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## **Managing Healthcare Provision and Health Outcomes through Local Governance**

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# MANAGING HEALTHCARE PROVISION AND HEALTH OUTCOMES THROUGH LOCAL GOVERNANCE\*

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## Abstract

Has the devolution of responsibilities and finances to local governments in India produced positive impacts on the health status and incomes of men and women? Using a national dataset with details on health, health-seeking behavior and local governance, we estimate a system of simultaneous equations to analyze the incidence of illness via a health production function and show that healthcare expenditures at the household level, choice of healthcare provider by members, and the incidence of illness will jointly impact individual incomes. The incidence of illness is significantly reduced by better access to drinking water, clean surroundings and awareness about health campaigns. Discussions of health issues in the Gram Sabha lead to improved health for both men and women and reduce their private health expenditures. Reserving the position of the village head for women leads to greater participation in Gram Sabha meetings; better problem resolution with regard to water supply, sanitation and health; increase in village health expenditures; and greater satisfaction in terms of access to healthcare. The increased expenditures by panchayats on healthcare reduce the incidence of illness three times more for women than for men, but reduce their private healthcare expenditures almost equally. Besides, they shift the choice of healthcare providers from private to public facilities, more so for women than for men. Family inheritance increases the use of private healthcare for both genders, while a woman's individual land inheritance increases her use of both public and private healthcare. While women do not have lower access to healthcare, nor are they discriminated against within the household in terms of access to different providers, their earnings are adversely affected to a greater degree by illness compared to the earnings of men. Women's private health expenditures tend to improve their incomes more compared to men.

Keywords: Political Agency, Gender, Health, India.

JEL codes: H41, I18, O15

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## 1. Introduction

India has relatively poor rural health indicators and its healthcare systems are among the most privatized in the world. This high degree of privatization of its healthcare can be attributed to inadequate access to and poor quality of public healthcare available in urban and rural areas. Rural households are more susceptible to ill health compared to urban households, and their poor health status results in absenteeism and consequent lower wages and incomes, in turn leading to a further worsening of health. It is, therefore, important to devise policies for improved provision of healthcare to rural households.<sup>1</sup>

India has been trying to improve its public healthcare both in terms of access and quality by increasingly devolving more powers and responsibility for the management of health services to local governments, henceforth panchayats.<sup>2</sup> Of particular concern is the status of the vulnerable groups such as women, and people belonging to backward castes. Important questions dealt with in this paper, therefore, are: i) How does devolution affect the relative health status of men and women? ii) Will access to and choice of healthcare providers be affected, and if so how? iii) What are the income consequences of such access and choices and, are these outcomes gender variegated? iv) Will empowering women individually as well as politically produce different results with respect to access to healthcare, health status, private health expenditures and incomes? To answer these questions, we use the 1999 and 2006 rounds of the nationally representative Rural Economic and Demographic Survey (REDS) of the National Council for Applied Economic Research (NCAER), which contain detailed gender-specific data on illness,

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<sup>1</sup> The private sector has been able to provide better access to curative medicines to rural households than the public sector, as shown by the 52nd round of National Sample Survey (NSS). Duraisamy (2001), using the NCAER Human Development Indicators survey of 1994, shows that with increased education levels, village infrastructure and household income, rural households are more likely to choose private healthcare.

<sup>2</sup> A panchayat represents a set of villages (and in Kerala a set of wards). The responsibility for the allocation of monies and other resources to individual villages rests with the panchayat.

absence from work, health expenditures, incomes; as well as information on the quality of and access to health facilities and providers of these facilities, variables related to village governance such as Gram Sabha meetings, participation in such meetings by members of households, village-level expenditures on health, and political and individual empowerment of women.

While certain results arrived at in this paper can be derived directly from descriptive statistics, others require a structure. Since political reservation of the position of the panchayat head (Pradhan or Sarpanch) for women is decided by a random process, many impacts of reservations can be directly inferred from two-way tables. The incidence of illness is treated as a random variable, while health expenditures and the choice of providers of healthcare are individual choices of men and women in a bargaining process within the family. These choices are constrained by household wealth and the political variables associated with governance. While we do not construct an explicit bargaining model, the implications of such a model for health status, health expenditures, the choice of healthcare provider, and for individual incomes are reflected in the respective reduced-form equations that are estimated. This will define a simultaneous equations model in which the instruments that will predict the choice of healthcare provider and private health expenditures of men and women are identified.

In addition, these choices are influenced by the availability and costs of different healthcare providers and the perceived quality of their services. The quality of public health facilities is in turn expected to be influenced by political decisions, public expenditures, and other actions including public decisions taken by the panchayats. These public decisions can be influenced by the participation of the members of households in the Gram Sabha (the village assembly) and by political empowerment of women. Ill health, choice of healthcare providers, and private expenditures on health will then impact individual incomes. We estimate the system

of equations separately for men and women using the cross-sectional data of the REDS 2006 round as well as variables from the REDS 1999 round.

The specific hypotheses tested in this paper are as follows: (1) The probability of men and women falling ill during the year is the same, and the number of days they are absent from work is also the same. (2) The perceived quality of public and private healthcare providers does not differ. For a given perceived healthcare quality, men and women are likely to choose the same providers, and this does not have any impact on their incomes. (3) Women are not particularly disadvantaged compared to men in terms of access to healthcare or to healthcare providers. (4) Devolution of financial resources, increased village expenditures on health, level of people's participation in the Gram Sabha, and solution of health-related problems by the panchayat, have no impact on (i) the prevalence of ill health of men and women, (ii) problem resolution, (iii) preference for and use of public healthcare, and (iv) reduction in private health expenditures. (5) Individual empowerment of women through inheritance of land, and their political empowerment through the reservation of the Pradhan's position have no impact on (i) the prevalence of illness among men and women, (ii) problem resolution, (iii) preference for and use of public healthcare, and (iv) reduction in private health expenditures. Individual and political empowerment, therefore, is not complementary. (6) Increasing village health expenditures will have an identical impact on (i) the incidence of illness and (ii) private health expenditures of men and women. While hypotheses 1, 2, 4, and 5, and the first part of hypothesis 6 are rejected, we are not able to reject hypothesis 3.

We begin by relating this paper to the extant literature, with a brief discussion of the status of healthcare in rural India (section 2). Subsequently (in sections 3 and 4) the data and descriptive statistics are discussed, with special reference to governance and delivery of

healthcare services. Next we discuss the reduced-from-simultaneous-equation models that we estimate and the instrumental variables that we use to identify the jointly endogenous variables (section 5). This is followed by a discussion of the results (section 6), and finally, we present the conclusions (section 7).

## **2. Literature and Background**

### **2.1 Literature**

Avdic and Johansson (2012) find that men and women's preventive health behaviors differ, given that absenteeism due to illness is higher among women compared to men. Gender differences in health-related behaviors — with women in general being less likely to take risks in matters related to health — have been examined by Stronegger *et al.* (1997) and Uitenbroek *et al.* (1996).

The literature citing actions taken by local governments on issues related to healthcare access and expenditures is limited. Bhalotra and Clots-Figueras (2011) show that for India, political agency of women is significant in explaining the problems related to healthcare. They find that a one-standard-deviation change in women's participation in the political process during the year in which they gave birth, or in any of the two years preceding this event, results in a 24 percent decline in neonatal mortality. This is consistent with our findings related to the political empowerment of women, incidence of illness, and the magnitude of private health expenditures.

