

# Incentivizing Community Health Workers in Guinea-Bissau: Experimental Evidence on Social Status and Intrinsic Motivation\*

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## Abstract

Community Health Workers (CHWs) constitute a fundamental component of health systems in the developing world. Still, they are typically volunteers. This paper follows all the CHWs in the capital city of Guinea-Bissau and tests the impact of different types of non-financial incentives on CHW performance and household health. Specifically, we conducted a randomized field experiment around two main sources of incentives: (i) an honorific award for good performance aimed at raising the social status of CHWs; (ii) a video treatment centered on the task significance of CHWs targeting an increase in their intrinsic motivation. We also test variations of the video, the role of household awareness about the CHWs, and complementarity between the treatments. We employ administrative data on CHWs, as well as CHW and household survey data to measure outcomes. We find that the social status intervention improves CHW performance in terms of CHW learning about health practices with an impact on household health, in particular of children under 5 years old. Effects of the task significance video are weaker, like those of other treatments and interactions. The main implication is that inexpensive status awards can improve the performance of health workers.

**JEL codes:** O12, D91, I15.

**Keywords:** Non-financial incentives, Community Health Workers, social status, intrinsic motivation, task significance, Africa, Guinea-Bissau.

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# 1 Introduction

'Ensure healthy lives and promote well-being.' The United Nations currently prescribes this goal as one of the most fundamental ones for human kind. Be it a matter of fundamental human rights or just because healthy people are more productive, this is a shared objective for public policy around the world. At the same time, substantial health challenges persist on a given year (Report of the UN Secretary-General on the Sustainable Development Goals, 2019): 5.4 million children under 5 years of age died with almost half of these deaths occurring in the first month of life; close to 303 thousand women around the world died due to complications of pregnancy and childbirth. Crucially, almost all of these deaths are avoidable and the majority occurs in Sub-Saharan Africa.

This grim picture of health in Sub-Saharan African countries hides substantial improvements made on health indicators over the last few decades. Important improvements in the supply of health services (infrastructure, personnel) were accompanied by increased education for health and demand for health services by the population. Community Health Workers (CHWs) have made a central contribution in linking their communities to the health system - see [Haines et al. \(2007\)](#), [Christopher et al. \(2011\)](#), and [Gilmore and McAuliffe \(2013\)](#). Indeed, CHWs are typically community members who are tasked with providing the referred link while providing direct health support to their communities.<sup>1</sup> CHWs allowed the spread of simple technologies allowing the prevention and treatment of health problems. As a result, those avoidable deaths became more often avoided.

CHWs are however atypical health workers. They generally do not have medical or nursing formal education: just a few weeks of specialized training are needed in most CHW programs. And the majority is not salaried. Data for 34 Sub-Saharan African countries on 322,199 CHWs shows that 46 percent of these workers do not receive any type of monetary compensation, and that 23 percent, although not receiving a salary, receive periodic monetary incentives.<sup>2</sup> Most CHWs are therefore voluntary, part-time workers. Many public health specialists have proposed the path of professionalization of CHWs: not surprisingly, many of the most successful CHW programs are those with full-time, salaried workers, fully integrated in the formal health system.<sup>3</sup> Still, these programs are not affordable in many countries without significant inflows of foreign aid ([Taylor, Griffiths, and Lilford, 2017](#)).

In this paper we ask how volunteer, part-time CHWs can be incentivized to do a better job without employing financial incentives. Specifically, we consider two main possibilities to incentivize CHWs. First, by improving the social status of CHWs in their communities.

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<sup>1</sup>The official definition offered by the International Labour Organization in their International Standard Classification of Occupations is: 'CHWs provide health education and referrals for a wide range of services, and provide support and assistance to communities, families and individuals with preventive health measures and gaining access to appropriate curative health and social services. They create a bridge between providers of health, social and community services and communities that may have difficulty in accessing these services.' There is however a range of definitions employed in practice - see [Olaniran et al. \(2017\)](#).

<sup>2</sup>Data Tool, One Million Community Health Workers Campaign, 2019.

<sup>3</sup>See for instance [Zambruni et al. \(2017\)](#) and 'WHO Guideline on Health Policy and System Support to Optimize Community Health Worker Programmes,' WHO, April 2018.

Second, by increasing the perceived task significance of CHWs and therefore their levels of intrinsic motivation. We take the case of the capital city of Guinea-Bissau, where we study the full contingent of 1,015 CHWs in that city, each of them assigned to a pre-defined set of households, during 2017-2019, when they were faced with new incentives schemes in line with the two referred non-financial dimensions. Guinea-Bissau is one of the poorest countries in the world. It faces significant challenges in terms of health indicators, even for regional standards. CHWs constitute a central component of the country strategy to address these challenges.

We employ a field experiment where CHWs faced randomized interventions. The first main intervention is defined by access to honorific awards for good performance as CHWs, which is assigned to CHWs at the neighborhood level. These awards are distributed in ceremonies with the presence of local authorities; text messages announcing the award follow to the households of the awarded CHWs. The objective is to increase the social status of awarded CHWs in their communities. The second main intervention is the visualization, assigned at the CHW level, of a video shot from the perspective of the CHW on a day of work, where the task significance of the CHW is emphasized. This is achieved by the insertion of an interactive decision in the video when the treated CHW is faced with a difficult situation in a household visit. After deciding and watching the subsequent video ending, CHWs watch the counterfactual ending. Crucially, the ending that follows the low-effort decision involves someone dying in the visited household, which demonstrates the potential extreme consequences of CHWs' work for community welfare.

Apart from these two main interventions, we designed two variations of the video treatment: one yielding a strong benchmark/placebo to task significance, involving just some information provision (the video stops at the point the interactive decision is formulated); the other adding on top of the main task significance video, the endorsement (by video) of the CHWs by traditional healers, who are culturally relevant figures in Guinea-Bissau. Finally, we tested the impact of a simple information campaign raising awareness about the CHW function among households in the communities. It is possible that CHW productivity increases when households are more aware of the CHW and hence potentially more cooperative. This campaign was implemented through text messages. All treatments were cross randomized, which allowed all possible interactions in our experimental design. Hence, we are able to test the complementarity between different types of incentives schemes as well as between these and the information campaign. Finally, we can identify the Local Average Treatment Effects (LATE) of the video treatments by employing data on compliance with those treatments.

We measure treatment effects on CHW performance and health-related outcomes of the corresponding households. To assess CHW performance, we employ administrative data from our implementing partner on CHW monitoring, as well as household survey data, collected both face-to-face and by phone, on home visits, and household satisfaction. We collected health-related indicators through household surveys. These include measures at the level of the household, the child under 5 years old, and the recently pregnant mother. We also collected data directly from CHWs through face-to-face surveys. Baseline survey data (in the case of households and CHWs) allows improving the statistical power of the analysis.

