binary variables, the table reports the proportion of the sample in each illness category. If assignment to the routine and the non-routine category is independent of a given characteristic, then the statistics reported in Columns 1 and 2 will be the same. For example, the proportion of high caste children in both the routine and the non-routine illness categories is 0.31 (the proportion of high caste children in the sample), which implies that the probability of reporting a non-routine illness does not vary by caste. Along the same lines we see that the probability of reporting a non-routine illness does not vary across a number of individual

and household characteristics; the gender of the child, the education of the parents, and household income. The only exception is the child's age; older children are more likely to suffer from non-routine illnesses. Later in Section 4 we will study how the treatment decision varies with the distance to the household's ancestral location in Tamil Nadu as a way of providing additional support for the view that networks far away shape human capital investments in the tea estates. Notice from Table 3 that the probability of reporting a non-routine illness does not vary by caste or distance to the origin, yet treatment choices will vary substantially along both these dimensions.[3]

3.3 Illness Treatment

Previously we mentioned that a household could choose between the company's medical facilities and private clinics or the government hospital. While these are the main treatment options available in the tea estates, the parents could visit a traditional healer, treat the children at home, or get medicine directly from the chemist. These last two options are low cost and most likely perceived to be of low quality; hence, for the analysis that follows, the private clinic, the government hospital, and the traditional healer will be included in the "outside" category.

Most studies of health seeking behavior collect data on a single treatment choice per illness. In practice, however, it is common for individuals to seek treatment from multiple providers, sequentially or concurrently (eg. Feierman 1985). An important feature of our survey was that information on the first and second (where relevant) treatment was collected. Differences by caste in treatment choice only emerge in the second treatment, emphasizing the importance of collecting the treatment history. While households favor low cost treatment options, notably the estate hospital, for the first treatment, the emphasis shifts to higher (perceived) quality choices when a second treatment is required. Consistent with our classification by quality, "outside" providers are much more likely to be sought out for the second treatment than for the first.[4]

The average cost of treatment for routine illnesses from the survey is Rs. 17 for inside treatment versus Rs. 499 for outside treatment, whereas the corresponding costs for non-routine illnesses are Rs.

[3]While medical facilities might be uniform across estate hospitals, distance to the General Hospital and to the private facilities situated in the main town, Munnar, could potentially vary by caste. We verified, however, that this is not the case; the average distance to Munnar in km (with standard errors in parentheses) is 15.47(0.20) for the low castes and 15.60 (0.26) for the high castes.

[4]The following treatment choices were listed for the first treatment: self (2.5%), chemist (2.5%), company hospital (81.5%), local healer (0.5%), government hospital (0.5%), private clinic (12.5%). The mix of choices for the second treatment was as follows: self (0.5%), chemist (3.0%), company hospital (39.0%), local healer (2.0%), government hospital (3.0%), private clinic (52.5%).

264 versus Rs. 1984 (costs by type of treatment are significantly different at the 5 percent level in both cases). The choice of treatment appears to have important cost and (perceived) efficacy implications. This is what we turn to next.

Table 4, Columns 1-2 compare treatment choices for routine and non-routine illnesses. Starting with the first treatment in Panel A we see that the more complicated non-routine illnesses are significantly more likely to be treated outside. We noted above that the cost of treatment outside is significantly higher with each illness type, and non-routine illnesses are more expensive than routine illnesses with each treatment choice, so the total cost of treatment (in logs) is not surprisingly significantly higher for non-routine illnesses.[5] The parents are also much more likely to have taken their children for subsequent treatment with these illnesses.

Panel B combines the first and second treatment to construct a binary variable indicating whether the child was ever taken outside for the last illness. As with the first treatment, the children are much more likely to have ever been treated outside for the non-routine illnesses, at significantly higher cost.

