

Improving Health Outcomes Incentives for Immunization and Reliable Services

Rachel Glennerster & Neelima Khetan

The poor in rural Rajasthan spend a lot on health care but have bad health—they suffer chronic weakness, are anemic and immunization rates are low. With government health workers regularly absent, the poor turn to private quacks for short term relief. Reliable attendance by nurses combined with small incentives dramatically increased immunization rates. More general absenteeism was harder to fix.

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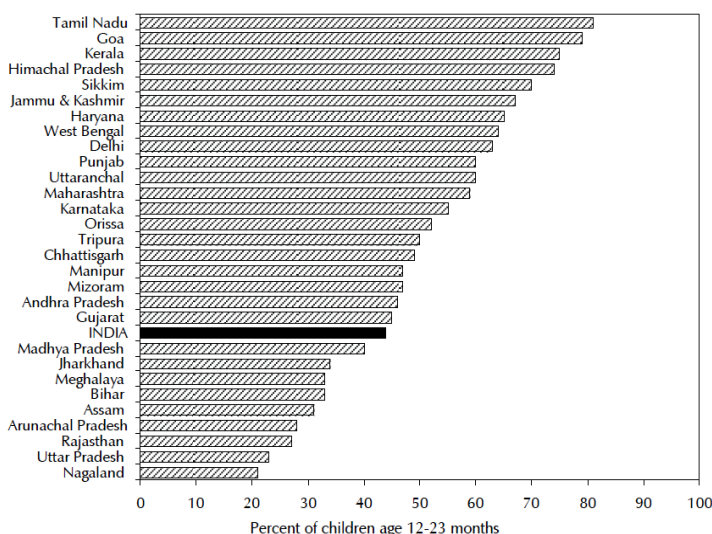
Field Partners: Seva Mandir



Immunization Policy Issue

In India, 1 out of every 14 children born dies before the age of five. The under five mortality rate varies widely across states: in Kerala only 16 children per 1,000 children born will die before the age of five, while in Bihar, the under five mortality rate is 85. Immunization is a highly cost-effective way of improving child survival in developing countries, but according to the National Family Health Survey, only 44% of children aged 1-2 years old have received the basic package of immunizations in India. Ninety-five percent of children below two years of age receive at least one vaccine, but nearly half of them do not make the necessary five visits for full immunization. In a 2003 survey of Udaipur,

Full Immunization Rates in Different States, 2005-2006



in rural Rajasthan, less than 2% of children aged 1-3 had received full immunization—much fewer than government statistics suggest. A number of factors contribute to low vaccination rates:

- **Unreliable Supply:** Even though vaccines are free, nationwide studies have shown high absenteeism rates among healthcare workers, including nurses in the health subcenters who are responsible for vaccinating. Not knowing if the subcenter will be open discourages parents from bringing their children to be vaccinated.
- **Lack of Demand:** The poor spend a lot of money on acute care but not as much on prevention. Under-consumption of preventative healthcare is common in many countries—possibly because it is harder to directly observe the benefits or because the benefits are in the future. Across the world people are reluctant to pay much or travel far to get preventative healthcare.

Description of Immunization Program

Seva Mandir decided to address both unreliable supply and lack of demand. A mobile vaccination team (hired by Seva Mandir) conducted immunization “camps” in each village every month on the same date, thus reducing the distance to travel for vaccination and providing a predictable schedule for parents. The camps were held from 11am – 2pm on a fixed day of the month, and the immunization teams were monitored with date and time stamped photos. They were paid only if they

conducted the camp, ensuring reliability. A village worker notified families the day before the camp was held, ensuring that those in need of immunization would be aware of the camp. The vaccine package administered was the WHO/UNICEF Extended Package of Immunization (EPI), which is the package provided by the Indian government.



A mother receives lentils at an immunization camp in Udaipur.

At the first immunization, every child was given an official immunization card indicating name, parent's name, and the date and type of each immunization performed. When a child arrived at a camp without an immunization card and it could not be ascertained whether they had received a given immunization, he or she was immunized. In some camps further encouragement to parents was tried. Parents who brought their children were offered a one kilogram bag of *daal* per scheduled immunization, and a steel *thali* set after receiving all necessary immunization ("full immunization"). Compliance with the full course of immunizations was verified by the child's health card and a survey of randomly selected households.

Results

This model was a dramatic success. More than 95% of camps took place on schedule, meaning there was little risk that parents would waste their time travelling to a cancelled camp. The system of regular camps without incentives increased the number of children getting one shot but parents did not persist to the end of the immunization schedule. Regular camps with incentives managed, in just 18 months, to increase full immunization rates for one-year olds by 32 percentage points compared to comparison villages without camps. In comparison, the national immunization rate only rose from 42% to 44% in 7 years. Thus in a very short period of time, this model created a significant change in immunization supply and demand.