Our main result is that the social status intervention improved the performance of CHWs and household health. Specifically, we identify significantly positive effects on CHW evaluation scores, number of home visits, and household satisfaction with the CHW. We also report significant improvements on household knowledge about health practices. On children under 5 years old, we observe in individual vaccination bulletins that the probability that these children have all main five vaccinations increases by 4 percentage points; we also see effects on lower probabilities of being sick and higher probabilities of being given treatment for malaria if symptoms appear. Related to natal care, we find positive effects on newborn nutrition.

We do not find clear treatment effects for the task significance video. The exception is positive impacts on vaccination of children under 5 years old. Note that the LATE of this treatment yields stronger effects, namely on measures of direct CHW performance - this pattern suggests that effects are concentrated on the compliers to the video treatment. However, overall, it is difficult to distinguish the task significance video from its benchmark video treatment. Finally, we do not find statistically significant effects for the addition of endorsements to the videos, the SMS information campaign, and the interactions testing complementarity between incentive types, and between these and information.

Our paper relates to different strands of the literature. First of all with the theoretical literature on incentives and motivation.<sup>4</sup> [Akerlof and Kranton \(2000\)](#) model agents as motivated by the will to adopt an identity, which affects economic outcomes. In this world, identity is an important supplement to monetary compensation, which, as a sole motivator, can be both costly and ineffective ([Akerlof and Kranton, 2005](#)). The same idea is present in [Bénabou and Tirole \(2003\)](#) who model the mechanism underlying the phenomenon of crowding-out motivation. Related, the concept of mission, as opposed to profit, as a fundamental driver of motivation and performance, is proposed by [Besley and Ghatak \(2005\)](#). [Bénabou and Tirole \(2006\)](#) get closest to the conceptual structure of our paper in that they propose a model where agents' behaviors reflect a combination of three types of motivation: extrinsic or related to financial incentives (which is well defined but outside the scope of this paper), reputational or related to social status, and intrinsic.<sup>5</sup>

Turning to related empirical studies, [DellaVigna and Pope \(2017\)](#) dedicate to assessing differences between monetary and non-monetary motivators in inducing costly effort by conducting a large-scale real-effort experiment. They confirm the importance of the three dimensions introduced above which they name (i) standard incentives, (ii) behavioral factors like social preferences and reference dependence, and (iii) non-monetary inducements from psychology. Within the latter, task significance has received little attention in the literature as a mediator of intrinsic motivation. However, from psychology, [Grant \(2008\)](#) provides evidence that manipulations of perceived task significance can have a positive effect on performance at work in

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<sup>4</sup>Many authors base their definition of motivation on Self-Determination Theory, developed in psychology by [Ryan and Deci \(2000b\)](#) and [Ryan and Deci \(2000a\)](#), which underlines the role of three innate psychological needs - competence, autonomy, and relatedness. For a comprehensive survey on the topic, refer to [Gagné \(2014\)](#).

<sup>5</sup>Like [Dana, Weber, and Kuang \(2007\)](#) show in lab games, reputational motivation could be related to self-image. Their experimental evidence shows that subjects behave fairly mainly because they intrinsically dislike appearing unfair, either to themselves or others.

different contexts. Task significance signals to agents that their efforts have an impact on the well-being of other people (Grant, 2007). Taking task significance as a trigger of motivation to the real world is one of the contributions of our paper.

Our paper is closest to a few empirical contributions to the study of incentives and motivation in the context of health workers and developing countries. The contributions by Ashraf, Bandiera, and Lee (2018) and Deserranno (2019) are devoted to the analysis of selection of health workers. The first looks at recruitment of nurses in Zambia to test whether career benefits attract talent at the expense of pro-social motivation. The second estimates the effect of financial incentives on job candidates' perceptions of a new health-promoter position in Uganda. To an extent, both studies find that financial incentives reduce the ability to recruit the most socially motivated agents.

We now refer to studies testing different incentive schemes for health workers. Nyqvist et al. (2018) test a novel approach to health care delivery in Uganda by incentivizing sales agents to conduct home visits, educate households on essential health behaviors, provide medical advice and referrals, and sell preventive and curative health products. This mix of standard incentives with entrepreneurial incentives resulted in substantial health impacts. Ashraf, Bandiera, and Jack (2014) compare the effect of financial and non-financial rewards on the performance of health agents in promoting HIV prevention and selling condoms in Zambia. Non-financial rewards, akin to our social status treatment, are found to be more effective than financial rewards. In a related study with a health worker training program in Zambia, Ashraf, Bandiera, and Lee (2014) unbundle non-financial rewards and find that employer recognition and positive social visibility are the main drivers of effects. Our paper adds to this literature by contrasting social status with intrinsic motivation driven by task significance.

The paper is organized as follows. In the next section we give the context of our experiment. Section 3 is dedicated to experimental design, including a description of treatments, randomization, sampling, and measurement. The following section explains our hypotheses and estimation strategy. Subsequently, we show our econometric results which are structured in balance, main treatment effects, aggregation and other treatment effects of interest, complementarity between treatments, LATE of the video treatments, as well as additional results and robustness. Section 6 concludes.

## 2 Context

Guinea-Bissau is one of the poorest countries in the world with more than two thirds of the population living below the poverty line. Its GDP per capita was USD 1,796 in 2018, ranking 160 in 172 countries. The population of Guinea-Bissau is estimated at 1.874 million of which 57 percent lives in rural areas and 30 percent lives in the capital city of Bissau. The health situation in the country is characterized by the persistence of high morbidity and mortality in maternal, newborn and child and youth health. The country's life expectancy is 58 years, which is lower

than the average in Sub-Saharan Africa.<sup>6</sup> The main causes of death are lower respiratory infections (accounting for 12 percent of deaths), maternal and neo-natal complications (12 percent), HIV/AIDS (11 percent), malaria (8 percent), and diarrhoeal diseases (6 percent).<sup>7</sup> The country's health system faces persistent challenges related to inadequate supply of health workers, low public spending, and poor infrastructure.<sup>8</sup>

In order to address the significant difficulties faced by the healthcare system of Guinea-Bissau, international organizations have strongly supported the introduction of CHWs in the country. This is in line with World Health Organization policy<sup>9</sup> and recent efforts across Sub-Saharan Africa - see for instance the One Million Community Health Workers Campaign - <http://1millionhealthworkers.org/>.

In this context, CHWs were introduced for the first time in the capital city of Bissau (Autonomous District of Bissau) in 2017. This effort was formally conducted by the Ministry of Public Health of Guinea-Bissau in collaboration with the European Union and UNICEF, which were the main funders. International NGO VIDA (<https://vida.org.pt/>), present in the health sector of the country since the 1990s, managed this contingent of CHWs. In close coordination with international guidelines, this CHW program focuses on improving maternal, newborn, and child health. It consists in training community members on a series of simple health practices, who then provide regular household visits within their communities. CHWs are trained to give health education, refer households to the health centers, and offer simple medical treatments during their visits to the households.

