The Indian Health Insurance Experiment: A Randomized Controlled Trial of the Effect of Hospital Insurance on Utilization and Health

Anup Malani, Ph.D., J.D.; Gabriella Conti, Ph.D; Phoebe Holtzman, M.A.; Kosuke Imai, Ph.D; Cynthia Kinnan, Ph.D; Morgen Miller, M.A.; Anuj Shah, PhD; Shailender Swaminathan, Ph.D.; Alessandra Voena, Ph.D; and Bartosz Woda, M.A.

AUTHOR AFFILIATIONS. University of Chicago Law School (A.M., M.M., B.W.); the University of Chicago Pritzker School of Medicine (A.M.); Department of Economics and Department of Social Science at University College London (G.C.); Department of Economics at Tufts University (C.K.); Department of Government and Department of Statistics at Harvard University (K.I.); Department of Economics at the University of Chicago (A.V.); the Public Health Foundation of India and SRM University (S.S.); the University of Chicago Booth School of Business (A.S.); and the National Bureau of Economic Research (A.M., C.K., A.V.).

DISCLOSURES. This study was funded by grants from the Law School, the MacLean Center for Bioethics, and the Becker-Friedman Institute at the University of Chicago, U.S.; the Department for International Development, U.K.; the International Growth Centre, U.K.; the Tata Trusts through the Tata Centre for Development at the University of Chicago; and SRM University, Andhra Pradesh, India.

WORD COUNT: 2872 words.

ABSTRACT

IMPORTANCE. In 2018, India replaced a public, hospital insurance plan (Rashtriya Swasthya Bima Yojana or RSBY) that covered roughly 280 million people below its poverty line with one that covers 538 million persons, many above the poverty line.

OBJECTIVE. To assess the impact of expanding eligibility on insurance use, healthcare utilization and health.

DESIGN. A randomized controlled trial with follow-up at 18 months and 4 years.

SETTING. Central and South India.

PARTICIPANTS. Households above the poverty line, living within 25 km of a hospital, and lacking insurance.

INTERVENTIONS. Households were assigned in 2013 to free hospital insurance under RSBY, sale of that insurance, sale of that insurance plus a cash transfer equal to the premium, or no intervention. To estimate spillover effects from other village households' insurance status, we varied the fraction of households given insurance access across villages.

OUTCOMES. Outcomes were enrollment, insurance use, healthcare utilization, risk factors for cardiovascular and metabolic conditions, cognitive capacity, and self-reported physical and mental health. Hypotheses were formulated during data collection.

RESULTS. 10,879 households were consented. Access to free insurance, sale of insurance with a transfer, and sale of insurance led to enrollment by 79.4%, 73%, and 62% of households, respectively. Enrollment increased insurance use at 18 months (6.6 percentage points (pp); 95% CI: 0.2 to 13.0). Many enrollees were unable to use insurance (3.5 pp at 18 months; 95% CI: 0.2 to 6.8). Enrollment increased outpatient surgeries at 4 years (6.5 pp; 95% CI 0.5 to 12.5). Ignoring spillovers, enrollment improved male cognition at 18 months (0.95 on Raven Test; 95% CI: 0.14 to 1.75).

CONCLUSIONS AND RELEVANCE. Insurance access increased enrollment, even when a premium was charged. Enrollment increased insurance use, mainly through spillover effects. Lack of familiarity with insurance and poor implementation reduced the use of insurance. Enrollment did not significantly affect health, perhaps because it mainly altered payment for care, not the utilization of care. We cannot rule out medically significant health effects.

TRIAL REGISTRATION. ClinicalTrials.gov Identifier: NCT03144076; American Economic Association Registry Identifier: AEARCTR-0001793.

INTRODUCTION

Financing healthcare in lower-income countries is challenging. Whereas U.S. consumers finance 11% of health expenditures out-of-pocket, India's finance 75% out-of-pocket.[1] Although India subsidizes care at public facilities, they have limited inventories of consumables such as anaesthetics[2,3]. Moreover, only 25% of Indians obtain care at government facilities[4].

To address these concerns, in 2008 the Indian government launched Rashtriya Swasthya Bima Yojana (RSBY), an insurance program that covered care at public and private hospitals, mainly for households living below India's poverty line. Of the roughly 280 million people eligible, 170 million enrolled. In 2018, India replaced RSBY with Pradhan Mantri Jan Arogya Yojana, a plan that expanded eligibility above the poverty line (APL), to 537 million people.

Although there is growing evidence on the effects of health insurance in the US[5] and other emerging economies[6-9], rigorous evidence on the likely impact of India's insurance expansion is sparse[10,11]. The experience of other countries cannot be extrapolated to India. It is less urban and has different disease burdens than many other emerging economies[12]. It has fewer safety nets than the United States.

In 2013, we began a study involving 52,292 persons in Central and South India to evaluate the impact of expanding RSBY eligibility to APL households. Selection into insurance based on unobservable health factors and risk preferences threatens the validity of observational studies.[5,13-15]. Therefore, we conducted a randomized, controlled trial. We examined multiple ways of expanding access, including free insurance and sale of insurance. Because insurance is an unfamiliar product in rural India, word of mouth may affect its utilization. We varied how many households in a village access insurance to measure spillover effects of insurance penetration within a village[16]. Here we report the impact of insurance access and enrollment on insurance and healthcare utilization and on health 18 months and 4 years after randomization.

METHODS

INTERVENTION AND RANDOMIZATION

RSBY provided insurance to households below the poverty line and certain vulnerable occupations. The government paid private companies a premium -- INR 133 ($7.59) and INR 173 ($9.87) per household per year in Gulbarga and Mysore, respectively -- to cover select outpatient surgeries, diagnostic tests, and inpatient treatments at in-network (empanelled) public and private hospitals. (We employ the 17.152 INR/USD purchasing-power-parity exchange rate from 2015, the date of treatment.[17]) Households enrolled by paying INR 30 ($1.71) to obtain an insurance card. There was no deductible or copay, but there was an annual cap of INR 30,000 ($1,712.33) per household of 5 members. The government dictated prices for procedures, so this cap is enough to cover, e.g., 4 c-sections or 10 MRIs.

Our sample includes 10,879 households from 435 villages in two districts of Karnataka: Mysore (5769 households) in South India and Gulbarga (5110 households) in Central India. The sample size was calculated to ensure 5% significance and 80% power to detect a 25% change in hospitalization rate across study arms and allow for a 10% attrition rate. Only villages within 25 km of a hospital empanelled as of 2013 were included to ensure that insurance had some use. Households were included if they were above the poverty line and excluded if any member was eligible for RSBY or had hospital insurance. These criteria ensured the sample was treatment naïve. The CONSORT flowchart is in Supplement eFigure 1.

Households were assigned to one of 4 treatments: (A) access to RSBY for free ("free insurance"), (B) the right to purchase RSBY ("sold insurance") plus an unconditional cash transfer ("transfer") equal to the purchase price, (C) the right to purchase RSBY, or (D) no intervention. The purchase price for arms B and C was the premium the government paid for RSBY plus INR 30 for the insurance card. The transfer to B was the premium plus the price of the card.

Overall, 40% of households (4,401 households) were assigned to arm A and roughly 20% to every other arm (2,180 households to B, 2,146 to C, and 2,152 to D). The sample size of the free-insurance arm was larger because the government was likely to (and did) use this method of access when expanding eligibility.

To measure spillover effect, i.e., if the share of sample households given insurance within a village altered the impact of insurance on individual households, we employed a two-stage design (eFigure 1) was employed [16]. First, villages were randomized to five conditions, each a different share of sample households allocated to arms A to D. Second, households in each village were randomized to conditions A to D based on the allocation to which their village was assigned. Overall, village-level conditions involved either 50%, 30% or 10% of sample households being assigned to the control group.

The study was conducted from 2013 to 2019. Study households that enrolled in RSBY received coverage from May 2015 to August 2018. The University of Chicago's IRB approved the study (IRB12-2085).

DATA COLLECTION

The primary outcomes were enrollment in RSBY; use of insurance and healthcare; and several clinical and self-reported measures of physical and mental health, cognition and health behaviors.

Approximately 18 months prior to treatment, we conducted a baseline survey of the male head of household, a female knowledgeable about household finances, and a female with children below the age of 18. For a random subsample of 3,651 households, a biomarker survey gathered objective measures of health on the male head, a female of childbearing age, and a child under 18. Approximately 18 months following treatment, we conducted a midline survey similar to the baseline. Approximately 4 years following treatment, we conducted an endline

survey of the male head or a female knowledgeable about household finances. The biomarker survey was not conducted at endline.

Measured outcomes vary across surveys (Supplement). We examine successful use of and inability to use the RSBY insurance card at midline and endline. Healthcare use was measured using visit to healthcare facilities (midline), inpatient hospitals (endline) and outpatient surgeries (endline). Self-reported health measures on all surveys include overall health on a 5-point scale; Short Form 8 (SF-8); being diagnosed with certain chronic conditions; smoking; drinking; fertility and mortality. Additionally, versions of the Perceived Stress Scale (PSS-10) and General Health Questionnaire GHQ-12 were measured at endline. Four cognitive tests (Raven, Corsi, Stroop, Coding), along with a subset of 12 questions from the Cognitive Failures Questionnaire (CFQ-25) and 10 questions from Self-Control Scale Questionnaire (SCSQ), were administered to all males at midline. The biomarker survey includes, inter alia, height, weight and blood pressure.

Good health is an indicator for a score of 4 or 5 on self-reported health. Underweight is a BMI < 18.5, obesity is a BMI > 30, severely obese is a BMI > 40[18]. Hypertension grade 1 is a BP of 130-139/80-89; and grade 2 as 140/90 and higher[19]. SF-8 physical component score (PCS) and the mental health component score (MCS) are the sum of answers to the physical and mental health questions, respectively, in an 8-item subset of the SF-36 survey. The PSS-10 is the sum of answers to the 10-item Perceived Stress Scale survey. GHQ-12 binary uses the binary scoring method for the 12-item version of the General Health Questionnaire wherein symptomatic responses are scored a 1 and questions are summed. The Raven, Corsi, Stroop and Coding scores measure fluid intelligence, memory span, and cognitive control.

STATISTICAL ANALYSIS

Here we report intent-to-treat (ITT) estimates of the effect of different methods of access to RSBY on enrollment and complier average treatment effect (CATE) estimates of the effect of enrollment in RSBY on utilization and health at the 18 months and 4 years follow-ups. (The Supplement reports ITT estimates for utilization and health.)

ITT regressions included indicators for household access arms. The average effect of providing access to a given household was estimated using the coefficient on these indicators.

CATE analyses employ an instrumental variables approach. Outcome regressions include an indicator for household enrollment in insurance, the share of sample households in a village enrolled in RSBY, and the interaction of these variables. The instruments for these endogenous variables were indicators of household access arms, the share of the sample in a village randomized to arms A - C, and the interaction of these variables.

The CATE estimate of enrolling a given household (direct effect) was estimated using the coefficient on enrollment. The average effect on a given household of enrolling other households in a village (spillover effect) was estimated using the coefficients on the share enrolled and the interaction of share and the indicator for household enrollment. The total effect

of enrolling all sample households in a village was estimated by summing the direct effect and the spillover effect of moving the percent of a village sample that was enrolled from 0 to 100. Standard errors are clustered at the village level to account for the two-stage randomization design[20].

Linear regression was employed in all analyses. For binary outcomes, logit regressions, reported in the Supplement, yielded similar results in ITT analyses. All analyses weight households equally. Although males and females are asked the same health questions at 18 months, we present a common effect across sexes. The Supplement presents seperate effects by sex. To show how impacts differ across geographies, treatment indicators were interacted with an indicator for Gulbarga district.

We present two options for p-values. First, we present p-values for individual outcomes. All outcomes at endline are specified in our analysis plan. Second, to test the hypotheses pertaining to groups of related outcomes, we report critical p-values for those groups using a multiple-testing correction procedure[21] to control the false discovery rate. Our statistical significance threshold is 95% confidence in a 2-sided test.

Analyses were performed using Stata version 15 (StataCorp) and R.

RESULTS

STUDY POPULATION

Non-response rates for our main surveys average 5% at baseline, 7% at 18 months, and 13% at 4 years. The biomarker surveys non-response rates average 6% at baseline and 15% at 18 months (Supplement eTable 1).

Table 1 presents characteristics of respondent households across arms at baseline. On average, the annual household budget was INR 50,361.54 ($2,876.71). Average medical expenditure was INR 38,114.54 ($2,191.78), of which INR 8,147.03 ($462.33) was spent on hospital care (Supplement eTable 2).

A few variables, such as household annual budget (free insurance arm v. control, P=0.025), significantly differ across arms at baseline (Supplement eTable 3). Accounting for multiple hypothesis testing, however, household characteristics are balanced (*P*=1.000) across insurance-access arms (Supplement eFigure 2).

INSURANCE ENROLLMENT

Enrollment rates were 79.4% (95% CI: 76.9 to 81.9%) for free insurance, 73.0% (95% CI: 69.1 to 76.9%) for sold insurance plus transfer, and 61.2% (95% CI: 56.7 to 65.7%) for sold insurance (Supplement eTable 4).

UTILIZATION OF INSURANCE

Enrollment in insurance increased use of RSBY for payment (Table 2). Direct effects of enrollment increased successful RSBY use over the prior 6 months only at the 4 year follow-up (2.7 pp, 95% CI: 0.4 to 5.0 pp). Adding spillover effects, however, enrollment increased RSBY use at both 18 months (6.6 pp; 95% CI: 0.2 to 13.0 pp) and 4 years (1.1 pp; 95% CI: 0.1 to 2.1 pp).

Many households attempted to use RSBY to pay for care at 18 months but were unsuccessful (total effect 3.5 pp; 95% CI: 0.2 to 6.8 pp). Common reasons given by households for inability to use RSBY are that it was not accepted by the provider (48%) and households forgot their card at home (14.9%) (Supplement eTable 6).

Enrollment in insurance did not lead to a significant increase in healthcare utilization, except for day surgeries at 4 years (6.5 pp; 95% CI: 0.5 to 12.5 pp) (Table 2).

HEALTH OUTCOMES

Effects of enrolling in RSBY on health at 18 months and 4 years are presented in Tables 3 and 4, respectively. Enrollment had a positive direct effect on male fluid intelligence at 18 months (Raven score, 0.945; 95% CI: 0.144 to 1.746). This was not significant if the hypothesis being tested is that insurance has cognitive effects generally. Overall, insurance enrollment has few significant health effects. The effect of insurance access shows similar patterns (eTables 9-12).

