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Political agency and public healthcare

Evidence from India

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Abstract: The development of institutions of self-governance in India, and specifically the 2005 reform—the National Rural Health Mission that introduced village health and sanitation committees—provide a unique opportunity to study the effects of the strengthening of the political agency on collective healthcare decision-making in rural areas. We use data from the District Level Household Survey and take advantage of the heterogeneity of maternal and child healthcare use, before and after the introduction of village health and sanitation committees. Specifically, we examine the effect of village health and sanitation committees on use of both public and preventive healthcare among children. Our results suggest that local democracy has increased access to preventive child healthcare services. Part of the effect is driven by an increase in the utilization of the public healthcare network. We find some evidence of an effect of village residence heads of a Panchayat on preventive healthcare use.

Keywords: decentralization, direct democracy, India, immunization, maternal healthcare, public healthcare
JEL classification: H7, I18

Figures and tables: at the end of the paper

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1 Introduction

The development of institutions of self-governance can have important welfare effects for groups that are dependent on public services for essential healthcare. This is particularly the case for more vulnerable populations whose specific preferences and needs are not accounted for by either electoral processes or traditional forms of political participation. Indeed, traditional electoral processes often aggregate preferences in a crude way that can neglect the needs of large population groups. Processes of local political decentralization, in contrast, are argued to help accommodate locally scattered preferences and demands of a vulnerable population that might be different from those of the state. One of the important areas decentralization reforms have targeted is enhancing participation in collective healthcare system decision-making—that is, strengthening the role of local preferences in setting healthcare priority decisions. Healthcare is an essential policy area in which public intervention has frequently shown evidence of failure (Chaudhury et al. 2006). Hence, the involvement of local preferences in decision-making is expected to change the delivery of care. This paper attempts to contribute to testing the latter proposition.

A paradigmatic country in which to examine the effects of local healthcare decentralization is India. India is one of the world's largest countries run by a quasi-federal system in which states are increasingly gaining more control of their healthcare system. In 1992, the 73rd and 74th Amendments to the Constitution established the Panchayats Raj Institutions (PRIs), self-governance agencies at the local level. The PRIs have financial resources, and one of their main activities is organizing village meetings to provide a forum to reduce problems of agency, which political decision makers typically suffer from.

Village meetings (Gram Sabhas) are called by the Village Panchayat (VP) to discuss resource allocation decisions in the village including healthcare. A VP covers 1–5 villages, and the Gram Sabha, the village body consisting of participants on the electoral register, plays a role in supervising the VP by ratifying its budget and identifying potential untargeted beneficiaries. These meetings, intended to reduce problems of political agency, remain even after electoral participation, and better reflect the specific preferences of the citizenry. In particular, by involving minority groups and interest groups (e.g. women who can advise on maternal healthcare needs), these meetings ensure people are aware of the resources available and trade-offs considered. Besley et al. (2005) find that these meetings helped the selection of beneficial welfare programmes, and disadvantaged groups appeared to benefit the most. However, further reforms were put forward in 2005 to set up village health and sanitation committees (VHCs) in the context of the National Rural Health Mission (NRHM) in order to advance the remit of self-governance by PRIs. This paper focuses on examining the effect of the introduction of specific health meetings on healthcare utilization.

We study in a systematic way the effectiveness of VHCs as an intervention intensifying the local decentralization of the healthcare system. Preliminary evaluation of the functioning of the NRHM has been completed (Bajpai et al. 2009), but it is limited to a handful of healthcare outcomes, and it does not address the causal concerns of the non-random nature of setting up the VHCs. We fill these gaps in this evaluation. Specifically, given the remit of decisions typically made by VHCs, we examine the effect of VHCs on the use of maternal and child health (MCH) care services by estimating an instrumental variable model that adjusts for the non-random introduction of VHCs and provides causal inferences. Our estimates control for both time (survey interview date) and state-specific effects (given that healthcare is organized at the state level in India). We further examine the performance of VHCs by investigating whether the

VHCs develop village health plans and whether this has an effect on the use of public healthcare and specific preventive and MCH care services.

Our paper contributes to the wider literature by examining a specific case in which a policy intervention can be identified. We contribute to the literature on the expansion of political agency in India (Besley et al. 2005) by examining the specific effect of VHCs. One previous study (Kumar and Prakash 2012) has examined a related question, focusing on two states in India (Bihar and Jharkhand). They studied the effect of both decentralization and women's reservations (a requirement that one-third of village council leadership positions are reserved for women) on safe deliveries and institutional births. We follow a different strategy. We draw upon the variability in the adoption of VHCs and the different timing of births, and study the effect on a more comprehensive set of outcomes—MCH care services—for all the representative samples of Indian states covered by the District Level Household Survey (DLHS), which is a sample of 202,000 individual respondents. We employ an instrumental variable strategy to account for the omitted variable bias present in the adoption of VHCs. Namely, the adoption of VHCs is not a random event, but one that results from some common unobservable element such as the presence of modernizers in the community, which we pick up by examining the potential penetration of new ideas due to better communications.

The organization of the paper is as follows: Section 2 provides the background; Section 3 is devoted to the data and methods; Section 4 contains the results; and Section 5 concludes.

2 Background

2.1 Political agency and health services

Local democracy is expected to improve healthcare delivery. However, the precise mechanisms underpinning such effect are still unclear. It might well be that opposition and minority groups lose interest in council/village meetings, or see themselves as ineffective, which might consolidate the ruling elite (Bardhan 2002). More generally, traditional fiscal federalism literature (which envisages decentralization reforms as resulting from a trade-off between the costs associated with the presence of spillovers and economies of scale versus heterogeneity costs), need to deal with issues related to government accountability. In a similar low-income context, Faguet (2001) finds evidence of an important expansion in the quality of social services in Bolivia after municipalities took control of social service delivery. The latter can be explained by the political incentive to deliver visible policy outcomes to constituents in order to get re-elected. However, whether this result applies across the board, and specifically whether it can be extended to healthcare services is not clear-cut. Healthcare is an area in which there are important information asymmetries, and hence improvement in government accountability might not always translate immediately into better outcomes. However, among all areas of healthcare delivery, one would expect to see an effect on the uptake of preventive care, which is typically associated with an unsatisfied demand for health, and could arguably be better addressed when a channel is offered for collective healthcare decision-making to aggregate demands for healthcare improvement.