CHWs were recruited through a local selection process organized in collaboration with community representatives. The CHW position was advertised as a volunteering one with no mention of any monetary compensation or career opportunities. Candidates had to be aged at least 18 years and to have at least nine years of education. As part of selection procedures, VIDA conducted a face-to-face interview and a test evaluating writing skills to the eligible candidates. After recruitment, agents received training on basic health practices for 21 days in January 2017, and, after the program started in March 2017, they also attended refresher training sessions every month.<sup>10</sup>

Like in most other health worker programs in Sub-Saharan Africa, CHWs in the Bissau program are labelled as volunteers and do not receive significant financial incentives. There is however a monthly monetary compensation, which is a function of the number of household visits: this is approximately USD 0.2 per household visited each month. And there is a small monetary award every semester for achieving pre-established health goals at the health area level: this is at most USD 20.50 per semester. The setting of this study is thus representative of many CHW programs in the region, where community volunteers are in charge of following a group of pre-assigned households on a regular basis and where designing effective incentive

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<sup>6</sup>Latest available years, World Development Indicators, World Bank, 2019.

<sup>7</sup>Latest available years, World Health Organization, 2019.

<sup>8</sup>See 'Guinea-Bissau: Service Delivery Indicators Report-Health,' World Bank, June 2019.

<sup>9</sup>Refer to: 'Global Strategy on Human Resources for Health: Workforce 2030,' WHO, 2016; 'WHO Guideline on Health Policy and System Support to Optimize Community Health Worker Programmes,' WHO, April 2018.

<sup>10</sup>Table A1 in the Online Appendix shows the 16 Essential Family Practices promoted by the program.

schemes remains a major challenge.

### 3 Experimental design

#### 3.1 Treatments

The interventions we followed in this project relate to non-financial incentives of the CHWs in the city of Bissau. Our field experiment included three types of treatments. First, we analyze incentives targeting increased social status of the CHW in his/her community. Second, we devote attention to incentives aimed at increasing CHWs' intrinsic motivation. The explored mechanism relates to the significance attributed by CHWs to their role/task. Third, we follow an information campaign about the role of CHWs in their communities. Note that the experiment took place shortly after the CHWs were introduced in the city of Bissau, and so, at a moment where there was still limited knowledge about their role in the neighborhoods of Bissau. There were three rounds of treatment for each one of the interventions. Figure 1 presents a timeline of the interventions. We now turn to the details of these interventions.

The first intervention aimed to improve CHWs' performance through increased social recognition of the CHW in the community. We label it *Social status (award, ceremony, and SMS)*. This intervention was assigned to CHWs at the neighborhood level, i.e., all CHWs in a given neighborhood either received this treatment or not. All agents assigned to this treatment who performed above a performance threshold were awarded with an honorific prize during a ceremony with the presence of health authorities and community-relevant figures. On top of the award and the ceremony, information on the awarded CHWs was also passed to the corresponding households at the neighborhood level. All treated CHWs were announced the possibility of awards in initial meetings at the neighborhood level.

In collaboration with the research team, NGO VIDA built for each CHW a score of performance using individual (administrative) information collected by VIDA on a monthly basis. The score was based on three sources of information: (i) the number of monthly reports submitted by each CHW;<sup>11</sup> (ii) supervisors' evaluations of CHWs' performance;<sup>12</sup> and (iii) test scores from short exams submitted to CHWs every month during the monthly CHW general meeting and refresher training sessions.<sup>13</sup> The specific threshold was never made public to CHWs during the three rounds of awards. However, all along, CHWs were informed that the

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<sup>11</sup>Each CHW is expected to submit a monthly report with aggregate information on the number of households visited, and a headcount of kids and pregnant women tracked and treated. However, all the information is self-reported and is typically not validated externally, which may induce over-reporting of activities by CHWs. The score did not consider the specific information provided in the report.

<sup>12</sup>The CHWs were organized in teams, which corresponded to health units. Supervisors were assigned to each team, both by VIDA and by the National Health System. The supervisors from VIDA were selected, trained and employed full time for this activity, with direct responsibility over their teams' performance: they oversaw day-to-day activities, collected data and filled reports, thus carrying most of the administrative tasks. The supervisors from the National Health System were selected among doctors, nurses, and administrative personnel from the health system, with limited time to devote to the supervision of the CHWs. There were 26 supervisors from VIDA in total.

<sup>13</sup>These meetings were typically held at the level of the health unit.

three referred sources of data would be used to decide the awards.<sup>14</sup>

To avoid spillovers to non-treated agents, attendance at the award ceremonies was conditional on receiving an invitation. During the ceremony, the awarded CHWs were called individually and received an honorific award with residual monetary value. The awards were traditional objects, slightly different between rounds, associated with community honor.<sup>15</sup> In addition and in order to increase awareness in the community about the awards, all households assigned to an awarded CHW received a text message to inform them that their CHW was given a performance award.<sup>16</sup> Note that in each of the three rounds of awards all CHWs in treated neighborhoods had the possibility of winning the award.

The second intervention aimed to improve CHWs' performance through increased intrinsic motivation towards performing their role as health workers. The intervention manipulated CHWs' perceived task significance using an interactive video, which was visualized individually by treated CHWs. The video aimed to make salient the social impact of the CHW task, i.e., the extent to which CHWs' actions improve the welfare of the members of their communities (Grant, 2008). We label this intervention *Task significance (video)*. This intervention was assigned to CHWs at the individual level. The video was recorded from the point of view of the CHW performing daily activities.

There are three versions of the full video, which allowed showing a different version on each round of treatment. Each version regards a different health problem arising on a given day of the CHW activity, directly related to the Essential Family Practices. The three health problems covered are related to: (i) assistance to a pregnant woman, (ii) treatment of diarrhea, and (iii) treatment of severe malaria. The videos were watched individually in tablets using headphones. After watching the video, treated CHWs participated in focus groups to discuss the content of the video and the main messages.

The full video has three components, which we describe as follows.<sup>17</sup>

1. **Presentation:** The video begins by showing a CHW visiting a household where he/she encounters a household member facing a health problem.
2. **Interactive decision and ending:** The agent needs to make a single central decision about how to solve the problem raised in the first part of the video. After presenting the health issue, the video stops and offers the agent two different paths: one in which he/she needs to exert/ elicit some effort, and another in which he/she leaves the household. Depending on the decision taken by the CHW, the video continues with a positive or a negative ending for the health condition of the referred household member. The negative ending involves the death of that household member. After the decision is taken by

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<sup>14</sup>The specific criteria used for assigning the awards were as follows: (i) CHWs had to submit all monthly reports in the period under evaluation; (ii) CHWs had to be given an average score of 4.5 out of 5 or more in the supervisors' reports; (iii) CHWs had to be given an average score of 15 out of 20 or more in the quizzes submitted during the monthly meetings.