DISCUSSION

We conducted a trial to understand the effect of access to hospital insurance on uptake of insurance, insurance and healthcare utilization, and health among above-poverty-line (APL) populations in India.

Sample households were on average just above the poverty line. The poverty line in Karnataka in 2012 was an annual income of INR 54,120 ($3,089.04) in rural and INR 65,340 ($3,729.45) in urban areas for a family of 5.[22] Sample households' average annual budget plus medical expenditures was INR 88,800 ($5,068.49).

Access to insurance increased enrollment, though less so when households were charged for insurance. Enrollment increased insurance payment for care, driven by spillover effects from a larger fraction of village households enrolling in insurance. Many beneficiaries were unable to use their insurance card. There was no significant increase in visits to medical facilities at 18 months, but enrollment did increase certain outpatient surgeries at 4 years. The impact of insurance enrollment on health was limited. Ignoring spillovers, enrollment improved male cognition at 18 months.

Enrollment in insurance was higher (free insurance arm, 79.4%) in the study population than among below-poverty-line populations already eligible for RSBY (43.12% in Gulbarga, 59.97% in Mysore).[23]. The difference was probably not the result of higher income because enrollment did not vary significantly by household budget (Supplement eTable 7). It may be attributable to more intensive marketing: whereas RSBY merely distributed flyers to eligible households just before enrollment, we visited households in person and guided them to enrollment stations if they wanted insurance.

Unconditional cash transfers increased enrollment by 11 pp. This effect could indicate a high willingness to spend incremental income on insurance, perhaps due to liquidity constraints; gratitude toward gift-givers selling insurance; or a nudge because recipients associated the transfer with insurance[24].

Charging for insurance reduced insurance enrollment by 19 pp. Given the insurance premium, this effect implies that a 10% increase in insurance price causes a 2.97% decline in enrollment. This price response is towards the high end -- but within the range -- of estimates from the literature on insurance demand elasticity.[25]

The estimated spillover effects on use of insurance are consistent with people learning about the value of insurance via word-of-mouth from neighbors, as reported in a prior study of insurance in Karnataka.[11] Failing to account for spillover effects may explain findings of null effects on insurance utilization in studies that do not provide insurance to whole villages.[9] Untreated households in treated areas in such studies may be indirectly treated and an inappropriate control group.

Our modest health results are consistent with prior experimental studies of health insurance in Mexico, Cambodia, Nicaragua and Kenya[6-9]. Those studies also found small impacts on healthcare utilization, which could explain minor health impacts.

Care should be taken in interpreting the insignificant health effects observed. Perhaps hospital care was not effective for the outcomes measured[26]. Moreover, we cannot rule out medically significant effects for many outcomes. The bounds of confidence intervals are occasionally as high as 103% of a standard deviation of outcomes, with the average bound 46% of a standard deviation (Tables 3 and 4).

Our study has implications for the implementation of public insurance in India. First, many households were unable to use their insurance, as in a prior study of Seguro Popular in Mexico[6]. The reasons respondents gave suggested that they went to the wrong facility, did not understand what was covered, or forgot their insurance card (eTable 6). This may be due to unfamiliarity with insurance [27], low reimbursement rates that discouraged hospitals from accepting RSBY patients[28], or a failure of the payment infrastructure for RSBY. Improved information provision to households, higher reimbursement rates, and increased investment in IT are worth considering. These reforms may affect the long term success of public insurance: the inability to use RSBY early in the study may also explain why insurance use was low after 4 years[29,30].

Second, spillover effects on insurance use have implications for marketing insurance. With a fixed budget, there may be a greater utilization if the government is able to focus more on increasing coverage within a smaller number of villages rather than spread their resources over more villages with lower coverage in each.

While our study is the largest experimental evaluation of health insurance in an emerging economy and the first to examine spillover effects, it has important limitations. First, the study was powered to detect a change in the hospitalization rate. It was not powered to detect changes in each health outcome we examined. Second, the study examines an insurance plan that does not cover care at physician offices nor most drugs. This limits its ability to predict the impact of more comprehensive insurance schemes. Third, while the study helps predict the impact of expanding eligibility under India's new PMJAY insurance, it does not inform the impacts of that plan's expansion of coverage to long-term (tertiary) hospital treatments. Fourth, our sample may differ from APL populations in Northern India and other emerging economies. Caution should be exercised prior to extrapolating results to those environments.

Despite these limitations, our study provides insight into the value of India's latest insurance scheme, now the world's largest health insurance plan. Our finding of spillover effects underlines the importance of studying insurance at scale to understand its impacts.

REFERENCES

1. Berman P, Ahuja R, Bhandari L. The impoverishing effect of healthcare payments in India: new methodology and findings. *Economic & Political Weekly.* 2010;45(16):65-71.

2. Deka K. No free treatment in Assam's government hospitals. *India Today.* May 17, 2012, 2012.

3. Nair P. Delivery in government hospitals free but not exactly. *The Times of India.* February 20, 2018, 2018.

4. Government of India MoHaFW. National Health Accounts - Estimates for India 2014-2015. In:2014-2015.

5. Baicker K, Taubman SL, Allen HL, et al. The Oregon Experiment — Effects of Medicaid on Clinical Outcomes. *New England Journal of Medicine.* 2013;368(18):1713-1722.

6. King G, Gakidou E, Imai K, et al. Public policy for the poor? A randomised assessment of the Mexican universal health insurance programme. *The Lancet.* 2009;373(9673):1447-1454.

7. Thornton RL, Hatt LE, Field EM, Islam M, Solís Diaz F, González MA. Social security health insurance for the informal sector in Nicaragua: a randomized evaluation. *Health Economics.* 2010;19(S1):181-206.

8. Levine D, Polimeni R, Ramage I. Insuring health or insuring wealth? An experimental evaluation of health insurance in rural Cambodia. *Journal of Development Economics.* 2016;119:1-15.

9. Haushofer J, Chemin M, Jang C, Abraham J. Peace of mind: health insurance reduces stress and cortisol levels–evidence from a randomized experiment in Kenya2017.

10. Das J, Leino J. Evaluating the RSBY: Lessons from an Experimental Information Campaign. *Economic & Political Weekly.* 2011;46(32):85.

11. Sood N, Bendavid E, Mukherji A, Wagner Z, Nagpal S, Mullen P. Government health insurance for people below poverty line in India: quasi-experimental evaluation of insurance and health outcomes. *BMJ.* 2014;349:g5114.

12. Naghavi M, Abajobir AA, Abbafati C, et al. Global, regional, and national age-sex specific mortality for 264 causes of death, 1980–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet.* 2017;390(10100):1151-1210.

13. Wagstaff A, Pradhan M. Health Insurance Impacts on Health and Nonmedical Consumption in a Developing Country. *ICFAI Journal of Risk and Insurance.* 2005;2(4):44-68.

14. Wagstaff A, Lindelow M. Can insurance increase financial risk?: The curious case of health insurance in China. *Journal of Health Economics.* 2008;27(4):990-1005.

15. Wagstaff A, Lindelow M, Jun G, Ling X, Juncheng Q. Extending health insurance to the rural population: An impact evaluation of China's new cooperative medical scheme. *Journal of Health Economics.* 2009;28(1):1-19.

16. Hudgens MG, Halloran ME. Toward Causal Inference With Interference. *Journal of the American Statistical Association.* 2008;103(482):832-842.

17. OECD. Purchasing power parities (PPP) (indicator). 2020. Accessed January 6, 2020.

18. CDC. Assessing Your Weight. 2015; https://www.cdc.gov/healthyweight/assessing/index.html. Accessed November 11, 2019, 2019.

19. Chopra HK, Ram CVS. Recent Guidelines for Hypertension. *Circulation Research.* 2019;124(7):984-986.

20. Imai K, Jiang Z, Malani A. Causal Inference with Interference and Noncompliance in Two-Stage Randomized Experiments. In:2019.

21. Benjamini Y, Yekutieli D. The control of the false discovery rate in multiple testing under dependency. *Ann Statist.* 2001;29(4):1165-1188.

22. Prabhavathi PC, Naveena N. An Analysis of Poverty in Karnataka: A Study. *IOSR Journal Of Humanities And Social Science.* 2014;19(3):72-31.

23. RSBY. You are viewing: Karnataka; Enrollment of Beneficiaries. 2018; https://web.archive.org/web/20180131035129/http://www.rsby.gov.in/Statewise.aspx?state=29.

24. Thaler RH, Sunstein CR. *Nudge: Improving decisions about health, wealth, and happiness.* Penguin; 2009.

25. Pendzialek JB, Simic D, Stock S. Differences in price elasticities of demand for health insurance: a systematic review. *The European Journal of Health Economics.* 2016;17(1):5-21.

26. Das J, Hammer J, Leonard K. The Quality of Medical Advice in Low-Income Countries. *Journal of Economic Perspectives.* 2008;22(2):93-114.

27. Rajasekhar D, Berg E, Ghatak M, Manjula R, Roy S. Implementing Health Insurance: The Rollout of Rashtriya Swasthya Bima Yojana in Karnataka. *Economic and Political Weekly.* 2011;46(20):56-63.

28. Devadasan N, Seshadri T, Trivedi M, Criel B. Promoting universal financial protection: evidence from the Rashtriya Swasthya Bima Yojana (RSBY) in Gujarat, India. *Health research policy and systems.* 2013;11:29-29.

29. Fenton JJ, Jerant AF, Bertakis KD, Franks P. The Cost of Satisfaction: A National Study of Patient Satisfaction, Health Care Utilization, Expenditures, and Mortality. *Archives of Internal Medicine.* 2012;172(5):405-411.

30. Trivedi M, Saxena DB. Third Angle of RSBY: Service Providers' Perspective to RSBY-operational Issues in Gujarat. *Journal of family medicine and primary care.* 2013;2(2):169-172.

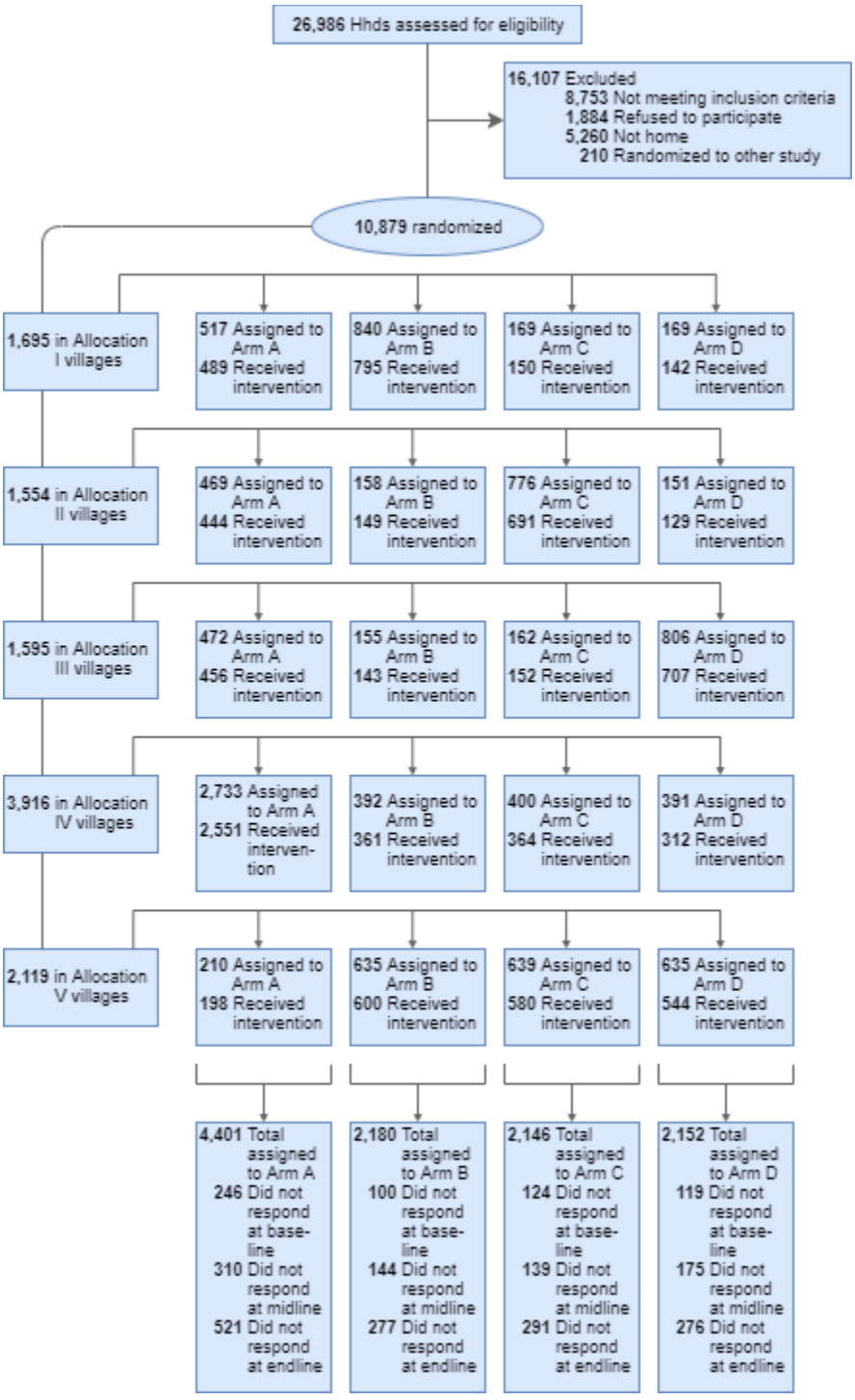


Figure 1. *CONSORT flowchart for the Indian Health Insurance Experiment.*

***Table 1**. Household characteristics in different access-to-insurance conditions.*

	N	Free insurance Mean (SD)	Sale of insurance + transfer Mean (SD)	Sale of insurance Mean (SD)	No access to insurance Mean (SD)
Demographic					
Number of hhld. members[b]	10850	5.1 (2.4)	5.1 (2.4)	5.1 (2.5)	5.0 (2.4)
Number of children in hhld.[a]	10156	1.4 (1.5)	1.5 (1.5)	1.4 (1.4)	1.4 (1.4)
Age of head of hhld.[a]	10156	51.4 (13.4)	51.2 (13.6)	51.4 (13.4)	50.8 (13.4)
Education of male head of hhld.[b]	10834	6.5 (5.0)	6.7 (4.9)	6.6 (4.9)	6.6 (5.0)
KM to nearest town[c]	10404	9.9 (5.1)	9.8 (4.8)	9.7 (5.0)	9.6 (4.9)
Financial					
Number of rooms in house[b]	10816	3.2 (1.6)	3.2 (1.5)	3.2 (1.6)	3.2 (1.6)
Number of concrete rooms[a]	10184	1.2 (2.0)	1.2 (2.0)	1.2 (1.9)	1.1 (2.0)
Annual hhld. budget[a,d]	7717	52.0 (39.9)	49.7 (33.6)	48.5 (30.7)	49.6 (31.3)
Annual food expenditure[a,d]	9919	41.0 (24.0)	41.3 (25.8)	41.2 (24.4)	40.3 (23.4)
Health and utilization					
Major illness in household[b]	10833	0.16 (0.37)	0.16 (0.37)	0.16 (0.37)	0.17 (0.37)
Visited HCP 1 yr, male or female[a]	10067	0.98 (0.13)	0.98 (0.12)	0.98 (0.12)	0.98 (0.14)
Annual non-hosp. med. exp.[a,d]	9554	30.2 (72.2)	29.8 (57.2)	33.0 (118.5)	28.4 (64.8)
Annual hospital expenditure[a,d]	9982	7.08 (21.46)	9.78 (55.49)	8.66 (39.76)	8.15 (37.38)

a - baseline survey. **b** - listing data. **c** - based on GPS coordinates. **d** - in 1000s of INR.