Probably, the most important argument to advocate for further health system decentralization is government accountability. Local or regional governments tend to have an informational advantage in identifying the needs of their populations, and if governments are more accountable at lower levels there might be 'political incentives' for politicians at the local level to use that

advantage to get re-elected. Hence, if the latter holds true, one would expect the quality of public healthcare to improve under decentralized governments. Azfar et al. (2000) surveyed the preferences of individuals (constituents) and bureaucrats at different levels of government in the Philippines; they found evidence of a positive correlation between constituents' and bureaucrats' preferences at the local level, but no correlation at higher levels of government. However, the question of the efficiency of centralization has to grapple with elite capture—that is, whether the central or state government is more likely to be captured by elites than is the local government. This would impact service delivery, together with efficiency, as authority is allocated to those responsive to social needs. The extent of elite capture depends on the existence of social inequality, which could pave the way for some elite collusion and avoid catering to people's needs. As Bardhan (2002) argues, the extent of local capture depends on traditions of public participation, regulation, and media attention. But the general view is that central governments are more likely to be captured, given the larger returns of doing so, which explains to some extent the large funds being spent on national political campaigns. In contrast, local governments are more trusted and deliver more satisfaction (on visible dimensions of public service) than central governments. Some consistent evidence with the argument is found in Brazil, where the number of public clinics and consultation rooms—the visible public goods—are positively related to voter turnout, but not the number of doctors and nurses (Mobarak et al. 2011). Hence, one would expect decentralized governance to result in greater use of public services (mostly visible to the public), and especially public healthcare.

One of the limitations of traditional fiscal federalism approaches lies in the consideration of *information asymmetries*, specifically among poorer population groups who might not be informed enough to make efficient 'voting with one's feet' decisions. In the case of healthcare, information asymmetries can be significant as information is often technical, and hence the objective quality is not clearly observable. Furthermore, many services are community-specific and often either exclude non-residents or impose transaction costs on non-residents and outsiders. This is especially the case in developing countries, which lag behind in institutional development, and it is not uncommon to find that they are subject to the governance of corrupt bureaucrats. The latter makes accountability more complex to trace, and hence returns of decentralization are not always granted

Given that the funds/taxes decentralized to local levels of government are less flexible and more regressive, there is some degree of concentration of economic activity in certain areas, which can create territorial inequalities. Local governments in poor areas face difficulty in raising fiscal revenues, and thus creating a pervasive fiscal imbalance. In India, Bardhan (2002) argues there is evidence that local democracy and states are more effective than central government, but then again, there are large differences across states; for example, West Bengal is a state with high trust and Bihar is one with low trust (Mitra and Singh 1999). Despite spending a small share of gross domestic product (GDP) on healthcare, a disproportionate share of the health budget is dedicated to inpatient care, as opposed to preventive care—the latter being more pro-poor (Peters et al. 2002). Hence, this paper focuses primarily on public, preventive, and outpatient care. In India, evidence suggests that while a higher voter turnout in a district increases the allocation of nurses to rural areas of the district, it has no effect on the allocation of doctors and has a negative effect on the allocation of teachers (Betancourt and Gleason 2000).

2.2 Governance in India

Decentralization of governance has always been envisaged in post-independence India. In a predominately rural and heterogeneous country like India, decentralization was foreseen to bring inclusive development. PRIs constitutional amendments were based on the premise that local

government would lead and manage social programmes by adapting them to local contexts, and would be accountable to the community they serve. However, the vision that self-government would pave the way for development remained an unrealized goal even after two decades of PRIs. PRIs were riddled with problems: they lacked political and bureaucratic power, which continued to be held by the state and central government, and they were largely constituted of higher caste members. Weaker sections of society, like the scheduled tribes (STs), scheduled castes (SCs), and women, were not adequately represented in local government. This was particularly problematic in healthcare, given the serious consequences of poor governance.

In India, public health and sanitation, and management of hospitals and dispensaries, are the state's responsibility. Medical education, medical professionals, and family control are the joint responsibilities of the central government and the states. In terms of health budgets, district officials aggregate demand for healthcare provision from local governments (PRIs) and present them to the state government. These are then discussed in the respective state legislative assemblies and incorporated into state budgets. The implementation of policy decisions mainly rests with the District Planning Committees that coordinate information flows from the lower levels to the states. When power over the implementation of developmental projects was devolved to the district and village levels, according to the 1993 Constitutional Amendments, the PRI structure included elected bodies at the village, block, and districts levels, with the exception of small states with populations under two million people. Panchayat elections take place every five years, and one-third of the seats are reserved for women and SCs/STs; state legislation can further reserve seats for other underrepresented groups.

The PRI amendments listed the functions suitable for devolution to the VPs; states, however, had considerable autonomy in interpreting and defining the scope of decentralization. Although these amendments were a big step in the decentralization process, there was some degree of uncertainty about the precise role of Panchayats in the political, administrative, and fiscal functioning of the states, and over the years the process and reach of decentralization varied across states. Johnson (2003) and Singh (2008) argue that decentralization in India has been implemented with uneven distribution of tax and administrative capacities. Kerala is probably the best example of decentralization, where VPs were given real autonomy and fiscal devolution. In many other states, the role of VPs remained restricted. Gram Sabhas often had no power to approve plans and budgets, their role was mainly seen as consultative. The PRIs, on the other hand, acted mainly as executing and supervisory agents for the state government.

The second wave of impetus to decentralization, specifically targeting the health sector, was brought about by the NRHM in 2005. The NRHM was launched to bring about 'necessary architectural correction in the basic healthcare delivery system', with the goal of improving the availability of and access to good-quality healthcare services, especially for those residing in rural areas. The NRHM action plan included multiple, interlinked components aimed at increasing decentralization of decision-making and management of health programmes. It established the VHCs, the standing committee of the VP, to provide oversight of all NRHM activities at the village level. Under the NRHM, VHCs are central to 'local-level community action' and to fostering decentralized health planning. A VHC has a minimum of 15 members, which includes members of the VP (with priority given to elected, women VP members) and community (including those working in the health sector, service users and members of community-based organizations). Fifty per cent of the VHC members should be women, and SCs, STs, and minorities should be adequately represented as per their population in the village.

Specifically, VHCs are responsible for developing village health plans and for managing an untied fund of Rs.10,000 per annum to enable local planning and action. They organize health-

promotion activities and mobilize pregnant women and children to access maternal and healthcare services, especially antenatal care (ANC), facility delivery, postnatal care (PNC), and child immunizations.

2.3 Health care governance in India

India's health care performance is still far from what is desired, and is still heavily burdened. Importantly, such a burden can be significantly reduced as many existing morbidities and mortalities are preventable, often with access to primary care, which is provided by the public health network. The Indian health system was initially designed as a publicly funded and run system that would provide healthcare free of charge. Policy reform has emphasized primary healthcare with a limited private sector presence.

In India, public spending on health is about 4 per cent of GDP, but the health system is wasteful and there is great scope for significant efficiency improvements. Currently it is inefficient and delivers very low-quality health services, so much so that the private sector has become the de facto provider of health services in India. Although privately purchased or employer-provided health insurance is available to only a small share of the population (Reddy 2015), even the poor frequently choose private healthcare—which is an unregulated sector. Hence, the extra financial burden of ill health can exacerbate problems of poverty. Indeed, 70 per cent of healthcare expenditures consist of out-of-pocket spending, which is highly impoverishing (Reddy 2015).

