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Case- Using Evaluations to Diagnose the Problem and Design Policy Solutions: Health and Healthcare in Rajasthan

This case study describes how data gathering and data analysis, combined with the use of randomized trials, can be used to identify critical problems and evaluate which solutions are effective. It highlights a joint enterprise on healthcare in rural Rajasthan among Seva Mandir, an NGO active in the area, Vidhya Bhavan, a consortium of schools and colleges in Udaipur, and a group of researchers.

This case study, with the kind permission of the authors, is based on "Health and health care in Rajasthan: Identifying Problems, Designing Solutions," by Abhijit Banerjee and Esther Duflo (Abdul Latif Jameel Poverty Action Lab working paper, 2004).

1. Introduction

The 2004 World Bank Development Report opens with the statement “social services fail the poor.” There are few contexts where this failure is more apparent than in the Indian healthcare system. Especially in rural areas, public healthcare often seems to be on the verge of collapse and the poor, like everyone else, have opted for private healthcare which is largely unregulated and of dubious quality. The recent launching of the National Rural Health Mission (NRHM) reflects the widely held view that the Indian government needs to do more about healthcare.

Under the NRHM, public spending on healthcare will go up from 0.9 percent of GDP to two percent or more. How are we to make sure that this extra money is well spent? How do we identify the most important healthcare problems, and design effective policies to solve these problems?

This case study describes how data gathering and data analysis, combined with the use of randomized trials, can be used to identify critical problems and evaluate which solutions are effective. It highlights a joint enterprise in rural Rajasthan among Seva Mandir, an NGO active in the area, Vidhya Bhavan, a consortium of schools and colleges in Udaipur, and a group of researchers.

2. The Udaipur Rural Health Survey

Seva Mandir is a very well established NGO that has operated for over 50 years in Udaipur district, Rajasthan, and works in several areas: education, environment, microfinance, and health. Its health unit had traditionally organized health camps in villages, trained traditional birth attendants and paid them to perform deliveries. It also trained village health workers to provide health advice and some basic healthcare to the villagers. However, by 2001, the organization was increasingly frustrated with the impact its work in health was having. Many felt that while working hard, the unit was merely scratching the surface of the problem and that it was necessary to completely re-think priorities, interact more closely with the government, and find a way of piloting successful, replicable models that could inspire other NGOs or the government.

Seva Mandir approached MIT Professor Abhijit Banerjee, who felt that too little was known about the situation for him to make any reasonable recommendation. It was decided to start by collecting a rich data set on healthcare and healthcare behavior in the Seva Mandir work area, as a way to identify the problems and think about possible solutions. The proposed solutions would then be implemented in a limited number of Seva Mandir's villages as a pilot and their impact would be evaluated. The successful solutions would then be scaled up. Vidhya Bhavan, a consortium of schools, teaching colleges, and agricultural colleges in Udaipur agreed to host and supervise the survey team. Professors Abhijit Banerjee, Angus Deaton, and Esther Duflo led the research effort.

The data collection occurred between January 2002 and August 2003 in 100 hamlets in Udaipur district, Rajasthan. Udaipur is one of India's poorest districts, with a large tribal population and an unusually high level of female illiteracy. The sample frame consisted of all the hamlets in the 362 villages where Seva Mandir operates in at least one hamlet.[1] Seva Mandir's relation with the villages and the health authorities ensured participation in the survey, and allowed collection of very detailed information at the village and household level.

The data collection had four components: (1) A village survey done in 100 villages, which yielded a village census, a description of the village's physical infrastructure, and a list of health facilities commonly used by villagers; (2) A survey of over 1,000 households which provided detailed health and economic information about the households, including health and fertility histories, reports of experiences with the health system (public and private), as well as a small array of direct measures of health (hemoglobin, body temperature, blood pressure, weight and height, and a peak flow meter measurement of lung capacity); (3) A facility survey, aimed at obtaining detailed information on the nature of health facilities in the area (including types of treatment

[1] A hamlet is a set of houses that are close together and share a community center, and constitutes a separate entity. A village is an administrative boundary. One to 15 hamlets constitute a village (the mean number of hamlets in a village is 5.6). Seva Mandir in general operates in the poorest hamlets within a given village. In this project, the researchers exploited the extensive network of Seva Mandir's employees in the district to hire 130 reliable employees. The sample was stratified according to access to a road (out of the 100 hamlets, 50 hamlets are at least 500 meters away from a road). Hamlets within each stratum were selected randomly, with a probability of being selected proportional to the hamlet population.

and how much they cost, as well as quality of the infrastructure), that reached all the 143 public facilities serving the sample villages along with the "modern" private facilities mentioned in the village surveys or in the household interviews (a total of 451), and a sample of 98 bhopas (traditional healers); (4) A continuous facility survey which involved a random, timed weekly visit to all public facilities serving the villages (143 facilities in total, with 49 visits per facility on average) during hours of operation to check whether the facility was open, and count the number of doctors, nurses, other medical and non-medical personnel, and clients present in the facility (if the facility was closed because the staff was supposedly performing a scheduled village visit, the para-worker went to the village that the staff was supposed to be visiting, and checked whether the staff was there).[2]