<sup>15</sup>See Section B.1 for photos of these objects.

<sup>16</sup>Section B.1 reproduces all the text messages sent to the households.

<sup>17</sup>In the Online Appendix to this paper, in Section B.2, we show video snapshots and online links to the videos.



the CHW watching the video, and the corresponding ending is visualized, the CHW is instructed to play again the video and visualize the other possible ending. The objective of this interactive video is that the CHW clearly sees the potential consequences of his/her actions during household visits, i.e., fleshing out the causality of his/actions as CHWs and the dramatic significance they can have for the health of the community.

- 3. Endorsement of traditional healers:** A group of eminent traditional healers from outside Bissau appears sequentially on the video, one at a time, making a speech about the importance of CHWs for the welfare of the communities, in practice endorsing their activity. Sometimes, traditional healers also thank CHWs for their good work. Traditional healers are labeled as such in the video, including name and location of origin in the country. These figures are very influential in the sphere of tradition and spirituality in Guinea-Bissau.

Importantly, we divide the submission of the video intervention into three cumulative versions, each one constituting a different treatment condition in our experimental design. The first is composed of Part 1 - Presentation only. We label this treatment as *Information/placebo (video)*. This is because this part of the full video just reminds CHWs of specific health problems they can encounter, thus providing some information. At the same time, this part of the video constitutes an appropriate placebo for the remaining parts. The second version includes both Part 1 and Part 2 - Interactive decision and ending. We label this treatment as *Task significance alone (video)* provided it embeds the simple message of task significance of CHWs. The third version includes all three parts (in addition to the previous two, Part 3 - Endorsement of traditional healers). We label this treatment as *Task significance plus endorsement (video)*. This treatment is intended to be a strong version of task significance, with cultural adherence.

Finally, the third intervention aimed to improve CHWs' performance through enabling higher levels of cooperation from households. In the context of the recent introduction of CHWs in the city of Bissau, low levels of information in the urban neighborhoods about the role of CHWs could constitute an impediment to their performance. Hence, this intervention disseminated information to households via text messages on the role of the CHWs. We label this intervention *Information campaign (SMS)*. This intervention was assigned to CHWs at the individual level, meaning all households for a given treated CHW were assigned information SMSs.

Prior to the start of the program, NGO VIDA completed a census of the Autonomous District of Bissau and collected phone numbers for every household. Each household assigned to the information campaign received three rounds of 2-3 text messages about CHW activities and their role in the community. The information campaign started by presenting the program in the first round. In the second round it provided detailed information about the practices that the CHW were trained to implement. It also encouraged households to learn more about the program. In the third and last round, the messages included information on the success of some of the activities implemented by the CHW. Section B.3 of the Online Appendix reproduces all the text messages sent to the households.

### 3.2 Randomization and sampling

Our study includes the full number of CHWs active in the city of Bissau by September 2017, i.e., 1,015 individuals. This means our study encompasses the whole of the Autonomous District of Bissau.

The randomization procedure for the allocation of treatments to CHWs was implemented following a three-step stratified cluster design. First, within health areas, after neighborhoods were paired based on population size (number of households), half of them were randomly allocated to the social status intervention (76 clusters). Second, within neighborhood, after pairs of CHWs were formed based on observable characteristics (age, gender, civil status, education, and employment), half of the CHWs were randomly allocated to the information campaign intervention. As mentioned, all the households assigned to those health workers received text messages during the intervention. Finally, within neighborhood and within information campaign treatment status, after quadruplets of CHWs were formed based on observable characteristics (age, gender, civil status, education, and employment), CHWs were randomly assigned to one of four groups regarding the video interventions: (i) the information/placebo group, only exposed to the first component of the full video, i.e., the presentation; (ii) the task significance alone group, exposed to the presentation and the interactive component of the video; (iii) the task significance plus endorsement group, exposed to the presentation, the interactive video and the endorsements by the traditional healers; (iv) and a control group not exposed to any video intervention.

This crossed randomization procedure produced 15 treatment groups and one pure control group. These comparison groups are shown in Table 1. As expected, the numbers of CHWs are similar across these 16 groups.

As part of the measurement in this project we sampled households for surveying face-to-face and by phone. This was done by randomly selecting a fixed number of households from the list of households for each CHW. In the face-to-face survey, two households were sampled from each CHW for the baseline and endline surveys. In the phone survey, four households were sampled from half the CHWs, whom were randomly selected. Note that for the phone survey, the sampling process was conditional on the existence of phone numbers for the corresponding households and happened after the interventions finished.

### 3.3 Measurement

Our measurement in this project includes a broad range of data sources. These encompass: (i) administrative data from NGO VIDA, the local counterpart implementing the project; (ii) baseline and endline CHW surveys; (iii) baseline and endline household face-to-face surveys; and (iv) a household phone survey administered after the end of the interventions. We now turn to providing some details about the design of these data.

The administrative data from our implementing partner include CHW retention rates until

three months after the end of the interventions, i.e., until February 2019. Apart from these data, we also had access to self-reported monthly reports of CHWs' home visits, tests scores before and after the training sessions, and evaluation records of CHWs by their supervisors. We also employ administrative records on supervisors' basic demographic characteristics.

The survey data we designed and conducted includes face-to-face surveys to all CHWs and to a random sample of households before the start of the intervention (July-September 2017) and 14 months later (October-November 2018). The survey questionnaire targeting CHWs includes questions on their demographic and socioeconomic characteristics. It also includes a module on psychometric questions related to motivation, on social connections to other agents in the program, and on participation in community activities. The endline survey includes specific questions on their experience as CHWs. The face-to-face survey questionnaire targeting households includes questions on demographic and socioeconomic characteristics for all household members. Importantly for our analysis, we asked questions to the household head on health and sanitation practices in the household as well as on health outcomes for all children living in the household who were 5 years of age or younger. We gathered information on fertility for all women between the ages of 12 and 49, and we asked questions on natal care to all women with children born alive in the last two years. In the endline questionnaire we include questions on knowledge of the 16 essential family practices and on the household's experience with the CHW program.

The household phone survey we designed and conducted was administered after the end of the treatments in November 2018. It included simple demographic questions as well as a small number of questions about the household's experience with the CHW program. Submitting the phone survey lasted on average 10 minutes.

All main outcome questions employed in our study, structured by data source, are fully described in Section C of the Online Appendix to this paper.

## 4 Hypotheses and estimation strategy

Our experiment is designed to study the impact of two distinct types of non-financial incentives, one on social status, the other on intrinsic motivation via task significance. We are also able to identify the effect of an information campaign. Our design allows testing for complementarity between social status and intrinsic motivation, as well as between those types of non-financial incentives and information. We are mainly interested in assessing impacts on CHWs' performance and on households' health outcomes. Our main specific hypotheses are the following:

**Hypothesis 1:** The two main incentive treatments, i.e., Social status (award, ceremony, and SMS) and Task significance video (blending the groups with and without endorsement by traditional healers), improve the performance of CHWs as well as the health outcomes at the level of the households. It is likely that an increase in effort by the CHWs translates into better practices among the visited households.

