

Bakhtiar, M. Mehrab; Guiteras, Raymond; Levinsohn, James Alan; Mobarak, Ahmed Mushfiq

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Social and financial incentives for overcoming a collective action problem

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Social and Financial Incentives for Overcoming a Collective Action Problem

M. Mehrab Bakhtiar*
IFPRI

Raymond Guiteras
North Carolina State University

James Levinsohn
Yale University

Ahmed Mushfiq Mobarak
Yale University

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Abstract

Addressing public health externalities often requires community-level collective action. Each person's sanitation behavior can affect the health of neighbors. We report on a cluster randomized controlled trial conducted with 19,000 households in rural Bangladesh where we randomized (1) either group financial incentives or a non-financial "social recognition" reward, and (2) asking each household to make either a private pledge or a public pledge to maintain hygienic latrines. The group financial reward has the strongest impact in the short term (3 months), inducing a 7.5-12.5 percentage point increase in hygienic latrine ownership. Getting people to publicly commit to maintaining and using a hygienic latrine in front of their neighbors induced a 4.2-6.1 percentage point increase in hygienic latrine ownership in the short term. In the medium term (15 months), the effect of the financial reward dissipates while the effect of the public commitment persists. Neither social recognition nor private commitments produce effects statistically distinguishable from zero.

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1 Introduction

Many inexpensive, efficacious technologies with the potential to address important development challenges are used at surprisingly low rates in developing countries (Foster and Rosenzweig 2010). Prominent examples include drinking water disinfectants (Ashraf et al. 2010), fertilizers (Duflo et al. 2011), nutritional supplements (Maluccio et al. 2009), high-yield crop varieties (Udry 2010), and rainfall insurance (Cole et al. 2014). The productivity and welfare benefits of many of these technologies are potentially very large, which makes low rates of adoption and use a central puzzle in development.

Social scientists and development practitioners have studied several explanations for low initial adoption: poor households may be liquidity or credit constrained (Dupas and Robinson 2013), they may simply not understand a technology’s benefits (Foster and Rosenzweig 1995), they may be highly risk averse (Bryan et al. 2014), they may suffer from self-control problems (Banerjee and Mullainathan 2010), or learning externalities may lead to inefficient experimentation (Munshi 2003; BenYishay and Mobarak 2019). This paper tests strategies to promote a healthier technology based on another class of explanations: that adoption decisions may be inter-linked across households when there are public health externalities, and interactions with neighbors may mediate those decisions.

Sanitation is a leading example of this class of problem. Health gains from a household’s use of a hygienic latrine likely accrue largely to other households in the community (Fuller et al. 2016; Andrés et al. 2017). One billion people, or about 15% of the world’s population, currently practice open defecation (OD) in spite of the existence of simple, affordable pour flush latrines that effectively confine fecal matter in sealed pits (WHO and UNICEF 2017). Open defecation spreads bacterial, viral, and parasitic infections, including diarrhoea, polio, cholera and hookworm and has been identified as a leading cause of child stunting (Spears 2013; Chambers and Von Medeazza 2013; Augsburg and Rodríguez-Lesmes 2018) and infant

death (Hathi et al. 2017). Diarrheal diseases kill nearly one million people per year (Prüss-Ustün et al. 2014), and cause nearly 20% of deaths of children under five in low income countries (Mara et al. 2010).

Research on barriers to sanitation adoption includes studies of interventions to educate and motivate communities (Pattanayak et al. 2009; Gertler et al. 2015), micro-finance loans to overcome credit constraints (BenYishay, Fraker, et al. 2017; Smets et al. 2021), and targeted subsidies to increase affordability and leverage social spillovers in adoption (Guiteras et al. 2015; Cameron et al. 2021). There has been much academic and policy interest in “community led total sanitation” (CLTS) interventions (Pickering et al. 2015), which aim to bring the community together to jointly discuss the public health externality problems. In this paper, we devise and test interventions that isolate specific aspects of the community-level interactions in CLTS programs.

Our intervention design also pays attention to the issue of proper use and maintenance after initial adoption.¹ While adoption is necessary for health gains, it is not sufficient – hygienic latrines will only produce health benefits if they are consistently used and are kept in good condition so that fecal pathogens are safely isolated from the environment. This requires each household to incur time and materials costs to keep the latrine clean, conduct maintenance and dispose of waste properly.

The fact that the benefits largely accrue to others creates a divergence between the incidence of benefits and costs, and with it, a classic collective action problem – while it may be in all households’ interests collectively to use and maintain hygienic latrines, any individual household may privately find it beneficial to deviate from the public optimum. When institutions are strong, regulation mandating adoption and enforcing use can solve this problem. However, in the absence of such institutions, other tools are required.

¹See Coffey et al. (2014) on unused latrines in rural Northern India, Orgill-Meyer et al. (2019) and Pakhtigian et al. (2021) on long-term use patterns in Orissa, India, and Deutschmann et al. (2021) on pit-emptying in Dakar, Senegal.

In this paper, we test several such tools designed to overcome this collective action problem. Our context is rural Tanore district in Bangladesh, where, in previous research, we evaluated a set of interventions intended to increase investment in hygienic latrines (Guiteras et al. 2015). In this study, we designed new interventions to help households overcome any collective action failures that may be impeding ongoing consistent use. As a basic, common treatment, we form groups of 15-20 neighboring households who participate in monthly meetings with a health worker from a well-known NGO to discuss sanitation, OD and disease risk. On top of this common treatment, we randomize four additional treatments. The first, “monetary reward,” is a slight variation on the standard public finance policy prescription: a subsidy for a well-maintained hygienic latrine. The non-standard component is an element of joint liability: households receive the reward only if both that household’s latrine is hygienic and a certain share of all households in the group maintain a hygienic latrine. While this payment for environmental service scheme is appealing, it may be challenging to sustain financially, and credible monitoring may be similarly difficult. Our second treatment, “recognition reward,” attempts to address these shortcomings by substituting a non-pecuniary reward, a recognition certificate from the local government.

Our third treatment, “public commitment,” explores whether a simple verbal coordination device can sustain a cooperative equilibrium (Schelling 1960). In public commitment groups, groups are asked to make a joint public (but non-binding) commitment in front of each other, stating that they will try to address the OD issue in their neighborhood by using and maintaining hygienic latrines. This public commitment could be operating through two mechanisms: the act of making a commitment, which as an “implementation intention” can itself spur action (Gollwitzer and Brandstätter 1997); and the fact that this commitment was made in public with others who are making the same public commitment. Our fourth treatment, “private commitment,” was designed to separate these two mechanisms. In groups in the private commitment arm, households make the same pledge as those in the public commitment arm, but this pledge is made in private.

These interventions are implemented at a large scale, covering a sample of 19,345 households in 107 villages, and we measure short-term (at the time of the assessment for rewards, roughly 3 months after the interventions began) and medium-term (12-15 months after assessment) effects. We find that group-level monetary reward has the strongest impact in the short term, inducing an 7.5 to 12.5 percentage point (pp) increase in the share of households with hygienic latrines. The public commitment treatment caused a 4.2 to 6.1 pp increase in the same period. Neither the non-monetary reward nor the private commitment treatments had statistically significant impacts. In the medium term, the effect of the monetary reward dissipates, while the effect of the public commitment treatment persists. We find that in the case of both the monetary reward and public commitment treatments, households tended to meet the short-run assessment criteria for hygienic status through small, relatively inexpensive improvements to or repairs of existing latrines, rather than making large investments in major improvements or new latrines. In the public commitment group, households tended to maintain these small improvements into the medium-term, while those in the monetary reward group tended to let these improvements deteriorate.

The paper proceeds as follows: Section 2 describes the study setting and the sample; Section 3 describes our interventions and experimental design; Section 4 describes our data; Section 5 presents our estimation equations and results, with reduced-form treatment effects in Section 5.1 and mechanisms in Section 5.2; Section 6 concludes.

2 Setting and Sample

This study was conducted with 19,271 households in 107 villages in 4 unions (sub-districts) of Tanore district, Bangladesh. These villages were the site of a randomized evaluation of a set of interventions designed to study interdependencies in household investment in hygienic latrines (Guiteras et al. 2015). We refer to this first set of interventions as the “first set of

interventions” or the “demand study interventions,” and the second set, the focus of this paper, as the “second set of interventions” or the “incentives for use interventions.” The study area was chosen in part because of its low level of latrine coverage: at baseline, 30.8% of households reported a regular level of open defecation among adults, 50.4% reported that they had access to a hygienic latrine and 40.1% owned a hygienic latrine. This first set of interventions was conducted February 2012 – August 2012, with baseline data collected December 2011 – February 2012 and four rounds of followup data collected through May 2013 – July 2013. Guiteras et al. (2015) show that subsidies increase adoption of hygienic latrines, both directly – among households winning a subsidy voucher in a public lottery – and indirectly – the share of subsidy winners was randomized at the community level, and as this “saturation” increased, investment increased among both subsidized and unsubsidized households. The current study was intended to understand how to sustain or increase these gains.

In our 107 study villages, we created 1,236 groups of approximately 14-17 neighboring households, roughly 4-16 groups per village, and the incentives-for-use interventions were conducted at this group level. While the unit of intervention was the group, randomization was at the village level.

3 Interventions and Experimental Design

In this section, we describe the treatments and the randomization. A timeline for a typical village is provided in Figure 1.

3.1 Common Intervention

All 980 treatment groups (in 84 treatment villages) received a basic intervention consisting of monthly meetings for three consecutive months with a Health Motivator to encourage investment in and maintenance and use of hygienic latrines.² Health Motivators, trained by and contracted from our implementation partner VERC, discussed the health risks of open defecation and unhygienic sanitation practices, the collective nature of the problem (i.e., the externality in non-technical terms), the types and costs of hygienic latrines, and the current level and monthly change in the share of households with or advancing towards a hygienic latrine. The intervention protocol is provided in Section SM3 of the Supplementary Materials.

In the common as well as in the cross-cutting interventions, the Health Motivator provided both a general, conceptual definition of a hygienic latrine and a specific, technical definition. The conceptual definition emphasized that a hygienic latrine was one that:

1. Limits the spread of diseases caused by feces in the water and keeps the environment pollution free;
2. Confines feces in an enclosed pit so that they cannot be seen or smelled;
3. Prevents flies or other insects from entering the pit.

The specific, technical definition listed the characteristics based on which a latrine was judged to be hygienic, in particular:

1. There must be a slab and it cannot be broken.

²Different sources define “hygienic” in different ways, and there are also other labels such as “improved” or “sanitary.” Conceptually, a hygienic latrine safely confines feces. For pour-flush latrines (the relevant type in our context), this typically requires a water seal to block flies and other insects, and a sealed pit to store fecal matter for safe disposal (Hanchett et al. 2011). In our survey data, we define an *unimproved latrine* as a bucket, a simple pit with no slab or cover, or a “hanging latrine” (a platform over open land or water), and a *hygienic latrine* as having a functional, non-broken slab and water seal leading to a sealed pit.

2. There must be a water-seal (locally known as ‘gooseneck’ or ‘siphon’) and it cannot be broken.
3. Different latrine components such as rings, delivery pipe, Y-junction (whenever applicable), pit cover (whenever applicable), etc. should be functional and without any leaks.
4. There should not be any feces in or around the latrine.
5. The latrine cannot pollute the environment. In particular, the latrine/delivery pipe can only discharge the waste into a sealed pit and not to the external environment (for example, a stream or just out in the open).

These characteristics of a hygienic latrine were relayed to participants at each of the three group meetings.³ Participants were made aware of the fact that for latrines to be considered hygienic all the above mentioned requirements had to be met by the specified deadline, approximately four months after the intervention began.

Health Motivators also emphasized that a latrine’s hygienic status was not just determined by the collection of parts, but depended on maintenance, repair and sanitary use. Discussions, both with the group and with individual households, emphasized small improvements or repairs that could be made to achieve hygienic status, and how to maintain hygienic status once it was achieved.

³Households were also encouraged to ensure that no gaps existed between different latrines components that could compromise the ‘sealed’ nature of a pit. For single-pit latrines, this meant that there would not be any gap between the cover of the slab and the top-most ring. For offset latrines (involving multiple pits or a pit that is not situated directly below the latrine) there should not be any gap between the top-most ring and the pit cover. Moreover, although not perfectly observed (and therefore, not a strict requirement of a hygienic latrine) households were encouraged to install adequate number of rings depending on the depth of the latrine pit.

3.2 Reward Treatments

There were two reward treatments, monetary and non-monetary, both of which were conditioned on both the household’s own status and the share of households in the group achieving hygienic latrine status. This element of “joint liability” was intended to incentivize households to motivate and assist each other.

The monetary reward consisted of a cash payment to the household if, at the end of the intervention period, (a) the household owned a hygienic latrine and (b) the share of households in that group with a hygienic latrine was above a designated threshold. Hygienic was defined as described in Section 3.1 above. The reward was BDT 250 (USD 3.33) in groups that surpassed the lower of the two thresholds and BDT 500 (USD 6.67) in groups that surpassed the higher of the two thresholds.⁴ For comparison, the cost of building a single-pit hygienic latrine was approximately BDT 2350 (USD 31.33), while common improvements to existing latrines that would be necessary to reach hygienic status cost substantially less, e.g., a new water seal BDT 65 (USD 0.87), delivery pipe BDT 360 (USD 4.8).

The non-monetary reward consisted of a certificate of hygiene attainment from the local government, presented to qualifying households in a public ceremony.⁵ The non-monetary reward used the same standard for “hygienic” as the monetary reward.

Thresholds were determined based on baseline hygienic latrine ownership by union. In three of the four unions, the lower threshold was set at one-third of households and the upper threshold at two-thirds. In one union with significantly lower hygienic latrine ownership at baseline, the lower and upper threshold were set at one-quarter and one-half, respectively. A lower threshold was set such that even low baseline-ownership groups would feel they could attain something, while high baseline-ownership groups would have something to reach for.

⁴US dollar equivalents at 75 BDT/USD, the approximate market exchange rate at the time.

⁵This certificate was printed on thick glossy paper, so it could be displayed on an interior wall. However, no weatherproof frame was provided. As a result, it would be difficult for a household to display the certificate outdoors where it would be publicly visible.

We also chose thresholds that were simple and easy to explain at a group meeting: a phrase like “two out of every three households” is easier to understand than a phrase like “sixty-six percent of all households.”

The assessment was conducted approximately four months after the intervention began, after three group meetings with the Health Motivator. Health Motivators did not conduct assessments in villages where they had worked. See Section 4.3 for a discussion of the assessment process. The full survey instrument is provided in Section SM4 of the Supplementary Materials. Households knew the deadline for achieving hygienic status, and that the assessment would occur within one-two weeks after the deadline, but did not know the specific day of the assessment.

3.3 Commitment Treatments

There were two commitment treatments, public and private.

In the public commitment arm, during each group meeting, members from all the households of a group were encouraged to make a public pledge that those who did not yet have hygienic latrines would meet hygienic latrine standards as set by the project. Those with hygienic latrines pledged to help others reach the goal within the time limit set by the project. The script of the pledge, in English translation, was: “I hereby promise before everyone present that I will do my best to set up hygienic latrines or improve existing ones into hygienic latrines for myself and for my neighbors by [end date].” In the public commitment arm, this pledge was repeated at the end of each monthly group meeting.

In the private commitment arm, health motivators visited each household in the group after each group meeting. The member of the household attending the meeting would be encouraged by the Health Motivator to make a commitment before the health motivator that

he/she would transform their unhygienic latrines to hygienic ones within the time limit set by the project. The script of the pledge was identical to that in the public commitment arm.

3.4 Experimental Design

The reward and commitment treatments lead to a 3x3 design, plus a pure control group. The design is summarized in Table 1. Although the treatments were implemented at the group level, randomization was conducted at the village level because of the potential for spillovers within village. We allocated approximately 25% of villages to pure control, and then the remaining villages were intended to be allocated equally across the commitment and reward treatments. With 107 villages (84 treatment villages), we did not expect to have adequate power to detect interaction effects. The randomization was stratified by union. The resulting assignment is presented in Table 1. Because of a coding error, there is some imbalance in the number of villages per cell. Most significantly, the basic treatment only cell was under-populated (8 villages), so we will use Wild bootstrap standard errors for inference in our group-level analyses (MacKinnon and Webb 2017; Roodman et al. 2019). Descriptive statistics and balancing tests for key baseline observables are provided in Table 2.

4 Data

The full timeline of all data-collection activities for a typical village is presented in Figure 1.

4.1 Previous Surveys

As noted above, several rounds of surveys had been conducted for the previous demand study. Specifically, these were: a census, a baseline (conducted on a 50% subsample, stratified by

village) and four monitoring rounds focused on latrine improvements and condition. In this study, we primarily use: the census data on landless status, social networks, in particular who households identify as local leaders; the third followup monitoring round, in which we collected location data to assist in creating groups and to construct density measures.

4.2 Baseline Latrine Coverage

A few months before beginning the interventions in this study, we conducted what we will refer to as the “baseline” survey for this study.⁶ We collected data from all households on latrine ownership, including detailed information on the condition of each household’s latrine. This allowed us to classify each household’s latrine as “none,” “non-hygienic,” or “hygienic.” We include hanging latrines (an exposed platform over a marsh or stream) and uncovered pits in the “none” category, since these are effectively the same as open defecation in terms of disease, and cannot possibly be transformed into a hygienic latrine through simple improvements. This provided our baseline measures of our outcome variables. We used these data to determine union-specific thresholds for the reward treatments when designing the interventions.

4.3 Short-term Outcomes

At the end of the intervention, we collected data on latrine investment, use and maintenance. In reward and recognition groups, these data were collected as part of the reward determination process. These data were collected 1-2 weeks after the program’s end date; households knew the general time frame but not the specific date. For budgetary reasons and because Health Motivators already had the training to assess latrine conditions, we used Health Motivators

⁶This was the fourth round of followup data-collection for the project as a whole. We will refer to the baseline survey for the overall project as the “demand study baseline.” See Figure 1 for the full project timeline.

to collect these data, but no Health Motivator collected data in a village where he or she had led an intervention. The Health Motivators that collected data were not informed of the village’s treatment status, nor which Health Motivators had led the intervention in that village. Similarly, Health Motivators were not told which of their peers had collected the evaluation data in villages where they had led the intervention. In addition, to understand the mechanisms for the success or failure of the intervention, households were asked whether they received any assistance (financial, labor, advice) from community members, and whether they were pressured or encouraged by others in their group.

The criteria by which a household’s latrine was judged “hygienic” for the purpose of the reward are given in Section 3.2. See the Supplementary Materials for precise definitions for coding the outcome variables of interest (Section SM1) and the survey instrument (Section SM4). Data were collected following the same protocol in all villages, regardless of treatment status.

4.4 Medium-term Outcomes

Medium-term outcome data were collected 12-15 months after the assessment (June 2015 – August 2015). This round served as an endline survey for the project as a whole, and so included several lengthy socio-economic and demographic modules. Because of budget constraints, we conducted this survey with the 50% subsample surveyed at baseline in the demand study (see Sec. 4.1 above). The baseline subsampling was stratified by village, and since the sub-village groups for this study had not been created yet, our endline subsample was unbalanced across groups. To avoid under-sampling groups, we identified any groups with fewer than six households included in the endline sample, determined how many households would be needed to have endline data for six households in the group, and randomly sampled that many additional households in the group. With this “top-up” sample, we conducted a

brief endline survey on latrine status only, using the same modules on latrine status, use and maintenance as with those households receiving the full endline survey.

5 Estimation and Results

5.1 Program Effects

To measure reduced-form effects of our treatments, we estimate

$$y_{gv} = \beta_0 + \beta_1 \text{Incent}_v + \beta_2 \text{Cert}_v + \beta_3 \text{Priv}_v + \beta_4 \text{Publ}_v + \delta y_{0gv} + \gamma \text{ShareLandless}_{gv} + \varphi_u + \varepsilon_{gv} \quad (1)$$

where y_{gv} is the outcome variable of interest (e.g., share of households owning a hygienic latrine) for group g in village v , Incent_v and Cert_v are indicators for village v 's reward treatment assignment (financial incentive and social incentive, respectively), Priv_v and Publ_v are indicators for village v 's commitment treatment assignment (private commitment and public commitment, respectively), y_{0gv} is the pre-intervention level of the outcome variable (McKenzie 2012), $\text{ShareLandless}_{gv}$ is the share of landless households in the group, which proxies for the financial resources available to the group as a whole, φ_u is a set of union fixed effects, and ε_{gv} is an error term which may be correlated at the village level (the level of randomization).

The coefficients β_1 and β_2 represent the effects of the reward treatments, controlling for potential imbalances in the commitment treatment, while coefficients β_3 and β_4 represent the effects of the commitment treatment, controlling for potential imbalances in the reward treatment.⁷ These effects are conditional on receiving the common messaging treatment,

⁷As discussed in Muralidharan et al. (2020), in a factorial (interacted) design, the interpretation of coefficients in this “short” regression depends on priors about interaction effects. In the presence of interactions

and we do not include pure control villages. That is, the omitted category in our main specifications consists of villages receiving the common messaging treatment, but no other treatment (cell A in Table 1), and our estimates should be interpreted as effects relative to this basic, common treatment.⁸

Our main outcome of interest is the share of households in the group household owning a hygienic latrine. As discussed in Sections 3.1 and 4, “hygienic” refers not just to the physical components (especially, water seal and sealed pit), but also the condition of these components (e.g., no leaks). Ideally, we would like to estimate effects on actual use and open defecation but these are difficult to measure objectively. Households may overstate the condition of their latrine and understate their rate of open defecation because of social desirability bias, and this is especially likely when a reward or their reputation may be at stake. In contrast, whether a household owns a hygienic latrine and whether that latrine is being kept clean can be assessed in a fairly objective manner. Our evaluation visits were unannounced so households could not meet our criteria by rushing to complete a repair or a major cleaning, although we cannot rule out that news of the assessment team’s arrival in the village would spread in time to allow a household to conduct some minor cleaning.

Short-term results

Table 3 reports the short-term effects of the different treatment arms. We estimate equation (1) without controls in column 1, then add union fixed effects, the baseline value of the outcome variable, and the share of households in the group that are landless in columns 2, 3 and 4, respectively. The last of these is our pre-specified preferred model. The unit of

between treatments, Incent_v , for example, should be interpreted as the average effect of the incentive treatment in a context where some groups are receiving no other treatment, some the public commitment treatment, and some the private commitment treatment. When we estimate fully interacted factorial models, we see little evidence of interaction effects (see Figures B1 and B2), but as Muralidharan et al. (2020) point out, these tests have low power. In retrospect, it would have been preferable to design the experiment without treatment interactions.