The relationship of private health expenditures to income, first estimated by Grossman (1972), is referred to as the 'gradient'. Any estimation of the gradient has to deal with simultaneity. The literature suggests three channels of causality: (i) from income to health expenditure (Marmot 1999), (ii) from health status to earnings and earning capacity (Smith 2004), and (iii) from factors such as ability/intelligence, parental background and incomes,

education, and even genetics, to their impact on health (Case *et al.* 2002; Dehejia and Lleras-Muney 2004; and Lleras-Muney 2005). In our paper we deal with the first and to some extent the third channel identified by this literature; we also deal implicitly with the second channel via the endogenous choices of health providers and private health expenditures.<sup>3</sup>

Pritchett and Summers (1996) derive the long-run income elasticity of infant and child mortalities by estimating the marginaleffects of incomes on health. A health production function approach has been adopted in Muennig (2008); Lavy and Quigley (1991); Ntembe (2009); and Lopez-Cevallos and Chi (2010). In this paper, we relate the incidence of illness to measures of individual empowerment such as inherited wealth and land by women, as well as other variables. The paper uses a health production function approach similar to the literature and is able to derive the income elasticity with respect to private health expenditures. The long run relationship between incomes and changes in health expenditures is, therefore, identified in our paper.<sup>4</sup>

Increased devolution of finances, functions and functionaries to panchayats has been shown to empower households to influence both the provision and quality of healthcare services (Bhalotra and Clots-Figueras 2011). This may also enable women to participate in decisions related to health expenditures and accountability processes. However, even though increased healthcare expenditures at the community level are important, it is the management of these allocations that will most likely lead to a reduction in illness and improvement in the quality of

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<sup>3</sup> Following Grossman (1972) many authors have related health expenditures to welfare outcomes, and investigated the intermediating effects on the health-welfare relationship of the presence and quality of institutions, shocks, non-income variables related to healthcare, and non-income variables (Smith 1999; Nixon and Ulmann 2006; Lynch *et al.* 1997; Bloom *et al.* 2004; Bhargava *et al.* 2001; Bloom and Canning 2000; Hamoudi and Sachs 1999; Sachs and Warner 1997; Adda *et al.* 2008; Leu 1986; Hitiris and Posnett 1992).

<sup>4</sup> There is not much extant work on the gradient in the Indian literature. Sarma (2009) finds that the demand for healthcare was price- and income-inelastic. Borah (2006) uses data from NSS to show that demand for healthcare in rural areas is price-inelastic and low income households are more sensitive to the price of healthcare.

life. Therefore, the elected officials' reaction to problems in the provision of public goods and healthcare is of significance. Hence in line with Munshi and Rosenzweig (2008), we take it that increased discussions on healthcare in Gram Sabha meetings signal greater commitment of the elected representatives towards not only the provision of quality healthcare but also towards empowering the households to ensure that there is an improvement in both allocation as well as the management of these resources.

Gender-based political reservations, along with empowerment allow women to redress the imbalances in healthcare by effectively raising relevant issues in the Gram Sabha meetings and ensuring accountability. Deininger *et al.* (2012a, b) have shown that political reservations empower women to hold elected officials accountable while at the same time increasing access to public goods. In addition, women in India have been empowered to inherit equal shares of land. This has a positive impact on spending patterns on children's schooling and healthcare (Deininger *et al.* 2012c).<sup>5</sup>

## **2.2 Health, Healthcare, and Health Decentralization in India**

According to the United Nations, even though the mortality of children below five has dropped from 12.4 million to 8.1 million globally between 1990 and 2009, India, Nigeria and the Democratic Republic of Congo together account for 40 percent of it. Maternal mortality in India was 254 per 100,000 live births during 2004 – 2006 and declined marginally to 212 during the period 2007 – 2009 (Census of India Report). The Federation of Obstetrics and Gynecological Society of India, however, reports this to still be 250 in 2011.<sup>6</sup> There are other problems such as

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<sup>5</sup> We show that the Hindu Succession (Amendment) Act (HSAA), by enabling women to inherit household wealth (in particular land) more equally than before, allows them the freedom to allocate increased expenditures to health.

<sup>6</sup> The global ranking of India is 127 out of 181 countries as of 2008.

persistently low coverage of immunization (61 percent in 2009) due to which the incidence of diseases like hepatitis-B; diphtheria and tuberculosis (TB) continues to be high.

Communicable diseases such as diarrhea, cholera, malaria, encephalitis, kala-azar, dengue, and Leptospirosis form a significant part of the healthcare burden in India. There were approximately 1.5 to 2 million confirmed cases and 1000 deaths annually due to malaria in 2009 but these figures have come down to 1.1 million cases and 430 deaths in 2011 (GoI 2012). There were 2.4 million confirmed cases of HIV AIDS in 2009 (UNAIDS 2010). Although improvements in sanitation and the development of vaccines have lead to declines in infectious diseases, communicable diseases are still significant and only polio and smallpox have been eradicated. The reasons for these are: (i) absence of a credible and adequate healthcare and prevention system, (ii) lack of significant new financial resources to enhance the system, (iii) a largely illiterate and poor population and, (iv) corruption.

India's healthcare system is among the most privatized in the world. In 2009, the per capita public expenditure on health was only \$44.80, while this figure is \$4590 in the world's richer countries (World Bank 2010). The total expenditure on health as a share of GDP in India is 4.1 percent and is composed of 2.9 percent contributed by private spending and 1.2 percent through public (government) spending. The latter magnitude is far below the levels prescribed by the WHO (i.e. 5 percent of GDP). Only five other countries in the world have lower public healthcare spending than India (Burundi, Myanmar, Pakistan, Sudan, and Cambodia) (WHO 2003).

In India much of finance and policy originate from the central government, with the responsibility for service delivery resting with the state governments. Presently the levels of devolution of service responsibility and accountability to the panchayats are far from optimal.

To rectify these pathologies associated with the healthcare system, the Government of India launched the National Rural Health Mission (NRHM) in 2005. It is designed to provide effective healthcare to the rural population in general and to weaker sections such as women and children in particular. NRHM seeks to improve access to health facilities, enable community ownership of services, strengthen public health systems, enhance the equity and accountability of the providers, and most importantly, strengthen and deepen the levels of decentralization by increasing the resources available to the Panchayats. NRHM, in addition, addresses issues detrimental to health, such as poor sanitation, lack of nutrition, and non-availability of clean drinking water. The implementation of this program has been vested with the state governments. The NRHM seeks to empower the panchayats to manage, control and be accountable for health services. Block-level Panchayat Samitis will co-ordinate the work of panchayats within their jurisdiction and serve as links to DHMs and DHFs (district level hospitals for males and females). These will be led by the Zilla Parishad and will control, guide and manage all public health institutions in the district. Our household-specific data refer primarily to 2007, when the NRMH had been in effect for only two years.

Junaid *et al.* (2005) have shown that decentralization of healthcare needs to be made part of the broader efforts at decentralization and devolution of powers. They suggest that disease-specific programs should be planned in a centralized manner and implemented through a decentralized health system. This will involve the participation of the community members and

various stakeholders, apart from specialists, leading to the provision of health services in an equitable manner, thus reducing the scope for income and gender discrimination. Panchayats are also critical to the planning, implementation, and monitoring of the NRHM. Success of NRHM depends on the inter-sectoral convergence, community ownership steered through village-level health committees at the level of panchayats, and a strong public sector health system with support from the private sector. Success is also dependent on well functioning panchayats at the village, block and district levels.

### **3. Data and Descriptive Statistics**

The data for this paper are based on the ARIS and REDS surveys of NCAER. These surveys contain data at the village, household, and member levels, from 241 rural villages across 17 states,<sup>7</sup> collected over six rounds during the period 1969 to 2006.<sup>8</sup> For the 1999 and 2006 rounds, detailed demographic information on households is available. Participation in welfare schemes, governance, evaluation of governance by households and members of households, composite pattern of cultivation, infrastructure, availability of public goods, etc., are also available with the community (i.e. the village) data. The last two rounds cover a period of considerable change in the rural economy of India, both in terms of structure as well as policy, and allow the impact of the changes in policy to be traced onto the households. In this paper we use data from the 1999 and 2006 rounds, because it is for these periods that we have consistent data on panchayats, Gram Sabhas, health expenditures by households and at the village level, and participation by the

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<sup>7</sup> The states include Tamil Nadu, Kerala, Karnataka, Maharashtra, Gujarat, Rajasthan, Punjab, Haryana, Uttar Pradesh, Bihar, Jharkhand, West Bengal, Orissa, Chhattisgarh, Madhya Pradesh, and Andhra Pradesh. The state reorganization that influenced Bihar, Madhya Pradesh, and Uttar Pradesh did not affect the selection of villages that have remained intact since 1969.