3. Findings: Health Status

Surveyed households in Udaipur are poor, even by the standards of rural Rajasthan. Their average per capita household expenditure (PCE) is 470 rupees, and more than 40 percent of the households fall below the official poverty line, compared with only 13 percent in rural Rajasthan in the latest official counts for 1999-2000. Only 46 percent of adult (14 and older) males and 11 percent of adult females report themselves literate. Only 21 percent of households have electricity. In terms of measures of health using a standard cutoff for anemia (11 g/dl for women, and 13 g/dl for men), men are almost as likely (51 percent) to be anemic as women (56 percent) and older women are not less anemic than younger ones, suggesting that diet is a key factor. Moreover, five percent of adult women and one percent of adult men have hemoglobin levels below eight grams

[2] To ensure the quality of the data collected in the Continuous Facility Survey, a strictly enforced monitoring system was implemented: every four weeks, all the CFS para-workers of a block met, and their data entry forms were collected. They were also given a schedule indicating on which days they had to complete their visits. Two members of the team of investigators used motorcycle transport to visit several facilities every day, following the schedules given to the CFS para-workers. The para-workers were paid only if their visits had been completed on the planned day, and only if there were no unexplained discrepancies between their reports and those of the CFS monitors. The CFS monitors also visited the facilities on different days, so that they could check that there was no collusion between the para-workers and the facility staff. This survey took place for 13 to 14 months, including a "pilot period" of one to two months in each facility, during which the system was fine-tuned. We report data for 12 months for each facility. The survey is complemented by a detailed one-time facility survey, which, among other things, allows us to identify correlates of absenteeism in the centers.

per deciliters, which is the standard cut-off for being critically anemic.

The average Body Mass Index (BMI) is 17.8 among adult men, and 18.1 among adult women. Within the population surveyed, 93 percent of adult men and 88 percent of adult women have a BMI less than 21, considered to be the cutoff for low nutrition in the US (Fogel, 1997). We also used peak-flow meter measurement to measure lung capacity in an attempt to detect asthma or other respiratory disorders such as chronic bronchitis. Among adults, the average peak flow meter measurement is 316 ml per expiration (anything below 350 for an adult 1.60 meters tall is considered to be an indicator of respiratory difficulties).

Symptoms of disease are widespread, and adults report a wide range of symptoms: a third reported experiencing cold symptoms in the past 30 days, and 12 percent said the condition was serious. In adults, 33 percent reported fever (14 percent reported serious fever), 42 percent reported “body ache” (20 percent reported serious “body ache”), 23 percent reported fatigue (seven percent serious), 14 percent reported problems with vision (three percent serious), 42 percent reported headaches (15 percent serious), 33 percent reported back aches (10 percent serious), 23 percent reported upper abdominal pain (nine percent serious), 11 percent reported chest pains (four percent serious), and 11 percent had experienced weight loss (two percent serious). Few people reported difficulties in activities that involved taking care of themselves, such as bathing, dressing, or eating, but many reported difficulty with the physical activities that are required to earn a living in agriculture. Indeed, 30 percent or more reported having difficulty walking five kilometers, drawing water from a well, or working unaided in the fields. 18-20 percent had difficulty squatting or standing up from a sitting position.

Table 1 shows the number of symptoms reported in the 30 days before the survey, BMI, fraction of individuals with hemoglobin counts below 12, peak flow meter reading, high blood pressure, and low blood pressure, broken down by thirds of distribution of the monthly per capita expenditure. Individuals in the lower third of the per capita expenditure distribution have, on average, a lower BMI, lower lung capacity, and are more likely to have a hemoglobin count below 12 than those in the upper third. Individuals in the upper third report the most symptoms over the last 30 days, perhaps because they are more aware of their own health status – there is a long tradition in the

Indian and developing country literature of better-off people reporting more sickness (see, for example, Murray and Chen (1992) and Sen (2002)).

Interestingly, when asked to report their own health status and shown a ladder with 10 rungs, 62 percent of individuals placed themselves on rungs five through eight (more is better), and less than seven percent placed themselves on one of the bottom two rungs. However, most people report themselves close to the middle and the life-satisfaction measures don't show any great dissatisfaction with life: on a five point scale, 46 percent take the middle value, and only nine percent say their life makes them generally unhappy. Such results are similar to those for rich countries; for example, in the United States more than a half of respondents report themselves as a three (quite happy) on a four-point scale, and 8.5 percent report themselves as unhappy or very unhappy. So, those surveyed are presumably adapted to the sickness that they experience in that they do not see themselves as particularly unhealthy or, in consequence, unhappy. Nonetheless, they are not completely free of complaints: when asked about their financial status, which was also self-reported on a 10-rung ladder, the modal response was the bottom rung, and more than 70 percent of people live in households that were self-reported as being on the bottom three rungs.

Discussion Topic 1: Does health lead to wealth or is it the other way around?

The high rates of anemia that we see suggest a close relationship between health and wealth. Anemia can be caused by nutritional deficits (and is particularly likely in this context, since its not only women in the child-bearing ages who have high rates of anemia). In turn, anemia weakens the body and makes people less productive, which limits their capacity to earn a living. This possibility of a "nutrition-productivity trap" has been discussed extensively in the economics literature. Our data reveals a strong relationship between self reported health and income, as shown in Table 1.

1. Can we necessarily conclude from this data that poor health causes low incomes?

2. What are possible alternative explanations?

3. Which are more plausible?

One of the interventions that was tried in Udaipur was to work with local Chakkiwalis (flour-making units) in 60 villages with the goal of training them to fortify villagers' flour with an iron premix distributed by Seva Mandir. Iron helps reduce anemia. These 60 villages were randomly selected among the villages in the study.