Table 4, Columns 3-6 report the statistics just described for low castes and high castes separately for routine and non-routine illnesses. There are absolutely no differences by caste for the routine illnesses. The first treatment choice for the non-routine illnesses also does not differ by caste. But notice that the low castes are substantially more likely to send their children for a second treatment, although the caste differences are not significant at the 5 percent level. Once we combine the first and second treatment, the low castes are 50% more likely than the high castes to send their children with non-routine illnesses outside for treatment, and this difference is significant at the 5 percent level. Low castes spend 50% more on the treatment of non-routine illnesses than high castes, and these differences are significant at the 5 percent level as well.

4 Caste and Illness Treatment

We saw in Table 4 that low caste children with non-routine illnesses were more likely to be sent for relatively costly outside treatment than high caste children with the same illnesses. In contrast, caste differences were absent with the routine illnesses. The analysis in this section verifies that these caste patterns, by type of illness, continue to be obtained after controlling for the child's age and gender.

[5] A substantial fraction of treatments (in the estate hospital) are reported at zero cost, despite the fact that the cost is meant to include expenditures on transportation, etc. Consequently we add one to all costs before taking logs. The log transformation is required because the distribution of expenditures is extremely skewed and so we would like to put less weight on the extremely high (outlying) expenditures.

Section 4.1 discusses alternative interpretations of the estimated caste-gap and presents simple tests to support the view that this caste-gap is a consequence of underlying differences in the network quality. Section 4.2 reports the regression results and the tests that were proposed in the previous section. Section 4.3 extends the analysis to study caste effects separately by the gender of the child.

4.1 Specification and Identification

We estimate regressions, separately for routine and non-routine illnesses, of the form

$$y_i = \alpha C_i + X_i\beta + \epsilon_i$$

where y_i measures treatment choice either by the type of treatment (outside=1, inside=0) or the cost of treatment. C_i measures the child's caste (high=1, low=0), X_i is restricted to the child's age and gender for the time being, and ϵ_i is a mean-zero disturbance term.

A major virtue of the empirical setting that we have chosen is that occupations, and hence incomes, do not vary by caste in the tea estates. However, we saw in Section 2 that differences in network quality lead to differences in schooling levels and marriage patterns, in addition to the differences in treatment choice that we focus on in this paper, by caste. Schooling levels are higher among the low caste workers in Table 1. These workers are also less likely to have married a relative and so it follows that the low caste workers and their spouses are less likely to be first-generation arrivals in the tea estates. It is entirely possible that more educated parents have different beliefs about the treatment options that are available than less educated parents, or perhaps their children receive preferential treatment outside the tea estates. First-generation arrivals similarly might have different beliefs or might be treated differently by the company's medical staff than more established workers who have more experience with the estate facilities. The regression results that we report below indicate that the estimated caste effect is hardly affected by the inclusion of parents' educational attainment and arrival (first generation) status as additional controls.

Our interpretation of this caste effect is that differences in network quality lead the low caste parents to invest more in their children's human capital, including education and health, than high caste parents. But other interpretations of this result are also available. For example, there might be a perception among the low caste workers that the company's medical staff discriminate against them, leading them to seek the relative anonymity of medical services outside the tea estates. Shared historical experience at the level of the caste might also have resulted in a caste-specific culture that

shapes treatment choices, although we would expect the high castes to invest more in health in this case, as they do elsewhere. Finally, while high castes might invest more in their children's health than low castes in general, the high caste workers might not be representative of the population that they are drawn from. We have no reason to suspect that selection favors the low castes in the tea estates. The companion paper compares the low castes and the high castes on a number of dimensions associated with female autonomy and male participation in traditionally female household tasks and finds that the high castes do at least as well along all these dimensions. It is only with a particular set of choices – education, health, and marriage – that the high castes seem to lag behind.