<sup>8</sup> The first three rounds included Assam and Jammu and Kashmir. However, the 1982 round did not include Assam, while the 1999 round excluded Jammu and Kashmir (both in view of the local law-and-order situation prevailing in these states at that time). The current round excludes both these states.

households in village-level decision-making.<sup>9</sup> The 2006 round has surveyed 8,659 households, out of which 5,885 cover both the 2006 and 1999 rounds.<sup>10</sup> The data are in three parts, viz., listing, community, and household schedule (which were mostly collected in 2007). Descriptive statistics for the 1999 and 2006 rounds are reported in Table 1. Very important changes are the rapid rise in years of schooling, income, consumption, non-farm employment, access to toilets, and the rapid decline in land owned, average household size, number of children per household and the proportion of households reporting dirty surroundings.

**Table 1**  
*Descriptive statistics*

Variables	2006	1999	% Change
<i>Individual Characteristics</i>			
Percentage of females (including children)	48.59	47.68	1.91
Percentage of males (including children)	51.41	52.32	-1.71
Percentage of married members	49.67	48.08	3.31
Percentage of unmarried members	50.33	51.92	-3.06
Average age of the members	29.48	26.87	9.71
Average years of schooling	4.64	3.87	19.90
Average weight of adult members (in kg)	52.86	-	-
Heights of adult members (in centimeters)	155.59	-	-
<i>Household Characteristics</i>			
Average household size	5.16	6.02	-14.29
Average income (in Indian Rupees)	86675.28	51297.69	68.965
Percentage of agricultural workers	30.33	25.08	20.93
Percentage of non-agriculture workers	11.21	6.76	65.83
Land owned (in acres)	2.80	3.97	-29.471
Number of children per household	1.51	1.98	-23.737
Average consumption expenditure (in Indian Rupees)	39822.13	32747.49	21.604
Percentage of households that have toilets	40.30	29.68	35.78
Percentage of households reporting dirty surrounding	3.82	5.22	-26.82
Percentage of households reporting clean surrounding	37.01	34.41	7.56
Percentage of households aware of health campaign	81.23	80.60	0.78
Number of observations	8659.00	7474.00	-

<sup>9</sup> For the purpose of estimating the impacts at the household level we use the ‘panel’ of households, that is, households surveyed in 1999 and 2006.

<sup>10</sup> The household sample has compensated for attrition through a random addition to the original sample since 1982. Ten households were randomly selected from the process of listing in each survey round.

Households access 10 types of health facilities from the private, public and alternate sectors. Private clinics include those that cater to allopathic, Unani and Ayurvedic systems of medicine.<sup>11</sup> Government facilities include health sub-centers, subsidiary health centers, primary health centers, hospitals, Anganwadi (focusing on child welfare), and family planning clinics<sup>12</sup> (Table 2).

**Table 2**  
*Availability of healthcare for households in the villages*

Healthcare centers	One-way distance from the village in km	Number of patients treated per day	Number of days open per week	Number of hours open per day
Health sub-center	5.29 (5.68)	20.60 (29.37)	5.24 (1.93)	6.84 (3.77)
Subsidiary health center	10.41 (9.58)	39.35 (51.80)	6.23 (0.71)	8.95 (5.84)
Primary health center	7.99 (6.86)	55.87(58.00)	6.30(0.59)	8.75(6.67)
Hospital	25.87 (24.62)	205.05 (156.22)	6.52 (0.51)	13.74 (9.23)
Family planning clinic	11.15 (13.18)	18.41 (24.69)	5.92 (1.22)	8.99 (6.83)
Anganwadi	1.78 (1.11)	23.79 (63.64)	6.01 (0.44)	5.22 (2.51)
Allopathic doctor	8.64 (8.77)	37.32 (46.23)	6.75 (0.70)	11.27 (5.80)
Unani doctor	11.24 (8.15)	19.05 (32.59)	6.44 (0.66)	8.43 (2.04)
Ayurvedic doctor	10.78 (13.48)	19.42 (29.28)	6.48 (0.99)	8.44(2.90)
Traditional healer	6.24 (5.73)	8.09 (9.68)	6.67 (1.03)	11.68 (6.32)

*Notes:* Standard errors are in parenthesis

The data show that the private sector is, on an average, more accessible to rural households. Allopathic clinics (private clinics with doctors who follow the western system of medicine) have better density of doctors compared to primary or subsidiary health centers or health sub-centers compared to any of the formal institutions (except the larger hospitals). Given

<sup>11</sup> Unani is a system of medicine that came to India from the Middle East, and Ayurvedic is a system of treatment evolved in India. Both are well-evolved systems of medicine and are recognized by the Government of India.

<sup>12</sup> Health sub-centers provide basic preventive healthcare services as well as act as referral centers. They cater to a population of 5000, and are mandated to provide basic medicines and nutrition supplements like folic acid, iron tablets and provide advice on pre-natal and ante-natal care. Primary and subsidiary health centers are also supposed to offer help during child birth. The primary health centers are hospitals with four beds and deal with both preventive and curative care. They cater to a population of 30,000 as well as manage five health sub-centers and are manned by a doctor. The other health centers are, however, manned by an auxiliary nurse. The Anganwadi is meant to help with child care, immunization, and growth monitoring. A secondary activity is maternal healthcare.

that government hospitals are, on an average, 26 km from the villages and private clinics less than 9 km, it is quite possible that distance is a significant determinant of the choice of the healthcare provider. The survey also shows that, on an average, there is greater probability of the basic curative medicines being available with the private doctors compared to any of government-run health centers located close to the villages. We had noted earlier that diseases like malaria, diphtheria and hepatitis are significantly prevalent in rural India and the non-availability or availability of such drugs at high costs are a huge problem for households. Details of the availability of doctors, medicines, as well as the number of beds are given in Table 3.

**Table 3**  
***Density of doctors, beds, and medicines***

Healthcare centers	Number of male doctors	Number of female doctors	Number of beds available for maternal care and treatment	Availability of medicines (% of institutions)				
				Malaria	Diphtheria	Dengue	Hepatitis	Rehydration salt
Health sub-center	1.44 (0.95)	1.09 (0.29)	3.77 (6.82)	0.61 (0.49)	0.41 (0.49)	0.23 (0.42)	0.23 (0.42)	0.73 (0.45)
Subsidiary health center	1.84 (1.87)	1.37 (0.69)	10.16 (17.18)	0.63 (0.48)	0.49 (0.50)	0.26 (0.44)	0.23 (0.42)	0.66 (0.47)
Primary health center	1.58 (0.98)	1.34 (0.95)	8.12 (13.73)	0.96 (0.20)	0.53 (0.44)	0.30 (0.47)	0.35 (0.48)	0.87 (0.33)
Hospital	6.12 (4.72)	3.28 (1.81)	74.33 (69.30)	0.95 (0.23)	0.91 (0.29)	0.73 (0.45)	0.65 (0.48)	0.90 (0.30)
Family planning clinics	1.84 (2.15)	1.58 (1.19)	9.68 (15.59)					
Allopathic clinics (private doctor)	2.05 (1.86)	1.62 (1.08)	9.54 (11.62)	0.84 (0.37)	0.63 (0.57)	0.34 (0.48)	0.40 (0.49)	0.76 (0.43)
Unani	1.26 (0.56)	1.20 (0.36)	2.56 (1.62)	0.16 (0.37)	0.11 (0.32)	0.09 (0.28)	0.07 (0.26)	0.12 (0.32)
Ayurvedic	1.39 (1.09)	1.82 (1.13)	6.61 (25.42)	0.37 (0.48)	0.19 (0.39)	0.13 (0.34)	0.14 (0.35)	0.36 (0.48)
Traditional	1.73 (1.57)	1.11 (0.33)	1.63 (0.50)	0.13 (0.34)	0.10 (0.30)	0.08 (0.27)	0.11 (0.31)	0.12 (0.32)
Observations	238							