***Table 2**. Direct and spillover effects of insurance enrollment on use of insurance and visits to medical facilities.*

	Midline			Endline				
	Successful use (past 6 mos.)	Failed use (past 6 mos.)	Visited HCP 1 yr (male or female)	Successful use (past 6 mos.)	Successful use (most serious event[a])	Failed use (most serious event[a])	Visited big hosp (most serious event[a])	Day surgery
	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value
Direct effect[b]								
Enrolled	3.9% (-1.5 to 9.2) 0.156	3.6% (-0.1 to 7.3) 0.058	-0.7% (-14.2 to 12.8) 0.923	2.7% (0.4 to 5.0) 0.020	0.5% (-1.1 to 2.1) 0.566	1.2% (-2.0 to 4.4) 0.461	-11.5% (-24.6 to 1.6) 0.084	-4.1% (-11.0 to 2.7) 0.238
Indirect effects[c]								
Enrolled	2.7% (-6.1 to 11.6) 0.546	-0.1% (-5.4 to 5.3) 0.984	-5.3% (-31.2 to 20.5) 0.687	-1.6% (-4.7 to 1.6) 0.340	0.7% (-1.4 to 2.8) 0.534	0.3% (-4.2 to 4.9) 0.885	18.9% (-1.5 to 39.3) 0.070	10.6% (1.9 to 19.3) 0.017
Total effects[c]								
Enrolled	6.6% (0.2 to 13.0) 0.042	3.5% (0.2 to 6.8) 0.035	-6.0% (-30.2 to 18.2) 0.628	1.2% (-0.4 to 2.7) 0.142	1.1% (0.1 to 2.1) 0.024	1.6% (-0.2 to 3.3) 0.088	7.3% (-10.6 to 25.3) 0.424	6.5% (0.5 to 12.5) 0.035
Mean in control	3.9%	1.5%	79.3%	0.5%	0.1%	0.6%	39.8%	6.8%
SD in control	19.3%	12.2%	40.5%	7.0%	3.6%	7.5%	48.9%	25.1%
N	9960	9960	9573	9458	9450	9451	9489	9474

All models estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, shares in A, B, C, and all their interactions. Standard errors were clustered at the village level. Coefficients were transformed to show percentage point changes from the control group. **a** - the most serious event is defined as an accident which caused a household member to miss at least two days of work, a childbirth or a stillbirth, or three functional limitations. If none of those occurred, it is defined as the most expensive health event or one that led to the longest hospital stay. **b** - only inludes the coefficient on enrollment. **c** - the total effect is calculated as the sum of the enrollment coefficient, the share enrolled and their interaction: $\beta_{enrolled} + \beta_{shareenrolled} + \beta_{interaction}$

***Table 3**. Total effect of insurance enrollment on health outcomes at 18 months after treatment.*

	N	Mean (SD)	Direct effect Coefficient (95% CI)	Direct effect P-value[a] (95% CI / SD)[b]	Total effect Coefficient (95% CI)	Total effect P-value[a] (95% CI / SD)[b]	FDR Critical value[c]
Overall health							
Good health[e]	18983	0.657 (0.475)	0.085 (-0.012 to 0.182)	0.088 (-0.026 to 0.383)	-0.083 (-0.238 to 0.072)	0.296 (-0.501 to 0.152)	0.050
Weight							
Underweight[d]	5375	0.088 (0.283)	0.015 (-0.084 to 0.115)	0.763 (-0.297 to 0.406)	-0.052 (-0.159 to 0.055)	0.341 (-0.563 to 0.195)	0.050
Hypertension							
Hypertension grade 1[d]	5402	0.449 (0.498)	-0.112 (-0.273 to 0.048)	0.171 (-0.549 to 0.097)	-0.032 (-0.210 to 0.146)	0.728 (-0.421 to 0.294)	0.017
Hypertension grade 2[d]	5402	0.201 (0.401)	-0.075 (-0.202 to 0.052)	0.248 (-0.504 to 0.130)	0.004 (-0.164 to 0.173)	0.960 (-0.409 to 0.431)	0.017
Doctor diagnoses							
Told has hypertension[e]	18939	0.189 (0.392)	-0.027 (-0.120 to 0.065)	0.562 (-0.307 to 0.167)	-0.057 (-0.143 to 0.029)	0.191 (-0.364 to 0.073)	0.006
Told has diabetes[e]	18913	0.069 (0.253)	-0.012 (-0.064 to 0.039)	0.640 (-0.254 to 0.156)	0.007 (-0.040 to 0.054)	0.777 (-0.160 to 0.214)	0.006
Told has heart disease[e]	18868	0.022 (0.147)	0.017 (-0.015 to 0.049)	0.304 (-0.104 to 0.334)	0.013 (-0.011 to 0.037)	0.281 (-0.073 to 0.250)	0.006
Told had stroke[e]	18826	0.008 (0.091)	0.005 (-0.015 to 0.026)	0.605 (-0.164 to 0.281)	0.003 (-0.011 to 0.016)	0.692 (-0.118 to 0.178)	0.006
Mental health							
Raven score[f]	7635	4.534 (2.331)	0.945 (0.144 to 1.746)	0.021* (0.062 to 0.749)	0.897 (-0.608 to 2.401)	0.243 (-0.261 to 1.030)	0.050
Risky behavior							
Currently consumes tobacco[e]	19192	0.136 (0.343)	-0.020 (-0.102 to 0.062)	0.636 (-0.297 to 0.181)	-0.033 (-0.121 to 0.054)	0.457 (-0.352 to 0.158)	0.017
Currently consumes alcohol[e]	18985	0.064 (0.244)	-0.048 (-0.097 to 0.001)	0.054 (-0.399 to 0.003)	-0.034 (-0.094 to 0.026)	0.269 (-0.385 to 0.107)	0.017
Fertility							
Delivered in facility past yr[d]	9320	0.033 (0.179)	0.008 (-0.041 to 0.058)	0.738 (-0.228 to 0.322)	-0.019 (-0.114 to 0.075)	0.692 (-0.634 to 0.420)	0.050

All models were estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, shares in A, B, C, and all their interactions. Standard errors clustered at the village level. **a** - * indicates FDR-adjusted significance. The FDR-adjusted critical values (at 5% uncorrected significance) are: *overall health* - , *weight* - , *hypertension* - , *doctor diagnoses* - , *mental health* - , *risky behavior* - , *fertility* - . **b** - confidence interval divided by the standard deviation in the control group. **c** - p-value from a test that both female and male coefficients are equal to zero. * indicates FDR-adjusted significance. The FDR-adjusted critical values (at 5% uncorrected significance) are: *overall health* - , *weight* - , *doctor diagnoses* - , *hypertension* - , *risky behavior* - . **d** - outcomes from the anthro survey. **e** - self-reported outcomes. **f** - based on a Raven test administered to male respondents.

***Table 4**. Total effect of insurance enrollment on health outcomes at 4 years after treatment.*

			Direct effect		Total effect		FDR
	N	Control mean (SD)	Coefficient (%95 CI)	P-value[a] (95% CI / SD)[b]	Coefficient (%95 CI)	P-value[a] (95% CI / SD)[b]	FDR Crit. value
Overall health							
Good or v. good health	9492	0.516 (0.500)	-0.000 (-0.157 to 0.157)	0.998 (-0.315 to 0.314)	0.038 (-0.123 to 0.200)	0.642 (-0.246 to 0.400)	0.009
SF-8, PCS	9510	2.250 (0.899)	-0.064 (-0.402 to 0.274)	0.711 (-0.446 to 0.304)	0.230 (-0.042 to 0.501)	0.097 (-0.047 to 0.558)	0.009
SF-8, MCS	9510	1.508 (0.789)	-0.027 (-0.265 to 0.212)	0.825 (-0.336 to 0.268)	0.057 (-0.211 to 0.324)	0.678 (-0.267 to 0.410)	0.009
Doctor diagnoses							
Told had hypertension	9476	0.235 (0.424)	-0.074 (-0.198 to 0.049)	0.239 (-0.467 to 0.116)	0.018 (-0.082 to 0.118)	0.727 (-0.194 to 0.278)	0.004
Told had diabetes	9479	0.119 (0.324)	-0.078 (-0.174 to 0.019)	0.116 (-0.538 to 0.059)	-0.013 (-0.088 to 0.062)	0.739 (-0.270 to 0.192)	0.004
Told had heart disease	9473	0.043 (0.202)	-0.028 (-0.096 to 0.039)	0.409 (-0.474 to 0.193)	-0.011 (-0.058 to 0.037)	0.667 (-0.288 to 0.185)	0.004
Told had stroke	9446	0.006 (0.077)	-0.013 (-0.038 to 0.012)	0.305 (-0.496 to 0.155)	-0.002 (-0.015 to 0.011)	0.757 (-0.196 to 0.143)	0.004
Has eyesight problems	9480	0.324 (0.468)	0.010 (-0.137 to 0.158)	0.889 (-0.292 to 0.337)	0.127 (0.006 to 0.248)	0.040 (0.013 to 0.530)	0.004
Mental health							
PSS-10 score	9510	17.842 (3.502)	-0.121 (-1.133 to 0.891)	0.815 (-0.324 to 0.255)	0.510 (-0.653 to 1.674)	0.390 (-0.187 to 0.478)	0.017
GHQ-12, binary scoring	9510	2.451 (3.323)	0.417 (-0.533 to 1.366)	0.390 (-0.160 to 0.411)	0.473 (-0.792 to 1.738)	0.464 (-0.238 to 0.523)	0.017
Risky behavior							
Consumes tobacco	9510	0.121 (0.326)	-0.053 (-0.141 to 0.034)	0.230 (-0.432 to 0.104)	0.036 (-0.049 to 0.121)	0.411 (-0.151 to 0.371)	0.017
Consumes alcohol	9397	0.024 (0.154)	0.004 (-0.041 to 0.048)	0.871 (-0.263 to 0.311)	0.026 (-0.003 to 0.054)	0.077 (-0.018 to 0.351)	0.017
Fertility							
Delivery in facility past 3 yrs	9510	0.149 (0.356)	-0.053 (-0.158 to 0.052)	0.323 (-0.444 to 0.146)	-0.025 (-0.111 to 0.061)	0.564 (-0.313 to 0.171)	0.050
Mortality							
HH member died past 3 yrs	9482	0.127 (0.333)	-0.002 (-0.095 to 0.091)	0.961 (-0.287 to 0.273)	0.025 (-0.034 to 0.084)	0.409 (-0.103 to 0.252)	0.050

All models were estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, shares in A, B, C, and all their interactions. Standard errors clustered at the village level. **a** - * indicates FDR-adjusted significance. The FDR-adjusted critical values (at 5 % uncorrected significance) are: *overall health* - , *doctor diagnoses* - , *mental health* - , *risky behavior* - , *fertility* - , *mortality* - . **b** - confidence interval divided by the standard deviation in the control group

SUPPLEMENTARY CONTENT

METHODS

SAMPLE

The sampling strategy, implemented in 2013, first identified eligible villages and then eligible households within villages. Villages were included if they met 2 criteria

1. Were in Gulbarga or Mysore district, Karnataka State, and
2. Were within 25 km of a hospital empaneled in RSBY in 2013.

Within eligible villages, households were included if they answered the door and met 1 inclusion criteria:

1. Had a member that held an Above Poverty Line (APL) ration card.

Households were excluded if, as of 2013, they

1. Had a member who possessed a card indicating they were below-the-poverty-line (BPL);
2. Had a member working in an occupation that was eligible for RSBY irrespective of BPL status; or
3. Had a member that was enrolled in insurance that provided access to secondary hospital care.

The sample was identified via a listing exercise and a consent process. The listing was conducted in two waves, in March-June 2013 and in November-December 2013. The actual randomized sample was smaller than the listing because not all listed households were available the days we approached household for consent and because many households became ineligible by the time they were approached for consent. The main cause of ineligibility is that households obtained BPL cards. A total of 8,866 and 2,013 households were identified and enrolled from the two listing waves, respectively. Figure 1 presents the CONSORT flowchart for both districts combined.

RANDOMIZATION

In order to generate variation in both types of access to insurance (household-level conditions) and in the share of a village given access to insurance (village-level conditions), a 2 stage randomization process was employed separately in each district (Gulbarga, Mysore).

The first-stage randomization in each district varied the share of sample households in a village allocated to different household-level arms. The probabilities of assignment to and descriptions of each village condition are given in eFigure 1. Matching before randomization increases the power to detect spillovers because it reduces orthogonal variation. Therefore, the first stage was implemented in 2 steps. First, blocks of 20 matched villages were created. Specifically, villages were stratified into quintiles based on the number of eligible households per village. Within each quintile, blocks were constructed using village-level sample averages, Mahalanobis matching on continuous variables (head of household's level of education, age of head of household, number of children and number of rooms in the house), and caliper matching on binary variables (had major illness in last year and head of household was unemployed). These variables were constructed from a listing exercise to determine eligible villages in each village of our sample prior to our baseline survey. Second, within each block, villages were randomly assigned to 5 village-level conditions without replacement.

The second stage of randomization assigned households in a village to household-level arms based on the village-level arm to which the village was assigned. This stage also had 2 steps. First, households were sorted into blocks of 10 matched households. These blocks were constructed using household-level data gathered during our listing exercise and Mahalanobis matching on the same continuous variables and caliper matching on the same binary variables used for constructing village blocks. Second, with each block, households were randomly assigned to 4 household conditions based on the village condition to which we assigned their village in stage one.