4. How can we use this set up to answer the question of whether high anemia causes low income?

4. Findings: Healthcare Facilities

Types of facilities

There are three broad categories of facilities: public, private and traditional. The official policy on public facilities requires that there be one sub-center (or sometimes an aid-post) staffed by one trained nurse (ANM) for every 3,000 individuals. These sub-centers provide the first point of care, the Public Health Centers (PHCs) or Community Health Centers (CHCs) provide the next step, and the referral hospitals deal with the most serious health problems. In the data from Udaipur, we found that each sub-center serves on average 3,600 individuals and is usually staffed by one nurse. Almost no sub-centers report vacancies. A primary health center serves 48,000 individuals and has on average 5.8 medical personnel appointed, including 1.5 doctors. Very few of the PHCs report vacancies.

The list of private facilities includes every place that our respondents describe as a private facility that they have visited. These include a wide range of options, from facilities run by people who have completed their medical training and have additional post-graduate medical degrees, to traditional birth attendants (TBAs/"Daimas") and pharmacists, who in most cases have no formal medical training whatsoever.

Within traditional healers there are two main categories: Out of the 98 we have in our sample, 63 are jhad-fook practitioners who focus mainly on exorcisms and prayers, 5 just do desi ilaaj (they give traditional, usually herbal, medicines) and the rest do both.

Providers in the public facilities are required to have certain qualifications and these requirements are usually respected. The ANM in a sub-center is someone who has at least a high-school degree and has then undergone training (in Rajasthan the training lasts a year and a half). He/she is trained to handle a limited set of heath conditions and to identify a wider set, which get referred to the PHC/CHC or to the referral hospital. The doctors in the PHCs/CHCs are fully qualified to practice as general practitioners and might have some specialized degrees (87 percent of the CHCs and 13 percent of the PHCs have one or more specialist).

By contrast, many private doctors are not formally qualified to practice medicine. Table

2a reports that 27 percent of the private doctors who are described as the main provider in their facility claim to have some kind of specialist degree over and above the standard medical college degrees. Another 28 percent self-report a medical college degree, though this includes a sizeable fraction who have degrees in Ayurvedic (traditional Hindu) medicine (BAMS) or Unani (traditional Islamic) medicine (only 10.7 percent have an MBBS, i.e., are qualified in conventional modern medicine). The rest do not claim medical college degrees. They may, however, be trained as compounders (the Indian equivalent of what are known as pharmacists in the United States) or have attended some course that gives them some medical training. In the local parlance these doctors are referred to as Bengali doctors. Among the staff that are not the "main providers" at the facility (most of them also see patients), 67.2 percent have no formal qualifications, and less than three percent are qualified as MBBS.

About 36 percent of the private doctors do not have a college degree in any subject (Table 2b). Among them the average years of schooling is 11 years, which is a year less than what it takes to graduate from schooling. The education level among the nurses and compounders/pharmacists is very similar.

Table 2a shows that traditional healers do not claim to have any formal medical training. They are also less educated than the private doctors, with an average schooling level of between four and five years.

How far are the facilities from the population?

The mean distance to the closest public facility is 2.09 km, and the mean distance to the closest PHC/CHC is 6.7 km. The mean distance to the closest private provider that anyone in our sample has reported using is 3.78 km. The mean distance to the closest self-described qualified private doctor (once again that anyone has reported using) is 8.01 km. Traditional healers are much closer. The closest traditional healer in our sample is 1.53 km away, and this probably understates how close they are since we only have a sample of the traditional healers.

How much does treatment cost?

The services of the government doctors are supposed to be free, though everyone who is above the poverty line is required to pay for medicines, tests, etc. Nevertheless, visits to sub-centers are cheap: Table 3 reports that the average visit to a sub-center/ aid-post only costs Rs. 33, whereas visiting a Bengali doctor costs Rs. 105, on average. The average cost of visiting a PHC/CHC is Rs. 138 (only Rs. 100 if we leave out operations and tests), while visiting a qualified private doctor costs Rs. 179 (not including operations and tests).[3] Surprisingly, visiting a traditional healer is also quite expensive--the average visit costs Rs. 131 (typically because you have to bring a chicken or a goat).

Equipment and infrastructure

Every public health facility has syringes and needles, but beyond that equipment availability is patchy. About 20 percent of the aid-posts and one-third of the sub-centers lack a stethoscope, a blood pressure instrument, a thermometer, or a weighing scale, and only one quarter of the sub-centers have a sterilizer. Since every facility is supposed to have at least one of each of these pieces of equipment, there is some concern that the practitioners might have "privatized" the equipment that was provided to them.

The quality of the infrastructure is also unimpressive: none of the sub-centers has a water supply, only seven percent have a toilet for patients and only eight percent have electricity. It is therefore not surprising that only three percent of rooms have fans, despite the 50 plus degrees Centigrade summer weather. Finally, 45 percent of the rooms leak when it rains.

Unfortunately, there is no comparable data on private facilities. Casual observation suggests that the infrastructure is not much better there than in other facilities, but almost all of them seem to have a stethoscope and a thermometer (this is part of what makes private facility doctors credible).

[3] In a previous paper we had said that visits to public and private facilities cost more or less the same. The difference comes from a relatively small number of operations/tests in public facilities which are very expensive. Our interpretation is that these procedures are inherently expensive and the government facility may well be the least expensive and perhaps the only place to get them done.

Are the government facilities actually running?

