Can Citizen Pressure Be Induced to Improve Public Service Provision?

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Abstract

Encouraging citizens to apply pressure on underperforming service providers has emerged in recent years as a prominent response to the failure of states to provide needed services. We outline three theoretical mechanisms through which bottom-up citizen-oriented pressure campaigns may affect development outcomes and investigate them via a large-scale field experiment in the Ugandan health sector. While we find modest positive impacts on treatment quality and patient satisfaction, we find no effects on utilization rates, child mortality, or other health outcomes. We also find no evidence that citizens increased their monitoring or sanctioning of health workers. Our findings therefore cast doubt on the power of outside actors to generate bottom-up pressure by citizens or improvements in development outcomes. Held up against the findings of other, similar studies, our results point to the salience of mechanisms other than citizen pressure for improvements in service delivery, and to the importance of baseline health conditions for the success of bottom-up, citizen-oriented pressure campaigns. Such conditions shape outcomes both across countries and within countries over time, with the latter finding holding important implications for countries undergoing rapid socioeconomic change.[1]

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1 Introduction

Public service provision is the most important function of the state. What happens, then, when the state fails to provide necessary public services? In many instances, citizens simply go without: public safety is not protected, clean water is unreliable, waste is uncollected, roads are potholed, and healthcare and schooling are underprovided. Private actors sometimes emerge to substitute for the state in providing these public goods, but the services they offer are often out of reach of the poorest community members. In such a context, a potentially viable strategy for citizens is to apply pressure on the state to improve its performance. Given the significant share of the world's population that faces severe shortfalls in public service provision and is too poor to acquire these services through the private sector, a critical question is whether such bottom-up pressure (or what Hirschmann (1970) terms "voice"—the other two responses, going without and turning to the private sector, being "loyalty" and "exit") can be induced, and whether—or under what conditions—it leads to improvements in service delivery.

Bottom-up pressure can be applied either directly on underperforming frontline service providers or indirectly through the political representatives who are responsible for their performance. The latter route, while central to theorizing about democratic accountability, assumes a responsiveness to electoral pressure that is frequently absent in places where public service delivery is most deficient (Dunning et al., 2019; Humphreys and Weinstein, 2012; Chong et al., 2015). The alternative, non-electoral route, whereby citizens monitor and apply pressure directly on absent or underperforming frontline service providers, may be more promising in uncompetitive, semi-democratic political systems such as those found in many low-income countries.

Generating bottom-up pressure can be challenging, however. Collective action problems (Olson, 1971), low efficacy (Lieberman and Zhou, 2020), low expectations of government capacity and/or responsiveness (Gottlieb, 2016; Kruks-Wisner, 2018), and the weakness of supportive local institutions (Ostrom, 1990) all present obstacles to mobilizing citizens to demand better public services. This paper addresses whether providing citizens with information about service delivery shortfalls along with guidance about how to mobilize and apply pressure in light of this information is sufficient for overcoming these challenges.

We assess the viability of this information-focused, non-electoral approach through a field experiment undertaken in 187 health centers and their associated catchment areas in 16 districts in Uganda. Motivated by the theoretical literature on principal agent problems and designed in keeping with the received wisdom in development circles on the use of information to generate bottom-up pressure on service providers (Björkman and Svensson, 2009; Mansuri and Rao, 2013; Kosack and Fung, 2014; Molina et al., 2016; World Bank, 2016; Arkedis et al., 2019; Christensen et al., 2020), the intervention delivered information about patient rights and responsibilities, uti-

lization patterns, and health outcomes at the local health center, worked with health center staff and community members to develop action plans in light of that information, and organized meetings between members of the community and health center staff to generate a joint social contract to guide both actors' future behavior and interactions.

We randomized whether health centers received the intervention and, to assess its impact, collected three waves of annual panel data on utilization rates, treatment quality, patient satisfaction, and health outcomes at both the health center (N=187) and household (N=7,288) levels. To capture the channels through which the intervention operated, we collected data on a broad array of intermediate outcomes. We also implemented a factorial design involving another 189 health centers (and another 7,300 households) to unbundle the effects of different components of the intervention. Finally, we collected data on a broad array of health center, community, and household characteristics to better understand the conditions under which the intervention had the greatest impact.

While we find positive (albeit substantively small) impacts on treatment quality and patient satisfaction, these improvements do not translate into statistically significant effects on utilization rates, child mortality, or other health outcomes on average, either eight or twenty months after the intervention. These null findings are reinforced when we examine sub-populations of health centers, communities and individuals: we find persistently null effects on utilization, child mortality, and other health outcomes across the vast majority of subgroups. We also find no effects on these outcomes in the additional treatment arms designed to capture sub-components of the full intervention. In addition, we find little evidence that the intervention caused citizens to increase their monitoring or sanctioning of health care workers, although we do find suggestive evidence that the presence of sub-county officials during the programming boosted the impact of the intervention on treatment quality. This suggests that top-down monitoring by government officials may be a more powerful tool for changing health workers' behavior than bottom-up monitoring by citizens. Taken together, our findings cast doubt on the ability of information and citizen mobilization to generate bottom-up pressure on health workers or improvements in health outcomes.

The paper makes two main contributions. First, we contribute to the literature emphasizing information and community monitoring as solutions to the problem of poor service provision. Notwithstanding its broad embrace in development circles, this approach has found only mixed empirical support. Olken (2007), Banerjee et al. (2010), and Keefer and Khemani (2014) all report weak effects of interventions designed to generate behavioral change by frontline service providers through information provision and bottom-up grassroots monitoring. Pandey, Goyal and Sundararaman (2009), Barr et al. (2012), Pradhan et al. (2014), Andrabi, Das and Khwaja (2017), Fiala and Premand (2018), and Banerjee et al. (2018), meanwhile, find more promising results. In

the health-focused studies closest to our own, Björkman and Svensson (2009) find strong positive effects on infant weights, under-five mortality, immunization rates, and other measures of health service delivery; Christensen et al. (2020) find effects on utilization, patient satisfaction, and child mortality, but not on service quality or other health outcomes; Mohanan et al. (2020) find impacts on utilization and child mortality, but not on treatment quality; and Arkedis et al. (2019), who study interventions in two different countries, find no effects on any health-related outcomes in either. Our study makes a contribution by providing a particularly high-powered test of the potential impact of information provision and community mobilization as tools for generating bottom-up citizen pressure and improving service delivery. In addition, by distinguishing among three different mechanisms through which bottom-up interventions may generate improvements in development outcomes (discussed below), we provide a theoretical apparatus for making sense of the literature's divergent findings.

A second contribution of the paper, and a second way in which we reconcile our findings with those of other studies, is to emphasize the importance of baseline health conditions. Notwithstanding our null results on utilization, health outcomes, and child mortality in the average health center, we do find significant treatment impacts on child mortality, as well as stronger effects on treatment quality, in the subset of catchment areas in our sample with lowest levels of development and the highest baseline child mortality rates. This may help explain the differences across the several health-related studies mentioned above. All six studies examined the impact of very similar interventions—indeed, both Christensen et al. (2020) and our own study were modeled explicitly on Björkman and Svensson (2009), and both Mohanan et al. (2020) and Arkedis et al. (2019) adapted many of its key design features. But baseline health conditions in the six settings were quite different, and, as we show in Section 8, the strength of the reported treatment effects are broadly correlated with these baseline conditions. Bottom-up citizen pressure interventions appear to be more effective when baseline health conditions are lower. This is an especially important lesson for researchers and policymakers working in countries, like Uganda, that are undergoing rapid socioeconomic change. Held up against the results of these other studies—especially Björkman and Svensson (2009), which was implemented in the same setting but ten years earlier, when health conditions were significantly worse—our findings underscore the often underemphasized *temporal* dimension of external validity, and the extent to which interventions that may be highly effective under one set of conditions may lose their power when conditions improve.

2 Three Mechanisms Through Which Bottom-Up Pressure Campaigns May Improve Development Outcomes

Attempts to generate bottom-up pressure for service delivery improvements almost always involve two core components: 1) the provision of information about the relative performance of the service delivery unit and 2) meetings aimed at mobilizing communities and helping them overcome collective action problems (Mansuri and Rao, 2013; Molina et al., 2016). Some efforts also add a third component involving interface meetings in which citizens and service providers come together to discuss how they might work together to jointly improve service delivery outcomes. We argue that these components may affect development outcomes through one of three distinct channels: by generating citizen pressure, by promoting utilization, and by directly changing the behavior of the frontline service providers.

The first, *citizen pressure*, channel occurs in two steps. First, the distribution of benchmarked information about the relative performance of the service delivery unit puts citizens in a stronger position to evaluate whether their own local service providers are performing adequately (Besley and Case, 1995; Kruks-Wisner, 2018) and creates common knowledge about the service providers' performance. In interventions containing an interface meeting component, this common knowledge extends beyond the community to include the service providers as well. Second, the holding of community meetings may generate internal efficacy (Lieberman and Zhou, 2020), foster a sense of responsibility for monitoring service providers (Pandey, Goyal and Sundararaman, 2009), help overcome free riding problems, and enable citizens to identify concrete actions they can take to improve services—all of which may be critical for generating bottom-up pressure by citizens (Barr et al., 2012; Lieberman, Posner and Tsai, 2014). The resulting bottom-up pressure may then translate into improved service delivery by inducing service providers to exert more effort, divert fewer resources, and/or allocate resources more efficiently. Interface meetings, where held, may augment the impact of this pressure by allowing citizens to confront service providers directly, apply social sanctions on those revealed to be underperforming, and, generate improvements in the relationship between community members and service providers. These effects can be direct—frontline service providers responding directly to community demands—or indirect—higher-level actors overseeing frontline workers, such as local politicians or bureaucrats, becoming aware of community demands and responding by increasing their oversight efforts (Pradhan et al., 2014). Either way, the improvement in service delivery is expected to generate improved outcomes. Evidence that the citizen pressure channel is operating would be found in increases in collective action, improvements in service delivery, better development outcomes, and possibly also increased utilization in response to the improvements in service delivery.

The citizen pressure channel is the mechanism that most researchers and policymakers have in mind when they think about the impact of information provision and community mobilization. However, there are two alternative channels, less well emphasized in the literature and not involving citizen pressure, through which an ostensibly "bottom-up" intervention might also generate improvements in service delivery. First, the intervention might affect outcomes through an increase in *utilization*. Utilization is critically important in sectors such as health and education, as well as for some aspects of public safety (i.e., reporting crime) and sanitation (i.e., using latrines). In the health sector specifically, an information and mobilization intervention may improve health outcomes by causing sick people to seek professional care at the health center rather than to self-treat or visit traditional healers. This may occur if the dissemination of information and the holding of community meetings make the existence of the health center more salient, build trust between community members and health care providers (Christensen et al., 2020), or reduce uncertainty about the costs of seeking services at the health center. Under such circumstances, we may observe improvements in health outcomes even in the absence of collective action or improvements in treatment quality. This channel should be particularly relevant in settings where baseline utilization rates of the formal health sector are low.

Finally, the intervention may *directly affect the behavior of frontline service providers*. The dissemination of unit-specific information may make workers feel monitored, which may cause them to put more effort into service provision (Duflo, Hanna and Ryan, 2012; Nagin et al., 2002; Olken, 2007). Hearing about the performance of their unit relative to others may also increase workers' intrinsic motivation to provide better services—especially if the information they receive suggests that their unit is under-performing. If this channel is operating, we would expect to observe improved treatment quality (possibly resulting in increased utilization) and improved development outcomes, all in the absence of changes in collective action.

3 Health Service Delivery in Rural Uganda

Public health services in Uganda are provided in a hierarchical system with national referral hospitals at the national level, regional referral hospitals at the regional level, general hospitals at the district level, and smaller scale health centers at the sub-county and parish levels—the former termed HC3s; the latter, HC2s. Our study focuses on health care delivery at the HC3 and HC2 levels, the lowest levels of the public health system. HC3s, which are staffed by a trained medical worker and one or more nurses and lab technicians, provide preventative and out-patient care

and have laboratory services to undertake basic tests.[2] They also generally have maternity wards and offer prenatal and antenatal services. HC2s, which comprise over half of all government-run health facilities and represent the primary source of professional medical care for many Ugandans, provide outpatient services and antenatal care (Uganda Ministry of Health, 2018). They are run by a nurse, sometimes working with a midwife and a nursing assistant. Both types of units are supported by Village Health Teams (VHTs) comprised of volunteer community health workers who undertake health education outreach, provide simple curative services, and refer patients to higher level health centers for treatment of more complicated conditions. Generally speaking, patients seek care at the facility closest to their home and are then referred on to higher-level facilities as the nature of their medical condition requires.

Government-run health facilities operate alongside a growing number of private for-profit and not-for-profit (often religious) health providers, as well as traditional practitioners. In our sample at baseline, 45 percent of households that reported having a health condition requiring treatment during the past year sought care at a government-run health center, whereas 17 percent sought care at a private or NGO-run clinic. Thirty-two percent visited traditional healers or self-treated, and 6 percent sought care from a member of the VHT. Among the reasons cited for not visiting the government-run health center were lack of drugs, long waiting times, poor quality of services, and poor staff attitude.[3]

Factors both within and outside the health workers' control contribute to these outcomes. Understaffing, low and irregular pay, shortages of necessary medical supplies, and limited oversight by higher-level health officials are major problems (Uganda Ministry of Health, 2017; Tweheyo et al., 2019). They lead to low morale, absenteeism, and poor treatment quality, which in turn generate poor health outcomes and reduce incentives for citizens to utilize the government-run health facilities.

4 Accountability Can Transform (ACT) Health

The intervention we study, Accountability Can Transform (ACT) Health, was implemented by a consortium of civil society organizations coordinated by GOAL Uganda.[4] These organizations had

[2]These are the government standards. At the time of our study HC3s frequently did not have adequate staff or equipment and materials to provide the full set of services that government standards specified.

[3]Additional information on baseline conditions is provided in Table 1.

[4]ACT Health was implemented by GOAL Uganda with funding from the UK's Department for International Development (DFID). The field experiment was undertaken by Innovations for Poverty Action (IPA) under the direction of the study authors. The project was approved by the Internal Review Boards at IPA (Protocol ID: 0497) and at the Uganda National Council for Science and Technology (UNCST) (Protocol ID: ARC157). Approval for the project was also received from UNCST (Protocol ID: SS3559) and the Office of the President, Uganda. Participation in the study was voluntary and all respondents were required to give their informed consent in order to participate.

prior experience in health programming in their respective regions but had not previously worked in the specific communities to which they were deployed in ACT Health.[5] The intervention consisted of three components:[6]

Information. The research team used data collected in the baseline health center and household surveys to create citizen report cards (CRCs) providing health center-specific information about citizens' knowledge of their rights and responsibilities, utilization of the various services offered at the health center, citizens' perceptions of the quality of these services, and overall satisfaction with the health care they received. For most outcomes, the health center-specific data was presented alongside district averages to provide a benchmark of relative performance. The CRCs were shared with both health care providers and community members. Information was presented with the help of visual props designed by local artists to ensure comprehension among illiterate participants.

Mobilization. Trained facilitators worked with local leaders and VHT members to organize community meetings at which the CRC results were presented and discussed. An action plan was developed to identify specific steps that could be taken by community members to improve health service delivery. Significant efforts were made to ensure that the meetings included representatives from all major social groups in the community.[7] Parallel meetings were also held separately with health center staff at which the CRC results were discussed and an action plan was formulated describing steps that the staff could take to improve health outcomes.

Interface. Facilitators brought the health center staff together with representatives of the community to discuss their respective action plans and how they might work together to improve the quality of health care in the community.[8] The output of the interface meeting was a social contract between the citizens and health care workers laying out specific steps that each could take to contribute to improvements in health outcomes.

Implementing teams spent several days in each catchment area to organize the community, health center, and interface meetings, and they returned every six months (for a total of three follow-up visits before endline data collection) to meet with community members and health center staff to check on the progress that had been made toward the commitments stipulated in the social contract. A timeline of the intervention is provided in Figure 1. Examples of a CRC, community and health center action plans, and a joint social contract are included in Appendix H.3.

[5] See Appendix H.1 for further details.

[6] Additional information about each of these components is provided in Appendix H.3.

[7] The meetings included an average of 100 attendees. Further details about the meeting participants, as well as the worksheet used to guide the implementing teams' mobilization efforts, are provided in Appendix H.2

[8] On average, 50 community members and four health center staff members participated in the interface meetings. Further details are provided in Appendix H.2

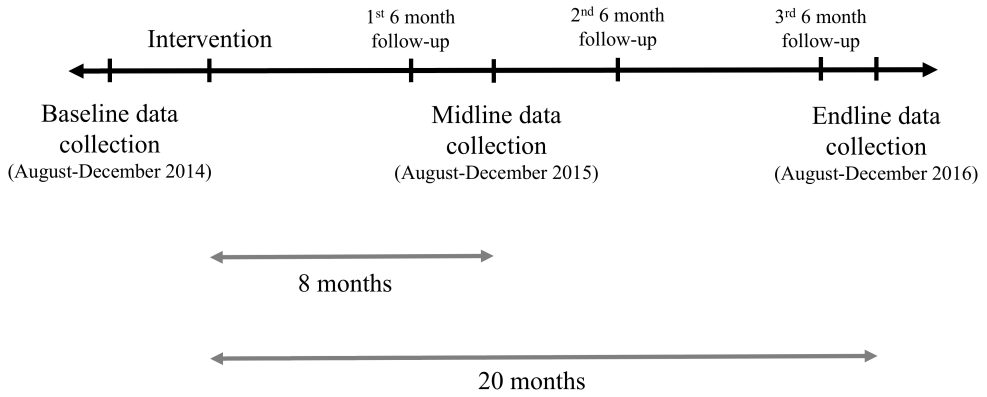


Figure 1: Timeline of the intervention

5 Data and Estimation

The unit of randomization in our study is the health center and its associated catchment area. The sample we focus on in this paper includes 187 health centers spread across sixteen districts.[9] These health centers were randomized to receive the ACT Health intervention, with blocking by district and health center (HC2 or HC3) level. We define the catchment area as the three villages that are closest in proximity to the health center in question (including the village in which the health center is located), as measured by the straight-line distance from the health center to the village centroid.[10] In identifying these villages, we only include villages located in the same parish (for HC2s) or sub-county (for HC3s) as the health center in question.[11] We discuss our ethical considerations in Appendix B.

[9]The full study included 376 health centers, but half of them received only partial treatments, in keeping with our factorial design (see Appendix F.7). Because the effects in these additional treatment arms are nearly identical to those in the sample of health centers that received the full ACT Health treatment, we focus our discussion in this paper on the latter. The sixteen districts are: Lira, Apac, Pader, Gulu, Lamwo, Kitgum, Agago, Katakwi, Bukedea, Manafwa, Tororo, Kabarole, Mubende, Nakaseke, Kibaale, and Bundibugyo. A map is included in Appendix G. We excluded government health centers funded by the military or prison departments.

[10]Catchment areas were determined using village-level shape files provided by the Uganda Bureau of Statistics, and health center GPS coordinates collected by GOAL. To minimize overlap of catchment areas (and hence the possibility of spillovers), we excluded health centers that were less than 2.5 km apart or that shared a village among their three closest villages.

[11]If only two villages were located within a parish or sub-county, then only these two villages were included in the catchment area.

5.1 Data

Our data come from two main sources: a household survey and a health center survey. Both were collected at baseline, midline, and endline, with as close as possible to 12 months separating each survey round in each health center/catchment area in order to control for seasonal effects that might influence utilization rates or health outcomes.[12] Data collection staff were completely separate from the teams that implemented the programming and had no knowledge of the treatment status of the health centers and households they visited.

Since treatment could not be administered until after the baseline data had been collected and distilled into the CRCs, the average interval between intervention and midline data collection was less than one year (8 months; SD=1.37 months). The average interval between the intervention and endline data collection was 20 months (SD=1.34 months). In the results presented below, we privilege the endline findings, but we report the full midline results in Appendix F.8.

The health center survey consisted of three components. The first was a brief questionnaire completed at the time of initial contact with the health center in each survey round. Since this visit was unannounced, it provided an opportunity for the collection of information about staff attendance, cleanliness, wait times, and other clinic characteristics before the clinic staff was able to respond to the fact that they were being evaluated. The second component was the main health center staff survey, which collected information about the variety and quality of health services provided, utilization rates, staff structure and perceptions, funding mechanisms, and drug stock-outs. This survey was conducted with the most senior health center staff member, as well as randomly drawn health workers.[13] The third component involved the collection of administrative data on file at the health center, including monthly Health Management Information System (HMIS) forms and drug stock cards. Physical checks of drug stocks were conducted to verify the accuracy of these records.

The sample for the household survey was drawn from a sampling frame of households in the three village catchment areas containing at least one child under five years old or a pregnant woman, based on village household lists and consultations with the village chairperson, VHT members, Health Unit Management Committee (HUMC) members, and other knowledgeable persons. We randomly sampled 40 households per catchment area from this frame, with the number of households drawn from each village proportional to the number of eligible households in that

[12]The average interval between baseline and midline surveys was 11.9 months (SD=0.3 months); the average interval between the midline and endline surveys was 12.0 months (SD=0.11 months). These intervals are balanced across treatment arms.

[13]If the most senior staff member was unavailable, we interviewed the next most highly ranked (or longest serving) health center staff member. In order not to distract health workers from performing their duties, enumerators were instructed to suspend the survey when a health worker was busy and to resume when she was again available.

village.[14]

The primary respondent for the household survey was the female head of household. The survey collected information about household members' recent experiences with the local health center, their knowledge about their rights and responsibilities, their health status, and their participation in community activities (including those directly related to monitoring the performance of their local health center), among other topics. All household surveys also included an anthropometric survey component in which we recorded the weight, height, and middle-upper arm circumference (MUAC) of each child under the age of five in the household. The ages of the children and their immunization status were verified using immunization cards, if available. At endline, we also collected retrospective information on the month of birth and, if applicable, death of all children recorded at baseline and midline in order to generate more precise estimates of child mortality rates, as described in Appendix E.

The household surveys were conducted in ten local languages with the help of 279 field staff hired and trained by IPA Uganda . All data was collected using smart phones, with date and time stamps, GPS coordinates, and information transmitted daily to an encrypted server.[15] In all, we completed 15,295 household surveys at baseline, 14,459 at midline, and 14,609 at endline.[16] Thanks to detailed tracking protocols, we were successful in re-interviewing 95.5 percent of our study households at endline. The analyses we discuss in the paper are based on the panel of 7,288 households in the 187 health centers receiving the full treatment or in the control arm, each interviewed at minimum at baseline and endline, and the vast majority at three different points in time. As shown in Appendix D.2, attrition is balanced across treatment arms.

5.1.1 Outcomes of Interest

We estimate the impact of the ACT Health intervention on five categories of outcomes: utilization rates, treatment quality, patient satisfaction, health outcomes, and child mortality. Child mortality is, of course, also a health outcome, but we break it out as a separate category because of its singular importance as a bottom-line measure of health system performance. For each of the first four outcome categories, we create an averaged z-score index (Kling, Liebman and Katz, 2007), constructed so that higher values imply a more positive outcome.

[14] At baseline, an additional short survey was administered to another randomly selected 15 households in catchment areas assigned to the information and mobilization treatments. These additional households were included to reduce noise in the measures included in the CRC and to increase the likelihood that the community would feel that the CRC represented its views and experiences.

[15] Further details of the procedures employed to ensure data quality are discussed in Appendix C.

[16] This includes the data collected in the 189 catchment areas in the sub-treatment arms, which are discussed in Appendix F.7.

Table 1: Main outcome indices and their components, baseline values

	Mean
Utilization	
Vaccination rates of children $<$ 36 months for polio, DPT, BCG, and measles, by age bracket $\star$	75.3%
Share of self-reported visits to the HC versus other providers	37.5%
Number of self-reported visits to the HC by household members in past 12 months	14.0
Treatment quality	
Equipment was used during the most recent visit to the HC	68.0%
Total time spent waiting for initial consultation and examination	104 mins.
Person seeking care was examined by trained HC staff during most recent visit	99.9%
Person seeking care had privacy during most recent examination	89.2%
Lab tests were administered during most recent visit	62.8%
Diagnosis was clearly explained to person seeking care during most recent visit	59.5%
Share of staff in attendance during unannounced visit to health center	29.3%
Health center was clean (floors and walls; smell) as observed during unannounced visit	80.3%
Share of months in which stock cards indicate availability of six key tracer drugs in past 3 months, as determined during unannounced visit	93.2%
Patient satisfaction	
Services offered at health center are judged to be of "very"/"somewhat high" quality $\diamond$	45.9%
Person seeking care was "very satisfied"/"satisfied" with care received during most recent visit	67.8%
Person conducting the examination behaved politely	89.9%
Person conducting examination appeared interested in health condition of person seeking care	90.1%
Person conducting examination listened to what person seeking care had to say	90.3%
Person seeking care felt free to express him/herself to person conducting examination	83.1%
Compared to the year before, availability of medical staff has improved	48.8%
Health outcomes	
Weight for age among children aged 0-18 months	1.23 kgs/mo
Weight for age among children aged 18-36 months	1.39 kgs/mo
Upper arm circumference among children aged 0-18 months	2.51 cms/mo
Child mortality	
0 to 5 years (per 1,000 live births)	45
0 to 12 months (per 1,000 live births)	40
1 to 5 years (per 1,000 live births)	5

Notes. The baseline values reported here are for the full sample, across all four treatment conditions. $\star$ Vaccination rates are calculated at the household level as the percentage of children under 36 months who, subject to a six-week grace period, have received the full set of age-relevant vaccinations as recommended in the Uganda National Expanded Program on Immunization. $\diamond$ Baseline values for this variable were not collected; values shown are from the control group. The baseline index omits this component.

Child mortality is calculated at the health center level using the synthetic cohort life table approach, as used in the Demographic and Health Surveys (DHS) Program (Croft, Marshall and Allen, 2018). Based on data on the months of birth and death of all children under the age of five in our sample households, we are able to calculate the probability of death for children aged 0-12 months, 1-5 years, and under 5 years. The mortality rates we report here are the estimated probability of a child in our sample dying before reaching a given age, expressed as a rate per 1,000 live births.[17] For this measure alone, lower values imply a more positive outcome. The components of the five main outcome indices, along with their mean values at baseline, are presented in Table 1.

