Providing Conditional Cash Transfers to Encourage Childhood Immunization in Pakistan

Researchers:

Sara Abdullah

Danya Arif

Subhash Chandir

Esther Duflo

Rachel Glennerster

Aamir Khan

Sector(s): Health

Location: Korangi town

Sample: 11,197 caregiver-child pairs

Target group: Children under five

Outcome of interest: Immunization

Intervention type: Nudges and reminders Conditional cash transfers

AEA RCT registration number: AEARCTR-0008852

Research Papers: Small mobile conditional cash transfers (mCCTs) of different amounts, schedules…

Partner organization(s): Interactive Research and Development, Global Innovation Fund, GiveWell

Although vaccines are one of the most effective tools to prevent infectious diseases and save lives, rates of childhood immunization remain low globally due to factors such as poor health service delivery, or caregivers' lack of knowledge and competing priorities. In Pakistan, researchers conducted an evaluation to test the impact of different types of mobile conditional cash transfers (mCCTs) on childhood immunization coverage and timeliness. Overall, small mCCTs led to increases in rates of immunization coverage at a low administrative cost. Additionally, researchers found that design details like payment certainty, schedule, and delivery method are important considerations.

Policy issue

Routine childhood immunization, which increases the likelihood of child survival, is very often provided for free. However, coverage of childhood vaccines lags—in 2020, 23 million infants did not get the necessary age-appropriate immunizations and over 1.5 million children died from vaccine-preventable diseases.

In some middle-income countries, especially in Latin America, cash transfers conditional on receipt of immunization, clinic visits, or school enrollment have increased the use of preventive health services, including vaccines. Similar results were observed in low- and lower-middle income countries, where families that received small conditional cash transfers (CCTs) experienced increases in immunization uptake. While CCTs have shown success in these contexts, questions remain about how to best structure them, in terms of amount, schedule, and design, to realize the greatest impact on child health.

Context of the evaluation

Pakistan is one of the ten countries where approximately 60 percent of the world's unvaccinated children live. Since 1978, the government-run Expanded Program on Immunization (EPI) has been offering free vaccination to children aged 0-23 months against vaccine-preventable diseases.[1] Efforts to increase immunization rates have thus far primarily focused on supply side interventions while demand side interventions have been limited to social mobilization, education, and communication.

As of 2017 to 2018, full immunization coverage (FIC) for children aged 12 to 23 months in Pakistan was 66 percent. In the Sindh province, FIC rates were below the national average at 48.8 percent. Korangi town, where this evaluation took place, is in Sindh's Karachi city and home to an ethnically diverse population of over one million. Children in Korangi are vaccinated at fixed immunization clinics or during outreach by vaccinators. Before the intervention, 61.8 percent of children in Korangi had received BCG (Bacille Calmette Guérin), the first vaccine in a child's schedule, compared to 88 percent of children across Pakistan.

A health worker enters data from an Expanded Programme on Immunization (EPI) card into the Government of Sindh's electronic immunization registry in Pakistan.

Photo Credit: IRD Global

Details of the intervention

Researchers partnered with IRD Global, a global health delivery and research organization, to conduct a randomized evaluation testing the impact of different small mobile conditional cash transfers (mCCTs) structures as well as SMS reminders on childhood immunization coverage and timeliness.

Researchers randomized a total of 11,197 caregiver-child pairs into different groups that varied according to (i) whether they received an mCCT after each immunization or not, (ii) the amount of the payment (high or low), (iii) whether payments were flat or

increasing over time, (iv) if the transfer was certain or dependent on a lottery, (v) whether payments were done via mobile money or airtime, and (vi) whether participants also received SMS reminders.

This design resulted in the following seven treatment groups:

1. *SMS Only* (1,600 caregiver-child pairs): Pairs in this group received only SMS reminders about vaccine due dates.
2. *Mobile Money* (1,600 caregiver-child pairs): Pairs in this group received SMS reminders about vaccine due dates and a high mobile money payment post vaccination that did not increase over the course of the vaccination schedule.
3. *Airtime High x Sharp* (1,598 caregiver-child pairs): Pairs in this group received SMS reminders about vaccine due dates and a high payment amount as airtime that increased over the course of the vaccination schedule.
4. *Airtime High x Flat* (1,598 caregiver-child pairs): Pairs in this group received SMS reminders about vaccine due dates and a high payment amount as airtime that did not increase over the course of the vaccination schedule.
5. *Airtime Low x Flat* (1,600 caregiver-child pairs): Pairs in this group received SMS reminders about vaccine due dates and a low payment amount as airtime that did not increase over the course of the vaccination schedule.
6. *Airtime Low x Sharp* (1,600 caregiver-child pairs): Pairs in this group received SMS reminders about vaccine due dates and a low payment amount as airtime that increased over the course of the vaccination schedule.
7. *Comparison* (1,599 caregiver-child pairs): Pairs in this group did not receive SMS reminders nor mCCTs.