Public sub-centers and Primary Health Centers are supposed to be open six days a week, six hours a day. In the Udaipur survey, public health facilities were surveyed weekly, and we have on average 49 observations per facility. Table 7 summarizes the main result – things are not working the way they are supposed to be. On average, 45 percent of the medical personnel are absent in sub-centers and aid-posts, and 36 percent are absent in the (larger) Primary Health Centers and Community Health Centers. High absence rates are not due to staff outreach activities since, whenever the nurse was absent from a sub-center, we made sure to look for him/her in the community. Since sub-centers are often staffed by a single nurse, this high absenteeism means that these facilities are often closed: we found the sub-centers closed 56 percent of the time during regular operating hours. Only in 12 percent of the cases was the nurse to be found in the area of his/her sub-center.

Table 8 reports results on the kinds of facilities we are most likely to find closed. The six percent of sub-centers that are far from the road have, on average, only 38 percent of their personnel present, compared to the 55 percent general average. Facilities that are closer to Udaipur or to another town do not have lower absenteeism. The available amenities (water and electricity) do not seem to have a large impact on absenteeism, although the presence of living quarters does have a large impact on the fraction of personnel present, particularly in sub-centers. Reservations of the position of chairperson (Sarpanch) of the panchayat to a woman have no impact on sub-centers, but seem to be associated with increased personnel presence in PHCs.

The weekly survey makes it possible to assess whether there is any predictability in the fraction of staff present at a center or sub-center. In other words, we can ask whether there is a specific time of the day or day of the week when a sub-center, for example, is very likely to be open. The answer turns out to be no. Public facilities are thus open infrequently and unpredictably, leaving people to guess whether it is worth their while to walk for over half an hour to cover the 2.09 km that separate the average village in our sample from the closest public health facility.

5. Patterns of Healthcare Use

How frequent are healthcare visits?

Table 4 shows that adults visit a health facility, on average, 0.51 times a month. The poor, defined here as people who are in households in the bottom third of the distribution of PCE (average expenditure of Rs. 219 per month), visit a facility 0.43 times a month, while an adult in the middle third of the distribution (average PCE of Rs. 361) visits a facility 0.54 times a month and an adult in the highest group (average PCE of Rs. 770) visits a facility 0.55 times a month.

Determinants of healthcare visits

Each adult interviewee was also asked what symptoms of ill health he/she had in the past month and what he/she did to deal with these symptoms. Table 5 reports the results. When someone reports a symptom, he/she visits some facility 31 percent of the time on average. The frequency, however, varies substantially by disease: a person will see a provider more than 50 percent of the time for a high fever and more than 45 percent of the time for diarrhea, but less than 20 percent of the time for chest pains, trouble breathing, genital ulcers, blood in saliva, worm in stool, weight loss, night sweats, or hearing or eye-sight problems. The pattern seems to be that people are more likely to see someone for *relatively short-duration morbidities than for more chronic problems* (other conditions which make them go to the doctor include vomiting for which a doctor is visited 40 percent of the time, and cold symptoms, headaches and productive coughs for which a doctor is visited about a third of the time). This is especially striking given that most of the short-duration morbidities tend to get cured on their own, or in the case of acute diarrhea, with the help of some simple home remedies, while many of the chronic conditions are either potentially debilitating (hearing problems, eye-sight problems, etc.) or possible symptoms of some grave condition (chest pains, breathing problems, blood in saliva, etc.).

The use of preventive care

In contrast to frequent visits to health facilities in response to symptoms, a very small number of health visits occur to obtain preventive care. For instance, full immunization rates for children aged one to five turn out to be only 2.5 percent.

Choice of healthcare providers

Where do these people get the healthcare they are buying? In the Udaipur survey, of the 0.51 visits to a health facility that the average person in our survey reports in a month, only 0.12 visits (i.e. less than quarter) are to a public facility. The fraction of visits to a public facility is highest for the richest group (the poor and middle income groups visit public facilities less frequently than the wealthy and with about the same frequency as one another). Overall, no one uses public facilities very much, and if anything, the poor use them the least. The majority of the rest of the visits (0.28 visits per adult per month) are to private facilities. The rest are to bhopas (0.11 visits per adult per month), who are the traditional healers. For the poor, the fraction of visits to a bhopa is well over a quarter of all visits, while for the richest group it is about an eighth of all visits.

Patients associate specific diseases with specific providers. Table 5 lists the conditions in the order of how likely it is that the person will see a doctor for them. When we compare public versus private facilities there is no discernable pattern, except that those who have blood in cough tend to go to public facilities relatively more often. On the other hand, it is clear that a person is somewhat less likely to see a bhopa for the conditions at the top of the table, which are the conditions which the patient presumably takes most seriously (since he/she goes to the doctor more frequently for these conditions than for others).

Discussion Topic 2: Patterns of healthcare usage— Are providers or patients driving it?
Another pattern we observed in the survey is that the poor are less likely to visit the sub-centers that were often closed according to the absenteeism survey. Instead of attending these sub-centers, they go to the bhopas more often.
1. Why would provider absence discourage patients?
However, government nurses tend to blame the patients. Patients, they suggest, prefer to go to Bengali doctors because the Bengali doctors give them lots of injections and tablets, and prefer to go to see bhopas because patients are superstitious. Nurses claim that patients do not understand the dangers of being over-medicated or the futility of trying to exorcise diseases. In the end, government nurses say they do not come to work because there is no demand for their services.

2. Do we know anything about whether patients can make reliable judgments about the kind of healthcare to get?

The Udaipur Health project team, the collector, and the Chief Medical Health Officer (CMHO) were keen to answer this question. They decided to try to implement an intervention that would improve absenteeism in some selected centers. First, they had to decide on an intervention.