Healthcare infrastructure has often been underutilized and inefficiently run (Reddy 2015). Most programmes have focused on maternal and child health, infectious diseases, and family planning. Yet, it is inadequate in terms of coverage of the population, especially in rural areas, and grossly underutilized because of the dismal quality of healthcare provided. It is not uncommon that public health centres are understaffed due to absenteeism and that drugs and equipment are missing or in short supply. Absenteeism is particularly costly because it has an associated salary burden (Chaudhury et al. 2006). Similarly, it is not uncommon for rural health posts to remain vacant due to lack of availability of qualified doctors and other healthcare workers; further, absenteeism is encouraged due to lack of effective monitoring. Rural healthcare structure is often unable to respond effectively to local realities and needs.

It is against the background described above that the NRHM was created in 2005 in an effort to improve public health services, with a special focus on states with weak public health infrastructure and indicators. The NRHM focuses mostly on maternal and child health, aiming to reduce mortality in those groups to the Millennium Development Goal targets; it is focused on 18 states designated as 'high-focus states' (Reddy 2015). The original primary goal was to increase the availability of, as well as access to, quality healthcare among those living in rural areas, especially the poorest groups, women, and children. The NRHM is undoubtedly the most ambitious rural health initiative to be launched in post-independence India by the United Progressive Alliance (UPA) of various political parties coming together after the 2004 general election. The NRHM envisages an incremental 30 per cent budget over existing budgetary outlays every year to meet the goal of increasing the public health outlay from 0.9 per cent to 2–3 per cent of GDP. The states are expected to raise their contributions by a minimum of 10 per cent per year to support the programme.

3 Data and methods

3.1 The data

We use the Indian DLHS[1], repeated cross-sections, to study the effect of the NRHM. The District Level Household and Facility Survey (DLHS-3), administered during 2007 and 2008, is one of the largest ever demographic and health surveys carried out in India, with a sample size of about seven million households, covering all districts of the country. This survey was designed to capture the impact of the NRHM on MCH outcomes, family planning, and other reproductive health indicators. Unlike the previous two waves, DLHS-3 interviewed married women (aged 15–49) and also unmarried women (aged 15–24) as respondents. Questionnaires were bilingual, in the local language and in English. The advantage of this data-set is that it provides individual-, household-, and village-level information.

MCH information was collected from 1,245,590 women (451,951 households) across India. Women were specifically asked about their use of maternal health services (ANC, delivery, and PNC) for the most recent birth in the last five years, and immunization information was collected for the youngest two surviving children born during this time. We therefore use data pertaining to the youngest child born during 2004–08 (169,672 children) to study the use of maternal health services, and we use data pertaining to the youngest two children born during 2004–08 (211,964 children) to explore immunization uptake.

The village data[2] in DLHS-3 allows us to identify the presence of a VHC in the village. It further allows us to access the performance of these committees, for example by examining whether the VHC develops health plans. The DLHS-3 data pertain to 22,508 communities spread across 592 districts and 34 states (excluding Nagaland). After the launch of the NRHM, 28.9 per cent of the villages set up a VHC (see Appendix Table A1 for the names of such villages and samples). Further, 61.2 per cent of the VHCs develop village health plans and 44.8 per cent manage untied fund of Rs.10,000. Hence, the data-set allows us to go beyond intention-to-treat estimates and measure the treatment effect on the treated quite precisely. By examining the use of MCH services we can compare the effects of the introduction of VHCs on the probability of using MCH services, before and after the introduction of the NRHM.

The DLHS-3 survey was designed using multi-stage stratified systematic sampling using the 2001 census from India as a sampling frame. Specifically, the design is based on districts alongside 50 primary sampling units (PSUs)—which were census villages in rural areas and urban wards—selected in the first stage by systematic probability proportional to size sampling. PSUs were stratified by number of households into three strata—fewer than 50, between 50 and 300, and more than 300 households.

3.2 Econometric strategy

The empirical strategy of the paper focuses on outcomes that can be measured for the period before and after the NRHM reform. We apply an instrumental variable (IV) strategy, given that it

[1] Districts are administrative units lower than states that play an active role in areas of welfare such as healthcare.

[2] In the survey this refers to the PSU, which could be a single village or a group of smaller villages. Sometimes larger villages were also split into two or more PSUs.

does not seem reasonable to assume that the VHCs were set up at random. For the health outcomes, we observe births before and after the reform; we can write the following estimation:

$$Y_{it} = \gamma_0 + \gamma_1 Head_{tg} + \gamma_2 VHC_{itg} + \gamma_3 X_{itg} + \mu_g + \delta_t + \varepsilon_{it} \quad (1)$$

Y refers to the use of MCH services (ANC, public facility delivery, PNC, and immunizations). Our regression on healthcare utilization and exposure to VHCs allows identification of political externalities, as in Besley et al. (2005), and *i* refers to individuals, *g* refers to the state/village, and *t* refers to time. Our parameter of interest is γ_2, which identifies the changes in healthcare utilization after the introduction of VHCs, over and above the effect of time trends and state fixed effects and alongside a number of controls for confounding effects. Our exposure variable refers to being exposed to a VHC. We control for contextual effects such as the household head's and mother's and child's characteristics. We include as a control the variable 'head', which controls for the fact that villages where heads of Panchayat live might exhibit systematically better outcomes. We use a linear model since fixed effects probit estimates are inconsistent in short panels (Nickell 1981). Standard errors are robust to arbitrary forms of heteroscedasticity and clustered at the household level. The identifying assumption is that the timing of policy change is not correlated with the trends in healthcare use. Treated cohorts are born after 2005, while control cohorts are born before, and we take advantage of the variation of birth dates.

In this section we explain further our empirical strategy and discuss how we address some potential threats to the specification that could have biased our results. From an econometric perspective, the natural question would be whether the variation in treatment can be deemed exogenous and, if not, whether we know what determined implementation—for example, whether it was a phased-in programme with phase-in defined by the literacy rate in the district, or whether there was simply a variation in bureaucratic efficiency in implementing a state-wide programme. In our data-set we can clearly identify the use of healthcare services and whether the village has a VHC, but the data are only available for one wave that contains two years following the implementation of the reform. In addition, it can be argued that the presence of common unobservables may drive both the introduction of VHCs and healthcare use. Hence, we have chosen to follow an IV strategy. An IV strategy requires an instrumental variable that should influence the intervention (in our case, setting up of the VHC) but should not be related to the outcome (i.e. MCH service use). The IV we use is whether the village is connected by an all-weather road to the district headquarters. We expect the connection to the district headquarters to be a source of the introduction and transference of new ideas about social reforms, which will explain the creation of a VHC, but will not influence healthcare utilization. The instrument is hence theoretically valid, and we will test whether it is statistically significant and strong We therefore estimate the following:

$$VHC_{it} = \vartheta_0 + \vartheta_1 Connected_{it} + \vartheta_2 X_{it} + \mu_i + \delta_t + \varepsilon_{it} \quad (2)$$

The Wu–Hausman test rejects the null hypothesis of endogeneity, and the first stage indicated a value of the F exceeding the Staiger criteria with a value for 23; the coefficient, as expected, appears to be significant and positively associated with the exposure to a VHC. Another threat to the specification lies in the presence of district–year varying changes in other determinants, which we address by controlling for unobservable trends. In the specification illustrated above we control for state-specific trends, and in extensions of this we demonstrate robustness to district-specific trends and district by mother-cohort effects. We also control for time effects that control for the effect of time-specific covariates. We include the date of data collection (month

and year) and year of birth. In addition, we run different specifications (OLS and IV), and we employ different treatment variables.