⁸This basic treatment had no effect on our main outcomes when compared to pure control, see Appendix A

observation is the group, and groups are weighted by the number of households in the group, although results are not sensitive to weighting (see Appendix Table B1). We report standard errors robust to clustering at the village level (the level of randomization) in parentheses. Additionally, in brackets we report 95% confidence intervals from wild cluster bootstrapping for our coefficients of interest (MacKinnon and Webb 2017; Roodman et al. 2019). Estimated coefficients from column 4, with 95% confidence intervals, are plotted in Figure 2.

As shown in Table 3, the monetary reward treatment is most effective at increasing hygienic latrine ownership in the short term. The point estimate ranges from +7.5 to +12.5 percentage points (pp) depending on the specification, relative to an omitted category mean of 45.1%. The public commitment treatment increases ownership by 4.2 to 6.1 pp. The effects of the reward certificate and the private commitment are both economically small and statistically insignificant.

It is possible that the impact of these interventions on the overall health environment could be greater than just the effect on ownership if households allow others to use their hygienic latrine. However, when we use *access* to a hygienic latrine as the outcome variable rather than *ownership*, we see little evidence of this (see Appendix Table B2). In Appendix Table B3, we see that households appear to pay attention to the specific requirement built into our intervention: unlike hygienic latrine ownership, ‘*any* latrine ownership’ (including non-hygienic) does not respond at all.

We prioritize our direct observation of the latrine condition as our preferred outcome rather than self-reported open defecation, because data on these short-term outcomes were collected as part of the end-of-intervention assessment and therefore even more prone to bias than usual. We see little impact on self-reported open defecation, as shown in Appendix Table B4. This implies that the successful interventions appear to be inducing households already using latrines to continue to do so while upgrading their existing latrines, rather than persuading open defecators to build new latrines or use existing latrines.

Medium-term results

To measure effects in the medium-term, we again estimate equation (1) using endline ownership (12-15 months after the intervention) as the outcome variable. The results are reported in Table 4, with estimated coefficients and 95% confidence intervals from the pre-specified preferred specification (column (4) in the table) plotted in Figure 3. The effect of the monetary reward has faded (+1.0 to +5.2 pp, $p < 0.1$ in only one of four specifications), while the effect of the public commitment treatment persists (+6.1 to +7.6 pp, $p < 0.05$ in all specifications). As in the short term, neither the reward certificate nor the private commitment have statistically significant effects. Again, these results are not sensitive to weighting (see Appendix Table B5).

There may be some enhancement of the effect of the public commitment treatment on the community environment beyond ownership, as its effect on access is slightly greater (8-9 percentage points increase in access; see Appendix Table B6). While this is plausible given that the public commitment treatment placed greater emphasis on collective responsibility than the other treatments, we consider this only suggestive, since the marginal gain in ‘access’ over ‘ownership’ is only an extra 1-2 pp. As with the short-term results, the effects are concentrated on ‘hygienic latrines’ (the target of our intervention design), not ‘any latrine’ (see Appendix Table B7). Similarly, the effects of the interventions on household self-reported open defecation remain small (Appendix Table B8).⁹

⁹For comparability with the short-term followup, we also report results using open defecation as inferred from the surveyor’s assessment. Again, we find no effect, see Appendix Table B9.

5.2 Mechanisms

Household investments and behavior

The clear pattern that emerges is that monetary rewards produce the largest short-term gains in hygienic latrine ownership which dissipates, while the public commitment treatment produces a steady increase which persists for at least a year or more. In this section, we delve into our detailed data on latrine components to understand the specific investment decisions households made under different treatments that could produce these patterns. The effects we show in Tables 3 and 4 could have been produced by either households investing in entirely new hygienic latrines, or making smaller investments to maintain or improve their existing latrines. We directly asked all households these questions - and find no significant effect of any treatment on “construction of a new latrine since Nov 1, 2013” (which is the start of our intervention period). In contrast, we find significant effects on “purchased/installed specific latrine components since Nov 1, 2013”.

In Tables 5 and 6, we investigate the specific latrine components the households prioritized for investment. We show effects on the three most important components that – when properly installed, functional and unbroken – define a latrine to be hygienic. These components are a concrete slab (on which the ceramic pan is placed, where the user squats), a water seal (to prevent bad smells and flies from moving in and out of the pit where the waste is stored), and the cover for the latrine pit and rings that safely confines the accumulated waste and prevents any leakages. We see statistically significant investments in all three components in the short-run under the monetary reward treatment, but this dissipates in the medium term. In contrast, we observe a significant 4.9 pp increase in functional, intact pit cover and rings in the medium term under the public commitment treatment. One characteristic that distinguishes the pit cover from the other components is that it sits outside the toilet and its privacy shield (since the pits have to be emptied periodically, and are designed to be ‘offset’

from the toilet and not directly underneath), and therefore more easily visible to neighbors. Under the ‘public commitment’ treatment, we detect investments in the component that neighbors can more easily monitor.

Some analogous patterns emerge in Tables 7 and 8, where we examine outcomes related to latrine maintenance. We orient all variables so that one corresponds to better condition and zero to worse. We assign one to households that own a latrine with the specified desirable characteristic, and zero to households that either own a latrine without the desired characteristic or do not own a latrine. The proxies analyzed are no bad smell noticed, no leaks observed, and whether water and soap for hand-washing are present at or near the latrine. Again, there are improvements in all dimensions in the short-run under the monetary reward treatment, which dissipate after a year. In contrast, there are statistically significant effects on avoiding bad smells and leaks in the medium terms under the public commitment treatment.

Again, smells and pit leaks are the most visible components of maintenance, as opposed to water, soap and flies inside the toilet, which are aspects that neighbors cannot easily monitor. Avoiding leaks and smells requires the household to invest in fixing broken pit covers and rings, which are precisely the components we observed statistically significant improvements in Table 6. In summary, the data are consistent with the households who were asked to make a public commitment to maintain and use hygienic latrines making the investments in both latrine components and maintenance that avoid the most obvious, visible failures that can create slippage into a ‘non-hygienic’ sanitation territory.

In Table 9, we study the nature of interactions between households within the same treatment group, to investigate whether the interventions generated any conversations, cooperation, advice, or reciprocity that ultimately produced the changes in investment behavior. We show effects of the treatments on indicators for whether the household reports receiving different types of assistance or information from their neighbors, or pressure from others in the group.

Generally speaking, all treatments led to greater assistance, advice and information sharing, so our interventions were successful in achieving the immediate, proximate goal. But we don't observe any clear pattern that helps explain why those conversations and assistance converted into persistent hygienic latrine maintenance effects in the 'public commitment' treatment.

Household Characteristics

To examine the extent to which program effects vary with respect to household characteristics, we modify equation (1) in two ways: by using household-level data and by interacting household characteristics with treatments. Specifically, we estimate

$$\begin{aligned}
 y_{hgv} = & \alpha_0 + \alpha_1 D_{hgv} \\
 & + \sum_{p=1}^4 \beta_p \cdot 1 \{1\text{Treat}_v = p\} + \sum_{p=1}^4 \theta_p \cdot 1 \{\text{Treat}_v = p\} \times D_{hgv} \\
 & + \delta y_{0gv} + \gamma \text{ShareLandless}_{gv} + \varphi_u + \varepsilon_{hgv}
 \end{aligned} \tag{2}$$

where y_{hgv} is the outcome variable of interest for household h in group g in village v , D_{hgv} is a characteristic of household h , $1 \{\text{Treat}_v = p\}$ is an indicator for the treatment status of village v , i.e., $p = 1, 2, 3, 4$ refer to financial incentive, social incentive, private commitment and public commitment, respectively, and all other variables are as defined in equation (1). The coefficient α_1 represents the level effect of characteristic D , i.e., the association of D with the outcome variable y_{gv} in the comparison group, the coefficient β_p represents the level effect of treatment p , i.e., the effect of treatment p on households with $D = 0$, and the coefficient θ_p is the interaction between treatment p and characteristic D .¹⁰ We will focus on the primary outcome of hygienic latrine ownership unless otherwise noted, and will present results for

¹⁰For comparison with the group-level results, we estimate equation (2) with no household characteristics or interactions in Appendix Tables B10 (short-term) and B11 (medium-term). The results are very close to the corresponding group-level estimates in Tables 3 and 4, respectively.

the monetary reward and public commitment treatments, with full regression results for all treatments in Appendix tables.

We first examine whether households' responsiveness differ by poverty, which we proxy by landlessness. We hypothesized that landless households would be less able to respond to the non-monetary arms but might benefit from cross-subsidization in the monetary arms. In fact, in the short term, landless households responded nearly identically, as shown in Figure 4a. (Regression results reported in Appendix Table C1.) In the medium term (Figure 4b), point estimates suggest some heterogeneity in response: both the fading of the effect of the monetary treatment and the sustained effect of the public commitment treatment is among *landed* households, although in neither case do the estimated interaction terms reach statistical significance (Appendix Table C2).

We also investigate heterogeneity by the household's baseline ownership status. Households are classified as owning none (the base category), owning a non-hygienic latrine, or owning a hygienic latrine. We hypothesized that households owning a non-hygienic or hygienic latrine at baseline would be relatively more responsive to the non-monetary treatments than households owning no latrine at baseline, since these households might need only minor improvements to reach (in the case of owners of non-hygienic latrines) or sustain (in the case of owners of hygienic latrines) hygienic status. Similarly for the monetary reward treatment, because the reward amount was not large relative to the cost of a new hygienic latrine, we expected larger effects in the higher baseline categories, although there was greater potential for cross-subsidization of households owning no latrine in the monetary reward arm.

These predictions largely hold in the medium term, although not in the short term. In the short term (Figure 5a, Appendix Table C3), the effects of both the monetary reward and public commitment treatment are similar across baseline ownership status categories. In the medium term (Figure 5b, Appendix Table C4), the point estimates indicate larger impacts among households owning a non-hygienic latrine at baseline, although these either do not

reach statistical significance (monetary reward) or are only borderline statistically significant (public commitment). That the public commitment treatment’s effect is sustained into the medium term largely through its effect on this group suggests that modest improvements to existing latrines were more sustainable than major efforts to build a new, hygienic latrine quickly.

Group Characteristics

Ex post, we conducted an exploratory analysis of the association between group-level characteristics and the magnitude of treatment effects. Similar to equation 2, we estimate

$$\begin{aligned}
 y_{gv} = & \alpha_0 + \alpha_1 D_{gv} \\
 & + \sum_{p=1}^4 \beta_p \cdot 1 \{1\text{Treat}_v = p\} + \sum_{p=1}^4 \theta_p \cdot 1 \{\text{Treat}_v = p\} \times D_{gv} \\
 & + \delta y_{0gv} + \gamma \text{ShareLandless}_{gv} + \varphi_u + \varepsilon_{gv}
 \end{aligned} \tag{3}$$

where y_{gv} is the outcome variable of interest for group g in village v , D_{gv} is a characteristic of group g and all other variables are as defined in equation (2). The coefficient α_1 represents the level effect of characteristic D , i.e., the association of D with the outcome variable y_{gv} in the comparison group, the coefficient β_p represents the level effect of treatment p , i.e., the effect of treatment p on groups with $D = 0$,¹¹ and the coefficient θ_p is the interaction between treatment p and characteristic D .

We considered the following characteristics, which were relevant as proxies for resources available to the group, baseline sanitation status, or group social cohesion:

- Share of landless households in the group
- Baseline ownership of hygienic latrines
- Baseline ownership of non-hygienic latrines

¹¹For continuous D , we de-mean the interaction variable so β_p represents the effect of treatment p on groups with the mean level of D (Wainer 2000).

- Baseline ownership of any latrine
- Whether the group contained an individual considered by others in the village to be a village leader
- Group size (number of households)
- Group density (the average number of households within 50m of each household in the group)
- Two social network statistics calculated using baseline data on household relationships within the village
 - Maximum eigenvalue of adjacency matrix, interpretable as the speed at which information will spread within the group
 - The second eigenvalue of the stochastized adjacency matrix, interpretable as how segregated a network is, i.e., negatively related to the extent to which information will spread within the group

Overall, we do not find strong evidence of an association between these variables and the size of our estimated treatment effects. There is a weak negative association between the share of landless household in the group and the effectiveness of the monetary reward treatment, although only in the short term (Tables D1-D2). Contrary to our expectation, the presence of a village leader in a group is negatively associated with the effectiveness of the monetary reward and reward certificate treatments, although again only in the short term (Tables D9-D10). The effectiveness of the monetary reward treatment is negatively associated with the network segregation measure, once again in the short term only (Tables D17-D18). Given the large number of hypotheses tested and the relatively low power to detect interactions, we view these results as suggestive only.

6 Conclusion

While there has been widespread recognition in the development economics literature that investments in welfare-improving technologies with the potential to address important development challenges has remained puzzlingly low, scant attention has been paid to inter-

dependencies in decision-making. We design a series of interventions to explore whether we can promote investments in a healthier technology to address an important public health externality by taking advantage of the fact that coordination schemes that help communities overcome collective action failures. The two specific strategies we tested were creating a joint financial liability by offering a joint monetary or non-monetary reward, and by encouraging community members to publicly commit to pursuing healthier behaviors in front of their neighbors, so that both their own, and their neighbors' health would improve.

We find that the monetary reward has the largest effect in the short term (3 months), increasing the share of households with hygienic latrines by 7.5 to 12.5 percentage points. The public commitment treatment lead to a 4.2 to 6.1 pp increase in the same period. The effect of the monetary reward faded in the medium term (15 months), while the effect of the public commitment treatment persisted. We find that this difference is explained by households in the public commitment treatment maintaining improvements in publicly visible components of the latrine. We find little evidence of heterogeneity in impacts with respect to group characteristics.

Our results are immediately relevant for policymakers in South Asia and other developing countries struggling with the stubborn problem of low investment in improved sanitation and hygiene. They are also more broadly relevant for development economists studying the under-investment in a broader range of (seemingly beneficial) products, technologies and behaviors, including hand-washing and masks (Abaluck et al 2021) that became especially relevant during the COVID-19 pandemic. We highlight decision inter-dependencies as a driving factor for adoption of product categories that may impose externalities on other members of society, or are strategic complements in investment. Our direct comparison of incentives and rewards (both monetary and in-kind) against public commitments contribute to an even broader literature in public economics on how personal and social incentives are shaped.

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Table 1: Randomization

Reward	Commitment		
	None	Private	Public
None	A: 8 villages; 121 groups 1,898 households (9.8%)	B: 11 villages; 177 groups 2,626 households (13.6%)	C: 11 villages; 69 groups 1,088 households (5.6%)
Monetary	D: 10 villages; 79 groups 1,159 households (6.0%)	E: 5 villages; 58 groups 885 households (4.6%)	F: 9 villages; 97 groups 1,568 households (8.1%)
Certificate	G: 12 villages; 145 groups 2,314 households (12.0%)	H: 9 villages; 110 groups 1,694 households (8.8%)	I: 9 villages; 124 groups 1,970 households (10.2%)
Pure Control	J: 23 villages; 256 groups 4,069 households (21.1%)		

Table 2: Descriptive Statistics and Balance Tests

Treatment:	All	Pure Control	Basic Only	Reward		Commitment		Joint
	Mean (S.D.) (1)	Mean (S.D.) (2)	Mean (S.D.) (3)	Diff [S.E.] (4)	Diff [S.E.] (5)	Diff [S.E.] (6)	Diff [S.E.] (7)	
<i>Group characteristics:</i>								
Group size (num. HH)	15.59 (2.74)	15.89 (2.78)	15.69 (2.48)	-0.25 [0.51]	0.09 [0.46]	-0.60 [0.47]	0.27 [0.48]	0.286
Share landless	0.350 (0.243)	0.363 (0.251)	0.312 (0.208)	0.054 [0.042]	0.025 [0.033]	0.031 [0.034]	0.027 [0.036]	0.852
Regular open defecation by adults (HH self-report)	0.263 (0.250)	0.270 (0.251)	0.199 (0.224)	0.082* [0.045]	0.035 [0.045]	0.073 [0.049]	0.049 [0.044]	0.675
Density (mean num. HH within 50m)	12.33 (6.07)	11.69 (5.74)	13.67 (6.58)	-1.81 [1.39]	-1.03 [1.43]	-0.87 [1.43]	-1.18 [1.55]	0.884
Village leader in group	0.153 (0.360)	0.156 (0.364)	0.116 (0.321)	0.072** [0.035]	0.032 [0.032]	0.009 [0.032]	0.060* [0.032]	0.376
<i>Baseline latrine ownership:</i>								
Owns no latrine	0.403 (0.202)	0.394 (0.195)	0.377 (0.188)	0.014 [0.026]	0.012 [0.029]	0.040 [0.033]	0.008 [0.029]	0.187
Owns any latrine	0.597 (0.202)	0.606 (0.195)	0.623 (0.188)	-0.014 [0.026]	-0.012 [0.029]	-0.040 [0.033]	-0.008 [0.029]	0.187
Owns non-hygienic latrine	0.214 (0.154)	0.244 (0.155)	0.212 (0.151)	0.000 [0.024]	-0.015 [0.025]	-0.007 [0.025]	0.001 [0.026]	0.903
Owns hygienic latrine	0.397 (0.218)	0.374 (0.201)	0.435 (0.203)	-0.023 [0.040]	-0.006 [0.044]	-0.043 [0.050]	-0.016 [0.041]	0.625
<i>Baseline latrine access:</i>								
No latrine access	0.211 (0.223)	0.196 (0.205)	0.170 (0.209)	0.042 [0.039]	0.024 [0.039]	0.061 [0.043]	0.028 [0.040]	0.525
Access to any latrine	0.789 (0.223)	0.804 (0.205)	0.830 (0.209)	-0.042 [0.039]	-0.024 [0.039]	-0.061 [0.043]	-0.028 [0.040]	0.525
Access to hygienic latrine	0.491 (0.257)	0.466 (0.242)	0.533 (0.232)	-0.031 [0.046]	0.001 [0.052]	-0.053 [0.056]	-0.015 [0.048]	0.496
<i>Sample sizes:</i>								
Villages	107	23	8	24	30	25	29	
Groups	1,236	256	121	234	379	345	290	
Households	19,271	4,069	1,898	3,612	5,978	5,205	4,626	

Notes: this table presents summary statistics (means and standard deviations) of key baseline variables for all villages (Column 1), pure control villages (Column 2) and villages where groups received only the basic health messaging treatment (Column 3). Standard deviations are in parentheses. Columns 4-7 show estimated coefficients for indicators for the village-level treatments (monetary reward, reward certificate, private commitment, public commitment) in regressions where the baseline variable is the dependent variable, and the basic health messaging treatment is the omitted category. Estimated standard errors robust to clustering at the village level are in brackets. Column 8 shows the p-value on a joint F-test of significance of the treatment indicators. Sample sizes do not sum because villages may be assigned to one reward treatment, one commitment treatment, one from each category, or neither. (See discussion of experimental design in the text.) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3: Short-term Effects: Hygienic Latrine Ownership

	(1)	(2)	(3)	(4)
Monetary reward	0.100** (0.045) [0.007, 0.198]	0.125*** (0.035) [0.050, 0.204]	0.072*** (0.015) [0.039, 0.105]	0.075*** (0.015) [0.043, 0.106]
Reward certificate	0.051 (0.044) [-0.050, 0.151]	0.043 (0.037) [-0.048, 0.129]	0.009 (0.012) [-0.019, 0.037]	0.010 (0.012) [-0.017, 0.037]
Private commitment	0.002 (0.044) [-0.098, 0.104]	0.010 (0.038) [-0.074, 0.100]	0.011 (0.012) [-0.017, 0.038]	0.010 (0.012) [-0.017, 0.037]
Public commitment	0.056 (0.041) [-0.034, 0.143]	0.061 (0.037) [-0.023, 0.144]	0.042*** (0.015) [0.008, 0.077]	0.042*** (0.015) [0.008, 0.077]
Baseline share owning hyg. lat.			0.748*** (0.023)	0.720*** (0.023)
Share of households landless				-0.067*** (0.017)
Union FEs	No	Yes	Yes	Yes
Number of groups	980	980	980	980
Number of villages	84	84	84	84
Omitted category mean	0.451	0.451	0.451	0.451
Omitted category S.D.	(0.189)	(0.189)	(0.189)	(0.189)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received basic health message on hygienic latrines and sanitation practices. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficients of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Medium-term Effects: Hygienic Latrine Ownership

	(1)	(2)	(3)	(4)
Monetary reward	0.041 (0.036) [-0.036, 0.119]	0.052* (0.030) [-0.014, 0.119]	0.010 (0.019) [-0.030, 0.051]	0.015 (0.019) [-0.026, 0.054]
Reward certificate	0.045 (0.038) [-0.043, 0.131]	0.042 (0.035) [-0.041, 0.123]	0.016 (0.023) [-0.037, 0.066]	0.018 (0.022) [-0.032, 0.066]
Private commitment	0.011 (0.040) [-0.084, 0.101]	0.012 (0.039) [-0.079, 0.101]	0.012 (0.025) [-0.046, 0.067]	0.011 (0.024) [-0.046, 0.065]
Public commitment	0.075** (0.032) [0.006, 0.145]	0.076*** (0.029) [0.014, 0.137]	0.061*** (0.017) [0.026, 0.096]	0.061*** (0.017) [0.025, 0.096]
Baseline share owning hyg. lat.			0.578*** (0.036)	0.533*** (0.039)
Share of households landless				-0.107*** (0.032)
Union FEs	No	Yes	Yes	Yes
Number of groups	979	979	979	979
Number of villages	84	84	84	84
Omitted category mean	0.544	0.544	0.544	0.544
Omitted category S.D.	(0.255)	(0.255)	(0.255)	(0.255)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received basic health message on hygienic latrines and sanitation practices. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficients of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5: Short-term Effects: Latrine Components Functional and Unbroken

	(1) Slab	(2) Seal	(3) Pit Cover and Rings
Monetary reward	0.029* (0.017)	0.058*** (0.014)	0.070*** (0.021)
Reward certificate	0.011 (0.016)	0.009 (0.011)	0.027 (0.019)
Private commitment	-0.006 (0.015)	0.003 (0.011)	0.006 (0.020)
Public commitment	0.002 (0.019)	0.018 (0.013)	0.039* (0.020)
Baseline share owning hyg. lat.	0.539*** (0.035)	0.764*** (0.022)	0.482*** (0.041)
Share of households landless	-0.058** (0.023)	-0.068*** (0.019)	-0.021 (0.026)
Union FEs	Yes	Yes	Yes
Number of households	14,430	14,094	14,430
Number of groups	980	980	980
Number of villages	84	84	84
Omitted category mean	0.664	0.484	0.522

Notes: this table shows estimated treatment effects on indicators for whether the household owns a latrine with the component indicated in the column header functional and unbroken in the short term (at the time of assessment). The sample excludes pure control villages, so the omitted category consists of households in groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Medium-term Effects: Latrine Components Functional and Unbroken