*Notes:* Standard errors in parenthesis

The NRHM provides for an increase in the number of *dais*, health guides, and health workers in villages. The survey shows that the density of such functionaries has improved.<sup>13</sup> These personnel perform a range of functions such as aiding in births and pre- and post-natal care, immunization, spreading awareness about polio, HIV/AIDS, etc., help in malaria eradication campaigns, chlorination of wells, spreading general awareness about health, and provision of food supplements. While the survey finds that the female health workers and *dais* are present in most villages, others such as ASHA, ANM, and Anganwadi workers — also crucial to spreading awareness about health — are relatively scarce. Such scarcity is likely to induce households to access information about key health-related problems from informal sources such as social networks (Table 4).<sup>14</sup>

**Table 4**  
***Presence of health workers in villages***

Health workers	2006	1999
Trained <i>dai</i> (traditional birth attendant)	0.735(0.521)	0.618 (0.487)
Health guide	0.458(0.499)	0.391 (0.489)
Trained male health worker	0.471(0.500)	0.424 (0.495)
Trained female health worker	0.819(0.446)	0.714 (0.480)
Number of observations	238	

*Note:* Standard errors in parenthesis

Table 5 shows that the incidence of illness among women is less compared to men. The proportion of women not treated for illness is slightly lower than that of men, but there are no big differences in terms of the place of treatment between men and women. However, men work many more days than women and despite this the women lost more days at work. The average

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<sup>13</sup> Within the public health system in India, the Public Health Nurse, called the District Public Health Nurse (DPHN), is the senior health worker at the district level. She leads the work of the ANMs, now called Female Health Workers (FHWs). They are skilled birth attendants ensuring good quality maternal and child health services. For monitoring the work of FHW, each PHC has a Female Health Supervisor (FHS). The *dai* is a traditional birth attendant. According to WHO, the Community Health Worker/Village Health Guide is chosen by the community and trained to deal with the health problems of individuals and the community, and to work in close collaboration with the health services. They are either paid or voluntary workers.

<sup>14</sup> The percentage of females accessing information from friends and neighbors about HIV, birth control, pulse polio, dietary supplements for newborns has gone up from 55 percent in 1999 to 68 percent during the current survey period.

period of women remaining absent was 16.28 days, or nearly 15 percent of working days. The corresponding figures for men were 11.4 days or 6.36 percent. The average agricultural wage rates for men and women during the reference period were Rs 63.26 and Rs 59.51, respectively. The male-female wage gap has reduced considerably,<sup>15</sup> and female wage rates have increased by up to 51 and 56 percent, respectively for farm and non-farm sectors (Footnote 16). This implies that absenteeism due to illness will have increasing income effects for the households. For instance, the average losses through wages due to absenteeism, if a female member of the household is working in agriculture, will be Rs 970 per worker. This is Rs 250 more than the losses incurred if a male member was absent from work. The losses are greater if the female workers are in the non-farm sector, in which case, the gap in losses increases to Rs 390.

**Table 5**  
***Incidence of illness and absenteeism***

Variables	Male	Female	All
Percentage of members ill during the year	55.16 (0.497)	53.45 (0.499)	54.31 (0.498)
Average number of days worked	179.27 (54.58)	109.45 (52.62)	144.36 (54.23)
Average no of days absent from work due to illness	11.405 (22.153)	16.278 (21.90)	13.84 (21.50)
Percentage of days absent due to illness	6.36 (25.78)	14.87 (28.56)	10.62 (27.84)
Percentage of members treated in government hospitals and healthcare centers	22.71 (0.424)	23.48 (0.419)	23.09 (0.421)
Percentage of members treated in private hospitals	25.45 (0.436)	25.06 (0.433)	25.26 (0.434)
Percentage of members treated in other hospitals	2.75 (0.164)	2.56 (0.158)	2.66 (0.161)
Percentage of members not treated for illness	8.48 (0.279)	7.51 (0.264)	7.99 (0.271)
Number of observations	15913	15752	31665

*Note:* Standard errors in parenthesis

<sup>15</sup> Growth in male and female wage rates

Category	1999		2006		% Change	
	Male	Female	Male	Female	Male	Female
Agricultural wage	51.25	39.41	63.26	59.51	23.43	51.00
Non-agricultural wage	67.17	57.08	93.45	89.38	39.12	56.59

#### 4. Governance and the Quality of Healthcare

Bhalotra and Clots-Figueras (2011) show that political agency in general, and of women in particular, is significant for the provision of satisfactory healthcare. For example, the incidence of post-natal mortality is significantly less if childbirth takes place during the period of the agency of a woman in the local panchayat. In India the 73rd Amendment includes the responsibility of solving health-related problems such as non-availability of clean drinking water, sanitation, immunization, among others. The NRHM has added complementary powers to the role of the panchayats. To examine this role it is important to understand the status of the various dimensions of healthcare, viz., access, availability, and quality. In the REDS survey, each respondent (both male and female) who accessed or attempted to access a health facility, independently evaluated the facility on the basis of its functionality, presence of trained staff, waiting time, payment of bribes, and the availability of the recommended medicines. Table 6 provides a summary of the survey findings. The two attributes of quality, viz., the presence of trained staff and the availability of recommended medicines, leave much to be desired.

**Table 6**  
*Evaluation of medical facilities*

Institution	All			Male			Female		
	Pub.	Pvt.	Other	Pub.	Pvt.	Other	Pub.	Pvt.	Other
<i>1. Was the facility functional when visited?</i>									
Always	63	76.2	62.1	63.3	75.9	63	62.6	76.5	61.2
Most of the time	30.3	21.7	27.3	29.6	21	26.8	31.1	22.3	27.8
Sometimes	5.6	1.6	8.9	5.9	2.6	8.8	5.4	0.7	8.9
Rarely	1.1	0.4	1.7	1.2	0.4	1.4	1	0.4	2.1
Never	0	0.1	0	0	0.1	0	0	0.1	0
<i>2. Availability of trained staff (doctor, nurses, dais, etc.)</i>									
Always	47.05	72.35	62	47.60	73.4	59.4	46.5	71.3	64.6
Most of the times	43.7	25.5	27.1	44.20	24.8	28.7	43.2	26.2	25.5
Sometimes	6.9	1.5	7.5	4.70	1.3	9.1	9.1	1.7	5.9
Rarely	1.4	0.65	2.95	1.60	0.5	1.9	1.2	0.8	4
Never	0.95	0	0.45	1.90	0	0.9	0	0	0

<i>3. Waiting time during the visit (hours)</i>									
No waiting time	20.49	42.11	41.60	22.81	43.38	42.66	40.84	18.17	40.54
Less than ½ hour	46.58	41.88	41.16	47.84	43.23	40.17	40.52	45.31	42.15
½ – 1 hour	18.75	11.91	10.96	16.96	11.24	13.3	12.58	20.54	8.62
1 – 2 hours	12.37	3.68	5.87	10.61	1.72	3.05	5.64	14.13	8.69
2 – 5 hours	1.82	0.43	0.42	1.78	0.44	0.83	0.42	1.85	0
<i>4. Need for bribe for appointment, referral, and bed</i>									
Always	4.55	2.45	13.2	3.3	1.8	12.2	5.8	3.1	14.2
Most of the times	11.15	3.7	12.15	12.6	3.4	11.6	9.7	4	12.7
Sometimes	10.4	2.9	10.65	9.4	1.3	9.1	11.4	4.5	12.2
Rarely	5.9	0.65	4	6.3	0.7	4.4	5.5	0.6	3.6
Never	68	90.3	60	68.4	92.8	62.7	67.6	87.8	57.3
<i>5. Availability of recommended medicines</i>									
Always	34.45	45.55	39.55	41.2	47.3	40.1	27.7	43.8	39
Most of the times	43.8	35.35	32.1	39.9	40	35.7	47.7	30.7	28.5
Sometimes	14.65	15.1	19.75	12.3	10.6	18.5	17	19.6	21
Rarely	4.1	1.7	4.55	3.2	1.4	1.9	5	2	7.2
Never	3	2.3	4.05	3.4	0.7	3.8	2.6	3.9	4.3
Total	100	100	100	100	100	100	100	100	100

We evaluate the impact of women’s political empowerment using simple two-way tables for the following governance indicators: formulating the agenda for Gram Sabha meetings; attendance of villagers when these items were on the agenda (Table 7); problems experienced by villagers; and the satisfactory resolution of problems (Table 8). Here, we present the two-way tables for water, sanitation and health.