3.3 Falsification tests

We examine the effects on the use of MCH services before the NRHM for a subsample of states, to confirm that we are identifying the effect of the programme (which we do not report here). In addition, we measure the effect on the use of private healthcare services for deliveries to test whether the effects we are identifying are the intended outcomes, as the creation of the VHC should encourage the use of public facilities and consequently should reduce the use of private health facilities.

3.4 Variables

Table 1 reports the main dependent variables of the study, which refer to whether the respondent delivered a child in a public health, facility consistent with the hypothesis that increasing the political agency would have enhanced the use of public healthcare in the context of India, where public healthcare is underused. The second set of variables includes a list of MCH services, including child immunizations against tuberculosis (Bacillus Calmette-Guérin vaccine, BCG), diphtheria, pertussis, and tetanus (DTP), and polio, and deliveries under caesarean section, which mainly refers to surgical procedures typically employed in high-risk deliveries. Table 1 includes the treatment variables of interest, including the presence of a VHC, which affect about 15 per cent of our sample and whether the VHC developed the health plans. In addition, we include information about whether the head of the VP lives in the community (41 per cent), the religion and caste of the household head, socioeconomic status (SES), mother's age at birth, whether the mother ever attended school, and the sex of the child. Also, we include another variable, JSY, which indicates whether the mother received benefits from a cash transfer scheme (Janani Suraksha Yojana, JSY) that was launched at the same time as the NRHM to promote institutional deliveries among poor mothers.

Figure 1 provides evidence on the uptake of immunization pre- and post-NRHM for areas with and without a VHC. For all vaccines considered (BCG, DTP, and polio) we find that where there is no VHC after the introduction of the NRHM there is an average pre-NRHM immunization uptake, while for areas with a VHC there is a spike in immunizations after the introduction of the NRHM. Similarly, Figure 2 shows that non-VHC areas exhibit average maternal healthcare use of deliveries in public facilities, caesarean section, ANC, and PNC. In contrast, we observe a spike after the introduction of a VHC. Nonetheless, these figures do not allow us to distinguish whether the effects are driven by other confounding factors rather than the introduction of a VHC. We need to review the results in the following section to gather a better picture of the effect of the introduction of VHCs.

4 Results

4.1 Effect of VHCs on the use of public health facilities for deliveries

Given that a widespread improvement in MCH would require an expansion of access to public healthcare, Table 2 reports the effect of VHCs on the use of public health facilities for deliveries. Specifically column 1 offers a naive specification without controls; column 2 includes a number of controls, in addition to time effects that control for the effect of time-specific covariates.

Column 3 includes state fixed effects to control for state effects. Column 4 presents the effects of setting up a VHC, adjusting for endogeneity by using an IV. The results suggest that, as expected, the introduction of a VHC increased the probability of using public health facilities for deliveries. The coefficient is consistent with the idea suggested in the paper, that the strengthening of political agency is linked to an expansion of the use of public healthcare. The increase is significant when the household head is Hindu. Further, poorer households and educated mothers have a higher probability of using public health facilities. However, households with SC/ST heads, larger households, older mothers, and male children have a lower probability of using public facilities for deliveries.

4.2 Caesarean deliveries

Using the same empirical strategy, we examine the effect on caesarean deliveries in Table 3. We find that the introduction of a VHC increases the probability of caesarean deliveries. Similar to the results on public health facility deliveries, the probability of caesarean deliveries is higher for households with a Hindu head, richer households, educated mothers, and male children, and lower for households with SC/ST heads and larger households. However, unlike the results for public health facility deliveries, the probability of caesarean deliveries increases with the mother's age, which is expected as caesarean deliveries are more prevalent among older mothers in other contexts as well.

4.3 Use of ANC and PNC services

The effects of VHCs on the use of ANC and PNC are shown in Tables 4 and 5, respectively. These results are similar—a VHC has a significant and positive effect on the use of both ANC and PNC services. Further, the probability of using ANC and PNC services is higher for Hindu, richer, and smaller households. It is also higher for educated mothers and male children, but lower for older mothers and for SC/ST households.

4.4 Immunizations

Tables 6, 7, and 8 report the effect of the introduction of VHCs on immunizations, consistently showing that VHCs increased the probability of a child being immunized with BCG, polio, and DTP vaccines. Further, the probability of the child receiving all of these immunizations is higher when the household head is Hindu, for richer and smaller households, for educated mothers, and for male children. The probability, however, reduces for older women and there are no differences among caste groups.

4.5 Performance of VHCs

The effect of the performance of VHCs, measured by whether a VHC drafts village health plans, on the use of maternal healthcare services and immunizations are presented in Tables 9 and 10 (only IV models). VHCs that draft health plans increase the use of both maternal healthcare services (deliveries in public health facilities, caesarean deliveries, ANC, and PNC) as well as immunizations (BCG, polio, and DTP). Consistently, the probability is higher among Hindu households, smaller households, educated mothers, and for male children. It is also higher among richer households, except for public facility deliveries, which are higher among poorer households. The probability is less consistent with regard to SC/ST status and the mother's age. Although STs/SCs have a higher probability of public facility deliveries and of being immunized against BCG (at 10 per cent significance) and DTP (at 5 per cent significance), the probability is lower for caesarean deliveries and for ANC and PNC. Older mothers have a higher probability

of public facility deliveries but a lower probability of using ANC and PNC services, and a lower probability also of their children being immunized.

4.6 Effect of VHCs on the use of private health facilities for deliveries

Table 11 shows that VHC reduced deliveries in private health facilities. This reduction was significant for households with Hindu heads, educated mothers, and male children. However, the probability of deliveries at private facilities increased for ST/SC-headed households, larger households, and older mothers.

5 Conclusion

This paper has examined the effects of the strengthening of political agency in the Indian health system after the introduction of the NRHM, which created VHCs, which in turn increased further political accountability with regards to healthcare. Specifically, we have examined two of the recurrent health system shortcomings, namely the limited use of public healthcare and the limited use of preventive care, drawing from a number of observable services such as the use of caesarean sections, ANC, PNC, child vaccinations, and the use of both public and private healthcare. We have relied on an empirical strategy that is explained by the introduction of voluntary health councils which can be identified using an IV approach.

Our results suggest that the implementation of VHCs has increased the probability of preventive healthcare utilization regarding obstetric care and vaccinations. Specifically, we find that it increases public healthcare use and the uptake of immunizations as well as the use of caesarean sections. We show that part of the effect lies in the increasing probability of using the public health network, which is rather underused in India. That is, the probability of a delivery in a public health facility was found to increase after the adoption of a VHC. As a falsification test, we find that the use of private healthcare delivery declined by a comparable magnitude. We find that when a village is the residence of a head of a Panchayat, it exhibits higher use of public healthcare and higher preventive and maternal healthcare use. This finding is suggestive that even when examining differences across villages in a decentralized context such as the Indian one, there are important differences that result from proximity to decision-making.