	(1)	(2)	(3)
	Slab	Seal	Pit Cover and Rings
Monetary reward	-0.008 (0.017)	0.025 (0.022)	0.003 (0.023)
Reward certificate	0.016 (0.019)	0.024 (0.023)	0.023 (0.027)
Private commitment	0.002 (0.020)	-0.001 (0.025)	-0.003 (0.029)
Public commitment	0.014 (0.014)	0.016 (0.020)	0.049** (0.020)
Baseline share owning hyg. lat.	0.432*** (0.044)	0.621*** (0.038)	0.343*** (0.045)
Share of households landless	-0.136*** (0.029)	-0.141*** (0.032)	-0.139*** (0.027)
Union FEs	Yes	Yes	Yes
Number of households	6,282	6,206	6,269
Number of groups	979	979	979
Number of villages	84	84	84
Omitted category mean	0.734	0.604	0.642

Notes: this table shows estimated treatment effects on indicators for whether the household owns a latrine with the component indicated in the column header functional and unbroken in the medium term (12-15 months after assessment). The sample excludes pure control villages, so the omitted category consists of households in groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Short-term Effects: Latrine Condition

	(1) No Bad Smell	(2) No Leaks	(3) No Flies	(4) Water	(5) Soap
Monetary reward	0.083*** (0.023)	0.051*** (0.018)	0.176*** (0.024)	0.096*** (0.019)	0.079*** (0.019)
Reward certificate	-0.022 (0.026)	0.009 (0.018)	0.053*** (0.019)	-0.001 (0.017)	-0.001 (0.021)
Private commitment	-0.027 (0.026)	0.005 (0.018)	0.024 (0.019)	0.018 (0.018)	0.026 (0.023)
Public commitment	0.037 (0.023)	0.033* (0.020)	0.029 (0.022)	-0.030* (0.018)	0.011 (0.017)
Baseline share owning hyg. lat.	0.500*** (0.031)	0.455*** (0.032)	0.604*** (0.032)	0.539*** (0.029)	0.486*** (0.035)
Share of households landless	-0.023 (0.024)	-0.005 (0.028)	-0.020 (0.024)	-0.096*** (0.021)	-0.127*** (0.023)
Union FEs	Yes	Yes	Yes	Yes	Yes
Number of households	14,426	14,427	14,414	14,150	14,147
Number of groups	980	980	980	980	980
Number of villages	84	84	84	84	84
Omitted category mean	0.323	0.614	0.340	0.398	0.299

Notes: this table shows estimated treatment effects on indicators of the household latrine condition noted in the column header. in the short term (at the time of assessment). The sample excludes pure control villages, so the omitted category consists of households in groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 8: Medium-term Effects: Latrine Condition

	(1) No Bad Smell	(2) No Leaks	(3) No Flies	(4) Water	(5) Soap
Monetary reward	-0.056 (0.042)	0.016 (0.019)	-0.001 (0.037)	0.027 (0.028)	0.028 (0.029)
Reward certificate	-0.065* (0.033)	0.012 (0.021)	-0.093* (0.054)	0.009 (0.030)	0.044* (0.025)
Private commitment	-0.001 (0.034)	0.004 (0.023)	-0.069 (0.057)	-0.005 (0.032)	0.029 (0.028)
Public commitment	0.081** (0.039)	0.035** (0.018)	0.023 (0.042)	0.022 (0.025)	0.026 (0.026)
Baseline share owning hyg. lat.	0.236*** (0.050)	0.334*** (0.037)	0.221*** (0.057)	0.447*** (0.055)	0.402*** (0.052)
Share of households landless	-0.087*** (0.033)	-0.135*** (0.030)	-0.140*** (0.040)	-0.166*** (0.037)	-0.159*** (0.042)
Union FEs	Yes	Yes	Yes	Yes	Yes
Number of households	6,284	6,282	6,280	6,015	6,282
Number of groups	979	979	979	979	979
Number of villages	84	84	84	84	84
Omitted category mean	0.314	0.700	0.417	0.534	0.387

Notes: this table shows estimated treatment effects on indicators of the household latrine condition noted in the column header. in the medium term (12-15 months after assessment). The sample excludes pure control villages, so the omitted category consists of households in groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 9: Short-term Effects: Assistance from others in group

	(1)	(2)	(3)	(4)	(5)	(6)
	Any	Advice or info.	Materials, cash, labor	Privately	Publicly	Pressure
Monetary reward	0.141*** (0.032)	0.135*** (0.032)	0.006*** (0.002)	0.036 (0.026)	0.131*** (0.030)	0.116*** (0.031)
Reward certificate	0.079** (0.036)	0.077** (0.037)	-0.000 (0.001)	0.037 (0.026)	0.080** (0.040)	0.034* (0.019)
Private commitment	0.087** (0.039)	0.086** (0.040)	-0.000 (0.001)	0.018 (0.027)	0.081* (0.043)	0.019 (0.020)
Public commitment	0.065* (0.035)	0.063* (0.035)	0.003* (0.002)	0.021 (0.034)	0.048 (0.031)	0.046* (0.025)
Baseline share owning hyg. lat.	0.212*** (0.044)	0.213*** (0.044)	-0.003 (0.002)	0.088** (0.035)	0.192*** (0.044)	0.158*** (0.030)
Share of households landless	0.026 (0.033)	0.027 (0.033)	-0.002 (0.002)	0.018 (0.030)	0.046* (0.026)	0.029 (0.026)
Union FEs	Yes	Yes	Yes	Yes	Yes	Yes
Number of households	14,116	14,055	14,055	14,098	14,098	14,103
Number of groups	980	980	980	980	980	980
Number of villages	84	84	84	84	84	84
Omitted category mean	0.258	0.259	0.001	0.187	0.183	0.153

Notes: this table shows estimated treatment effects on indicators of indicators for different types of assistance (noted in the column header) the household reports receiving from others in the group. in the short term (at the time of assessment). The sample excludes pure control villages, so the omitted category consists of households in groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Figure 1: Timeline for a typical village

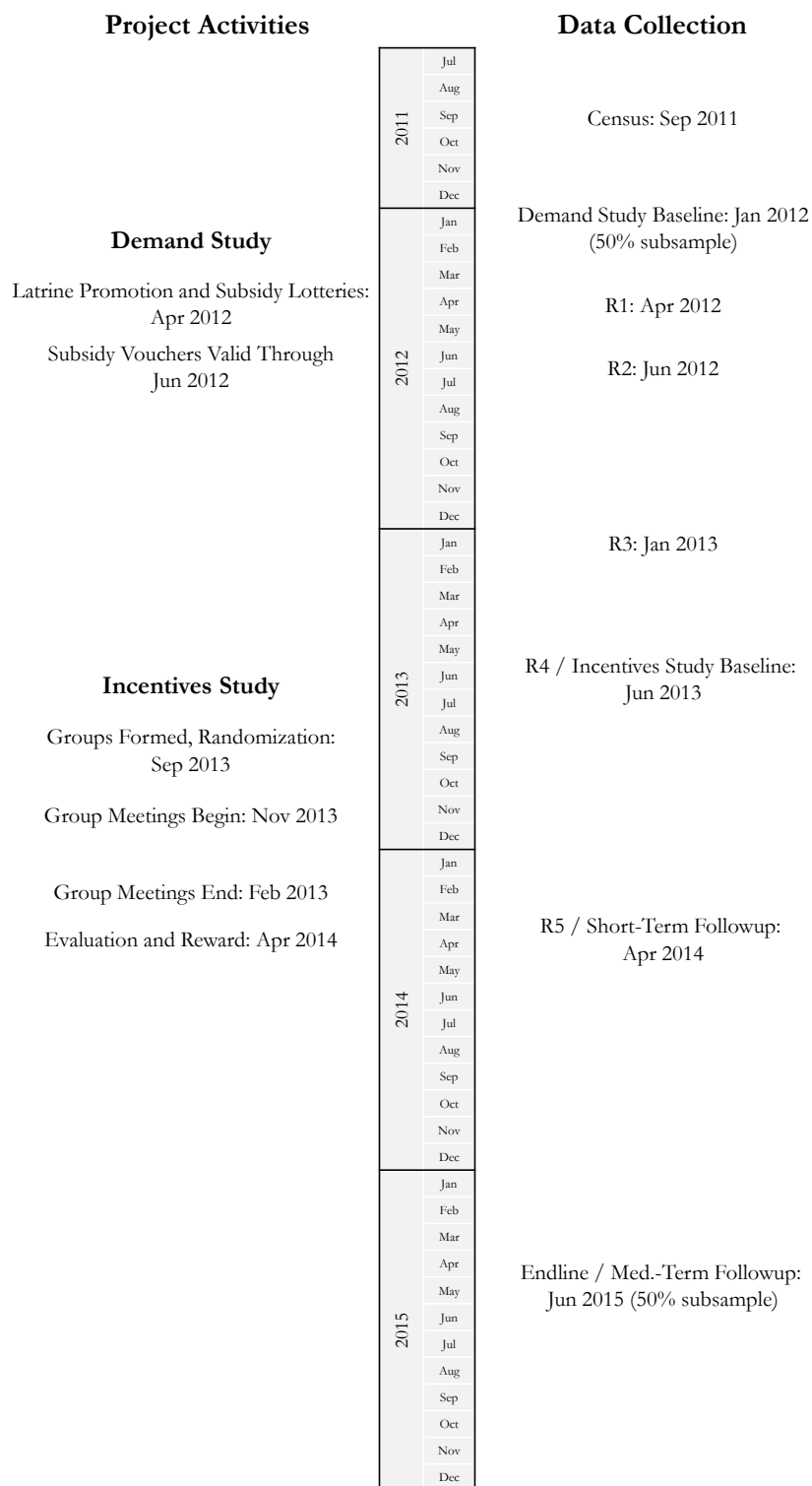
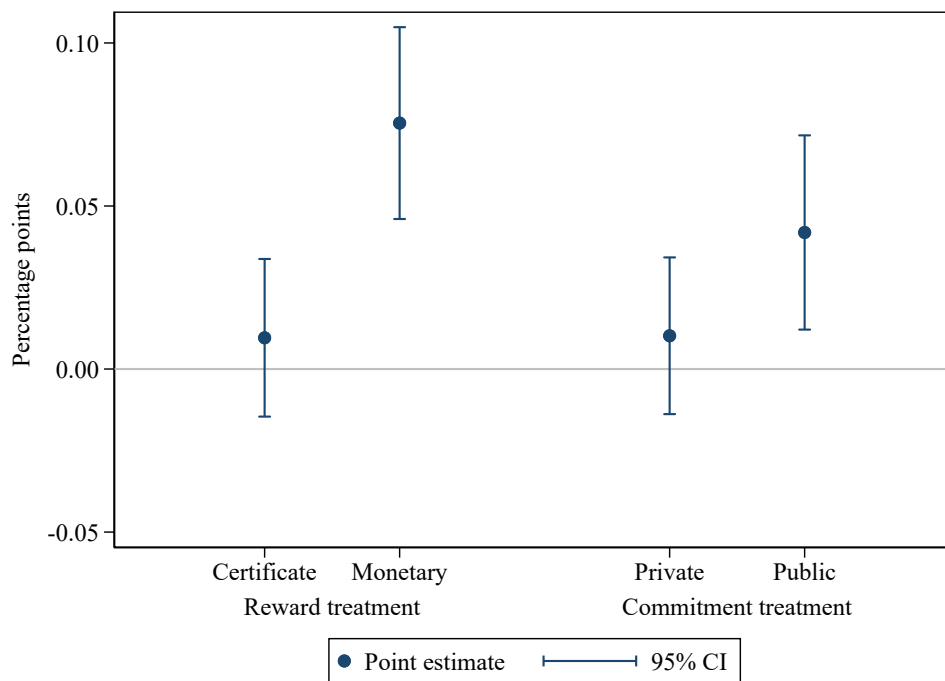
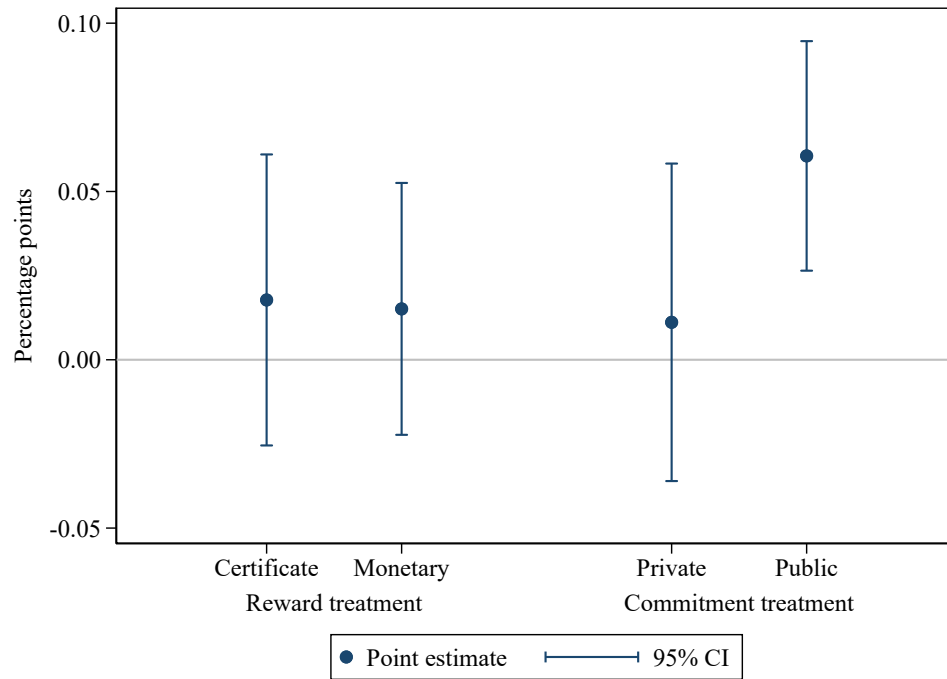


Figure 2: Short-term Effects: Hygienic Latrine Ownership



Notes: this graph presents estimated treatment effects of the interventions on the share of households in the group with a hygienic latrine in the short term (at the time of assessment). The regression includes for the baseline level of the outcome variable, the share of households in the group that are landless, and union fixed effects. Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received basic health message on hygienic latrines and sanitation practices. 95% confidence intervals use standard errors clustered at the village level (the level of randomization).

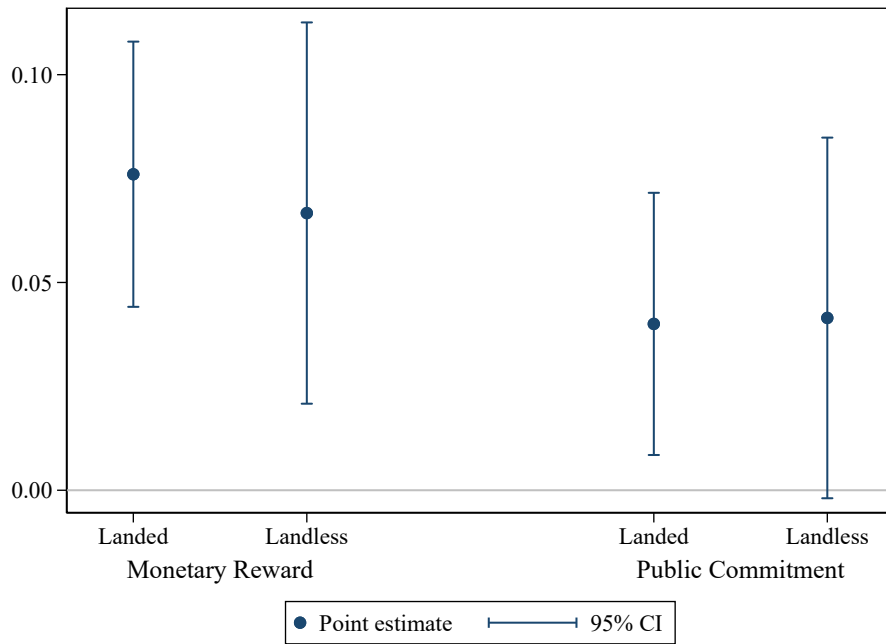
Figure 3: Medium-term Effects: Hygienic Latrine Ownership



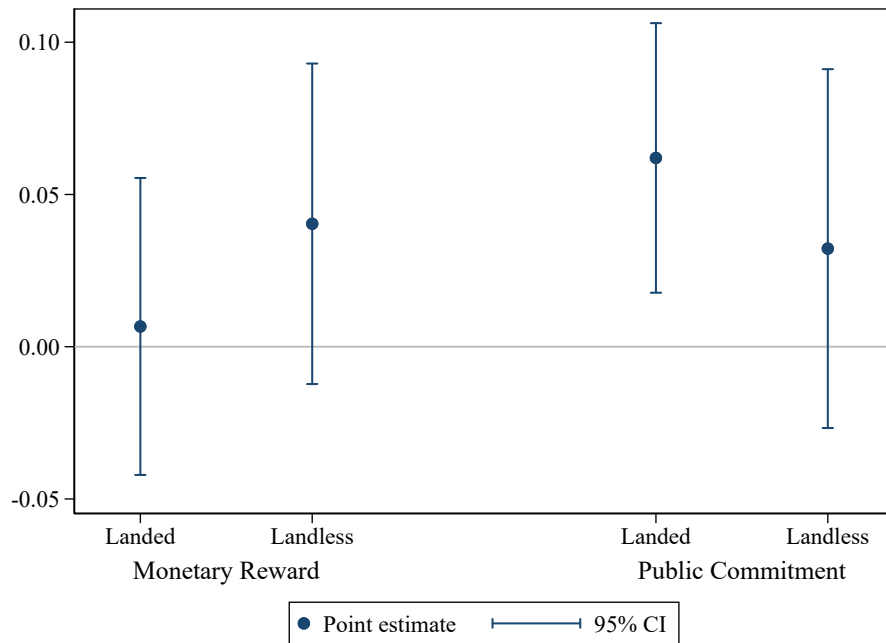
Notes: this graph presents estimated treatment effects of the interventions on the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). The regression includes for the baseline level of the outcome variable, the share of households in the group that are landless, and union fixed effects. Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received basic health message on hygienic latrines and sanitation practices. 95% confidence intervals use standard errors clustered at the village level (the level of randomization).

Figure 4: Effect on Hygienic Latrine Ownership
By Household's Landless Status

(a) Short-term



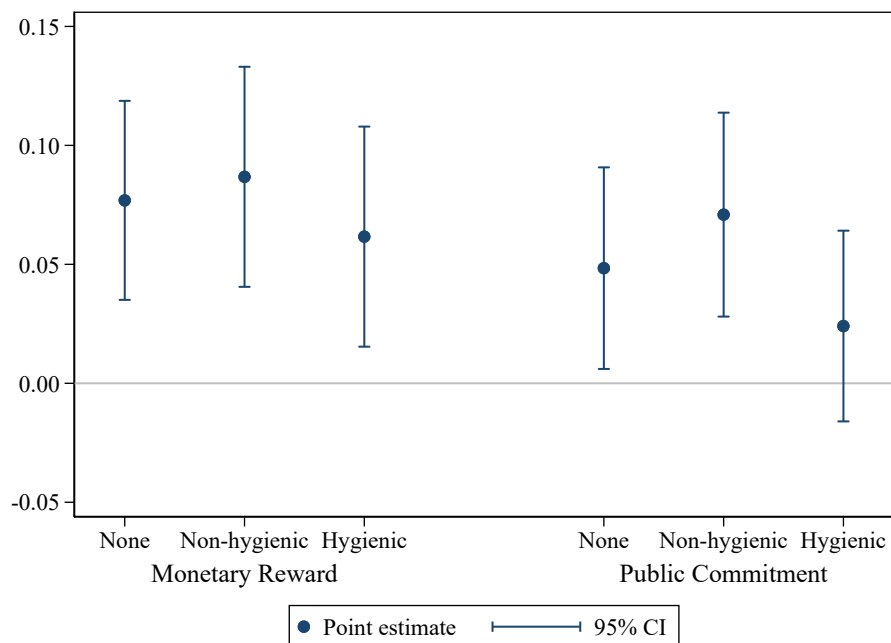
(b) Medium-term



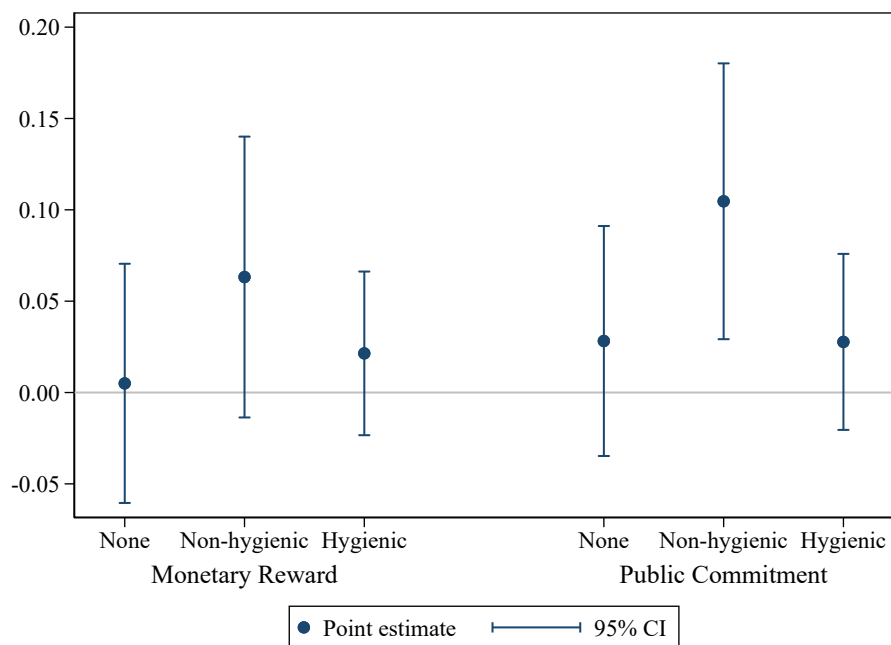
Notes: these graphs present estimated treatment effects of the Monetary Reward and Public Commitment treatments on ownership of a hygienic latrine by household land ownership status. The top panel shows short-term effects and the bottom panel shows medium-term effects. The comparison group consists of households in villages receiving only the basic health intervention. The regression controls for group-level baseline hygienic latrine ownership, group share of landless households, and union fixed effects. 95% confidence intervals use standard errors clustered at the village level (the level of randomization).

Figure 5: Effect on Hygienic Latrine Ownership
By Household's Baseline Latrine Ownership Category

(a) Short-term



(b) Medium-term



Notes: these graphs present estimated treatment effects of the Monetary Reward and Public Commitment treatments on ownership of a hygienic latrine by category of baseline latrine ownership. The top panel shows short-term effects and the bottom panel shows medium-term effects. The comparison group consists of households in villages receiving only the basic health intervention. The regression controls for group-level baseline hygienic latrine ownership, group share of landless households, and union fixed effects. 95% confidence intervals use standard errors clustered at the village level (the level of randomization).