Nevertheless, to provide independent support for the network-based interpretation of the caste effect we proceed to study variation in treatment choice by distance to the household's origin location in rural Tamil Nadu. The idea here is that distance to the origin mechanically determines the strength of the household's ties to the extended family network. Households that are geographically closer to their networks will be more closely tied to them and will end up investing more in the extended family network and less in their children's human capital. In the companion paper we show that children's educational attainment is indeed increasing with distance to the origin, whereas the probability that the child will marry a relative, be sent to school in the origin location, and will ultimately settle there, is declining with distance. The supporting regressions that we present later will consequently replace caste with distance to the origin. Controlling now for the household's caste, we expect to find a positive relationship between distance and outside treatment, particularly among the non-routine illnesses, if home networks are indeed influencing investment in child health in the tea estates.

4.2 Treatment by Caste and Distance to the Origin

Table 5, Columns 1-4 reports results from the basic regression specification with the child's caste, age, and gender as regressors. All the regressions are estimated separately for routine and non-routine illnesses, with treatment choice as the dependent variable in Columns 1-2 and log-cost as the dependent variable in Columns 3-4.

Caste has no effect on treatment choice with the routine illnesses in Column 1, but low castes are significantly more likely to send their children outside for treatment with the non-routine illnesses in Column 2. Since we use the linear probability model to estimate these regressions, the coefficients are easy to interpret; the low castes are 10 percentage points more likely to send their children outside, matching the statistics that we reported earlier in Table 4. Repeating this exercise with log-cost as

the dependent variable, the caste effects are qualitatively similar to what we obtain with treatment choice, with a caste-gap of 50 percent in the log-cost (significant at the 5 percent level). The age and gender effects in Columns 1-4, however, are less easy to interpret. Age has a positive and significant effect on both treatment choice and treatment cost with the routine illnesses, possibly because older children are treated differently or perhaps due to heterogeneity within the set of routine illnesses. Age effects in contrast are absent for the non-routine illnesses. Gender with one exception (treatment choice for routine illnesses) has no effect on treatment choice or treatment cost. In particular, there is no evidence that health investments favor the boys, as has been found in many other studies.

Appendix Table A1 verifies that these results are robust to alternative classification of the outside treatment category and non-routine illnesses. Gastrointestinal, childhood diseases, and pain are included in the routine category, resulting in a substantial decline in the number of observations in the non-routine category. Nevertheless, the caste-gap in treatment choice and cost remains large and significant. This caste-gap is maintained with an alternative provider classification, moving traditional healers from the outside to the inside category as well.

Since education and marriage (migration) patterns vary by caste in the tea estates, in addition to investments in health, we next proceed to include parental characteristics as additional controls in the treatment regressions. Educational attainment and a first-generation indicator variable are included for each parent in Table 5, Columns 5-8. The estimated caste effects are hardly affected by the inclusion of the parental variables. Moreover, neither schooling nor arrival status has a consistently strong effect on treatment choice. In contrast, educational attainment of both the father and the mother have a large and significant effect on children's educational attainment in the companion paper.

While the results in Table 5 match the caste differences in treatment choice reported earlier in Table 4, we noted that alternative interpretations for these caste differences are available. To provide additional support for the view that it is variation in network quality across castes that is driving these differences in health investment, we proceed to study the relationship between treatment choice and distance to the origin. The low castes tend to be disproportionately represented in the distant locations (not reported), and so the treatment regressions in Table 6 include a full set of *jati* dummies to account for the potentially confounding effect of caste on treatment choice. Some urban locations around the city of Chennai display anomalous treatment choice and treatment cost patterns, and so we account for those locations with a Chennai dummy in Table 6. Apart from these additional controls, the child's age and gender are included as regressors as usual.

Nonparametric regressions (not reported) reveal a linear relationship between treatment choice and the log of the distance to the origin location. Log-distance has a positive and significant effect on the probability that the child will be treated outside for non-routine illnesses consistent with our network-based interpretation of the patterns in Table 5. The distance coefficient is positive for the routine illnesses as well, but is smaller in magnitude and statistically insignificant. Log-distance also has a positive and significant effect on treatment cost, with a much larger coefficient for the non-routine than the routine illnesses as expected. The age and gender coefficients in Table 6 are qualitatively similar to the corresponding coefficients in Table 5. Taken together with the results in the companion paper – that households from more distant locations invest more in education and are less tied to their origin networks through marriage – the strong distance effect in Table 6 provides independent support for the view that home networks are shaping health investments in the tea estates.