These findings suggest that strengthening political agency can, as expected, increase the use of healthcare services that can, in turn, prevent certain conditions, and especially increase the use of (underused) public healthcare facilities. This is especially important when a programme such as the NRHM targets more deprived areas that have a greater capacity to benefit. Policy implications indicate that the strengthening of political agency is an alternative to privatizing the health system, and is in line with a wider policy strategy to expand preventive healthcare use. Hence, policy recommendations indicate that greater constituent involvement in collective healthcare decision-making can increase the use of public health, and can have a significant effect on the adoption of desirable preventive approaches.

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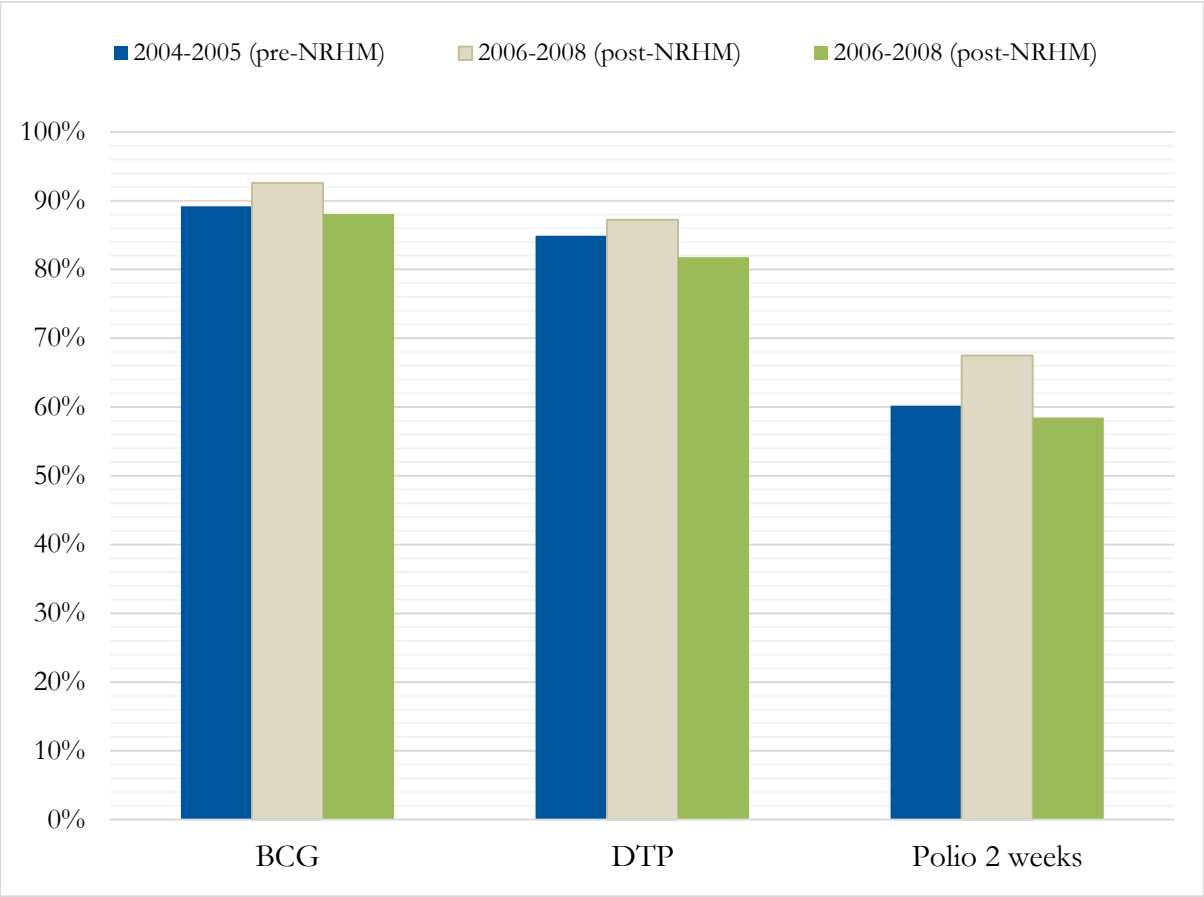
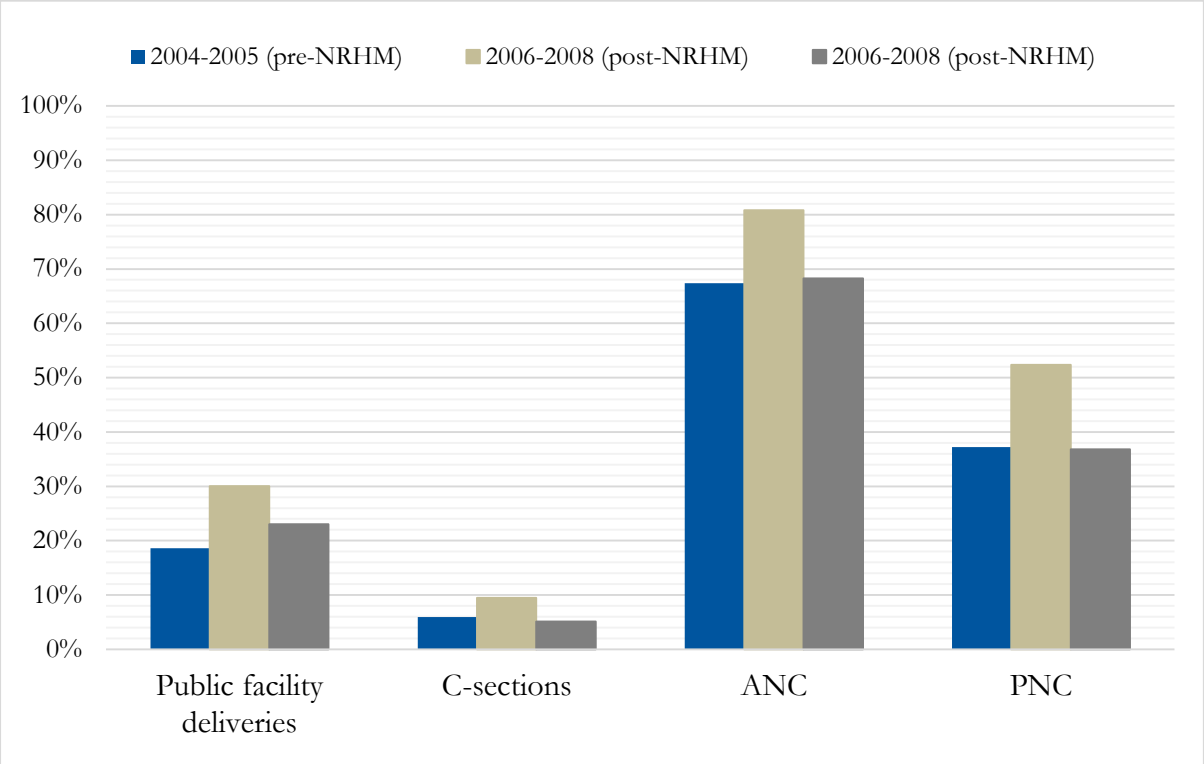
Figures and tables

Figure 1: Immunization uptake, pre and post-NRHM period



Source: Indian District Level Household surveys, all waves.