Social and Financial Incentives for Overcoming a Collective Action Problem

Appendix Tables and Figures

M. Mehrab Bakhtiar***
IFPRI

Raymond Guiteras
North Carolina State University

James Levinsohn
Yale University

Ahmed Mushfiq Mobarak
Yale University

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A Effect of Basic Information Treatment

Hygienic Ownership

Table A1: Short Term Hygienic Ownership (Weighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.043 (0.033) [-0.038, 0.113]	0.046 (0.035) [-0.047, 0.131]	0.011 (0.028) [-0.068, 0.083]	0.009 (0.027) [-0.067, 0.079]
Baseline share owning hyg. lat.			0.708*** (0.043)	0.655*** (0.049)
Share of households landless				-0.106*** (0.037)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	376	376
Number of villages	31	31	31	31
Omitted category mean	0.399	0.399	0.401	0.401
Omitted category S.D.	(0.240)	(0.240)	(0.240)	(0.240)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A2: Short Term Hygienic Ownership (Unweighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.053 (0.033) [-0.024, 0.122]	0.055 (0.034) [-0.037, 0.138]	0.012 (0.028) [-0.067, 0.083]	0.010 (0.027) [-0.066, 0.079]
Baseline share owning hyg. lat.			0.702*** (0.042)	0.648*** (0.051)
Share of households landless				-0.111*** (0.040)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	376	376
Number of villages	31	31	31	31
Omitted category mean	0.399	0.399	0.401	0.401
Omitted category S.D.	(0.240)	(0.240)	(0.240)	(0.240)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the short term (at the time of assessment). Observations (groups) are unweighted. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A3: Medium Term Hygienic Ownership (Weighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.002 (0.036) [-0.078, 0.093]	0.023 (0.030) [-0.044, 0.094]	-0.000 (0.025) [-0.058, 0.060]	-0.002 (0.024) [-0.059, 0.058]
Baseline share owning hyg. lat.			0.459*** (0.065)	0.428*** (0.075)
Share of households landless				-0.064 (0.068)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	376	376
Number of villages	31	31	31	31
Omitted category mean	0.540	0.540	0.543	0.543
Omitted category S.D.	(0.249)	(0.249)	(0.247)	(0.247)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4: Medium Term Hygienic Ownership (Unweighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.003 (0.037) [-0.076, 0.098]	0.023 (0.028) [-0.045, 0.090]	-0.005 (0.023) [-0.061, 0.052]	-0.007 (0.023) [-0.061, 0.048]
Baseline share owning hyg. lat.			0.450*** (0.065)	0.414*** (0.076)
Share of households landless				-0.074 (0.070)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	376	376
Number of villages	31	31	31	31
Omitted category mean	0.540	0.540	0.543	0.543
Omitted category S.D.	(0.249)	(0.249)	(0.247)	(0.247)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are unweighted. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Hygienic Access

Table A5: Short Term Hygienic Access (Weighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.033 (0.036) [-0.051, 0.113]	0.040 (0.038) [-0.056, 0.129]	-0.001 (0.031) [-0.080, 0.081]	-0.003 (0.031) [-0.083, 0.078]
Hygienic latrine access (group share, R4)			0.696*** (0.042)	0.655*** (0.043)
Share of households landless				-0.115*** (0.042)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.484	0.484	0.484	0.484
Omitted category S.D.	(0.268)	(0.268)	(0.268)	(0.268)

Notes: the dependent variable is the share of households in the group with access to a hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A6: Short Term Hygienic Access (Unweighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.044 (0.036) [-0.038, 0.123]	0.050 (0.037) [-0.047, 0.140]	0.001 (0.032) [-0.083, 0.083]	-0.001 (0.031) [-0.083, 0.079]
Hygienic latrine access (group share, R4)			0.687*** (0.042)	0.648*** (0.044)
Share of households landless				-0.113*** (0.040)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.484	0.484	0.484	0.484
Omitted category S.D.	(0.268)	(0.268)	(0.268)	(0.268)

Notes: the dependent variable is the share of households in the group with access to a hygienic latrine in the short term (at the time of assessment). Observations (groups) are unweighted. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A7: Medium Term Hygienic Access (Weighted)

	(1)	(2)	(3)	(4)
Common treatment only	-0.007 (0.039) [-0.096, 0.089]	0.013 (0.032) [-0.062, 0.096]	-0.011 (0.029) [-0.079, 0.064]	-0.012 (0.028) [-0.081, 0.061]
Hygienic latrine access (group share, R4)			0.399*** (0.067)	0.381*** (0.073)
Share of households landless				-0.050 (0.069)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.636	0.636	0.636	0.636
Omitted category S.D.	(0.253)	(0.253)	(0.253)	(0.253)

Notes: the dependent variable is the share of households in the group with access to a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A8: Medium Term Hygienic Access (Unweighted)

	(1)	(2)	(3)	(4)
Common treatment only	-0.009 (0.039) [-0.096, 0.088]	0.010 (0.031) [-0.064, 0.090]	-0.017 (0.028) [-0.084, 0.055]	-0.018 (0.027) [-0.084, 0.051]
Hygienic latrine access (group share, R4)			0.385*** (0.068)	0.359*** (0.074)
Share of households landless				-0.075 (0.067)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.636	0.636	0.636	0.636
Omitted category S.D.	(0.253)	(0.253)	(0.253)	(0.253)

Notes: the dependent variable is the share of households in the group with access to a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are unweighted. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Any Ownership

Table A9: Short Term Any Ownership (Weighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.037 (0.032) [-0.027, 0.130]	0.034 (0.028) [-0.035, 0.098]	0.031 (0.026) [-0.039, 0.090]	0.026 (0.025) [-0.042, 0.081]
Any latrine ownership (group share, R4)			0.738*** (0.064)	0.674*** (0.067)
Share of households landless				-0.132*** (0.043)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	376	376
Number of villages	31	31	31	31
Omitted category mean	0.666	0.666	0.669	0.669
Omitted category S.D.	(0.229)	(0.229)	(0.225)	(0.225)

Notes: the dependent variable is the share of households in the group with any latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A10: Short Term Any Ownership (Unweighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.047 (0.033) [-0.019, 0.139]	0.044 (0.027) [-0.022, 0.104]	0.036 (0.025) [-0.032, 0.090]	0.030 (0.024) [-0.035, 0.082]
Any latrine ownership (group share, R4)			0.739*** (0.068)	0.677*** (0.070)
Share of households landless				-0.134*** (0.041)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	376	376
Number of villages	31	31	31	31
Omitted category mean	0.666	0.666	0.669	0.669
Omitted category S.D.	(0.229)	(0.229)	(0.225)	(0.225)

Notes: the dependent variable is the share of households in the group with any latrine in the short term (at the time of assessment). Observations (groups) are unweighted. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A11: Medium Term Any Ownership (Weighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.008 (0.034) [-0.062, 0.098]	0.027 (0.028) [-0.039, 0.092]	0.025 (0.025) [-0.039, 0.081]	0.021 (0.025) [-0.044, 0.078]
Any latrine ownership (group share, R4)			0.529*** (0.074)	0.487*** (0.066)
Share of households landless				-0.086* (0.047)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	376	376
Number of villages	31	31	31	31
Omitted category mean	0.768	0.768	0.771	0.771
Omitted category S.D.	(0.203)	(0.203)	(0.198)	(0.198)

Notes: the dependent variable is the share of households in the group with any latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A12: Medium Term Any Ownership (Unweighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.015 (0.035) [-0.061, 0.104]	0.033 (0.028) [-0.035, 0.097]	0.026 (0.024) [-0.038, 0.083]	0.023 (0.025) [-0.042, 0.078]
Any latrine ownership (group share, R4)			0.517*** (0.080)	0.477*** (0.069)
Share of households landless				-0.085 (0.052)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	376	376
Number of villages	31	31	31	31
Omitted category mean	0.768	0.768	0.771	0.771
Omitted category S.D.	(0.203)	(0.203)	(0.198)	(0.198)

Notes: the dependent variable is the share of households in the group with any latrine in the medium term (12-15 months after assessment). Observations (groups) are unweighted. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Any Access

Table A13: Short Term Any Access (Weighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.008 (0.035) [-0.068, 0.104]	0.008 (0.029) [-0.062, 0.084]	-0.011 (0.016) [-0.049, 0.028]	-0.015 (0.016) [-0.054, 0.025]
Any latrine access (group share, R4)			0.717*** (0.057)	0.670*** (0.057)
Share of households landless				-0.114** (0.050)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.850	0.850	0.850	0.850
Omitted category S.D.	(0.208)	(0.208)	(0.208)	(0.208)

Notes: the dependent variable is the share of households in the group with access to any hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A14: Short Term Any Access (Unweighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.018 (0.036) [-0.060, 0.113]	0.017 (0.030) [-0.054, 0.092]	-0.008 (0.017) [-0.049, 0.034]	-0.011 (0.018) [-0.054, 0.033]
Any latrine access (group share, R4)			0.720*** (0.055)	0.680*** (0.054)
Share of households landless				-0.105** (0.047)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.850	0.850	0.850	0.850
Omitted category S.D.	(0.208)	(0.208)	(0.208)	(0.208)

Notes: the dependent variable is the share of households in the group with access to any hygienic latrine in the short term (at the time of assessment). Observations (groups) are unweighted. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A15: Medium Term Any Access (Weighted)

	(1)	(2)	(3)	(4)
Common treatment only	-0.003 (0.030) [-0.072, 0.074]	0.008 (0.027) [-0.055, 0.080]	-0.004 (0.020) [-0.054, 0.044]	-0.005 (0.020) [-0.058, 0.045]
Any latrine access (group share, R4)			0.474*** (0.081)	0.459*** (0.081)
Share of households landless				-0.037 (0.045)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.916	0.916	0.916	0.916
Omitted category S.D.	(0.153)	(0.153)	(0.153)	(0.153)

Notes: the dependent variable is the share of households in the group with access to any hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A16: Medium Term Any Access (Unweighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.002 (0.032) [-0.073, 0.078]	0.013 (0.028) [-0.055, 0.085]	-0.003 (0.021) [-0.059, 0.050]	-0.005 (0.022) [-0.063, 0.050]
Any latrine access (group share, R4)			0.475*** (0.083)	0.461*** (0.083)
Share of households landless				-0.037 (0.044)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.916	0.916	0.916	0.916
Omitted category S.D.	(0.153)	(0.153)	(0.153)	(0.153)

Notes: the dependent variable is the share of households in the group with access to any hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are unweighted. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Open Defecation (Surveyor Assessment)

Table A17: Short Term OD (Weighted)

	(1)	(2)	(3)	(4)
Common treatment only	-0.008 (0.035) [-0.104, 0.066]	-0.008 (0.029) [-0.085, 0.060]	-0.003 (0.012) [-0.030, 0.025]	-0.000 (0.013) [-0.029, 0.030]
Open defecation (group share, R4)			0.775*** (0.059)	0.748*** (0.058)
Share of households landless				0.057 (0.038)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.150	0.150	0.150	0.150
Omitted category S.D.	(0.208)	(0.208)	(0.208)	(0.208)

Notes: the dependent variable is the share of households primarily practicing OD in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A18: Short Term OD (Unweighted)

	(1)	(2)	(3)	(4)
Common treatment only	-0.018 (0.036) [-0.111, 0.060]	-0.017 (0.030) [-0.093, 0.054]	-0.006 (0.013) [-0.035, 0.026]	-0.003 (0.014) [-0.035, 0.031]
Open defecation (group share, R4)			0.774*** (0.055)	0.749*** (0.054)
Share of households landless				0.055 (0.037)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.150	0.150	0.150	0.150
Omitted category S.D.	(0.208)	(0.208)	(0.208)	(0.208)

Notes: the dependent variable is the share of households primarily practicing OD in the short term (at the time of assessment). Observations (groups) are unweighted. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A19: Medium Term OD (Weighted)

	(1)	(2)	(3)	(4)
Common treatment only	0.003 (0.030) [-0.075, 0.072]	-0.008 (0.027) [-0.080, 0.054]	-0.005 (0.018) [-0.047, 0.042]	-0.005 (0.018) [-0.048, 0.045]
Open defecation (group share, R4)			0.501*** (0.081)	0.500*** (0.080)
Share of households landless				0.003 (0.046)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.084	0.084	0.084	0.084
Omitted category S.D.	(0.153)	(0.153)	(0.153)	(0.153)

Notes: the dependent variable is the share of households primarily practicing OD in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A20: Medium Term OD (Unweighted)

	(1)	(2)	(3)	(4)
Common treatment only	-0.002 (0.032) [-0.078, 0.074]	-0.013 (0.028) [-0.084, 0.056]	-0.005 (0.019) [-0.051, 0.045]	-0.005 (0.019) [-0.051, 0.048]
Open defecation (group share, R4)			0.501*** (0.081)	0.498*** (0.082)
Share of households landless				0.006 (0.044)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.084	0.084	0.084	0.084
Omitted category S.D.	(0.153)	(0.153)	(0.153)	(0.153)

Notes: the dependent variable is the share of households primarily practicing OD in the medium term (12-15 months after assessment). Observations (groups) are unweighted. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Open Defecation (HH Self-report, endline only)

Table A21: Medium Term OD (Weighted)

	(1)	(2)	(3)	(4)
Common treatment only	-0.125 (0.112) [-0.360, 0.156]	-0.247** (0.099) [-0.470, 0.004]	-0.222** (0.103) [-0.457, 0.053]	-0.220** (0.102) [-0.453, 0.045]
Open defecation (group share, R4)			0.376*** (0.090)	0.342*** (0.087)
Share of households landless				0.101 (0.068)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.469	0.469	0.469	0.469
Omitted category S.D.	(0.355)	(0.355)	(0.355)	(0.355)

Notes: the dependent variable is the share of households regularly practicing OD in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

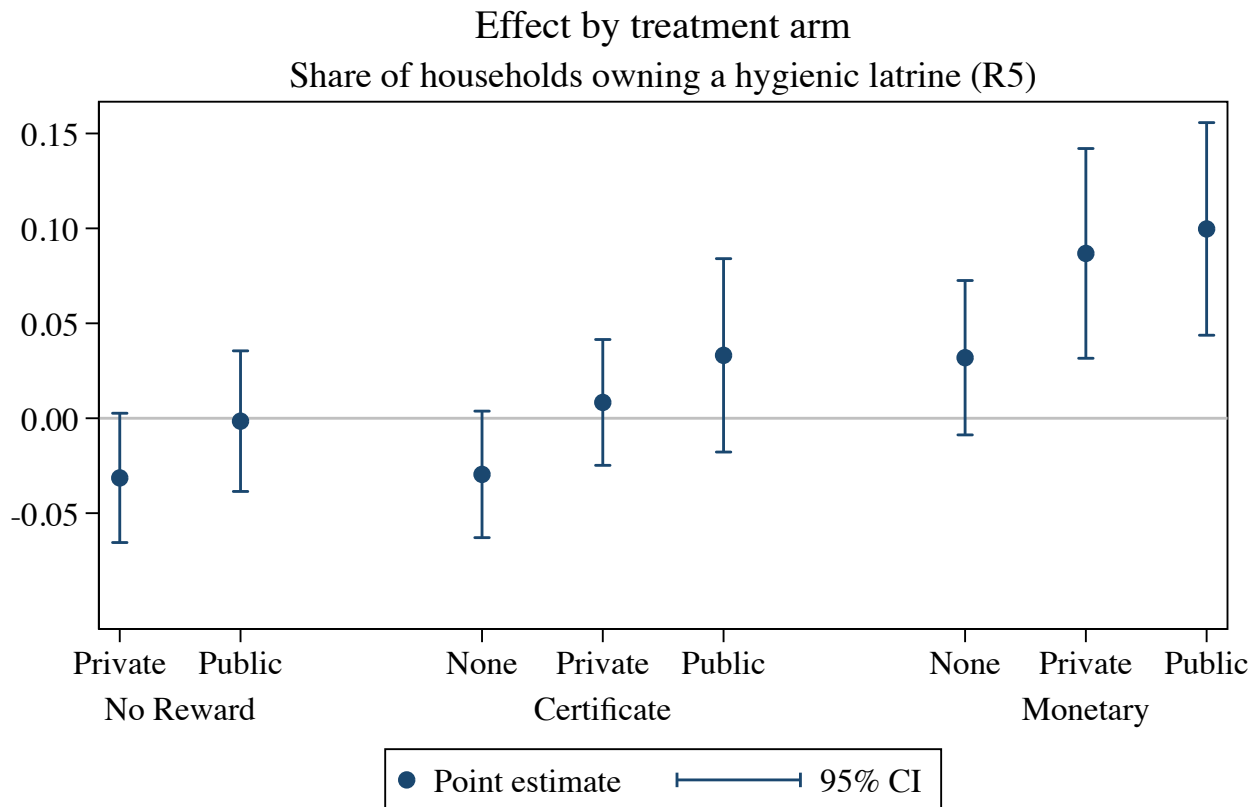
Table A22: Medium Term OD (Unweighted)

	(1)	(2)	(3)	(4)
Common treatment only	-0.124 (0.116) [-0.366, 0.171]	-0.239** (0.100) [-0.463, 0.023]	-0.212* (0.105) [-0.448, 0.068]	-0.209* (0.104) [-0.449, 0.062]
Open defecation (group share, R4)			0.370*** (0.089)	0.337*** (0.086)
Share of households landless				0.102 (0.069)
Union FEs	No	Yes	Yes	Yes
Number of groups	377	377	377	377
Number of villages	31	31	31	31
Omitted category mean	0.469	0.469	0.469	0.469
Omitted category S.D.	(0.355)	(0.355)	(0.355)	(0.355)

Notes: the dependent variable is the share of households regularly practicing OD in the medium term (12-15 months after assessment). Observations (groups) are unweighted. The sample consists of villages either in the pure control group or receiving only the basic health messaging treatment, so the omitted category consists of groups in pure control villages. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficient of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

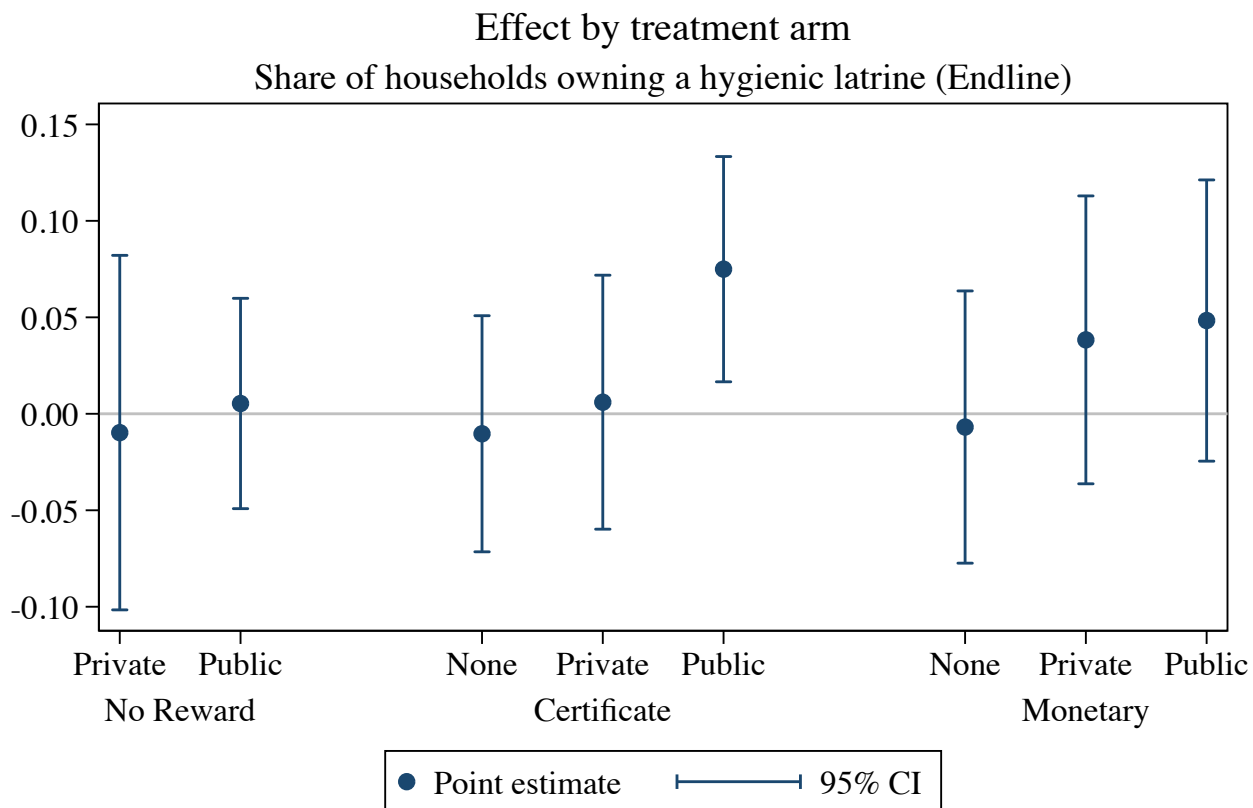
B Program Effects

Figure B1: Short-term Effects – Hygienic Latrine Ownership
Fully Interacted Treatments



Control group consists of basic treatment villages only. Drops pure controls.
Controls: round 4 ownership share, share landless, union fixed effects.

Figure B2: Medium-term Effects – Hygienic Latrine Ownership
Fully Interacted Treatments



Control group consists of basic treatment villages only. Drops pure controls.
Controls: round 4 ownership share, share landless, union fixed effects.