**Hypothesis 2:** There is a positive difference on the performance of CHWs and the health outcomes of the households when comparing Task significance with Placebo/information. The visualization of CHW impact in community health (through the video) with the addition of endorsements by traditional figures is the crucial component of the video intervention: in other words, there is an effect of the video over that of knowledge diffusion.

**Hypothesis 3:** There is a positive difference on the performance of CHWs and the health outcomes of the households when comparing Task significance plus endorsement with Task significance alone. Endorsements by traditional figures are impactful.

**Hypothesis 4:** The Information campaign (SMS) improves the performance of CHWs as well as the health outcomes at the level of the households. This is accomplished by higher levels of cooperation by the households when interacting with CHWs, enabling higher CHW productivity.

**Hypothesis 5:** The two main incentive treatments, i.e., Social status (award, ceremony, and SMS) and Task significance video (blending the groups with and without endorsement by traditional healers) are complementary regarding improvements in the performance of CHWs as well as in the health outcomes of the households. The same happens between the two main incentive treatments and the Information campaign (SMS).

To evaluate these hypotheses we estimate a set of specifications, where the treatments are labeled SS for Social Status, TSA for Task Significance Alone, TSE for Task Significance plus Endorsement, TS for Task Significance both with and without endorsements by traditional healers, IP for Information/Placebo video, and IC for Information Campaign.

The first specification we consider is the following.

$$y_i = \alpha + \beta_1 SS_i + \beta_2 TS_i + \beta_3 IP_i + \beta_4 IC_i + X_i' \gamma + \epsilon_i \quad (1)$$

where  $y_i$  is the outcome of interest at the endline, i.e., related to CHW performance and household health (assumed to be measured in a way that higher values signify better outcomes). Note that individual  $i$  can be a CHW, a household head, a child under 5 years old belonging to a household, a woman with a child born alive in the past two years belonging to a household, a woman in fertile age (12-49 years old) belonging to a household, or a phone-survey respondent belonging to a household. Treatment indicators are binary variables taking value 1 for CHWs or households whose CHWs were assigned the corresponding treatment (in the case of TS it could be TSA or TSE).  $X_i$  is a set of controls including strata fixed effects.<sup>18</sup>  $\epsilon_i$  is an idiosyncratic error term.

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<sup>18</sup>Control variables include CHW characteristics (gender, age, and education) and households characteristics when interviewed face-to-face (age and gender of the household head and household size). When analyzing health of children under 5 years old, women in fertile age, or women with a child born alive in the past two years, controls include the age of the corresponding subject.

To account for possible correlation in outcomes within neighborhoods, the error term is clustered at the neighborhood level for CHW outcomes and at the CHW level for household outcomes.

When baseline values of the outcome variable are available, we can employ an ANCOVA specification which can be described as follows:

$$y_i = \alpha + \beta_1 SS_i + \beta_2 TS_i + \beta_3 IP_i + \beta_4 IC_i + X_i' \gamma + \delta y_{i0} + \epsilon_i \quad (2)$$

where  $y_{i0}$  is the baseline value of the dependent variable. If auto-correlation of outcome variables are low, which is the case for most survey outcomes, this specification maximizes statistical power in field experiments (McKenzie, 2012).

Specifications 1 and 2 allow testing Hypotheses 1 ( $\beta_1 > 0$  and  $\beta_2 > 0$ ), 2 ( $\beta_2 > \beta_3$ ) and 4 ( $\beta_4 > 0$ ).

We modify the above specifications to test whether the endorsement of traditional healers has an added effect on our outcomes of interest. We exemplify with the specification analogous to 1.

$$y_i = \alpha + \beta_1 SS_i + \beta_{2a} TSA_i + \beta_{2b} TSE_i + \beta_3 IP_i + \beta_4 IC_i + X_i' \gamma + \epsilon_i \quad (3)$$

This specification allows testing Hypothesis 3 ( $\beta_{2b} > \beta_{2a}$ ).

Finally, we test Hypothesis 5 in specifications analogous to 1 or 2, but adding interactions of interest. First we test interactions between incentive treatments. Then we test interactions between the incentive treatments and the information campaign. We exemplify with the specification analogous to 1 as follows.

$$y_i = \alpha + \beta_1 SS_i + \beta_2 TS_i + \beta_3 SS_i \times TS_i + \beta_4 IP_i + \beta_5 SS_i \times IP_i + \beta_6 IC_i + X_i' \gamma + \epsilon_i \quad (4)$$

This specification allows testing the first part of Hypothesis 5 ( $\beta_2 > 0$ ) on complementarity between incentive treatments.

$$y_i = \alpha + \beta_1 SS_i + \beta_2 SS_i \times IC_i + \beta_3 TS_i + \beta_4 TS_i \times IC_i + \beta_5 IP_i + \beta_6 IP_i \times IC_i + \beta_7 IC_i + X_i' \gamma + \epsilon_i \quad (5)$$

This specification allows testing the second part of Hypothesis 5 ( $\beta_2 > 0$  and  $\beta_4 > 0$ ) on

complementarity between incentive treatments and the information campaign.

For all specifications, we estimate linear regressions regardless of whether the outcomes are continuous or discrete. In the results section we check whether the main results of the paper are robust to using the Post-Double Selection LASSO procedure to select control variables.

The fact that we analyze in this paper a large number of outcome variables raises concerns about multiple-hypothesis testing: as the number of single hypotheses under consideration increases, the probability that at least one of them is falsely rejected given that all of them are true, i.e., the family-wise error rate, increases as well. In order to reduce this concern, we follow two strategies. First, while employing the algorithm described in [Romano and Wolf \(2016\)](#), we also compute, for each null hypothesis under study, a corresponding p-value adjusted for the stepwise multiple hypothesis testing method proposed in [Romano and Wolf \(2005b\)](#) and [Romano and Wolf \(2005a\)](#). This method is stepdown like other improvements over Bonferroni (e.g., [Holm \(1979\)](#)), and resampling-based, which allows accounting for dependence between hypotheses. Hence, the underlying procedure allows increasing the power of the testing over other previous methods. Second, we follow [Kling, Liebman, and Katz \(2007\)](#) and aggregate similar individual outcomes into indices. This is done by calculating within-sample z-scores for each outcome variable, using the mean and the standard deviation of the pure control group, and applying non-weighted averages of z-scores between outcomes.

## 5 Results

### 5.1 Balance and descriptive statistics

We show balance tests in Section [D](#) of the Online Appendix. Appendix Table [D1](#) presents balance tests on baseline characteristics for the full set of CHWs across the three main treatment arms, i.e., social status, video treatments, and information campaign, when compared to the corresponding control groups. We also employ a joint F-test to test for all main differences together and report p-values for this test. We run 90 tests and find statistically significant ones for only four cases.