Figure 2: Maternal health care use, pre- and post-NRHM



Source: Indian District Level Household surveys, all waves.

Table 1: Variable definitions and description

Variable	Definition	Mean (SD) or Percentage
Dependent variables		
Public	Delivery in a public health facility = 1; 0 otherwise	23%
Caesarean	Caesarean delivery = 1; 0 otherwise	6%
ANC	Had at least one antenatal care visit = 1; 0 otherwise	70%
PNC	Had PNC within two weeks of birth = 1; 0 otherwise	39%
BCG	Child had BCG vaccine = 1; 0 otherwise	89%
Polio	Child had polio vaccine within two weeks of birth = 1; 0 otherwise	60%
DTP	Child had at least one dose of DTP vaccine = 1; 0 otherwise	83%
Independent variables—decentralization		
VHC	Village had a VHC = 1; 0 otherwise	15%
Health plan	VHC developed village health plans = 1; 0 otherwise	14%
Independent variables—other variables		
Head	Panchayat head lives in the village = 1; 0 otherwise	41%
Hindu	Household head is a Hindu = 1; 0 otherwise	76%
ST/SC	Household belongs to ST/SC caste = 1; 0 otherwise	40%
SES	Household in the poorest SES quintile = 1	25%
	Household in SES quintile 2 = 2	25%
	Household in SES quintile 3 = 3	23%
	Household in SES quintile 4 = 4	18%
	Household in the richest SES quintile = 5	9%
Size	Number of family members in the household	7 (3)
Age	Mother's age at the time of delivery	25 (5)
School	Mother ever attended school = 1; 0 otherwise	50%
Boy	Child is a boy = 1; 0 if girl	52%
JSY	Mother received any benefit under JSY = 1; 0 otherwise	11%

Source: authors' calculations.

Table 2: Effect of VHC on utilization of public health facility for deliveries

Variables	(1) OLS	(2) OLS	(3) OLS	(4) IV
VHC	0.086***	0.029***	0.006**	0.676***
	(0.003)	(0.003)	(0.003)	(0.085)
Head		0.025***	0.001	0.044***
		(0.002)	(0.002)	(0.006)
Hindu		0.015***	0.042***	0.043***
		(0.002)	(0.002)	(0.003)
ST/SC		0.009***	−0.011***	−0.013***
		(0.002)	(0.002)	(0.002)
SES = 2		0.038***	0.035***	0.028***
		(0.002)	(0.002)	(0.003)
SES = 3		0.082***	0.066***	0.052***
		(0.003)	(0.003)	(0.004)
SES = 4		0.123***	0.101***	0.078***
		(0.003)	(0.003)	(0.005)
SES = 5 (richest)		0.113***	0.096***	0.066***
		(0.004)	(0.004)	(0.006)
Size		−0.005***	−0.003***	−0.003***
		(0.000)	(0.000)	(0.000)
Age		−0.001***	−0.001***	−0.002***
		(0.000)	(0.000)	(0.000)
School		0.073***	0.049***	0.043***
		(0.002)	(0.002)	(0.003)
Boy		0.002	0.002	0.003
		(0.002)	(0.002)	(0.002)
JSY		0.535***	0.496***	0.488***
		(0.004)	(0.004)	(0.004)
Constant	0.214***	−0.003	0.393***	0.356***
	(0.001)	(0.009)	(0.016)	(0.019)
Time effects	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Observations	169,572	169,535	169,535	169,535
R-squared	0.006	0.206	0.255	

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: authors' calculations.

Table 3: Effect of VHC on caesarean deliveries

Variables	(1) OLS	(2) OLS	(3) OLS	(4) IV
VHC	0.041***	0.027***	0.007***	0.144***
	(0.002)	(0.002)	(0.002)	(0.043)
Head		0.002	−0.001	0.007**
		(0.001)	(0.001)	(0.003)
Hindu		−0.002	0.009***	0.009***
		(0.001)	(0.002)	(0.002)
ST/SC		−0.014***	−0.015***	−0.016***
		(0.001)	(0.001)	(0.001)
SES = 2		0.007***	0.006***	0.004***
		(0.001)	(0.001)	(0.001)
SES = 3		0.025***	0.017***	0.014***
		(0.001)	(0.001)	(0.002)
SES = 4		0.064***	0.052***	0.047***
		(0.002)	(0.002)	(0.003)
SES = 5 (richest)		0.137***	0.120***	0.113***
		(0.003)	(0.003)	(0.004)
Size		−0.004***	−0.002***	−0.003***
		(0.000)	(0.000)	(0.000)
Age		0.000***	0.001***	0.000***
		(0.000)	(0.000)	(0.000)
School		0.033***	0.023***	0.022***
		(0.001)	(0.001)	(0.001)
Boy		0.004***	0.005***	0.005***
		(0.001)	(0.001)	(0.001)
JSY		0.016***	0.008***	0.007***
		(0.002)	(0.002)	(0.002)
Constant	0.054***	0.091***	0.102***	0.094***
	(0.001)	(0.006)	(0.010)	(0.011)
Time effects	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Observations	169,553	169,521	169,521	169,521
R-squared	0.004	0.049	0.078	0.043

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' calculations.

Table 4: Effect of VHC on utilization of ANC

Variables	(1) OLS	(2) OLS	(3) OLS	(4) IV
VHC	0.129***	0.070***	0.027***	0.718***
	(0.003)	(0.003)	(0.003)	(0.103)
Head		0.018***	−0.007***	0.037***
		(0.002)	(0.002)	(0.007)
Hindu		0.026***	0.038***	0.039***
		(0.003)	(0.003)	(0.003)
ST/SC		−0.031***	−0.030***	−0.032***
		(0.002)	(0.002)	(0.003)
SES = 2		0.054***	0.066***	0.058***
		(0.003)	(0.003)	(0.004)
SES = 3		0.122***	0.124***	0.110***
		(0.003)	(0.003)	(0.004)
SES = 4		0.192***	0.190***	0.167***
		(0.004)	(0.004)	(0.005)
SES = 5 (richest)		0.258***	0.257***	0.226***
		(0.004)	(0.004)	(0.007)
Size		−0.007***	−0.004***	−0.004***
		(0.000)	(0.000)	(0.000)
Age		−0.006***	−0.005***	−0.005***
		(0.000)	(0.000)	(0.000)
School		0.146***	0.117***	0.112***
		(0.003)	(0.003)	(0.003)
Boy		0.002	0.005***	0.006***
		(0.002)	(0.002)	(0.002)
JSY		0.138***	0.129***	0.120***
		(0.003)	(0.003)	(0.004)
Constant	0.679***	0.561***	0.212***	0.174***
	(0.001)	(0.011)	(0.018)	(0.021)
Time effects	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Observations	169,567	169,527	169,527	169,527
R-squared	0.011	0.129	0.191	

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' calculations.