In addition to these five main outcomes, we also test for treatment effects on seven intermediate outcomes that map onto the mechanisms discussed in Section 2: citizen knowledge, health center staff knowledge, efficacy, community responsibility, community monitoring, the relationship between health workers and the community, and health center transparency. The components of these indices, along with baseline means, are listed in Appendix A. The logic underlying our approach is that if the treatment affects health care delivery through its impact on intermediate outcome Q, then we should see an effect of the treatment on Q. Estimating treatment effects on these intermediate outcomes can thus help us gain a deeper understanding of the mechanisms through which the intervention operates.

5.2 Estimation

5.2.1 Main Effects and Intermediate Outcomes

To estimate the effect of exposure to ACT Health, we estimate the following intent-to-treat equation:

$$Y_{ij} = \beta_0 + \beta_1 T_{ij} + \beta_2 Y_{ij}^0 + \beta_3 X_{ij} + \beta_4 X_{ij} * T_{ij} + \phi_d + u_{ij} \quad (1)$$

where Y_{ij} is the outcome measure (in our main specifications, one of our five indices) of household i in health center catchment area j. T_{ij} is a binary variable indicating whether the health center and catchment area j was assigned to treatment. β_1 is the average treatment effect, Y_{ij}^0 is the baseline value of the outcome measure,[18] X_{ij} is a vector of demeaned controls,[19] $X_{ij} * T_{ij}$ is their

[17] See Appendix E for further details. We also supplemented this health center-level synthetic cohort data with a child-level measure that leverages the detailed child-month level retrospective data we collected at endline. Results for these child-level estimates are shown in Appendices F.5 and F.7.

[18] We did not collect baseline values for a subset of index components, as highlighted in Tables 1 and A1. In these cases, the baseline value of the outcome index omits this component. For analyses of treatment effects on these individual components, the baseline value is omitted from the estimating equation.

[19] As specified in our pre-analysis plan, the controls include whether the health center is a HC2, whether the health center provides delivery services, whether the health center has staff houses, whether household members report using

interaction with the treatment indicator,[20] ϕ_d are district fixed effects, and u_{ij} are robust standard errors clustered by the health center catchment area. For child mortality, the unit of observation is the health center catchment area. Following Lin (2013), we use Huber-White sandwiched standard errors. We deal with missing values and outliers as described in Appendix D.1.

We also use Equation 1 to estimate the effects of treatment on the intermediate outcomes described in Section 5.1.1.

6 Results

As a first step, we check for covariate balance to ensure we are drawing inferences from valid comparisons. As shown in Appendix D.2, our sample is balanced across treatment and control groups with respect to the baseline characteristics of the catchment areas and health centers. Baseline levels of our main and intermediate outcome indices are also balanced. We test for evidence of treatment spillover by comparing outcomes in control health centers that were close to and far from the nearest treated health center, and find no statistically significant differences.[21]

6.1 Main Outcomes

Figure 2 presents the study's main findings. The coefficient plot summarizes the effect of the ACT Health program on the five main outcome indices as measured at endline, 20 months after the initial treatment. Corresponding regression tables for the outcome indices as well as their components (both standardized and non-standardized) are included in Appendix F.1. The dots represent the estimated treatment effect in standard deviation (sd) units; thin error bars represent the 95% confidence interval; thick error bars the 90% confidence interval. Our findings allow us to conclude with great confidence that the effects on utilization rates, health outcomes, and child mortality are either zero or so small as to be substantively not meaningful. The upper bound of the 95% confidence interval of the average treatment effect on utilization is 0.070 sd; on health outcomes it is 0.051 sd. On child mortality, the (relevant) lower bound is -0.026 sd. All of these bounds are well below the 0.2 sd that is often conventionally considered a weak effect Cohen

the health center within the 12 months prior to baseline, the education level of the interviewed household head, and household wealth (calculated as the first component of a principal component analysis of the number of items of 17 assets—including cattle, radios, bicycles etc.—owned by the household, as well as three measures of housing quality).

[20] The inclusion of the interaction between the controls and the treatment dummy was not pre-specified. We added this term in line with the recommendations in Lin, Green and Coppock (2016).

[21] "Close" control health centers are defined as those whose distance to the nearest treated health center was less than 5.2 miles, which is the 67th percentile of distances among all closest control/treated pairs in our sample. For this analysis, we define "treated" health centers as those receiving either the full ACT Health intervention or one of its sub-components.

(1992).[22] We can also be confident that the intervention *does have* positive effects on the quality of care provided by health care providers and on patient satisfaction, which increase by 0.070 (95% confidence interval 0.018 to 0.122) and 0.077 sd (95% confidence interval 0.029 to 0.124), respectively. We underscore, however, that the substantive sizes of these effects are not particularly large, both in absolute terms and relative to secular changes taking place in both treatment and control units during the period we study.

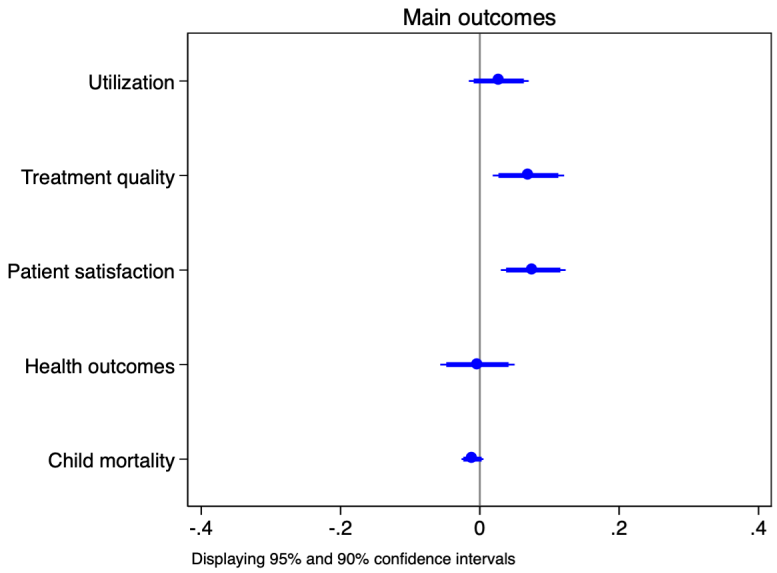


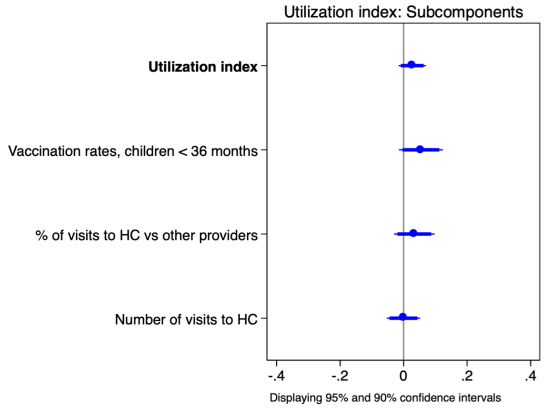
Figure 2: Effect of the full treatment at endline

Figure 3 unpacks these index-level results into their components, showing that the null findings with respect to utilization, health outcomes, and child mortality are rooted in statistically insignificant coefficient estimates on every index component. The one utilization index component that approaches conventional levels of statistical significance—and that, in fact, drives the nearly significant index coefficient—is child vaccination rates (see panel (a)). The effect on the critical number of visits to the health center during the past 12 months measure, however, is a precisely estimated zero. Similarly, panel (d) shows precisely estimated null effects for all four components of the health outcomes index. Neither weight-for-age nor the upper arm circumference for children aged 0-18 or 18-36 months are affected by the intervention. Panel (e) shows null effects on child mortality outcomes (note the different scale in this sub-figure). Treatment effects on mortality rates of children under five, infants (0-12 months), and 1-5 year-olds are -0.011, -0.006, and -0.005 sd, respectively, and all insignificant. To give a sense of the bounds for under-five mortality, the lower and upper limits of the 95% confidence interval on the average treatment effect are -0.026 and

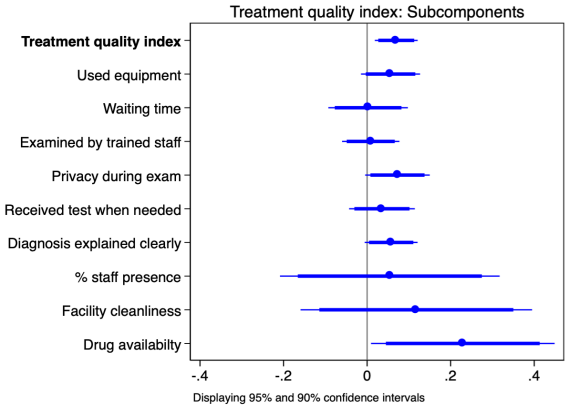
[22] We present a formal test for the absence of treatment effects on these outcomes in Appendix F.11.

Figure 3: Treatment effects on main indices and their subcomponents at endline

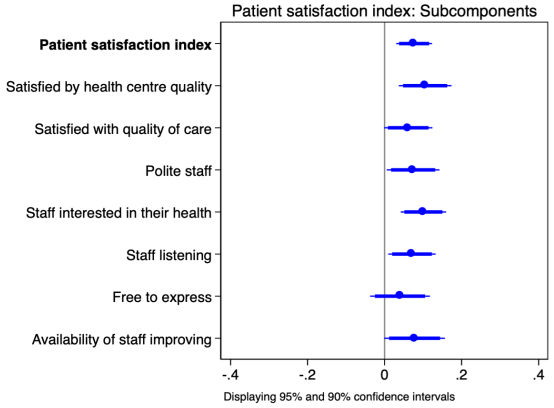
(a) Utilization



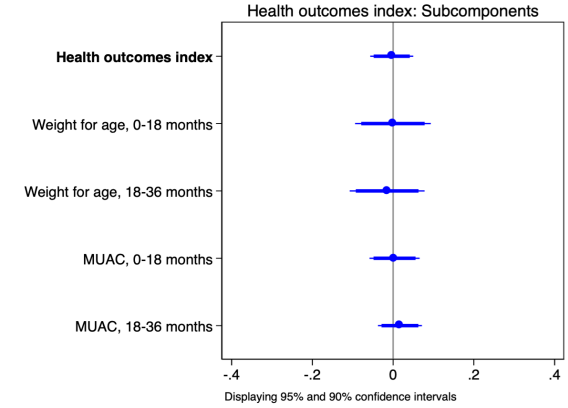
(b) Treatment quality



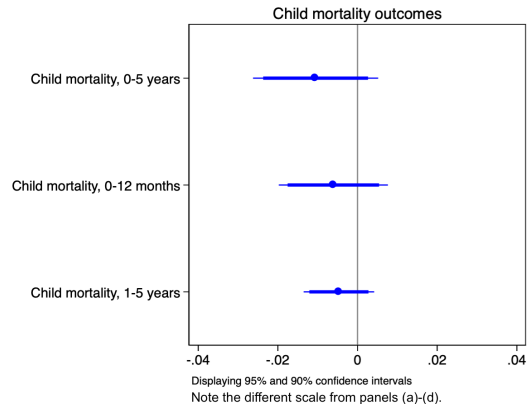
(c) Patient satisfaction



(d) Health outcomes



(e) Child mortality



0.005 sd, respectively, implying that we are 95% certain that the average treatment effect on child mortality is between 1.7 fewer and 0.35 more under-five deaths per 1,000 live births.

The patient satisfaction findings shown in panel (c), by contrast, are a product of significant, positive estimates on every component but one (which is still positive, but not statistically significant).

Our significant results with respect to treatment quality are built on somewhat more mixed component-level findings (see panel (b)). Respondents in households who received their care from treated health centers were more likely to report having had privacy during their most recent exam and having had their diagnosis clearly explained to them (1.5 and 2.3 percentage points, respectively). Treated health centers were also 5.9 percentage points less likely to have had stockouts of key drugs during the past three months. Although these three index components are the only ones for which treatment effects reach traditional levels of statistical significance, all of the other components also have positive coefficients, resulting in a significant positive estimate for the index as a whole. This positive index-level effect is robust to several alternative specifications, including (with one exception, discussed below) dropping index components one by one and excluding the three index components measured at the health center level (observed staff presence, cleanliness, and drug availability), whose inclusion in the household-level index artificially inflates their contributions (see Appendix F.5).

The only index component whose single omission causes the treatment quality index to lose its statistical significance is drug availability. Drug stockouts are more than just a statistically influential index component, however. The unavailability of essential medicines is a major source of poor health—and even death—in rural Uganda. Uganda employs a hybrid "push-pull" system under which requested quantities of basic drug supplies are sent to clinics from the National Medical Store (BMAU, 2015; Rwothungeyo, 2016). Hence, exposure to the ACT Health intervention might reduce stockouts via two channels. First, health workers who might otherwise file incomplete or late paperwork requesting drugs might be impelled by the complaints they hear from community members to project their drug needs more accurately and to request restocking in a timelier manner. Second, interacting with community members might cause health workers to resist the temptation to steal clinic drugs and sell them to patients at private pharmacies in which they have financial interests. Such drug thefts by clinic staff were a major problem in Uganda at the time of our study (Arinaitwe, 2017). Eighty-eight percent of households in our sample cited health workers selling drugs on the side as an important factor in explaining poor health service delivery. The problem was so severe that in 2009 President Museveni established a special agency within State House to combat the issue. The outsized contribution of drug availability to our treatment quality index can therefore be justified by pointing to the importance of reducing drug stockouts to improving health outcomes.

We underscore again, however, that, while statistically significant, the estimated impacts on

treatment quality and patient satisfaction are substantively quite small and do not translate into measurable effects on utilization, child mortality, or other health outcomes—at least in the time frame we study.

6.1.1 Midline Results for Main Outcomes

Our findings at midline are generally consistent with those at endline (see Appendix F.8). When we use outcome data measured 8 months after treatment, we find no effects of exposure to the ACT Health intervention on utilization, health outcomes, or child mortality, and a significant but substantively small (0.06 sd) effect on treatment quality. In contrast to our endline findings, we observe no treatment impacts on patient satisfaction at midline. Exposure to the ACT Health intervention thus does not appear to have had shorter-term effects that dissipated by the time of our endline data collection.

6.1.2 Robustness Tests

In addition to the main results shown in Figure 2 and Appendix F.1, we find consistent effects in t-tests (see Appendix F.9), and in various alternative models we pre-specified in our pre-analysis plan. As we show in Appendix F.5, running the models without control variables or district fixed effects, aggregating all outcome measures to the health center level, and re-specifying our outcome measures as the difference between post-treatment and pre-treatment values all leave our findings substantively unchanged. We also show that our estimated null effects on child mortality are unchanged when we re-analyze our data using at the child level using a Cox proportional hazards model, leveraging the fact that we have child-month data on survival over the course of 36 months for over 10,000 children (again, see Appendix F.5).

To allay concerns that the number of hypotheses we test might lead us to falsely report statistically significant effects, we provide estimates of treatment impact on all indices and index components both with and without False Discovery Rate adjusted p-values (Benjamini and Hochberg, 1995), based on the comparison families described in Appendix F.10.

Quantile regressions of our five outcome indices (reported in Appendix F.5) suggest that our estimated treatment effects (both null and positive) are not driven by just parts of the distribution. Our results on utilization, patient satisfaction, and health outcomes are also robust to substituting our main pre-registered outcome measures with alternative indices based on the first component of a principal component analysis (also see Appendix F.5). This is important insofar as our pre-registered indices, while deductively sensible, might not perfectly capture the underlying outcomes they were designed to summarize.

6.2 Subgroup Effects

The evidence presented thus far speaks to the weak impact of ACT Health in the *average* health center or catchment area. However, it is possible that the intervention may have had significant effects in some subsets of health centers and catchment areas with particular characteristics—for example, those with different baseline levels of service provision, fewer alternative health care options, different exposure to prior NGO health programming, where health center staff are more embedded in the community, or where the community has higher (or lower) baseline levels of efficacy, collective action potential, or ongoing monitoring of health workers. Investigating such sub-group effects can be helpful for better understanding the mechanisms at work and for generating expectations about the likely external validity of the findings in other settings and populations (Banerjee, Chassang and Snowberg, 2017)—a benefit we exploit in the discussion in Section 8 below.

The results of our investigation into subgroup effects (described in detail in Appendix F.3) bolster our null findings with respect to utilization, child mortality, and other health outcomes by demonstrating that these statistically insignificant results hold across nearly all subsets of health centers and catchment areas.

7 Discussion

Beyond our main finding of null effects on utilization, health outcomes and child mortality, and weak effects on treatment quality, three other results have important implications for the literature on service provision and accountability. The first is the lack of evidence that the intervention had any effect on citizen pressure. The second is suggestive evidence for the importance of monitoring by top-down officials. The third is our finding that exposure to the intervention caused patients to say they were more satisfied with the quality of the care they received at their local health center. We discuss each in turn.

7.1 No Evidence of Citizen Pressure

As noted in Section 2, the principal rationale for providing information to citizens and mobilizing them in light of that information is that it will put them in a better position to monitor and sanction underperforming service providers. Yet, as our investigation into intermediate outcomes makes clear (see Figure 4), we find no evidence that ACT Health had any impact on efficacy, perceived community responsibility for monitoring health service delivery, or actual monitoring activities undertaken by community members—the three intermediate outcome indices that best capture

citizen monitoring and bottom-up pressure.[23]

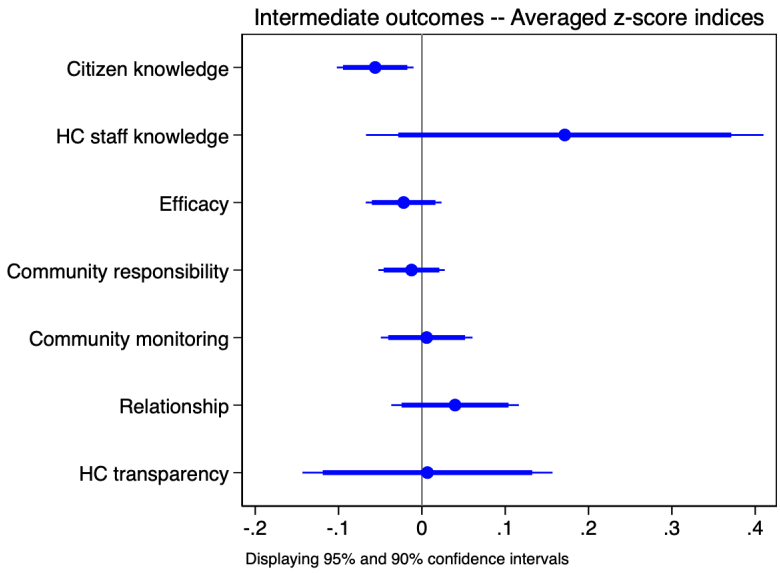


Figure 4: Treatment effect on intermediate outcomes at endline

The lack of evidence for the citizen pressure channel is reinforced when we look at the specific components of the efficacy, community responsibility, and community monitoring indices that most directly measure citizens' abilities to achieve these ends (see Appendix F.2 for details). For example, we find that exposure to the ACT Health programming generated no increase in the share of respondents reporting that they thought they were responsible for making sure health workers came to work and provided high quality health services. Although respondents in households located in treated villages were slightly more likely to report at midline that they thought they had a say in how health centers provided care to their community, that they could pressure a health worker to report to work on time if he/she were regularly coming late, and that they could pressure a health worker to exert better effort in caring for patients, these effects disappeared by endline. To the extent that sustained confidence in one's ability to effect change is a necessary condition for citizens to invest in applying bottom-up pressure on health providers (Lieberman and Zhou, 2020; Lieberman, Posner and Tsai, 2014), these findings may help account for why we see such

[23] We also find no evidence for positive treatment impacts on the other intermediate outcomes we studied: knowledge of patients' rights and responsibilities among community members; perceived quality of community members' relationship with health care workers; health workers' knowledge of patients' rights and responsibilities; or actions the health center staff may have undertaken to improve transparency vis-à-vis the community (for example, having a suggestion box or posting opening times, duty rosters, or information about services provided and patients' rights). Insofar as citizen knowledge can be thought of as a manipulation check in an information-focused intervention like ACT Health, the significant negative sign on that intermediate outcome measure may appear troubling. We note that the estimate loses statistical significance once a multiple testing adjustment is applied and that the substantive size of the coefficient is, in any case, tiny—corresponding to less than one additional correctly named right or responsibility.

weak effects on citizen monitoring—and also why health center staff in treated and control units reported no differences in the rates at which community members called for meetings with health workers, made suggestions, or lodged formal complaints.

It is worth considering whether the lack of evidence for the citizen pressure channel might be due to the fact that ACT Health's mobilization efforts were too weak or reached too few community members. This explanation has at least superficial plausibility: notwithstanding the intervention's stated goal of mobilizing "the community," fewer than 20 percent of households surveyed at midline in treated villages had even heard about the community dialogues or interface meetings. In this respect, however, ACT Health is little different from most bottom-up community mobilization interventions, where the number of directly treated individuals constitutes only a small fraction of the people living in the "treated community," and where awareness of the intervention is often quite low.[24] Moreover, it is wrong to think that treating every member of the community with information is necessary for bottom-up pressure to materialize. All that is required is that a sufficiently large number of community members monitor and apply pressure on underperforming service providers (Olson, 1971), and it is reasonable to think that the 100 people attending the average community meeting in ACT Health should have been sufficient to achieve this end. It is therefore unlikely that the weak first stage in the link between information provision and improved service delivery is rooted in insufficient community mobilization.

A more likely explanation lies in the fact that, notwithstanding the theoretical and policy appeal of the citizen pressure channel, bottom-up pressure is extremely difficult to mobilize. Baseline levels of citizen demand for better services are often low, as are expectations of government capacity and responsiveness (Gottlieb, 2016; Kruks-Wisner, 2018). Collective action problems are challenging to overcome (Dasgupta, 2009); citizens' efficacy and sense of responsibility for monitoring health care providers are often weak (Lieberman and Zhou, 2020); formal institutions such as local councils may be moribund and/or corrupt, and therefore unable to support citizens' monitoring efforts; and, compared to the other more immediate problems people face, health care may be insufficiently important to justify the investments in time and energy that the citizen pressure channel assumes community members will be willing to make to try to effect change (Lieberman,

[24]For example, the village meetings that are central to Olken's much celebrated study in Indonesia (Olken, 2007) contained an average of between 45 and 65 people in communities containing roughly 2,500 residents. This implies that only 2-3 percent of the community was directly treated by attendance at a village meeting. In Björkman and Svensson (2009), attendance at community meetings averaged 150 people in catchment areas that contained an average of 2,500 households, implying that only 6 percent of households were directly mobilized. Even when a larger share of the community attends the project meetings, awareness of the intervention can still be low. Banerjee et al. (2010) report the results of an intervention in India in which the average treatment village had 360 households and 108 adults attend the community meetings. Yet despite this comparatively high rate of participation, fewer than 7 percent of households in treated villages had heard about the village education committees that were the central aspect of the intervention.

Posner and Tsai, 2014).

The logic of the principal agent framework also helps explain the limits of such a strategy. As explicated in the classic theoretical treatments of Ross (1973) and Holmström (1979), the crux of the principal-agent problem lies in two characteristics of the relationship between any actor and the agent to whom she has delegated responsibility for completing a task. The first is that the principal cannot directly observe the actions of the agent—whether he comes to work on time (or at all), how hard he works, whether he has been wasteful with resources, etc. The second is that the outcome the principal observes is affected by factors outside of the agent's control. These conditions make it very difficult for the principal to make a clear inference about the agent's actions from the outcome that she observes. Simply supplying community members with information about the outcomes that have been achieved at the health center and how these outcomes compare with district averages (precisely the kind of information the CRC provides) does nothing to solve the problem of the health workers' effort being unobservable. If outcomes are found to be deficient, it will be difficult for community members to discern whether the poor performance stems from low effort by the health center staff or, as the health workers will certainly claim, from circumstances outside of their control—underfunding, staff shortages, delays in the delivery of drugs and other supplies, or other factors. The provision of information may aid community members and health center staff in developing joint action plans that are built around problems over which they actually have control, as Björkman Nyqvist, de Walque and Svensson (2017) emphasize. But information alone will be insufficient for enforcing the agreements that those action plans contain.

These considerations are reinforced by the absence in the setting we study of another key factor stressed in principal-agent models: the ability to sanction. To the extent that information provision works, it may be that it only does where citizens have actual leverage over the frontline service providers they are being encouraged to monitor. In our study context, as in many settings where similar interventions have been deployed, it is difficult to imagine how even highly mobilized citizens would be able to sanction underperforming service providers.[25] Absent the ability to sanction, investments in monitoring may appear futile, and thus not be made. Of course, service providers may alter their behavior in *anticipation* of citizen pressure, even if such pressure never materializes.[26] But such a response is not likely to be sustainable once it is revealed that sanctions are not forthcoming.

[25]Citizen monitoring interventions aimed at shaping the behavior of elected officials, over whom citizens in principle have sanctioning power via their votes, may be more promising. For example, Grossman and Michelitch (2018) find that Ugandan politicians about whom performance information was circulated to voters did in fact perform better, but only in competitive constituencies where citizens possessed real leverage over the politicians. For a less optimistic set of findings about voters' sanctioning power, see Dunning et al. (2019).

[26]Indeed, Grossman and Michelitch (2018) identify precisely this type of anticipatory response as responsible for the effect of information provision on politicians' behavior in their study.

7.2 Top-Down Monitoring as an Alternative Strategy?

If citizens lack the power to sanction frontline health care providers from the bottom up, what about the local government officials who oversee them? Can this alternative set of principals, who, by virtue of their formal oversight role and their connections with actors higher up in the government, *do* have the ability to sanction underperforming health care workers, successfully apply pressure from the top down? Although ACT Health did not explicitly involve district- or subcounty-level government health officials in its programming, such officials were informed of the intervention and invited to attend the community and interface meetings, and our implementing partners kept careful records of whether or not such officials did, in fact, attend these meetings (see Appendix H.2). Where they did, the effect of the intervention on treatment quality nearly doubled (see Appendix F.6). While the fact that the subcounty officials' attendance at the meetings was not randomly assigned cautions against reading too much into this finding, the result is suggestive of the power of top-down monitoring, perhaps in combination with bottom-up monitoring by citizens, to improve the performance of frontline service providers.[27]

It may be satisfying from a democratic theory perspective to think that the answer to the problem of poor service delivery lies in giving "power to the people." But mobilizing citizens to monitor and apply pressure on frontline providers may not be the most powerful strategy for improving the quality of health care and other services. Our findings suggest that more direct engagement with service providers (the third channel discussed in Section 2), and perhaps top-down monitoring by government officials, may be a more promising approach.