We can also employ Table [D1](#) to provide an overall description of CHWs' characteristics by looking at the mean of the pure control group. The average age of these CHWs is 26 years, 48 percent are female, and 50 percent are Catholic. 76 percent have completed 12 years of schooling, and 51 percent were studying at the time the CHW program started. 51 percent worked in the 12 months previous to the beginning of the CHW program and 11 percent had a business when the program started. 62 percent of the CHWs had done volunteer work at a health center before the beginning of the program and 81 percent had had a position in the community.

Appendix Table [D2](#) reports balance tests for the sample of households interviewed using the face-to-face survey. We run 96 tests and find statistically significant ones for eight cases. We can conclude that our randomization procedure was able to identify comparable groups,

namely in terms of demographic characteristics of both CHWs and households.

Table D2 provides an overall characterization of the demographic characteristics of the sample of households interviewed face-to-face. The average age of the household head is 44.5 years, 33 percent are female, and 41 percent are Catholic. 24 percent have completed 12 years of schooling, and 69 percent worked in the 12 months previous to the beginning of the CHW program. 20 percent are Balanta, 14 percent Papeis and 19 percent Fula. Households are composed on average of 7 members, among whom 2 are women in fertile age and 1 is a child under 5 years old. The average number of assets is 4.29 (over a maximum of 15) and the average number of mosquito nets per household member is 0.48. 81 percent have access to piped water and only 3 percent use latrines.

An analysis of attrition is given in Section E in the Online Appendix. Table E1 shows data availability rates for the pure control group as well as differences across treatment groups. We look at both CHW and household level data. We have complete administrative records for 90 percent of the CHWs, and 86 percent of the CHWs were interviewed in the endline survey (rates for the pure control group). Turning to households, for 48 percent of the CHWs in the pure control group we have at least one household interviewed by phone at the endline. Attrition in the face-to-face household survey was 12 percent (for the pure control). We test for differences across treatment arms and for all differences together. Attrition and interviewed rates by CHW are not significantly different across treatment arms. The exception, which is marginally significant, is that CHWs assigned to task significance plus endorsement (video) are 4 percentage points less likely to have complete administrative records and 7 percentage points more likely to have at least one household interviewed by phone (compared to the video control group).

## 5.2 Treatment effects of incentives - main outcomes

In this section, we analyze treatment effects on our main outcome variables related to CHW performance and household health. We employ specifications 1 and 2 but focus attention on the incentive treatments, i.e., on the effect of Social status (award, ceremony, and SMS) and of Task significance (video), which blends the task significance treatments with and without endorsements by traditional healers. This analysis enables reporting about the validity of Hypothesis 1. We also explicitly show the treatment effect of the Information/placebo video, which allows testing Hypothesis 2, on the difference between the Task significance treatments over that of the first component of the video.

We begin our analysis of main outcome variables with measures of direct CHW performance. These are shown in Table 2. Columns (1) to (4) are dedicated to administrative data for CHWs, i.e., at the level of the CHW. Specifically, we analyze CHW dropout in February 2019, three months after the end of the interventions, the share of monthly reports submitted by CHWs during the time they were active, the test score of CHWs in examinations taken during monthly meetings, and the evaluation score of CHWs attributed by their supervisors. Columns (5) to (10) are devoted to household survey data from the endline phone survey (5)-(7), and

from the endline face-to-face survey (8)-(10), i.e., at the level of the household. The specific outcome variables we observe are the total number of CHW visits reported by the households (including and excluding zeros), as well as household satisfaction with the CHWs.

We find positive treatment effects of Social status on several outcome variables related to CHW direct performance. This is clearly the case for performance scores of CHWs from administrative data, CHW home visits, and household satisfaction with the CHWs. We observe that test scores improve by 1 percent and that supervisory scores improve by 2 percent, with both statistically significant at the 10 percent level. Total home visits increase by 0.38 (phone survey), with this number being 0.66 (face-to-face survey) if one conditions on a positive number of visits per household (both estimates are significant at the 10 percent level). Finally, household satisfaction increases by 0.26 standard deviation units (face-to-face survey) - this effect is statistically significant at the 5 percent level. Other treatment effects of Social status are generally consistently positive, although not significant at standard levels. We also find one significant and positive effect of the Task significance video, namely for household satisfaction with the CHWs in the phone survey data. However, this effect is not robust when considering the face-to-face survey data. The effects of Social status are significantly different from those of Task significance when considering the test scores and household satisfaction with CHWs (face-to-face survey). Overall, on Hypothesis 2, we do not find clear differences between the two video treatments under consideration. Exceptions are the differences for household satisfaction with the CHWs and total home visits (conditional on being visited), which go in different directions. Still, the treatment effects of the Information/placebo video are never statistically significant.

On treatment effects related to the direct performance of CHWs, we conclude that Social status incentives were clearly effective. The same cannot be said about the Task significance video intervention. This means Hypothesis 1 is only partly verified. Hypothesis 2 is not verified, even though the impact of the Information/placebo video is never significant.

We now turn to measures of household health from the endline face-to-face household survey we conducted. Table 3 depicts results on outcome variables related to the whole surveyed household, i.e., at the household level. Specifically, we analyze knowledge of the 16 essential family practices by the survey respondent, whether the household treats water or chlorine, the number of mosquito nets in the household, and whether the household uses latrines. Note that for these outcomes, we can employ baseline data in our specification, which allows us to use the ANCOVA specification 2.

We observe a clearly positive effect of Social status when considering our knowledge dependent variable. The magnitude is 0.41 correct answers, statistically significant at the 1 percent level. The mean of the control group is relatively high: 23 correct answers out of 28. Note that this effect is consistent with the direct effects on CHW performance, namely those on CHW learning (assessed through the test scores of CHWs, which included knowledge of the essential family practices) and house visiting efforts: it is likely that Social status incentives triggered effects on education for health in the households. Note that this effect is significantly different from that of the Task significance video intervention (at the 1 percent level of statistical



confidence). We do not find other clear effects of Social status, except for a negative effect on the treating of water by the households (only for the ANCOVA specification). This is possibly evidence that there was more emphasis on other aspects of education for health, which were less known to households, with negative effects on this specific dimension. Although there were no significant impacts of the Task significance treatment, the negative effect of Information/placebo for knowledge of the essential family practices makes Task significance have an added positive effect which is statistically significant.

In Table 4 we show treatment effects on outcomes related to the health of children under 5 years old. Our estimations are at the level of the child under 5 living in households interviewed in the endline face-to-face survey. In the case of columns (3) and (4) our sample of children is restricted to children with a vaccination bulletin. We analyze the extent to which children were vaccinated by employing an index of taking the five most important vaccines (BCG, polio, diphtheria-tetanus-pertussis, measles-mumps-rubella, and yellow fever). We employ both self-reports and observation of vaccination bulletins for individual children. We also explore results on whether children are reported to have been sick in the last 15 days before the survey, and on whether they took a malaria test conditional on having malaria symptoms. We are able to employ ANCOVA specifications for the vaccination index.