Table 5: Effect of VHCs on utilization of PNC

Variables	(1) OLS	(2) OLS	(3) OLS	(4) IV
VHC	0.154***	0.079***	0.008**	1.261***
	(0.003)	(0.003)	(0.003)	(0.123)
Head		−0.017***	−0.008***	0.067***
		(0.002)	(0.002)	(0.008)
Hindu		−0.021***	0.019***	0.020***
		(0.003)	(0.003)	(0.004)
ST/SC		−0.026***	−0.043***	−0.049***
		(0.002)	(0.002)	(0.003)
SES = 2		0.055***	0.044***	0.032***
		(0.003)	(0.003)	(0.004)
SES = 3		0.140***	0.105***	0.084***
		(0.003)	(0.003)	(0.005)
SES = 4		0.253***	0.197***	0.159***
		(0.004)	(0.004)	(0.007)
SES = 5 (richest)		0.426***	0.336***	0.284***
		(0.005)	(0.005)	(0.009)
Size		−0.009***	−0.005***	−0.005***
		(0.000)	(0.000)	(0.000)
Age		−0.003***	−0.001***	−0.002***
		(0.000)	(0.000)	(0.000)
School		0.101***	0.080***	0.072***
		(0.003)	(0.003)	(0.004)
Boy		0.012***	0.013***	0.014***
		(0.002)	(0.002)	(0.003)
JSY		0.285***	0.282***	0.262***
		(0.004)	(0.004)	(0.006)
Constant	0.370***	0.519***	0.466***	0.389***
	(0.001)	(0.011)	(0.019)	(0.026)
Time effects	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Observations	162,319	162,278	162,278	162,278
R−squared	0.013	0.159	0.221	

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' calculations.

Table 6: Effect of VHCs on BCG vaccine uptake

Variables	(1) OLS	(2) OLS	(3) OLS	(4) IV
VHC	0.042***	0.014***	−0.004*	0.448***
	(0.002)	(0.002)	(0.002)	(0.093)
Head		0.019***	−0.001	0.023***
		(0.002)	(0.002)	(0.005)
Hindu		0.043***	0.063***	0.064***
		(0.002)	(0.002)	(0.003)
ST/SC		0.032***	0.003**	0.002
		(0.002)	(0.002)	(0.002)
SES = 2		0.027***	0.030***	0.026***
		(0.003)	(0.003)	(0.003)
SES = 3		0.058***	0.055***	0.048***
		(0.003)	(0.003)	(0.003)
SES = 4		0.079***	0.076***	0.063***
		(0.003)	(0.003)	(0.004)
SES = 5 (richest)		0.103***	0.102***	0.084***
		(0.003)	(0.003)	(0.005)
Size		−0.004***	−0.002***	−0.002***
		(0.000)	(0.000)	(0.000)
Age		−0.002***	−0.002***	−0.002***
		(0.000)	(0.000)	(0.000)
School		0.085***	0.056***	0.054***
		(0.002)	(0.002)	(0.002)
Boy		0.011***	0.011***	0.012***
		(0.001)	(0.001)	(0.001)
JSY		0.066***	0.035***	0.030***
		(0.002)	(0.002)	(0.002)
Constant	0.884***	0.646***	0.847***	0.825***
	(0.001)	(0.008)	(0.013)	(0.015)
Time effects	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Observations	191,952	191,833	191,833	191,833
R-squared	0.002	0.069	0.133	

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' calculations.

Table 7: Effect of VHCs on polio vaccine uptake

Variables	(1) OLS	(2) OLS	(3) OLS	(4) IV
VHC	0.084***	0.043***	−0.010**	0.619***
	(0.004)	(0.005)	(0.005)	(0.162)
Head		−0.015***	−0.003	0.028***
		(0.003)	(0.003)	(0.009)
Hindu		0.064***	0.026***	0.028***
		(0.004)	(0.005)	(0.005)
ST/SC		0.016***	−0.002	−0.005
		(0.003)	(0.003)	(0.004)
SES = 2		0.038***	0.031***	0.025***
		(0.005)	(0.005)	(0.005)
SES = 3		0.096***	0.073***	0.064***
		(0.005)	(0.005)	(0.006)
SES = 4		0.142***	0.112***	0.097***
		(0.005)	(0.005)	(0.007)
SES = 5 (richest)		0.214***	0.170***	0.149***
		(0.007)	(0.007)	(0.009)
Size		−0.005***	−0.003***	−0.003***
		(0.000)	(0.000)	(0.001)
Age		−0.001***	−0.001**	−0.001**
		(0.000)	(0.000)	(0.000)
School		0.073***	0.048***	0.044***
		(0.004)	(0.004)	(0.004)
Boy		0.008***	0.009***	0.011***
		(0.003)	(0.003)	(0.003)
JSY		0.101***	0.086***	0.078***
		(0.005)	(0.005)	(0.006)
Constant	0.591***	0.710***	1.024***	1.001***
	(0.002)	(0.016)	(0.027)	(0.029)
Time effects	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Observations	108,054	108,008	108,008	108,008
R-squared	0.003	0.044	0.104	

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' calculations.

Table 8: Effect of VHCs on DTP vaccine uptake

Variables	(1) OLS	(2) OLS	(3) OLS	(4) IV
VHC	0.045***	0.023***	0.008***	0.745***
	(0.002)	(0.002)	(0.003)	(0.113)
Head		0.022***	−0.003*	0.035***
		(0.002)	(0.002)	(0.006)
Hindu		0.049***	0.078***	0.079***
		(0.002)	(0.003)	(0.003)
ST/SC		0.034***	0.006***	0.003
		(0.002)	(0.002)	(0.002)
SES = 2		0.036***	0.041***	0.034***
		(0.003)	(0.003)	(0.003)
SES = 3		0.069***	0.068***	0.057***
		(0.003)	(0.003)	(0.004)
SES = 4		0.102***	0.098***	0.079***
		(0.003)	(0.003)	(0.005)
SES = 5 (richest)		0.134***	0.133***	0.104***
		(0.003)	(0.004)	(0.006)
Size		−0.005***	−0.002***	−0.002***
		(0.000)	(0.000)	(0.000)
Age		−0.002***	−0.001***	−0.002***
		(0.000)	(0.000)	(0.000)
School		0.110***	0.076***	0.073***
		(0.002)	(0.002)	(0.003)
Boy		0.014***	0.015***	0.016***
		(0.002)	(0.002)	(0.002)
JSY		0.060***	0.036***	0.027***
		(0.002)	(0.002)	(0.003)
Constant	0.828***	0.478***	0.638***	0.603***
	(0.001)	(0.009)	(0.015)	(0.019)
Time effects	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Observations	186,682	186,567	186,567	186,567
R-squared	0.002	0.095	0.152	

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' calculations.