Table B1: Short-term Effects: Hygienic Latrine Ownership
Unweighted Regressions

	(1)	(2)	(3)	(4)
Monetary reward	0.098** (0.046) [0.000, 0.196]	0.126*** (0.036) [0.047, 0.205]	0.074*** (0.016) [0.038, 0.107]	0.077*** (0.016) [0.041, 0.110]
Reward certificate	0.056 (0.046) [-0.052, 0.163]	0.047 (0.039) [-0.050, 0.139]	0.010 (0.013) [-0.018, 0.037]	0.011 (0.012) [-0.017, 0.038]
Private commitment	0.007 (0.046) [-0.094, 0.114]	0.014 (0.040) [-0.074, 0.108]	0.013 (0.012) [-0.016, 0.040]	0.012 (0.012) [-0.017, 0.039]
Public commitment	0.057 (0.043) [-0.036, 0.148]	0.065* (0.038) [-0.020, 0.151]	0.043*** (0.016) [0.007, 0.079]	0.043*** (0.016) [0.007, 0.079]
Baseline share owning hyg. lat.			0.753*** (0.022)	0.725*** (0.022)
Share of households landless				-0.064*** (0.017)
Union FEs	No	Yes	Yes	Yes
Number of groups	980	980	980	980
Number of villages	84	84	84	84
Omitted category mean	0.451	0.451	0.451	0.451
Omitted category S.D.	(0.189)	(0.189)	(0.189)	(0.189)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the short term (at the time of assessment). Observations (groups) are unweighted. The sample excludes pure control villages, so the omitted category consists of groups that received basic health message on hygienic latrines and sanitation practices. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficients of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B2: Short-term Effects: Hygienic Latrine Access

	(1)	(2)	(3)	(4)
Monetary reward	0.098** (0.049) [-0.004, 0.202]	0.124*** (0.038) [0.044, 0.205]	0.073*** (0.018) [0.033, 0.110]	0.076*** (0.018) [0.037, 0.113]
Reward certificate	0.060 (0.050) [-0.058, 0.174]	0.051 (0.044) [-0.059, 0.151]	0.005 (0.016) [-0.031, 0.042]	0.007 (0.016) [-0.029, 0.043]
Private commitment	0.014 (0.050) [-0.100, 0.127]	0.023 (0.045) [-0.074, 0.127]	0.031** (0.015) [-0.002, 0.063]	0.030* (0.015) [-0.003, 0.062]
Public commitment	0.065 (0.048) [-0.038, 0.167]	0.069 (0.043) [-0.027, 0.168]	0.052** (0.021) [0.002, 0.101]	0.051** (0.021) [0.002, 0.102]
Hygienic latrine access (group share, R4)			0.726*** (0.027)	0.698*** (0.029)
Share of households landless				-0.080*** (0.025)
Union FEs	No	Yes	Yes	Yes
Number of groups	980	980	980	980
Number of villages	84	84	84	84
Omitted category mean	0.528	0.528	0.528	0.528
Omitted category S.D.	(0.218)	(0.218)	(0.218)	(0.218)

Notes: the dependent variable is the share of households in the group with access to a hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received basic health message on hygienic latrines and sanitation practices. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficients of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B3: Short-term Effects: Any Latrine Ownership

	(1)	(2)	(3)	(4)
Monetary reward	0.059* (0.030) [-0.002, 0.122]	0.059** (0.023) [0.010, 0.108]	0.022 (0.014) [-0.008, 0.054]	0.024* (0.014) [-0.006, 0.056]
Reward certificate	0.030 (0.029) [-0.039, 0.092]	0.028 (0.025) [-0.031, 0.087]	0.002 (0.012) [-0.024, 0.027]	0.003 (0.012) [-0.023, 0.028]
Private commitment	-0.006 (0.029) [-0.070, 0.055]	-0.004 (0.027) [-0.064, 0.059]	-0.003 (0.012) [-0.029, 0.022]	-0.004 (0.012) [-0.029, 0.020]
Public commitment	0.026 (0.027) [-0.033, 0.082]	0.015 (0.023) [-0.036, 0.065]	-0.002 (0.015) [-0.037, 0.030]	-0.002 (0.015) [-0.038, 0.030]
Any latrine ownership (group share, R4)			0.714*** (0.033)	0.689*** (0.032)
Share of households landless				-0.074*** (0.022)
Union FEs	No	Yes	Yes	Yes
Number of groups	980	980	980	980
Number of villages	84	84	84	84
Omitted category mean	0.713	0.713	0.713	0.713
Omitted category S.D.	(0.204)	(0.204)	(0.204)	(0.204)

Notes: the dependent variable is the share of households in the group with any latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received basic health message on hygienic latrines and sanitation practices. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficients of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B4: Short-term Effects: Open Defecation
Based on surveyor assessment of household's primary latrine

	(1)	(2)	(3)	(4)
Monetary reward	-0.037 (0.033) [-0.106, 0.032]	-0.032 (0.025) [-0.087, 0.020]	-0.001 (0.012) [-0.028, 0.025]	-0.002 (0.012) [-0.029, 0.024]
Reward certificate	-0.041 (0.031) [-0.105, 0.027]	-0.041 (0.026) [-0.097, 0.019]	-0.003 (0.009) [-0.024, 0.016]	-0.004 (0.010) [-0.025, 0.016]
Private commitment	0.015 (0.030) [-0.047, 0.081]	0.014 (0.027) [-0.043, 0.076]	-0.001 (0.010) [-0.023, 0.019]	-0.000 (0.010) [-0.022, 0.020]
Public commitment	-0.004 (0.030) [-0.066, 0.060]	0.010 (0.025) [-0.043, 0.064]	-0.003 (0.009) [-0.024, 0.017]	-0.003 (0.009) [-0.022, 0.018]
Open defecation (group share, R4)			0.779*** (0.028)	0.763*** (0.029)
Share of households landless				0.045** (0.021)
Union FEs	No	Yes	Yes	Yes
Number of groups	980	980	980	980
Number of villages	84	84	84	84
Omitted category mean	0.132	0.132	0.132	0.132
Omitted category S.D.	(0.195)	(0.195)	(0.195)	(0.195)

Notes: the dependent variable is the share of households primarily practicing OD in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received basic health message on hygienic latrines and sanitation practices. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficients of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B5: Medium-term Effects: Hygienic Latrine Ownership
Unweighted Regressions

	(1)	(2)	(3)	(4)
Monetary reward	0.039 (0.036) [-0.038, 0.115]	0.053* (0.031) [-0.015, 0.122]	0.012 (0.020) [-0.030, 0.053]	0.016 (0.019) [-0.025, 0.056]
Reward certificate	0.048 (0.040) [-0.045, 0.139]	0.045 (0.038) [-0.045, 0.132]	0.016 (0.023) [-0.037, 0.066]	0.017 (0.022) [-0.034, 0.066]
Private commitment	0.016 (0.042) [-0.084, 0.111]	0.016 (0.041) [-0.082, 0.113]	0.016 (0.025) [-0.045, 0.070]	0.014 (0.024) [-0.045, 0.068]
Public commitment	0.081** (0.032) [0.013, 0.150]	0.084*** (0.030) [0.021, 0.147]	0.066*** (0.018) [0.030, 0.103]	0.066*** (0.018) [0.029, 0.102]
Baseline share owning hyg. lat.			0.586*** (0.037)	0.542*** (0.040)
Share of households landless				-0.102*** (0.033)
Union FEs	No	Yes	Yes	Yes
Number of groups	979	979	979	979
Number of villages	84	84	84	84
Omitted category mean	0.544	0.544	0.544	0.544
Omitted category S.D.	(0.255)	(0.255)	(0.255)	(0.255)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are unweighted. The sample excludes pure control villages, so the omitted category consists of groups that received basic health message on hygienic latrines and sanitation practices. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficients of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B6: Medium-term Effects: Hygienic Latrine Access

	(1)	(2)	(3)	(4)
Monetary reward	0.028 (0.039) [-0.054, 0.112]	0.035 (0.034) [-0.040, 0.108]	-0.001 (0.023) [-0.049, 0.046]	0.003 (0.022) [-0.044, 0.049]
Reward certificate	0.046 (0.046) [-0.060, 0.150]	0.044 (0.043) [-0.059, 0.145]	0.013 (0.028) [-0.053, 0.074]	0.014 (0.028) [-0.049, 0.076]
Private commitment	0.019 (0.048) [-0.091, 0.128]	0.021 (0.047) [-0.087, 0.131]	0.027 (0.031) [-0.051, 0.097]	0.025 (0.030) [-0.052, 0.095]
Public commitment	0.094** (0.038) [0.013, 0.177]	0.090** (0.034) [0.015, 0.167]	0.078*** (0.022) [0.031, 0.126]	0.077*** (0.022) [0.031, 0.126]
Hygienic latrine access (group share, R4)			0.500*** (0.041)	0.467*** (0.042)
Share of households landless				-0.099*** (0.033)
Union FEs	No	Yes	Yes	Yes
Number of groups	979	979	979	979
Number of villages	84	84	84	84
Omitted category mean	0.627	0.627	0.627	0.627
Omitted category S.D.	(0.278)	(0.278)	(0.278)	(0.278)

Notes: the dependent variable is the share of households in the group with access to a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received basic health message on hygienic latrines and sanitation practices. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficients of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B7: Medium-term Effects: Any Latrine Ownership

	(1)	(2)	(3)	(4)
Monetary reward	0.023 (0.026) [-0.033, 0.079]	0.022 (0.021) [-0.023, 0.069]	-0.008 (0.017) [-0.043, 0.030]	-0.003 (0.016) [-0.037, 0.033]
Reward certificate	0.029 (0.022) [-0.021, 0.074]	0.029 (0.020) [-0.016, 0.071]	0.008 (0.016) [-0.026, 0.042]	0.009 (0.016) [-0.025, 0.044]
Private commitment	-0.008 (0.024) [-0.062, 0.040]	-0.009 (0.022) [-0.061, 0.038]	-0.008 (0.016) [-0.043, 0.029]	-0.010 (0.016) [-0.043, 0.026]
Public commitment	0.015 (0.021) [-0.030, 0.060]	0.008 (0.018) [-0.030, 0.044]	-0.006 (0.015) [-0.038, 0.025]	-0.007 (0.015) [-0.039, 0.025]
Any latrine ownership (group share, R4)			0.587*** (0.044)	0.534*** (0.048)
Share of households landless				-0.153*** (0.029)
Union FEs	No	Yes	Yes	Yes
Number of groups	979	979	979	979
Number of villages	84	84	84	84
Omitted category mean	0.782	0.782	0.782	0.782
Omitted category S.D.	(0.217)	(0.217)	(0.217)	(0.217)

Notes: the dependent variable is the share of households in the group with any latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received basic health message on hygienic latrines and sanitation practices. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficients of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B8: Medium-term Effects: Open Defecation
Based on household's self-report

	(1)	(2)	(3)	(4)
Monetary reward	0.071 (0.085) [-0.127, 0.253]	0.052 (0.060) [-0.091, 0.192]	0.057 (0.055) [-0.074, 0.184]	0.054 (0.056) [-0.077, 0.181]
Reward certificate	0.054 (0.069) [-0.097, 0.203]	0.065 (0.057) [-0.062, 0.191]	0.083 (0.054) [-0.045, 0.200]	0.082 (0.054) [-0.047, 0.201]
Private commitment	0.055 (0.064) [-0.084, 0.197]	0.043 (0.058) [-0.093, 0.176]	0.038 (0.054) [-0.096, 0.161]	0.040 (0.054) [-0.092, 0.166]
Public commitment	-0.029 (0.085) [-0.214, 0.159]	-0.014 (0.062) [-0.151, 0.124]	-0.009 (0.055) [-0.132, 0.116]	-0.007 (0.056) [-0.133, 0.117]
Open defecation (group share, R4)			0.494*** (0.060)	0.445*** (0.062)
Share of households landless				0.167*** (0.041)
Union FEs	No	Yes	Yes	Yes
Number of groups	979	979	979	979
Number of villages	84	84	84	84
Omitted category mean	0.346	0.346	0.346	0.346
Omitted category S.D.	(0.318)	(0.318)	(0.318)	(0.318)

Notes: the dependent variable is the share of households regularly practicing OD in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received basic health message on hygienic latrines and sanitation practices. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficients of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B9: Medium-term Effects: Open Defecation
Based on surveyor assessment of household's primary latrine

	(1)	(2)	(3)	(4)
Monetary reward	-0.011 (0.027) [-0.068, 0.046]	-0.004 (0.022) [-0.052, 0.045]	0.018 (0.016) [-0.017, 0.053]	0.017 (0.015) [-0.017, 0.050]
Reward certificate	-0.028 (0.023) [-0.076, 0.025]	-0.028 (0.022) [-0.076, 0.022]	-0.001 (0.013) [-0.028, 0.028]	-0.002 (0.013) [-0.030, 0.026]
Private commitment	0.009 (0.026) [-0.044, 0.069]	0.009 (0.025) [-0.045, 0.068]	-0.002 (0.014) [-0.032, 0.030]	-0.001 (0.014) [-0.030, 0.030]
Public commitment	-0.012 (0.022) [-0.056, 0.034]	0.000 (0.018) [-0.038, 0.039]	-0.009 (0.011) [-0.034, 0.014]	-0.008 (0.011) [-0.032, 0.015]
Open defecation (group share, R4)			0.552*** (0.050)	0.530*** (0.052)
Share of households landless				0.060** (0.027)
Union FEs	No	Yes	Yes	Yes
Number of groups	979	979	979	979
Number of villages	84	84	84	84
Omitted category mean	0.082	0.082	0.082	0.082
Omitted category S.D.	(0.188)	(0.188)	(0.188)	(0.188)

Notes: the dependent variable is the share of households primarily practicing OD in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received basic health message on hygienic latrines and sanitation practices. Standard errors clustered at the village level in parentheses. Wild cluster bootstrap (9,999 repetitions, Webb weights) 95% confidence intervals, resampling at the village level, in brackets for the coefficients of interest. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B10: Short-term Effects: Hygienic Latrine Ownership
Household-level Data

	(1)	(2)	(3)	(4)
Monetary reward	0.102** (0.044)	0.124*** (0.033)	0.073*** (0.015)	0.076*** (0.014)
Reward certificate	0.051 (0.042)	0.043 (0.035)	0.010 (0.012)	0.011 (0.012)
Private commitment	0.006 (0.041)	0.014 (0.036)	0.015 (0.011)	0.014 (0.011)
Public commitment	0.056 (0.040)	0.061* (0.036)	0.046*** (0.014)	0.045*** (0.015)
Baseline share owning hyg. lat.			0.720*** (0.021)	0.698*** (0.021)
Share of households landless				-0.051*** (0.017)
Union FEs	No	Yes	Yes	Yes
Number of households	14,447	14,447	14,447	14,447
Number of groups	980	980	980	980
Number of villages	84	84	84	84
Omitted category mean	0.429	0.429	0.429	0.429

Notes: the dependent variable is an indicator for whether the household owns a hygienic latrine in the short term (at the time of assessment). The sample excludes pure control villages, so the omitted category consists of households in groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table B11: Medium-term Effects: Hygienic Latrine Ownership
Household-level Data

	(1)	(2)	(3)	(4)
Monetary reward	0.042 (0.036)	0.054* (0.031)	0.014 (0.021)	0.019 (0.020)
Reward certificate	0.044 (0.039)	0.044 (0.036)	0.019 (0.024)	0.021 (0.024)
Private commitment	0.010 (0.041)	0.013 (0.039)	0.016 (0.026)	0.014 (0.025)
Public commitment	0.073** (0.032)	0.072** (0.030)	0.054*** (0.018)	0.053*** (0.018)
Baseline share owning hyg. lat.			0.578*** (0.037)	0.534*** (0.039)
Share of households landless				-0.111*** (0.030)
Union FEs	No	Yes	Yes	Yes
Number of households	6,284	6,284	6,284	6,284
Number of groups	979	979	979	979
Number of villages	84	84	84	84
Omitted category mean	0.551	0.551	0.551	0.551

Notes: the dependent variable is an indicator for whether the household owns a hygienic latrine in the medium term (12-15 months after assessment). The sample excludes pure control villages, so the omitted category consists of households in groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

C Interaction with Household Characteristics

Table C1: Short-term Effects: Hygienic Latrine Ownership
Household-Level Data – By Landlessness

	(1)	(2)	(3)	(4)
Monetary reward	0.115*** (0.038)	0.130*** (0.030)	0.078*** (0.016)	0.076*** (0.016)
Monetary reward X Household landless	-0.029 (0.041)	-0.009 (0.039)	-0.004 (0.025)	-0.009 (0.025)
Reward certificate	0.056 (0.044)	0.047 (0.038)	0.016 (0.015)	0.015 (0.015)
Reward certificate X Household landless	-0.018 (0.031)	-0.014 (0.031)	-0.015 (0.021)	-0.017 (0.021)
Private commitment	-0.001 (0.045)	0.010 (0.039)	0.009 (0.015)	0.010 (0.015)
Private commitment X Household landless	-0.002 (0.034)	-0.008 (0.036)	-0.005 (0.024)	-0.005 (0.024)
Public commitment	0.049 (0.037)	0.055* (0.033)	0.041** (0.017)	0.040** (0.016)
Public commitment X Household landless	-0.000 (0.035)	0.003 (0.035)	-0.001 (0.022)	0.001 (0.022)
Household landless	-0.215*** (0.025)	-0.202*** (0.026)	-0.148*** (0.020)	-0.163*** (0.020)
Baseline share owning hyg. lat.			0.684*** (0.021)	0.722*** (0.022)
Group share landless				0.110*** (0.019)
Union FEs	No	Yes	Yes	Yes
Number of households	13,417	13,417	13,417	13,417
Number of groups	980	980	980	980
Number of villages	84	84	84	84
Omitted category mean	0.452	0.452	0.452	0.452

Notes: the dependent variable is an indicator for whether the household owns a hygienic latrine in the short term (at the time of assessment). The sample excludes pure control villages, so the omitted category consists of households in groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table C2: Medium-term Effects: Hygienic Latrine Ownership
Household-Level Data – By Landlessness

	(1)	(2)	(3)	(4)
Monetary reward	0.043 (0.033)	0.048 (0.031)	0.007 (0.025)	0.007 (0.025)
Monetary reward X Household landless	0.012 (0.040)	0.027 (0.039)	0.034 (0.034)	0.034 (0.033)
Reward certificate	0.035 (0.039)	0.035 (0.037)	0.013 (0.027)	0.013 (0.027)
Reward certificate X Household landless	0.029 (0.037)	0.027 (0.037)	0.023 (0.033)	0.022 (0.033)
Private commitment	0.024 (0.040)	0.028 (0.039)	0.032 (0.029)	0.032 (0.029)
Private commitment X Household landless	-0.040 (0.038)	-0.042 (0.039)	-0.047 (0.033)	-0.047 (0.033)
Public commitment	0.077** (0.030)	0.076** (0.029)	0.062*** (0.023)	0.062*** (0.023)
Public commitment X Household landless	-0.031 (0.043)	-0.028 (0.043)	-0.030 (0.037)	-0.030 (0.037)
Household landless	-0.166*** (0.031)	-0.157*** (0.030)	-0.112*** (0.029)	-0.114*** (0.030)
Baseline share owning hyg. lat.			0.531*** (0.037)	0.535*** (0.039)
Group share landless				0.012 (0.029)
Union FEs	No	Yes	Yes	Yes
Number of households	6,280	6,280	6,280	6,280
Number of groups	979	979	979	979
Number of villages	84	84	84	84
Omitted category mean	0.552	0.552	0.552	0.552

Notes: the dependent variable is an indicator for whether the household owns a hygienic latrine in the medium term (12-15 months after assessment). The sample excludes pure control villages, so the omitted category consists of households in groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table C3: Short-term Effects: Hygienic Latrine Ownership
Household-Level Data – By Baseline Ownership Category

	(1)	(2)	(3)	(4)
Monetary reward	0.077** (0.033)	0.083*** (0.025)	0.074*** (0.022)	0.077*** (0.021)
Monetary reward X Owns non-hygienic latrine	0.007 (0.024)	0.007 (0.023)	0.009 (0.023)	0.010 (0.023)
Monetary reward X Owns hygienic latrine	-0.014 (0.037)	-0.018 (0.035)	-0.014 (0.033)	-0.015 (0.033)
Reward certificate	0.010 (0.023)	0.003 (0.020)	-0.002 (0.017)	-0.001 (0.017)
Reward certificate X Owns non-hygienic latrine	-0.003 (0.023)	0.000 (0.021)	0.002 (0.021)	0.003 (0.021)
Reward certificate X Owns hygienic latrine	0.013 (0.028)	0.021 (0.027)	0.021 (0.026)	0.022 (0.026)
Private commitment	-0.004 (0.023)	0.002 (0.020)	0.002 (0.017)	0.002 (0.017)
Private commitment X Owns non-hygienic latrine	0.026 (0.023)	0.027 (0.022)	0.027 (0.022)	0.027 (0.022)
Private commitment X Owns hygienic latrine	0.015 (0.028)	0.013 (0.028)	0.012 (0.027)	0.012 (0.027)
Public commitment	0.051* (0.029)	0.052** (0.025)	0.050** (0.022)	0.048** (0.022)
Public commitment X Owns non-hygienic latrine	0.027 (0.024)	0.021 (0.021)	0.021 (0.021)	0.023 (0.021)
Public commitment X Owns hygienic latrine	-0.012 (0.034)	-0.026 (0.031)	-0.026 (0.030)	-0.024 (0.029)
Owns non-hygienic latrine	-0.008 (0.020)	-0.012 (0.019)	-0.014 (0.019)	-0.016 (0.019)
Owns hygienic latrine	0.651*** (0.029)	0.642*** (0.029)	0.618*** (0.027)	0.618*** (0.027)
Baseline share owning hyg. lat.			0.129*** (0.022)	0.105*** (0.023)
Share of households landless				-0.059*** (0.017)
Union FEs	No	Yes	Yes	Yes
Number of households	14,083	14,083	14,083	14,083
Number of groups	980	980	980	980
Number of villages	84	84	84	84
Omitted category mean	0.432	0.432	0.432	0.432

Notes: the dependent variable is an indicator for whether the household owns a hygienic latrine in the short term (at the time of assessment). The sample excludes pure control villages, so the omitted category consists of households in groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table C4: Medium-term Effects: Hygienic Latrine Ownership
Household-Level Data – By Baseline Ownership Category

	(1)	(2)	(3)	(4)
Monetary reward	0.015 (0.043)	0.014 (0.037)	-0.001 (0.035)	0.005 (0.033)
Monetary reward X Owns non-hygienic latrine	0.053 (0.040)	0.056 (0.041)	0.059 (0.040)	0.058 (0.041)
Monetary reward X Owns hygienic latrine	0.021 (0.044)	0.013 (0.043)	0.018 (0.041)	0.016 (0.040)
Reward certificate	0.020 (0.040)	0.018 (0.038)	0.011 (0.035)	0.012 (0.035)
Reward certificate X Owns non-hygienic latrine	0.002 (0.044)	0.009 (0.042)	0.012 (0.041)	0.013 (0.041)
Reward certificate X Owns hygienic latrine	0.013 (0.043)	0.018 (0.042)	0.018 (0.040)	0.018 (0.040)
Private commitment	0.016 (0.043)	0.014 (0.042)	0.015 (0.038)	0.012 (0.038)
Private commitment X Owns non-hygienic latrine	-0.013 (0.046)	-0.014 (0.045)	-0.009 (0.043)	-0.008 (0.043)
Private commitment X Owns hygienic latrine	0.013 (0.047)	0.020 (0.046)	0.017 (0.044)	0.019 (0.043)
Public commitment	0.045 (0.040)	0.038 (0.036)	0.032 (0.032)	0.028 (0.032)
Public commitment X Owns non-hygienic latrine	0.076* (0.045)	0.069 (0.044)	0.073* (0.043)	0.076* (0.043)
Public commitment X Owns hygienic latrine	-0.001 (0.043)	-0.008 (0.043)	-0.005 (0.042)	-0.000 (0.041)
Owns non-hygienic latrine	-0.023 (0.041)	-0.029 (0.039)	-0.037 (0.037)	-0.041 (0.038)
Owns hygienic latrine	0.421*** (0.041)	0.413*** (0.040)	0.375*** (0.039)	0.373*** (0.038)
Baseline share owning hyg. lat.			0.193*** (0.036)	0.149*** (0.038)
Share of households landless				-0.111*** (0.028)
Union FEs	No	Yes	Yes	Yes
Number of households	6,168	6,168	6,168	6,168
Number of groups	979	979	979	979
Number of villages	84	84	84	84
Omitted category mean	0.553	0.553	0.553	0.553