3. Brainstorming session: What are possible interventions to reduce absenteeism?

The intervention they finally decided on was to provide incentives to the nurses to be present at their centers on a specific day of the week. All regular nurses were given an order to be present at their centers (and to not visit the field) on Mondays. All additional nurses were given an order to be present at their centers (and to not visit the field) at least 3 days a week.[4] This order was implemented in all of Udaipur district. However, in addition, in half (randomly selected) of the sub-centers serving our study villages, Seva Mandir was given a mandate to monitor the nurses on the specified days. The nurses were given a time and date stamp and a register.[5] Seva Mandir collected the register, and provided the information to the CMHO. The CMHO announced punishments for nurses with high absences on these days (pay deduction and threat of termination).

4. What data do we need to collect to assess whether the monitoring system made a difference in term of absence rates? And in terms of facility usage?

[4] "Regular" nurses are "permanent" while "additional" nurses are hired on a yearly contract basis.

[5] A time and date stamping machine allows for monitoring of ANM presence at sub-centers by requiring ANMs to stamp a register three times daily.

5. In the first 6 months, the program led to a sharp reduction in absence rates. For example, columns 3 and 4 in Table 9 show that, between May and October, the absence rate on Mondays for the regular ANMs in the treatment group was 40.6 percent while the absence rate for regular ANMs in the control group was 69.2 percent. However, there was no change in the usage of the facility, even on Mondays. How do we explain this? Is this necessarily a sign that consumers are the main problem?
6. After 6 months, the program stopped having any effect on absence rates: Absence was as high in the centers where the program was implemented as in the other centers when it was measured by the researcher. Yet, Figure 1 shows that the recorded absence did not go up. What happened? Does Figure 1 give us a clue?

How much do they spend?

Columns 1 and 2 of Table 6 show the monthly expenditure on health in the Udaipur survey, calculated in two ways: from the expenditure survey, and from the expenditures reported in the adult and children surveys. Column 3 shows the expenditure as a fraction of household total expenditures, and from the expenditures reported in the adult and children survey as a fraction of personal expenditures. The average household spends seven percent of its budget on health. While the poor spend less than the rest of the population in absolute amount, they spend the same amount as a share of their budget. Column 4 shows the average health expenditure for adults. It is about 60 rupees, or 13 percent of the monthly PCE of the average family. This fraction is highest for the poorest group (15 percent) and lowest for the richest group (11 percent).

Poor adults in the Udaipur survey spend 13 percent of their total health expenditures at public facilities, 23 percent on bhopas, and the rest at private facilities. The rich spend 23 percent of their total health expenditures at public facilities, and less than 10 percent on bhopas, while the middle group spends more than 17 percent of their health expenditures on bhopas and 13 percent at public facilities.[6] The rich therefore spend a significantly larger fraction of their health rupees at public facilities than do the poor, and a significantly smaller fraction on bhopas.

Treatments

Patients are given a shot in 68 percent of the visits to a private facility and a drip in 12 percent of the visits. A test is performed in only three percent of the visits. In public facilities, they are somewhat less likely to get an injection or a drip (32 percent and six percent, respectively) but no more likely to be tested. Among private doctors in this sample, it does not appear that more qualified doctors are less likely to administer shots: if anything, we seem to find the opposite. Given the evidence on the nature of the ailments that people see doctors for (mostly short-term, self-limiting diseases) it does seem likely that shots and drips are being overused, at least by the private doctors, and perhaps even by the public providers.

It is not clear that the public facilities are delivering what the patients want. Out of 898

[6] The percentages do not necessarily add up to 100, because some people did not know whether certain facilities were public or private.

people who could not remember ever going to a public facility, the most common reason for not attending (chosen by over 250 people) was "no proper treatment at government facilities." Another 60 people said that "better treatment (was) available elsewhere." The other most common answers were "I did not need to go" (roughly 175 people), followed by "too far" (roughly 100 people), "too expensive," "do not know where it is" (roughly 50 people each), and "do not know about government hospitals" (roughly 35 people). There is clearly a large group that feels that they are not getting the care they want. Among these people there are some who do say that they don't go to public facilities because they do not get a shot when they go, but most just say that they do not like the treatment at public facilities.

Discussion Topic 3: Preventive care—Distinguishing provider side and consumer side problems

In contrast to individuals' frequent visits to health providers when they are ill, there seems to be very little demand for preventive care. At the baseline, the full immunization rate (the share of children having received all the immunization recommended by the government of India after age one) was only 2.5 percent among children aged one to two.

1. The root of this low immunization rate could be caused by either the consumers or the providers. Develop possible arguments that suggest how each side could be responsible.

Improving the provider side: Instead of trying to improve the reliability of the government nurses, Seva Mandir and the health administration decided to form a direct partnership. Seva Mandir gets vaccines from the government for free, and organizes monthly, well publicized camps in a set of villages. Seva Mandir uses its network of para-workers to advertise the camps and remind people they can go to get their children vaccinated.

2. Is this arrangement necessarily a "temporary" fix until we can improve the government sector, or would it be possible to scale this program up in the context of a permanent public-private partnership? If we wanted to scale such a program up, what would we need to be careful of?

Encouraging the consumers: To encourage parents to get their children immunized, Seva Mandir designed a program in which a small quantity of lentils was going to be provided to each parent at the time of immunization. This program could be effectively combined with the camp.

Many say that one should not encourage parents to immunize their children with goods such as lentils. Instead, one should try and convince them that immunizing their children is the right thing to do. Yet, while immunization rates have improved significantly in Africa thanks to massive campaigns in which parents received free mosquito nets, they are stagnating in India. This is problematic both since immunization is mandatory in most OECD countries, and since immunization prevents many communicable diseases.