TREATMENT

Enrollment took place just after the government conducted its enrollment drive in early 2015. We used the same enrollment method (mobile enrollment vans) the government used. There were two differences in the marketing of RSBY. First, households were visited roughly 14 days prior to arrival of the enrollment van to inform them of their treatment condition and if appropriate give them a cash transfer. Second, we visited households eligible to enroll the day of the van arrived to guide them to the van. By contrast, the government conducted its enrollment drive by circulating flyers (chits) to eligible households a few days before the van. The government did not guide eligible households to the enrollment van. For all sample households that enrolled in RSBY, we collected the full amount (insurance premium plus cost of insurance card) to be paid by households and paid this amount to the government.

The Karnataka government automatically renewed RSBY coverage annually for non-study and study households in 2016 and 2017 without any action—even payment—by enrollees. RSBY technically ended on August 31, 2018, because it was superseded by Pradhan Mantri Jal Arogya Yojana (PMJAY), a part of Ayushman Bharat Yojana. As of completion of data gathering, Karnataka had agreed to implement PMJAY but had not yet rolled it out.

DATA COLLECTION

In March – June 2013 and again in November – December 2013, we conducted listing exercises wherein we surveyed 1 adult in 25,000 households in candidate villages to identify eligible households and gather data to construct blocks of similar villages and households prior to randomization.

In August 2013 - January 2014, a baseline survey was administered to the female and male most knowledgeable about household finances and a female of childbearing age in each sample household we could reach. The biomarker survey conducted as part of the baseline was administered to the male most knowledgeable, a woman of childbearing age, and a child under the age of 18 if available in 4000 randomly selected sample households. The actual number surveyed was less than this because of non-response. Households were paid INR 250 ($14.27) as a participation incentive for completing major sections of the survey. We performed back checks on 10% of households, a rate known to surveyors ex ante.

In March – June 2019, we conducted an endline survey of all sample households to measure outcomes after approximately 4 years. We asked the female most knowledgeable about household finances from baseline a subset of questions about personal health status and household health care utilization and finances. No biomarker survey was conducted at endline. We paid households INR 50 ($2.85) as a participation incentive since only 1 individual was surveyed and for a shorter period. We performed back checks on 10% of households, a rate known to surveyors ex ante.

STATISTICAL ANALYSIS

Balancing tests were conducted to validate that assignment to village and household conditions was indeed random. This was done in 4 steps. First, baseline measurements were gathered on as many of the outcome variables as defined in our Pre-Analysis Plan as possible. Second, we estimated multinomial logit models predicting village and household condition assignments for each village and household, respectively, as a function of outcomes measure at baseline, one at a time. Third, likelihood ratio tests were conducted where the null model was the same multinomial logit model without the baseline covariate to determine if the null hypothesis that the two models are statistically equivalent, i.e., that the baseline covariate has no explanatory power, could be rejected. The p-values from these tests were collected. Fourth, the null was rejected if a one-sided Kolmogorov-Smirnov test shows that the distribution of p-values stochastically dominates the uniform distribution.

Intent-to-treat (ITT) estimates are based on the following linear regression:

$$y_{ijt} = \alpha + \Sigma_{h=1}^{3}\beta_h d_{ij}^{h} + \delta s_j + \Sigma_{h=1}^{3}\gamma^h d_{ij}^{h} s_j + \gamma X_{ij} + \epsilon_{ijt}$$

where i, j and t index households, villages and time, respectively; d_{ij}^{h} is an indicator for assignment household-condition h with ($h = 1 = A, 2 = B, 3 = C$); s_j is the share of the sample in

village j that is in household conditions A, B or C; X_{ij} are covariates (if included); and ϵ_{ijt} is an error term. We account for spillovers at the village level by examining the predicted effects on outcomes for a household in a given household condition at different shares of the village sample in that condition. If the share given access lies between 50-90%, it is in sample. Otherwise, the prediction is out-of-sample. In order for the estimate of spillover effects to be unbiased, it is assumed that assignment in villages $j' \neq j$ do not influence outcomes in another village j (partial non-interference)[20]. The cluster robust HC2 standard error is used to cluster at the village level, which is conservative[20].

As stated in the main text, the average effect of providing access to a given household was estimated using the coefficient on these indicators. The average effect on a household of providing access to other households in a village (spillover effect) was estimated using the coefficients on the share of a sample in a village in any arm and the interaction between household arm indicators and the share variable. The total effect of providing access to all sampled households in a village is the sum of direct and indirect effects.

An instrumental variables approach is used to estimate a causal average treatment effect (CATE) of RSBY enrollment. This estimate is obtained from a regression with a two-stage least squares structure where the second stage regression is

$$y_{ijt} = \alpha + \phi r_{ij} + \theta z_j + \rho r_{ij} z_j + \psi X_{ij} + u_{ijt}$$

where r_{ij} is an indicator for RSBY enrollment and z_j is the share of the sample in village j that enrolled in RSBY. We instrument for $(r_{ij}, z_j, r_{ij}z_j)$ using variables $(d_{ij}^h, d_j^v, d_{ij}^h, d_j^v)$, where d_j^v is an indicator for assignment to village-condition v for $v \in (I, II, III, IV, V)$. Weighting, controls, and standard errors are handled the same as with the ITT estimator. The exclusion restriction is that treatment assignment only affects household outcomes through the decision to enroll in RSBY. To obtain unbiased estimates of spillovers, we assumed partial non-interference, as under ITT, and that, for non-compliers, their treatment assignment does not affect their outcomes through the enrollment of other units[20].

For binary outcomes we used a linear probability model in the main text. For our ITT analysis we contrasted those results with those from estimating a logit model. We did not find economically or medically significant differences. We were unable to estimate a logit model for our CATE estimates because of limitations with existing, implementable methods. For example, maximum likelihood requires that the first stage of our 2SLS model to be correctly specified abd the control function method requires that the endogenous regressor be continuous, whereas our (enrollment) is binary[31].

ECONOMIC CALCULATIONS

We convert Indian Rupees (INR) to 2019 US Dollars (USD) using a purchasing power parity adjusted exchange rate of 18 INR/USD [32].

We calculated the demand elasticity for hospital insurance with the following formula:

[(Enrollment in Arm A - Enrollment in Arm C)/(Enrollment in C)]
÷ [(Price for insurance in C - Price in A)/(Premium in C)]

The price for C is INR 173 ($9.87), including the cost of the insurance card. We do not use the usual arc elasticity formula, which normalizes by the midpoint of enrollment and price, because our change in price is going from full price to zero price. Our formula implies this is a 100% reduction in price while the usual arc elasticity formula would imply this is a nonsensical 200% reduction in price.

TRIAL REGISTRATION AND PRE-ANALYSIS PLAN

This study was registered before outcomes were measured in the first post-treatment survey at 18 months. A pre-analysis plan was posted prior to the last follow-up survey at 4 years under American Economic Association Registry Identifier AEARCTR-0001793.

RESULTS

STUDY POPULATION

eTable 1 reports the household sample size and response rates per survey analyzed in the main text.

The table below reports baseline characteristics for the whole sample. These were referenced in the main text.

BALANCE

The table below reports the p-values of the differences in baseline characteristics across arms.

eFigure 2 shows that baseline characteristics are balanced. It plots the p-values from a series of likelihood ratio tests comparing outcomes in each arm to outcomes in the control group. The outcomes examined include all those that are measured at baseline and included in Table 1 (baseline characteristics) and Tables 3 and 4 (health outcomes). The figure also plots a uniform distribution. A Kolmogorov-Smirnov test cannot reject that the two distributions are the same (*P=1.000*).

ENROLLMENT IN INSURANCE

ITT estimates suggests small and insignificant indirect effects of insurance access on enrollment (eTable 4). This is consistent with the assumption of no spillovers in enrollment, a sufficient condition for consistency of CATE estimators[20].

eTable 5 demonstrates that there is no significant difference in enrollment in each amd due to household wealth, as measured by monthly expenditure budget.

INSURANCE UTILIZATION

ITT results

There are no significant, direct effects of access to insurance on utilization of insurance (eTable 6). However, accounting for indirect effects, insurance access leads to an increase in use of insurance for payment at 18 months in all three treatment arms and at 4 years in the free insurance and sale of insurance arms. The coefficient in the free insurance and sale of insurance plus transfer arms at 18 months are driven mainly by indirect effects.

There are no significant, direct effects of access to insurance on most measures of visits to facilities. However, there is a significant, direct effect of insurance access on day surgeries in the sale of insurance plus transfers group, though the effect is negative (-9.5 pp; 95% CI: -1.3 to -17.7 pp). Nevertheless, accounting for indirect effects, there remain no significant effects of insurance access on health care utilization.

Respondents were asked why they failed in their efforts to use their insurance card. The most common responses and the rates at which they are listed are presented in eTable 7. The rates do not sum to one because respondents are permitted to give multiple reasons for failure.

Breakdown by sex

eTables 8 and 9 provide ITT and CATE results, respectively, for healthcare facility visits by males and by females. Although the midline survey (18 months) surveyed up to 3 members of each household, use of insurance for payment was only asked of 1 respondent. Therefore, we are unable to report sex level insurance use. Two members were asked about health care facility visits. Therefore, provider visits can be broken down by gender. Other than males being less likely to visit a government hospital among households offered sale of insurance (-13.4 pp, CI: -25.1 to -1.6 pp), there were no significant impacts on facility use.

HEALTH AND CLINICAL OUTCOMES

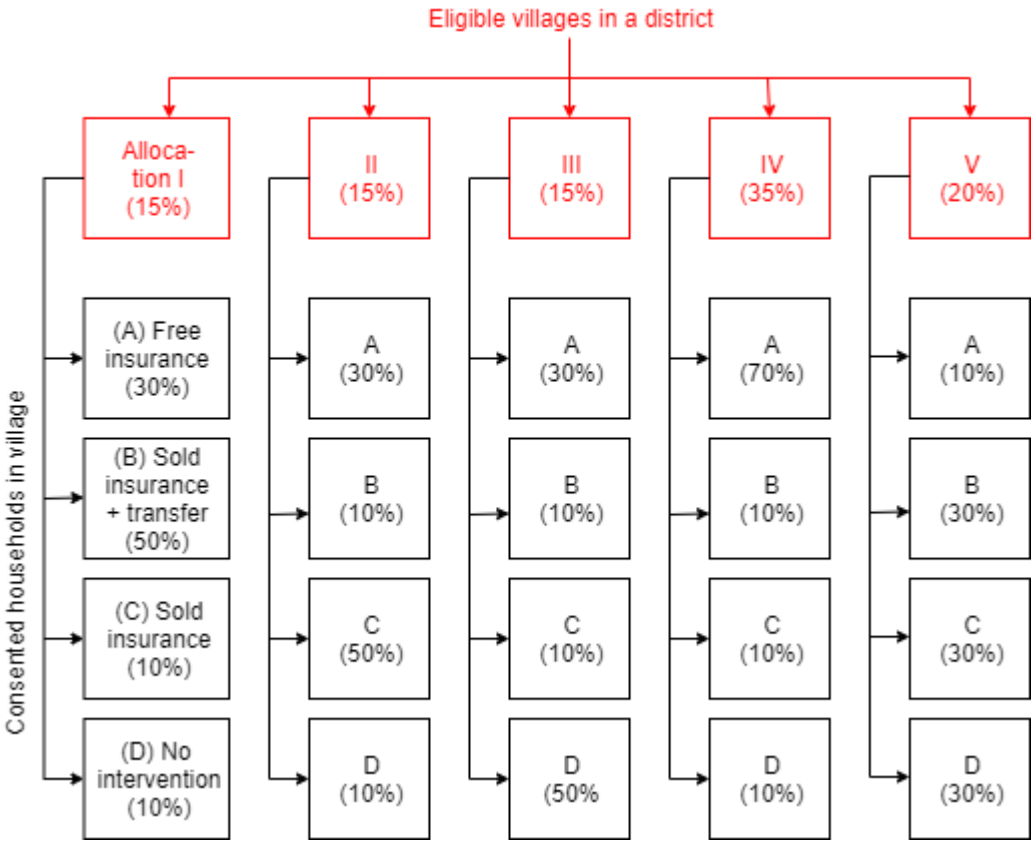
18 months

eTables 10-12 present total, direct and spillover effects of enrollment on health outcomes at 18 months separately for male and female respondents.

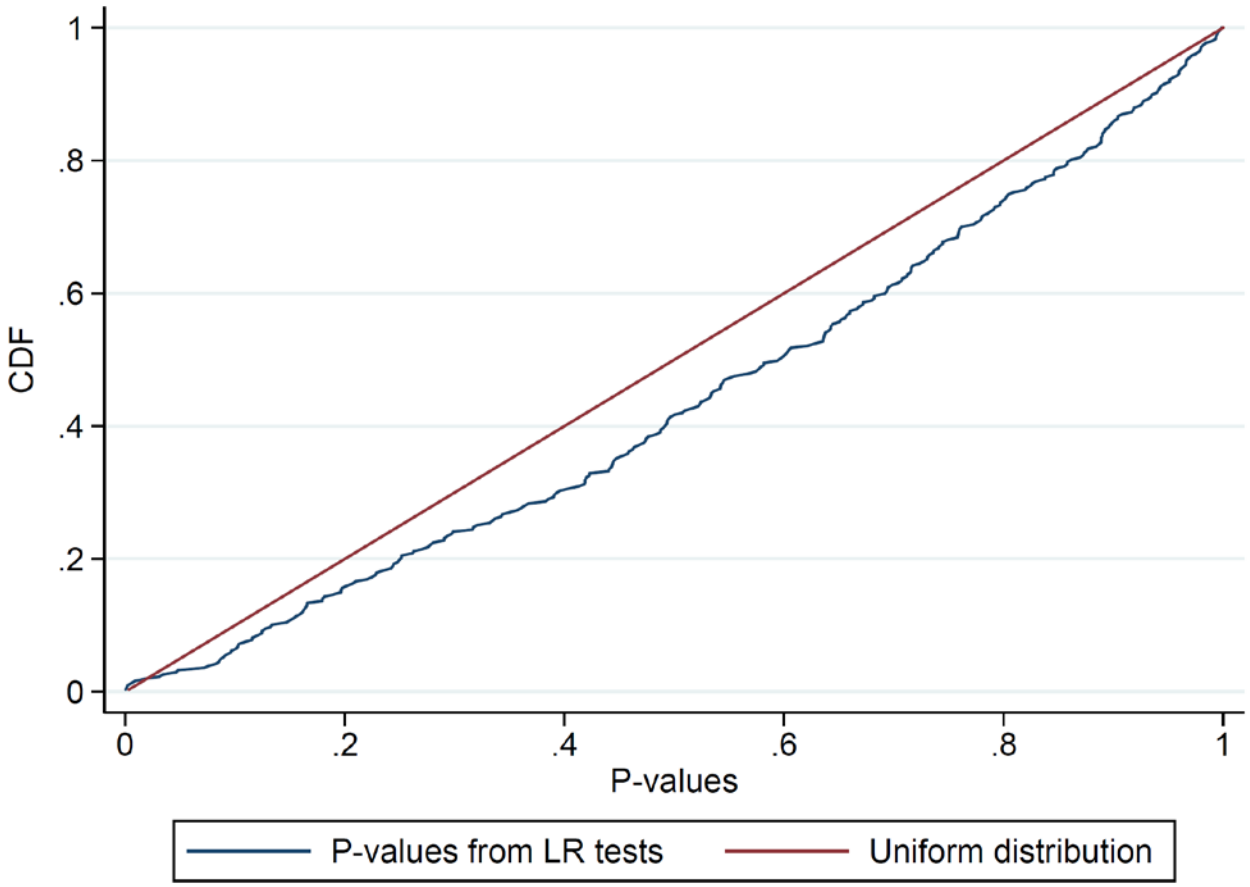
eTables 13-14 present direct and spillover effects of enrollment on health outcomes aside from those in Table 3. Estimated effects are broken down by sex.