Notes: the dependent variable is an indicator for whether the household owns a hygienic latrine in the medium term (12-15 months after assessment). The sample excludes pure control villages, so the omitted category consists of households in groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

D Interaction with Group Characteristics

Table D1: Short Term Effects: Hygienic Latrine Ownership
Interacted with Group Share Landless

	(1)	(2)	(3)
Monetary reward	0.109*** (0.035)	0.130*** (0.030)	0.075*** (0.014)
Monetary reward X Share Landless	-0.107 (0.091)	-0.050 (0.092)	-0.078* (0.042)
Reward certificate	0.048 (0.037)	0.041 (0.033)	0.008 (0.012)
Reward certificate X Share Landless	-0.005 (0.093)	0.011 (0.094)	-0.034 (0.044)
Private commitment	-0.002 (0.037)	0.007 (0.033)	0.009 (0.012)
Private commitment X Share Landless	-0.038 (0.089)	-0.059 (0.096)	-0.053 (0.042)
Public commitment	0.048 (0.034)	0.056* (0.034)	0.041*** (0.015)
Public commitment X Share Landless	-0.060 (0.098)	-0.042 (0.101)	-0.040 (0.046)
Group share landless	-0.325*** (0.077)	-0.279*** (0.085)	-0.002 (0.044)
Baseline share owning hyg. lat.			0.720*** (0.023)
Union FEs	No	Yes	Yes
Number of groups	980	980	980
Number of villages	84	84	84
Omitted category mean	0.451	0.451	0.451
Omitted category S.D.	(0.189)	(0.189)	(0.189)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D2: Medium Term Effects: Hygienic Latrine Ownership
Interacted with Group Share Landless

	(1)	(2)	(3)
Monetary reward	0.047 (0.029)	0.054** (0.027)	0.014 (0.019)
Monetary reward X Share Landless	0.063 (0.081)	0.093 (0.084)	0.069 (0.060)
Reward certificate	0.043 (0.032)	0.041 (0.031)	0.017 (0.022)
Reward certificate X Share Landless	0.063 (0.087)	0.059 (0.090)	0.026 (0.066)
Private commitment	0.009 (0.034)	0.010 (0.034)	0.012 (0.024)
Private commitment X Share Landless	-0.051 (0.082)	-0.070 (0.086)	-0.067 (0.057)
Public commitment	0.070** (0.028)	0.073** (0.028)	0.061*** (0.018)
Public commitment X Share Landless	-0.013 (0.093)	-0.004 (0.098)	-0.005 (0.073)
Group share landless	-0.358*** (0.072)	-0.317*** (0.077)	-0.112** (0.055)
Baseline share owning hyg. lat.			0.532*** (0.039)
Union FEs	No	Yes	Yes
Number of groups	979	979	979
Number of villages	84	84	84
Omitted category mean	0.544	0.544	0.544
Omitted category S.D.	(0.255)	(0.255)	(0.255)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D3: Short Term Effects: Hygienic Latrine Ownership Interacted with Baseline Hygienic Latrine Ownership Share

	(1)	(2)	(3)
Monetary reward	0.065*** (0.021)	0.071*** (0.015)	0.074*** (0.015)
Monetary reward X Baseline share owning hyg. latr.	0.094 (0.082)	0.063 (0.069)	0.056 (0.065)
Reward certificate	0.009 (0.013)	0.007 (0.013)	0.008 (0.012)
Reward certificate X Baseline share owning hyg. latr.	-0.001 (0.057)	0.028 (0.053)	0.028 (0.051)
Private commitment	0.006 (0.014)	0.010 (0.012)	0.009 (0.012)
Private commitment X Baseline share owning hyg. latr.	0.069 (0.052)	0.058 (0.055)	0.057 (0.052)
Public commitment	0.046*** (0.017)	0.040** (0.015)	0.040** (0.015)
Public commitment X Baseline share owning hyg. latr.	0.091 (0.073)	0.039 (0.065)	0.044 (0.061)
Baseline share owning hyg. latr.	0.720*** (0.057)	0.691*** (0.057)	0.663*** (0.054)
Share of households landless			-0.066*** (0.018)
Union FEs	No	Yes	Yes
Number of groups	980	980	980
Number of villages	84	84	84
Omitted category mean	0.451	0.451	0.451
Omitted category S.D.	(0.189)	(0.189)	(0.189)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D4: Medium Term Effects: Hygienic Latrine Ownership
Interacted with Baseline Hygienic Latrine Ownership Share

	(1)	(2)	(3)
Monetary reward	0.017 (0.024)	0.011 (0.020)	0.016 (0.020)
Monetary reward X Baseline share owning hyg. latr.	0.034 (0.082)	0.005 (0.078)	-0.005 (0.073)
Reward certificate	0.012 (0.023)	0.014 (0.022)	0.015 (0.022)
Reward certificate X Baseline share owning hyg. latr.	0.089 (0.078)	0.105 (0.077)	0.106 (0.074)
Private commitment	0.011 (0.025)	0.009 (0.025)	0.007 (0.024)
Private commitment X Baseline share owning hyg. latr.	0.046 (0.082)	0.077 (0.079)	0.076 (0.077)
Public commitment	0.067*** (0.020)	0.059*** (0.018)	0.058*** (0.018)
Public commitment X Baseline share owning hyg. latr.	-0.009 (0.081)	-0.039 (0.083)	-0.030 (0.080)
Baseline share owning hyg. latr.	0.538*** (0.076)	0.517*** (0.077)	0.472*** (0.074)
Share of households landless			-0.107*** (0.031)
Union FEs	No	Yes	Yes
Number of groups	979	979	979
Number of villages	84	84	84
Omitted category mean	0.544	0.544	0.544
Omitted category S.D.	(0.255)	(0.255)	(0.255)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D5: Short Term Effects: Hygienic Latrine Ownership
Interacted with Baseline Latrine Ownership Share

	(1)	(2)	(3)
Monetary reward	0.073** (0.031)	0.093*** (0.026)	0.100*** (0.024)
Monetary reward X Baseline share owning any latr.	0.054 (0.093)	0.013 (0.079)	-0.002 (0.073)
Reward certificate	0.022 (0.026)	0.020 (0.024)	0.021 (0.024)
Reward certificate X Baseline share owning any latr.	-0.008 (0.064)	0.006 (0.056)	0.018 (0.052)
Private commitment	0.004 (0.028)	0.011 (0.024)	0.008 (0.024)
Private commitment X Baseline share owning any latr.	0.071 (0.072)	0.053 (0.062)	0.055 (0.058)
Public commitment	0.042 (0.028)	0.047* (0.028)	0.045 (0.027)
Public commitment X Baseline share owning any latr.	0.129 (0.081)	0.044 (0.070)	0.070 (0.067)
Baseline share owning any latr.	0.578*** (0.054)	0.544*** (0.052)	0.469*** (0.049)
Share of households landless			-0.192*** (0.030)
Union FEs	No	Yes	Yes
Number of groups	980	980	980
Number of villages	84	84	84
Omitted category mean	0.451	0.451	0.451
Omitted category S.D.	(0.189)	(0.189)	(0.189)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D6: Medium Term Effects: Hygienic Latrine Ownership
Interacted with Baseline Latrine Ownership Share

	(1)	(2)	(3)
Monetary reward	0.021 (0.028)	0.027 (0.026)	0.033 (0.024)
Monetary reward X Baseline share owning any latr.	0.115 (0.101)	0.091 (0.098)	0.076 (0.093)
Reward certificate	0.023 (0.027)	0.024 (0.026)	0.026 (0.026)
Reward certificate X Baseline share owning any latr.	0.117 (0.099)	0.141 (0.093)	0.153* (0.089)
Private commitment	0.009 (0.029)	0.008 (0.029)	0.005 (0.028)
Private commitment X Baseline share owning any latr.	0.014 (0.106)	0.012 (0.103)	0.014 (0.100)
Public commitment	0.061** (0.024)	0.060*** (0.023)	0.058** (0.022)
Public commitment X Baseline share owning any latr.	0.084 (0.086)	0.030 (0.086)	0.055 (0.080)
Baseline share owning any latr.	0.428*** (0.082)	0.403*** (0.078)	0.328*** (0.075)
Share of households landless			-0.190*** (0.035)
Union FEs	No	Yes	Yes
Number of groups	979	979	979
Number of villages	84	84	84
Omitted category mean	0.544	0.544	0.544
Omitted category S.D.	(0.255)	(0.255)	(0.255)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D7: Short Term Effects: Hygienic Latrine Ownership
Interacted with Baseline Non-Hygienic Latrine Ownership Share

	(1)	(2)	(3)	(4)
Monetary reward	0.098** (0.042)	0.118*** (0.030)	0.124*** (0.028)	0.076*** (0.015)
Monetary reward X Baseline share owning non-hyg. latr.	-0.254* (0.144)	-0.215* (0.123)	-0.167 (0.106)	-0.127 (0.079)
Reward certificate	0.045 (0.038)	0.038 (0.032)	0.037 (0.030)	0.009 (0.012)
Reward certificate X Baseline share owning non-hyg. latr.	-0.227 (0.143)	-0.226 (0.137)	-0.176 (0.121)	-0.113 (0.068)
Private commitment	0.001 (0.038)	0.010 (0.033)	0.007 (0.030)	0.011 (0.012)
Private commitment X Baseline share owning non-hyg. latr.	-0.029 (0.138)	0.014 (0.126)	0.015 (0.112)	0.014 (0.072)
Public commitment	0.060 (0.037)	0.061* (0.031)	0.057* (0.030)	0.042*** (0.015)
Public commitment X Baseline share owning non-hyg. latr.	-0.115 (0.121)	-0.082 (0.092)	-0.049 (0.089)	-0.008 (0.064)
Baseline share owning non-hyg. latr.	-0.258*** (0.095)	-0.266*** (0.084)	-0.251*** (0.080)	0.103 (0.067)
Share of households landless			-0.287*** (0.035)	-0.064*** (0.018)
Baseline share owning hyg. latr.				0.729*** (0.026)
Union FEs	No	Yes	Yes	Yes
Number of groups	980	980	980	980
Number of villages	84	84	84	84
Omitted category mean	0.451	0.451	0.451	0.451
Omitted category S.D.	(0.189)	(0.189)	(0.189)	(0.189)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D8: Medium Term Effects: Hygienic Latrine Ownership
Interacted with Baseline Non-Hygienic Latrine Ownership Share

	(1)	(2)	(3)	(4)
Monetary reward	0.040 (0.035)	0.047* (0.028)	0.052** (0.026)	0.015 (0.019)
Monetary reward X Baseline share owning non-hyg. latr.	-0.013 (0.142)	0.036 (0.142)	0.077 (0.128)	0.109 (0.113)
Reward certificate	0.040 (0.035)	0.038 (0.032)	0.038 (0.030)	0.016 (0.022)
Reward certificate X Baseline share owning non-hyg. latr.	-0.176 (0.144)	-0.138 (0.140)	-0.088 (0.129)	-0.040 (0.107)
Private commitment	0.009 (0.037)	0.010 (0.035)	0.007 (0.032)	0.010 (0.024)
Private commitment X Baseline share owning non-hyg. latr.	-0.096 (0.133)	-0.114 (0.130)	-0.112 (0.110)	-0.113 (0.099)
Public commitment	0.078** (0.030)	0.075*** (0.026)	0.071*** (0.026)	0.059*** (0.018)
Public commitment X Baseline share owning non-hyg. latr.	0.041 (0.144)	0.048 (0.130)	0.075 (0.130)	0.107 (0.106)
Baseline share owning non-hyg. latr.	-0.175 (0.110)	-0.189* (0.105)	-0.174* (0.096)	0.101 (0.099)
Share of households landless			-0.280*** (0.037)	-0.106*** (0.033)
Baseline share owning hyg. latr.				0.566*** (0.045)
Union FEs	No	Yes	Yes	Yes
Number of groups	979	979	979	979
Number of villages	84	84	84	84
Omitted category mean	0.544	0.544	0.544	0.544
Omitted category S.D.	(0.255)	(0.255)	(0.255)	(0.255)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D9: Short Term Effects: Hygienic Latrine Ownership
Interacted with Village Leader Present

	(1)	(2)	(3)	(4)
Monetary reward	0.115** (0.050)	0.142*** (0.039)	0.150*** (0.034)	0.090*** (0.015)
Monetary reward X Village Leader Present in Group	-0.086 (0.059)	-0.094* (0.053)	-0.106** (0.049)	-0.073** (0.034)
Reward certificate	0.069 (0.047)	0.057 (0.040)	0.055 (0.036)	0.020 (0.012)
Reward certificate X Village Leader Present in Group	-0.104** (0.051)	-0.089** (0.044)	-0.078* (0.041)	-0.059** (0.026)
Private commitment	0.015 (0.046)	0.018 (0.040)	0.014 (0.036)	0.012 (0.012)
Private commitment X Village Leader Present in Group	-0.078* (0.046)	-0.044 (0.042)	-0.044 (0.040)	-0.014 (0.029)
Public commitment	0.052 (0.045)	0.057 (0.041)	0.050 (0.038)	0.034** (0.015)
Public commitment X Village Leader Present in Group	-0.004 (0.051)	0.002 (0.046)	0.012 (0.043)	0.027 (0.030)
Village Leader Present in Group	0.112*** (0.039)	0.100** (0.038)	0.075** (0.034)	0.030 (0.026)
Share of households landless			-0.321*** (0.037)	-0.070*** (0.017)
Baseline share owning hyg. lat.				0.718*** (0.023)
Union FEs	No	Yes	Yes	Yes
Number of groups	980	980	980	980
Number of villages	84	84	84	84
Omitted category mean	0.451	0.451	0.451	0.451
Omitted category S.D.	(0.189)	(0.189)	(0.189)	(0.189)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D10: Medium Term Effects: Hygienic Latrine Ownership
Interacted with Village Leader Present

	(1)	(2)	(3)	(4)
Monetary reward	0.054 (0.040)	0.066** (0.033)	0.073** (0.029)	0.028 (0.020)
Monetary reward X Village Leader Present in Group	-0.083 (0.052)	-0.084 (0.051)	-0.094** (0.047)	-0.070 (0.044)
Reward certificate	0.059 (0.041)	0.056 (0.037)	0.054 (0.033)	0.028 (0.023)
Reward certificate X Village Leader Present in Group	-0.093* (0.053)	-0.085 (0.053)	-0.076 (0.048)	-0.062 (0.046)
Private commitment	0.015 (0.042)	0.013 (0.040)	0.009 (0.035)	0.008 (0.024)
Private commitment X Village Leader Present in Group	-0.023 (0.050)	-0.002 (0.051)	-0.002 (0.049)	0.021 (0.044)
Public commitment	0.072** (0.036)	0.072** (0.031)	0.065** (0.030)	0.053*** (0.018)
Public commitment X Village Leader Present in Group	-0.005 (0.053)	0.004 (0.051)	0.013 (0.047)	0.025 (0.046)
Village Leader Present in Group	0.086* (0.049)	0.073 (0.050)	0.050 (0.044)	0.016 (0.046)
Share of households landless			-0.296*** (0.037)	-0.110*** (0.032)
Baseline share owning hyg. lat.				0.533*** (0.039)
Union FEs	No	Yes	Yes	Yes
Number of groups	979	979	979	979
Number of villages	84	84	84	84
Omitted category mean	0.544	0.544	0.544	0.544
Omitted category S.D.	(0.255)	(0.255)	(0.255)	(0.255)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D11: Short Term Effects: Hygienic Latrine Ownership
Interacted with Group Size (Number of Households)

	(1)	(2)	(3)	(4)
Monetary reward	0.101** (0.045)	0.128*** (0.035)	0.074*** (0.015)	0.077*** (0.015)
Monetary reward X Num. HH in group	0.004 (0.010)	-0.001 (0.008)	-0.003 (0.004)	-0.002 (0.004)
Reward certificate	0.057 (0.046)	0.047 (0.040)	0.010 (0.013)	0.011 (0.012)
Reward certificate X Num. HH in group	-0.009 (0.008)	-0.008 (0.008)	-0.002 (0.003)	-0.002 (0.003)
Private commitment	0.004 (0.044)	0.014 (0.039)	0.013 (0.012)	0.011 (0.012)
Private commitment X Num. HH in group	-0.012 (0.007)	-0.010 (0.007)	-0.005 (0.003)	-0.005 (0.003)
Public commitment	0.053 (0.042)	0.063 (0.038)	0.042** (0.017)	0.041** (0.016)
Public commitment X Num. HH in group	-0.003 (0.009)	-0.007 (0.007)	0.000 (0.004)	0.000 (0.004)
Num. HH in group	0.009 (0.007)	0.009 (0.006)	0.003 (0.003)	0.002 (0.003)
Baseline share owning hyg. lat.			0.747*** (0.023)	0.720*** (0.023)
Share of households landless				-0.066*** (0.017)
Union FEs	No	Yes	Yes	Yes
Number of groups	980	980	980	980
Number of villages	84	84	84	84
Omitted category mean	0.451	0.451	0.451	0.451
Omitted category S.D.	(0.189)	(0.189)	(0.189)	(0.189)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D12: Medium Term Effects: Hygienic Latrine Ownership
Interacted with Group Size (Number of Households)

	(1)	(2)	(3)	(4)
Monetary reward	0.043 (0.036)	0.056* (0.031)	0.014 (0.019)	0.017 (0.019)
Monetary reward X Num. HH in group	0.001 (0.009)	-0.002 (0.009)	-0.003 (0.007)	-0.002 (0.008)
Reward certificate	0.048 (0.041)	0.045 (0.039)	0.016 (0.024)	0.018 (0.023)
Reward certificate X Num. HH in group	-0.008 (0.008)	-0.007 (0.009)	-0.002 (0.007)	-0.002 (0.007)
Private commitment	0.016 (0.041)	0.018 (0.040)	0.017 (0.025)	0.015 (0.024)
Private commitment X Num. HH in group	-0.013* (0.007)	-0.011 (0.007)	-0.008 (0.005)	-0.006 (0.005)
Public commitment	0.078** (0.032)	0.081*** (0.029)	0.064*** (0.017)	0.063*** (0.018)
Public commitment X Num. HH in group	-0.010 (0.007)	-0.012* (0.007)	-0.006 (0.007)	-0.006 (0.007)
Num. HH in group	0.014** (0.007)	0.014** (0.007)	0.009 (0.006)	0.008 (0.006)
Baseline share owning hyg. lat.			0.576*** (0.036)	0.533*** (0.039)
Share of households landless				-0.104*** (0.032)
Union FEs	No	Yes	Yes	Yes
Number of groups	979	979	979	979
Number of villages	84	84	84	84
Omitted category mean	0.544	0.544	0.544	0.544
Omitted category S.D.	(0.255)	(0.255)	(0.255)	(0.255)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D13: Short Term Effects: Hygienic Latrine Ownership
Interacted with Group Density

	(1)	(2)	(3)	(4)
Monetary reward	0.104** (0.041)	0.127*** (0.033)	0.074*** (0.015)	0.076*** (0.015)
Monetary reward X Group density	0.004 (0.005)	0.003 (0.004)	0.003 (0.002)	0.003 (0.002)
Reward certificate	0.047 (0.042)	0.041 (0.035)	0.008 (0.012)	0.009 (0.012)
Reward certificate X Group density	-0.006* (0.004)	-0.004 (0.003)	-0.001 (0.002)	-0.001 (0.002)
Private commitment	-0.000 (0.043)	0.009 (0.038)	0.010 (0.012)	0.009 (0.012)
Private commitment X Group density	-0.007** (0.004)	-0.006* (0.003)	-0.002 (0.002)	-0.002 (0.002)
Public commitment	0.056 (0.036)	0.062* (0.035)	0.042*** (0.015)	0.042*** (0.015)
Public commitment X Group density	0.003 (0.004)	0.001 (0.004)	0.001 (0.002)	0.001 (0.002)
Group density	0.007** (0.003)	0.004 (0.003)	0.000 (0.002)	0.000 (0.002)
Baseline share owning hyg. lat.			0.744*** (0.023)	0.717*** (0.023)
Share of households landless				-0.065*** (0.017)
Union FEs	No	Yes	Yes	Yes
Number of groups	980	980	980	980
Number of villages	84	84	84	84
Omitted category mean	0.451	0.451	0.451	0.451
Omitted category S.D.	(0.189)	(0.189)	(0.189)	(0.189)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D14: Medium Term Effects: Hygienic Latrine Ownership
Interacted with Group Density

	(1)	(2)	(3)	(4)
Monetary reward	0.043 (0.034)	0.053* (0.030)	0.010 (0.019)	0.014 (0.019)
Monetary reward X Group density	0.004 (0.004)	0.003 (0.004)	0.003 (0.003)	0.003 (0.003)
Reward certificate	0.043 (0.038)	0.042 (0.035)	0.016 (0.023)	0.018 (0.023)
Reward certificate X Group density	-0.002 (0.004)	-0.001 (0.004)	0.001 (0.003)	0.001 (0.003)
Private commitment	0.009 (0.041)	0.011 (0.039)	0.011 (0.025)	0.010 (0.024)
Private commitment X Group density	-0.002 (0.004)	-0.002 (0.004)	0.002 (0.003)	0.002 (0.003)
Public commitment	0.074** (0.030)	0.076*** (0.028)	0.060*** (0.018)	0.060*** (0.018)
Public commitment X Group density	0.002 (0.005)	0.000 (0.005)	0.000 (0.003)	0.000 (0.004)
Group density	0.002 (0.003)	0.000 (0.003)	-0.003 (0.002)	-0.003 (0.002)
Baseline share owning hyg. lat.			0.580*** (0.037)	0.535*** (0.039)
Share of households landless				-0.110*** (0.031)
Union FEs	No	Yes	Yes	Yes
Number of groups	979	979	979	979
Number of villages	84	84	84	84
Omitted category mean	0.544	0.544	0.544	0.544
Omitted category S.D.	(0.255)	(0.255)	(0.255)	(0.255)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D15: Short Term Effects: Hygienic Latrine Ownership
 Interacted with Maximum eigenvalue of adjacency matrix