**Table 7**  
***Topics covered and reasons for participating in Gram Sabha meetings***

Agenda and Reasons for Attendance	Entire Sample	Reserved	Unreserved
<i>Agenda</i>	<i>Percentage of meetings</i>		
Water	8.83 (0.284)	10.29 (0.303)	8.192 (0.274)
Sanitation	8.76 (0.283)	8.69 (0.281)	8.79 (0.283)
Provision of health	4.88 (0.215)	4.97 (0.217)	4.83 (0.214)
<i>Reasons for attendance</i>	<i>Percentage of individuals</i>		
Attended GS meeting because water was agenda	6.3 (0.243)	8.49 (0.278)	5.34 (0.225)

Attended GS meeting because sanitation was agenda	5.61 (0.23)	7.73 (0.267)	4.68 (0.211)
Attended GS meeting because health was agenda	6.92 (0.254)	4.97 (0.217)	4.80 (0.214)

*Note:* Standard errors in parenthesis

**Table 8**  
***Problems in provision of health-related public goods and their resolution***

Issues	<i>Reserved Panchayat</i>				<i>Unreserved Panchayat</i>			
	Existence of problems		Satisfactory resolution of problems		Existence of problems		Satisfactory resolution of problems	
	Male	Female	Male	Female	Male	Female	Male	Female
Drinking water	75.99 (0.43)	76.77 (0.42)	68.67 (0.46)	70.34 (0.46)	74.43 (0.44)	75.26 (0.43)	63.96 (0.48)	65.74 (0.48)
Sanitation	78.45 (0.41)	79.20 (0.41)	59.26 (0.49)	61.02 (0.49)	79.04 (0.41)	78.39 (0.41)	58.29 (0.49)	58.65 (0.49)
Functioning of health center	55.98 (0.50)	56.53 (0.50)	22.49 (0.42)	24.18 (0.42)	60.22 (0.49)	61.18 (0.49)	19.31 (0.39)	19.97 (0.40)

*Note:* Standard errors in parenthesis

Table 7 shows that water-related issues were more frequently on the agenda of the Gram Sabha meetings of reserved panchayats, compared to sanitation and health issues. More members of the village attended the meetings when any of these items were on the agenda in panchayats reserved for women than in unreserved ones. Table 8 shows that for these three sectors, the results related to the solution of existing problems across reserved and unreserved panchayats are mixed. Resolution of health-related problems (functioning of health centers) in both reserved and unreserved panchayats is poor. However, as we will see in Table 9 the level of satisfaction of the village members with health services that were reserved in general — and for women in particular — is higher.

## 5. Healthcare and Individual Incomes

We use the representation of a health production function to explain the relationships between the choice of health provider, incidence of illness, private health expenditures, and incomes. This

is done using a two-stage instrumental variables estimation strategy, primarily relying on the 2006 data and additional variables from 1999. We estimate the relationship separately for males and females. The principal regression for estimation is written as follows:

$$\ln y_{it} = \alpha_k X_{kit} + \delta_m M_{mit} + \gamma HE_{it-1} + \varepsilon_{it} \quad (\text{Where, } I = 1, 2, 3 \dots) \quad (1)$$

$$X_{kit} = \beta_l Z_{lit} + v_{it} \quad (2)$$

In equation (1) the subscript  $i$  is the  $i$ th member of a household,  $t$  is the time period, and  $y$  is individual income,  $X_k$  is a vector of explanatory variables, including the following binary variables: health status (ill = 1; otherwise = 0), choice of healthcare provider (private, public, and others); and one continuous variable — the log of private health expenditures.  $M_{mit}$  is a vector of characteristics of household  $m$  in which member  $i$  lives. In line with the literature we condition the regression on the past health expenditures in the 1999 round shown here as  $HE_{mt-1}$ .

Equation (2) is used to predict the endogenous choice of the healthcare provider, using the vector  $Z$  of instruments. It includes the distance to health centers, losses due to village shocks, predicted village health expenditures, predicted health expenditures discussed in the Gram Sabha, individual awareness of health campaigns, adequate drinking water, clean surroundings, predicted household wealth, and inherited land by women. These instruments are chosen to enable us to test some of the stated hypotheses. We assume that (i)  $E(Z'X) \neq 0$  (i.e. all instruments are relevant to the vector  $X_{kit}$  and,  $Z_{lit}$  affects  $X_{kit}$ ) and, (ii)  $E(Z'\varepsilon) = 0$  (i.e. the instruments used are valid and uncorrelated with  $\varepsilon$ ). We compute the partial  $R^2$  of relevance of the instruments (also called the test for excluded instruments). If the value of  $R^2$  is high and standard error is low then the instruments are sufficiently relevant to explain the endogenous

regressors. This test performs under the null hypothesis, i.e. the instruments lack the sufficient relevance to explain the endogenous regressor. If the null hypothesis is rejected, then there are no redundant instruments that have been included. We have also used the Anderson canonical correlation likelihood ratio test under the null hypothesis that equations are under-identified (we expect the null to be rejected in our specification).<sup>16</sup> If our specification is identified then we wish to test whether the identification is strong or weak, using the Cragg–Donald’s F-statistic under the null of weak identification.<sup>17</sup> The Sargan test<sup>18</sup> has been used for over-identification.

The first-stage equations (2), in addition to the choices of healthcare providers, already include predicted village health expenditures, discussions in Gram Sabha, household wealth, and inherited land that could be potentially endogenous to the outcomes. We describe, as follows, the way these are predicted and identified.

### *5.1. Predicting Village Health Expenditures*

If public expenditures jointly reflect the preferences of the elected representatives and households, then we can expect a positive relationship between village-level expenditures on health and the political agency of women. Therefore, if village expenditures rise, concomitantly, household-level (or even member-level) expenditures on health are expected to decline. This will then imply that both members and households perceive public (village-level) expenditures to be substitutes for private (i.e. own) health expenditures as well as signal an improvement in the health status. For low-income households in particular, any savings from their budget should enhance welfare. Village expenditures on health are estimated as follows:

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<sup>16</sup> The under-identification test is a Maximum Likelihood test of whether the equation is identified, i.e. if the excluded instruments are ‘relevant’, i.e. correlated with the endogenous regressors. The test of the rank of the matrix under the null hypothesis is that the equation is under-identified. A rejection of the null indicates that the matrix is full column rank, i.e. the model is identified.

<sup>17</sup> Cragg–Donald’s F-statistic tests whether the equation is weakly identified, i.e. if the F-statistic is greater than 10 then the instruments are not weak.

<sup>18</sup> The Sargan is a test of over-identifying restrictions. The joint null hypothesis is that the instruments are valid instruments, i.e. uncorrelated with the error term.

$$\ln VH_{vt} = \pi_v P_{vt} + \mathcal{G}_{vt}, \quad (3)$$

where  $VH_{vt}$  are village-level health expenditures,  $P_{vt}$  is a vector of variables such as political reservations, controls such remoteness of the village (measured by its distance from district and block headquarters and, town). The regression is also conditioned by state-level health expenditures to reduce upward bias in the estimated coefficient of  $VH_{vt}$  in equation (1) and to help identify the equation.