7.3 Patient Satisfaction

In light of the evidence that ACT Health led to modest improvements in treatment quality—and that these improvements were already apparent by midline (see Appendix F.8)—our findings with respect to patient satisfaction make sense: the increase in patients' satisfaction with their care is plausibly a response to the positive changes in health providers' behavior, as captured in our treatment quality index. Since these changes in provider behavior were not associated with measurable changes in actual health outcomes, we can infer—in keeping with a common finding in the medical literature (Kahn et al., 2015)—that patient satisfaction may be rooted in the character of patients' interactions with their health care providers rather than in improvements in health outcomes that these interactions may generate.

An alternative interpretation is that our findings on patient satisfaction are due less to changes

[27] Raffler (2019) finds similarly that Ugandan councilors are effective in monitoring local bureaucrats only when they can call on Members of Parliament or local media as external levers.

in health provider behavior (which, after all, are substantively quite small) than to the participatory nature of the ACT Health intervention. Other studies have found similar increases in citizen satisfaction following community members' participation in interventions that involve consultation and/or direct participation in decision-making, even when the interventions have no tangible effects on other outcomes (Olken, 2010; Beath, Christia and Enikolopov, 2017).

These findings suggest that including non-elite community members in decision-making processes can generate satisfaction with the outcomes generated, even if the outcomes themselves are unaffected by the community members' participation. These effects may be particularly strong in settings like Uganda where, for reasons of elite capture and status differentials between regular citizens and service providers, community members rarely have their opinions taken seriously by elites and are ordinarily shut out of participation in collective decision-making. In such contexts, simply being asked for one's views and being in a position to interact on an equal basis with comparatively high-status service providers may alter citizens' subjective perceptions of the performance of the actors and institutions that they are later asked to evaluate.

8 Reconciling the Findings in ACT Health and Other Studies

How can we reconcile our findings with those in other studies—especially Björkman and Svensson (2009) and Christensen et al. (2020), whose designs are so similar to ours and whose findings diverge so significantly from our own? We believe the most compelling explanation lies in the different baseline health conditions present at the onset of each study.

According to World Bank figures, under-five mortality in Uganda was 117 per 1,000 live births in 2004, the time of Björkman and Svensson (2009), but had dropped to 59 per 1,000 by 2014, the time of ACT Health. In Sierra Leone, under-five mortality in 2012, the start of the Christensen et al. (2020) study, was 145 per 1,000, even higher than in Uganda in 2004. Other key indicators such as the share of births attended by a skilled provider (42 percent in Uganda in 2006; 60 percent in Sierra Leone in 2013; 74 percent in Uganda in 2016); stunting (38 percent in Uganda in 2006; 38 percent in Sierra Leone in 2013; 29 percent in Uganda in 2016); and wasting (6.1 percent in Uganda in 2006; 9 percent in Sierra Leone in 2013; 3.6 percent in Uganda in 2016) also point to significantly lower health conditions baselines in Björkman and Svensson (2009) and Christensen et al. (2020) than in ACT Health.[28] Significant improvements in child mortality rates and other health outcomes may simply be easier to achieve when health conditions are as poor as they were at the time of Björkman and Svensson (2009) and Christensen et al. (2020).

[28]Figures, reflecting data from the closest relevant years in each country, are from Uganda Bureau of Statistics (2007, 2017) and Statistics Sierra Leone (2014).

Suggestive support for this "advantages of a lower baseline" hypothesis comes from two sources in our own data. First, when we examine patterns of variation in treatment effects across sub-groups in our own study, we find evidence that impacts on treatment quality are driven by the more underdeveloped catchment areas: where baseline child mortality rates are higher and levels of treatment quality are lower; where community members have fewer alternative healthcare options; where the community is more rural; where fewer health NGOs are present; and where the health center is an HC2 rather than an HC3 (see Appendix F.4). Although the differences between catchment areas ranking above and below the median on these dimensions are rarely statistically significant, they all point in the direction of stronger effects on treatment quality in less developed contexts. Second, when we re-run our main analyses in the sub-sample of health centers whose baseline child mortality rates are above the 58th percentile in our distribution (the threshold below which health centers have a child mortality rate of zero), we find a significant reduction in child mortality (see Appendix F.4). These results are robust to extending the cutoff to the 66th percentile as well.

The plausibility of the "advantages of a lower baseline" thesis is further supported when we expand the universe of studies beyond the two that are closest to our own. As shown in Table 2, which includes all five of the studies analyzing the impact of information-oriented bottom-up pressure interventions in the health sector discussed in this paper's introduction, treatment impacts diminish as underlying health conditions (proxied by child mortality rates) improve.

Table 2: Average treatment effects in information-oriented bottom-up pressure interventions in the health sector in developing countries

Study	Country	Onset of intervention	Baseline U5MR (per 1,000 live births)	Treatment effect on			
				Collective action	Utilization	Treatment quality	Child mortality
Arkedis et al. 2019	Indonesia	2015	28	no	no	no	.
Arkedis et al. 2019	Tanzania	2015	59	no	no	no	.
This paper	Uganda	2014	59	no	no	yes	no
Mohanan et al. 2020	India (Uttar Pradesh)	2016	78	.	yes	.	no
Björkman & Svensson 2009	Uganda	2004	117	yes	yes	yes	yes
Christensen et al. 2020	Sierra Leone	2012	145	no	yes	no	yes

Notes. Data on baseline U5MR is from World Development Indicators and DHS (for Uttar Pradesh). "Yes" indicates that the study reports a significant positive treatment effect (negative for child mortality) at conventional significance levels for the respective outcome; "no" indicates that the reported effect is insignificant or a precise null; and "." indicates that the study does not report effects on this outcome.

9 Conclusion

When states fail to provide services to their citizens, citizens can in principle apply pressure on frontline service providers to improve their performance. An influential idea in development circles is that such pressure can be induced by providing citizens with information about service

delivery shortfalls and mobilizing them in light of that information. We test this hypothesis by studying a large-scale community health intervention modeled on precisely the received wisdom about the power of information and citizen mobilization to initiate this causal process. While we find evidence for small effects of the intervention on treatment quality, we find no evidence for its impact on utilization or health outcomes (including child mortality)—the bottom-line outcomes that policymakers ultimately want to affect. We also find no evidence that the intervention caused citizens to more closely monitor their local health care providers or apply pressure on those who were revealed to be underperforming.

Viewed in terms of the three channels discussed in Section 2, our findings provide no evidence for the citizen pressure or utilization channels. However, the combination of the (small) effect on treatment quality and the lack of evidence that the intervention generated citizen pressure is in keeping with the direct effect on service providers channel. Contra the literature, the link between information provision and provider behavior did not run through citizen pressure.

Our results challenge us to reconcile our findings with the more optimistic findings reported about other interventions designed to generate bottom-up pressure by citizens on frontline service providers. Taken together, the results of these six studies suggest that higher baseline levels of health outcomes are associated with generally weaker impacts. They also provide suggestive evidence for the differential salience of the three channels discussed in Section 2 at higher and lower baseline levels of health service delivery. A first key finding in this respect is the lack of evidence at any baseline condition consistent with the citizen pressure channel (with one notable exception). This is an important result given the literature's emphasis on bottom-up citizen pressure as a response to poor service delivery. A second finding is that the utilization channel seems only to operate in settings with the poorest baseline health conditions. This makes sense insofar as health improvements due to increased utilization will dissipate as larger shares of sick people seek professional care at the local health facility.

Recognizing the importance of baseline conditions also has implications for thinking about the extent to which the findings of our own study—and others—are likely to travel to other settings. As shown in Figure 5, baseline health conditions (proxied by child mortality rates) in Uganda in 2004, the time of the Björkman and Svensson (2009) study, and Sierra Leone in 2012, the time of the Christensen et al. (2020) study, are well outside the range of most African countries today. Baseline health conditions at the time of our own study in Uganda in 2014 and in Tanzania in 2015, the time of the Arkedis et al. (2019) study, by contrast, are much closer to the conditions in the modal African country in 2018 (the most recent data available). Our null results, and those in Arkedis et al. (2019), may therefore be more relevant for the question of whether interventions that provide citizens with information and mobilize them to apply bottom-up pressure on frontline

service providers are a viable lever for improving service delivery in Africa today.

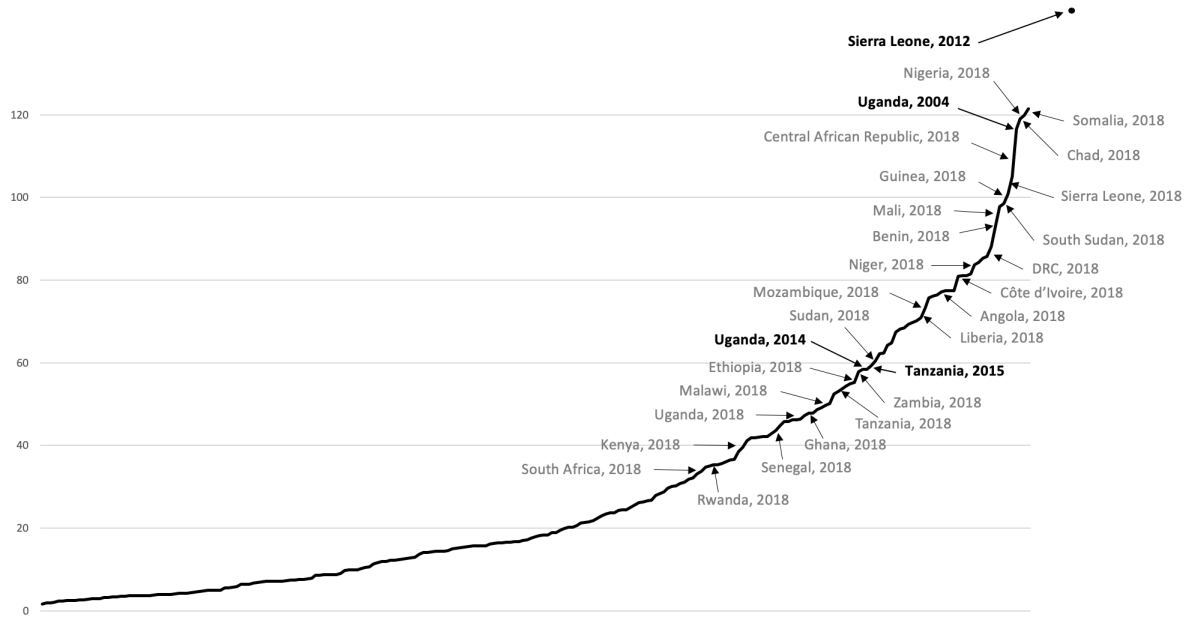


Figure 5: Global under-five mortality rates, ordered lowest to highest, with selected African countries labeled. All figures are from 2018, except those labeled in bold, which correspond to the dates of the studies discussed in the text.

The more focused comparison between our study and Björkman and Svensson (2009) holds a second lesson as well: that interventions that generate strong positive effects at one moment in a country's development may become less effective as conditions improve. We tend to think about external validity as relating to the generalizability of research findings across space. Our findings, viewed alongside those of Björkman and Svensson (2009), underscore the importance of also considering the generalizability of research findings in the same setting *over time*—especially during periods of rapid socioeconomic change, such as those experienced by many low-income countries during the past decade.

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Online Appendix for:
Can Citizen Pressure Be Induced to Improve Public Service Provision?

The following appendices are not intended for print publication.

Appendices

A Intermediate Outcomes

Table A1: Intermediate outcome indices and their components

	Mean
Citizen knowledge	
Share of patients' rights that household head is able to name correctly	10.20%
Share of patients' responsibilities that household head is able to name correctly	30.12%
Share of services offered at health center that household head is able to name correctly	64.76%
Health center staff knowledge	
Share of patients' rights that health center staff is able to name correctly	31.97%
Share of patients' responsibilities that health center staff is able to name correctly	54.93%
Efficacy	
Whether household head thinks she has "a lot"/"some" power to improve quality of health care at local HC	33.98%
Whether household head thinks she would be able to pressure a health worker to exert better effort	62.79%
Whether household head thinks she would be able to pressure a health worker to report to work on time ◇	61.93%
Whether household head thinks she has "a lot"/"some" influence in making village a better place to live ◇	33.65%
Whether household head agrees that "people like you have a say about how the government provides health care to your community"	82.32%
Whether household head agrees that "people like you have a say about how health facilities provide health care to your community"	81.18%
Community responsibility	
Whether household head thinks she is responsible for making sure health workers come to work and provide high quality health services	45.15%
Whether household head thinks community members are responsible for making sure health workers come to work and provide high quality health services	1.24%
Community monitoring	
Whether household members report having attended LC1 meetings in the last year	88.93%
Whether household members who attended LC1 meeting report that local health center was discussed	65.93%
Whether household members think engaged community members would find out if a health worker did not provide the effort that he/she should in caring for his/her patients ◇	73.04%
Whether household members think engaged community members would find out if a health worker did not report for work ◇	73.52%
Relationship between health care workers and the community	
Whether household members report being "satisfied"/"very satisfied" with relationship with health center staff	73.67%
Whether household members say they trust the workers at the health center	60.10%
Whether health center staff report being "satisfied"/"very satisfied" with their relationship with the community	90.62%
Whether household members did not say that the health center staff would "refuse to see me" or "behave hostilely toward me" if they had a complaint about the quality of services at the health center and decided to talk to the facility staff	97.69%
Health center transparency	
Whether a poster showing health center's opening/closing hours was visible during unannounced visit	2.78%
Whether a staff duty roster was displayed publicly during unannounced visit	20.31%
Whether a suggestion box was present during unannounced visit	6.14%
Whether information was posted listing services provided at the health center during unannounced visit	33.14%
Whether information was posted about patients' rights and responsibilities during the announced visit	3.46%

◇ Baseline values for this variable were not collected; values shown are from the control group. The baseline index omits these components.

B Ethical Considerations

IRB approvals for our research were secured at IPA (Protocol ID: 0497) and at the Uganda National Council for Science and Technology (UNCST) (Protocol ID: ARC157). More general approval for the project was also received from UNCST itself (Protocol ID: SS3559) and from the Office of the President, Uganda.

As indicated in the materials we submitted to these bodies, we took steps to address the major ethical challenges associated with our research. We took these challenges to be a) that providing information about poor service delivery and mobilizing citizens in light of that information might generate conflict between health care providers and citizens, b) that interviewing health care providers might have taken them away from their duties and delayed or otherwise compromised the health care of their patients, and c) that participants might feel pressured to participate in the study unwillingly and/or that their anonymity might be compromised by our data storage protocols.

With respect to the first concern, our implementation team underwent extensive training regarding how to present the information and conduct the dissemination and interface meetings in a manner that generated constructive discussion rather than conflict. With respect to the concern that our questioning of health workers might distract them from performing their duties, enumerators were instructed to interrupt the survey when a health worker was busy and to resume when she was again available.

With respect to concerns about survey respondents' informed consent and privacy, participation in the study was voluntary and all respondents need to have given their informed consent in order to participate. Respondents received a small compensation for their time in the form of a long bar of soap (worth 1,500 UGX, which about corresponds to the average rural income for the 90-minute duration of the survey).[29] All data was collected electronically on password protected PDAs, using SurveyCTO, an ODK based platform. Data was uploaded to an encrypted server on a daily basis, networks permitting, and then stored on password protected computers using encryption and removing all personally identifying information from the datasets.

Our protocols for the organization of the community and interface meetings were designed to ensure that participants included a diverse cross-section of citizens served by the health center being studied, as described in Appendix H.

We have no reason to believe, and our data reveal no evidence, that the intervention differentially benefited or harmed particular groups.

C Procedures to Ensure Data Quality

The ACT Health project team followed a standard set of procedures and processes developed by IPA over the years to manage large-scale academic research projects. These protocols include specific requirements for adhering to human subjects' regulations, developing survey instruments, fielding data collection teams, implementing data quality reviews, and producing and cleaning datasets for analysis.

[29] According to the Ugandan National Household Survey from 2016, the average monthly household income in rural areas was 303,000 UGX with an average household size of five persons (including children) at the time.

The ACT Health project submitted research protocols for the three waves of data collection to both a local IRB committee (Mildmay/MUREC and UNCST) and to IPA's internal IRB review committee (#2127). The project team worked closely with local authorities and received approvals for its work from the Office of the President, the Ugandan Ministry of Health, and from the chief administrative officers and district health officers in each of the 16 districts in which the project was implemented.

All personnel who handled the data and identified surveys in the field were required to obtain IRB training certificates. All field officers (including surveyors) signed confidentiality forms and administered informed consent to every respondent.

To minimize concerns over social desirability bias and Hawthorne effects, we took great care to decouple the intervention and the data collection exercise in the perception of respondents and blinded survey team members to treatment status. We can thus rule out the concern that members of the survey team might have sought to validate the program's objectives through the way they asked questions or recorded observations about the clinics they visited.

Data collection was undertaken in four distinct steps by teams headed by a research associate and consisting of field managers, team leaders, enumerators (health center, household, and anthropometric), mobilizers, trackers, and auditors.

1. Mobilization: A team of trained mobilizers contacted targeted households a day prior to the start of data collection to alert them to the survey work to come and to document the locations in which surveys would be administered. The conditions of the studied health center was assessed, staff attendance was recorded, and drug supplies were checked during a surprise visit to the health center on the same day. In-charges were notified to prepare the relevant records for the enumeration team's visit the following day.

2. Enumeration: The enumeration team completed four different surveys.

   (a) Household Survey: Household enumerators completed an average three to four surveys a day. The household survey took about one and a half hours to complete. Enumerators were instructed to interview the female head of the household. In the event that the female household head was no longer living in the house (at midline or endline), enumerators were instructed to follow the decision tree below to interview the correct person. During the interview, enumerators were asked to assess the number of children under five present in the household and to complete a form that household members would later give to anthropometric enumerators during their visits. At the end of the interview, contact forms were given to the household with instructions on how to report any comments to the HR management or IRB committee.

   (b) Anthropometric Survey: Anthropometric enumerators were specially trained to measure the height, weight and middle-upper arm circumference of all children in the household under 5 years old. Anthropometric enumerators were in charge of collecting the form left by household enumerators to ensure that the household survey was administered.

   (c) Health Center Survey: Each health center enumerator (three per team) completed one survey a day. The survey consisted of interviewing the in-charges (at endline, a survey

of other staff members was also added), assessing the quality of the health center, and collecting administrative reports (HMIS, PHC funds, etc.). Health center enumerators' visits were announced but could not take place the day of an immunization campaign, when health center staff were occupied. Health center enumerators were instructed to take pictures of administrative report pages with their PDA to prevent misreporting. These pictures were deleted each evening by the field team leaders.

(d) LC1 Survey: Team Leaders were responsible for the LC1 surveys, which involved interviewing the LC1 chairman about the characteristic of the village (rural/urban), its social cohesion, the political affiliations of officials, and other topics.

3. Tracking: Household that could not be found on the day of the enumeration were tracked by a team of trackers who were also trained to do the anthropometric survey. Tracking sheets were given to trackers by field managers after receiving approval from the research associate, following the decision tree below.

4. Auditing: Auditors performed back checks and spot checks (with field managers) on daily basis. Auditors received auditing sheets from the research associate once household data collection was finalized. They reported the findings of their investigations and handled their surveys directly to the research associate.

The ACT Health survey team followed a set of standard operating procedures to ensure high quality data collection. These included:

- High quality training for everyone involved in the data collection: A total of four different teams of 75 enumerators worked in the 16 different districts. Mobilizers, enumerators, auditors and team leaders went through one-week trainings before being selected, including a soft launch to put in practice what they had learned.

- High-frequency checks: Specific survey questions that were susceptible to typos or incoherence were audited every evening by the research associates and field managers to ensure data quality. Daily feedback was provided to enumerators based on the findings from the monitoring, back checks, and high-frequency checks.

- Back checks: During the survey itself, data auditors re-surveyed a random sub-sample of survey participants (on a portion of the survey) to monitor enumerators' performance and to confirm that enumerators were interviewing the correct respondents. Field managers monitored their teams and accompanied each enumerator at least once every week.

- Monitoring and supervision of data collection: Research associates traveled with the survey team throughout the five months of the data collection and across the 16 different districts to supervise the data collection process. Field managers were present in the villages in which enumeration was ongoing on daily basis in order to monitor the data collection and perform spot checks on randomly selected enumerators. Principal investigators were updated in weekly calls about the data collection and were consulted to solve problems as they arose.

D Technical Details and Validity Checks

D.1 Missing Values and Outliers

As specified in our pre-analysis plan, we remove outliers by capping (top-coding) unbounded variables at the 99th percentile of the observed values in our data. To deal with missing values on our covariates, we adopt the approach described in Lin, Green and Coppock (2016). If no more than 10% of the covariate's values are missing, we recode the missing values to the overall mean. If more than 10% of the covariate's values are missing, we include a missingness dummy as an additional covariate and recode the missing values to zero. We deal with missing values on our outcome measures by setting them equal to the means of the respective treatment arms.

D.2 Attrition, Balance, and Spillover

Table D1: Attrition Across Treatment Arms

	(1) Full treatment	(2) Information treatment	(3) Interface treatment	(4) Control	(5) P-value difference (1)-(4)	(6) P-value difference (1)&(2)-(3)&(4)	(7) P-value difference (1)&(3)-(2)&(4)
Reinterview rate, baseline to midline	0.947	0.940	0.950	0.944	0.68	0.44	0.16
Reinterview rate, baseline to endline	0.956	0.949	0.958	0.957	0.88	0.29	0.40

Notes. Numbers reported correspond to the average of household participation at health center level for the four different arms. The unit of observation is the health center catchment area. Columns (5)-(7) report the p-values of two-sided t-tests comparing re-interview rates in columns (1) and (4), (2) and (4), and (3) and (4), respectively. The full sample is composed of 376 health centers. At baseline, 379 health centers were surveyed but 3 dropped of the selected sample due to external factors (moved to another location, closed due to district decision or structural damages from flood).

Table D2: Spillover

	Mean close control HC	Mean far control HC	P-value difference
A. Difference Midline - Baseline levels of key outcome indices			
Utilization	0.006	-0.011	0.652
Treatment quality	-0.082	0.171	0.000
Patient satisfaction	0.012	-0.021	0.525
Health outcomes (HH level averaged at HC level)	-0.070	-0.034	0.621
Health outcomes (Child level averaged at HC level)	0.009	0.010	0.988
Child Mortality	0.010	0.029	0.286
B. Difference Endline - Baseline levels of key outcome indices			
Utilization	-0.009	-0.008	0.995
Treatment quality	-0.049	0.111	0.008
Patient satisfaction	-0.002	0.004	0.899
Health outcomes (HH level averaged at HC level)	0.033	0.008	0.714
Health outcomes (Child level averaged at HC level)	0.045	-0.074	0.430
Child Mortality	0.011	0.049	0.023
N	64	31	

Notes. Difference in means test comparing changes in main outcomes among control health centers that are relatively close to a treatment health center and those that are relatively far away. *Close* indicates that the distance to the nearest treatment health center is below the 67th percentile, *far* indicates that it is above. The dependent variable is defined as the change from baseline to midline (panel A) and the change from baseline to endline (panel B), respectively.

Table D3: Balance Across Treatment Arms

	(1) Full treatment	(2) Information only	(3) Interface only	(4) Control	(5) P-value difference (1) - (4)	(6) P-value difference (1)&(2)-(3)&(4)	(7) P-value difference (1)&(3)-(2)&(4)
A. Characteristics of catchment area							
Avg. distance of households to HC	0.98	0.97	0.85	1.34	0.28	0.52	0.17
Avg. household wealth in catchment area	0.01	-0.02	-0.00	0.02	0.86	0.79	1.00
Log pop. density in 3km radius around HC	8.46	8.62	8.64	8.64	0.23	0.34	0.45
Avg. level of education of household head	7.59	7.45	7.43	7.66	0.73	0.86	0.73
Share of households that received a VHT visit (last 12 months)	0.47	0.48	0.48	0.48	0.82	0.76	0.98
Share of households declaring NGOs activity in their village	0.15	0.13	0.14	0.15	0.87	0.80	0.63
B. Characteristics of HC							
Share providing delivery services	0.64	0.54	0.62	0.66	0.76	0.34	0.61
Share having staff houses	0.82	0.80	0.78	0.82	0.92	0.85	0.73
# of trained medical staff	6.26	6.45	6.34	7.17	0.18	0.40	0.28
Share having piped water	0.14	0.12	0.13	0.15	0.91	0.77	0.91
Share having electricity (grid or solar)	0.75	0.67	0.71	0.75	0.97	0.71	0.68
Avg. distance to nearest other government HC in district	3.90	3.63	3.97	4.09	0.49	0.17	0.70
C. Baseline levels of key outcome indices							
Utilization	5.24	5.27	5.52	5.43	0.41	0.17	0.86
Treatment quality	12.23	12.68	12.11	11.93	0.59	0.29	0.76
Patient satisfaction	0.78	0.79	0.78	0.78	0.61	0.82	0.35
Health outcomes (HH level)	1.07	1.12	1.07	1.05	0.38	0.10	0.58
Health outcomes (Child level)	2.01	2.04	2.07	1.97	0.61	0.96	0.53
Child Mortality (deaths per 1,000 live births)	50.3	50.3	41.4	39.4	0.26	0.13	0.88
D. Baseline levels of intermediate outcome indices							
Citizen knowledge	0.20	0.20	0.21	0.20	0.54	0.14	0.55
Health worker knowledge	0.45	0.44	0.42	0.43	0.39	0.26	0.98
Efficacy	0.58	0.56	0.57	0.59	0.11	0.09	0.61
Community responsibility	0.23	0.23	0.23	0.24	0.24	0.23	0.68
Community monitoring	0.79	0.77	0.78	0.77	0.23	0.93	0.10
Relationship between health workers and community	0.80	0.80	0.80	0.82	0.16	0.24	0.47
Health center transparency	0.14	0.13	0.12	0.14	0.88	0.52	0.66
N	92	92	97	95			

E Measuring Child Mortality

We use three different approaches to measure child mortality rates: a *synthetic cohort approach* to calculate mortality rates per health center catchment area, which is similar to the method used in the Demographic and Health Surveys (DHS), a *child-level indicator* for whether a specific child is alive or dead in a given month, and the share of children who died in a catchment area, which mirrors the *vital statistics approach* used in Björkman and Svensson (2009). We describe each in turn.