	(1)	(2)	(3)	(4)
Monetary reward	0.096** (0.045)	0.122*** (0.035)	0.070*** (0.015)	0.073*** (0.014)
Monetary reward X Max. eigval. of adj. matrix	0.003 (0.018)	0.004 (0.015)	-0.010 (0.008)	-0.009 (0.008)
Reward certificate	0.049 (0.043)	0.040 (0.037)	0.008 (0.012)	0.009 (0.012)
Reward certificate X Max. eigval. of adj. matrix	0.010 (0.014)	0.008 (0.013)	0.001 (0.007)	0.002 (0.007)
Private commitment	0.003 (0.042)	0.012 (0.038)	0.011 (0.012)	0.011 (0.012)
Private commitment X Max. eigval. of adj. matrix	-0.009 (0.012)	-0.009 (0.012)	-0.008 (0.006)	-0.007 (0.006)
Public commitment	0.059 (0.040)	0.063* (0.035)	0.042*** (0.015)	0.042*** (0.015)
Public commitment X Max. eigval. of adj. matrix	-0.011 (0.017)	-0.009 (0.015)	-0.005 (0.008)	-0.005 (0.008)
Max. eigval. of adj. matrix	-0.018 (0.011)	-0.006 (0.013)	0.000 (0.006)	-0.001 (0.006)
Baseline share owning hyg. lat.			0.746*** (0.023)	0.719*** (0.023)
Share of households landless				-0.065*** (0.017)
Union FEs	No	Yes	Yes	Yes
Number of groups	978	978	978	978
Number of villages	84	84	84	84
Omitted category mean	0.451	0.451	0.451	0.451
Omitted category S.D.	(0.189)	(0.189)	(0.189)	(0.189)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D16: Medium Term Effects: Hygienic Latrine Ownership
 Interacted with Maximum eigenvalue of adjacency matrix

	(1)	(2)	(3)	(4)
Monetary reward	0.041 (0.036)	0.055* (0.030)	0.014 (0.018)	0.019 (0.018)
Monetary reward X Max. eigval. of adj. matrix	-0.009 (0.014)	-0.009 (0.014)	-0.019 (0.013)	-0.017 (0.013)
Reward certificate	0.045 (0.038)	0.043 (0.035)	0.018 (0.022)	0.019 (0.021)
Reward certificate X Max. eigval. of adj. matrix	-0.009 (0.013)	-0.012 (0.012)	-0.017* (0.009)	-0.016* (0.009)
Private commitment	0.011 (0.040)	0.013 (0.038)	0.012 (0.023)	0.011 (0.023)
Private commitment X Max. eigval. of adj. matrix	-0.005 (0.013)	-0.007 (0.012)	-0.006 (0.010)	-0.004 (0.010)
Public commitment	0.075** (0.032)	0.076*** (0.028)	0.059*** (0.017)	0.059*** (0.017)
Public commitment X Max. eigval. of adj. matrix	-0.001 (0.014)	0.001 (0.013)	0.005 (0.011)	0.005 (0.011)
Max. eigval. of adj. matrix	0.003 (0.013)	0.012 (0.013)	0.016** (0.008)	0.015* (0.008)
Baseline share owning hyg. lat.			0.580*** (0.036)	0.536*** (0.039)
Share of households landless				-0.106*** (0.032)
Union FEs	No	Yes	Yes	Yes
Number of groups	977	977	977	977
Number of villages	84	84	84	84
Omitted category mean	0.544	0.544	0.544	0.544
Omitted category S.D.	(0.255)	(0.255)	(0.255)	(0.255)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D17: Short Term Effects: Hygienic Latrine Ownership
 Interacted with Second eigenvalue of stochastized adjacency matrix

	(1)	(2)	(3)	(4)
Monetary reward	0.100** (0.045)	0.126*** (0.035)	0.074*** (0.015)	0.077*** (0.015)
Monetary reward X Second eignval. of stoch. adj. matrix	0.007 (0.036)	0.017 (0.037)	-0.050** (0.022)	-0.048** (0.023)
Reward certificate	0.051 (0.044)	0.041 (0.037)	0.008 (0.013)	0.009 (0.012)
Reward certificate X Second eignval. of stoch. adj. matrix	0.002 (0.025)	0.015 (0.022)	-0.010 (0.016)	-0.010 (0.016)
Private commitment	0.002 (0.045)	0.011 (0.039)	0.012 (0.012)	0.011 (0.012)
Private commitment X Second eignval. of stoch. adj. matrix	0.011 (0.025)	0.007 (0.025)	-0.007 (0.016)	-0.007 (0.017)
Public commitment	0.056 (0.041)	0.063* (0.037)	0.044*** (0.015)	0.043*** (0.015)
Public commitment X Second eignval. of stoch. adj. matrix	0.017 (0.034)	-0.013 (0.030)	-0.005 (0.022)	-0.003 (0.022)
Second eignval. of stoch. adj. matrix	0.004 (0.021)	-0.001 (0.020)	0.024 (0.017)	0.022 (0.018)
Baseline share owning hyg. lat.			0.749*** (0.023)	0.722*** (0.023)
Share of households landless				-0.065*** (0.018)
Union FEs	No	Yes	Yes	Yes
Number of groups	978	978	978	978
Number of villages	84	84	84	84
Omitted category mean	0.451	0.451	0.451	0.451
Omitted category S.D.	(0.189)	(0.189)	(0.189)	(0.189)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the short term (at the time of assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D18: Medium Term Effects: Hygienic Latrine Ownership
Interacted with Second eigenvalue of stochastized adjacency matrix

	(1)	(2)	(3)	(4)
Monetary reward	0.039 (0.036)	0.051* (0.030)	0.010 (0.019)	0.015 (0.019)
Monetary reward X Second eignval. of stoch. adj. matrix	0.030 (0.040)	0.039 (0.036)	-0.012 (0.034)	-0.008 (0.035)
Reward certificate	0.044 (0.039)	0.041 (0.035)	0.015 (0.023)	0.017 (0.022)
Reward certificate X Second eignval. of stoch. adj. matrix	0.018 (0.032)	0.025 (0.029)	0.005 (0.028)	0.007 (0.028)
Private commitment	0.012 (0.041)	0.013 (0.039)	0.013 (0.025)	0.012 (0.024)
Private commitment X Second eignval. of stoch. adj. matrix	0.001 (0.031)	-0.001 (0.029)	-0.012 (0.027)	-0.012 (0.027)
Public commitment	0.075** (0.032)	0.077*** (0.029)	0.062*** (0.018)	0.061*** (0.018)
Public commitment X Second eignval. of stoch. adj. matrix	0.013 (0.037)	0.002 (0.034)	0.009 (0.033)	0.013 (0.032)
Second eignval. of stoch. adj. matrix	0.006 (0.028)	0.001 (0.025)	0.020 (0.020)	0.017 (0.020)
Baseline share owning hyg. lat.			0.577*** (0.036)	0.533*** (0.039)
Share of households landless				-0.107*** (0.032)
Union FEs	No	Yes	Yes	Yes
Number of groups	977	977	977	977
Number of villages	84	84	84	84
Omitted category mean	0.544	0.544	0.544	0.544
Omitted category S.D.	(0.255)	(0.255)	(0.255)	(0.255)

Notes: the dependent variable is the share of households in the group with a hygienic latrine in the medium term (12-15 months after assessment). Observations (groups) are weighted by the number of households. The sample excludes pure control villages, so the omitted category consists of groups that received the basic health messaging treatment. Standard errors clustered at the village level in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Social and Financial Incentives for Overcoming a
Collective Action Problem
Supplementary Materials

M. Mehrab Bakhtiar*
IFPRI

James Levinsohn
Yale University

Raymond Guiteras
North Carolina State University

Ahmed Mushfiq Mobarak
Yale University

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SM1 Outcome Variables

Here, we provide detail on how our outcome variables are constructed from our survey instruments. See Sections 3.2 and 4 for discussion of the concepts underlying these definitions.

Household-level variables

Short-term outcomes

- *Open defecation:*

Survey Section 1, Q4, “What kind of facility is the latrine most regularly used (primary latrine) by the household?” Surveyor observes facility. Response 01 “Don’t have any latrine / Open defecation” or 02 “Hanging latrine” coded as open defecation.

Because the short-term data collection was part of the assessment for rewards, self-report of open defecation was especially likely to be biased by treatment arm. Therefore, in this survey round, we use only OD as inferred from the surveyor’s assessment of the facility the household reports as its primary latrine or defecation site.

- *Any Latrine Access:*

Survey Section 1, Q4, “What kind of facility is the latrine most regularly used (primary latrine) by the household?” Surveyor observes facility. Response 01 “Don’t have any latrine / Open defecation” or 02 “Hanging latrine” coded as not having access to a latrine, while any other response for this question - ranging from Response 03 “Open Pit/hole without slab and lid or cover” to Response 17 “Sanitary latrine with septic tank” - was coded as having access to a latrine.

- *Any Latrine Ownership:*

Latrine ownership is defined as the sole or joint ownership of the household’s primary latrine facility. Ownership is a strict subset of access – households without access to a latrine are coded as not owning a latrine facility.

Survey Section 1, Q5, “What is the ownership status of the primary latrine? CODE: 01=Toilet jointly owned with another household, 02=Toilet solely owned by household, 03=community toilet, 04=owned by others/neighbor”. Response 01 or Response 02 was coded as owning a latrine, while any other response was coded as not owning a latrine facility.

- *Hygienic Latrine Access:*

A latrine that a household has access to (see above) is classified as hygienic if satisfies all three of the following criteria, which attempt to capture whether the latrine safely separates feces from the environment: (1) has an intact and functional slab; (2) has an

intact and functional water seal; and (3) does not have any observable leak from the pit or any other latrine component (such as the pipe or Y-junction).

Whether a latrine has an intact and functional slab is based on two questions. The first is Section 1, Q24, “Type of the latrine slab CODE: 00=No slab, 01=Concrete/cement, 02=Plastic, 03=Bamboo, 04=Brick, 05=Earthen, 06=Others”. The second is Section 1, Q25, “What is the current condition of latrine slab? CODE: 01=Fully Intact, 02=Partially Broken, 03=Completely Broken”. Response 00 for Q24 or Responses 02 or 03 for Q25 leads a latrine to be coded to not have a functional slab.

Whether a latrine has an intact and functional water seal is based on two questions. The first is Section 1, Q27, “What is the current condition of the water seal? CODE: 01=Fully Intact, 02=Partially Broken, 03=Completely Broken, 04=No water seal”. A latrine is coded to have a functional/intact water seal with Response 01 to this question. On the other hand, a latrine is coded to not have a functional water seal for Responses 02, 03 and 04. The second is Section 1, Q4, “What kind of facility is the latrine most regularly used (primary latrine) by the household?” Response 01 “Don’t have any latrine / Open defecation” or 02 “Hanging latrine” or 03 “Open Pit/hole without slab and lid or cover”, as well as 08 “Ring-slab latrine (direct) with water seal:broken/none” or 11 “Single pit ring-slab latrine (Offset) with water seal: broken” or 14 “Double pit Ring-slab latrine (Offset) with water seal: broken”, leads a latrine to be coded to not have a functional water seal.

Whether a latrine has components without any observed leaks is based on three questions. The first is Section 1, Q19a “(OBSERVE) Is there any leakage of the latrine pipe, Y junction, pit or the tank? Code: 01=Major, 02=Minor, 03=No leak”. A response of 01 or 02 for this question leads a latrine to be coded to have a leaking component. The second is Section 1, Q18, “Is the latrine pipe linked to any ditch/canal/pond etc.? CODE: 01=Yes, 02=No”. A response of 01 for this question leads a latrine to be coded to have a leaking component. The third is Section 1, Q4 is also used “What kind of facility is the latrine most regularly used (primary latrine) by the household?” . Response 01 “Don’t have any latrine / Open defecation” or 02 “Hanging latrine” or “03. Open Pit/hole without slab and lid or cover” leads a latrine to be coded to have a leaking component.

- *Hygienic Latrine Ownership:*

Hygienic latrine ownership is defined as the sole or joint ownership of a hygienic latrine facility a household has access to. Hygienic ownership is a strict subset of hygienic access – households without access to any latrine or a hygienic latrine are coded as not owning a hygienic latrine.

Survey Section 1, Q5, “What is the ownership status of the primary latrine? CODE: 01=Toilet jointly owned with another household, 02=Toilet solely owned by household, 03=community toilet, 04=owned by others/neighbor”. If a household has access to a hygienic latrine (see above), Response 01 or Response 02 is then coded as owning a hygienic latrine, while any other response was coded as not owning a hygienic latrine facility.

Medium-term outcomes

The medium-term outcomes are defined identically to those collected in the short term, except for household self-reported open defecation, which was not collected in the short term. There are slight differences in question and response numbering, so we include the definitions below in spite of the redundancy.

- *Open defecation*: Survey Section H, Q12, “What kind of facility is the latrine most regularly used (primary latrine) by the household?” Surveyor observes facility. Response 01 “Don’t have any latrine / Open defecation” or 02 “Hanging latrine” coded as open defecation.
- *Open defecation among adults (household self-report)*: Survey Section H, Q7, “Do (adult men, adult women, children) use open spaces / bushes / hanging latrines for defecation?” Coded Yes if respondent answered Yes (01) for adult men or adult women.

This measure was not collected in the short-term survey, since open defecation was connected to rewards and response bias would therefore likely be correlated with treatment.

- *Any Latrine Access*:

Survey Section H-1, Q13, “What kind of facility is the latrine most regularly used (primary latrine) by the household?” Surveyor observes facility. Response 01 “Don’t have any latrine / Open defecation” or 02 “Hanging latrine” coded as not having access to a latrine, while any other response for this question - ranging from Response 03 “Open Pit/hole without slab and lid or cover” to Response 17 “Sanitary latrine with septic tank” - was coded as having access to a latrine.

- *Any Latrine Ownership*:

Latrine ownership is a strict subset of latrine access and is defined as the sole or joint ownership of the latrine facility a household has access to.

Section H-1, Q18, “What is the ownership status of the primary latrine? CODE: 01=Toilet jointly owned with another household, 02=Toilet solely owned by household, 03= Other’s toilet”. Response 01 or Response 02 was coded as owning a latrine, while any other response was coded as not owning a latrine facility. Not having access to a latrine is also coded as not owning a latrine facility.

- *Hygienic Latrine Access*:

A latrine that a household has access to (see above) is classified as hygienic if satisfies all three of the following criteria: (1) has an intact and functional slab; (2) has an intact and functional water seal; and (3) does not have any observable leak from the pit or any other latrine component (such as the pipe or Y-junction).

Whether a latrine has an intact and functional slab is based on two questions. The first is Section H-1, Q46, “Type of the latrine slab CODE: 00=No slab, 01=Concrete/cement,

02=Plastic, 03=Bamboo, 04=Brick, 05=Earthen, 06=Others”. The second is Section H-1, Q47, “What is the current condition of latrine slab? CODE: 01=Fully Intact, 02=Partially Broken, 03=Completely Broken”. Response 00 for Q24 or Responses 02 or 03 for Q25 leads a latrine to be coded to not have a functional slab. Not having access to a latrine also leads this variable to be coded as zero.

Whether a latrine has an intact and functional water seal is based on two questions. The first is Section H-1, Q50, “What is the current condition of the water seal? CODE: 01=Fully Intact, 02=Partially Broken, 03=Completely Broken, 04=No water seal”. A latrine is coded to have a functional/intact water seal with Response 01 to this question. On the other hand, a latrine is coded to not have a functional water seal for Responses 02, 03 and 04. The second is Section H-1, Q13, “What kind of facility is the latrine most regularly used (primary latrine) by the household?” Response 01 “Don’t have any latrine / Open defecation” or 02 “Hanging latrine” or 03 “Open Pit/hole without slab and lid or cover”, as well as 08 “Ring-slab latrine (direct) with water seal:broken/none” or 11 “Single pit ring-slab latrine (Offset) with water seal: broken” or 14 “Double pit Ring-slab latrine (Offset) with water seal: broken”, leads a latrine to be coded to not have a functional water seal.

Whether a latrine has functional components without any observed leaks is based on three questions. The first is Section H-1, Q36a, “(OBSERVE) Is there any leakage of the latrine pipe, Y junction, pit or the tank? Code: 01=Major, 02=Minor, 03=No leak”. A response of 01 or 02 for this question leads a latrine to be coded to have a leaking component. The second is Section H-1, Q35, “Is the latrine pipe linked to any ditch/canal/pond etc.? CODE: 01=Yes, 02=No”. A response of 01 for this question leads a latrine to be coded to have a leaking component. The third is Survey Section H-1, Q13, “What kind of facility is the latrine most regularly used (primary latrine) by the household?” Response 01 “Don’t have any latrine / Open defecation” or 02 “Hanging latrine” or “03. Open Pit/hole without slab and lid or cover” leads a latrine to be coded to have a leaking component.

- *Hygienic Latrine Ownership:*

Hygienic latrine ownership is defined as the sole or joint ownership of a hygienic latrine facility a household has access to. Hygienic ownership is a strict subset of hygienic access – households without access to any latrine or a hygienic latrine are coded as not owning a hygienic latrine.

Section H-1, Q18, “What is the ownership status of the primary latrine? CODE: 01=Toilet jointly owned with another household, 02=Toilet solely owned by household, 03= Other’s toilet”. If a household has access to a hygienic latrine (see above), Response 01 or Response 02 is then coded as owning a hygienic latrine, while any other response was coded as not owning a hygienic latrine facility.

Group shares

In all cases, group shares are the fraction of households surveyed in the group in the corresponding category. As discussed in Section 4 of the main text, the endline survey was conducted with a 50% subsample stratified by village, leading to some imbalance in the number of households surveyed per group. For groups with fewer than 6 households selected for the endline survey, we randomly selected a “top-up” sample from the remaining households and conducted a brief followup consisting of the endline’s modules on latrine condition and use.

SM2 Group Formation

As noted in Section 2, the sample consisted of households living in villages that were part of the previous demand study. In that study, villages were subdivided into neighborhoods, and that first set of interventions was conducted at the neighborhood level.¹ The median number of households per neighborhood was 40 (IQR 26-56), and the median number of neighborhoods per village was 4 (IQR 2-6).

For this study, a somewhat smaller intervention unit was appropriate because our fieldwork and qualitative background-information gathering suggested that having households making public commitments to smaller groups of immediate neighbors was more sensible, and that there would be less free-riding and meeting non-attendance in smaller groups. Therefore, we further divided neighborhoods into “groups”: sets of 15-20 roughly contiguous households within the neighborhood.

The intervention supervisors who had also been involved with the first set of interventions – the “demand study interventions” – were tasked with the process of assigning households to groups. Because of their long stay in the survey area, the supervisors had developed a close understanding of the socio-dynamics of the sample. This helped them form groups without breaking any organic link between clusters of households in a neighborhood. The general instructions for constructing groups were:

1. Groups should consist of around 15 continuous / neighboring households;
2. Groups should generally not exceed 20 households

Generally, natural divisions such as rivers or open space between households were used to assign households into simple, contiguous groups. However, some exceptions were made based on practical constraints, in particular when:

1. Households were located in isolated places. If the number of such isolated households was too few to form their own group (say, only 1-2 households) they were added to the nearest group. On the other hand, if the number of such nearby households was higher but still less than 15, these households were put together to form a group. Ultimately, only 6 groups of less than 10 households were formed.
2. At the other extreme, sometimes households were very densely packed and it proved difficult to separate them meaningfully into discrete groups. The largest group in the study area consists of 33 households. Ultimately, only 3 groups consisted of more than 23 households.

¹The neighborhood, or *para* in Bangla, is not a formal or official designation, but unofficial neighborhood boundaries were usually common knowledge in the community, and in these cases we followed local convention. If there were not well-defined neighborhoods in a village, or if a neighborhood needed to be divided because of its size, we used natural divisions such as rivers or roads where such existed. If such natural pre-existing divisions did not exist or were not practical, we created “neighborhoods” (for the purpose of the study) of households in simple, contiguous sets.

Followup-02/Final Cluster Meeting Training Manual

Step-01: On the day before the cluster meeting, the selected leader will be called on mobile so that s/he tells all other members to be present at the meeting on time.

Step-02: After reaching a cluster, at first the Health Motivator will go to each house of the cluster, exchange greetings and invite them to join the meeting at a selected place. Then s/he will inspect the household's latrine/s and collect the information on the electronic tabs. If the latrine is unhygienic (based on the criteria listed below) then it must be explained to the household what steps they need to take in order to make the latrine hygienic.

<i>NOTE: Please ask the follow questions on the primary latrine which is the toilet facility that is used by the household members the majority of the time at the period during which the survey is being conducted.</i>			
1	What kind of facility is the primary latrine used by the household?	01. Don't have any latrine/Open defecation	10. Single pit Ring-slab latrine (Offset) with water seal: intact
		02. Hanging latrine	11. Single pit ring-slab latrine (Offset) with water seal: broken
		03. Open Pit/hole without slab and lid or cover	12. Single pit Ring-slab latrine (Offset) with flip/ polythene
		04. Pit latrine with slab but without lid or cover	13. Double pit Ring-slab latrine (Offset) with water seal: intact
		05. Pit latrine with cover	14. Double pit Ring-slab latrine (Offset) with water seal: broken
		06. Modern pit latrine with vent pipe	15. Double pit Ring-slab latrine (Offset) with flip/ polythene
		07. Ring-slab latrine (direct) with water seal: intact	16. Eco Latrine
		08. Ring-slab latrine (direct) with water seal: broken/none	17. Sanitary latrine with septic tank
		09. Ring-slab latrine (direct) with flip/ polythene	_____
2	What is the ownership status of the primary latrine? CODE: 01=Toilet jointly owned/shared with another household, 02=private toilet solely owned by household, 03=community toilet, 04=uses someone else's latrine, 05=open spaces/bushes/hanging latrine	_____	
3	Where is the primary latrine located? CODE: 01=In own homestead (attached), 02=Outside own homestead (not attached), 03=Community latrine, 04=Another household/neighbor's latrine, 05=open defecation	_____	
4	How many other households share this latrine facility?	_____	
5	What is the current condition of latrine slab? CODE: 01=Fully Intact, 02=Partially Broken, 03=Completely Broken, 04=No slab, 05=N/A	_____	
6	Is there any visual evidence of <u>lumps of feces</u> in the toilet area? (does <u>not</u> apply for traces or floating fecal matter) CODE: 01 = On Pan; 02 = On Slab, 03 = On both Pan and slab, 04 =No fecal matter seen, 05=N/A	_____	
7	What is the current condition of the water seal? CODE: 01=Fully Intact, 02=Partially Broken, 03=Completely Broken, 04= No Water Seal, 05=N/A	_____	
8	(If offset) What is the current condition of delivery pipe? CODE: 01=Fully Intact, 02=Partially Broken, 03=Completely Broken, 04= No Delivery Pipe, 05=N/A	_____	
9	(If offset) What is the current condition of pit cover? CODE: 01=Fully Intact, 02=Partially Broken, 03=Completely Broken, 04= No Pit Cover, 05=N/A	_____	
10	Are there rings in the latrine pit? CODE: 01=Sufficient no. of Rings, 02=Insufficient No. of Rings, 03=No rings, 05=N/A	_____	

Notes for data collection:

1. Information has to be entered for hanging latrines
2. If latrine code is 03 then the response to Question 6 is 05/N/A
3. If the latrine code is 08 and there is no evidence of feces lumps , then the response to Question 6 will be 04 or 'No fecal matter seen'
4. For hanging latrine (leaking latrine) even if the condition of the ring and pit cover is good, the response to Question-09 will be 02 or 'Partially broken'

5. Need to explain to the household that visible fecal matter makes the latrine unhygienic
6. We will also monitor rings to determine hygienic status – this should be explained
7. If the pit doesn't have sufficient number of rings, the latrine will be deemed unhygienic

Step-03: The meeting will start only when three-fourth of all the members of the cluster are present. The meeting will start by giving thanks to everyone. Everyone will introduce her/himself.