3. Discuss why this provides a rationale for making immunization mandatory or subsidizing it. What are the respective merits of subsidizing immunization versus making it mandatory?

4. Propose an experimental design using these two programs to assess the relative importance of the provider and consumer sides in determining the decision to get immunized.

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Table 1: Selected health indicators, by position in the per capita monthly expenditure distribution

group	reported health status	No. of symptoms self reported in last 30 days	BMI	hemoglobin below 12 g/dl	peak flow meter reading	high blood pressure	low blood pressure
bottom third	5.87	3.89	17.85	0.57	314.76	0.17	0.06
middle third	5.98	3.73	17.83	0.59	317.67	0.15	0.08
top third	6.03	3.96	18.31	0.51	316.39	0.20	0.09

Note:
Means based on data collected by the author from 1024 households. See text for survey and variable description

Appendices

Table 2a: Medical Training

Facility Type	No Formal Qual	RMP	BAMS	BIMS	BUMS	MBBS	BHMS/ DHMS	MBBS + Spec	ANM	Pharm	Seva Mandir	Other NGO Training	Govt Training	Other Training	Total
private doctor	13.9%	21.3%	6.6%	0.8%	0.0%	10.7%	10.7%	27.0%	0.0%	0.0%	0.0%	0.0%	0.0%	14.8%	105.7%
nurse/MPW	0.0%	0.0%	11.1%	0.0%	0.0%	0.0%	0.0%	0.0%	55.6%	0.0%	0.0%	0.0%	0.0%	33.3%	100.0%
compounder	15.6%	6.3%	12.5%	0.0%	3.1%	0.0%	0.0%	1.6%	6.3%	3.1%	0.0%	0.0%	6.3%	45.3%	100.0%
pharmacist	75.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.3%	18.8%	0.0%	0.0%	0.0%	100.0%
TBA/Dai	76.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	22.5%	0.0%	0.0%	0.0%	99.1%
VHW	4.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	86.4%	9.1%	4.5%	0.0%	104.5%
Commmunity Health Worker	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	50.0%	100.0%
Home Remedy Worker	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Trad healer/ desi ilaj practitioner	60.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	20.0%	20.0%	0.0%	0.0%	100.0%
jhaad fonk practitioner	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
desi ilaj and jhadd fonk	96.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.3%	0.0%	0.0%	100.0%
private hospital	0.0%	2.4%	0.0%	2.4%	0.0%	9.5%	0.0%	63.1%	2.4%	0.0%	0.0%	0.0%	0.0%	27.4%	107.1%
ayurvedic	50.0%	0.0%	50.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
non medical profession	75.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	0.0%	0.0%	100.0%
other	28.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	28.6%	0.0%	0.0%	42.9%	100.0%

Main Provider Education Table 2b

Main Providers						
factype	Percentage Educated People	Percentage Educated in NFE	Percentage Who Went To School	Percentage Graduate People	Percentage Who Went To School But Not Graduates	Mean Class Reached By People Who Went To School and Do Not Have Grad Diploma
private doctor	100.0%	0.0%	100.0%	63.1%	36.9%	11.1
nurse/MPW	100.0%	0.0%	100.0%	22.2%	77.8%	11.4
compounder	100.0%	3.1%	96.9%	34.4%	62.5%	11.5
pharmacist	100.0%	0.0%	100.0%	6.3%	93.8%	9.3
TBA/Dai	7.2%	5.4%	1.8%	0.0%	1.8%	2.5
VHW	95.5%	4.5%	90.9%	0.0%	90.9%	6.4
Commmunity Health Worker	100.0%	0.0%	100.0%	0.0%	100.0%	10.0
Home Remedy Worker	100.0%	0.0%	100.0%	50.0%	50.0%	11.0
Trad healer/desi ilaj practitioner	60.0%	20.0%	40.0%	0.0%	40.0%	4.5
jhaad fonk practitioner	23.8%	6.3%	17.5%	0.0%	17.5%	5.0
desi ilaj and jhadd fonk	40.0%	10.0%	30.0%	0.0%	30.0%	3.7
private hospital	97.6%	0.0%	97.6%	92.9%	4.8%	12.0
ayurvedic	100.0%	0.0%	100.0%	0.0%	100.0%	11.0
non medical profession	75.0%	0.0%	75.0%	0.0%	75.0%	8.0
other	85.7%	14.3%	71.4%	14.3%	57.1%	8.8