4 years

eTables 15-18 provide direct and spillover effects of enrollment on health outcomes at 4 years.



eFigure 1. *Flowchart illustrating trial design in each district, including assignment of villages to allocation conditions and of households to insurance access conditions.*



***eFigure 2**. Cumulative distribution of p-values from likelihood ratio tests checking balance (Data) and from a uniform distribution (Perfect randomization).*

***eTable 1**. Sample size per insurance access arm and attrition and response rates by survey.*

		Insurance (access) arm					
		(A) Free insurance	(B) Sale of insurance + transfer	(C) Sale of insurance	(D) No inter-vention	Total	Attrition
Study sample		4,401	2,180	2,146	2,152	10,879	
	Sample for anthropometric surv	1,363	718	737	833	3,651	
Baseline survey							
	Main survey	4,155	2,080	2,022	2,033	10,290	589
		(94%)	(95%)	(94%)	(94%)	(95%)	(5%)
	Anthropometric survey	1,324	652	702	748	3,426	225
		(97%)	(91%)	(95%)	(90%)	(94%)	(6%)
Midline (18 mo.) follow-up							
	Main survey	4,091	2,036	2,007	1,977	10,111	768
		(93%)	(93%)	(94%)	(92%)	(93%)	(7%)
	Anthropometric survey	1,195	607	632	667	3,101	550
		(88%)	(85%)	(86%)	(80%)	(85%)	(15%)
Endline (4 yr.) follow-up							
	Main survey	3,879	1,902	1,855	1,874	9,510	1,369
		(88%)	(87%)	(86%)	(87%)	(87%)	(13%)

***eTable 2**. Baseline characteristics for whole sample (N = 10,290).*

	Mean(SD)[a]	Median(IQR)[a]
Demographic		
Age of head of hhld.[b]	51.2 (13.5)	50.0 (41.0-60.0)
Education of male head of hhld.[c]	6.6 (5.0)	7.0 (0.0-10.0)
Major illness in household[c]	0.16	
Primary earner employed[c]	0.83	
KM to nearest town[d]	9.8 (5.0)	9.6 (6.6-12.9)
Financial		
Number of hhld. members[c]	5.1 (2.4)	5.0 (4.0-6.0)
Number of children in hhld.[b]	1.4 (1.5)	1.0 (0.0-2.0)
Number of rooms in house[c]	3.2 (1.6)	3.0 (2.0-4.0)
Number of concrete rooms[b]	1.2 (2.0)	0.0 (0.0-2.0)
Annual hhld. budget[b,e]	50.4 (35.4)	48.0 (24.0-60.0)
Annual food expenditure[b,e]	41.0 (24.4)	37.2 (24.0-51.6)
Utilization		
Annual non-hosp. med. expenditure[b,e]	30.3 (79.7)	14.5 (6.4-31.0)
Annual hospital expenditure[b,e]	8.1 (37.4)	0.1 (0.0-5.0)
Visited HCP, female[b,e]	0.92	
Visited HCP, male[b,e]	0.83	

a - SDs, medians and IQRs not reported for binary variables. **b** - baseline survey. **c** - listing data. **d** - based on GPS coordinates. **e** - in 1000s of INR.

***eTable 3**. Baseline characteristics by arm and p-value of difference relative to control arm.*

		No access to insurance	Free insurance		Sale of insurance + transfer		Sale of insurance	
	N	Mean (SD)[a]	Mean (SD)[a]	P-value[f]	Mean (SD)[a]	P-value[f]	Mean (SD)[a]	P-value[f]
Demographic								
Number of hhld. members[c]	10850	5.0 (2.4)	5.1 (2.4)	0.704	5.1 (2.4)	0.220	5.1 (2.5)	0.428
Number of children in hhld.[b]	10156	1.4 (1.4)	1.4 (1.5)	0.446	1.5 (1.5)	0.416	1.4 (1.4)	0.738
Age of head of hhld.[b]	10156	50.8 (13.4)	51.4 (13.4)	0.073	51.2 (13.6)	0.339	51.4 (13.4)	0.156
Education of male head of hhld.[c]	10834	6.6 (5.0)	6.5 (5.0)	0.818	6.7 (4.9)	0.356	6.6 (4.9)	0.534
KM to nearest town[d]	10404	9.6 (4.9)	9.9 (5.1)	0.018	9.8 (4.8)	0.263	9.7 (5.0)	0.528
Financial								
Number of rooms in house[c]	10816	3.2 (1.6)	3.2 (1.6)	0.826	3.2 (1.5)	0.188	3.2 (1.6)	0.943
Number of concrete rooms[b]	10184	1.1 (2.0)	1.2 (2.0)	0.271	1.2 (2.0)	0.739	1.2 (1.9)	0.867
Annual hhld. budget[b,e]	7717	49.6 (31.3)	52.0 (39.9)	0.039	49.7 (33.6)	0.917	48.5 (30.7)	0.322
Annual food expenditure[b,e]	9919	40.3 (23.4)	41.0 (24.0)	0.290	41.3 (25.8)	0.201	41.2 (24.4)	0.270
Health and utilization								
Major illness in household[c]	10833	0.17 (0.37)	0.16 (0.37)	0.461	0.16 (0.37)	0.653	0.16 (0.37)	0.587
Visited HCP 1 yr, male or female[b]	10067	0.98 (0.14)	0.98 (0.13)	0.280	0.98 (0.12)	0.238	0.98 (0.12)	0.194
Annual non-hosp. med. exp.[b,e]	9554	28.4 (64.8)	30.2 (72.2)	0.374	29.8 (57.2)	0.499	33.0 (118.5)	0.146
Annual hospital expenditure[b,e]	9982	8.15 (37.38)	7.08 (21.46)	0.161	9.78 (55.49)	0.277	8.66 (39.76)	0.680

a - SDs not reported for binary variables. **b** - baseline survey. **c** - listing data. **d** - based on GPS coordinates. **e** - in 1000s of INR. **f** - P-values from t-tests of equality of means between groups A, B, C and group D.

***eTable 4**. Direct and indirect effects of insurance access on insurance enrollment.*

	Coefficient (95% CI) P-value
Direct effects	
Free insurance	72.4% (63 to 81.8) 0.000
Sale of insurance + transfer	65.2% (49.8 to 80.6) 0.000
Sale of insurance	48.4% (32.5 to 64.3) 0.000
Indirect effects[c]	
Free insurance	7.0% (-4.2 to 18.1) 0.219
Sale of insurance + transfer	7.8% (-10.5 to 26.2) 0.402
Sale of insurance	12.8% (-6.5 to 32.1) 0.193
Total effects[c]	
Free insurance	79.4% (76.9 to 81.9) 0.000
Sale of insurance + transfer	73.0% (69.1 to 76.9) 0.000
Sale of insurance	61.2% (56.7 to 65.7) 0.000
Mean across all arms	57.6%
SD across all arms	49.4%
N	10879

All models estimated with OLS. Each treatment arm was interacted with the share of the village allocated to A, B, or C (combined). Standard errors were clustered at the village level. Coefficients were transformed to show percentage point changes from the control group D.

***eTable** 5. Direct and indirect effects of insurance access on insurance enrollment, interacted with household budget at baseline.*

	Coefficient (95% CI) P-value
Direct effects	
Free insurance	72.96 (58.95 to 86.98) 0.000
Sale of insurance + transfer	65.01 (43.21 to 86.81) 0.000
Sale of insurance	46.80 (20.31 to 73.30) 0.001
Free insurance × hhld. expenditure	-0.02 (-0.10 to 0.06) 0.655
Sale of insurance + transfer × hhld. expenditure	0.02 (-0.11 to 0.16) 0.756
Sale of insurance × hhld. expenditure	0.02 (-0.17 to 0.20) 0.862
Indirect effects[c]	
Free insurance	6.88% (-9.37 to 23.13) 0.406
Sale of insurance + transfer	5.04% (-20.99 to 31.07) 0.704
Sale of insurance	14.03% (-18.48 to 46.54) 0.397
Free insurance × hhld. expenditure	0.02% (-0.07 to 0.12) 0.601
Sale of insurance + transfer × hhld. expenditure	0.01% (-0.15 to 0.17) 0.879
Sale of insurance × hhld. expenditure	0.00% (-0.24 to 0.24) 0.984
Total effects[c]	
Free insurance	79.84% (76.75 to 82.93) 0.000
Sale of insurance + transfer	70.05% (64.58 to 75.52) 0.000
Sale of insurance	60.84% (52.97 to 68.70) 0.000
Free insurance × hhld. expenditure	0.01% (-0.02 to 0.03) 0.540
Sale of insurance + transfer × hhld. expenditure	0.03% (0.00 to 0.07) 0.047
Sale of insurance × hhld. expenditure	0.02% (-0.05 to 0.08) 0.570
Mean across all arms	57.62%
SD across all arms	49.42%
N	9080

All models estimated with OLS. Each treatment arm was interacted with the share of the village allocated to A, B, or C (combined). Standard errors were clustered at the village level. Coefficients were transformed to show percentage point changes from the control group D.

***eTable** 6. Effect of insurance access on insurance and facility utilization.*

	Midline			Endline				
	Successful use (past 6 mos.)	Failed use (past 6 mos.)	Visited HCP 1 yr (male or female)	Successful use (past 6 mos.)	Successful use (most serious event[a])	Failed use (most serious event[a])	Visited big hosp (most serious event[a])	Day surgery
	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value
Direct effects[b]								
Free insurance	2.5%	3.6%	2.3%	2.2%	0.4%	2.2%	0.2%	-2.1%
	(-1.7 to 6.7)	(-0.2 to 7.3)	(-8.4 to 13.0)	(-0.4 to 4.7)	(-1.4 to 2.2)	(-2.1 to 6.4)	(-10.7 to 11.1)	(-9.0 to 4.9)
	0.240	0.063	0.676	0.096	0.677	0.315	0.976	0.559
Sale of insurance + transfer	2.1%	3.5%	-11.3%	3.4%	0.6%	-1.3%	-17.8%	-9.5%
	(-5.2 to 9.5)	(-1.6 to 8.5)	(-30.4 to 7.8)	(-0.6 to 7.3)	(-1.3 to 2.6)	(-3.6 to 0.9)	(-36.2 to 0.5)	(-17.7 to -1.3)
	0.569	0.177	0.247	0.092	0.537	0.242	0.057	0.023
Sale of insurance	7.7%	2.6%	-16.3%	-1.2%	-1.3%	-1.1%	-7.3%	-6.0%
	(-0.7 to 16.0)	(-1.6 to 6.7)	(-35.7 to 3.0)	(-3.3 to 0.9)	(-3.0 to 0.4)	(-4.3 to 2.0)	(-26.8 to 12.3)	(-14.2 to 2.3)
	0.071	0.226	0.098	0.270	0.133	0.488	0.466	0.155
Indirect effects[c]								
Free insurance	4.7%	-0.3%	-11.6%	-1.0%	0.2%	-1.6%	-1.0%	4.4%
	(-0.6 to 10.0)	(-4.6 to 4.1)	(-31.5 to 8.2)	(-3.7 to 1.8)	(-1.7 to 2.2)	(-6.3 to 3.2)	(-18.8 to 16.8)	(-2.5 to 11.3)
	0.081	0.897	0.250	0.483	0.833	0.517	0.912	0.212
Sale of insurance + transfer	5.8%	-0.4%	3.8%	-2.2%	-0.1%	1.9%	18.8%	13.0%
	(-3.6 to 15.2)	(-6.5 to 5.8)	(-22.6 to 30.3)	(-6.7 to 2.4)	(-2.3 to 2.0)	(-0.7 to 4.6)	(-2.6 to 40.2)	(3.6 to 22.4)
	0.229	0.899	0.775	0.349	0.894	0.149	0.085	0.007
Sale of insurance	-0.3%	0.0%	11.8%	3.1%	2.3%	2.2%	2.1%	9.5%
	(-10.5 to 10.0)	(-5.0 to 5.0)	(-15.3 to 39.0)	(0.2 to 5.9)	(0.2 to 4.4)	(-1.7 to 6.1)	(-22.1 to 26.4)	(-0.9 to 19.9)
	0.962	0.990	0.392	0.033	0.031	0.274	0.862	0.073
Total effects[c]								
Free insurance	7.2%	3.3%	-9.3%	1.2%	0.6%	0.6%	-0.8%	2.3%
	(2.5 to 11.9)	(0.7 to 5.9)	(-30.7 to 12.0)	(0.0 to 2.3)	(-0.3 to 1.5)	(-0.5 to 1.8)	(-17.8 to 16.1)	(-3.2 to 7.8)
	0.003	0.014	0.391	0.047	0.187	0.302	0.923	0.407
Sale of insurance + transfer	7.9%	3.1%	-7.4%	1.2%	0.5%	0.6%	1.0%	3.5%
	(2.9 to 12.9)	(0.2 to 5.9)	(-29.1 to 14.2)	(-0.2 to 2.6)	(-0.4 to 1.4)	(-0.5 to 1.8)	(-15.8 to 17.7)	(-2.4 to 9.4)
	0.002	0.035	0.499	0.096	0.318	0.300	0.909	0.242
Sale of insurance	7.4%	2.6%	-4.5%	1.9%	1.0%	1.1%	-5.1%	3.5%
	(2.6 to 12.3)	(0.0 to 5.2)	(-26.1 to 17.1)	(0.4 to 3.3)	(0.0 to 2.0)	(-0.3 to 2.4)	(-22.4 to 12.1)	(-2.6 to 9.6)
	0.003	0.046	0.685	0.011	0.050	0.134	0.560	0.257
Mean in control	3.9%	1.3%	79.4%	0.3%	0.1%	0.2%	39.6%	6.5%
SD in control	19.3%	11.5%	40.4%	5.7%	3.3%	4.6%	48.9%	24.7%
N	9960	9960	9573	9458	9450	9451	9489	9474