Originally, we planned to use a vital statistics approach to measure mortality rates, since this was the main approach used in Björkman and Svensson (2009).[30] The vital statistics method uses a simple ratio of deaths under a certain age to live births during a recall period (UNDG, 2003). However, we updated our pre-analysis plan to prioritize the synthetic cohort life table approach because it offered a more precise measure of mortality. The difference in the data required for each method is that the synthetic life table approach requires the dates (month and year) of birth and death for every child that died during the recall period. In contrast, the vital statistics approach only requires asking if any child under the age of five had died in the last 12 months and the age they were when they died.

At endline, we collected the month of birth and, if applicable, death, also retrospectively for all children recorded during baseline and midline. Since the birth and death of children in the family is a very salient event, we are in this case not concerned about recall bias. To the contrary, the second, retrospective round of data collection of the month and age of death proved to be a helpful verification exercise, during which it became evident that a considerable share of the children that had been reported as having died in the past 12 months during baseline or midline had in fact died much earlier.

With this life table data, we are also able to use an even more nuanced measure of child mortality *at the child level*. Since we have the month of birth and, if applicable, death, for all 20,598 children in our sampled households who were ever under the age of five or unborn at baseline and still lived in the household (if alive) at either midline or endline, we are able to create a panel dataset indicating whether each child is dead or alive in a given month over the course of the 36 month study period.[31] This dataset, in turn, allows us to run child-level survival analyses using a Cox proportional hazards model (Cox, 1972), an estimation approach widely used for the analysis of survival rates (Rosner, 2015). We show results from this approach in the appendix.

Synthetic cohort life table

The *synthetic cohort life table* approach is used in the Demographic and Health Surveys (DHS), as described in Croft, Marshall and Allen (2018) and Rowland (2003).[32] The approach calculates the probability of dying before a certain age (expressed per 1,000 births) by dividing the total number of deaths under that age by the total number of child years of exposure to the risk of dying.

[30] Björkman and Svensson (2009) also use an alternative measure, a binary indicator for child death during the recall period.

[31] Twelve month recall period prior to the baseline, 12 months between baseline and midline, and 12 months between midline and endline.

[32] The approach has also been used to measure child mortality rates in a randomized evaluation of a community health promoter program in Uganda implemented by Living Goods and BRAC (Björkman Nyqvist et al., 2019)

We begin by calculating the age (in months) of each child in our sample, for each calendar month in the period of investigation. In our case, that is 12 months prior to the date of the first baseline survey (August 2013) until the date of the last endline survey (December 2016). In the case of death, the age counter stops on the date of death. For each child that died during the study period, we create a binary variable indicating the month during which the child died. On this basis, we can calculate for each calendar month and age (in months) the number of children per health center catchment area who died in a given calendar month, and who were alive. We then sum the number of children who were alive at a given age in a given HC catchment area across calendar months (the denominator); as well as the number of children who died at a given age in a given HC catchment area across calendar months (the numerator). We calculate the ratio to arrive at the age and health center specific mortality rate. We then calculate the age and health center specific survival rate by subtracting the mortality rate from one. Finally, we calculate the overall survival rate in a given age bracket by multiplying the individual age-specific survival rates across the relevant ages (e.g. 0-59 months for the under-five survival rate), and arrive at the overall mortality rate by subtracting the survival rate from one.

Vital statistics approach

The vital statistics approach calculates child mortality as the ratio of dead children in a given age bracket over all children in a given age bracket, dead or alive, calculated per catchment area.

Child-level indicator

A 36-month panel dataset for 20,598 children (some of whom are born into the panel at a later stage or age out of it), indicating for each month whether a child is dead or alive.

F Supporting Tables

F.1 Main Outcomes

The following tables show regression results for the main outcome indices (as summarized in Figure 2) and their components. The index components are shown first in standardized and then in non-standardized forms.

Table F1: Main outcomes: Averaged z-score indices

	(1) **Utilization**	(2) **Treatment quality**	(3) **Patient satisfaction**	(4) **Health outcomes**	(5) **Child mortality**
Full treatment	0.027	0.070***	0.077***	-0.003	-0.011
	(0.022)	(0.026)	(0.024)	(0.027)	(0.008)
Constant	-0.020	0.000	-0.002	-0.510***	0.061***
	(0.016)	(0.020)	(0.018)	(0.022)	(0.006)
N	7,288	7,288	7,288	4,930	187
R^2	0.230	0.102	0.043	0.112	0.197
P-value (Full treatment = 0)	0.213	0.008	0.001	0.900	0.188
Adjusted p-value (FT)	0.266	0.020	0.007	0.900	0.266

Notes. Estimates from Equation 1 comparing outcomes between the full treatment arm and the control group. The unit of observation in columns (1)-(3) is the household, in columns (4) it is the child, and in column (5) the health center catchment area. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at health center level. The row *P-value (Full treatment = 0)* shows p-values for a Wald test of the null hypothesis that the coefficient on *full treatment* is equal to zero. Adjusted p-values (FT) refer to p-values of the coefficient on *Full treatment* which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10

Table F2: Utilization index – Subcomponents

	(1) **Utilization index**	(2) Vaccination rates, children<36 months	(3) % of visits to HC, vs. other providers	(4) Number of visits to HC
Full treatment	0.027	0.054	0.034	-0.001
	(0.022)	(0.035)	(0.032)	(0.027)
Constant	-0.020	-0.011	-0.001	-0.017
	(0.016)	(0.025)	(0.023)	(0.020)
N	7,288	4,212	7,288	7,288
R^2	0.230	0.057	0.178	0.284
Adjusted p-value (FT)	0.266	0.370	0.446	0.981

Notes. Estimates are derived from from Equation 1, comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects as well as demeaned baseline covariates and their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the outcomes presented in columns (2)-(4). The latter are z-scores of (2) vaccination rates of children under 36 months, (3) share of visits to the designated health center versus other providers, (4) number of visits to the designated health center. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10.

Table F3: Utilization index – Non-standardized subcomponents

	(1) **Utilization index**	(2) Vaccination rates, children<36 months	(3) % of visits to HC, vs. other providers	(4) Number of visits to HC
Full treatment	0.027	0.022	0.007	-0.008
	(0.022)	(0.014)	(0.007)	(0.342)
Constant	-0.020	0.739***	0.231***	9.128***
	(0.016)	(0.017)	(0.007)	(0.316)
N	7,288	4,212	7,288	7,288
R^2	0.230	0.057	0.178	0.284
Mean control group endline	-0.013	0.787	0.326	15.327
Mean control group baseline	-0.008	0.755	0.377	14.186

Notes. Estimates are derived from from Equation 1, comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects as well as demeaned baseline covariates and their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the outcomes presented in columns (2)-(4). The latter are (2) vaccination rates of children under 36 months, (3) share of visits to the designated health center versus other providers, (4) number of visits to the designated health center. *** p<0.01; ** p<0.05; * p<0.10.

Table F4: Treatment quality index – Subcomponents

	(1) **Treatment quality index**	(2) Used equipment	(3) Waiting time	(4) Examined by trained staff	(5) Privacy during exam	(6) Received test when needed	(7) Diagnosis explained clearly	(8) % staff presence	(9) Facility cleanliness	(10) Drug availability
Full treatment	0.070***	0.056	0.002	0.009	0.073*	0.036	0.058*	0.054	0.118	0.229**
	(0.026)	(0.036)	(0.048)	(0.035)	(0.039)	(0.040)	(0.032)	(0.133)	(0.140)	(0.111)
Constant	0.000	0.031	-0.030	-0.000	-0.000	0.010	0.005	0.010	0.012	0.016
	(0.020)	(0.029)	(0.033)	(0.026)	(0.035)	(0.032)	(0.025)	(0.107)	(0.112)	(0.092)
N	7,288	7,288	7,288	7,288	7,288	7,288	7,288	187	187	187
R^2	0.102	0.023	0.084	0.026	0.039	0.030	0.019	0.299	0.166	0.421
Adjusted p-value (FT)	0.020	0.269	0.960	0.901	0.224	0.604	0.224	0.878	0.604	0.224

Notes. Estimates are derived from from Equation 1, comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects as well as demeaned baseline covariates and their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the components presented in columns (2)-(10). The latter are z-scores of (2) whether household members reported that, during their most recent visit to the health center, equipment was used during examination, (3) waiting time consisting of the total amount of time spent by the household members waiting for the initial consultation and the examination; whether household members declared that, during their most recent visit to the health center, (4) they were examined by trained health care staff, (5) they had privacy during their examination, (6) lab tests were administered, (7) their diagnosis was clearly explained to them; (8) percent of staff in attendance during an unannounced visit to the health center, measured at the health center level, (9) condition of the clinic (cleanliness of floors and walls, whether the clinic smelled as observed during unannounced visit to health center), measured at the health center level, (10) share of months in which stock cards indicated availability of six key tracer drugs in the past three months, measured at the health center level. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10.

Table F5: Treatment quality index – Non-standardized subcomponents

	(1) **Treatment quality index**	(2) Used equipment	(3) Waiting time	(4) Examined by trained staff	(5) Privacy during exam	(6) Received test when needed	(7) Diagnosis explained clearly	(8) % staff presence	(9) Facility cleanliness	(10) Drug availability
Full treatment	0.070***	0.021	0.142	0.000	0.015*	0.013	0.023*	0.017	0.016	0.059**
	(0.026)	(0.013)	(2.829)	(0.002)	(0.008)	(0.014)	(0.013)	(0.041)	(0.019)	(0.029)
Constant	0.000	0.759***	69.736***	0.831***	0.910***	0.742***	0.697***	0.379***	0.691***	0.731***
	(0.020)	(0.014)	(2.228)	(0.152)	(0.012)	(0.015)	(0.013)	(0.043)	(0.056)	(0.099)
N	7,288	7,288	7,288	7,288	7,288	7,288	7,288	187	187	187
R^2	0.102	0.023	0.084	0.026	0.039	0.030	0.019	0.299	0.166	0.421

Notes. Estimates are derived from from Equation 1, comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects as well as demeaned baseline covariates and their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the components presented in columns (2)-(10). The latter are (2) whether household members reported that, during their most recent visit to the health center, equipment was used during examination, (3) waiting time consisting of the total amount of time spent by the household members waiting for the initial consultation and the examination; whether household members declared that, during their most recent visit to the health center, (4) they were examined by trained health care staff, (5) they had privacy during their examination, (6) lab tests were administered, (7) their diagnosis was clearly explained to them; (8) percent of staff in attendance during an unannounced visit to the health center, measured at the health center level, (9) condition of the clinic (cleanliness of floors and walls, whether the clinic smelled as observed during unannounced visit to health center), measured at the health center level, (10) share of months in which stock cards indicated availability of six key tracer drugs in the past three months, measured at the health center level. *** p<0.01; ** p<0.05; * p<0.10.

Table F6: Patient satisfaction index – Subcomponents

	(1) **Patient satisfaction index**	(2) Satisfied by HC quality	(3) Satisfied with quality of care	(4) Polite staff	(5) Staff interested in health	(6) Staff listening	(7) Free to express clearly	(8) Availability of staff improving
Full treatment	0.077***	0.105***	0.061*	0.074**	0.101***	0.071**	0.040	0.078*
	(0.024)	(0.035)	(0.032)	(0.035)	(0.030)	(0.031)	(0.039)	(0.040)
Constant	-0.002	-0.007	0.017	0.016	0.020	0.013	0.020	-0.024
	(0.018)	(0.023)	(0.023)	(0.027)	(0.024)	(0.025)	(0.029)	(0.032)
N	7,288	7,288	7,288	7,288	7,288	7,288	7,288	7,288
R^2	0.043	0.066	0.044	0.024	0.018	0.023	0.019	0.053
Adjusted p-value (FT)	0.007	0.010	0.065	0.060	0.006	0.055	0.310	0.065

Notes. Estimates are derived from from Equation 1, comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the outcomes presented in columns (2)-(8). The latter are z-scores of indicator variables of whether household members declared that (2) the services currently offered at the health center are of "very high quality" or "somewhat high quality", (3) they were "very satisfied" or "satisfied" with the quality of care received during their most recent visits to the health center, (4) during their most recent visit to the health center, the person conducting the examination behaved politely/showed respect, (5) during their most recent visit to the health center, the person conducting the examination appeared to be interested in their health condition, (6) during their most recent visit to the health center, the person conducting the examination listened to what they had to say, (7) during their most recent visit to the health center, they felt free to express themselves to the person conducting the examination, (8) compared to the year before, the availability of medical staff had improved at the health center. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10.

Table F7: Patient satisfaction index – Non-standardized subcomponents

	(1) **Patient satisfaction index**	(2) Satisfied by HC quality	(3) Satisfied with quality of care	(4) Polite staff	(5) Staff interested in health	(6) Staff listening	(7) Free to express clearly	(8) Availability of staff improving
Full treatment	0.077***	0.052***	0.023*	0.016**	0.023***	0.016**	0.011	0.035*
	(0.024)	(0.017)	(0.012)	(0.007)	(0.007)	(0.007)	(0.011)	(0.018)
Constant	-0.002	0.423***	0.712***	0.878***	0.883***	0.869***	0.840***	0.394***
	(0.018)	(0.011)	(0.012)	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)
N	7,288	7,288	7,288	7,288	7,288	7,288	7,288	7,288
R^2	0.043	0.066	0.044	0.024	0.018	0.023	0.019	0.053

Notes. Estimates are derived from from Equation 1, comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the outcomes presented in columns (2)-(8). The latter are indicator variables of whether household members declared that (2) the services currently offered at the health center are of "very high quality" or "somewhat high quality", (3) they were "very satisfied" or "satisfied" with the quality of care received during their most recent visits to the health center, (4) during their most recent visit to the health center, the person conducting the examination behaved politely/showed respect, (5) during their most recent visit to the health center, the person conducting the examination appeared to be interested in their health condition, (6) during their most recent visit to the health center, the person conducting the examination listened to what they had to say, (7) during their most recent visit to the health center, they felt free to express themselves to the person conducting the examination, (8) compared to the year before, the availability of medical staff had improved at the health center. *** $p<0.01$; ** $p<0.05$; * $p<0.10$.

Table F8: Health outcomes index at the child level – Subcomponents

	(1) **Health outcomes index**	(2) **Weight/Age 0-18 months**	(3) **MUAC 0-18 months**	(4) **Weight/Age 18-36 months**	(5) **MUAC 18-36 months**
Full treatment	-0.003	-0.000	-0.015	0.004	0.017
	(0.027)	(0.048)	(0.047)	(0.031)	(0.028)
Constant	-0.510***	0.006	0.007	-0.463***	-0.640***
	(0.022)	(0.037)	(0.037)	(0.027)	(0.019)
N	4,930	2,140	2,140	2,790	2,790
R^2	0.112	0.018	0.018	0.225	0.346
Adjusted p-value (FT)	0.900	0.993	0.993	0.993	0.993

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the components presented in columns (2)-(7). The latter are z-scores of (2) the average ratio of weight over number of months for children under 18 months, (3) the average ratio of weight over number of months for children 18-36 months old, (4) the average ratio of upper arm circumference over number of months for children under 18 months, (5) the average ratio of upper arm circumference over number of months for children 18-36 months old. The unit of analysis is the child. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10

Table F9: Health outcomes index at the child level – Non-standardized subcomponents

	(1) **Health outcome overall**	(2) **Weight/Age 0-18 months**	(3) **MUAC 0-18 months**	(4) **Weight/Age 18-36 months**	(5) **MUAC 18-36 months**
Full treatment	-0.003	-0.000	-0.041	0.000	0.002
	(0.027)	(0.048)	(0.132)	(0.002)	(0.003)
Constant	-0.510***	1.351***	2.874***	0.363***	0.452***
	(0.022)	(0.139)	(0.327)	(0.003)	(0.003)
N	4,930	2,140	2,140	2,790	2,790
R^2	0.112	0.018	0.018	0.225	0.346

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the components presented in columns (2)-(7). The latter are (2) the average ratio of weight over number of months for children under 18 months, (3) the average ratio of weight over number of months for children 18-36 months old, (4) the average ratio of upper arm circumference over number of months for children under 18 months, (5) the average ratio of upper arm circumference over number of months for children 18-36 months old. The unit of analysis is the child. *** p<0.01; ** p<0.05; * p<0.10

Table F10: Child mortality at the HC level

	(1) Child mortality 0-5 years old	(2) Child mortality 0-1 year old	(3) Child mortality 1-5 years old
Full treatment	-0.011	-0.006	-0.005
	(0.008)	(0.007)	(0.004)
Constant	0.061***	0.041***	0.020***
	(0.006)	(0.005)	(0.003)
N	187	187	187
R^2	0.197	0.211	0.184
Adjusted p-value (FT)	0.266	0.383	0.383

Notes. Estimates from equation 1 comparing the full treatment to the control group. The unit of observation is health center catchment area. The dependent variable is the mortality rate calculated using a synthetic cohort approach for the age brackets 0-5 years (1), 0-12 months (2), and 1-5 years (3), respectively. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** $p<0.01$; ** $p<0.05$; * $p<0.10$

F.2 Intermediate Outcomes

The following tables show regression results for the seven intermediate outcome indices (as summarized in Figure 4) and their components.

Table F11: Intermediate outcomes – Averaged z-score indices

	(1) **Citizen knowledge**	(2) **HC staff knowledge**	(3) **Efficacy**	(4) **Community responsibility**	(5) **Community monitoring**	(6) **Relationship**	(7) **HC transparency**
Full treatment	-0.056**	0.171	-0.022	-0.012	0.006	0.040	0.007
	(0.023)	(0.121)	(0.023)	(0.020)	(0.028)	(0.039)	(0.076)
Constant	-0.009	-0.016	-0.002	-0.002	0.003	0.004	-0.006
	(0.016)	(0.080)	(0.015)	(0.014)	(0.019)	(0.028)	(0.053)
N	7,288	187	7,288	7,288	7,288	7,288	187
R^2	0.205	0.276	0.045	0.054	0.097	0.047	0.481
P-value (Full treatment = 0)	0.017	0.158	0.343	0.538	0.838	0.307	0.930
Adjusted p-value (FT)	0.121	0.552	0.601	0.754	0.930	0.601	0.930

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control for intermediate outcome indices. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The row *P-value (Full treatment = 0)* shows p-values for a Wald test of the null hypothesis that the coefficient on *full treatment* is equal to zero. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10

Table F12: Citizen knowledge index – Subcomponents

	(1) **Citizen knowledge index**	(2) # of patients rights correctly named	(3) # of patients resp. correctly named	(4) # of HC services correctly named
Full treatment	-0.056**	-0.094***	-0.118***	0.042
	(0.023)	(0.028)	(0.032)	(0.037)
Constant	-0.009	-0.009	-0.015	-0.003
	(0.016)	(0.019)	(0.024)	(0.023)
N	7,288	7,288	7,288	7,288
R^2	0.205	0.091	0.166	0.286
Adjusted p-value (FT)	0.121	0.001	0.001	0.246

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the dependent variables in columns (2)-(4). The dependent variable in column (2) is the z-score of the number of patient *rights*, listed in the patient's charter of the Ministry of Health, correctly named by community members, in column (3) is is the z-score of the number of patient *responsibilities*, listed in the patient's charter of the Ministry of Health, correctly named by households members, in column (4) it is the z-score of the number of health center services correctly named by community members. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10

Table F13: HC staff knowledge index – Subcomponents

	(1) **HC staff knowledge index**	(2) # of patients rights correctly named	(3) # of patients resp. correctly named
Full treatment	0.171	0.222	0.128
	(0.121)	(0.139)	(0.151)
Constant	-0.016	-0.019	-0.013
	(0.080)	(0.095)	(0.093)
N	187	187	187
R^2	0.276	0.290	0.211
Adjusted p-value (FT)	0.552	0.223	0.397

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the components presented in columns (2) and (3). The dependent variable in column (2) is the z-score of the number of patient *rights*, listed in the patient's charter of the Ministry of Health, correctly named by the health center in-charge, in column (3) it is the z-score of the number of patient *responsibilities*, listed in the patient's charter of the Ministry of Health, correctly named by the health center in-charge. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10

Table F14: Efficacy index – Subcomponents

	(1) **Efficacy index**	(2) Have power to improve HC services	(3) Can pressure health worker (effort)	(4) Can pressure health worker (timely)	(5) Can make village a better place to live	(6) Influence over gov. about health services	(7) Influence over HC about services provided
Full treatment	-0.022	-0.034	-0.014	-0.032	-0.040	-0.025	0.008
	(0.023)	(0.028)	(0.033)	(0.038)	(0.032)	(0.031)	(0.028)
Constant	-0.002	0.001	-0.009	-0.008	0.007	-0.001	0.001
	(0.015)	(0.021)	(0.023)	(0.026)	(0.023)	(0.020)	(0.018)
N	7,288	7,288	7,288	7,288	7,288	7,288	7,288
R^2	0.045	0.060	0.025	0.018	0.040	0.031	0.037
Adjusted p-value (FT)	0.601	0.632	0.787	0.632	0.632	0.632	0.787

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the components presented in columns (2)-(7). The remaining dependent variables are z-scores of the following indicator variables for whether community members think they: (2) have power to improve the quality of health care at the designated health facility, (3) they can pressure health worker to exert better effort in caring for patients by reporting them, (4) they can pressure health worker to work on time by reporting them, (5) they have influence in making the designated village a better place to live, (6) they have a say about how authorities provide health care to their community, (7) they have a say about how health facilities provide health care to their community. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10

Table F15: Community responsibility index – Subcomponents

	(1) **Community responsibility index**	(2) Community resp. for monitoring HC	(3) Community members also responsible
Full treatment	-0.012	0.014	-0.037
	(0.020)	(0.027)	(0.026)
Constant	-0.002	0.001	-0.006
	(0.014)	(0.019)	(0.018)
N	7,288	7,288	7,288
R^2	0.054	0.059	0.039
Adjusted p-value (FT)	0.754	0.614	0.303

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the components presented in columns (2) and (3). The dependent variable in column (2) is the z-score of a dummy variable indicating whether respondents think that they themselves are responsible for making sure that health workers come to work and provide high-quality health services, in column (3) it is the z-score of a dummy variable indicating whether respondents think *community members* are responsible for making sure that health workers come to work and provide high-quality health services. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10

Table F16: Community monitoring index – Subcomponents

	(1) **Community monitoring index**	(2) Attended LC1 meetings	(3) HC discussed at LC1 meetings	(4) Community would find out: staff late	(5) Community would find out: staff no effort
Full treatment	0.006	0.049	0.032	-0.008	-0.046*
	(0.028)	(0.052)	(0.070)	(0.032)	(0.027)
Constant	0.003	0.044	0.026	0.008	0.005
	(0.019)	(0.041)	(0.049)	(0.024)	(0.019)
N	7,288	7,288	7,288	7,288	7,288
R^2	0.097	0.105	0.086	0.035	0.026
Adjusted p-value (FT)	0.930	0.692	0.796	0.796	0.354

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the components presented in columns (2)-(7), which are z-scores of the following variables: (2) a dummy variable whether household members report having attended at least one LC1 meeting during the last 12 months; (3) a dummy variable whether the local health center was discussed at the most recent LC1 meeting; (4) a Likert-scale variable of whether the community would find out if a staff were regularly late or (5) extended no effort. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10

Table F17: Relationship index – Subcomponents

	(1) **Relationship index**	(2) Community satisfied with relations	(3) Trust health workers	(4) HC staff satisfied with relations	(5) Health workers will listen to complaints
Full treatment	0.040	0.060*	0.076**	-0.042	0.001
	(0.039)	(0.031)	(0.035)	(0.146)	(0.030)
Constant	0.004	-0.000	0.006	-0.002	0.000
	(0.028)	(0.021)	(0.024)	(0.102)	(0.024)
N	7,288	7,288	7,288	187	7,288
R^2	0.047	0.043	0.046	0.167	0.009
Adjusted p-value (FT)	0.601	0.112	0.112	0.969	0.969

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the components presented in columns (2) and (3). The latter are indicators variables of whether households think that (2) they are responsible for making sure that health workers come to work and provide high quality health services and (3) that health center staff would listen to their complaints and would not refuse to see them or behave hostilely. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10

Table F18: HC transparency index – Subcomponents

	(1) **HC transparency index**	(2) Poster with opening times	(3) Duty roster displayed	(4) Suggestion box	(5) Info on services provided	(6) Info on patient rights
Full treatment	0.007	0.126	-0.142	0.010	-0.093	0.125
	(0.076)	(0.139)	(0.145)	(0.124)	(0.142)	(0.121)
Constant	-0.006	-0.018	-0.014	0.053	0.002	0.081
	(0.053)	(0.093)	(0.114)	(0.099)	(0.101)	(0.091)
N	187	187	187	187	187	187
R^2	0.481	0.328	0.210	0.398	0.276	0.462
Adjusted p-value (FT)	0.930	0.610	0.610	0.937	0.643	0.610

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the components presented in columns (2)-(6). The remaining dependent variables are z-scores of the following indicator variables whether the designated health facility has: (2) a poster with opening times (3) a duty roster table displayed; (4) a suggestion box; (5) a list of services provided displayed; (6) patient's rights displayed. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10

F.3 Treatment Effects on Subgroups of Health Centers

The following tables provide further details on the subgroup results discussed in Section 6.2. To test for subgroup treatment effects, we undertake a number of tests for treatment effects on the five main outcome indices in particular subsets of our sample. We estimate the standard equation:

$$Y_{ij} = \beta_0 + \beta_1 T_{ij}^k + \beta_2 T_{ij}^k * Sub_{ij} + \beta_3 Sub_{ij} + \beta_4 Y_{ij}^0 + \beta_5 X_{ij} + \beta_6 X_{ij} * T_{ij}^k + \phi_d + u_{ij} \qquad (2)$$

where Sub_{ij} is an indicator variable of the subgroup for which we are testing for treatment effects, which for this purpose is not included in the vector of covariates X_{ij}.[33]

We conduct analyses on 10 pre-specified subgroups.[34] Based on our theoretical priors, we divide them into two sets of subgroups in the tables below based on baseline levels of development and proxies of community engagement.