Table 3: Health-care costs

Total Health Visit Cost (w/o Transportation)	Visit Cost (average of all) According To					Costs with Test/Ope		Cost Without Test/Ope
	Clients	Private Provider		Public Provider		Client	Provider	Client
Facility type	Average cost	Total Consultation Fee (Poor)	Total Consultation Fee (Rich)	Percentage of Facilities Who Charge Any Fee	Maximum Fee That Can be Charged	Cost of Visits with Tests or Operations	Amount for Lab Test + Operation+ InpatientStay	Cost of Visits Without Tests or Operations
CHC/	138.1			87.50%	17.3	683.0	14	100.2
PHC				0.0%				
Government referral hospital	1217.2					3145.2		555.0
Private hospital	889.5	1364.1	1344.5			3106.4		462.4
Ayurvedic hospital	1981.4			0.0%		29326.7		73.6
TB hospital	401.0					6667.0		.
dispensary	0.0					0.0		.
aidpost/subcenter	32.8			0.0%		300.0		32.5
angawadi	0.0					.		0.0
health camp	0.0					0.0		0.0
Ngo clinic	121.8					774.0		78.5
private qualified doctor	178.6	107.4	130.0			1788.0		145.3
private nurse/	157.9	53.3	61.7			4410.0		91.4
componder		44.0	46.9					
private pharmacist	16.7	38.5	37.3			.		16.7
bengali doctor	105.2					394.7		99.5
government doctor, private practice	179.2					3383.3		132.9
practitionner, private practice	103.7					540.0		93.5
TBA/Dai	103.3	6.2	10.7			.		103.3
VHW/	0.9	4.0	4.5			.		0.9
CHW		42.5	50.0					
HRW	33.2	767.5	767.5			.		33.2
bhopa	130.8							
(desi ilaj/		11.9	11.9					
jhaad fonk/		8.0	8.0					
both)		7.4	12.0					
OTHER	16.1	18.6	27.1			0.0		17.1
Don’t know	144.5					2050		103.8
ayurvedic		30.0	30.0					
non medical profession		2.8	2.8					

Note: we do not have detail on operations/lab test for private providers

Table 4: frequency of health care visits

	Per capita monthly expenditure	Total number of visits in the last 30 days			
		ALL	Public	Private	Bhopa
PANEL A: MEANS					
ALL	470	0.51	0.12	0.28	0.11
poor	219	0.43	0.09	0.22	0.12
middle	361	0.54	0.11	0.29	0.13
rich	770	0.55	0.15	0.33	0.07
PANEL B: OLS REGRESSIONS: dependent variable: number of visits					
Middle		0.11	0.02	0.07	0.01
		(.052)	(.023)	(.034)	(.027)
Rich		0.12	0.06	0.11	-0.05
		(.05)	(.024)	(.034)	(.022)
PANEL C: OLS REGRESSIONS, WITH VILLAGE FIXED EFFECTS					
Middle		0.14	0.02	0.09	0.02
		(.047)	(.024)	(.033)	(.023)
Rich		0.13	0.04	0.11	-0.03
		(.05)	(.026)	(.036)	(.025)
Villages Fixed effects		yes	yes	yes	yes

Note: Omitted dummies in panel B and C: poor
Standard errors in parentheses below the coefficients

Table 5: Choice of Facilities

Condition	Mean	Any Visit	Fraction of Private Hosp	Fraction of Private Visit	Pub	Pvt	NGO	Bhopa
MILD AND SERIOUS								
Hot Fever	0.32	0.54	0.03	0.02	0.19	0.59	0.01	0.14
Diarrhea	0.16	0.45	0.05	0.02	0.20	0.62	0.01	0.10
Vomiting	0.09	0.40	0.02	0.01	0.18	0.61	0.00	0.16
Pain in Upper Abdomen	0.23	0.38	0.03	0.01	0.20	0.45	0.00	0.29
Body Ache	0.42	0.37	0.04	0.02	0.21	0.51	0.01	0.20
Cold Symptoms	0.33	0.35	0.03	0.03	0.20	0.61	0.01	0.10
Cough with Blood	0.01	0.34	0.20	0.00	0.30	0.40	0.00	0.10
Dry Cough	0.20	0.34	0.02	0.01	0.23	0.60	0.02	0.10
Headache	0.42	0.34	0.03	0.01	0.20	0.53	0.02	0.19
Productive Cough	0.11	0.33	0.07	0.00	0.22	0.54	0.02	0.13
Pain in Lower Abdomen	0.12	0.31	0.01	0.04	0.14	0.47	0.00	0.33
Back Ache	0.33	0.28	0.03	0.03	0.21	0.49	0.03	0.19
Weakness/Fatigue	0.23	0.25	0.05	0.02	0.18	0.53	0.02	0.19
Skin Problems	0.03	0.24	0.15	0.00	0.10	0.55	0.05	0.10
Swelling Ankles	0.01	0.24	0.00	0.11	0.22	0.33	0.00	0.33
Menstrual Problems	0.06	0.24	0.05	0.05	0.25	0.20	0.05	0.40
Painful Urination	0.10	0.21	0.04	0.00	0.23	0.52	0.02	0.19
Chest Pain	0.11	0.20	0.02	0.02	0.24	0.51	0.02	0.18
Trouble Breathing	0.07	0.19	0.03	0.06	0.17	0.57	0.03	0.14
Genital Ulcers	0.01	0.18	0.00	0.00	0.17	0.50	0.00	0.33
Blood in Spit	0.01	0.17	0.00	0.00	0.25	0.50	0.00	0.25
Worms in Stool	0.03	0.14	0.00	0.09	0.55	0.18	0.00	0.18
Weight Loss	0.11	0.07	0.05	0.05	0.26	0.42	0.05	0.16
Problems with Vision	0.14	0.06	0.05	0.00	0.30	0.45	0.00	0.20
Night Sweats	0.03	0.04	0.00	0.00	0.33	0.67	0.00	0.00
Hearing Problems	0.04	0.03	0.00	0.00	0.00	0.33	0.00	0.67