Step-04: Discussion on working as a group:

A. Purpose behind forming groups and solving a problem collectively:

- Unhygienic latrine - feces will be visible, spread bad smell and exposed to flies and insects. Extensive discussion later.
- Unhygienic latrines and unhygienic practices are a social/collective problem. If someone has an unhygienic latrine then it will adversely impact others as well. For example - (pointing finger to someone from the group) "Because of your unhygienic latrine someone else/someone else's children (pointing fingers to someone else) might get sick with cholera, typhoid, diarrhea, jaundice and polio. It is likely to bring economic, physical loss to you and your children."
- For this reason having hygienic latrine for one's own household is not enough, neighbors must have hygienic latrines as well.
- "Whose problem is this? Is this your problem? Does this problem need to be solved in a collective manner?" Because of the enormity of this problem, it needs to be solved in a collective manner.
- "Unity is strength" (Similar Bangla phrases to put emphasis on group work)

B. Read out the names of the members of the group and put emphasis on the importance of spreading the information to those who are absent.

Step-05: Health Motivators will start the discussion on the topics detailed below. Characteristics of a hygienic latrine needs to be repeated as many times as required. Discussion on what is on this script must end within 10-12 minutes.

A. DEFINITION, CHARACTERISTICS AND USE OF HYGIENIC LATRINES

Broad definition of hygienic latrine

1. Hygienic latrines limit the spread of diseases caused by water/feces and keep the environment pollution free.
2. Feces is enclosed in one place and it can not be seen from outside.
3. Flies or other insects cannot enter into the pit.

Most Important technical characteristics of a hygienic latrine:

(These are the characteristics which form the basis for judging if a latrine is hygienic or not. Repeat these characteristics often in the cluster meeting so that participants can internalize these attributes.)

1. There must be a slab and it cannot be broken.
2. There must be a water-seal (gooseneck or siphon) and it cannot be broken.
3. There must be an adequate number of rings depending upon the depth of the well and those must not be broken.
4. There should be no gap between the cover of the slab and ring or between the ring and pit cover.
5. There should be no feces, flies or bad smell in or around the latrine.
6. Delivery pipe, y-junction, pit cover cannot be broken.
7. The latrine cannot be connected to a lake or any enclosed water body/ environment cannot be polluted.
8. There should be earth/cement moulded around the slab in case of direct pit latrines.

(Try to get these characteristics repeated by some of the participants)

Methods of using a hygienic latrine:

1. The pan should be made wet by using little water before each use. Feces will not stick on the pan if this is done
2. 1-2 pots (few liters) of water should be used after using the latrine
3. No solid object (like- stone, cloth, mud) should be thrown into the pan
4. The pan of the latrine and the slab/floor must be cleaned everyday.
5. If the latrine pit becomes full than another latrine must be built or the pit must be emptied.

B. Discuss about the number of hygienic/unhygienic latrines among the cluster members and their current condition. Discuss what must be done to turn the current unhygienic latrines of the clusters into hygienic ones.

C. Targeted number of latrines, deadline and rewards (where applicable) as set by the office must be repeated in front of everybody present so that they can understand it clearly. Make sure that everyone has understood it by asking one or two of them.

D. Motivate each of the households to create and maintain separate hygienic latrine. It must be ensured that they understand that only one household will be rewarded (where applicable) for one hygienic latrine.

[Note: *Cluster meeting participants cannot be shamed.* During household latrine visit if the latrine is found to be unhygienic then the Health Motivator must explain the reasons as to why the latrine is unhygienic. But during the meeting the household member can never be pointed out and shamed. If any household member present in the meeting asks something about her latrine then her questions must be answered while visiting her home at the end of the meeting. However, if any participant asks a question which is applicable for all the participants then that answer can be given in front of everyone. For example if someone asks, “I have not built a separate cover for my offset latrine. But I have covered it up nicely with a carpet (*chatai* in Bangla). Is this hygienic?” answer to this sort of questions can be given in front of all the participants as everyone needs to know about this.]

Step-06: Like the initial meeting, the Health Motivator will conduct a group commitment session (for public commitment intervention) where people will commit to achieve the target. In case of private commitment, the Health Motivators will go to each household separately and make people commit privately.

Commitment

Public Commitment: During each cluster meeting, members from all the households of a cluster will commit publicly that those who do not yet have hygienic latrines will meet hygienic latrine standards as set by the project. Those with hygienic latrines would promise that they would help others reaching the goal within the time limit set by the project. The script of the pledge is as follows:

“I hereby promise before everyone present that I will do my best to set up hygienic latrines or improve existing ones into hygienic latrines for myself and for my neighbors by [end date].”

Private Commitment: After organizing the cluster meeting, health motivators will visit each household in the cluster. The member of the household who had previously attended the meeting will make a commitment before the health motivator that he/she will transform their unhygienic latrines to hygienic ones within the time limit set by the project. The script of the pledge is as follows:

“I hereby promise that I will do my best to set up hygienic latrines or improve existing ones into hygienic latrines for myself and for my surrounding neighbors by [end date].”

Reward Components

There are two threshold targets fixed for clusters, which is in terms of ownership of hygienic latrines. The lower threshold is 25% for [Union 1] while it is 33% for rest of the unions. The higher threshold is 50% for [Union 1] and 66% for the rest of the unions.

Monetary Incentive: A household will get a monetary reward of Tk. 250 or Tk. 500, depending on whether the household owns a hygienic latrine and the ownership of hygienic latrine at the cluster level is above the lower or the upper threshold, respectively.

Certificate: A household will get a certificate of hygiene attainment by a Member or the Chairman of the union, depending on whether the household owns a hygienic latrine and the ownership of hygienic latrine at the cluster level is above the lower or the upper threshold, respectively.

At the end of the meeting, the name of the members of the group should be repeated again and the cluster leader should be handed a complete list containing names of all the members of the cluster so that the group has a better understanding of its members.

Step-07: At the end of the meeting the Health Motivator will briefly recap the whole discussion from beginning to end and give thanks to everyone.

Decisions:

0. Every cluster must be treated the same way (except for the differences arising from the difference in treatment type).

1. Census form has to be filled up in case of new members of the cluster. But add format does not need to be filled for this round.
2. The 'add or deduct' from has to be filled up if any household migrates. Use the code '8888' as before in the tab and in the tab, manually add to the cluster the household has been joined.
3. Similar to last rounds, in case of absent households, the form will be filled by using absent code 9999. Collecting information about the latrine of absent household is still a must.
4. If any new member (whose name is not in the village list) joins the meeting then enter 7777, give a space and then enter the name in the tab.
5. Cluster leader cannot be changed unless it is a special situation.
6. If any household member uses two latrines then enter information about the hygienic one. If both the latrines are used equally then collect information about the one which is closer to dwelling and contact with the field supervisor.
7. **Rewards will be given based on the total number of (hygienic) latrines in the cluster, not based on the number of households (or their access to hygienic latrines). Tell that to the household members a few times.**
8. Each field supervisor must meet two Health Motivators everyday and oversee 3 meetings.
9. The cluster meeting in which the supervisor is monitoring, has to end with a one-minute summary discussion. This has to be recorded as well.
10. Field supervisor will completely cross check the information about the latrine provided by Health Motivator.
11. Information on the hardcopy filled by Health Motivator cannot be sent to the server without the concerned field supervisor checking it.
12. Audio record of each of the meeting must be kept in the tab and submitted to the concerned field supervisor.
13. In the certificate intervention, there is no need to mention whose signature is going to be put in. Just mention that the certificates will be issued by the Union Parishad.
14. Do not use the word 'leader' in the meeting.
15. Consecutive meetings in the same cluster cannot happen within 18-21 days.
16. The new deadline is [end date] to meet the hygienic latrine criteria. This should be mentioned instead of January 20.
17. Supervisors must monitor three meetings everyday. Cross checks of recordings of the Health Motivators will be done by the supervisors under the guidance of the Project Assistant and Project Associates.

18. Health Motivators and Field Supervisors will be rewarded based on how well the cluster meetings have been conducted according the scripts.

19. Need to finish meetings with the words that “This is the last time I have come to talk about hygienic latrines and the reward/certificate program (if applicable). The next time someone else will come to monitor your progress in achieving hygienic latrine status.”

HHID: | | | | | | | | | | | | | | | | | | | | | |

Cluster ID:	Village ID:	Village name: _____	Union ID:	Para name: _____
Interviewer ID:	Interviewer's name: _____	Supervisor's initial: _____	Start Time: _____	End time: _____
HH head name: _____	Respondent's Name and ID: _____	Date: _____		

(N.B.: if you find anything out of the ordinary at this household, please take notes and contact your supervisor)

Consent

(READ TO RESPONDENT AT THE START OF THE VISIT) Introduction: Good morning/afternoon. My name is _____. I am working with Innovations with Poverty Action, an international research organization. We are currently interviewing households for a study on how people make decisions about sanitation. This study covers 4 unions (_____) in the Tanore Upazilla of Rajshahi.

Procedures: We would like to invite you to participate in our study. If you choose to participate, today we will ask you some questions about the types of sanitation facilities your family uses and your family's interactions with other members of your community. This survey will take approximately 15 minutes of your time. We may also come back once in the next three-six months to conduct a longer follow-up survey that will include questions on the health of your family, the sources of water your family uses and your family's income and assets. The information collected in the follow-up surveys will be used to study how behavior in your community changes over time.

Risks and Benefits: We do not expect there to be any risk to you or your household associated with your participation in this study. There will be no direct benefit to you or your household for your participation in this survey. However, we hope that this research will result in findings that will help in improving access to sanitation facilities in communities throughout Bangladesh.

Confidentiality: All of your responses will remain confidential and will never be shared with anyone besides the researchers involved in this study. Neither your personal information nor any information linking your identity to your responses will ever be made public. Should you feel at any time that you are not comfortable answering a question or that your confidentiality is not assured, for example because someone else may be listening, please let us know.

Voluntary Participation: Participation in this study is completely voluntary. You can refuse to answer the entire survey, or you can tell us when a question makes you uncomfortable and we can skip that question. There is no need to answer any question that you do not wish to answer for any reason. If you like, you can end the interview at any time. There will be no penalty for ending or refusing to participate in the survey.

Questions and Concerns: If you have any questions, comments or concerns, you may contact _____. The relevant principal investigators and their contact information is as follows: 1. _____, 2. _____.

I have read (or someone has read to me) and understood the above information. I have had the opportunity to have any questions about this study answered and I agree to participate in this study. **CODE:** 01=Agree, 02=Do not agree >> **STOP SURVEY**, 03=Entire HH absent for extended period of time, 04=Migrated Household, 05=Combined Household, 06=Dwelling destroyed/perished

HHID: | | | | | | | | | | | | | | | | | | | | | |

12	Where do the HH members usually wash their hands (henceforth, to be termed 'the hand-washing station') after going to the toilet? CODE: 01 = Inside toilet facility, 02=less than 3ft from toilet facility, 03=3-9ft of toilet facility, 04=more than 9ft from toilet facility, 05=No specific place >> Q16 , 06=Do not wash>> Q16	
13	Do HH members wash hands after returning from toilet? CODE: 01=Yes, with soap and water, 02= Yes, with only water, 03=Yes, With ash and water, 04= Yes, With clay and water (multiple responses allowed)	
For Q14 to Q37, OBSERVE		
14	Is water available at the hand washing station? CODE: 1=Yes, adequate water is available, 2=No, adequate water is not available, 3=No water available	
15	Is soap and/or clay/ash available at the hand washing station? CODE: 01=Bar soap, 02=Powder/detergent, 03=Liquid soap, 04=Clay/ash, 05=No soap/clay/ash observed (multiple responses allowed)	
16	a. Have you (the interviewer) observed a HH member running to clean a latrine because of your presence or you suspect so? CODE: 1=Yes, 2=No (Take note if necessary)	
17	What materials were used to construct the superstructures? a. walls? b. roofs?	
CODE: 00=none, 01=mud, 02=leaves/stick/straw, 03=bamboo thatch, 04=plastic sheets/polythene, 05=CJ sheets/tin, 06=wood, 07=clay tiles, 08=bricks, 09=RC/cement/concrete, 10=other (specify)		
18	Is the latrine pipe linked to any ditch/canal/pond etc.? CODE: 1=Yes, 2=No	
19	a) (OBSERVE) Leakage of the latrine pipe, Y junction, pit or the tank? Code: 01=Major, 02=Minor, 03=No leak>> Q21 b) Leakage in which component? Code: 01=Pipe, 02=Pit, 03=Tank, 04=Y-junction (Can choose several)	
20	If pit thought to be leaking what are the signs of leaking? CODE: 01=Wet soil around pit, 02=Water-logged area outside/around pit, 03=Floating feces outside pit, 04=Some odour, 05=Strong odour (<i>Multiple responses allowed</i>)	
21	If offset what is the current condition of delivery pipe/Y junction? CODE: 01=Fully Intact, 02=Partially Broken, 03=Completely Broken, 04= No Delivery Pipe, 66=Not an offset pit latrine>> Q23	
22	If offset What is the current condition of pit cover? CODE: 01=Fully Intact, 02=Partially Broken, 03=Completely Broken, 04= No Pit Cover	
23	Any broken ring? CODE: 01=Yes, 02=No, 66=No ring/Septic tank	
24	Type of the latrine slab CODE: 00=No slab>> Q28 , 01=Concrete/cement, 02=Plastic, 03=Bamboo, 04=Brick, 05=Earthen, 06=Others (mention)	
25	What is the current condition of latrine slab? CODE: 01=Fully Intact, 02=Partially Broken, 03=Completely Broken	
26	a. Type of pan CODE: 1=Ceramic commode, 02=Ceramic pan, 03=Plastic pan, 04=Concrete/Cement pan, 05=Tin, 06= Bamboo top/covered with polythene, 07=No pan>> Q08	
26	b. What is the current condition of the pan? CODE: 01=Fully Intact, 02=Partially Broken, 03=Completely Broken	
27	What is the current condition of the water seal? CODE: 01=Fully Intact, 02=Partially Broken, 03=Completely Broken	
28	Presence of Vent pipe on the pit, inside the latrine or outside, condition and net? CODE: 01=Yes, good condition, with net, 02=Yes, good condition, without net, 03=Yes, broken, 04=No vent pipe	
29	Has the 'slab and pan' (for direct pit) or pit cover (for off-set) been placed properly on top of pit so that flies cannot enter/exit? CODE: 1=Yes, 2=No	

HHID: _____

	2=No, 66=No Slab/pan/pit cover							
30	a) Any evidence of fecal matter on the latrine floor? CODE: 00=None, 01=Trace amounts only, 02=Lumps of Feces c) Any fecal matter floating in the gooseneck/water-seal? CODE: 00=None, 01=Trace amounts only, 02=Lumps of Feces, 66=No water-seal	_____	_____	b) Any evidence of fecal matter on the pan? CODE: 00=None, 01=Trace amounts only, 02=Lumps of Feces, 66=No pan>> Q31		_____	_____	_____
		_____	_____			_____	_____	_____
31	Is there a bad smell in and around the latrine? CODE: 01=Strong bad smell, 02=Some bad smell, 03=No bad smell							
32	Is there any visibility of flies or insects inside or around the latrine? CODE: 01=Yes, 02=No							
33	a) Slippers outside or inside latrine? CODE: 1=Yes, 2=No	_____	_____	b) Wet floor? CODE: 01=Yes, 02=No	_____	c) Dis-coloration of pan (e.g. yellow/green) CODE: 01=Yes, 02=No, 66=No pan>> e		_____
		d) Do you observe the following in the pan (that denotes lack of use) (Multiple response possible) CODE: 01= Leaves, 02= dirt, 03=spider webs, 04=Nothing						
34	e) Water container in/near the latrine? CODE: 01=Yes, 02=No	_____	_____	f) Cleaning agents inside the latrine? CODE: 01=Broom/brush, 02=Harplik/Bleaching powder/detergent, 03=Ash, 04=No cleaning agent		_____	g) Is there evidence that this latrine is used for storage? CODE: 01=Yes, 02=No	
		h) Does the path to the toilet suggest regular use (is it clear, well-worn, etc)? CODE: 01 = Yes; 02 = No						
34	Level of the latrine pan: CODE: 01=Above yard height, 02=At yard height, 03=Somewhat lower than the yard, 04=Much lower than the yard							
35	How many lumps of feces have you observed in the compound? CODE: 01=No lump of feces, 02=1-5 lumps, 03=6-10 lumps, 04=More than 10 lumps							
36	Physical/Travel distance of latrine from main living room CODE: 00=Inside home compound, 01=01-10 ft, 02=11-20 ft, 03=21-30 ft, 04=More than 30 ft							
37	a. (If the source of drinking water is TW or Dug well) Physical/Travel distance of latrine from the TW/ DW (Use next question's code)							
	b. Physical/Travel distance between the latrine and the source of water used in the latrine: Code: 00=Attached to the room, 01=01-10 ft, 02=11-20 ft, 03=21-30 ft, 04=More than 30 ft							
Section 02 (For Q38 to Q46 ASK)								
38	Since November 01, 2013, (the month of Karttik in Bangla calendar) have you installed a complete latrine or any latrine parts? CODE: 01=Complete latrine>> Q40 , 02=Latrine Parts, 03=Neither >> Q42							
39	If you have installed any parts , list all such latrine parts (Use CODE B)							
CODE B: 01=Water seal/goose-neck/syphon, 02=Slab/Pit Cover, 03=Pit Cover with pan, 04=Pan, 05=Delivery pipe/Y Junction, 06=Ventilation pipe, 07=Rings, 08=Mud/bricks/cement/sand, 09=Door, 10=Other (detail in note)								
40	Is this (for) the same latrine you have mentioned as your primary latrine? CODE: 01=Yes, 02=No							
41	If you have installed a complete latrine or any parts Since November 01, 2013 what was the amount spent in total (<i>In taka</i>) (Including transportation, labor etc.)							

HHID: _____

42	Since November 01, 2013 (prompt 'in the last three months' or 'since mid-Karttik' of Bangla calendar) has anyone from your community assisted you ('with advice-information/material/labor/cash/transport') to make your latrine hygienic? CODE: 01=Yes, 02=No>> Q44									
43	Since November 01, 2013 if you have received any assistance from your community to make your latrine hygienic, list the Households and the kind of assistance. (if cannot find HHID, use "99" and fill up section 03. If HH is outside the survey area, use "55")									
a. HHID	b. Relationship with HH head (Code: 01=parents; 02=siblings; 03=children;04=neighbor relatives;05=neighbor/community member; 06=other)	c. Assistance (Code: 01=Material; 02=Cash Loan >> e; 03=Cash help>> e; 04=Labor support>> f; 05=Advice or Information>> g,h&i; 06=Transport; 07=Other - Take Note)	d. What kind of material? (Code B);	e. Amount (in Tk.)	f. How many labor hours?	g. Frequency of mention/discussion on latrines	h. In private or public gathering (01=private, 02=public, 03=both)	i. Did you feel pressurized? (Code: If No, use 00; If Yes, use pressure scale 01-05; 01=least and 05=highest pressure)		
	a	b	c	d	e	f	g	h	i	
44	b. NGO/Government/UP Code: 01=Government/UP; 02=BRAC; 03=World Vision; 04= IPAVERC; 05=Other NGOs	c. Assistance Code (Code: 01=Material; 02=Cash Loan >> e; 03=Cash help>> e; 04=Labor support>> f; 05=Advice or Information; 06=Transport; 07=Other - Take Note)	d. What kind of material? (Code A); put commas in between each item	e. Amount (in Tk.)	f. Labor hours	Note				
CODE B: 01=Water seal/goose-neck/syphon, 02=Slab/Pit Cover, 03=Pit Cover with pan, 04=Delivery pipe, 05=Ventilation pipe, 06=Rings, 07=Mud/bricks/cement/sand, 08=Transportation, 09=Labor, 10=Door, 11=Superstructure (e.g. tin), 12=Other (detail in note)										

HHID: | | | | | | | | | | | | | | | | | | | | | |

45	Did you attend or know of any meeting sessions that were conducted in your village to promote hygienic sanitation between November 01, 2013 to February 05, 2014? CODE: 01= Yes, attended, 02=Knows, but did not attend, 03=Neither >> Q47 >>END (Even if HH didn't attend) What information was covered in these meetings? (Do not read out the options aloud) CODE: 1=Yes; 2=No		
46	a. Private Pledge		i. Reward (Money)
	b. Public Pledge		j. Reward (Certificate)
	c. Deadline (regarding hygienic latrine attainment)		k. Target (percentage or no. of households)
	d. Disadvantages of Open Defecation		l. Importance of washing hands
	e. Importance of proper disposal of feces		m. Installing a hygienic latrine
	f. Importance of hygienic sanitary habits		n. Assessing quality of latrine parts
	g. Importance of using hygienic latrine		o. Places where quality latrines parts are available
	h. Maintaining hygienic latrine		p. Others (Specify):
47	a. Did any of your neighbor build a latrine since November 01, 2013? CODE: 01=Yes; 02=No >> Q48 b. How many households?		
46	(Even if HH didn't attend) What information was covered in these meetings? (READ OUT the options) CODE: 1=Yes; 2=No		
	a. Private Pledge		i. Reward (Money)
	b. Public Pledge		j. Reward (Certificate)
	c. Deadline (regarding hygienic latrine attainment)		k. Target (percentage or no. of households)
	d. Disadvantages of Open Defecation		l. Importance of washing hands
	e. Importance of proper disposal of faeces		m. Installing a hygienic latrine
	f. Importance of hygienic sanitary habits		n. Assessing quality of latrine parts
	g. Importance of using hygienic latrine		o. Places where quality latrines parts are available
h. Maintaining hygienic latrine		p. Others (Specify):	