### 5.2. Predicting Discussions of Health in Gram Sabhas

If members of households are dissatisfied with the status of healthcare, we expect them to participate in Gram Sabha meetings and raise issues relevant to healthcare provision. These could include discussions on quality of health, financial allocations, quality of healthcare institutions and location of health centers, increasing the awareness about health campaigns, provision of drinking water and, cleanliness of streets. Participation in Gram Sabha (GS) meetings related to health is, therefore, predicted as follows:

$$\ln GS_{vit} = \alpha_v HS_{vit} + \delta_m V_t + \phi_{it} \text{ (where } i=1, 2, 3\dots); \quad (4)$$

$$HS_{vit} = \beta_s Z_{sit} + \omega_{it}, \quad (5)$$

where  $HS_{vit}$  is the composite health satisfaction index attributed to member  $i$  in village  $v$ ;  $v_t$  are village-level controls, and  $Z_{vit}$  are the instruments for predicting health satisfaction index and include political reservations for women. What are the variables that specifically identify the system 4 and 5? The composite health access index, which combines the elements of access, availability, and quality is constructed using the responses of individual respondents as follows:

$$f(h_i) = \log(h_i + \sqrt{(h_i + 1)}) \quad (6)$$

where  $h_i$  is the score of individuals with respect to all the five attributes (shown in Table 6). The response to each attribute is a categorical variable ranging from 1 to 5. These scores are added across attributes to arrive at an index  $h_i$  for each respondent  $i$  that takes on a value between 5 and 25. If the index takes on a value between 5 and 10 then the access to and/or quality of healthcare is poor/low. A value between 11 and 18 implies medium levels of access and quality. A value between 19 and 25 refers to high quality and/or excellent access.<sup>19</sup> The index in equation (1) is a parallel translation of the log function.

### 5.3. *Inheritance of Wealth by the Household*

Inheritance of wealth will affect the intra-household dynamics and outcomes. Wealthier households could choose private care over public healthcare. It is important to include inherited wealth as one of the controls. Since inherited wealth is endogenous, we control for this by predicting it using the framework suggested in Foster and Rosenzweig (2002) as follows:

$$\ln W_{ht} = \kappa_h L_{ht} + \eta_{ht} \quad (7)$$

The vector  $L_{ht}$  includes all variables that will lead to household splits, such as variance of education within the household, household size, age of the current head, inherited wealth, presence of non-co-resident father, non-co-resident brother, and non-co-resident sister in the previous survey period.

### 5.4. *Land Inheritance by Women*

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<sup>19</sup> All categories are equally weighted, i.e. availability of medicines is given the same weight as waiting time. The attribute related to cleanliness of the buildings, facilities, etc., was dropped since that was evaluated on a two-point scale.

Inheritance of land by women will boost their financial independence. It is also a significant source of individual empowerment of women. It has been shown that such empowerment enhances a woman's health, and the health of the girl child (Deininger *et al.* 2012a) We expect that inheritance will widen the choice of health providers for women. The Hindu Succession Act (HSA) Amendment passed in 1994 has provided that the male and female children are treated as coparceners in inheritance. The predicted inheritance equation is written as follows:

$$I_{gkj} = \alpha_1 + \alpha_2 F_{gk} + \alpha_3 F_{gk} * D_j + \alpha_4 X_{gkj} * F_{gk} * D_j + \gamma_j + \mu_{gk} + \varepsilon_{gkj} \quad (8)$$

where  $I_{gkj}$  is an indicator variable for whether an individual of gender  $g$ , born in year  $k$ , in household  $j$  inherited any land;  $F_{gk}$  and  $D_j$  are indicator variables for females and whether or not the father was alive after 1994 when the HSA was amended, and these help identify the equation.  $X_{gkj}$  is a vector of parental and household characteristics that include education, caste and land holding; and  $\gamma_j$  are household fixed effects to control for time invariant household characteristics. We include a complete set of gender-specific year of birth fixed effects ( $\mu_{gk}$ ) to control time varying aggregate factors that might independently affect relative inheritance patterns by males and females. The coefficient of primary interest is  $\alpha_3$ ; the estimate of the amendment induced an increase in females' likelihood to inherit land.

The estimates from equations 3, 4, 7, and 8 are used in the vector  $X_{kit}$  of equation (1).

## 6. Results

### ***6.1 Health Satisfaction, Village Governance and Village Health Expenditures***

We begin by explaining the relationship between the households' level of satisfaction with healthcare and the process of governance. Decentralization and devolution of powers to the

panchayats will work if members of households are able to effectively participate in the process of governance related to healthcare. We would expect that members who are not satisfied with healthcare provision will raise this issue in the Gram Sabha meetings. The tests for poor identification are all rejected in Table 9. Panel (a) shows that the overall health satisfaction index across all types of providers is greater for older individuals in smaller households whose land holdings are larger and education levels are higher. Both current and past reservations increase health satisfaction significantly, and the interaction of reservations with women indicates that the impact is greater for females than for males.<sup>20</sup> Panel (b) also shows that villagers participate less in Gram Sabha meetings that discuss health when they are more satisfied with their access to healthcare.

**Table 9**  
***Health satisfaction index and participation in Gram Sabha meetings***

Panel (a) Variables	Health satisfaction index (first stage)
Current reserved	0.0962** (0.0376)
Current reserved*female	0.155*** (0.0130)
Previous reserved	0.0926*** (0.0347)
Previous reserved*female	0.1214*** (0.0292)
Age	0.0194*** (0.000763)
Household size	-0.0676*** (0.00384)
Land holdings	0.0316*** (0.00226)
Years of schooling	0.0419*** (0.00268)
Constant	1.623*** (0.0605)
Panel (b) Variables	Participation in Gram Sabha meetings (second stage)
Health satisfaction index	-0.156*** (0.035)
Constant	2.963*** (0.726)
F-statistics	267.68***
Wu-Hausmann F test	327.40***
Durbin-Wu-Hausmann chi-sq test	319.91***
Village fixed effects	Yes
Observations	21,953

*Note:* Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

<sup>20</sup> Chattopadhyay and Duflo (2004) found that of all public goods water is the most effectively provided by women leaders. They also suggest that there could be women-centric and non-women-centric public goods. Deininger *et al* (2011b) found that there is no evidence of clear-cut gender differences of reservations for females; both men and women benefit from political reservations if the position of the Pradhan is reserved for women.

Table 10 shows that village health expenditures are higher wherever the state governments make larger allocations. They are also higher in villages that are at a greater distance from the district and block headquarters, and towns. This is consistent with the policy that allows larger allocations for healthcare to remote villages than to those that are located within easy reach. Panchayat allocations to healthcare are also higher in villages where there have been fewer conflicts. Besides, health expenditures are higher in villages that are currently reserved or have been reserved in the past, suggesting a strong impact of political empowerment of certain sections of the population. As for satisfaction with healthcare, the impact of reservations is greater for women than for men.

**Table 10**  
***Village health expenditure***

Variables	Ln(Change in village health expenditure)
Current reserved panchayat	0.376*** (0.071)
Previous reserved panchayat	0.208*** (0.053)
Ln (Change in population in the village)	0.276*** (0.067)
Ln (Distance to district)	0.421*** (0.0657)
Ln (Distance to block headquarters)	0.402*** (0.0214)
Ln (Distance to town)	0.572*** (0.0338)
Ln (Number of conflicts during the period)	-0.123*** (0.0357)
Ln (State health expenditure)	0.731*** (0.087)
Constant	5.061*** (0.193)
Observations	238
F-test	177.42***

*Note:* Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## **6.2 The Systems Estimates**

The joint estimates of illness, the choice of the healthcare provider, private expenditures, and the impact of the provider choice and growth in private health expenditures on incomes are discussed in Tables 11a and b, and in Table 12 separately for men and women.<sup>21</sup> The results from the various tests, viz., (a) excluded instruments, (b) the Anderson canonical correlation

<sup>21</sup> We have split the first stage results into two tables to better explain the outcomes related to choice of healthcare provider and the determinants of illness and private healthcare expenditures.

likelihood ratio test under the null hypothesis that equations are under-identified, (c) the Cragg–Donald F-statistic under the null of weak identification, and (d) the Sargan test of over-identification, suggest that (1) there are no redundant instruments that have been used, (2) the equations are not under-identified, (3) there are no weak instruments, and (4) the over-identification tests are rejected. The Wu-Hausmann F test<sup>22</sup> suggests that the regressors are endogenous and the two-stage approach used here is the preferred method of estimation. Similarly, the Durbin–Wu–Hausmann chi-square test shows that only the two-stage instrumental variable estimation is consistent (compared to GLM).<sup>23</sup>

### *6.2.1 Incidence of Illness and Private Health Expenditures*

The first-stage results are reported in Tables 11a and 11b. The main findings are as follows:

- a. Men and women are more likely to fall sick in villages that are far from health centers, with the impact being more severe on women. Village shocks impact negatively on health, again more in the case of women than men. Since these variables predict a greater likelihood of both men and women falling ill, they are also likely to increase the total private health expenditures of both.
- b. Adequate access to clean drinking water, awareness about health campaigns, and clean surroundings reduce the chances of both men and women falling ill, thereby reducing their private health expenditures. There is no significant gender difference in the magnitude of the impact of these variables on the incidence of illness, except in the case of clean surroundings where the impact is greater for men.