All models estimated with OLS. Each treatment arm was interacted with the share of the village allocated to A, B, or C (combined). Standard errors were clustered at the village level. Coefficients were transformed to show percentage point changes from the control group D. **a** - the most serious event is defined as an accident which caused a household member to miss at least two days of work, a childbirth or a stillbirth, or three functional limitations. If none of those occurred, it is defined as the most expensive health event or one that led to the longest hospital stay. **b** - only inludes the coefficient on treatment A, B, or C. **c** - the total effect is calculated as the sum of the treatment coefficient, the share ABC and their interaction: $\beta_{treat} + \beta_{shareABC} + \beta_{interaction}$

***eTable 7**. Reasons given for respondents inability to use RSBY insurance card.*

Reason for failure	Respon-dents (%)
Forgot the card or the papers at home	14.9
Have not yet received the card or the papers	3.2
Did not know the card can be used for this sort of purpose	14
Person who tried to use the card is not on this card	2.3
I have already used up all of the service provided by the card	2.3
Did not want to use this card for this treatment	11.3
Hospital or the doctor did not accept the card	48.4
Card machine did not work at the hospital or the doctor	1.8
Card cannot be used for this treatment	10.4
Hospital that accepts the card is too far	5.9
Did not know that card would reduce my own money payments or make treatment free	7.7

***eTable** 8: ITT effects of access to insurance on health care facility use at 18 months.*

	Female			Male		
	Visited HCP (past 1 yr)	Number of HCP visits (past 1 yr)	Last HCP was govt hosp (past 1 yr)	Visited HCP (past 1 yr)	Number of HCP visits (past 1 yr)	Last HCP was govt hosp (past 1 yr)
	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value
Direct effects[b]						
Free insurance	2.4 (-10.1 to 14.9) 0.704	-1.0 (-2.9 to 0.9) 0.291	6.1 (-3.4 to 15.6) 0.205	-1.4 (-13.3 to 10.6) 0.822	-0.0 (-0.8 to 0.7) 0.930	-4.2 (-12.0 to 3.6) 0.291
Sale of insurance	-15.4 (-38.6 to 7.8) 0.193	-2.5 (-7.4 to 2.4) 0.315	0.6 (-11.1 to 12.2) 0.923	-3.0 (-24.6 to 18.5) 0.783	-1.0 (-2.3 to 0.2) 0.111	-2.4 (-15.1 to 10.4) 0.713
Sale of insurance	-10.7 (-33.2 to 11.9) 0.354	-0.8 (-3.7 to 2.1) 0.593	1.8 (-10.3 to 13.9) 0.771	-11.3 (-34.5 to 11.8) 0.337	-1.2 (-2.4 to 0.1) 0.065	-13.4 (-25.1 to -1.6) 0.026
Total effects[c]						
Free insurance	-9.4 (-35.5 to 16.8) 0.483	-0.4 (-3.1 to 2.2) 0.749	1.7 (-7.1 to 10.5) 0.707	-3.2 (-29.6 to 23.2) 0.811	-0.5 (-1.8 to 0.9) 0.503	0.8 (-12.3 to 13.9) 0.904
Sale of insurance + transfer	-7.4 (-33.8 to 19.0) 0.582	0.5 (-2.4 to 3.5) 0.719	2.8 (-6.8 to 12.4) 0.566	-3.3 (-30.3 to 23.7) 0.810	-0.1 (-1.5 to 1.3) 0.909	-0.3 (-13.5 to 13.0) 0.970
Sale of insurance	-7.2 (-33.7 to 19.3) 0.594	-0.3 (-3.1 to 2.4) 0.806	2.8 (-6.3 to 11.9) 0.544	0.5 (-26.0 to 27.1) 0.968	-0.1 (-1.5 to 1.4) 0.940	3.2 (-10.0 to 16.4) 0.634
Mean in control	66.8%	3.4%	8.0%	43.6%	1.8%	11.2%
N	9690	9535	9694	9281	9092	9286

All models estimated with OLS. Each treatment arm was interacted with the share of the village allocated to A, B, or C (combined). Standard errors were clustered at the village level. Coefficients were transformed to show percentage point changes from the control group D. **b** - only inludes the coefficient on treatment A, B, or C. **c** - the total effect is calculated as the sum of the treatment coefficient, the share ABC and their interaction: $\beta_{treat} + \beta_{shareABC} + \beta_{interaction}$

***eTable** 9: CATE effects of insurance on health care facility use at 18 months.*

	Female			Male		
	Visited HCP (past 1 yr)	Number of HCP visits (past 1 yr)	Last HCP was govt hosp (past 1 yr)	Visited HCP (past 1 yr)	Number of HCP visits (past 1 yr)	Last HCP was govt hosp (past 1 yr)
	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value	Coefficient (95% CI) P-value
Direct effect[b]						
Enrolled	-2.5 (-18.8 to 13.8) 0.765	-0.7 (-3.4 to 2.0) 0.606	4.9 (-4.9 to 14.7) 0.325	-1.8 (-17.7 to 14.0) 0.819	-0.4 (-1.3 to 0.4) 0.331	-5.3 (-15.2 to 4.5) 0.288
Total effects[c]						
Enrolled	-5.1 (-34.8 to 24.7) 0.738	0.5 (-2.4 to 3.4) 0.744	0.3 (-9.4 to 10.0) 0.956	-0.8 (-29.2 to 27.6) 0.957	-0.1 (-1.6 to 1.5) 0.928	3.8 (-8.6 to 16.2) 0.549
Mean in control	66.5%	3.7%	9.3%	43.5%	1.8%	11.5%
N	9690	9535	9694	9281	9092	9286

All models estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, shares in A, B, C, and all their interactions. Standard errors were clustered at the village level. Coefficients were transformed to show percentage point changes from the control group. **b** - only inludes the coefficient on enrollment. **c** - the total effect is calculated as the sum of the enrollment coefficient, the share enrolled and their interaction: $\beta_{enrolled} + \beta_{shareenrolled} + \beta_{interaction}$

***eTable** 10. Total effects of enrollment on clinical and health outcomes at 18 months, by sex.*

	Female		Male		Combined	FDR
	Mean (SD)	Coefficient (95% CI)	Mean (SD)	Coefficient (95% CI)	P-value[c]	Critical value[c]
Overall health						
Good health[e]	0.654 (0.476)	-0.099 (-0.347 to 0.149)	0.660 (0.474)	-0.065 (-0.308 to 0.177)	0.576	0.050
Weight						
Underweight[d]	0.093 (0.291)	-0.063 (-0.213 to 0.087)	0.082 (0.274)	-0.041 (-0.134 to 0.053)	0.625	0.050
Hypertension						
Hypertension grade 1[d]	0.411 (0.492)	-0.087 (-0.291 to 0.117)	0.488 (0.500)	0.026 (-0.194 to 0.247)	0.574	0.017
Hypertension grade 2[d]	0.173 (0.379)	0.083 (-0.084 to 0.249)	0.229 (0.421)	-0.084 (-0.306 to 0.138)	0.230	0.017
Doctor diagnoses						
Told has hypertension[e]	0.197 (0.398)	-0.078 (-0.209 to 0.054)	0.181 (0.385)	-0.035 (-0.151 to 0.081)	0.413	0.006
Told has diabetes[e]	0.070 (0.256)	-0.001 (-0.070 to 0.068)	0.067 (0.251)	0.014 (-0.048 to 0.077)	0.904	0.006
Told has heart disease[e]	0.020 (0.140)	0.004 (-0.027 to 0.035)	0.024 (0.154)	0.022 (-0.011 to 0.055)	0.415	0.006
Told had stroke[e]	0.006 (0.079)	0.004 (-0.008 to 0.016)	0.010 (0.102)	0.002 (-0.022 to 0.025)	0.826	0.006
Mental health						
Raven test score[f]			4.534 (2.331)	0.897 (-0.608 to 2.401)		
Risky behavior						
Currently consumes tobacco[e]	0.058 (0.234)	-0.079 (-0.153 to -0.006)	0.217 (0.412)	0.015 (-0.148 to 0.178)	0.107	0.017
Currently consumes alcohol[e]	0.004 (0.063)	-0.015 (-0.032 to 0.003)	0.127 (0.333)	-0.054 (-0.177 to 0.068)	0.166	0.017
Fertility						
Delivered in facility past yr[d]	0.033 (0.179)	-0.019 (-0.114 to 0.075)				

All models were estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, shares in A, B, C, and all their interactions. Standard errors clustered at the village level. **a** - * indicates FDR-adjusted significance. The FDR-adjusted critical values (at 5% uncorrected significance) are: *overall health* - 0.017, *weight* - 0.017, *hypertension* - 0.006, *doctor diagnoses* - 0.002, *mental health* - 0.050, *risky behavior* - 0.006, *fertility* - 0.050. **b** - confidence interval divided by the standard deviation in the control group. **c** - p-value from a test that both female and male coefficients are equal to zero. * indicates FDR-adjusted significance. The FDR-adjusted critical values (at 5% uncorrected significance) are: *overall health* - 0.050, *weight* - 0.050, *doctor diagnoses* - 0.006, *hypertension* - 0.017, *risky behavior* - 0.017. **d** - outcomes from the anthro survey. **e** - self-reported outcomes. **f** - based on a Raven test administered to male respondents.

***eTable** 11. Direct effects of enrollment on clinical and health outcomes at 18 months, by sex.*

	Female			Male			FDR
	Mean (SD)	Coefficient (95% CI)	P-value[a] (95% CI / SD)[b]	Mean (SD)	Coefficient (95% CI)	P-value[a] (95% CI / SD)[b]	Critical value[c]
Overall health							
Good health[e]	0.654 (0.476)	0.021 (-0.121 to 0.163)	0.775 (-0.255 to 0.342)	0.660 (0.474)	0.154 (0.018 to 0.290)	0.027 (0.038 to 0.612)	0.017
Weight							
Underweight[d]	0.093 (0.291)	0.037 (-0.095 to 0.169)	0.584 (-0.326 to 0.580)	0.082 (0.274)	-0.010 (-0.149 to 0.130)	0.893 (-0.545 to 0.475)	0.017
Hypertension							
Hypertension grade 1[d]	0.411 (0.492)	-0.251 (-0.439 to -0.063)	0.009 (-0.892 to -0.128)	0.488 (0.500)	0.041 (-0.200 to 0.281)	0.739 (-0.399 to 0.563)	0.006
Hypertension grade 2[d]	0.173 (0.379)	-0.125 (-0.319 to 0.069)	0.208 (-0.843 to 0.183)	0.229 (0.421)	-0.012 (-0.220 to 0.195)	0.906 (-0.524 to 0.464)	0.006
Doctor diagnoses							
Told has hypertension[e]	0.197 (0.398)	0.056 (-0.071 to 0.184)	0.388 (-0.179 to 0.461)	0.181 (0.385)	-0.115 (-0.239 to 0.009)	0.069 (-0.622 to 0.023)	0.002
Told has diabetes[e]	0.070 (0.256)	0.002 (-0.070 to 0.074)	0.953 (-0.274 to 0.291)	0.067 (0.251)	-0.028 (-0.100 to 0.044)	0.447 (-0.400 to 0.176)	0.002
Told has heart disease[e]	0.020 (0.140)	0.008 (-0.033 to 0.049)	0.704 (-0.237 to 0.351)	0.024 (0.154)	0.026 (-0.019 to 0.070)	0.255 (-0.120 to 0.452)	0.002
Told had stroke[e]	0.006 (0.079)	0.031 (0.009 to 0.052)	0.005 (0.119 to 0.657)	0.010 (0.102)	-0.022 (-0.054 to 0.010)	0.180 (-0.529 to 0.099)	0.002
Mental health							
Raven score[f]				4.534 (2.331)	0.945 (0.144 to 1.746)	0.021* (0.062 to 0.749)	0.050
Risky behavior							
Currently consumes tobacco[e]	0.058 (0.234)	0.065 (-0.014 to 0.143)	0.108 (-0.061 to 0.612)	0.217 (0.412)	-0.108 (-0.245 to 0.029)	0.121 (-0.595 to 0.070)	0.006
Currently consumes alcohol[e]	0.004 (0.063)	-0.006 (-0.029 to 0.017)	0.617 (-0.462 to 0.274)	0.127 (0.333)	-0.094 (-0.192 to 0.005)	0.063 (-0.578 to 0.015)	0.006
Fertility							
Delivered in facility past yr[d]	0.033 (0.179)	0.008 (-0.041 to 0.058)	0.738 (-0.228 to 0.322)				0.050

All models were estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, shares in A, B, C, and all their interactions. Standard errors clustered at the village level. **a** - * indicates FDR-adjusted significance. The FDR-adjusted critical values (at 5% uncorrected significance) are: *overall health* - 0.017, *weight* - 0.017, *hypertension* - 0.006, *doctor diagnoses* - 0.002, *mental health* - 0.050, *risky behavior* - 0.006, *fertility* - 0.050. **b** - confidence interval divided by the standard deviation in the control group. **c** - p-value from a test that both female and male coefficients are equal to zero. * indicates FDR-adjusted significance. The FDR-adjusted critical values (at 5% uncorrected significance) are: *overall health* - 0.050, *weight* - 0.050, *doctor diagnoses* - 0.006, *hypertension* - 0.017, *risky behavior* - 0.017. **d** - outcomes from the anthro survey. **e** - self-reported outcomes. **f** - based on a Raven test administered to male respondents.