In the tables below, each set of subgroup effects is thus derived from a separate regression, estimated using Equation 2. The tables display the coefficient on Treatment for the base subgroup, β_1 (for example, HC3), the coefficient on the interaction between Treatment and an indicator variable describing the subgroup of interest, β_2, which is indicating the marginal increase in the treatment effect in the health centers/catchment areas in this subgroup (for example, Treat * HC2), and the linear combination of the two coefficients, $\beta_1 + \beta_2$ (for example, Treat + Treat * HC2). Further, we show the difference between subgroups in the control group, β_3. The corresponding standard errors are shown in parentheses. Thus, β_1 indicates the average treatment effect for the base subgroup, β_2 indicates the difference between subgroups, and $\beta_1 + \beta_2$ indicates the average treatment effect for the subgroup of interest.

[33] For specifications looking at subgroup effects by health center level we exclude the three health center level covariates from the vector since they have limited variation, leading to concerns about multicollinearity if they are not excluded.

[34] In deviation from our pre-analysis plan we added an eleventh subgroup. While we had pre-specified replicating our analyses in the subsample of health centers within one standard deviation of the child mortality level in (Björkman and Svensson, 2009); for greater generalizability, we are instead assessing heterogeneous treatment effects by different cutoffs of child mortality, as also shown in Table F22.

Table F19: Subgroup effects on main outcomes – Proxies of low levels of development

(1)	(2) **Utilization**	(3) **Treatment quality**	(4) **Patient satisfaction**	(5) **Health outcomes**	**Child mortality**
Treat	0.026	0.038	0.100***	0.024	-0.013
	(0.036)	(0.041)	(0.035)	(0.045)	(0.013)
Treat*HC2	0.003	0.054	-0.039	-0.047	0.005
	(0.046)	(0.055)	(0.049)	(0.059)	(0.017)
HC2	-0.005	-0.086**	-0.041	0.042	0.003
	(0.034)	(0.041)	(0.037)	(0.043)	(0.013)
Treat+Treat*HC2	0.029	0.093***	0.061*	-0.024	-0.008
	(0.028)	(0.035)	(0.033)	(0.036)	(0.011)
Treat	0.035	0.050*	0.051*	0.049	-0.022*
	(0.029)	(0.028)	(0.028)	(0.038)	(0.012)
Treat*Low treatment quality	-0.017	0.039	0.048	-0.103*	0.022
	(0.034)	(0.026)	(0.038)	(0.055)	(0.017)
Low treatment quality	-0.006	-0.008	-0.052*	0.070*	-0.020
	(0.023)	(0.020)	(0.029)	(0.040)	(0.012)
Treat+Treat*Low treatment quality	0.018	0.090***	0.100***	-0.054	0.000
	(0.026)	(0.030)	(0.032)	(0.038)	(0.011)
Treat	-0.034	0.053	0.128*	0.101	-0.007
	(0.059)	(0.067)	(0.074)	(0.075)	(0.021)
Treat*High U5MR	0.073	0.023	-0.059	-0.127	-0.007
	(0.064)	(0.073)	(0.078)	(0.080)	(0.023)
High U5MR	-0.009	0.119*	0.069	-0.026	-0.038**
	(0.051)	(0.064)	(0.078)	(0.081)	(0.018)
Treat+Treat*High U5MR	0.039*	0.076***	0.069***	-0.026	-0.014
	(0.023)	(0.028)	(0.026)	(0.029)	(0.009)
Treat	0.011	0.044	0.109***	0.008	-0.015
	(0.029)	(0.037)	(0.036)	(0.037)	(0.012)
Treat*Few alternative options	0.048	0.052	-0.069	-0.044	0.012
	(0.045)	(0.053)	(0.051)	(0.058)	(0.017)
Few alternative options	-0.090***	-0.027	0.039	0.094**	-0.015
	(0.032)	(0.042)	(0.038)	(0.043)	(0.012)
Treat+Treat*Few alternative options	0.059*	0.096**	0.040	-0.035	-0.003
	(0.033)	(0.038)	(0.035)	(0.042)	(0.012)
Treat	0.109**	-0.030	0.066	-0.009	0.001
	(0.042)	(0.053)	(0.051)	(0.065)	(0.018)
Treat*Rural	-0.099**	0.138**	0.007	0.002	-0.013
	(0.050)	(0.061)	(0.059)	(0.075)	(0.021)
Rural	0.149***	-0.039	-0.055	-0.053	0.023
	(0.036)	(0.051)	(0.047)	(0.055)	(0.017)
Treat+Treat*Rural	0.010	0.108***	0.073**	-0.008	-0.012
	(0.025)	(0.030)	(0.029)	(0.031)	(0.009)
Treat	0.048	0.024	0.112***	-0.043	-0.015
	(0.034)	(0.042)	(0.038)	(0.091)	(0.013)
Treat*No health NGO present	-0.035	0.073	-0.064	0.035	0.007
	(0.049)	(0.057)	(0.053)	(0.093)	(0.017)
No health NGO present	0.024	-0.083*	0.033	-0.074	-0.014
	(0.034)	(0.045)	(0.041)	(0.066)	(0.013)
Treat+Treat*No health NGO present	0.013	0.098***	0.048	-0.007	-0.008
	(0.032)	(0.036)	(0.035)	(0.043)	(0.010)

Notes. This table shows estimated average treatment effects for subgroups of health centers. Each set of subgroup effects is derived from a separate regression, estimated using Equation 2. For continuous variables, *High* indicates that a health center/catchment area's value for the given variable is at or above the median; *Low* indicates that it is below the median. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. *** p<0.01; ** p<0.05; * p<0.10

Table F20: Subgroup effects on main outcomes – Proxies of community engagement

(1)	(2) **Utilization**	(3) **Treatment quality**	(4) **Patient satisfaction**	(5) **Health outcomes**	**Child mortality**
Treat	0.017	0.068*	0.052	0.021	-0.012
	(0.033)	(0.038)	(0.036)	(0.038)	(0.009)
Treat*High embeddedness	0.022	0.004	0.047	-0.050	0.004
	(0.046)	(0.053)	(0.052)	(0.055)	(0.016)
High embeddedness	-0.004	0.041	-0.015	0.040	-0.000
	(0.031)	(0.042)	(0.037)	(0.041)	(0.012)
Treat+Treat*High embeddedness	0.039	0.072*	0.100***	-0.029	-0.008
	(0.030)	(0.037)	(0.036)	(0.040)	(0.013)
Treat	0.044	0.093**	0.103**	0.041	-0.007
	(0.033)	(0.043)	(0.041)	(0.045)	(0.012)
Treat*High collective action potential	-0.030	-0.041	-0.048	-0.075	-0.005
	(0.044)	(0.056)	(0.050)	(0.061)	(0.017)
High collective action potential	0.080**	0.035	0.113***	0.079*	0.005
	(0.032)	(0.043)	(0.037)	(0.044)	(0.013)
Treat+Treat*High collective action potential	0.015	0.052	0.055*	-0.034	-0.012
	(0.029)	(0.034)	(0.029)	(0.037)	(0.011)
Treat	0.041	0.115***	0.069**	0.002	-0.014
	(0.031)	(0.030)	(0.032)	(0.036)	(0.014)
Treat*High community monitoring	-0.026	-0.083**	0.012	-0.010	0.005
	(0.037)	(0.034)	(0.037)	(0.053)	(0.017)
High community monitoring	0.065**	0.053**	0.072**	-0.007	-0.006
	(0.027)	(0.024)	(0.029)	(0.041)	(0.014)
Treat+Treat*High community monitoring	0.015	0.032	0.082***	-0.008	-0.009
	(0.025)	(0.032)	(0.027)	(0.039)	(0.010)
Treat	0.003	0.076***	0.062**	0.045	0.005
	(0.028)	(0.028)	(0.028)	(0.038)	(0.012)
Treat*High efficacy	0.053*	-0.013	0.036	-0.108*	-0.032*
	(0.032)	(0.020)	(0.030)	(0.057)	(0.018)
High efficacy	-0.002	0.012	0.037*	0.047	0.019
	(0.023)	(0.015)	(0.022)	(0.042)	(0.012)
Treat+Treat*High efficacy	0.056**	0.063**	0.098***	-0.062	-0.027**
	(0.025)	(0.028)	(0.028)	(0.040)	(0.012)
Treat	0.063*	0.077*	0.120***	-0.008	-0.015
	(0.032)	(0.042)	(0.039)	(0.042)	(0.010)
Treat*HC far	-0.067	-0.017	-0.083	0.010	0.009
	(0.044)	(0.054)	(0.052)	(0.059)	(0.017)
HC far	0.036	-0.023	0.069*	0.033	0.006
	(0.031)	(0.041)	(0.036)	(0.042)	(0.011)
Treat+Treat*HC far	-0.004	0.060*	0.038	0.003	-0.006
	(0.030)	(0.034)	(0.032)	(0.038)	(0.013)

Notes. This table shows estimated average treatment effects for subgroups of health centers. Each set of subgroup effects is derived from a separate regression, estimated using Equation 2. For continuous variables, *High* indicates that a health center/catchment area's value for the given variable is at or above the median; *Low* indicates that it is below the median. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. *** p<0.01; ** p<0.05; * p<0.10

F.4 Treatment Effects by Baseline Level of Development

This section presents and summarizes subgroup analyses investigating whether the intervention had stronger treatment effects in health centers with lower baseline levels of development. Table F21 synthesizes the results from Table F19 with regard to treatment quality. Table F22 uses the same specification as described in Section F.3 to investigate heterogeneity of treatment effects by baseline level of mortality. Since this heterogeneous analysis was not pre-specified, we show results for different cutoffs.

Table F21: Estimated treatment effects on treatment quality, by baseline level of development in the health center catchment area

Less developed		More developed		
Subgroup	ATE	Subgroup	ATE	Difference significant
HC2	0.093***	HC3	0.038	no
Low BL TQ	0.090***	High BL TQ	0.050*	no
Few alternative options	0.096**	Many alternative options	0.044	no
HC far	0.060*	HC near	0.077*	no
Rural	0.108***	Urban	-0.03	yes
No health NGO present	0.098***	Health NGO present	0.024	no
High BL U5MR	0.076***	Low BL U5MR	0.053	no

Notes. The table shows estimated average treatment effects on the treatment quality index by subgroup; summarizing results presented in greater detail in column (2) of Table F19.

Table F22: Subgroup effects on child mortality by baseline mortality rate

	(1)	(2)	(3)	(4)
Percentile used to define subgroups:	**58th**	**66th**	**75th**	**90th**
Treat	-0.006	-0.005	-0.008	-0.012
	(0.011)	(0.011)	(0.010)	(0.009)
Treat * U5MR above xxth percentile	-0.014	-0.017	-0.009	0.017
	(0.016)	(0.016)	(0.017)	(0.023)
U5MR above xxth percentile	-0.028*	-0.018	-0.007	-0.006
	(0.017)	(0.017)	(0.018)	(0.018)
Treat + Treat * U5MR above xxth percentile	-0.020*	-0.022*	-0.017	0.005
	(0.011)	(0.012)	(0.013)	(0.021)

Notes. The table shows estimated average treatment effects for subgroups of health centers. The dependent variable is child mortality. Each set of subgroup effects is derived from a separate regression, estimated using Equation 2. The respective cutoff is indicated above the columns. The 58th percentile was chosen as the first cutoff since 58% of health centers have an under-five child mortality rate of 0 at baseline. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. *** p<0.01; ** p<0.05; * p<0.10

F.5 Robustness Checks for Endline Results

Table F23: Robustness check main outcomes

	(1) **Utilization**	(2) **Treatment quality**	(3) **Patient satisfaction**	(4) **Health outcomes**	(5) **Child mortality**
A: Without control variables					
Program impact	0.034	0.070***	0.075***	-0.014	-0.010
	(0.023)	(0.027)	(0.025)	(0.028)	(0.008)
Constant	-0.022	0.001	-0.001	-0.000	0.061***
	(0.017)	(0.021)	(0.018)	(0.022)	(0.006)
B: Without district fixed effects					
Program impact	0.013	0.064**	0.075***	-0.014	-0.009
	(0.028)	(0.029)	(0.025)	(0.029)	(0.008)
Constant	-0.012	0.003	-0.001	0.000	0.063***
	(0.020)	(0.023)	(0.018)	(0.023)	(0.006)
C: With outcome measures aggregated at HC level					
Program impact	0.035*	0.062**	0.080***	-0.012	-0.011
	(0.021)	(0.027)	(0.025)	(0.029)	(0.008)
Constant	-0.014	0.002	-0.001	-0.009	0.061***
	(0.014)	(0.021)	(0.019)	(0.022)	(0.006)
D: Difference between post and pre-treatment values					
Program impact	0.004	0.074***	0.067***	-0.023	-0.008
	(0.025)	(0.028)	(0.025)	(0.034)	(0.008)
Constant	-0.023*	0.020	-0.011	0.028	0.045***
	(0.012)	(0.016)	(0.015)	(0.040)	(0.005)
Observations (A & B)	7,288	7,288	7,288	4,930	187
Observations (C)	187	187	187	187	187
Observations (D)	14,576	14,576	14,576	9,860	374

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control, with the following variations: Panel A shows results without covariates, panel B without district fixed effects, and panel C aggregates outcome measures and covariates at the health center level (the unit of randomization). Panel D shows results from a difference in difference estimation. *** p<0.01; ** p<0.05; * p<0.10

Table F24: Robustness checks – Intermediate outcomes

	(1) **Citizen knowledge**	(2) **HC staff knowledge**	(3) **Efficacy**	(4) **Community responsibility**	(5) **Community monitoring**	(6) **Relationship**	(7) **HC transparency**
A: Without control variables							
Program impact	-0.063*	0.156	-0.024	-0.012	0.006	0.042	-0.028
	(0.033)	(0.125)	(0.024)	(0.021)	(0.028)	(0.039)	(0.089)
Constant	-0.005	-0.012	-0.000	-0.002	0.003	0.002	0.004
	(0.025)	(0.084)	(0.016)	(0.014)	(0.019)	(0.028)	(0.059)
B: Without district fixed effects							
Program impact	-0.065	0.155	-0.024	-0.018	0.010	0.044	0.005
	(0.040)	(0.123)	(0.027)	(0.028)	(0.036)	(0.042)	(0.079)
Constant	-0.005	-0.009	-0.000	0.001	0.001	0.002	-0.007
	(0.028)	(0.081)	(0.017)	(0.021)	(0.026)	(0.030)	(0.057)
C: Without ouctome measures aggregated at HC level							
Program impact	-0.058**	0.171	-0.023	-0.013	-0.001	0.029	0.007
	(0.024)	(0.121)	(0.025)	(0.022)	(0.029)	(0.042)	(0.076)
Constant	-0.008	-0.016	-0.001	-0.001	0.004	0.002	-0.006
	(0.017)	(0.080)	(0.016)	(0.015)	(0.020)	(0.030)	(0.053)
D: Difference between post and pre-treatment values							
Program impact	-0.067*	0.188	-0.025	-0.017	0.013	0.030	-0.012
	(0.038)	(0.118)	(0.025)	(0.022)	(0.032)	(0.040)	(0.080)
Constant	-0.006	0.046	-0.018	-0.016	0.029	-0.042	0.003
	(0.020)	(0.055)	(0.011)	(0.010)	(0.021)	(0.026)	(0.042)
Observations (A & B)	7,288	187	7,288	7,288	7,288	7,288	187
Observations (C)	187	187	187	187	187	187	187
Observations (D)	14,576	374	14,576	14,576	14,576	14,576	374

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control, with the following variations: Panel A shows results without covariates, panel B without district fixed effects, and panel C aggregates outcome measures and covariates at the health center level (the unit of randomization). Panel D shows results from a difference in difference estimation. *** p<0.01; ** p<0.05; * p<0.10

We also test the effect on child mortality with a Cox proportional hazards model, leveraging the fact that we have child-month level data on survival over the course of 36 months for over 20,000 children. By estimating the treatment effect on the chance of survival of the individual child, it mimics the data generation process more closely. The Cox model includes the same vector of controls and their interaction with the treatment indicator as Equation 1. Standard errors are clustered by health center catchment area.[35]

Table F25: Child mortality at the child level

	(1) **0-5 years old**	(2) **0-1 year old**	(3) **1-5 years old**
Full treatment	1.059	1.120	0.612
	(0.239)	(0.295)	(0.286)
N	10,118	4,543	8,635
Adjusted p-value (FT)	0.900	0.515	0.450

Notes. Displaying hazard ratios estimated with a Cox proportional hazards model, comparing outcomes between the full treatment and the control group. A hazard ratio below (above) 1 implies that the treatment led to lower (higher) mortality rates. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Standard errors are clustered at the health center level. The dependent variable is the incident of death, observed at the child-month level in the age bracket 0-5 years (1), 0-12 months (2), and 1-5 years (3), respectively. The unit of analysis is the child. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10

[35] An important assumption of the Cox model is that the relative effect of a covariate on the hazard function is constant over time (proportional hazard rates). We therefore do not include district fixed effects in our Cox models, since different regions of Uganda experience different seasonal patterns and thus different temporal patterns of child mortality rates. Our results are not affected by the exclusion of district fixed effects.

Table F26: Main outcomes – Principal component indices

	(1) **Utilization**	(2) **Treatment quality**	(3) **Patient satisfaction**	(4) **Health outcomes**
Full treatment	0.029	0.057	0.094***	-0.011
	(0.031)	(0.037)	(0.033)	(0.031)
Constant	-0.053**	-0.030	-0.047*	0.011
	(0.022)	(0.029)	(0.025)	(0.024)
N	7,288	7,288	7,288	4,212
R^2	0.284	0.040	0.028	0.042

Notes. Main outcome indices constructed using principal component analysis instead of averaged z-scores. Estimates from Equation 1 comparing outcomes measured at endline between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. *** p<0.01; ** p<0.05; * p<0.10

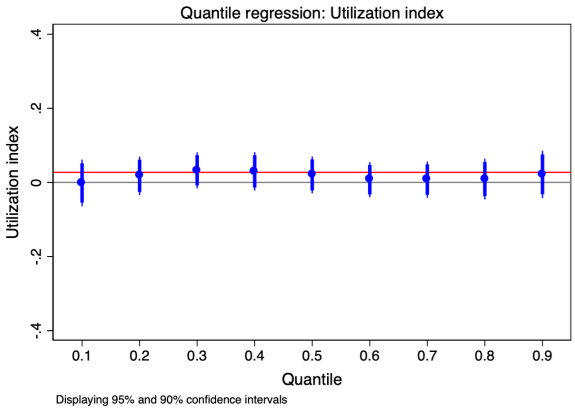
Table F27: Intermediate outcomes – Principal component indices

	(1) **Citizen knowledge**	(2) **HC staff knowledge**	(3) **Efficacy**	(4) **Community responsibility**	(5) **Community monitoring**	(6) **Relationship**	(7) **HC transparency**
Full treatment	-0.106***	0.175	-0.033	-0.017	-0.026	0.079**	0.018
	(0.032)	(0.140)	(0.036)	(0.027)	(0.032)	(0.035)	(0.115)
Constant	0.052**	-0.087	0.016	0.009	0.013	-0.041	0.005
	(0.023)	(0.096)	(0.024)	(0.019)	(0.022)	(0.025)	(0.079)
N	7,288	187	7,288	7,288	7,288	7,288	187
R^2	0.132	0.247	0.044	0.053	0.042	0.059	0.493

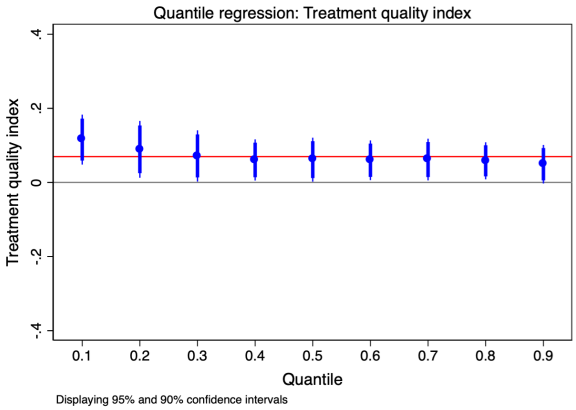
Notes. Intermediate outcome indices constructed using principal component analysis instead of averaged z-scores. Estimates from Equation 1 comparing outcomes measured at endline between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. *** p<0.01; ** p<0.05; * p<0.10

Figure 6: Quantile regressions of treatment effects

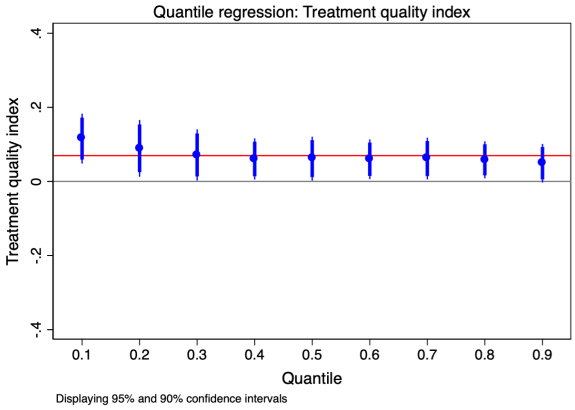
(a) Utilization



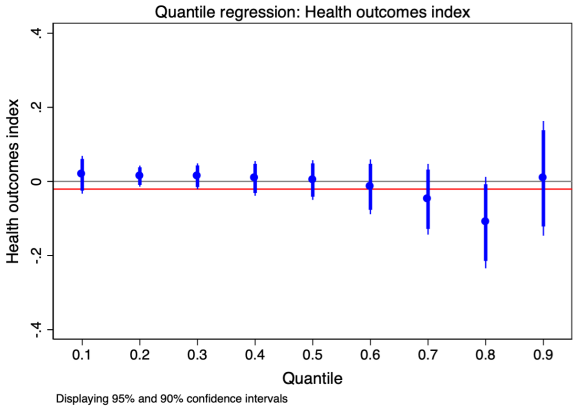
(b) Treatment quality



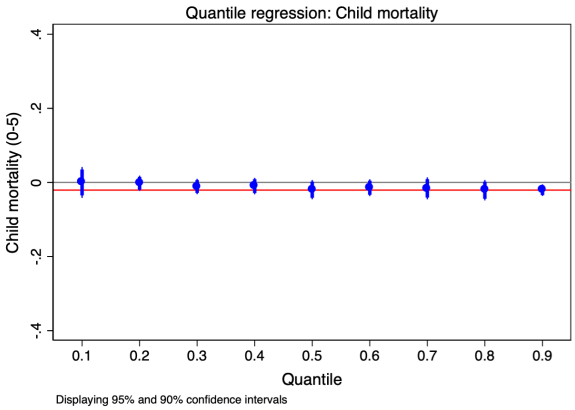
(c) Patient satisfaction



(d) Health outcomes



(e) Child mortality



Additional Robustness Checks on Treatment Quality

Table F28: Robustness check – Excluding subcomponents of treatment quality

	(1) Treatment quality wo/ used equipment	(2) Treatment quality wo/ waiting time	(3) Treatment quality wo/ examined by trained staff	(4) Treatment quality wo/ privacy during exam	(5) Treatment quality wo/ received test when needed	(6) Treatment quality wo/ diagnosis explained clearly	(7) Treatment quality wo/ % staff presence	(8) Treatment quality wo/ facility cleanliness	(9) Treatment quality wo/ drug availability
Full treatment	0.070***	0.021	0.142	0.000	0.015*	0.013	0.023*	0.017	0.016
	(0.026)	(0.013)	(2.829)	(0.002)	(0.008)	(0.014)	(0.013)	(0.041)	(0.019)
Constant	0.000	0.759***	69.736***	0.831***	0.910***	0.742***	0.697***	0.379***	0.691***
	(0.020)	(0.014)	(2.228)	(0.152)	(0.012)	(0.015)	(0.013)	(0.043)	(0.056)
N	7,288	7,288	7,288	7,288	7,288	7,288	7,288	187	187
R^2	0.102	0.023	0.084	0.026	0.039	0.030	0.019	0.299	0.166

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable is the treatment quality index, excluding one subcomponent at a time. *** p<0.01; ** p<0.05; * p<0.10

Table F29: Drugs availability in details

	(1) Health workers selling drugs on the side	(2) Patient did not receive drugs because no drug supplies
Full treatment	0.006	-0.018**
	(0.009)	(0.009)
Constant	0.883***	0.088***
	(0.006)	(0.007)
N	7,288	6,184
R^2	0.073	0.021

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. *** p<0.01; ** p<0.05; * p<0.10

Table F30: Robustness check main outcomes with treatment quality without HC-level subcomponents

	(1) **Utilization**	(2) **Treatment quality**	(3) **Patient satisfaction**	(4) **Health outcomes**	(5) **Child mortality**
A: Without control variables					
Program impact	0.034	0.038*	0.075***	-0.014	-0.010
	(0.023)	(0.020)	(0.025)	(0.028)	(0.008)
Constant	-0.022	-0.002	-0.001	-0.000	0.061***
	(0.017)	(0.015)	(0.018)	(0.022)	0.006
B: Without district fixed effects					
Program impact	0.013	0.036*	0.075***	-0.014	-0.009
	(0.028)	(0.020)	(0.025)	(0.029)	(0.008)
Constant	-0.012	-0.002	-0.001	0.000	0.063***
	(0.020)	(0.016)	(0.018)	(0.023)	0.006
C: With outcome measures aggregated at HC level					
Program impact	0.035*	0.031	0.080***	-0.012	-0.011
	(0.021)	(0.019)	(0.025)	(0.029)	(0.008)
Constant	-0.014	-0.002	-0.001	-0.009	0.061***
	(0.014)	(0.015)	(0.019)	(0.022)	(0.006)
D: Difference between post and pre-treatment values					
Program impact	0.004	0.039*	0.067***	-0.023	-0.008
	(0.025)	(0.022)	(0.025)	(0.034)	(0.008)
Constant	-0.023*	0.010	-0.011	0.028	0.045***
	(0.012)	(0.012)	(0.015)	(0.040)	(0.005)
Observations (A & B)	7,288	7,288	7,288	4,930	187
Observations (C)	187	187	187	187	187
Observations (D)	14,576	14,576	14,576	9,860	374