4.3 Treatment by Caste and Gender

The results this far indicate that low caste households invest significantly more in their children's health than high caste households, reversing the caste-pattern that we would expect to find elsewhere in the country. The analysis that follows explores this caste-gap further, by gender.

Table 7 estimates the effect of caste on treatment for routine and non-routine illnesses, separately for boys and girls. The caste-gap is very similar for boys and girls in each case. This equality in the caste-gap by gender contrasts with the results reported in the companion paper for investments in education. There we find that low caste children have higher educational attainment than high caste children in general, but that the gender-gap is significantly smaller for the low castes.

While health and education are both important components of human capital, they do not necessarily track together perfectly. As noted, notions of fairness within the household might be stronger for health investments than for other expenditures, including children's education. Thus, while boys continue to have higher educational attainment than girls in the tea estates, gender has no effect on health treatment (pooling both castes) in Table 5 and Table 6. Since the caste-gap does not vary by gender in Table 7, it follows that gender has no effect on treatment within each caste as well.

5 Conclusion

This paper assesses the role of social affiliation, measured by caste in India, in shaping investments in child health. The special empirical setting that we have chosen allows us to control nonparametrically

for differences in income, access to health services, and the incidence and type of illness across low caste and high caste households that would otherwise undermine any attempt to identify a caste-group effect.

We find that low caste households spend more on their children's health than high caste households in the tea estates. The explanation for this result that we put forward is based on the idea that while these households have the same income and access to the same facilities in the tea estates, the quality of the home networks in Tamil Nadu will vary by caste. A household in the tea estates can invest its resources in the home network (the extended family) or its children's human capital (the nuclear family). Everything else equal, low caste households with inferior networks will invest more in human capital, measured by their children's education and health.

The results in this paper present an optimistic view of the development process, at least as it is unfolding in the tea estates. First, low caste households invest more in child health than high caste households, reversing the caste-pattern we would expect to find elsewhere. Second, health expenditures do not vary by gender within either caste group, in contrast once again with the male-preference that has been documented elsewhere. This is a special setting in terms of the economic opportunities for men and women and access to welfare services, and so what we find in the tea estates may reflect what could be, rather than the situation as it currently exists elsewhere in the country. Nevertheless, the analysis in this paper and our companion paper indicates that transferring resources to historically disadvantaged groups – low castes and low caste women in particular – could have a positive impact on overall investments in human capital, while at the same time reducing historical inequities.

References

[1] Ayres, Ron and Manuela Torrijos Simon. 2003. Education, poverty and sustainable livelihoods in Tamil Nadu: Inequalities, opportunities and constraints, *Review of Political Economy* 15(2):211-229.

[2] Baak, Paul Erik. 1997. *Plantation, Production and Political Power: Plantation Development in South West India 1743-1963.* Delhi: Oxford University Press.

[3] Basu, Alaka Malwade. 1990. Cultural Influences on Health Care Use: Two Regional Groups in India, *Studies in Family Planning* 21(5):275-286.

[4] Bonu, S. M. Ranim and T.D. Baker. 2003. The Impact of the National Polio Immunization Campaign on Levels and Equity in Immunization Coverage: Evidence from Rural North India, *Social Science and Medicine* 57(10):1807-19.

[5] Burgard, Sarah. 2002. Does Race Matter? Children's Height in Brazil and South Africa, *Demography* 39(4):763-90.

[6] Chakravarti, Uma. 1993. Conceptualizing Brahmanical Patriarchy in Early India: Gender, Caste, Class and State, *Economic and Political Weekly*, 3 April.

[7] Das Gupta, M. 1987. Selective Discrimination Against Female Children in Rural Punjab, India, *Population and Development Review* 13:377-400.