Table 6: Patterns of Health-care Spending

	household monthly health expenditure			Average adult monthly expenditure on:				Average cost per visit			
	level		share/monthly exp.								
	expenditure survey	individual surveys	individual surveys	All visits	share public	share private	share bhopa	all visits	Public	Private	Bhopa
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
PANEL A: MEANS											
ALL	286	196	0.07	59	0.18	0.66	0.15	117	113	144	74
poor	70	99	0.07	32	0.13	0.61	0.24	72	71	84	61
middle	162	195	0.09	52	0.14	0.68	0.17	95	52	130	76
rich	571	286	0.08	88	0.23	0.68	0.09	166	173	191	90
PANEL B: OLS REGRESSION											
middle	92	96	0.02	19	0.01	0.07	-0.07	23	-19	46	16
	(21)	(38)	(.018)	(8)	(.042)	(.051)	(.041)	(12)	(24)	(20)	(31)
rich	500	187	0.01	55	0.10	0.07	-0.16	94	102	107	29
	(109)	(34)	(.012)	(12)	(.042)	(.053)	(.041)	(24)	(45)	(35)	(34)
PANEL C: OLS REGRESSIONS, WITH VILLAGE FIXED EFFECTS											
middle	92	63	0.02	16	0.01	0.08	-0.07	5.7	-33	0.46	-7.9
	(21)	(39)	(.015)	(12)	(.04)	(.049)	(.039)	(26)	(78)	(42)	(36)
rich	500	135	0.01	43	0.05	0.07	-0.10	76	-21	73	81
	(109)	(42)	(.016)	(13)	(.042)	(.052)	(.041)	(28)	(86)	(43)	(49)
village fixed effects	yes	yes		yes	yes	yes	yes	yes	yes	yes	yes

Table 7: Continuous facility survey: summary statistics

	Subcenters & aidposts	PHC & CHC
doors closed	0.56	0.03
no personnel found	0.45	0.03
fraction of medical personnel found	0.55	0.64
doctor is appointed	0	0.89
fraction of doctors present	--	0.55
at least one medical personnel is missing	0.56	0.78
observations	5268	1716
number of facilities	108	35
number of visits per facility	49	49

Table 8: Where is absence higher?

		Fraction of medical personnel present	
	number of visits	Subcenters & aidposts	PHC & CHC
Distance from road			
0 Km from road	5103	0.56	0.65
>0 and <=5 Km from road	1478	0.55	0.63
>5 Km from road	403	0.38	
Distance from Udaipur			
closest to udaipur	2315	0.53	0.61
farther	2254	0.58	0.68
farthest	2415	0.54	0.66
Distance from the nearest town			
closest to town	2350	0.56	0.64
farther	2396	0.55	0.75
farthest	2238	0.54	0.59
Reservations for women			
no reservation for women	2583	0.57	0.50
reservation for women	1843	0.56	0.68
Electricity			
no electricity	3123	0.56	0.60
electricity	1564	0.52	0.65
Water			
in facility	757	0.53	0.61
less than 30 meters from facility	2365	0.57	0.68
30 to 100 meters from facility	794	0.49	0.62
more than 100 meters from facility	771	0.59	0.62
Medical personnel living in facility			
no medical personnel living in facility (with living quarters)	2640	0.56	0.80
at least one medical personnel living in facility	853	0.64	0.69
no living quarters available	3171	0.49	0.64

Note: some data covers only a subset of facilities

Table 9: Difference Between Treatment and Comparison Centers: Centers with one ANM

	Entire period			May-October			November-June		
	Treatment	Control	Difference	Treatment	Control	Difference	Treatment	Control	Difference
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
A. On all days									
Center open	0.391	0.245	0.091	0.584	0.333	0.220	0.281	0.224	0.056
	(0.022)	(0.020)	(0.051)	(0.038)	(0.047)	(0.094)	(0.025)	(0.023)	(0.050)
Monitored ANM present	0.382	0.220	0.104	0.584	0.324	0.243	0.273	0.196	0.073
	(0.022)	(0.019)	(0.049)	(0.038)	(0.047)	(0.093)	(0.025)	(0.022)	(0.047)
Number of clients	0.309	0.167	0.081	0.572	0.294	0.237	0.182	0.113	0.065
	(0.038)	(0.026)	(0.062)	(0.093)	(0.073)	(0.245)	(0.030)	(0.025)	(0.045)
Number of clients (if center is open)	0.724	0.590	0.077	0.907	0.794	0.170	0.582	0.451	0.161
	(0.085)	(0.089)	(0.186)	(0.147)	(0.188)	(0.489)	(0.088)	(0.098)	(0.174)
Number of Visits	496	481	977	166	102	268	317	321	638
B. On Mondays									
Center open	0.546	0.408	0.138	0.594	0.308	0.286	0.443	0.431	0.012
	(0.036)	(0.059)	(0.078)	(0.043)	(0.133)	(0.148)	(0.064)	(0.066)	(0.111)
Monitored ANM present	0.541	0.394	0.147	0.586	0.308	0.279	0.443	0.414	0.029
	(0.036)	(0.058)	(0.073)	(0.043)	(0.133)	(0.148)	(0.064)	(0.065)	(0.105)
Number of clients	0.536	0.203	0.333	0.586	0.385	0.202	0.426	0.161	0.266
	(0.076)	(0.067)	(0.136)	(0.101)	(0.180)	(0.243)	(0.100)	(0.071)	(0.142)
Number of clients (if center is open)	0.906	0.464	0.441	0.911	1.000	-0.089	0.889	0.375	0.514
	(0.124)	(0.150)	(0.247)	(0.155)	(0.408)	(0.431)	(0.180)	(0.157)	(0.279)
Number of Visits	194	71	265	133	13	146	61	58	119

Notes:

1. Standard errors in parenthesese below the mean (or difference)
2. The difference in means is obtained from a regression where we control for the day of the week in which the visit took place
3. The standard errors of the difference in means is corrected for clustering a the center level.

Figure 1: ANM attendance according to official records, monitored days