***eTable** 12. Spillover effects of enrollment on clinical and health outcomes at 18 months, by sex.*

	Female			Male			FDR
	Mean (SD)	Coefficient (95% CI)	P-value[a] (95% CI / SD)[b]	Mean (SD)	Coefficient (95% CI)	P-value[a] (95% CI / SD)[b]	Critical value[c]
Overall health							
Good health[e]	0.654 (0.476)	-0.120 (-0.390 to 0.150)	0.385 (-0.820 to 0.316)	0.660 (0.474)	-0.219 (-0.477 to 0.039)	0.096 (-1.007 to 0.082)	0.017
Weight							
Underweight[d]	0.093 (0.291)	-0.100 (-0.302 to 0.103)	0.335 (-1.037 to 0.353)	0.082 (0.274)	-0.031 (-0.216 to 0.154)	0.742 (-0.787 to 0.561)	0.017
Hypertension							
Hypertension grade 1[d]	0.411 (0.492)	0.164 (-0.091 to 0.419)	0.208 (-0.186 to 0.852)	0.488 (0.500)	-0.015 (-0.319 to 0.289)	0.924 (-0.637 to 0.578)	0.006
Hypertension grade 2[d]	0.173 (0.379)	0.208 (0.000 to 0.415)	0.049 (0.001 to 1.095)	0.229 (0.421)	-0.072 (-0.344 to 0.201)	0.607 (-0.818 to 0.478)	0.006
Doctor diagnoses							
Told has hypertension[e]	0.197 (0.398)	-0.134 (-0.313 to 0.045)	0.143 (-0.786 to 0.114)	0.181 (0.385)	0.080 (-0.074 to 0.234)	0.310 (-0.193 to 0.608)	0.002
Told has diabetes[e]	0.070 (0.256)	-0.003 (-0.095 to 0.089)	0.950 (-0.373 to 0.349)	0.067 (0.251)	0.042 (-0.050 to 0.135)	0.369 (-0.200 to 0.538)	0.002
Told has heart disease[e]	0.020 (0.140)	-0.004 (-0.058 to 0.050)	0.888 (-0.413 to 0.357)	0.024 (0.154)	-0.003 (-0.051 to 0.044)	0.884 (-0.328 to 0.283)	0.002
Told had stroke[e]	0.006 (0.079)	-0.027 (-0.056 to 0.002)	0.066 (-0.704 to 0.023)	0.010 (0.102)	0.024 (-0.011 to 0.058)	0.186 (-0.112 to 0.576)	0.002
Mental health							
Raven test score[f]				4.534 (2.331)	-0.048 (-1.742 to 1.645)	0.955 (-0.747 to 0.706)	0.050
Risky behavior							
Currently consumes tobacco[e]	0.058 (0.234)	-0.144 (-0.252 to -0.035)	0.009 (-1.077 to -0.151)	0.217 (0.412)	0.123 (-0.066 to 0.312)	0.203 (-0.161 to 0.757)	0.006
Currently consumes alcohol[e]	0.004 (0.063)	-0.009 (-0.040 to 0.022)	0.586 (-0.630 to 0.356)	0.127 (0.333)	0.039 (-0.101 to 0.179)	0.582 (-0.302 to 0.538)	0.006
Fertility							
Delivered in facility past yr[d]	0.033 (0.179)	-0.028 (-0.114 to 0.059)	0.531 (-0.635 to 0.327)				0.050

All models were estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, shares in A, B, C, and all their interactions. Standard errors clustered at the village level. **a** - * indicates FDR-adjusted significance. The FDR-adjusted critical values (at 5% uncorrected significance) are: *overall health* - 0.017, *weight* - 0.017, *hypertension* - 0.006, *doctor diagnoses* - 0.002, *mental health* - 0.050, *risky behavior* - 0.006, *fertility* - 0.050. **b** - confidence interval divided by the standard deviation in the control group. **c** - p-value from a test that both female and male coefficients are equal to zero. * indicates FDR-adjusted significance. The FDR-adjusted critical values (at 5% uncorrected significance) are: *overall health* - 0.050, *weight* - 0.050, *doctor diagnoses* - 0.006, *hypertension* - 0.017, *risky behavior* - 0.017. **d** - outcomes from the anthro survey. **e** - self-reported outcomes. **f** - based on a Raven test administered to male respondents.

***eTable** 13A. Direct effects of enrollment on clinical and health outcomes at 18 months.*

	Female			Male			Combined
	Mean (SD)[a]	Coefficient (%95 CI)	P-value	Mean (SD)[a]	Coefficient (%95 CI)	P-value	P-value[b]
Weight							
Underweight[c]	0.093	0.036 (-0.096 to 0.168)	0.592	0.082	-0.011 (-0.151 to 0.129)	0.880	0.849
Severely obese[c]	0.062	-0.025 (-0.148 to 0.097)	0.685	0.027	0.056 (-0.039 to 0.152)	0.249	0.446
Abdominal obesity[c]	0.697	-0.194 (-0.440 to 0.052)	0.122	0.702	-0.030 (-0.374 to 0.313)	0.862	0.251
Mid upper arm circ[c]	26.47 (3.72)	-3.07 (-4.90 to -1.24)	0.001	27.31 (3.22)	-1.73 (-3.63 to 0.17)	0.075	0.004
Skinfolds total[c]	26.75 (9.83)	-3.54 (-9.36 to 2.29)	0.235	26.94 (9.89)	1.29 (-4.44 to 7.02)	0.658	0.268
Blood pressure							
Prehypertension (sys or dias)[c]	0.653	-0.273 (-0.478 to -0.069)	0.009	0.759	0.094 (-0.118 to 0.305)	0.387	0.017
Hypertension (sys or dias)[c]	0.173	-0.128 (-0.322 to 0.065)	0.193	0.229	-0.012 (-0.222 to 0.197)	0.908	0.403
Doctor diagnoses							
Any doctor-diagnosed problem[d]	0.234	0.082 (-0.058 to 0.222)	0.251	0.228	-0.105 (-0.231 to 0.021)	0.102	0.139
No. of doctor-diagnosed issues[d]	0.297 (0.597)	0.105 (-0.077 to 0.286)	0.258	0.281 (0.571)	-0.147 (-0.314 to 0.019)	0.083	0.112
Depressed most or all the time[d]	0.569	-0.087 (-0.250 to 0.076)	0.297	0.701	-0.016 (-0.181 to 0.149)	0.848	0.580
Good health[d]	0.654	0.020 (-0.122 to 0.161)	0.787	0.660	0.153 (0.017 to 0.290)	0.028	0.085
Currently consumes tobacco[d]	0.058	0.064 (-0.014 to 0.143)	0.109	0.217	-0.109 (-0.246 to 0.029)	0.122	0.060
Raven test score[e]				4.534 (2.331)	0.945 (0.144 to 1.746)	0.021	

All models, except Raven test, were estimated with GMM. Raven test was estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, shares in A, B, C, and all their interactions. Standard errors clustered at the village level. **a** - standard deviations not reported for binary variables. **b** - p-value from a test that both female and male coefficients are equal to zero. **c** - outcomes from the anthro survey **d** - self-reported outcomes **e** - based on a Raven test administered to male respondents.

***eTable** 13B. Direct effects of enrollment on self-reported health outcomes at 18 months.*

	Female			Male			Combined
	Mean (SD)[a]	Coefficient (%95 CI)	P-value	Mean (SD)[a]	Coefficient (%95 CI)	P-value	P-value[b]
Chronic conditions							
Told has hypertension[d]	0.197	0.056 (-0.071 to 0.184)	0.386	0.181	-0.115 (-0.239 to 0.010)	0.071	0.115
Told has diabetes[d]	0.070	0.002 (-0.070 to 0.074)	0.957	0.067	-0.028 (-0.100 to 0.045)	0.450	0.750
Told has cancer[d]	0.005	-0.001 (-0.015 to 0.014)	0.926	0.005	-0.013 (-0.031 to 0.005)	0.158	0.367
Told has lung disease[d]	0.035	0.025 (-0.028 to 0.079)	0.349	0.036	-0.032 (-0.096 to 0.032)	0.332	0.332
Told has heart disease[d]	0.020	0.008 (-0.033 to 0.049)	0.712	0.024	0.025 (-0.019 to 0.069)	0.263	0.522
Told had stroke[d]	0.006	0.031 (0.010 to 0.053)	0.005	0.010	-0.022 (-0.054 to 0.010)	0.175	0.004
Told had arthritis[d]	0.225	-0.116 (-0.256 to 0.024)	0.105	0.126	-0.090 (-0.195 to 0.015)	0.094	0.099
Diagnose with high cholesterol[d]	0.022	0.012 (-0.029 to 0.054)	0.557	0.021	0.010 (-0.020 to 0.040)	0.499	0.686
Health behaviour							
Currently consumes tobacco[d]	0.058	0.064 (-0.014 to 0.143)	0.109	0.217	-0.109 (-0.246 to 0.029)	0.122	0.060
Currently consumes alcohol[d]	0.004	-0.006 (-0.029 to 0.017)	0.611	0.127	-0.094 (-0.193 to 0.004)	0.061	0.148
Good health[d]	0.654	0.020 (-0.122 to 0.161)	0.787	0.660	0.153 (0.017 to 0.290)	0.028	0.085
Underweight[c]	0.093	0.036 (-0.096 to 0.168)	0.592	0.082	-0.011 (-0.151 to 0.129)	0.880	0.849
Overweight[c]	0.310	-0.052 (-0.259 to 0.154)	0.619	0.252	0.033 (-0.205 to 0.271)	0.785	0.793
Weight in kg[c]	54.51 (9.83)	-3.73 (-8.47 to 1.02)	0.124	61.92 (9.88)	-0.29 (-6.08 to 5.50)	0.921	0.266
Currently pregnant[d]	0.058 (0.233)	0.035 (-0.038 to 0.107)	0.345				

All models, except pregnancy, were estimated with GMM. Pregnancy was estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, shares in A, B, C, and all their interactions. Standard errors clustered at the village level. **a** - standard deviations not reported for binary variables. **b** - p-value from a test that both female and male coefficients are equal to zero. **c** - outcomes from the anthro survey **d** - self-reported outcomes.

***eTable** 14A. Spillover effects of enrollment on self-reported health outcomes at 18 months.*

	Female			Male			Combined
	Mean (SD)[a]	Coefficient (%95 CI)	P-value	Mean (SD)[a]	Coefficient (%95 CI)	P-value	P-value[b]
Weight							
Underweight[c]	0.093	-0.099 (-0.301 to 0.104)	0.339	0.082	-0.029 (-0.214 to 0.155)	0.755	0.633
Severely obese[c]	0.062	0.031 (-0.114 to 0.175)	0.677	0.027	-0.058 (-0.168 to 0.052)	0.302	0.476
Abdominal obesity[c]	0.697	0.363 (-0.068 to 0.794)	0.099	0.702	0.064 (-0.301 to 0.429)	0.731	0.228
Mid upper arm circ[c]	26.47 (3.72)	2.43 (-0.85 to 5.71)	0.147	27.31 (3.22)	0.27 (-3.17 to 3.72)	0.878	0.166
Skinfolds total[c]	26.75 (9.83)	2.98 (-8.32 to 14.28)	0.605	26.94 (9.89)	1.53 (-8.51 to 11.56)	0.765	0.866
Blood pressure							
Prehypertension (sys or dias)[c]	0.653	0.158 (-0.147 to 0.464)	0.310	0.759	-0.030 (-0.311 to 0.251)	0.835	0.528
Hypertension (sys or dias)[c]	0.173	0.209 (0.003 to 0.416)	0.047	0.229	-0.072 (-0.345 to 0.200)	0.604	0.111
Doctor diagnoses							
Any doctor-diagnosed problem[d]	0.234	-0.179 (-0.373 to 0.014)	0.070	0.228	0.069 (-0.096 to 0.234)	0.415	0.135
No. of doctor-diagnosed issues[d]	0.297 (0.597)	-0.154 (-0.414 to 0.106)	0.245	0.281 (0.571)	0.125 (-0.102 to 0.352)	0.281	0.278
Depressed most or all the time[d]	0.569	0.304 (0.011 to 0.596)	0.042	0.701	-0.021 (-0.282 to 0.240)	0.874	0.086
Good health[d]	0.654	-0.118 (-0.388 to 0.151)	0.390	0.660	-0.218 (-0.477 to 0.041)	0.099	0.168
Currently consumes tobacco[d]	0.058	-0.144 (-0.252 to -0.035)	0.009	0.217	0.124 (-0.066 to 0.313)	0.200	0.015
Raven test score[e]				4.534 (2.331)	-0.048 (-1.742 to 1.645)	0.955	

All models, except Raven test, were estimated with GMM. Raven test was estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, shares in A, B, C, and all their interactions. Standard errors clustered at the village level. **a** - standard deviations not reported for binary variables. **b** - p-value from a test that both female and male coefficients are equal to zero. **c** - outcomes from the anthro survey **d** - self-reported outcomes **e** - based on a Raven test administered to male respondents.

***eTable** 14B. Spillover effects of enrollment on self-reported health outcomes at 18 months.*

	Female			Male			Combined
	Mean (SD)[a]	Coefficient (%95 CI)	P-value	Mean (SD)[a]	Coefficient (%95 CI)	P-value	P-value[b]
Chronic conditions							
Told has hypertension[d]	0.197	-0.134 (-0.313 to 0.045)	0.142	0.181	0.079 (-0.075 to 0.233)	0.315	0.176
Told has diabetes[d]	0.070	-0.003 (-0.095 to 0.090)	0.955	0.067	0.042 (-0.050 to 0.135)	0.372	0.671
Told has cancer[d]	0.005	0.004 (-0.015 to 0.024)	0.665	0.005	0.023 (-0.003 to 0.049)	0.080	0.200
Told has lung disease[d]	0.035	-0.051 (-0.111 to 0.009)	0.095	0.036	0.036 (-0.038 to 0.110)	0.341	0.140
Told has heart disease[d]	0.020	-0.004 (-0.058 to 0.050)	0.895	0.024	-0.003 (-0.050 to 0.044)	0.900	0.986
Told had stroke[d]	0.006	-0.027 (-0.056 to 0.002)	0.065	0.010	0.024 (-0.011 to 0.059)	0.179	0.047
Told had arthritis[d]	0.225	0.050 (-0.178 to 0.277)	0.668	0.126	0.203 (0.032 to 0.375)	0.020	0.064
Diagnose with high cholesterol[d]	0.022	0.008 (-0.049 to 0.066)	0.781	0.021	-0.014 (-0.066 to 0.038)	0.604	0.791
Health behaviour							
Currently consumes tobacco[d]	0.058	-0.144 (-0.252 to -0.035)	0.009	0.217	0.124 (-0.066 to 0.313)	0.200	0.015
Currently consumes alcohol[d]	0.004	-0.009 (-0.039 to 0.022)	0.589	0.127	0.040 (-0.100 to 0.179)	0.576	0.723
Good health[d]	0.654	-0.118 (-0.388 to 0.151)	0.390	0.660	-0.218 (-0.477 to 0.041)	0.099	0.168
Underweight[c]	0.093	-0.099 (-0.301 to 0.104)	0.339	0.082	-0.029 (-0.214 to 0.155)	0.755	0.633
Overweight[c]	0.310	0.169 (-0.157 to 0.496)	0.309	0.252	-0.085 (-0.400 to 0.230)	0.596	0.432
Weight in kg[c]	54.51 (9.83)	3.84 (-3.69 to 11.36)	0.318	61.92 (9.88)	-2.40 (-10.94 to 6.13)	0.581	0.253
Currently pregnant[e]	0.058 (0.233)	-0.089 (-0.220 to 0.043)	0.186				

All models, except pregnancy, were estimated with GMM. Pregnancy was estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, shares in A, B, C, and all their interactions. Standard errors clustered at the village level. **a** - standard deviations not reported for binary variables. **b** - p-value from a test that both female and male coefficients are equal to zero. **c** - outcomes from the anthro survey **d** - self-reported outcomes **e** - based on a Raven test administered to male respondents.