[8] Deshpande, Ashwini. 2002. Assets versus autonomy? The changing face of the gender-caste overlap in India. *Feminist Economics* 8(2):19-35.

[9] Dumont, L. 1986. *A South Indian Subcaste.* Delhi: Oxford University Press.

[10] Feierman, Steven. 1985. Struggles for Control: The Social Roots of Health and Healing in Modern Africa. *African Studies Review* 28(2/3):73-147.

[11] Geetha, V. 2002. *Gender*, Calcutta: Stree Publishers.

[12] International Institute for Population Sciences (IIPS) and ORC Macro. 2000. *National Family Health Survey (NFHS-2), 1998-99: India.* Mumbai: IIPS.

[13] Kabir, Z., J. Long, V.P. Reddaiah, J. Kevany, and S.K. Kapoor. Non-specific Effect of Measles Vaccination on Overall Child Mortality in an Area of Rural India with High Vaccination Coverage: A Population-based Case-control Study, *Bulletin of the World Health Organization* 81(4):244-50.

[14] Kapadia, Karin. 1995. *Siva and Her Sisters; Gender, Caste, and Class in Rural South India.* Boulder: Westview Press.

[15] Kapoor, A.K., G.K. Kshatriya, and S. Kapoor. 2003. Fertility and Mortality Differentials among the Population Groups of the Himalayas, *Human Biology* 75(5):729-47.

[16] Karve, Irawati. 1953. *Kinship Organization in India.* New York: Asia Publishing House.

[17] Kishor, S. 1995. Gender Differentials in Child Mortality: A Review of the Evidence, in M. Das Gupta, L.C. Chen, and T.N. Krishnan (eds), *Women's Health in India; Risk and Vulnerability*, Bombay: Oxford University Press.

[18] Kooiman, Dick. 1989. *Conversion and Social Equality in India; the London Missionary Society in South-Travancore in the 19th Century*, Delhi: Manohar Press.

[19] Kumar, Dharma. 1965. *Land and Caste in South India; Agricultural Labour in the Madras Presidency During the Nineteenth Century*, Cambridge: Cambridge University Press.

[20] Luke, Nancy and Kaivan Munshi. 2005. Women as Agents of Change: Female Income, Social Affiliation, and Household Decisions in South India, Brown University, typescript.

[21] Munshi, Kaivan and Mark Rosenzweig. 2003. Traditional Institutions Meet the Modern World: Caste, Gender and Schooling Choice in a Globalizing Economy, *BREAD Working Paper* No. 038.

[22] Munshi, Kaivan and Mark Rosenzweig. 2005. Why is Mobility in India so Low? Social Insurance, Inequality, and Growth, *BREAD Working Paper* No. 097.

[23] Stephenson, Rob and Amy Ong Tsui. 2002. Contexutal Influences on Reproductive Health Service Use in Uttar Pradesh, India, *Studies in Family Planning* 33(4):309-320.

[24] Tata Tea South India Division. 2000. Welfare Audit 1999-2000.

[25] Trautmann, T.R. 1981. *Dravidian Kinship.* Cambridge: Cambridge University Press.

Table 1: Caste Comparison in the Tea Estates

Generation:	parents				children			
Gender:	male		female		male		female	
Caste:	low	high	low	high	low	high	low	high
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Individual characteristics								
Income	18.58	19.02	21.46	21.43	--	--	--	--
	(0.19)	(0.28)	(0.09)	(0.13)				
Schooling	5.97	5.56 *	3.84	3.34 *	9.47	9.32	9.36	8.82 *
	(0.06)	(0.09)	(0.07)	(0.09)	(0.06)	(0.09)	(0.07)	(0.09)
Panel B: Marriage patterns								
Married within *jati*	--	--	0.98	0.95 *	0.87	0.86	0.93	0.89 *
			(0.003)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Married to relative	--	--	0.54	0.64 *	0.40	0.56 *	0.48	0.57 *
			(0.01)	(0.01)	(0.02)	(0.03)	(0.02)	(0.02)

Note: standard errors in parentheses. * denotes rejection of the equality of means at the 5 percent significance level.
Low caste refers to former slave castes - Pallars and Paraiyars. High castes includes all other *jatis* .
Schooling is measured in years. Income is measured in thousands of Rupees per year.