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control, with the following variations: Panel A shows results without covariates, panel B without district fixed effects, and panel C aggregates outcome measures and covariates at the health center level (the unit of randomization). Panel D shows results from a difference in difference estimation. Here, the treatment quality index excludes the components measured at the health center level. *** p<0.01; ** p<0.05; * p<0.10

F.6 Presence of Local Government Officials

Table F31: Main outcomes and presence of an official

	(1) **Utilization**	(2) **Treatment quality**	(3) **Patient satisfaction**	(4) **Health outcomes**	(5) **Child mortality**
Full treatment	0.049**	0.054*	0.074***	-0.006	-0.011
	(0.023)	(0.028)	(0.026)	(0.032)	(0.009)
Subcounty official present	-0.068*	0.048	0.008	-0.047	0.001
	(0.036)	(0.036)	(0.038)	(0.040)	(0.013)
Constant	-0.020	0.000	-0.002	0.004	0.061***
	(0.016)	(0.020)	(0.018)	(0.021)	(0.006)
N	7,288	7,288	7,288	4,212	187
R^2	0.231	0.104	0.043	0.026	0.197
Full treatment + presence	-0.019	0.102***	0.082**	-0.053	-0.010
	(0.034)	(0.035)	(0.036)	(0.036)	(0.012)

Notes. Subcounty official present indicates whether an official from the local government was present at either the community dialogue or the interface meeting. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control. The unit of observation in columns (1)-(4) is the household, in column (5) it is health center catchment area. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at health center level. *** p<0.01; ** p<0.05; * p<0.10

Table F32: Subcomponents of the treatment quality index and presence of an official

	(1) **Treatment quality index**	(2) Used equipment	(3) Waiting time	(4) Examined by trained staff	(5) Privacy during exam	(6) Received test when needed	(7) Diagnosis explained clearly	(8) % staff presence	(9) Facility cleanliness	(10) Drug availability
Full treatment	0.054*	0.045	0.005	0.008	0.069	0.023	0.079**	-0.046	0.139	0.168
	(0.028)	(0.040)	(0.052)	(0.039)	(0.042)	(0.044)	(0.036)	(0.145)	(0.166)	(0.121)
Subcounty official present	0.048	0.033	-0.007	0.002	0.013	0.038	-0.066	0.321	-0.065	0.188
	(0.036)	(0.047)	(0.085)	(0.030)	(0.049)	(0.053)	(0.046)	(0.196)	(0.168)	(0.163)
Constant	0.000	0.031	-0.030	-0.000	-0.000	0.011	0.005	0.005	0.013	0.012
	(0.020)	(0.029)	(0.033)	(0.026)	(0.035)	(0.032)	(0.025)	(0.107)	(0.112)	(0.093)
N	7,288	7,288	7,288	7,288	7,288	7,288	7,288	187	187	187
R^2	0.104	0.023	0.084	0.026	0.039	0.030	0.020	0.310	0.167	0.425
Full treatment + presence	0.102***	0.079*	-0.003	0.010	0.081	0.061	0.013	0.276	0.073	0.357**
	(0.035)	(0.045)	(0.080)	(0.035)	(0.053)	(0.052)	(0.044)	(0.190)	(0.150)	(0.159)

Notes. Subcounty official present indicates whether an official from the local government was present at either the community dialogue or the interface meeting. All models include district fixed effects as well as demeaned baseline covariates and their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the components presented in columns (2)-(10). The latter are z-scores of (2) whether household members reported that, during their most recent visit to the health center, equipment was used during examination, (3) waiting time consisting of the total amount of time spent by the household members waiting for the initial consultation and the examination; whether household members declared that, during their most recent visit to the health center, (4) they were examined by trained health care staff, (5) they had privacy during their examination, (6) lab tests were administered, (7) their diagnosis was clearly explained to them; (8) percent of staff in attendance during an unannounced visit to the health center, measured at the health center level, (9) condition of the clinic (cleanliness of floors and walls, whether the clinic smelled as observed during unannounced visit to health center), measured at the health center level, (10) share of months in which stock cards indicated availability of six key tracer drugs in the past three months, measured at the health center level. *** $p<0.01$; ** $p<0.05$; * $p<0.10$.

Table F33: Subcomponents of patient satisfaction and presence of an official

	(1) **Patient satisfaction index**	(2) Satisfied by HC quality	(3) Satisfied with quality of care	(4) Polite staff	(5) Staff interested in health	(6) Free to express clearly	(7) Availability of staff improving
Full treatment	0.074***	0.060*	0.075*	0.111***	0.077**	0.043	0.039
	(0.026)	(0.036)	(0.039)	(0.030)	(0.035)	(0.043)	(0.043)
Subcounty official present	0.008	0.005	-0.002	-0.031	-0.017	-0.008	0.119**
	(0.038)	(0.052)	(0.052)	(0.050)	(0.045)	(0.060)	(0.053)
Control	-0.002	0.017	0.016	0.020	0.013	0.020	-0.024
	(0.018)	(0.023)	(0.027)	(0.024)	(0.025)	(0.029)	(0.032)
N	7,288	7,288	7,288	7,288	7,288	7,288	7,288
R^2	0.043	0.044	0.024	0.018	0.023	0.019	0.055
Full treatment + presence	0.082**	0.065	0.073	0.080	0.060	0.035	0.158***
	(0.036)	(0.048)	(0.049)	(0.051)	(0.042)	(0.058)	(0.054)

Notes. Subcounty official present indicates whether an official from the local government was present at either the community dialogue or the interface meeting. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of the outcomes presented in columns (2)-(8). The latter are z-scores of indicator variables of whether household members declared that (2) the services currently offered at the health center are of "very high quality" or "somewhat high quality", (3) they were "very satisfied" or "satisfied" with the quality of care received during their most recent visits to the health center, (4) during their most recent visit to the health center, the person conducting the examination behaved politely/showed respect, (5) during their most recent visit to the health center, the person conducting the examination appeared to be interested in their health condition, (6) during their most recent visit to the health center, the person conducting the examination listened to what they had to say, (7) during their most recent visit to the health center, they felt free to express themselves to the person conducting the examination, (8) compared to the year before, the availability of medical staff had improved at the health center. *** p<0.01; ** p<0.05; * p<0.10.

F.7 Main Results, by Treatment Arm

F.7.1 Analysis by Treatment Arm

Although our primary interest is in the impact of the full ACT Health intervention, we use a factorial design to better understand the effects of the program's different elements, as described in Section 4. We combine the information and mobilization components into one treatment arm and cross it with the interface treatment, as depicted in Figure 7. We then randomly assign health centers and their catchment areas to one of the four treatment groups, with treatment assignment blocked by district and health center level. Communities and health centers assigned to the information and mobilization treatment received the CRCs and were invited to attend separate meetings—one for health center staff, another for community members—at which the contents of the CRCs were discussed and action plans were developed in light of the information they contained. Communities and health centers assigned to the interface only treatment did not receive the CRCs but were invited to attend a meeting that brought citizens and health center staff together to discuss how to improve health outcomes in the community. Communities and health centers assigned to the full treatment received both of these components: the CRCs and separate community and health center staff meetings plus the meeting that brought the two parties together. The factorial design enables us to assess the effectiveness of the full ACT Health intervention by comparing units in the bottom right cell to the control group and to learn which aspects of the broader intervention are doing the work in generating the effects we find by making comparisons across all four cells.

		Interface meetings are held between community and health facility staff	
		No	**Yes**
Report card info is reported to community and health facility staff and action plans are developed	**No**	CONTROL 95 HCs (54 HC2 ; 41 HC3)	INTERFACE WITHOUT INFORMATION OR MOBILIZATION 97 HCs (60 HC2 ; 37 HC3)
	Yes	INFORMATION AND MOBILIZATION WITHOUT INTERFACE 92 HCs (55 HC2 ; 37 HC3)	FULL ACT HEALTH INTERVENTION 92 HCs (56 HC2 ; 36 HC3)

Figure 7: Factorial design

To test the effect of each treatment arm, we estimate the model:

$$Y_{ij} = \beta_0 + \beta_1 T_{ij}^{IM} + \beta_2 T_{ij}^{IMI} + \beta_3 T_{ij}^{I} + \beta_4 Y_{ij}^{0} + \beta_5 X_{ij} + \beta_6 X_{ij} * T_{ij}^{IM} + \beta_7 X_{ij} * T_{ij}^{IMI} + \beta_8 X_{ij} * T_{ij}^{I} + \phi_d + u_{ij} \quad (3)$$

where T_{ij}^{IM} is a binary variable indicating whether the health center and catchment area j was assigned to receive only the information and mobilization treatment, T_{ij}^{I} indicates whether the unit was assigned to receive only the interface treatment, T_{ij}^{IMI} indicates whether the unit was assigned to receive the full treatment (i.e., information and mobilization plus interface), and all other terms are defined as in Equation 1. This set-up allows us to compare each cell in the factorial design to the control group.[36]

Main Specification

Table F34: Utilization outcomes – All treatment arms

	(1) **Utilization index**	(2) Vaccination rates, children<36 months	(3) % of visits to HC, vs. other providers	(4) Number of visits to HC
Full treatment	0.027	0.048	0.038	-0.002
	(0.022)	(0.036)	(0.033)	(0.027)
Information and mobilization only	0.013	0.026	0.025	-0.003
	(0.022)	(0.034)	(0.031)	(0.029)
Interface only	0.054**	0.049	0.074**	0.038
	(0.022)	(0.034)	(0.033)	(0.027)
Constant	-0.018	-0.008	0.001	-0.016
	(0.015)	(0.025)	(0.022)	(0.020)
N	14,609	8,548	14,609	14,609
R^2	0.221	0.045	0.173	0.273
P-value (Information and mobilization = Interface)	0.066	0.485	0.151	0.141
P-value (Information and mobilization = Full treatment)	0.518	0.520	0.712	0.962
P-value (Interface = Full treatment)	0.234	0.979	0.296	0.121
F-test (joint significance of all 3 treatment groups)	2.243	0.859	1.702	1.133
P-value (joint significance of all 3 treatment groups)	0.083	0.463	0.166	0.335

Notes. Estimates comparing outcomes between each treatment arm and the control from Equation 3. Each treatment arm enters as an indicator variable. All models include district fixed effects and demeaned baseline covariates, as well as their interactions with the treatment indicators. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of columns (2)-(4). The remaining dependent variables are z-scores of: (2) vaccination rates of children under 36 months; (3) the share of visits to the designated health center versus other providers; (4) the number of visits to the designated health center by all household members. *** p<0.01; ** p<0.05; * p<0.10

[36] We had initially pre-specified the model $Y_{ij} = \beta_0 + \beta_1 T_{ij}^{IM} + \beta_2 T_{ij}^{IM} T_{ij}^{I} + \beta_3 T_{ij}^{I} + \beta_4 Y_{ij}^{0} + \beta_5 X_{ij} + \phi_d + u_{ij}$, which considers the rows and columns in Figure 7 as well as their interaction. We deem the model described in Equation 3 superior since it relies on fewer assumptions, is easier to interpret, and presents our findings in a way that is consistent with the results in the main specification. Results from the pre-specified model are presented further below.

Table F35: Treatment quality outcomes – All treatment arms

	(1) **Treatment quality index**	(2) Used equipment	(3) Waiting time	(4) Examined by trained staff	(5) Privacy during exam	(6) Received test when needed	(7) Diagnosis explained clearly	(8) % staff presence	(9) Facility cleanliness	(10) Drug availability
Full treatment	0.071***	0.062*	0.003	0.006	0.075*	0.041	0.063*	0.030	0.107	0.246**
	(0.026)	(0.037)	(0.049)	(0.032)	(0.040)	(0.041)	(0.033)	(0.136)	(0.137)	(0.109)
Information and mobilization only	0.013	-0.035	-0.011	0.004	0.050	-0.007	-0.019	-0.121	-0.074	0.313***
	(0.029)	(0.040)	(0.043)	(0.039)	(0.043)	(0.046)	(0.036)	(0.140)	(0.135)	(0.111)
Interface only	0.022	0.036	-0.035	0.017	0.015	0.036	0.022	-0.138	-0.099	0.343***
	(0.027)	(0.042)	(0.046)	(0.033)	(0.045)	(0.046)	(0.037)	(0.134)	(0.137)	(0.103)
Constant	-0.002	0.021	-0.035	-0.001	0.001	0.012	-0.003	0.013	0.016	0.010
	(0.021)	(0.028)	(0.034)	(0.026)	(0.035)	(0.032)	(0.025)	(0.106)	(0.109)	(0.088)
N	14,609	14,609	14,609	14,609	14,609	14,609	14,609	376	376	376
R^2	0.102	0.030	0.102	0.015	0.031	0.035	0.021	0.299	0.176	0.367
P-value (Information and mobilization = Interface)	0.740	0.098	0.558	0.677	0.382	0.369	0.293	0.892	0.835	0.748
P-value (Information and mobilization = Full treatment)	0.025	0.011	0.751	0.956	0.475	0.265	0.019	0.239	0.132	0.525
P-value (Interface = Full treatment)	0.032	0.521	0.417	0.616	0.106	0.895	0.247	0.163	0.096	0.292
F-test (joint significance of all 3 treatment groups)	3.222	2.425	0.292	0.137	1.562	0.634	2.130	0.907	1.144	4.065
P-value (joint significance of all 3 treatment groups)	0.023	0.065	0.831	0.938	0.198	0.594	0.096	0.438	0.331	0.007

Notes. Estimates comparing outcomes between each treatment arm and the control from Equation 3. Each treatment arm enters as an indicator variable. All models include district fixed effects and demeaned baseline covariates, as well as their interactions with the treatment indicators. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of columns (2)-(10). The latter are z-scores of (2) whether household members reported that, during their most recent visit to the health center, equipment was used during examination, (3) waiting time consisting of the total amount of time spent by the household members waiting for the initial consultation and the examination; whether household members declared that, during their most recent visit to the health center, (4) they were examined by trained health care staff, (5) they had privacy during their examination, (6) lab tests were administered, (7) their diagnosis was clearly explained to them; (8) percent of staff in attendance during an unannounced visit to the health center, measured at the health center level, (9) condition of the clinic (cleanliness of floors and walls, whether the clinic smelled as observed during unannounced visit to health center), measured at the health center level, (10) share of months in which stock cards indicated availability of six key tracer drugs in the past three months, measured at the health center level. *** p<0.01; ** p<0.05; * p<0.10

Table F36: Patient satisfaction outcomes – All treatment arms

	(1) **Patient satisfaction index**	(2) Satisfied by HC quality	(3) Satisfied with quality of care	(4) Polite staff	(5) Staff interested in health	(6) Staff listening	(7) Free to express clearly	(8) Availability of staff improving
Full treatment	0.080***	0.105***	0.063*	0.074**	0.104***	0.076**	0.043	0.088**
	(0.024)	(0.035)	(0.034)	(0.036)	(0.030)	(0.031)	(0.040)	(0.041)
Information and mobilization only	0.073***	0.100***	0.056	0.054	0.114***	0.102***	0.077*	0.018
	(0.026)	(0.036)	(0.035)	(0.041)	(0.034)	(0.033)	(0.040)	(0.043)
Interface only	0.064***	0.067**	0.060*	0.048	0.093***	0.062**	0.089**	0.025
	(0.022)	(0.034)	(0.033)	(0.033)	(0.028)	(0.030)	(0.037)	(0.044)
Constant	-0.006	-0.011	0.006	0.005	0.009	0.007	0.008	-0.027
	(0.018)	(0.023)	(0.023)	(0.027)	(0.023)	(0.025)	(0.030)	(0.032)
N	14,609	14,609	14,609	14,609	14,609	14,609	14,609	14,609
R^2	0.040	0.071	0.040	0.019	0.016	0.020	0.016	0.057
P-value (Information and mobilization = Interface)	0.697	0.356	0.896	0.870	0.464	0.182	0.728	0.878
P-value (Information and mobilization = Full treatment)	0.778	0.905	0.839	0.608	0.740	0.403	0.360	0.075
P-value (Interface = Full treatment)	0.441	0.285	0.934	0.397	0.662	0.612	0.174	0.109
F-test (joint significance of all 3 treatment groups)	4.435	3.914	1.662	1.508	5.322	3.403	2.225	1.943
P-value (joint significance of all 3 treatment groups)	0.004	0.009	0.175	0.212	0.001	0.018	0.085	0.122

Notes. Estimates comparing outcomes between each treatment arm and the control from Equation 3. Each treatment arm enters as an indicator variable. All models include district fixed effects and demeaned baseline covariates, as well as their interactions with the treatment indicators. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of columns (2)-(8). (The latter are z-scores of indicator variables of whether household members declared that (2) the services currently offered at the health center are of "very high quality" or "somewhat high quality", (3) they were "very satisfied" or "satisfied" with the quality of care received during their most recent visits to the health center, (4) during their most recent visit to the health center, the person conducting the examination behaved politely/showed respect, (5) during their most recent visit to the health center, the person conducting the examination appeared to be interested in their health condition, (6) during their most recent visit to the health center, the person conducting the examination listened to what they had to say, (7) during their most recent visit to the health center, they felt free to express themselves to the person conducting the examination, (8) compared to the year before, the availability of medical staff had improved at the health center. *** p<0.01; ** p<0.05; * p<0.10

Table F37: Health outcomes at the child level – All treatment arms

	(1) **Health outcomes index**	(2) **Weight/Age 0-18 months**	(3) **MUAC 0-18 months**	(4) **Weight/Age 18-36 months**	(5) **MUAC 18-36 months**
Full treatment	-0.003	-0.001	-0.013	0.003	0.019
	(0.028)	(0.048)	(0.048)	(0.032)	(0.028)
Information and mobilization only	-0.023	-0.036	-0.026	-0.011	-0.011
	(0.029)	(0.048)	(0.048)	(0.035)	(0.029)
Interface only	-0.011	-0.019	-0.023	0.014	0.026
	(0.028)	(0.046)	(0.046)	(0.036)	(0.032)
Constant	-0.488***	0.005	0.005	-0.461***	-0.630***
	(0.022)	(0.038)	(0.038)	(0.026)	(0.020)
N	10,023	4,379	4,379	5,644	5,644
R^2	0.103	0.011	0.012	0.207	0.328
P-value (Information and mobilization = Interface)	0.653	0.661	0.933	0.500	0.258
P-value (Information and mobilization = Full treatment)	0.472	0.408	0.753	0.687	0.303
P-value (Interface = Full treatment)	0.767	0.651	0.805	0.739	0.840
F-test (joint significance of all 3 treatment groups)	0.251	0.293	0.122	0.154	0.590
P-value (joint significance of all 3 treatment groups)	0.861	0.831	0.947	0.927	0.622

Notes. Estimates comparing outcomes between each treatment arm and the control from Equation 3. Each treatment arm enters as an indicator variable. All models include district fixed effects and demeaned baseline covariates, as well as their interactions with the treatment indicators. Robust standard errors are clustered at the health center level. The dependent variable in column (1) is the averaged z-score index of columns (2)-(7). The latter are z-scores of (2) the average ratio of weight over number of months for children under 18 months, (3) the average ratio of weight over number of months for children 18-36 months old, (4) the average ratio of upper arm circumference over number of months for children under 18 months, (5) the average ratio of upper arm circumference over number of months for children 18-36 months old. *** p<0.01; ** p<0.05; * p<0.10

Table F38: Child mortality at the HC level

	(1) Child mortality 0-5 years old	(2) Child mortality 0-1 year old	(3) Child mortality 1-5 years old
Full treatment	-0.011	-0.006	-0.006
	(0.008)	(0.007)	(0.004)
Information and mobilization only	-0.020**	-0.013**	-0.007
	(0.008)	(0.006)	(0.004)
Interface only	-0.009	-0.004	-0.006
	(0.008)	(0.007)	(0.005)
Constant	0.061***	0.042***	0.020***
	(0.006)	(0.005)	(0.003)
N	376	376	376
R^2	0.151	0.160	0.159
P-value (Information and mobilization = Interface)	0.204	0.212	0.753
P-value (Information and mobilization = Full treatment)	0.281	0.334	0.738
P-value (Interface = Full treatment)	0.820	0.797	0.992
F-test (joint significance of all 3 treatment groups)	2.225	1.509	0.887
P-value (joint significance of all 3 treatment groups)	0.085	0.212	0.448

Notes. Estimates comparing outcomes between each treatment arm and the control from Equation 3. Each treatment arm enters as an indicator variable. All models include district fixed effects and demeaned baseline covariates, as well as their interactions with the treatment indicators. The dependent variable is the child mortality rate in the health center catchment area calculated with the synthetic cohort approach, in the age bracket 0-5 years (1), 0-12 months (2), and 1-5 years (3), respectively. The unit of analysis is the health center catchment area. *** p<0.01; ** p<0.05; * p<0.10

Table F39: Child mortality at the child level

	(1) **0-5 years old**	(2) **0-1 year old**	(3) **1-5 years old**
Full treatment	1.080	1.150	0.614
	(0.241)	(0.301)	(0.292)
Information and mobilization only	0.960	0.900	0.189***
	(0.228)	(0.255)	(0.080)
Interface only	1.166	1.145	0.970
	(0.245)	(0.278)	(0.396)
N	20,371	9,171	17,363
R^2			
P-value (Information and mobilization = Interface)	0.367	0.322	0.000
P-value (Information and mobilization = Full treatment)	0.606	0.352	0.012
P-value (Interface = Full treatment)	0.702	0.986	0.323
F-test (joint significance of all 3 treatment groups)	0.998	1.278	21.373
P-value (joint significance of all 3 treatment groups)	0.802	0.734	0.000

Notes. Estimates comparing outcomes between each treatment arm and the control from Equation 3. Each treatment arm enters as an indicator variable. All models include district fixed effects and demeaned baseline covariates, as well as their interactions with the treatment indicators. The dependent variable is the child mortality rate in the health center catchment area calculated with the synthetic cohort approach, in the age bracket 0-5 years (1), 0-12 months (2), and 1-5 years (3), respectively. The unit of analysis is the health center catchment area. *** p<0.01; ** p<0.05; * p<0.10

Table F40: Robustness check – Excluding control variables interacted with treatment

	(1) **0-5 years old**	(2) **0-1 year old**	(3) **1-5 years old**
Full treatment	1.042	1.131	0.746
	(0.208)	(0.267)	(0.227)
Information and mobilization only	0.894	0.952	0.730
	(0.197)	(0.242)	(0.236)
Interface only	1.013	1.071	0.769
	(0.201)	(0.243)	(0.245)
N	20,371	9,171	17,363
R^2			
P-value (Information and mobilization = Interface)	0.537	0.595	0.876
P-value (Information and mobilization = Full treatment)	0.450	0.452	0.944
P-value (Interface = Full treatment)	0.879	0.787	0.924
F-test (joint significance of all 3 treatment groups)	0.614	0.658	1.288
P-value (joint significance of all 3 treatment groups)	0.893	0.883	0.732

Notes. Estimates comparing outcomes between each treatment arm and the control from Equation 3. Each treatment arm enters as an indicator variable. All models include district fixed effects and demeaned baseline covariates, as well as their interactions with the treatment indicators. The dependent variable is the child mortality rate in the health center catchment area calculated with the synthetic cohort approach, in the age bracket 0-5 years (1), 0-12 months (2), and 1-5 years (3), respectively. The unit of analysis is the health center catchment area. *** p<0.01; ** p<0.05; * p<0.10

Table F41: Intermediates outcomes – All treatments

	(1) **Citizen knowledge**	(2) **HC staff knowledge**	(3) **Efficacy**	(4) **Community responsibility**	(5) **Community monitoring**	(6) **Relationship**	(7) **HC transparency**
Full treatment	-0.054**	0.140	-0.019	-0.011	0.003	0.039	-0.026
	(0.024)	(0.118)	(0.023)	(0.021)	(0.029)	(0.040)	(0.077)
Information and mobilization only	0.001	0.226**	0.006	0.001	0.036	0.063	-0.126
	(0.024)	(0.110)	(0.023)	(0.022)	(0.030)	(0.039)	(0.077)
Interface only	-0.031	0.107	-0.011	-0.025	0.041	0.020	-0.104
	(0.023)	(0.110)	(0.022)	(0.021)	(0.029)	(0.042)	(0.080)
Constant	-0.019	-0.012	-0.003	-0.005	0.005	0.004	-0.010
	(0.017)	(0.079)	(0.015)	(0.015)	(0.020)	(0.029)	(0.055)
N	14,609	376	14,609	14,609	14,609	14,609	376
R^2	0.193	0.191	0.044	0.047	0.077	0.050	0.402
P-value (Information and mobilization = Interface)	0.179	0.266	0.467	0.240	0.874	0.296	0.784
P-value (Information and mobilization = Full treatment)	0.032	0.457	0.296	0.566	0.284	0.536	0.198
P-value (Interface = Full treatment)	0.327	0.772	0.708	0.510	0.200	0.652	0.336
F-test (joint significance of all 3 treatment groups)	2.297	1.438	0.447	0.646	1.063	0.940	1.194
P-value (joint significance of all 3 treatment groups)	0.077	0.232	0.720	0.586	0.365	0.421	0.312

Notes. Estimates comparing outcomes between each treatment arm and the control group for intermediate outcome indices from Equation 3. Each treatment arm enters as an indicator variable. All models include district fixed effects and demeaned baseline covariates, as well as their interactions with the treatment indicators. Robust standard errors are clustered at the health center level. *** p<0.01; ** p<0.05; * p<0.10

Pre-specified Specification

In addition, we show the main results from the pre-specified model, which includes an interaction term rather than estimating average treatment effects for each cell more flexibly, below.