We report clear positive effects of both incentive treatments on the probability of getting all five vaccines, robust across specifications, i.e., with or without baseline dependent variables as controls, and across data sources, i.e., considering self-reports or observed bulletins. Note that levels of vaccination are relatively high: 77-89 percent control children get all five vaccines. Magnitudes are 2 to 4 percentage points for the Social status treatment, significant at the 5 or 10 percent levels, and 3 to 6 percentage points for the Task significance treatment, significant at the 5 percent level. Differences across the two incentive treatments are not statistically significant for the vaccination index. Interestingly, also the Information/placebo video has significant impacts on the same range (2 to 5 percentage points), which are indistinguishable from the effects of task significance. Turning to the other outcome variables in the table, we find statistically significant impacts of the Social status treatment. Specifically, the probability of being sick in the last 15 days before the survey decreases by 7 percentage points - this effect is significant at the 1 percent level of confidence. The probability of taking a malaria test in case symptoms of malaria appear increases by 14 percentage points - significant at the 10 percent level. We do not identify clear effects on these outcomes for the video interventions. In fact, the treatment effect of Social status is statistically different from the one of Task significance for the probability that the child was sick just before the endline survey.

Table 5 displays measures related to family planning and natal care. The level of analysis is that of women living in households interviewed in the endline face-to-face survey. In the case of columns (1) and (2) these women had to be between the ages of 12 and 49 (sexually active). In the case of the remaining columns, considered women had children born alive in the two years before the survey interview. The outcomes we analyze are on: whether women used family planning methods in the 12 months before the survey; the number of pre-natal visits to a health facility during pregnancy; an index of quality of pre-natal care averaging indicator

variables for taking pre-natal care exams (blood pressure, blood, and urine tests) and taking a vaccine (tetanus); whether women attended a post-natal visit to a health center after giving birth; whether women nursed their children after birth; and on whether women administered vitamin A to their children in the 45 days after birth. The variable on using family planning was available at the baseline and so we are able to employ the ANCOVA specification for this outcome variable.

We do not find clear effects of our incentive treatments on family planning and natal care. The exception is the probability that women administered vitamin A to their newborns in the 45 days following their birth: the Social status induces an increase in this probability of 6 percentage points, which is statistically significant at the 5 percent level. Most other treatment effects of Social status are positive but do not reach significance at standard levels. We do not find any statistically significant differences between Social status and Task significance. The same happens to the difference between the two video treatments under consideration.

On treatment effects related to household health, we reach the conclusion that Social status incentives had some positive effects. This is the case for knowledge about health practices in the household, vaccination of children, likelihood that children are not sick, likelihood that sick children take a malaria test, and administration of vitamin A to newborns. Apart from positive effects on vaccination of children, we do not find clear impacts of the Task significance intervention. This means Hypothesis 1 is only verified for Social status. Overall, we do not find evidence in favor of Hypothesis 2, on the added effect of Task significance over that of the first component of the video.

### 5.3 Aggregation and additional treatment effects

In order to address the risks posed by the analysis of multiple outcomes, we now turn to aggregating the outcomes we analyzed in detail in the previous section. We bundle outcomes in indices that are built using the procedure detailed in [Kling, Liebman, and Katz \(2007\)](#). We then calculate within-sample z-scores for each individual outcome, employing the mean and the standard deviation of the pure control group. Subsequently, we obtain the unweighted average z-score for each set. We define indices as a function of level of analysis and source. Specifically, we consider indices on: CHW performance, employing administrative data at the level of the CHW, built from outcomes in columns (1)-(4) of [Table 2](#); home visits, using phone survey at the level of the household, built from outcomes in columns (5)-(7) of [Table 2](#); home visits, utilizing face-to-face survey at the level of the household, built from outcomes in columns (8)-(10) of [Table 2](#); household health, employing face-to-face survey data at the level of the household, built from the outcomes of [Table 3](#); health of children under 5 years old, using face-to-face survey data at the level of the household child, built from the outcomes in [Table 4](#); natal care, utilizing face-to-face survey data at the level of the responding woman, built from the outcomes in [Table 5](#).

[Figure 2](#) shows treatment effects analogous to the ones shown in the previous section on the aggregate indices we describe above. We employ specification [1](#) throughout for consistency.

Confidence intervals are built using statistical significance at the 5 percent level. In face of the standardization of outcome variables embedded in the procedure we adopted, all treatment effects are in standard deviation units.

We find significant effects for the Social status treatment in the case of household health, and health of children under 5 years old. The magnitudes of these effects are: 0.05 standard deviation units for household health, significant at the 5 percent level; and 0.1 standard deviation units, significant at the 1 percent level. Effects for the other treatments, i.e., Task significance and Information/placebo, are much less clear. However, driven by the outcome variables on vaccinations of children, we find significant effects (at the 5 percent levels of statistical confidence) for Task significance when considering the index on health of children under 5 years old.

We now devote our attention to the distinction between the two task significance treatments, i.e., Task significance alone and Task significance plus endorsement by the traditional healers, and to the remaining treatment in our experimental design, the SMS information campaign. We undertake the analysis of employing aggregate indices for simplicity and display it in Figure 3. The specification employed for the analysis of all the video treatment effects, in panel (a) of the figure, is described in equation 3 above. The specification used for estimating the treatment effect of the Information campaign, in panel (b) of the figure, is the same as for Figure 2.

The results we encountered show no statistically significant differences across any of the video treatment effects. This implies Hypotheses 2 and 3 are not verified at this analysis. Despite this fact, we notice smaller effect sizes for the full video treatment (including endorsements by traditional figures) than for the simpler treatment on task significance alone when considering household health and health of children under 5 years old. These are the outcomes for which treatment effects are statistically significant when considering Task significance alone, which suggests that endorsements of traditional healers could actually be detrimental to household health outcomes. A final note goes to the fact that we do not find any statistically significant treatment effects of the Information campaign delivered through text messages to households, meaning that we could not find evidence in favor of Hypothesis 4. Possible interpretations for this null result are: (i) that many SMSs did not reach households due to attrition of phone numbers; (ii) households were sufficiently aware of CHWs activity or CHWs did not use increased trust by the households to improve their productivity.

#### 5.4 Complementarity between treatments

In this section we analyze the complementarity between incentive treatments, i.e., Social status (award, ceremony, and SMS) and Task significance (video), where we blend both task significance treatment groups, with and without endorsements by traditional healers. We also assess the complementarity between these incentive treatments and the Information campaign (SMS). Our cross-randomization design enabled all the interactions between the different treatment groups. The estimation of interaction effects employing specifications 4 and 5 allows testing

Hypothesis 5 above on the referred two types of complementarity between treatments. Here, we show analysis using the same aggregated outcomes introduced in the previous section. As a consequence, all effect sizes are expressed in standard deviation units.