Table 2: Illness Incidence

Descriptive statistics:	Percentage	
Caste:	low	high
	(1)	(2)
Time of last illness		
Last week	14.48	14.65
Last month	23.17	24.22
Last 3 months	19.28	20.65
Last 6 months	16.32	14.19
Last year	11.20	9.46
More than one year	15.55	16.84
Treated	98.57	97.79
	(0.003)	(0.005)

Note: standard errors in parentheses.
Sample restricted to children age 15 and under residing at home.
Low caste refers to former slave castes - Pallars and Paraiyars. High caste includes all other *jatis* .
Decision to treat is not siginificantly different by caste at the 5 percent level.

Table 3: Type of Illness

Descriptive statistics:	Means/ Proportions	
Type of illness:	routine	non-routine
	(1)	(2)
Panel A: Child's characteristics		
Age	8.27 *	8.94 *
	(0.09)	(0.17)
Boy	0.51	0.51
	(0.01)	(0.02)
Panel B: Household characteristics		
Mother's schooling	4.56	4.42
	(0.07)	(0.13)
Father's schooling	6.29	6.13
	(0.06)	(0.13)
Household income	39.40	38.95
	(0.18)	(0.36)
Panel C: Network characteristics		
High caste household	0.31	0.31
	(0.01)	(0.02)
Distance to origin	3.62	3.56
	(0.03)	(0.07)

Note: standard errors in parentheses.
* denotes rejection of the equality of means at the 5 percent significance level.
Sample restricted to children age 15 and under residing at home.
Schooling is measured in years. Income is measured in thousands of Rupees per year.
Low caste refers to former slave castes - Pallars and Paraiyars. High caste includes all other *jatis* .
Distance to origin location by road is measured in hundreds of km.

Illness Classification:

A. Routine
1. Cough and throat infection: cough, sinus, throat pain, throat infection, tonsils
2. Headache and fever: fever, infection, headache, loss of appetite
3. Injury and accident: injury, leg injury, accident, bee sting, hand injury, dog bite, glass cut, head injury, hip injury, spider bite, bleeding, toe nail, hemorrhoids
4. ENT: ear pain, tooth pain, ear infection, eye problem, nose pain

B. Non-Routine
1. Gastrointestinal: diarrhoea, vomitting, dehydration, dysentary
2. Respiratory: respiratory, breathing problem, chest pain, nose bleed, asthma
3. Typhoid and jaundice: low weight, typhoid, jaundice
4. Childhood diseases: mumps, measles, chicken pox
5. Fits: epilepsy, fits, mental
6. Tumors and operations: appendix, stroke, ear operation, head tumor, child birth, heart operation, hip operation, kidney problem, leg tumor, neck tumor, chest operation, operation, heart pain, leg operation, nose operation, jaw operation, stomach operation, throat tumor, throat operation, tumor, stomach tumor, urinary problem
7. Pain: leg pain, back pain, body pain, finger pain, leg and hand pain, neck pain, stone pain, stomach pain
8. Skin conditions: allergy, boils, skin problem
9. Chronic conditions: anemia, blood pressure, giddiness, sugar, ulcer, deaf

Table 4: Illness Treatment

Descriptive statistics:	Means/ Proportions					
Type of illness:	routine	non-routine	routine		non-routine	
Sample:	full		low castes	high castes	low castes	high castes
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: First treatment						
Outside	0.12	0.17 *	0.12	0.12	0.17	0.17
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.03)
Log-cost	0.88	1.38 *	0.85	0.94	1.43	1.25
	(0.04)	(0.11)	(0.05)	(0.08)	(0.14)	(0.20)
Went for second treatment	0.13	0.23 *	0.13	0.12	0.25	0.19
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.03)
Panel B: First and second treatment						
Outside	0.19	0.28 *	0.19	0.18	0.32	0.21 *
	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.03)
Log-cost	1.23	1.99 *	1.22	1.26	2.20	1.48 *
	(0.05)	(0.13)	(0.06)	(0.09)	(0.16)	(0.21)

Note: Standard errors in parentheses. * denotes rejection of the equality of means at the 5 percent significance level.