***eTable** 15. Direct effects of enrollment on self-reported health outcomes at 4 years.*

	Control mean (SD)	Coefficient (%95 CI)	P-value[a] (95% CI / SD)[b]	FDR Crit. value
Overall health				
Good or v. good health	0.516 (0.500)	-0.000 (-0.157 to 0.157)	0.998 (-0.315 to 0.314)	0.009
SF-8, PCS	2.250 (0.899)	-0.064 (-0.402 to 0.274)	0.711 (-0.446 to 0.304)	0.009
SF-8, MCS	1.508 (0.789)	-0.027 (-0.265 to 0.212)	0.825 (-0.336 to 0.268)	0.009
Doctor diagnoses				
Told had hypertension	0.235 (0.424)	-0.074 (-0.198 to 0.049)	0.239 (-0.467 to 0.116)	0.004
Told had diabetes	0.119 (0.324)	-0.078 (-0.174 to 0.019)	0.116 (-0.538 to 0.059)	0.004
Told had heart disease	0.043 (0.202)	-0.028 (-0.096 to 0.039)	0.409 (-0.474 to 0.193)	0.004
Told had stroke	0.006 (0.077)	-0.013 (-0.038 to 0.012)	0.305 (-0.496 to 0.155)	0.004
Has eyesight problems	0.324 (0.468)	0.010 (-0.137 to 0.158)	0.889 (-0.292 to 0.337)	0.004
Mental health				
PSS-10 score	17.842 (3.502)	-0.121 (-1.133 to 0.891)	0.815 (-0.324 to 0.255)	0.017
GHQ-12, binary scoring	2.451 (3.323)	0.417 (-0.533 to 1.366)	0.390 (-0.160 to 0.411)	0.017
Risky behavior				
Consumes tobacco	0.121 (0.326)	-0.053 (-0.141 to 0.034)	0.230 (-0.432 to 0.104)	0.017
Consumes alcohol	0.024 (0.154)	0.004 (-0.041 to 0.048)	0.871 (-0.263 to 0.311)	0.017
Fertility				
Delivery in facility past 3 yrs	0.149 (0.356)	-0.053 (-0.158 to 0.052)	0.323 (-0.444 to 0.146)	0.050
Mortality				
HH member died past 3 yrs	0.127 (0.333)	-0.002 (-0.095 to 0.091)	0.961 (-0.287 to 0.273)	0.050

All models were estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, shares in A, B, C, and all their interactions. Standard errors clustered at the village level. a - * indicates FDR-adjusted significance. The FDR-adjusted critical values (at 5 % uncorrected significance) are: *overall health* - 0.009, *doctor diagnoses* - 0.004, *mental health* - , *risky behavior* - 0.017, *fertility* - 0.050, *mortality* - 0.050. b - confidence interval divided by the standard deviation in the control group

***eTable** 16A. Direct effects of enrollment on health outcomes aside from those in Table 4 at 4 years.*

	Control mean (SD)[a]	Coefficient (%95 CI)	P-value
Good or v. good health	0.516	-0.001 (-0.159 to 0.157)	0.988
Poor or v. poor health	0.104	-0.038 (-0.138 to 0.063)	0.462
HH member died within past 3 years	0.127	-0.002 (-0.095 to 0.091)	0.963
Weight in KGs (self-reported)	57.3 (11.3)	-1.0 (-4.9 to 2.9)	0.615
Chronic conditions			
Told had hypertension	0.235	-0.074 (-0.198 to 0.050)	0.240
Told had diabetes	0.119	-0.079 (-0.175 to 0.018)	0.110
Told had cancer	0.005	-0.000 (-0.017 to 0.016)	0.977
Told had lung disease	0.055	-0.050 (-0.111 to 0.012)	0.112
Told had heart disease	0.043	-0.029 (-0.096 to 0.038)	0.400
Told had stroke	0.006	-0.013 (-0.038 to 0.012)	0.300
Told had arthritis	0.199	-0.052 (-0.179 to 0.074)	0.418
Diagnosed with high cholesterol	0.022	0.003 (-0.040 to 0.046)	0.896
Has eyesight problems	0.324	0.011 (-0.136 to 0.158)	0.884

All models were estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, combined share ABC and their interactions. Standard errors clustered at the village level. a - standard deviations not reported for binary variables.

***eTable** 16B. Direct effects of enrollment on health outcomes aside from those in Table 4 at 4 years.*

	Control mean (SD)[a]	Coefficient (%95 CI)	P-value
Physical health			
Fainted in past 4 wks.	0.012	0.015 (-0.017 to 0.046)	0.363
Felt dizzy in past 4 wks.	0.132	0.086 (-0.007 to 0.178)	0.071
Shortness of breath in past 4 wks.	0.056	0.038 (-0.025 to 0.102)	0.237
Heart pounded in past 4 weeks	0.071	0.009 (-0.060 to 0.078)	0.803
Mental health			
PSS-10 score	17.8 (3.5)	-0.1 (-1.1 to 0.9)	0.831
GHQ-12, Likert scoring	9.3 (6.8)	0.8 (-1.1 to 2.8)	0.405
GHQ-12, binary scoring	2.5 (3.3)	0.4 (-0.5 to 1.4)	0.371
Health behaviour			
Currently consumes tobacco	0.121	-0.057 (-0.145 to 0.031)	0.204
Currently consumes alcohol	0.024	0.002 (-0.043 to 0.048)	0.916
Fertility			
Childbirth, incl. stillbirth, past 6 mos.	0.045	0.009 (-0.048 to 0.066)	0.757
Childbirth, incl. stillbirth, past 3 yrs.	0.187	-0.004 (-0.121 to 0.113)	0.949
Num. of live births, past 3 yrs.	0.202 (0.491)	-0.003 (-0.135 to 0.129)	0.964
Doctor or nurse assisted with delivery	0.161	-0.035 (-0.142 to 0.073)	0.525
Delivery occurred at a hospital	0.136	-0.038 (-0.145 to 0.068)	0.483

All models were estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, combined share ABC and their interactions. Standard errors clustered at the village level. a - standard deviations not reported for binary variables.

***eTable** 17. Spillover effects of enrollment on self-reported health outcomes at 4 years.*

	Female			Male			FDR
	Mean (SD)	Coefficient (95% CI)	P-value[a] (95% CI / SD)[b]	Mean (SD)	Coefficient (95% CI)	P-value[a] (95% CI / SD)[b]	Critical value[c]
Overall health							
Good health[e]	0.654 (0.476)	-0.120 (-0.390 to 0.150)	0.385 (-0.820 to 0.316)	0.660 (0.474)	-0.219 (-0.477 to 0.039)	0.096 (-1.007 to 0.082)	0.017
Weight							
Underweight[d]	0.093 (0.291)	-0.100 (-0.302 to 0.103)	0.335 (-1.037 to 0.353)	0.082 (0.274)	-0.031 (-0.216 to 0.154)	0.742 (-0.787 to 0.561)	0.017
Hypertension							
Hypertension grade 1[d]	0.411 (0.492)	0.164 (-0.091 to 0.419)	0.208 (-0.186 to 0.852)	0.488 (0.500)	-0.015 (-0.319 to 0.289)	0.924 (-0.637 to 0.578)	0.006
Hypertension grade 2[d]	0.173 (0.379)	0.208 (0.000 to 0.415)	0.049 (0.001 to 1.095)	0.229 (0.421)	-0.072 (-0.344 to 0.201)	0.607 (-0.818 to 0.478)	0.006
Doctor diagnoses							
Told has hypertension[e]	0.197 (0.398)	-0.134 (-0.313 to 0.045)	0.143 (-0.786 to 0.114)	0.181 (0.385)	0.080 (-0.074 to 0.234)	0.310 (-0.193 to 0.608)	0.002
Told has diabetes[e]	0.070 (0.256)	-0.003 (-0.095 to 0.089)	0.950 (-0.373 to 0.349)	0.067 (0.251)	0.042 (-0.050 to 0.135)	0.369 (-0.200 to 0.538)	0.002
Told has heart disease[e]	0.020 (0.140)	-0.004 (-0.058 to 0.050)	0.888 (-0.413 to 0.357)	0.024 (0.154)	-0.003 (-0.051 to 0.044)	0.884 (-0.328 to 0.283)	0.002
Told had stroke[e]	0.006 (0.079)	-0.027 (-0.056 to 0.002)	0.066 (-0.704 to 0.023)	0.010 (0.102)	0.024 (-0.011 to 0.058)	0.186 (-0.112 to 0.576)	0.002
Mental health							
Raven test score[f]				4.534 (2.331)	-0.048 (-1.742 to 1.645)	0.955 (-0.747 to 0.706)	0.050
Risky behavior							
Currently consumes tobacco[e]	0.058 (0.234)	-0.144 (-0.252 to -0.035)	0.009 (-1.077 to -0.151)	0.217 (0.412)	0.123 (-0.066 to 0.312)	0.203 (-0.161 to 0.757)	0.006
Currently consumes alcohol[e]	0.004 (0.063)	-0.009 (-0.040 to 0.022)	0.586 (-0.630 to 0.356)	0.127 (0.333)	0.039 (-0.101 to 0.179)	0.582 (-0.302 to 0.538)	0.006
Fertility							
Delivered in facility past yr[d]	0.033 (0.179)	-0.028 (-0.114 to 0.059)	0.531 (-0.635 to 0.327)				0.050

All models were estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, shares in A, B, C, and all their interactions. Standard errors clustered at the village level. **a** - * indicates FDR-adjusted significance. The FDR-adjusted critical values (at 5% uncorrected significance) are: *overall health* - 0.017, *weight* - 0.017, *hypertension* - 0.006, *doctor diagnoses* - 0.002, *mental health* - 0.050, *risky behavior* - 0.006, *fertility* - 0.050. **b** - confidence interval divided by the standard deviation in the control group. **c** - p-value from a test that both female and male coefficients are equal to zero. * indicates FDR-adjusted significance. The FDR-adjusted critical values (at 5% uncorrected significance) are: *overall health* - 0.050, *weight* - 0.050, *doctor diagnoses* - 0.006, *hypertension* - 0.017, *risky behavior* - 0.017. **d** - outcomes from the anthro survey. **e** - self-reported outcomes. **f** - based on a Raven test administered to male respondents.

***eTable** 18A. Spillover effects of enrollment on health outcomes aside from those in Table 4 at 4 years.*

	Control mean (SD)[a]	Coefficient (%95 CI)	P-value
Good or v. good health	0.516	0.038 (-0.173 to 0.249)	0.722
Poor or v. poor health	0.104	0.062 (-0.049 to 0.174)	0.272
HH member died within past 3 years	0.127	0.027 (-0.080 to 0.134)	0.618
Weight in KGs (self-reported)	57.3 (11.3)	1.3 (-3.9 to 6.4)	0.628
Chronic conditions			
Told had hypertension	0.235	0.092 (-0.043 to 0.228)	0.182
Told had diabetes	0.119	0.064 (-0.040 to 0.169)	0.226
Told had cancer	0.005	0.008 (-0.011 to 0.026)	0.402
Told had lung disease	0.055	0.048 (-0.024 to 0.120)	0.190
Told had heart disease	0.043	0.018 (-0.059 to 0.095)	0.651
Told had stroke	0.006	0.011 (-0.013 to 0.035)	0.377
Told had arthritis	0.199	0.124 (-0.046 to 0.293)	0.153
Diagnosed with high cholesterol	0.022	-0.006 (-0.052 to 0.040)	0.796
Has eyesight problems	0.324	0.117 (-0.046 to 0.280)	0.159

All models were estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, combined share ABC and their interactions. Standard errors clustered at the village level. a - standard deviations not reported for binary variables.

***eTable** 18B. Spillover effects of enrollment on health outcomes aside from those in Table 4 at 4 years.*

	Control mean (SD)[a]	Coefficient (%95 CI)	P-value
Physical health			
Fainted in past 4 wks.	0.012	-0.013 (-0.049 to 0.023)	0.476
Felt dizzy in past 4 wks.	0.132	-0.049 (-0.163 to 0.064)	0.391
Shortness of breath in past 4 wks.	0.056	0.010 (-0.057 to 0.077)	0.769
Heart pounded in past 4 weeks	0.071	-0.001 (-0.090 to 0.087)	0.974
Mental health			
PSS-10 score	17.8 (3.5)	0.6 (-0.8 to 2.1)	0.402
GHQ-12, Likert scoring	9.3 (6.8)	0.1 (-2.5 to 2.7)	0.920
GHQ-12, binary scoring	2.5 (3.3)	0.1 (-1.4 to 1.5)	0.935
Health behaviour			
Currently consumes tobacco	0.121	0.088 (-0.016 to 0.192)	0.099
Currently consumes alcohol	0.024	0.021 (-0.026 to 0.068)	0.382
Fertility			
Childbirth, incl. stillbirth, past 6 mos.	0.045	0.010 (-0.059 to 0.079)	0.770
Childbirth, incl. stillbirth, past 3 yrs.	0.187	0.004 (-0.142 to 0.150)	0.959
Num. of live births, past 3 yrs.	0.202 (0.491)	0.021 (-0.137 to 0.178)	0.797
Doctor or nurse assisted with delivery	0.161	0.043 (-0.073 to 0.160)	0.466
Delivery occurred at a hospital	0.136	-0.006 (-0.115 to 0.102)	0.910

All models were estimated with 2SLS. Enrollment was interacted with share enrolled in the village. Enrollment, share enrolled and their interaction were instrumented with treatments A, B, C, combined share ABC and their interactions. Standard errors clustered at the village level. a - standard deviations not reported for binary variables.