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<sup>22</sup> This is the test of endogeneity and performs under the null that the regressors are exogenous.

<sup>23</sup> This test balances the consistency of instrumental variables estimation against efficiency of the least squares estimation. It tests under the null that instrumental variables estimation and least squares estimation are both consistent.

- c. Village health expenditures reduce the incidence of illness among women three times more compared to men, suggesting sharp gender differences in the impact of these expenditures. On the other hand they reduce the private expenditures of both men and women about equally.
- d. Participation of both men and women in discussions on health-related issues in the Gram Sabha meetings leads to reduced chances of them falling ill, about equally. The same holds true for the impact of such participation on private health expenditures.
- e. Inherited wealth of the family reduces the incidence of illness more or less equally for both men and women. However, the reduction in private health expenditures is slightly less for men than for women. This could be indicative of improved intra-household bargaining in favor of women. This finding is again consistent with the literature on this dynamic.
- f. A woman's own land inheritance further reduces her chances of falling ill, perhaps because it also increases her health expenditures. These effects are enhanced if the village too spends more on healthcare.
- g. There are thus complementarities between a woman's inheritance and the village health expenditures, suggesting a significant individual empowerment effect on the choice of healthcare and the level of private health expenditures. The individual empowerment effect is enhanced by the previously discussed positive impact of female reservations on village health expenditures — a political empowerment effect. In healthcare, individual and political empowerments are complements.

**Table 11a**  
*Determinants of illness and health expenditures (first stage)*

Variables	Illness	Male Ln(private health expenditure)	Illness	Female Ln(private health expenditure)
Distance to health center	0.00136**	0.0343**	0.00225***	0.0562***

	(0.000636)	(0.0138)	(0.000620)	(0.0137)
Losses due to village shocks	0.00227**	0.0362***	0.00313*** (0.0001)	0.0308***
	(0.000917)	(0.0020)		(0.0204)
Predicted village health expenditure	-0.00508***	-0.107***	-0.01530***	-0.120***
	(0.00108)	(0.0235)	(0.00107)	(0.0235)
Predicted health-related issues discussed in GS	-0.290***	-0.320***	-0.345***	-0.414***
	(0.00225)	(0.0489)	(0.00224)	(0.0494)
Aware about health campaign	-0.0682***	-0.851***	-0.0712***	-0.882***
	(0.00726)	(0.158)	(0.00723)	(0.159)
Adequate drinking water	-0.0323***	-0.695***	-0.0258***	-0.609***
	(0.00923)	(0.201)	(0.00922)	(0.203)
Clean surroundings	-0.0432***	-0.954***	-0.0302***	-0.679***
	(0.00621)	(0.135)	(0.00618)	(0.136)
Predicted household wealth	-0.0197***	0.247***	-0.0242***	0.361***
	(0.00324)	(0.0704)	(0.00324)	(0.0714)
Land inherited by woman			-0.0599***	0.119***
			(0.00155)	(0.0342)
Land inherited by woman*village health expenditure			-0.00857**	0.0155**
			(0.00342)	(0.00754)
Constant	2.371***	32.58*** (0.899)	2.445***	34.34***
	(0.0413)		(0.0413)	(0.911)
Test of excluded instruments	1908.39***	1889.73***	1684.80***	1623.4***
Anderson canon. Corr. LR stat	26.09***		23.39***	
Crag-Donald F-stat	21.34***		19.87***	
Village fixed effect	Yes		Yes	
Observations	11,013	11,013	10,940	10,940

Note: Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

### 6.2.2 Choice of Healthcare Provider

Table 11b shows the determinants of the choice of healthcare provider. The results are explained as follows:

- a. Distance reduces access to all three types of healthcare providers almost equally for both men and women. However, the negative impact of greater distance is more when it comes to accessing public healthcare facilities. Village shocks will lead to preference for both private and public healthcare providers, with slightly greater impact on women.
- b. Adequate access to clean drinking water, awareness about health campaigns, and clean surroundings reduce the use of private as well as public healthcare for both men and women. The magnitude of the impact of increased provision of such public services and increased information campaigns is not gender variegated.

- c. Even though village health expenditures increase the use of public healthcare, women stand to gain more from this. Discussions on health issues in the Gram Sabha lead to greater use of both private and public health facilities, but reduce the use of other facilities, suggesting that discussions in a public forum lead to increased awareness and widen the choice of healthcare facilities being accessed.
- d. Inherited wealth by the family shifts the choice of health providers to private facilities, with men being more likely to opt for the latter.
- e. A woman's own land inheritance increases her use of both private and public healthcare. The impact on private healthcare is greater. However, if the village-level expenditures are higher than before, then the choice of public health facilities by women increases. This reinforces our previous conclusions about the possible complementarities of individual and political empowerment.<sup>24</sup>

**Table 11b**  
***Determinants of choice of provider (first stage)***

Variables	Male			Female		
	Private	Public	Other	Private	Public	Other
Distance to health center	-0.00325*** (0.000785)	-0.00472*** (0.000755)	-0.00117*** (0.000352)	-0.00348*** (0.000761)	-0.00404*** (0.000727)	-0.00147*** (0.000353)
Losses due to village shoc	0.00313*** (0.00113)	0.00633*** (0.00109)	-0.00276*** (0.000508)	0.00595*** (0.00114)	0.00776*** (0.00108)	-0.00249*** (0.000527)
Predicted village health expenditure	0.00654*** (0.00133)	0.0257*** (0.00128)	-0.00131** (0.000598)	0.00725*** (0.00131)	0.0370*** (0.0012)	-0.00119** (0.000607)
Predicted health related issues discussed in GS	0.166*** (0.00277)	0.185*** (0.00266)	-0.0143*** (0.00124)	0.166*** (0.00275)	0.216*** (0.00263)	-0.0120*** (0.00128)
Aware about health campaign	-0.0363*** (0.00896)	-0.0833*** (0.00861)	-0.0329*** (0.00402)	-0.0521*** (0.00887)	-0.102*** (0.00848)	-0.0451*** (0.00412)
Adequate drinking water	-0.00607 (0.0114)	-0.0308*** (0.0109)	-0.00416 (0.00511)	-0.0123 (0.0113)	-0.0303*** (0.0108)	-0.0119** (0.00525)
Clean surroundings	0.00120 (0.00766)	-0.0469*** (0.00736)	-0.000693 (0.00344)	-0.00517 (0.00759)	-0.0426*** (0.00725)	-0.00177 (0.00352)

<sup>24</sup> The village health expenditures could be influenced by both political agency and the mobilization of women during the Gram Sabha meetings; hence the conclusion about complementarities between individual and political empowerment.