Routine and non-routine illnesses were defined in Table 3.

Low caste refers to former slave castes - Pallars and Paraiyars. High caste includes all other *jatis* .

Treatment outside = 1 if the child is sent to the private clinic, the government hospital, or the traditional healer, 0 otherwise.

Cost of treatment is measured in Rupees.

Sample restricted to children age 15 and under residing at home.

Table 5: Treatment by Caste

Dependent variable:	treatment outside		log-cost		treatment outside		log-cost	
Type of illness:	routine	non-routine	routine	non-routine	routine	non-routine	routine	non-routine
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High caste	-0.017	-0.105	0.022	-0.713	-0.007	-0.118	0.058	-0.760
	(0.015)	(0.030)	(0.091)	(0.150)	(0.015)	(0.031)	(0.095)	(0.148)
Age	0.004	0.001	0.045	0.038	0.006	-0.001	0.058	0.040
	(0.002)	(0.004)	(0.015)	(0.027)	(0.002)	(0.004)	(0.012)	(0.029)
Boy	-0.032	-0.021	-0.098	-0.117	-0.038	-0.015	-0.123	-0.108
	(0.009)	(0.018)	(0.094)	(0.252)	(0.011)	(0.018)	(0.092)	(0.243)
Mother's schooling	--	--	--	--	0.010	-0.006	0.050	-0.030
					(0.003)	(0.003)	(0.018)	(0.031)
Father's schooling	--	--	--	--	-0.007	0.011	-0.019	0.076
					(0.003)	(0.005)	(0.008)	(0.026)
Mother first generation	--	--	--	--	-0.031	-0.068	0.032	-0.394
					(0.026)	(0.042)	(0.134)	(0.234)
Father first generation	--	--	--	--	-0.067	0.095	-0.366	0.364
					(0.018)	(0.052)	(0.165)	(0.328)
Constant	0.174	0.327	0.895	1.935	0.163	0.297	0.726	1.614
	(0.017)	(0.029)	(0.137)	(0.154)	(0.029)	(0.043)	(0.092)	(0.295)
Number of observations	2,172	580	1,936	523	2,153	575	1,920	518

Note: Standard errors in parentheses. Standard errors are robust to heteroscedasticity and clustered residuals within each *jati* .

Treatment outside = 1 if the child is sent to the private clinic, the government hospital, or the traditional healer, 0 otherwise.

Cost of treatment is measured in Rupees.

Routine and non-routine illnesses were defined in Table 3.

Low caste refers to former slave castes - Pallars and Paraiyars. High caste includes all other *jatis* .

Sample restricted to children age 15 and under residing at home.

Decline in observations in Columns 3-8 is due to missing values for some of the regressors.

Table 6: Treatment by Distance to Origin

Dependent variable:	treatment outside		log-cost	
Type of illness:	routine	non-routine	routine	non-routine
	(1)	(2)	(3)	(4)
Log-distance	0.028	0.042	0.188	0.386
	(0.030)	(0.014)	(0.090)	(0.221)
Age	0.004	0.001	0.045	0.039
	(0.003)	(0.003)	(0.015)	(0.031)
Boy	-0.028	-0.032	-0.048	-0.084
	(0.010)	(0.023)	(0.042)	(0.208)
Constant	0.006	0.056	-0.181	-0.534
	(0.169)	(0.084)	(0.572)	(1.320)
Number of observations	2,141	577	1,913	520

Note: Standard errors in parentheses are robust to heteroscedasticity and clustered residuals within each *jati* .