Table F42: Main outcomes - All treatment arms: Averaged z-score indices

	(1) **Utilization**	(2) **Treatment quality**	(3) **Patient satisfaction**	(4) **Health outcomes**	(5) **Child mortality**
Information and mobilization	0.013	0.013	0.073***	-0.023	-0.020**
	(0.022)	(0.029)	(0.026)	(0.029)	(0.008)
Interface	0.054**	0.022	0.064***	-0.011	-0.009
	(0.022)	(0.027)	(0.022)	(0.028)	(0.008)
Information and mobilization x Interface	-0.039	0.036	-0.058*	0.030	0.018
	(0.031)	(0.037)	(0.033)	(0.039)	(0.011)
Constant	-0.018	-0.002	-0.006	-0.488***	0.061***
	(0.015)	(0.021)	(0.018)	(0.022)	(0.006)
N	14,609	14,609	14,609	10,023	376
R^2	0.221	0.102	0.040	0.103	0.151
Information + Information x Interface	-0.026	0.049**	0.016	0.008	-0.002
	(0.022)	(0.023)	(0.020)	(0.025)	(0.008)
P-value (Information and mobilization = Interface)	0.066	0.740	0.697	0.653	0.204

Notes. Estimates comparing outcomes between each treatment arm and the control. All models include district fixed effects as well as demeaned baseline covariates and their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. *** p<0.01; ** p<0.05; * p<0.10

Table F43: Intermediate outcome indices – All treatment arms

	(1) **Citizen knowledge**	(2) **HC staff knowledge**	(3) **Efficacy**	(4) **Community responsibility**	(5) **Community monitoring**	(6) **Relationship**	(7) **HC transparency**
Information and mobilization	0.001	0.245**	0.005	0.004	0.039	0.066*	-0.111
	0.025	0.114	0.023	0.022	0.030	0.039	0.083
Interface	-0.028	0.086	-0.010	-0.023	0.042	0.020	-0.115
	0.023	0.113	0.022	0.021	0.029	0.043	0.084
Information and mobilization x Interface	-0.027	-0.191	-0.016	0.008	-0.077*	-0.046	0.187
	0.034	0.167	0.032	0.030	0.042	0.057	0.120
Constant	-0.019	-0.011	-0.003	-0.005	0.004	0.004	-0.009
	0.017	0.079	0.015	0.015	0.020	0.029	0.054
N	14,609	376	14,609	14,609	14,609	14,609	376
R^2	0.194	0.195	0.045	0.049	0.079	0.051	0.411
Information + Information x Interface	-0.025	0.054	-0.011	0.012	-0.038	0.020	0.076
	(0.023)	(0.122)	(0.023)	(0.020)	(0.029)	(0.042)	(0.085)
P-value (Information and mobilization = Interface)	0.210	0.167	0.514	0.230	0.912	0.273	0.966

Notes. Estimates comparing outcomes between each treatment arm and the control group for intermediate outcome indices. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. *** p<0.01; ** p<0.05; * p<0.10

F.8 Midline Results

The tables that follow show the treatment effect on main and intermediate outcome indices at midline, both for the comparison between treatment and the full intervention and for all treatment arms.

Main Results

Table F44: Main outcomes (midline)

	(1) **Utilization**	(2) **Treatment quality**	(3) **Patient satisfaction**	(4) **Health outcomes**	(5) **Child mortality**
Full treatment	-0.012	0.060*	0.036	0.024	-0.014
	(0.020)	(0.033)	(0.029)	(0.027)	(0.010)
Constant	-0.012	-0.002	-0.000	-0.153***	0.054***
	(0.015)	(0.024)	(0.019)	(0.023)	(0.008)
N	7,204	7,204	7,204	5,337	187
R^2	0.255	0.095	0.049	0.102	0.204
P-value (Full treatment = 0)	0.560	0.066	0.207	0.382	0.166
Adjusted p-value (FT)	0.560	0.331	0.344	0.477	0.344

Notes. Estimates from Equation 1 comparing outcomes measured at midline between the Full treatment arm and the Control. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10

Table F45: Intermediate outcomes (midline) – Averaged z-score indices

	(1) **Citizen knowledge**	(2) **HC staff knowledge**	(3) **Efficacy**	(4) **Community responsibility**	(5) **Community monitoring**	(6) **Relationship**	(7) **HC transparency**
Full treatment	0.009	0.084	0.039**	0.009	0.018	-0.041	-0.090
	(0.023)	(0.099)	(0.019)	(0.021)	(0.024)	(0.043)	(0.064)
Constant	-0.009	-0.006	-0.001	-0.005	-0.001	0.003	-0.016
	(0.017)	(0.072)	(0.014)	(0.015)	(0.018)	(0.026)	(0.050)
N	7,204	187	7,204	7,204	7,204	7,204	187
R^2	0.157	0.442	0.044	0.044	0.050	0.095	0.352
P-value (Full treatment = 0)	0.693	0.395	0.045	0.684	0.470	0.339	0.163
Adjusted p-value (FT)	0.693	0.658	0.318	0.693	0.658	0.658	0.570

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control for intermediate outcome indices measured at midline. All models include district fixed effects and demeaned baseline covariates, as well as their interaction with the treatment indicator. Robust standard errors are clustered at the health center level. Adjusted p-values (FT) refer to p-values of the coefficient on Full Treatment which are adjusted using the Benjamini-Hochberg method. *** p<0.01; ** p<0.05; * p<0.10

Table F46: Robustness check main outcomes (midline)

	(1) **Utilization**	(2) **Treatment quality**	(3) **Patient satisfaction**	(4) **Health outcomes**	(5) **Child mortality**
A: Without control variables					
Program impact	-0.006	0.057*	0.035	0.021	-0.013
	(0.022)	(0.034)	(0.029)	(0.028)	(0.010)
Constant	-0.015	-0.001	0.001	0.000	0.055***
	(0.017)	(0.025)	(0.020)	(0.020)	0.008
B: Without district fixed effects					
Program impact	-0.018	0.062*	0.038	0.021	-0.012
	(0.026)	(0.035)	(0.030)	(0.029)	(0.010)
Constant	-0.009	-0.003	-0.001	-0.000	0.055***
	(0.018)	(0.025)	(0.021)	(0.020)	0.008
C: With outcome measures aggregated at HC level					
Program impact	-0.011	0.050	0.039	0.024	-0.014
	(0.021)	(0.035)	(0.030)	(0.028)	(0.010)
Constant	-0.003	0.002	0.000	0.003	0.054***
	(0.015)	(0.025)	(0.021)	(0.020)	(0.008)
D: Difference between post and pre-treatment values					
Program impact	-0.035	0.065*	0.029	0.020	-0.011
	(0.024)	(0.035)	(0.030)	(0.028)	(0.010)
Constant	-0.023**	0.021	-0.008	0.014	0.045***
	(0.012)	(0.017)	(0.015)	(0.020)	(0.005)
Observations (A & B)	7,204	7,204	7,204	5,337	187
Observations (C)	187	187	187	187	187
Observations (D)	14,408	14,408	14,408	10,674	374

Notes. Estimates from Equation 1 comparing outcomes between the Full treatment arm and the Control, with the following variations: Panel A shows results without covariates, panel B without district fixed effects, and panel C aggregates outcome measures and covariates at the health center level (the unit of randomization). Panel D shows results from a difference in difference estimation. *** p<0.01; ** p<0.05; * p<0.10

Table F47: Robustness check intermediate outcomes (midline)

	(1) **Citizen knowledge**	(2) **HC staff knowledge**	(3) **Efficacy**	(4) **Community responsibility**	(5) **Community monitoring**	(6) **Relationship**	(7) **HC transparency**
A: Without control variables							
Program impact	-0.001	0.046	0.038*	0.007	0.018	-0.041	-0.117*
	(0.031)	(0.103)	(0.020)	(0.022)	(0.024)	(0.045)	(0.070)
Constant	-0.005	0.010	-0.000	-0.004	-0.001	0.002	-0.001
	(0.022)	(0.076)	(0.014)	(0.016)	(0.018)	(0.027)	(0.058)
B: Without district fixed effects							
Program impact	-0.007	0.088	0.037	-0.004	0.013	-0.038	-0.103
	(0.037)	(0.110)	(0.023)	(0.027)	(0.027)	(0.044)	(0.064)
Constant	-0.001	-0.009	0.000	0.001	0.001	0.001	-0.011
	(0.025)	(0.083)	(0.017)	(0.019)	(0.021)	(0.027)	(0.051)
C: Without ouctome measures aggregated at HC level							
Program impact	0.003	0.084	0.036*	0.006	0.009	-0.017	-0.090
	(0.027)	(0.099)	(0.022)	(0.024)	(0.028)	(0.050)	(0.064)
Constant	-0.004	-0.006	-0.000	-0.002	0.003	-0.006	-0.016
	(0.019)	(0.072)	(0.015)	(0.017)	(0.022)	(0.033)	(0.050)
D: Difference between post and pre-treatment values							
Program impact	-0.005	0.117	0.035*	0.002	0.021	-0.060	-0.109*
	(0.038)	(0.104)	(0.021)	(0.022)	(0.027)	(0.046)	(0.065)
Constant	-0.003	0.044	-0.016	-0.013	0.027	-0.042	0.001
	(0.019)	(0.057)	(0.011)	(0.010)	(0.020)	(0.026)	(0.041)
Observations (A & B)	7,204	187	7,204	7,204	7,204	7,204	187
Observations (C)	187	187	187	187	187	187	187
Observations (D)	14,408	374	14,408	14,408	14,408	14,408	374

Midline Results by Treatment Arm

Table F48: Main outcomes (midline) – All treatments

	(1) **Utilization**	(2) **Treatment quality**	(3) **Patient satisfaction**	(4) **Health outcomes**	(5) **Child mortality**
Full treatment	-0.015	0.061*	0.039	0.031	-0.014
	(0.021)	(0.033)	(0.029)	(0.028)	(0.010)
Information and mobilization only	-0.031	0.066**	0.044	0.017	-0.021**
	(0.022)	(0.033)	(0.027)	(0.028)	(0.009)
Interface only	-0.007	0.031	0.018	-0.004	-0.011
	(0.023)	(0.033)	(0.028)	(0.027)	(0.010)
Constant	-0.009	-0.005	-0.003	0.022	0.054***
	(0.016)	(0.024)	(0.020)	(0.020)	(0.007)
N	14,459	14,459	14,459	9,201	376
R^2	0.239	0.091	0.048	0.050	0.153
P-value (Information and mobilization = Interface)	0.275	0.263	0.342	0.422	0.269
P-value (Information and mobilization = Full treatment)	0.422	0.871	0.849	0.616	0.392
P-value (Interface = Full treatment)	0.708	0.344	0.470	0.183	0.812
F-test (joint significance of all 3 treatment groups)	0.736	1.715	1.075	0.727	1.876
P-value (joint significance of all 3 treatment groups)	0.531	0.163	0.359	0.536	0.133

Notes. Estimates comparing midline outcomes between each treatment arm and the control. Each treatment arm enters as a separate indicator. All models include district fixed effects and demeaned baseline covariates, as well as their interactions with the treatment indicators. Robust standard errors are clustered at the health center level. *** p<0.01; ** p<0.05; * p<0.10

F.9 Results from T-Tests

This section shows results from two-sided t-tests of difference of means, with the unit of observation being the health center catchment area.

Table F49: Twosided t-tests (midline and endline)

	(1) Full treatment	(2) Information only	(3) Interface only	(4) Control	(5) P-value difference (1) - (4)	(6) P-value difference (1) & (2) - (3) & (4)	(7) P-value difference (1) & (3) - (2) & (4)
A. Midline levels of main outcome indices							
Utilization	5.96	5.88	6.28	6.22	0.37	0.08	0.70
Treatment quality	0.77	0.76	0.76	0.75	0.18	0.14	0.67
Patient satisfaction	0.77	0.77	0.77	0.76	0.26	0.17	0.80
Health outcomes	1.03	1.01	1.05	0.98	0.22	0.97	0.06
Mortality	0.04	0.04	0.05	0.06	0.26	0.12	0.90
B. Midline levels of intermediate outcome indices							
Citizen knowledge	0.40	0.39	0.40	0.40	0.84	0.88	0.89
Health worker knowledge	0.40	0.38	0.37	0.38	0.47	0.45	0.84
Efficacy	0.64	0.64	0.65	0.63	0.16	0.72	0.13
Community responsibility	0.28	0.29	0.28	0.28	0.91	0.97	0.84
Community monitoring	0.77	0.78	0.77	0.76	0.33	0.42	0.51
Relationship between health workers and community	0.80	0.82	0.81	0.81	0.44	0.70	0.12
Health center transparency	0.19	0.22	0.23	0.22	0.22	0.27	0.58
C. Endline levels of main outcome indices							
Utilization	6.16	6.19	6.47	6.36	0.55	0.27	0.83
Treatment quality	0.79	0.77	0.78	0.77	0.01	0.27	0.03
Patient satisfaction	0.78	0.78	0.77	0.76	0.01	0.03	0.15
Health outcomes	1.07	1.05	1.06	1.08	0.86	0.80	0.97
Mortality	0.05	0.05	0.06	0.06	0.31	0.11	0.89
D. Endline levels of intermediate outcome indices							
Citizen knowledge	0.43	0.44	0.43	0.45	0.12	0.45	0.13
Health worker knowledge	0.35	0.36	0.34	0.32	0.29	0.12	0.95
Efficacy	0.65	0.66	0.65	0.66	0.29	0.66	0.29
Community responsibility	0.33	0.33	0.33	0.34	0.60	0.92	0.39
Community monitoring	0.73	0.74	0.74	0.73	0.72	0.91	0.52
Relationship between health workers and community	0.80	0.81	0.80	0.79	0.17	0.17	0.62
Health center transparency	0.28	0.24	0.24	0.30	0.68	0.72	0.78
N	92	92	97	95			

F.10 Multiple Comparison Corrections

Given the number of outcome variables in our study, multiple testing is a concern. Main tables also include corrected p-values for the average effect of the full treatment, calculated using the Benjamini and Hochberg (1995) False Discovery Rate correction, in the bottom panel. This simple step-up procedure is slightly less punitive than a Bonferroni correction since it focuses exclusively on correcting for the false discovery rate (type I errors).

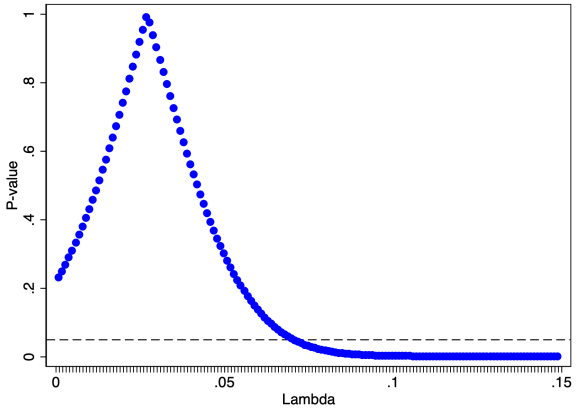
For outcome indices, the family is defined as the set of main outcome indices or the set of intermediate outcome indices, respectively. For components of an index, the family is defined as the set of components of a given index.

F.11 Two One-Sided Tests (TOST) Procedure

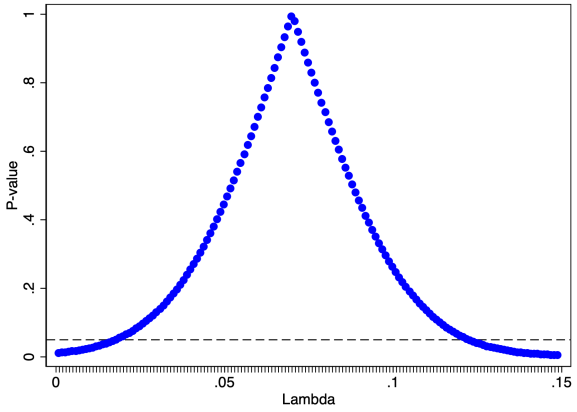
The figures below show results from the Two One-Sided Tests (TOST) procedure developed in Schuirmann (1987) and further explained in Lakens (2017). We conduct an equivalence test (Wald-test) of the estimated treatment effect and different critical values, lambda. The figures plot the maximum p-value from the equivalence test against lambda. We choose this approach to interrogate our null effects since, for the reasons outlined in Hoenig and Heisey (2001), post-experiment power calculations, often used to determine statistical power post-hoc, are problematic. We plot different levels of critical values since we did not pre-specify any particular critical value below which we deem our effect sizes substantively meaningless.

Figure 8: Plotting p-values from two one-sided tests against lambda for main outcome indices at endline

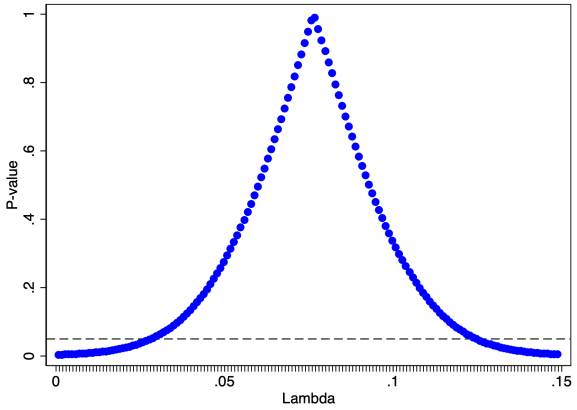
(a) Utilization



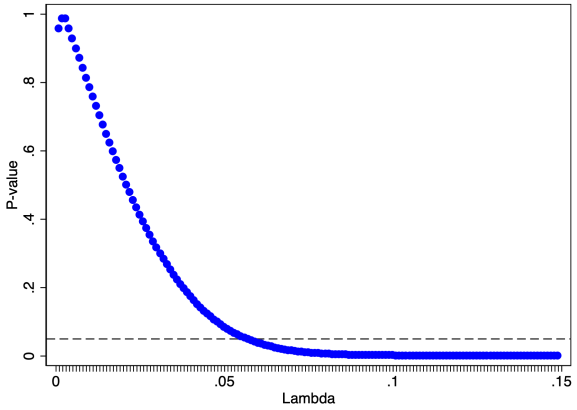
(b) Treatment quality



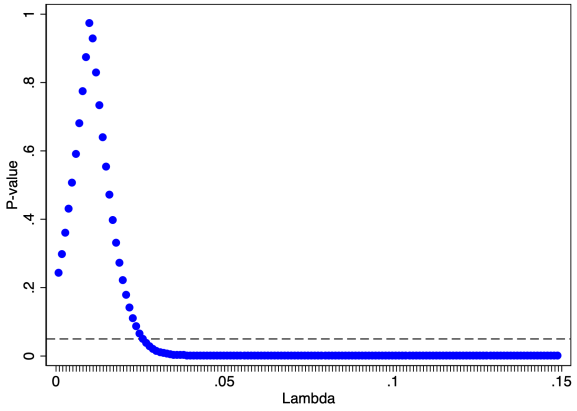
(c) Patient satisfaction



(d) Health outcomes



(e) Child mortality



G Comparison of ACT Health and Björkman and Svensson (2009)

	Difference	P2P	ACT Health
Program Design and Implementation	1. Intervention dates	2004-2005	2014-2016
	2. Number of program variations	1. Control 2. Full intervention	1. Control 2. Information and mobilization only 3. Interface meeting only 4. Full intervention
	5. Involvement of community-based organizations (CBOs)	Worked through 18 CBOs with prior experience in health programming in some of the treatment communities	Worked in consortium with 4 implementing partner organizations with prior experience in health programming, but not in the treatment communities
	6. Length of time of community dialogue meeting	2 half-days	1 half-day
	7. Role playing activity?	Yes	No
	8. Avg number of participants at community dialogue meetings	150	100
Research Design and Data Collection	9. Districts included in study	9	16
	10. Interval between intervention and collection of outcome data	~1 year (4 years in follow-up study)	8 months (to midline) 20 months (to endline)
	11. HC sample inclusion criteria	HC3s only	HC2s and HC3s
	12. HC catchment area definition	5km radius around each HC	Nearest three villages to each HC
	13. HC sample size	50 HCs (only HC3s)	376 HCs (225 HC2s and 157 HC3s) Full treatment & control: 189 HCs
	14. Household sample size	5,000 households; 100 per HC catchment area	14,609 households (7,288 households in full treatment & control); 40 per HC catchment area

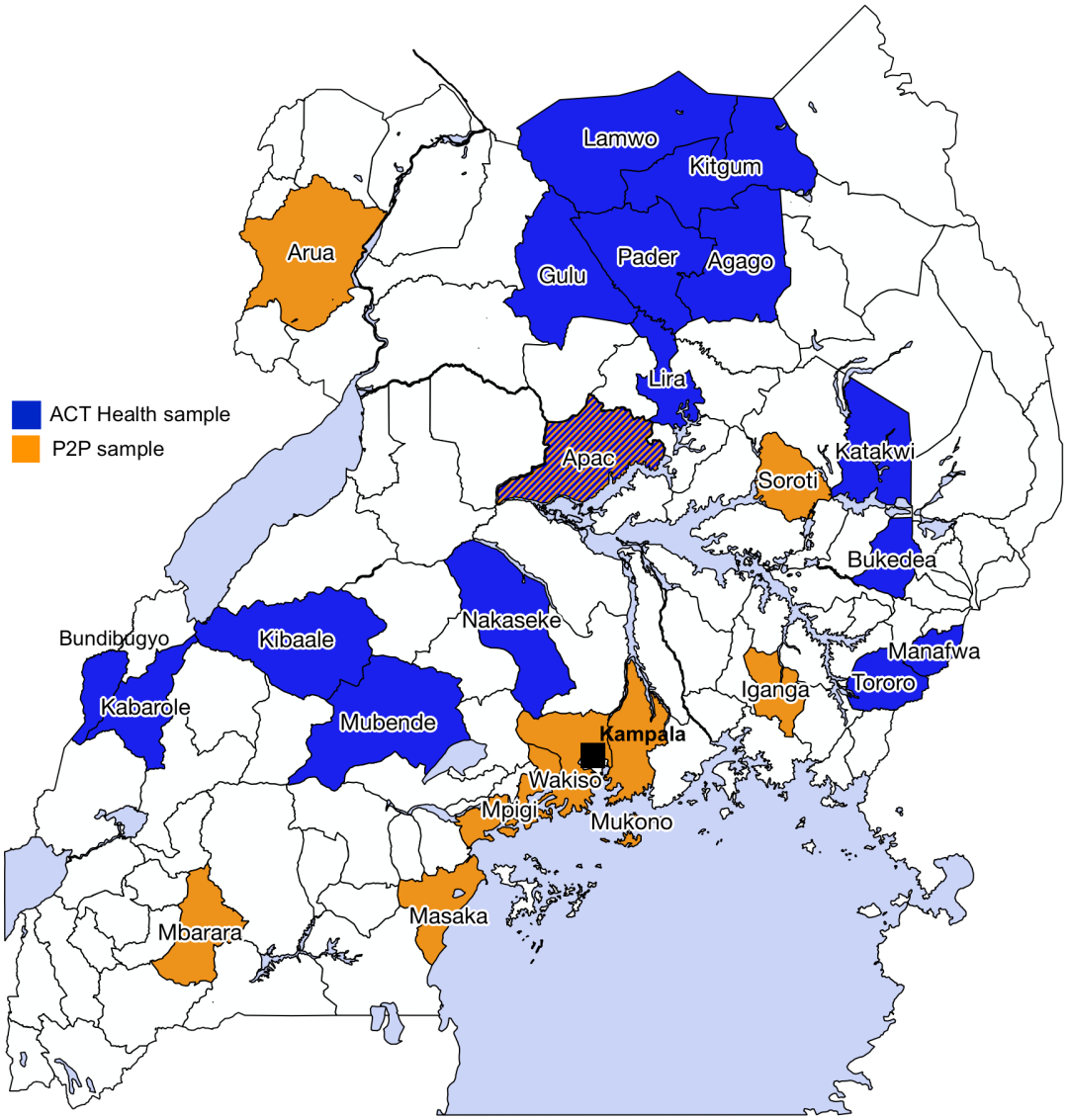


Figure 9: Map indicating the districts in the ACT Health and P2P samples

H Implementation of ACT Health

H.1 Implementing Organizations

The Irish NGO, GOAL, launched the ACT Health program in 2014 with funding from DFID. The program was implemented by three Ugandan regional partners across 15 districts and by GOAL Uganda in one district. All three regional partners had prior experience working on community mobilization and/or public health, and already had a strong footprint in the regions (if not the districts) in which they implemented ACT Health. In particular, the Coalition for Health Promotion and Social Development (HEPS), which was founded in 2000, focused on access to health care and essential medicines, maternal health rights, community-based empowerment work, and health advocacy prior to becoming involved in the implementation of ACT Health. The Multi-Community Based Development Initiative (MUCOBADI) was started by HIV positive teachers in 2000 and focused on HIV prevention, access to primary health care, community mobilization, and livelihood development. Finally, the Kabarole Research and Resource Centre (KRC), which was founded in 1996, focused on leadership mobilization, good governance, and research and advocacy. Two of the three regional partners, HEPS and MUCOBADI, were actively involved in the design and implementation of a pilot of the ACT Health program in Bugiri district. Organizational leadership aside, implementing staff for the intervention were specifically recruited for the program and had to have prior experience in community mobilization and/or public health. All implementing staff underwent extensive training and were continuously monitored and supervised by GOAL Uganda.

H.2 Implementation Monitoring

GOAL ensured fidelity to both the intervention and the randomized impact evaluation protocol through several quality control measures.

- Detailed procedure manuals for each of the three variations of the program (the full program, the information and mobilization program—called separate dialogues by GOAL—and the interface-only program). These manuals were used for training and as a reference to ensure that all partners had clear and precise instructions regarding every detail of the intervention. These manuals were used for training and as a reference so that all implementing partners had clear and precise instructions of every detail of the interventions.
- Extensive monitoring data captured in an online monitoring database, which tracked the dates and numbers of people participating in each dialogue. The database also includes the actions agreed upon in the action plans and social contracts developed during the dialogues, and tracked their progress at each follow-up meeting. The reports include data on the dates and number of people participating for each program activity, including HC and community meetings, interface meetings, and each of the follow-up meetings. They also record all the actions agreed to in the action plans and social contracts and track their progress at the follow-up meetings.
- Direct observation by GOAL's monitoring team. To assure quality across the life of the intervention, GOAL had "mentor" managers and monitoring, evaluation, and learning (MEL) officers embedded within the teams of each partner organization to provide direct support

and programmatic guidance, as needed. Mentor manager and MEL officers observed a portion of each partner's dialogues and follow-ups for quality assurance purposes. In particular, 97% of health centers were monitored at least once by either a mentor manager or MEL officer (see Section E of Table H1 for more details). During these direct observations, officers recorded information about facilitator behavior, the presentation of the citizen report cards, the nature of participation during the meeting, and whether the action plans and social contracts met certain quality criteria. The feedback tool for these observations is reproduced below.

- Issues tracking. GOAL tracked issues as they came up during implementation. They gave field teams a detailed protocol of issues to watch out for and flag. Issues were shared with the evaluation team and solutions were jointly decided to resolve the issues.