Predicted household wealth	0.0328*** (0.00399)	-0.0460*** (0.00384)	-0.00301* (0.00179)	0.0239*** (0.00397)	-0.0358*** (0.00380)	-0.00554*** (0.00185)
Land inherited by woman				0.0512*** (0.00190)	0.00501*** (0.00182)	-0.00150* (0.000883)
Land inherited by woman *village health exp.				0.0299*** (0.00420)	0.0109*** (0.00401)	0.00224 (0.00195)
Constant	0.688*** (0.0510)	1.646*** (0.0490)	0.173*** (0.0229)	0.796*** (0.0507)	1.540*** (0.0485)	0.197*** (0.0236)
Test of excluded instruments	383.31***	368.71***	32.32***	341.45***	337.45***	25.71***
Anderson canon. Corr. LR stat		26.09*** 21.34***			23.39*** 19.87***	
Crag-Donald F-stat		Yes			Yes	
Village fixed effect						
Observations	11,013	11,013	11,013	10,940	10,940	10,940

Note: Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

### 6.2.3 Impact of Choice of Providers and Individual Health Expenditures on Individual Income

Table 12 shows the second-stage results of impact on incomes. We estimate the regressions for male and female members separately. The results of both the Sargan and F-tests show that the instruments included in the regressions are uncorrelated with the residuals and the equations are well specified.

**Table 12**  
**Impact on incomes (second stage)**

Variables	Ln (Income)	
	Male	Female
Illness	-0.430*** (0.0543)	-0.559*** (0.0863)
Private	0.171*** (0.0237)	0.123** (0.0355)
Public	0.0678*** (0.0116)	0.0967*** (0.0154)
Other	-0.117*** (0.0348)	-0.159*** (0.050)
Ln (Health exp, 2006)	0.0322*** (0.0024)	0.0453*** (0.0038)
Ln (Health exp, 1999)	0.0208*** (0.0024)	0.0318*** (0.0036)
Constant	2.266*** (0.596)	2.283** (0.963)
Observations	11,013	10,940
Sargan statistic	352.24***	851.23***
F-test	35.75***	17.17***
Wu-Hausmann F-test	64.03***	151.56***
Durbin-Wu-Hausmann chi-sq test	311.62***	709.84***
Village fixed effects	Yes	Yes

Note: Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Being ill has a greater negative impact on women's own income ( $-0.56$ ) than on men's own income ( $-0.43$ ), but the standard errors of the coefficients are such that it is unlikely that the difference is significant. On the other hand, own health expenditures tend to increase women's incomes more ( $0.045$ ) than men's incomes ( $0.032$ ), both estimated with small standard errors, suggesting that the 'gradient' is larger for males than for females. It therefore makes sense to create avenues whereby women are able to spend more on their health. The impact of private and public healthcare is positive for the income of both men and women. But it is negative and highly significant for the use of other healthcare providers, suggesting that such use may retard appropriate healthcare with a negative ultimate outcome on income.

Private healthcare does more for the earnings of both men and women than public healthcare, but only slightly for women, who in terms of earnings seem to benefit almost as much from public healthcare as from private healthcare. This suggests that the objective and subjective quality differential between private and public healthcare has significant consequences on incomes. In the case of private healthcare the impact is greater on male income than on female income, while the reverse is true for public healthcare.

The choice of other healthcare providers (Unani doctors, Ayurvedic doctors and traditional healers) reduces the incomes for both men and women, perhaps because it retards access to allopathic health services where these are needed. These coefficients say little about the potential health impacts of the different systems because they are not analyzed separately and because the informal practitioners visited may include poorly trained providers.

## **7. Conclusions**

Our systems analysis of the quality of healthcare providers; the impact of local governance on them and on health satisfaction; choice of providers and health expenditures; and the resulting income impacts have given us many important insights. They reveal significant positive impacts of local governance, of empowerment of women, and complex and sometimes surprising similarities and differences in illness and treatment impacts between men and women.

We find that private clinics are doing better than public facilities on a number of quality indicators. When these data are aggregated over indicators, they show higher quality scores for private clinics than for public facilities.

Sickness is significantly reduced through improved access to drinking water, clean surroundings, and awareness about health campaigns. These factors reduce the use of public and private healthcare, as well as private health expenditures.

Women have a slightly lower probability of having been ill compared to men, but they lose more days at work from being ill. Since they also work fewer days in a year, they lose almost 15 percent of their work days to illness, while men lose only 6 percent. Being ill, therefore, has greater impact on a woman's own income than that of a man. On the other hand, her own health expenditures tend to increase her income more compared to men.

Private expenditures on health have grown less than the incomes of both men and women. Private healthcare does more for the earnings of men than public healthcare, but for women this difference is not that large. This result is encouraging for women only, and this may be because public healthcare puts greater emphasis on maternal and child healthcare than on routine healthcare.

A family's inherited wealth reduces the incidence of illness almost equally for both men and women, and reduces the private health expenditures slightly more for women than for men. This is suggestive of some discrimination within families with regard to healthcare access. Individual empowerment as a result of inheritance of land by a woman has an overall positive impact on her health and her use of healthcare. We also find that there are complementarities between family inheritance and a woman's own inheritance of land on health and health expenditures. The model of family resource allocation to female healthcare is, therefore, responsive to both increases in family wealth and individual female empowerment.

We now turn to the impact of village governance on the incidence of illness, healthcare, private expenditures and individual incomes. An important finding is that higher village health expenditures reduce the illness of women three times more than of men. Village health expenditures increase the use of public healthcare by both genders, but especially by women.

While in terms of access to health facilities women are not at a disadvantage, they benefit significantly in terms of health from individual empowerment through land inheritance. But we also find significant positive impacts on both men and women due to political empowerment of women as a result of the reservation of the Pradhan's position for a woman. In reserved panchayats: (i) more people attend Gram Sabha meetings when water supply, sanitation, or health issues are on the agenda; (ii) the resolution of problems in these sectors is better; (iii) village health expenditures are higher; and (iv) the satisfaction index in terms of access to healthcare is higher, especially for women. These outcomes persist even after a woman has completed her term and the position is again occupied by a man. Reservations, therefore, bring about permanent changes in the political system in relation to health.

We also find that there is a positive interaction between a woman's inheritance of land and village health expenditures (that we have seen to be higher in reserved panchayats). There are, therefore, complementarities between women's individual and political empowerment.

A number of policy implications emerge from the preceding discussion:

- Devolution of responsibilities and resources to panchayats has produced positive results for health and individual health spending. A number of recent additional devolution measures have been put in place but they only started to take effect in 2007 when most of the household data collection of the REDS surveys took place. Our conclusions, therefore, suggest that we should look to further improvements in rural healthcare in the future.
- Both the survey and empirical results suggest that women are not particularly disadvantaged in terms of their access to healthcare or in terms of intra-family discrimination vis a vis health access. They benefit more from improvements in public healthcare brought about by panchayat expenditures, compared to men. Nevertheless, women's earnings are more adversely affected from illness than of men, while at the same time their own health expenses tend to improve their incomes more compared to men.
- Women's health and healthcare can be improved both by their individual and political empowerment, which are complementary to each other.

The results amplify the many policies and channels by which healthcare and health outcomes can be improved. Villagers' participation in governance is a very powerful tool, as it allows them

to articulate preferences, raise issues as well as hold elected officials and providers to account. The consequences include improved health status in the village owing to improved governance of public health facilities, reduced reliance on private health provider, and reduction in private health expenditures. The public provision of healthcare is significant since it improves not only health outcomes, but also allows members of the low income households to use the surplus income on other activities or to increase their savings. Providing incentives to individuals to increase their private health expenditures is also a way of improving healthcare, but benefits and costs will have to be compared to the improvements in public healthcare.

Increases in financial allocations, improvement in health facilities and governance — they all matter for the provision and outcomes of healthcare. But budget allocations and facilities are also improved when governance is improved, so governance appears to be an overridingly important policy variable for healthcare. Political and individual empowerment of women are important elements for improving the health status in general, and of women in particular. We have not been able to investigate the impact of empowerment of vulnerable groups such as SC/ST on healthcare, and figuring out these pathways remains an important research issue.

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