Treatment outside = 1 if the child is sent to the private clinic, the government hospital, or the traditional healer, 0 otherwise.

Cost of treatment is measured in Rupees.

Routine and non-routine illnesses were defined in Table 3.

Distance to origin location by road is measured in km.

All regressions include a full set of *jati* dummies and a dummy for urban locations around Chennai.

Sample restricted to children age 15 and under residing at home.

Decline in observations from Table 5 is due to missing distance values.

Table 7: Treatment by Caste and Gender

Dependent variable:	treatment outside				log-cost			
Type of illness:	routine		non-routine		routine		non-routine	
Gender:	girl	boy	girl	boy	girl	boy	girl	boy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High caste	-0.017	-0.017	-0.108	-0.092	0.019	0.021	-0.622	-0.746
	(0.016)	(0.023)	(0.033)	(0.042)	(0.154)	(0.136)	(0.313)	(0.212)
Age	0.002	0.006	0.012	-0.012	0.027	0.064	0.104	-0.028
	(0.002)	(0.002)	(0.004)	(0.004)	(0.022)	(0.010)	(0.050)	(0.027)
Constant	0.191	0.126	0.224	0.411	1.047	0.639	1.346	2.410
	(0.020)	(0.014)	(0.033)	(0.028)	(0.207)	(0.050)	(0.251)	(0.233)
Number of observations	1,076	1,096	282	298	956	980	250	273

Note: Standard errors in parentheses. Standard errors are robust to heteroscedasticity and clustered residuals within each *jati* .

Treatment outside = 1 if the child is sent to the private clinic, the government hospital, or the traditional healer, 0 otherwise.

Cost of treatment is measured in Rupees.

Routine and non-routine illnesses were defined in Table 3.

Low caste refers to former slave castes - Pallars and Paraiyars. High caste includes all other *jatis* .

Sample restricted to children age 15 and under residing at home.

Table A1: Treatment and Caste - Robustness Tests

Alternative classification:	routine				outside			
Dependent variable:	treatment outside		log-cost		treatment outside		log-cost	
Type of illness:	routine	non-routine	routine	non-routine	routine	non-routine	routine	non-routine
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High caste	-0.024	-0.134	-0.057	-0.688	-0.013	-0.102	0.022	-0.713
	(0.018)	(0.054)	(0.080)	(0.346)	(0.014)	(0.030)	(0.091)	(0.150)
Age	0.004	-0.002	0.041	0.049	0.004	0.001	0.045	0.038
	(0.001)	(0.003)	(0.013)	(0.038)	(0.001)	(0.005)	(0.015)	(0.027)
Boy	-0.033	-0.017	-0.093	-0.432	-0.029	-0.011	-0.098	-0.117
	(0.006)	(0.033)	(0.080)	(0.627)	(0.009)	(0.022)	(0.094)	(0.252)
Constant	0.187	0.401	0.969	2.701	0.167	0.301	0.895	1.935
	(0.011)	(0.021)	(0.124)	(0.165)	(0.017)	(0.040)	(0.137)	(0.154)
Number of observations	2,474	278	2,215	244	2,172	580	1,936	523

Note: Standard errors in parentheses. Standard errors are robust to heteroscedasticity and clustered residuals within each *jati* .

Treatment outside = 1 if the child is sent to the private clinic, the government hospital, or the traditional healer, 0 otherwise.

Cost of treatment is measured in Rupees.

Routine and non-routine illnesses were defined in Table 3.

Low caste refers to former slave castes - Pallars and Paraiyars. High caste includes all other *jatis* .

Sample restricted to children age 15 and under residing at home.

Decline in observations in Columns 3-8 is due to missing values for some of the regressors.

Alternative classification of routine illness includes gastrointestinal, childhood diseases, and pain in that category.

Alternative classification of outside moves traditional healer from outside to inside category.