Table H1: GOAL attendance and monitoring data

	Full treatment			Information only			Interface only		
	N	**Mean**	**SD**	**N**	**Mean**	**SD**	**N**	**Mean**	**SD**
A. HC information separate dialogue									
# of HC staff present	90	6.14	3.26	92	6.24	3.42	n/a	n/a	n/a
% of HC staff present	90	67.25	33.89	92	71.04	27.56	n/a	n/a	n/a
B. Community information separate dialogue									
# of community members present	90	102.36	20.99	91	99.01	25.17	n/a	n/a	n/a
# of female community members present	90	35.67	8.79	91	34.26	9.91	n/a	n/a	n/a
% of HCs where at least one SC official is present	90	0.10	0.30	91	0.36	0.48	n/a	n/a	n/a
C. Interface meeting									
# of community members present	91	33.10	14.94	n/a	n/a	n/a	97	67.38	13.67
# of female community members present	90	16.87	8.83	n/a	n/a	n/a	97	34.79	10.49
# of HC staff present	91	3.97	2.31	n/a	n/a	n/a	97	3.80	2.45
% of HCs where at least one SC official is present	91	0.30	0.46	n/a	n/a	n/a	97	0.35	0.48
D. Follow-up meetings (average across three meetings)									
# of community members present	91	41.01	14.77	92	54.51	20.14	97	55.67	17.54
# of female community members present	91	20.54	8.13	92	27.37	11.01	97	29.21	11.41
# of HC staff present	91	3.71	2.22	90	3.14	3.30	97	3.46	2.10
% of HCs where at least one SC official is present	91	0.39	0.54	.	.	.	97	0.47	0.60
E. Monitoring & oversight									
% supervision during the initial activity	92	0.80	0.40	92	0.62	0.49	97	0.58	0.50
% supervision during at least one follow-up meeting	92	0.76	0.43	92	0.92	0.27	97	0.73	0.45
% supervision at least one time (initial activity or follow-up)	92	0.98	0.15	92	0.99	0.10	97	0.93	0.26

Notes. Data is drawn from implementer's monitoring tools, and verified by GOAL's monitoring team through direct observation in the share of meetings indicated in Panel E.

Version 10-Mar-2015

Observation-Feedback Tool for ACT Health Community Activities

*This form is for use by Line Managers and Mentorship Managers when observing **dialogues** and **interfaces.** Compete for each observation and share your feedback with the Officers after the visit. Copy should be kept in file of Officer and Observer.*

Observerer	Name			Title		Organisation	
Date of observation	Day	Month	Year	**Procedure # (Tick One ONLY)**	#2	#3	#4
Location	Health Centre			Sub-county		District	
Activity observed	h of WDWW. Linking the HC Dialogue		Community Dialogue	Interface			
Facilitators Observed	Name		Organisation	Name		Organsiation	

	Was the Facilitator . . .	YES	NO	Partly
Facilitator behaviour	Well-prepared on the process and purpose of meeting?			
	Effective in managing expectations of participants?			
	Clear and audible so participants understood?			
	Managing time? (Covered all agenda items, not exceed 5 hrs)			
	Listening actively? (Eye contact, summarising, repeating)			
	Enabling diverse participants to speak and participate?			
	Ensuring mutual respect among participants?			
	Bringing focus to Responsibility of community members?			
	Bringing focus to Responsiveness of HC staff?			
	Impartial? (non-biased, non-judgemental, not taking sides)			
	Managing challenges? (conflicts, disturbances)			
CRC Presentation **Applicable to** Separate Dialogues Full Programme Observer must also study the CRC before meeting	**Did the Facilitator(s)…**	**YES**	**NO**	**Partly**
	Clearly understand the CRC content before the meeting?			
	Know and clearly communicate the MoH standards?			
	Bring the appropriate posters for the HC level?			
	Present clearly? (word choice, local language, explain boxes)			
	Check to ensure that participants understood the CRC?			
	Use CRC information to challenge perceptions and excuses?			
	Use probing questions to improve Responsibility?			
	Use probing questions to improve Responsiveness?			
	Use probing questions to improve Relationships?			
	Ensure mis-conceptions raised by participants are corrected			
Participation	**How participatory was the meeting?**	**YES**	**NO**	**Partly**
	Were *all* HC staff present?			
	Were all social groups represented as per mobilisation list?			
	Were all small groups working effectively?			
	Was the participation in the large group balanced? Women talked?			
	Was the posture and positioning of facilitator conducive?			
Action Plan/Social Contract	**Action plan/social contract meet basic quality criteria**	**YES**	**NO**	**Partly**
	Issues are clearly stated			
	Issues are related to the CRC/Information in CRC (Procedure #2 & #4)			
	Actions are related to the issue			
	Actions are achievable with local resources (low/no cost)			
	Inclusive of actions for community AND health centre staff			
	How many priority issues from women's groups are included?			
	Inclusive of issues/actions from all social groups?			
	Mix of actions for now (6months), soon (12 months) and later			

Observation-Feedback Tool for ACT Health Community Activities

*This form is for use by Line Managers and Mentorship Managers when observing **dialogues** and **interfaces.** Compete for each observation and share your feedback with the Officers after the visit. Copy should be kept in file of Officer and Observer.*

Observerer								
	Name			Title			Organisation	
Date of observation				**Procedure # (Tick One ONLY)**				
	Day	Month	Year		#2	#3	#4	
Location								
	Health Centre			Sub-county			District	
Activity observed	h of WDWW. Linking the							
	HC Dialogue		Community Dialogue		Interface			
Facilitators Observed								
	Name		Organisation		Name		Organsiation	

Feedback for Facilitator/Officer

The ACT Health programme has a component of on-the-job training and support. This support (mentorship) is very important for continuous learning and implementation of a high quality programme. These feedback tips should be shared with the faciltiators(s) after the meeting or in a visit to the Officer shortly (within three (3) working days) of the observation.

WELL DONE! These are the areas where you excelled. Thanks for your work!	
1)	
2)	
3)	
There are a few things you can work on for next time. Let me know how I can support you best.	
1)	
2)	
3)	

As an observer, what do you think participants in this community feel about the ACT Health programme?

Observer	
Name	
Signature	
Date of sharing with facilitator	

Facilitator	
Name	
Signature	
Date of discussing with facilitator	

H.3 Intervention Materials

H.3.1 Steps of the intervention

Procedures Table

Procedure		Citizen Report Card (CRC)	Health Centre Dialogue	Community Dialogue	Interface	Final Output Action Plan or Social Contract	Follow-up every six (6) months
1	No intervention (control)	Baseline data will be collected but no activities.	None will be held.	None will be held.	None will be held.	None will be developed.	*Survey at 12 months and 36 months after baseline.
2	Information provided (CRCs) and two separate action plans are developed in community and health centre dialogues. There is no interface between HC staff and community.	The Citizens Report Card will be shared in community dialogue and health centre dialogue.	Health centre staff have a dialogue and develop an action plan.	Community members have a dialogue and develop an action plan.	This will not be held.	Two separate action plans will be developed – one by the health centre staff and one by the community members.	Every six months separate follow-up dialogues for community members and health centre staff. *Survey at 12 months and 36 months after baseline.
3	No information (CRC) provided and no health centre or community dialogues are held. Interface between health centre staff and communities yields one social contract.	The Citizens Report Card will not be shared.	This will not be held.	This will not be held.	The interface will bring together community members and health centre staff.	One social contract developed at the interface combining community and HC actions.	Every six months follow-up interface with community members and HC staff. *Survey at 12 months and 36 months after baseline.
4	**Information (CRC) provided in separate dialogues at health centre and community levels. During these dialogues, each group develops an action plan which is discussed at the interface. The interface yields one social contract.**	**The Citizens Report Card will be shared at community dialogue and health centre dialogue.**	**Health centre staff dialogue and develop an action plan.**	**Community dialogue and develop an action plan.**	**The interface will bring together health centre staff and representatives of the communities.**	**One social contract developed combining community and HC actions.**	**Every six months follow-up interface with community members and HC staff jointly. *Survey at 12 months and 36 months after baseline.**

H.3.2 Example of a mobilization protocol and citizen report card

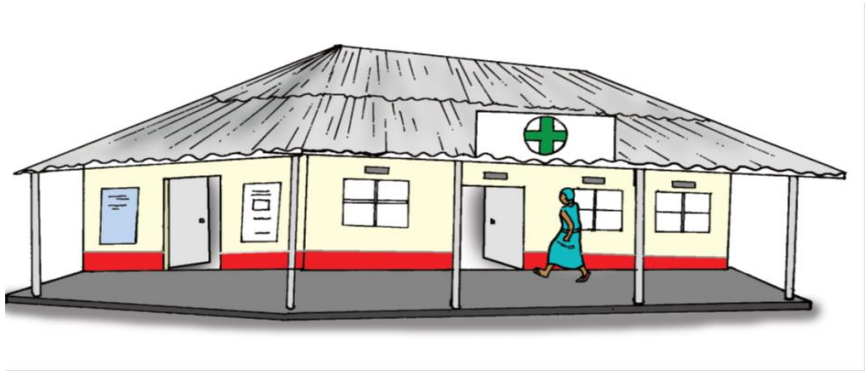
Version: 27-August-2014

Community Mobilisation List

Mobilising diverse social groups (women and men of different ages, income levels and social standing) is very important! We want to hear voices of all social groups in the community. Please think of someone in the village who meets the social group description below and would be willing to participate. Thank you for your time!

Health Centre	
Village	
Name of VHT carrying out mobilisation	

Dialogue Meeting Participants *at least 50% of the participants from each village should be women		
Social Group to Target	**Individual Name**	**Will attend interface meeting?**
1. LC1 Chairperson		
2. LC Women Representative		
3. LC Youth Representative (15-20 years old)		
4. LC Representative with disability		
5. Mother		
6. Mother		
7. Mother		
8. Male Lowest Income Group		
9. Female Lowest Income Group		
10. Female youth (15-20) in Lowest Income Group		
11. Male youth (15-20) in Lowest Income Group		
12. Male Highest Income Group		
13. Female Highest Income Group		
14. Male youth (15-20)		
15. Female youth (15-20)		
16. Male adult (21-49)		
17. Female adult (21-49)		
18. Male elder (50+)		
19. Female elder (50+)		
20. VHT Member		
21. VHT Member		
22. VHT Member		
23. VHT Member		
24. VHT Member		
25. HUMC Member		



Kagote Health Center III

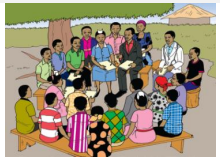
Kabarole District

Citizen Report Card

Survey dates: 10th October 2014 to 26th October 2014

Report Card Prepared: 27th October 2014

Responsibility	Responsiveness	Relationships
Individuals have good health-seeking behaviour. They seek preventive care (ANC, immunisations, testing, etc.) and go early for treatment of illness to avoid complications.	Health Center staff use resources effectively and provide care as per Ministry of Health standards in the Uganda National Minimum Health Care Package (UNMHCP).	Mutual understanding and trust between community members and health Center staff. Includes better understanding of each other's constraints.



Note: This Citizens Report Card has been compiled from responses to household surveys and HC staff interviews.

Rights and Responsibilities

Issue	Households say	Health Center says
Who could name at least 5 health rights and entitlements	0%	Could name 3

Health Rights

Some Major Health Rights in Uganda Patient's Charter
Right to choose
Right to complaint and redress
Right to access essential medicine
Right to access information
Right to privacy and confidentiality

Health Responsibilities

Health Responsibilities include
Responsibility to be healthy
Responsibility to participate

What services does our HC III provide?

GOVERNMENT STANDARD* Services that should be provided by HCIII	Health Center says
Antenatal care	Yes
Delivery	No
Outpatient care	Yes
HIV counselling and testing (HCT)	Yes
Immunisation	Yes
Lab services	Yes
Family planning methods (simple)	Yes
Family planning methods (advanced)	Yes
Health education (at HC)	Yes
Family planning education	Yes
Health Outreach (villages)	Yes
Prevention of Mother to Child Transmission (PMTCT)	Yes
Anti-retroviral therapy (ART)	Yes

*Uganda National Minimum Health Care Package

How many people use this HC? (Responsibility)

The community member visits to Kagote health Center III in the past 12 months.

Use patterns (adults and children)
17% of all health care visits in this community were to Kagote health Center

Reasons why community do not use health Center	
Reasons why the households in the community DO NOT visit Kagote health Center	60% Lack of drugs 20% Long waiting time 20% Long Distance 0% Cannot afford payment 20% Attitude of Staff 0% Unclean facility 10% Poor quality services 10% Have not been sick 10% Don't provide treatment I need 10% Others

Community member visits to other health providers in the past 12 months.

Other providers	Average utilisation (adults and children)
Private not for Profit (PNFP) e.g. NGO, missionary health Center	5% of all health care visits
Private for profit	19% of all health care visits
Traditional healer	1% of all health care visits
Community health worker e.g. VHT	6% of all health care visits
Self-treatment (pharmacy, drug shop)	32% of all health care visits
Other government health facilities e.g. HC III, IV, hospital	20% of all health care visits

How does our community compare?		
Health care provider	Kagote health Center	District use patterns of nearest government health centers
Use patterns	17%	31%

How many of us use ANC and deliver at our HC III? (Responsibility)

GOVERNMENT STANDARD = pregnant mothers should have four (4) ANC visits

Community's utilisation of antenatal care, family planning	
Percentage of households with pregnant women who have visited **Kagote health Center** for **antenatal care** since **September 2013**	63%
Percentage of those pregnant in the last year who **delivered** at **Kagote** health Center since **September 2013**	0%
Percentage of women who received an **HIV test** during ANC visit **(PMTCT)**	100%

Reasons why we (community members) do not deliver at this HC

Why do pregnant women in the community choose **NOT** to deliver at **Kagote** health center	**0%** Cannot afford **20%** Health Center was not open **0%** Use traditional birth attendant **0%** Attitude of staff **0%** Was not treated well at the HC **10%** Delivered quickly **20%** Referred to another health center **20%** Other provide better services **20%** Did not have the requirements **40%** Other

How do we compare? Antenatal care and maternity care		
Use pattern of antenatal care and maternity care	Among pregnant women in this community	Among pregnant women in Kabarole District
Percentage of households with pregnant women who have visited **their closest government** health Center for antenatal care	**63%**	**46%**
Percentage of pregnant women who made four (4) ANC visits to the nearest health center.	**10%**	**23%**

How do we compare? Immunisation		
Immunisation	In this community	*Among children in District*
% of children <5 immunised in **Kagote** catchment area	**98%**	**98%**

How many of us use family planning services at our HC III? (Responsibility)

Community's utilisation of family planning	
Percentage of households who have visited **Kagote health Center** for **family planning** since **September 2013**	29%

Why do households in the community choose NOT to use family planning services at Kagote health Center?	**0%** Attitude of staff **9%** Use natural methods **N/A** Not interested **Data not collected** **6%** Fear side effects **3%** Do not provide family planning education **19%** Do not need (young/want children/too old) **0%** Partner does not want **19%** Go elsewhere **3%** Health center lacks family planning drugs **3%** Did not know about the service **3%** Refused to answer **41%** Other

What community says about staff attendance at our HC III (Responsiveness)

GOVERNMENT STANDARD = absenteeism is any *unexcused* absence

Percentage of household saying medical staff attend work at Kagote health Center	
Always at work	71%
Sometimes at work	22%
Rarely at work	7%

GOVERNMENT STANDARD = HC III should have eleven (11) medical staff + eight (8) other staff for a total of nineteen (19) staff

Type of Staff	Government Standard	Staff actually allocated	Staff present on survey day
Medical	11	12	8
All staff	19	18	11

Medical staff attendance at Kagote health Center on survey day	
Total number of medical staff out on leave and/ or training on the survey day	2
Total number of medical staff out for outreach on the survey day	0
Percentage of households who said the health Center was open when they last visited	93%

What community says about drug availability

Household rating of drug availability

Household rating of drug availability at Kagote health Center	
Patients who received drugs at their last visit	88%
Drugs are always available	16%
Drugs are sometimes available	76%
Drugs are rarely available	9%

Do community members know when drugs are received?

Health issue	Households say	Health Center says
Do you know when drugs are delivered to Kagote health Center?	31% yes	Yes, we do distribute information on drug deliveries

Households reporting about the drugs they have	
Average number of type/brands of drugs received per visit per person	2
Percentage of patients who say it was clearly explained how to take the drugs	79%

GOVERNMENT STANDARD = All six (6) items should be available at all times

Health Center reporting stock outs of the following tracer items in the last 3 months	
1. Cotrimoxazole (CTX)	No
2. Artemether/Lumefantrine	No
3. Oral Rehydration salts (ORS)	Yes
4. Depo Provera	No
5. Measles Vaccine	No
6. Sulfadoxine and Pyrimethamine (SP)	No

Minimum standard drug storage conditions	
Method in place to control temperature	Yes
Windows that can be opened or there are air vents	Yes
Direct sunlight cannot enter the area	Yes
Area is free from moisture	Yes
Cold storage in the health Center	Yes
Medicines are stored directly on the floor	No
There is evidence of pests in the area	No

Fees at our HC (Responsiveness)

Government Standard	Health Center says	Community says	
0.00 UGX for government health facilities	No	Average amount paid	
		Cash	Value: In kind
		300 UGX	0 UGX

What did we bring / buy most?	
Top 3 things that have to be bought or brought to Kagote health Center	1.Exrecise book for prescription 2.N/A 3.N/A

Fees – HC III services	Households say	Health Center says	District Averages (Households say)
User fees (Cash)	2%	No	2%
Average amount paid for user fees (cash)	300 UGX	N/A	3,610 UGX
User fees (In-kind)	0%	N/A	0.1%
Average amount paid for user fees (in-kind)	N/A	N/A	1,200 UGX
Center charges for antenatal care (answered by pregnant women)	10%	No	1%
Average amount paid for antenatal care	300 UGX	0 UGX	1,650 UGX
Center charges for delivery (answered by women who delivered there)	0%	No	2%
Average amount paid for delivery	N/A	0 UGX	5,000 UGX
Center charges for drugs (including injections)	0%	No	0.1%
Average amount paid for drugs	N/A	0 UGX	1,800 UGX
Patients have to pay for immunization	0%	No	0.4%
Average amount paid for immunization	N/A	0 UGX	2,890 UGX

Satisfaction

Waiting times

GOVERNMENT STANDARD = waiting time should be less than one hour

Waiting time until first attended to

Government Standard	Community says	Health Center says
Less than 1 hour	00 Hour 39 Minutes	30 Minutes

Health Unit Management Committees (HUMCs)

Percentage of households who DO know at least two (2) roles of the HUMC	4%

Satisfaction with Relationships between HC Staff and Community

Overall satisfaction with relationship between community members and HC staff	Households say	HC says
Very satisfied	18%	Satisfied
Satisfied	60%	
Not satisfied	22%	

Health issue	Households say	Health Center says
Were patients treated politely	86% yes they were polite/ extremely polite	" Yes, we sometimes treat patients politely"
Average exam time for patients at their last visit	14 minutes	45 minutes

Health issue	Percentage
Percentage of patients who said the health worker listened to what they said at their last visit	89% yes/ very interested and asked questions
Percentage of patients who said the staff clearly explained their medical condition	70%
Percentage of patients who were examined at their last visit	65%
Percentage of patients who said health worker wore uniform at their last visit	59%
Percentage of patients who said they had privacy during the examination at their last visit	89%

How do we compare?		
Household says	Kagote health Center	District
Average waiting time for patients	39 minutes	46 minutes

H.3.3 Example of a community action plan, health center action plan, and social contract

Instructions
Please record below the action plan that was developed. Please do not edit. Type it exactly as members developed. You will need a verison in the local language and you will work with the secretary to translate to English for analysis/tracking.
For **Procedure #2 (Separate Dialogues)** PLEASE USE THE SOCIAL CONTRACT TEMPLATE Because the actions in the social contract template are final, not "suggested."
For **Procedure #3 (Interface Only)** and **Procedure #4 (Full Programme)**, the action plan should be placed in the file. Only the social contract is submitted with the report to your manager.

Document Type	**ACTION PLAN**			For Document type enter "Community Action Plan" or "HC Action Plan"
District	**Kabarole**			
Sub-County	**West division**			
Health Centre	**Kagote health center III**			
Procedure #	**4**			
Facilitator name(s)	**Makasi and Hilary**			
Facilitator Organisation	**KRC**			
Action Plan By (tick one)				
	COMMUNITY			
Date developed	1	12	2014	
	Day	Month	Year	

#	Issue	Reasons for Issue	*Suggested* Action	*Suggested* Person Responsible	*Suggested* Completion Date
1	Information on drug availability	Community is not informed whenever drugs are available at the health center	Writing to the in charge to always inform the community through the notice board whenever drugs are available at the health center	VHT Nkayezu	30/12/2015
2	Staff putting on uniform	Not following up staff who come on duty without putting on uniform by the incharge	Writing to the in charge to speak to the staff to always put on Uniform while on duty	VHT Coordinator Richard mwagushia	30/1/2015
3	Lab equipments	Some of the Lab equipment's are not at the health center like the one for Typhoid	Writing to the in charge to ensure that all the Lab equipment's are available at the health center	VHT Nkayezu	30/1/2015
4	The behavior for the staff	The staff do not mind about the patients at the health center	Writing to the in charge to speak to the staff about there behaviors in handling the patients at the health center and come up with the solution	Kairu christopher (Elder)	30/1/2015
5	UHMC roles	Community does not know the role of HUMC at the health center	Writing to the incharge to inform the community on the role of HUMC through the village notice boards	incharge Mugisa Brian	30/1/2015
6	Coming late by patients for treatment at health center	Community members have a thinking that there are always no drugs at the health center	HVTs should sensitize the community members to always come early for treatment at the health center before the sickness worsens	VHT Coordinator Richard mwagushia	30/12/2015

Figure 10: Sample Community Action Plan from Kabarole-Kagote HC3

Instructions
Please record below the action plan that was developed. Please do not edit. Type it exactly as members developed. You will need a verison in the local language and you will work with the secretary to translate to English for analysis/tracking.
For **Procedure #2 (Separate Dialogues)** PLEASE USE THE SOCIAL CONTRACT TEMPLATE Because the actions in the social contract template are final, not "suggested."
For **Procedure #3 (Interface Only)** and **Procedure #4 (Full Programme)**, the action plan should be placed in the file. Only the social contract is submitted with the report to your manager.

Document Type	**ACTION PLAN**			For Document type enter "Community Action Plan" or "HC Action Plan"
District	**KABAROLE**			
Sub-County	**WEST DIVISION**			
Health Centre	**KAGOTE HEALTH CENTER 3**			
Procedure #	**4**			
Facilitator name(s)	**MAKASI & HILARY**			
Facilitator Organisation	**KRC**			
Action Plan By (tick one)				
		HEALTH CENTRE		
Date developed	24	11	2014	
	Day	Month	Year	

#	Issue	Reasons for Issue	***Suggested*** **Action**	***Suggested*** **Person Responsible**	***Suggested*** **Completion Date**
1	Bringing mothers to deliver at the health center	Service was not being offered at the health center	Using VHTs to give information that the center now conducts deliveries, Carry out health education at the HC	Health assistant Muhumuza Michael	end of Feb 2015
2	Information on drug availabiltiy	Information gap	Displaying dlivery of drug on public notice boards	Medical records officer Henry & Beatrace	end of Jan 2015
3	Information on health rights & responsibility	Information gap	Display alist of health rights and responsibility on the public notice boards	In cahrge Mugisa	end of Feb 2015
4	Involvement of HUMC in HC activity	Not community members & have over stayed in office	Write to the office of the town clack about formation of HUMC at the HC	In charge	end of march 2015
5	Community dialogue	CRC not disemineted to the community	Disemineting the CRC	Hilary and Makasi	end of Dec 2014

Figure 11: Sample HC Action Plan from Kabarole-Kagote HC3

Instructions

Please record below the social contract that was developed in the interface. Please do not edit - type it exactly as members have developed. You will need a verison in the local language and you will work with the secretary to translate to English for analysis/tracking.

For **procedure #2 (Separate Dialogues)** please use this format to develop action plans.
For **Procedure #3 (Interface Only)** and **Procedure #4 (Full Programme)**, attach a copy of the social contract to the Interface report and submit to Manager within five (5) working days of the Interface.

Document Type	**SOCIAL CONTRACT**		
District	KABAROLE		
Sub-county	WEST DIVISION		
Health Centre	KAGOTE HEALTH CENTER 3		
Procedure #	4		
Facilitator name(s)	MAKASI K. EDWARD & RUYOOKA HILARY		
Facilitator Organisation	KRC		
Date developed	8	12	2014
	Day	Month	Year

For "Document" you will enter "social contract" if this is used in Interface. Enter "Commuity Action Plan" or "HC Action Plan" for Procedure #2 (Separate Dialogues)

#	Issue	Action	Person Responsible	Expected Completion Date	Evidence of Progress on Action	Person Responsible for Monitoring Progress
1	Putting on Unifrom by staff	Incharge to inform the staff in a meeting to always put on uniform while on duty at the health center	In-charge Mugusa Bra	End of March 2015	Finding staff in uniform while on duty and the minuts for the meeting	O/c Kagote station Muhindo
2	Staff conduct	Incharge to hold a meeting with staff to discuss about there conduct towards the patients while on duty at the health center and come up with a solution	In-charge Mugusa Bra	End of Feb 2015	Minutes for the meeting and the change in the conduct for the staff towards the patients	Kabasiguzi Beatrace (elder)
3	HUMC Functionality	Electing the new HUMC	Town clark and the incharge	End of June 2015	Council Minutes and the new HUMC to be in place	Tuhaise Aisha (elder)
4	Information on Health rights and responsibility	Providing information on health rights and responsibilites by VHTs in the villages and health center staff at OPD and hang it on the notice board	Health Assistant Muhumuza michael	End of Feb 2015	VHTs Reports	VHT kayezu
5		Health center staff provide information on health right at and responsibility at OPD and hang it on the notice board	Health Assistant Muhumuza michael	End of Feb 2015	Information on health rights and responsibility hanged on the notie board	VHT kayezu
6	Coming late for teatment at the H/C by the patients	Providing information on the need to always come early for treatment by VHTs in the villages and	VHTs	End of Dec 2015	VHTs Reports	Health Assistant

Figure 12: Sample Social Contract from Kabarole-Kagote HC3

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