Table 9: Effect of performance of VHC on maternal health care use

Variables	(1) Public facility delivery	(2) Caesarean sections	(3) ANC	(4) PNC
Health plan	0.553***	0.117***	0.587***	1.104***
	(0.065)	(0.035)	(0.080)	(0.097)
Head	0.035***	0.006**	0.028***	0.054***
	(0.005)	(0.002)	(0.006)	(0.006)
Hindu	0.042***	0.009***	0.038***	0.017***
	(0.003)	(0.002)	(0.003)	(0.004)
ST/SC	−0.011***	−0.015***	−0.029***	−0.044***
	(0.002)	(0.001)	(0.003)	(0.003)
SES = 2	0.029***	0.005***	0.059***	0.033***
	(0.003)	(0.001)	(0.004)	(0.004)
SES = 3	0.053***	0.014***	0.110***	0.082***
	(0.003)	(0.002)	(0.004)	(0.005)
SES = 4	0.077***	0.047***	0.165***	0.155***
	(0.005)	(0.003)	(0.005)	(0.006)
SES = 5 (richest)	0.065***	0.113***	0.225***	0.281***
	(0.006)	(0.004)	(0.006)	(0.008)
Size	−0.002***	−0.002***	−0.003***	−0.003***
	(0.000)	(0.000)	(0.000)	(0.000)
Age	−0.002***	0.000***	−0.005***	−0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
School	0.043***	0.022***	0.112***	0.070***
	(0.002)	(0.001)	(0.003)	(0.003)
Boy	0.003	0.005***	0.006**	0.014***
	(0.002)	(0.001)	(0.002)	(0.003)
JSY	0.490***	0.007***	0.123***	0.269***
	(0.004)	(0.002)	(0.003)	(0.005)
Constant	0.258***	0.073***	0.070**	0.203***
	(0.023)	(0.013)	(0.027)	(0.033)
Time effects	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
Observations	169,535	169,521	169,527	162,278
R−squared	0.099	0.059	0.043	

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' calculations.

Table 10: Effect of performance of VHC on child immunization uptake

Variables	(1) BCG	(2) Polio	(3) DTP
Health plan	0.288***	0.393***	0.482***
	(0.058)	(0.100)	(0.070)
Head	0.018***	0.022***	0.027***
	(0.004)	(0.007)	(0.005)
Hindu	0.064***	0.030***	0.078***
	(0.003)	(0.005)	(0.003)
ST/SC	0.003*	−0.002	0.005**
	(0.002)	(0.004)	(0.002)
SES = 2	0.027***	0.025***	0.035***
	(0.003)	(0.005)	(0.003)
SES = 3	0.048***	0.065***	0.057***
	(0.003)	(0.005)	(0.004)
SES = 4	0.063***	0.095***	0.078***
	(0.004)	(0.007)	(0.005)
SES = 5 (richest)	0.085***	0.144***	0.105***
	(0.005)	(0.010)	(0.006)
Size	−0.001***	−0.002***	−0.002***
	(0.000)	(0.001)	(0.000)
Age	−0.002***	−0.001**	−0.002***
	(0.000)	(0.000)	(0.000)
School	0.053***	0.045***	0.072***
	(0.002)	(0.004)	(0.002)
Boy	0.012***	0.010***	0.016***
	(0.001)	(0.003)	(0.002)
JSY	0.032***	0.084***	0.032***
	(0.002)	(0.005)	(0.003)
Constant	0.772***	0.930***	0.514***
	(0.020)	(0.037)	(0.024)
Time effects	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Observations	191,833	108,008	186,567
R-squared	0.054	0.041	

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' calculations.

Table 11: Effect of VHC on utilization of private health facility for deliveries

Variables	(1) OLS	(2) OLS	(3) OLS	(4) IV
VHC	−0.086***	−0.028***	−0.005*	−0.668***
	(0.003)	(0.003)	(0.003)	(0.085)
Head		−0.024***	−0.000	−0.043***
		(0.002)	(0.002)	(0.006)
Hindu		−0.016***	−0.043***	−0.045***
		(0.002)	(0.002)	(0.003)
ST/SC		−0.009***	0.011***	0.013***
		(0.002)	(0.002)	(0.002)
SES = 2		−0.038***	−0.036***	−0.028***
		(0.002)	(0.002)	(0.003)
SES = 3		−0.082***	−0.066***	−0.052***
		(0.003)	(0.003)	(0.004)
SES = 4		−0.123***	−0.101***	−0.079***
		(0.003)	(0.003)	(0.005)
SES = 5 (richest)		−0.113***	−0.096***	−0.066***
		(0.004)	(0.004)	(0.006)
Size		0.005***	0.003***	0.003***
		(0.000)	(0.000)	(0.000)
Age		0.001***	0.001***	0.002***
		(0.000)	(0.000)	(0.000)
School		−0.073***	−0.048***	−0.043***
		(0.002)	(0.002)	(0.003)
Boy		−0.002	−0.002	−0.003
		(0.002)	(0.002)	(0.002)
JSY		−0.534***	−0.495***	−0.487***
		(0.004)	(0.004)	(0.004)
Constant	0.783***	1.002***	0.590***	0.626***
	(0.001)	(0.009)	(0.016)	(0.019)
Time effects	No	Yes	Yes	Yes
State FE	No	No	Yes	Yes
Observations	169,572	169,535	169,535	169,535
R-squared	0.006	0.203	0.252	

Robust standard errors in parentheses.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: authors' calculations.

Appendix

Table A1: Villages that had a VHC in 2008

State	Villages with a VHC	Percentage	Total number of villages
Jammu and Kashmir	40	6.78	590
Himachal Pradesh	81	14.75	549
Punjab	179	22.57	793
Chandigarh	2	50.00	4
Uttarakhand	64	11.35	564
Haryana	145	17.68	820
Delhi	7	21.88	32
Rajasthan	126	9.43	1,336
Uttar Pradesh	714	20.68	3,452
Bihar	29	1.71	1,694
Sikkim	64	28.44	225
Arunachal Pradesh	12	2.48	483
Manipur	88	21.62	407
Mizoram	205	52.16	393
Tripura	80	37.04	216
Meghalaya	79	22.57	350
Assam	123	10.52	1,169
West Bengal	125	16.03	780
Jharkhand	72	7.36	978
Orissa	41	3.56	1,153
Chhattisgarh	139	18.83	738
Madhya Pradesh	613	28.33	2,164
Gujarat	324	29.86	1,085
Daman and Diu	16	36.36	44
Dadra and Nagar Haveli	8	18.18	44
Maharashtra	825	46.56	1,772
Andhra Pradesh	527	50.10	1,052
Karnataka	466	37.92	1,229
Goa	3	6.82	44
Lakshadweep	9	29.03	31
Kerala	466	71.47	652
Tamil Nadu	615	53.62	1,147
Pondicherry	16	28.57	56
Andaman and Nicobar	22	28.57	77
Total (average for percentage)	6,325	24.21	26,123

Note: the average percentage is computed from the survey data rather than the numbers shown in the table.

Source: authors.