This model is inexpensive to implement. The cost of running a camp was Rs. 3,571 per month in Rajasthan (in current costs). Those camps were run in districts with low population density and therefore each camp served only a few children. If implemented in a higher density village, up to 70 children could be immunized in a half-day camp, enough to cover a village of about 8,800 residents.

Additional Readings:

(available at www.povertyactionlab.org)

Abhijit Banerjee, Esther Duflo, Rachel Glennerster, Dhruva Kothari: "Improving Immunization Coverage in Rural India: A Clustered Randomized Controlled Evaluation of Immunization Campaigns with and without Incentives." *Working Paper*.

Improving Health Outcomes Healthcare Service Provider Attendance

Rachel Glennerster & Neelima Khetan

When properly administered and effectively enforced, financial incentives linked to time monitoring can increase healthcare service provider attendance. However, incentive systems can be quickly undermined if there is insufficient political will to enforce them.

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Field Partners: Seva Mandir



Attendance Policy Issue

Even if clinics and hospitals are built, and well stocked with drugs and equipment, these investments will not have the desired impact on health outcomes if the healthcare providers are chronically absent. In theory, India's public health care system may seem like the model for delivering universal health services. Its comprehensive design ensures that all households, rural and urban, are close to a free government health facility, yet in practice, the system often fails to deliver basic health services. The system is plagued by high staff absence, low effort by providers, and limited use by potential beneficiaries who prefer private alternatives. An extensive survey in 2003 on health in 100 villages in Udaipur found that the poor had largely abandoned the public health care system: more than 75% of people needing medical care went to the more expensive and less well trained healers and private providers.



Clinics in rural India are often closed unpredictably due to nurse absence.

One potential reason for the low usage of government facilities is pervasive provider absenteeism. Health care facilities are often closed because the nurses simply do not show up for work, as they are not effectively supervised and generally face little incentive to come to work. Primary Health Centers (PHCs) and subcenters in the state were supposed to be open 6 days a week, 6 hours a day, but the 2003 survey found them to be closed 56% of the time during regular business hours, and only 12% of the time was this because the nurse was on duty elsewhere; the rest of the time she was simply absent.

Monitoring Service Provider Attendance

In 2005, Seva Mandir began discussions with the government to pilot a monitoring program for nurses in local health clinics. This was aimed at increasing the regularity and predictability of the attendance of Auxiliary Nurse Midwife (ANM) in rural subcenters serving 135 villages in Udaipur. Seva Mandir was asked by the government to undertake the monitoring of ANMs on certain days. Later, the Chief Medical Officer of the district announced punitive pay deductions linked to this monitoring.

To help ensure that subcenters were open, additional ANMs were hired for some subcenters. These ANMs were expected to stay in the subcenter most of the time, rather than do field work. Attendance of these additional ANMs was monitored at 16 two-nurse centers three days a week. Further, to enhance the predictability of services, the ANMs in single nurse centers were

told they should always be in the center on Mondays, whatever other responsibilities they had. Attendance of these additional ANMs was monitored at 33 single-nurse centers on Mondays. To monitor presence, Seva Mandir used time/date-stamping machines locked into a caddy and password-protected to prevent tampering. The ANM was required to both sign and stamp a register secured to the wall of the subcenter three times a day. Random unannounced visits to subcenters were also conducted by field officers.



Monitoring technology: Time and date stamping machine used to confirm ANM presence at work.

Pay deductions for absent nurses were also announced to complement the monitoring: ANMs absent for more than 50% of the time on monitored days were supposed to have their pay reduced proportional to the number of absences recorded that month. Further, ANMs absent more than 50% of monitored days for a second month would be suspended from government service.

Results

There was a sharp improvement in ANM attendance during the first six months of the program when government pay deductions were effectively in place to complement Seva Mandir's monitoring. The rate of presence of the treatment ANMs was about 15 percentage points higher than for the comparison ANMs. But after the first six months the local health administration, which was caught between the pressure of the nurses and their directions to enforce the pay deductions, began to undermine the incentive structure. Nurses intentionally broke time clocks, making their supervisors unable to verify their presence or absence until the machine was fixed. But because

machines could not get fixed unless a nurse was at the subcenter to meet the program monitor, machines began to remain broken indefinitely. The local health administration was thus unable to verify the nurses' presence or absence for long periods of time. Further, the administration began granting a large numbers of "exempt days", ostensibly for field activities that are very hard to verify. This gave the administration a way to respond to the pressure from the nurses without breaking the rules or officially protesting the program. The result was that 16 months after program inception, there was no difference between the absence rates in treatment and comparison centers.

These results show that, like other public service providers, nurses are responsive to incentives when properly administered. However ensuring that nurses come to work is a low priority for the local health administration and incentive systems are quickly undermined from the inside if supervisors are given any discretion over how and whether incentives are applied. Similar results have been found in education in Kenya.