Within each of the mCCT groups, caregiver-child pairs were also randomly assigned to either receive certain payments or lottery payments. A full description of the random assignment is depicted below:

Figure 1 .

Researchers followed-up with participants until children were at least 18 months. Data for the evaluation was taken from the Government of Sindh's *Zindagi Mehfooz* electronic immunization registry (EIR). Study staff also collected immunization data at enrollment and follow-up appointments by verifying vaccination administration with the vaccinator and follow-up phone calls if needed. The primary outcome measure of interest was full immunization coverage (FIC) at 12 months, specified as having received one dose of BCG, three doses of pentavalent, pneumococcal, and oral poliovirus, and at least one dose of measles vaccines. Researchers also considered timeliness, or whether vaccines were received within 28 days of the recommend age, and up-to-date immunization coverage at 18 months of age.

Results and policy lessons

Participants receiving a small mCCTs (ranging from US$0.80 to 2.40) of any structure type had higher FIC at 12 months and up-to-date coverage at 18 months compared to those that only received SMS reminders. In terms of design features, FIC was higher for the higher payment amount versus the low amount, certain versus lottery payment, and airtime payment versus mobile money while there was no difference between a flat and rising schedule of payment.

Full Immunization Coverage (FIC) at 12 months: Participants receiving any mCCT were 1.18 times more likely to fully vaccinate their children compared to those in the SMS only group (FIC of 62.3 percent in any mCCT group versus 58.4 percent in the SMS only group). Researchers found that the size of the payment and its certainty were important while the payment schedule was not. Children in the higher payment groups (US$1.80 per visit) were 1.16 times more likely to be fully vaccinated compared to those in lower payment groups (US$0.60 per visit). This is equivalent to a 2.6 percentage point increase in FIC. Additionally, payments via

airtime were more effective than mobile money payments, while lottery payments were less effective than certain payments. Airtime payments increased FIC by 3.4 percentage points more than mobile money. Lottery payments reduced take-up by 5.5 percentage points and were less effective at cost per additional immunization than certain payment amounts.

Timeliness and Up-to-date Immunization Coverage at 18 months: Overall, mCCTs did not have an impact on the timeliness of receipt of the third pentavalent vaccine or the two measles vaccines compared to the SMS only group. Similarly, there were no differences in timeliness of these vaccines among the different mCCT groups. Up-to-date immunization coverage at 18 months for the third pentavalent vaccine and the two measles vaccines was higher among the higher payment groups, certain payment groups, and airtime payment groups compared to the lower payment, lottery payment, and mobile money payment groups respectively. Children in the high payment groups were 1.13 to 1.22 times more likely to have received the three vaccines at 18 months than the low payment groups while the certain payment groups were 1.24 to 1.40 times more likely than the lottery payment. Finally, children whose caregivers received airtime payments upon their vaccination were 1.13 to 1.26 times more likely to have up-to-date immunization coverage at 18 months than those who receive payment as mobile money.

Cost-effectiveness: Overall, small mCCTs (US$0.80 to 2.40) increased FIC at 12 months and up-to-date coverage at 18 months for US$23 per additional fully immunized child.[2] Even though higher payments had a larger impact on FIC than lower payments, the researchers suggest that, in a resource-constrained setting, smaller transfer amounts that allow for greater coverage may be a better option. For instance, in this evaluation, once government and beneficiary costs and benefits are considered, the best performing low mCCT (low amount, certain payment, rising schedule) cost US$23 per additional fully immunized child while the best performing high mCCT (high amount, certain payment, flat schedule) cost US$24. Moreover, utilizing airtime payments and certain payments increased FIC as much, or more than, moving from a low to a high payment or tripling the payment amount.

In response to the study findings, IRD Global designed the Choti Khushi Incentive Support Program in 2022 and with support from Government of Sindh scaled-up across seven high-risk (lowest coverage) districts in the province to improve immunization coverage and timeliness. The program utilized guaranteed incentives of US$1.26 per vaccine delivered via mobile airtime payments on a flat payment schedule. In its first year the program enrolled over 480,000 children and over 960,000 directly incentivized vaccines were administered.

Chandir, Subhash, Danya Arif Siddiqi, Sara Abdullah, Esther Duflo, Aamir Javed Khan, and Rachel Glennerster. "Small mobile conditional cash transfers (mCCTs) of different amounts, schedules and design to improve routine childhood immunization coverage and timeliness of children aged 0-23 months in Pakistan: An open label multi-arm randomized controlled trial." Eclinicalmedicine 50 (2022): 101500.

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1. World Health Organization Regional Office for the Eastern Mediterranean. “Expanded Programme on Immunization.” https://www.emro.who.int/pak/programmes/expanded-programme-on-immunization.html. Accessed May 5, 2023.

2. Costs were calculated in current Pakistan rupees for each year of the project and converted into dollars using the average market exchange rate for that year. US inflation rates were used to convert all costs into 2020 dollars.