Healthcare delivery greatly suffers without dependable service provider attendance.

Additional Readings:

(available at www.povertyactionlab.org)

Abhijit Banerjee, Esther Duflo, Rachel Glennerster: "Putting a Band-Aid on a Corpse: Incentives for Nurses in the Indian Public Health Care System". *Journal of the European Economic Association*, April–May 2008, 6(2–3):487–500.

Improving Health Outcomes Decentralized Iron Fortification of Grain

Rachel Glennerster & Neelima Khetan

When take up is high, fortifying foods commonly eaten by the poor can be effective at reducing iron deficiency anemia and improving associated health outcomes. But people will not go to much effort to get fortified foods. Double fortified salt may be a better option for reducing anemia among rural populations than decentralized fortification of grain.

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Field Partners: Seva Mandir, Vidya Bhavan



Fortification Policy Issue

Iron deficiency anemia (IDA) is prevalent in India and has been linked to low productivity, increased susceptibility to infections and slower cognitive and physical growth among children. Among pregnant women, severe anemia can result in low birth weight and child mortality. IDA is a significant problem in the tribal villages of Udaipur district: the 2003 survey found 51% of men and 80% of women to be anemic.

In resource-poor settings, systematic distribution of iron supplement pills is an impractical policy, as public health systems do not have the capacity to distribute supplements reliably on a large scale. Iron fortification of food is an attractive alternative: it requires no additional effort on the part of the consumer, and can be done relatively cheaply in centralized locations. Many countries have adopted fortification of food as an alternative to distributing pills. In India, Gujarat is the leading state for flour fortification, while West Bengal, Tamil Nadu, Punjab, Andhra Pradesh and Haryana also have programs.

The problem with centralized fortification is that it may not reach the poorest populations who do not purchase commercially processed food. For isolated populations, such as the tribal communities in Udaipur district, grain must be fortified locally.

Iron Fortification of Grain

The community-level iron fortification program was designed by Seva Mandir, to provide an option

for iron supplementation for families who do not buy commercially processed food. The program was implemented in 68 of 134 villages, with the remainder serving as comparison. On average, each village had four chakkis (local millers), of which up to two were offered a flat monthly payment to participate in the fortification program.

The technology used for fortification begins with a micronutrient premix, initially diluted with flour by Seva Mandir to avoid health risks associated with over-ingestion of iron. This produces a pre-blend, which was supplied to the chakkis. Customers brought their grain to the chakkis where it was milled and supplemented with the pre-blend at no additional cost. The fortified grain supplies 20-40% of the recommended daily intake of iron for males and 10-20% for females, based on average daily flour consumption.

Detailed data was collected monthly on local health, through a unique survey where individuals gave information on symptoms, self-reported health and their work schedule during the week. This survey, in addition to monitoring the compliance of the chakkis, allowed researchers to assess the logistical feasibility of this intervention, as well as its effects on anemia and other health and economic outcomes.

Results

Fortification Uptake: Program uptake was initially high, with as much as 60% of households milling their flour at fortifying chakkis, but subsequently declined. Take up by the endline was quite low:

only 30% of flour was fortified. Some of the drop in take up may be explained by a misunderstanding on the part of the millers: once a household had agreed to participate, millers failed to fortify their flour at *every* subsequent visit. Households were also reluctant to walk further to chakkis who fortified flour.

Impact on Anemia: The program was effective in reducing anemia as long as the take up was sufficiently high, but ineffective when take up was low. A midline survey shows a 7 percentage point difference in anemia rates between treatment and comparison villages. However, this survey was performed when take up of fortification was at its peak. At endline, no impact of the program on anemia or on associated measures of health and fatigue is observed. Identification of effects was also complicated by limited data on anemia tests (which involved finger pricks to collect blood): 25% of adults and 72% of small children do not have an anemia test at endline, and while two-thirds of missing observations are due to technical reasons, one-third is due to refusal.

Community level iron fortification appears to be effective at a technical level: anemia is reduced when the program is taken up. However, in line with other findings (such as the immunization study above), people are unwilling to go out of their way to take actions that could improve their health in the long run. Getting the chakkis to systematically fortify flour over the long term also proved challenging.

Centralized fortification which requires no particular effort by local actors is a more promising direction. As discussed, many poor rural communities do not use centrally processed flour. However, nearly all communities purchase salt, suggesting that double fortified salt may be a better option for reducing anemia among rural populations.



*Left: Iron fortification machine.
Right: Grain milling machine.*

Additional Readings:
(available at www.povertyactionlab.org)

Abhijit Banerjee, Esther Duflo: “Reducing Anemia Through Iron Fortification of Grain in Udaipur, India.” *Working Paper*.