Table 6 shows results on complementarity between incentive treatments. The main effect of interest is that of the interaction between Social status and Task significance. We do not find any statistically significant interaction coefficient. Still, all outcomes but CHW performance (administrative data) have positive magnitudes, which are indistinguishable (statistically) from those of the interaction between Social status and Information/placebo. We report the results on complementarity between the incentive treatments and the information campaign in Table 7. The main effects of interest are those of the interactions between Social Status and Information campaign, as well as between Task significance and Information campaign. Like before, we do not find any significant interaction effect.

We conclude that there is no evidence for complementarities between incentive treatments or between those and the information campaign. This implies Hypothesis 5 is not verified in our data. A possibility is that limited statistical power prevents us from achieving statistical significance on some of these interaction effects.

## 5.5 LATE of the video treatments

We now explore the availability of data on compliance with the video treatments to identify the treatment effects of having visualized the different video interventions. Section F of the Online Appendix, more specifically, Table F1 shows the number of treatment rounds faced by CHWs in the different video comparison groups. There we see that only 7 to 11 percent of the CHWs in the video treatment groups were not exposed to any round of treatment. The average number of rounds of video treatments ranged from 2.2 to 2.3, with most CHWs in each video treatment group having watched the full three rounds of treatment. At the same time no video control CHWs watched any round of video treatment.

Table 8 shows the effects of having visualized each type of video, where we instrument visualization of a given video by the random assignment to that treatment condition. In other words, the endogenous variables of interest are defined as having visualized at least one round of the corresponding video treatments. We are thus estimating the LATE of the video treatments. While the relevance of the three instruments is difficult to dispute (notwithstanding, we show tests of weak instruments), the exclusion restriction is also likely to be valid in face of the implausibility of direct impacts of invitations to watch the video treatments. We conduct our analysis by employing as outcome measures the aggregate z-scores we introduced before.

We find clearly positive effects of watching the video on task significance alone. These are effects are on CHW performance as well as on Health of children under 5 years old. Magnitudes are 0.38 and 0.12 standard deviation units (respectively), both statistically significant at the 1 percent level of confidence. Interestingly, we find significant differences between watching the simple task significance video and watching the version including endorsements: the former

yields better outcomes than the latter for household health and health of children under 5 years old. We also note a positive and significant effect of watching the full video on CHW performance, which is not distinguishable from watching the other types of video. Differences between watching the task significance plus endorsement video and watching the information/placebo video are generally undetectable across the different outcome variables.

We conclude that watching the task significance alone video may have led to improvements in CHW performance and the health of children under 5 years of age. The difference to the weaker intent-to-treat effects suggests that treatment effects are more centered around compliers to the video treatments.

## 5.6 Additional results and robustness

We now turn to a few auxiliary results, which are reported in Section G of the Online Appendix.

First, we analyze treatment effects on CHW motivation assessed through standard survey questions on social recognition and monetary awards (Amabile et al., 1994), and on social impact (Grant and Campbell, 2007). These questions were submitted in both baseline and endline face-to-face surveys of CHWs, which allows employing ANCOVA specifications. Table G1 is devoted to the estimation of the main treatment effects, i.e., on the impact of Social status and Task significance. Table G2 reports on the other treatment effects, distinguishing between all video treatments and displaying the impact of the Information campaign.

We find positive and significant effects of Social status on social impact, consistently with the main treatment effects of social impact we document in this paper. Magnitudes are 1 percent of the scale employed, with confidence levels at the 1 or 10 percent. These effects are however indistinguishable from those of task significance. We also find clear effects of the Task significance alone video on social impact. Effect sizes are 2 percent of the scale employed, significant at the 10 percent level. We observe significant differences of the simple Task significance video treatment to the full video treatment on social impact, consistently with negative marginal effects of endorsements of traditional figures.

Second, we report in Table G3 the main treatment effects on different dimensions of household knowledge about the essential family practices conveyed by CHWs to households as part of their CHW mandate. The outcomes are constructed from questions in the endline face-to-face household survey. We distinguish between knowledge about newborn care, nutrition, hygiene/washing hands, use of latrines, water treatment, preventive measures about tuberculosis and HIV, pre-natal care, alert signals of illnesses, and family planning.

We observe positive treatment effects for Social status on knowledge about newborn care, nutrition, and washing hands. These effects range from 3 to 5 percentage points, with all of them statistically significant at the 1 percent level and different from the treatment effects of Task significance. We also find a negative effect of Social status on knowledge about water treatment, which is marginally significant and consistent with the result on treating water of Table 3.

A final note goes to robustness exercises we conduct on the choice of control variables for CHWs and households and multiple hypothesis testing. In Section H of the Online Appendix we show the replication of the main results of the paper while employing the Post-double Selection Lasso procedure for selecting the referred control variables. In Section I of the Online Appendix we report p-values of the procedure described in Romano and Wolf (2016), which we employ to account for multiple hypothesis at the row level of each of the main tables of the paper. We do not identify any relevant departure from the overall benchmark results of the paper.

## 6 Concluding remarks

In this paper we report on the results of a field experiment testing the impact of non-financial incentives for CHWs in Guinea-Bissau. Specifically, we follow the activation of social status, through the attribution of honorific awards for good performance, and of intrinsic motivation, through a video treatment that establishes the task significance of CHWs in saving lives. We vary the components of the video to isolate the impact of a basic video without the task significance component, and the marginal impact of endorsements by traditional healers. We also follow a simple SMS information treatment aimed to raise awareness about CHWs in the communities. Our design enables testing complementarity between the different treatments. The main finding is that raising the social status of CHWs is effective at improving their direct performance in terms of learning about their role and home visits, as well as household health in terms of household knowledge of good practices and the health of children under 5 years old, e.g., through higher rates of vaccination, treatment of malaria, and nutrition of newborns. We find weak but positive effects of the task significance video, which are difficult to distinguish from the basic video treatment. Endorsements of traditional healers are not improving our outcomes of interest, the information campaign had no effects, and we find no clear complementarity between treatments.

In settings like the one we study in Guinea-Bissau, volunteer health workers constitute an essential part of the health system. It is a shared belief by all stakeholders in the system that no easy path to professionalizing these volunteers is available due to limited resources. Although the role of financial incentives/professionalization is likely important, this paper devotes attention to short run and inexpensive strategies to keep CHWs motivated. We show that increasing the social status of these health workers, while incentivizing worker learning about health practices, is an effective strategy to improve their performance and impact relevant dimensions of household health. The policy recommendation is clear in face of the reduced costs of this type of intervention. More work is needed on understanding the triggers of intrinsic motivation for pro-social behavior.

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# Figures and tables

Figure 1: Timeline

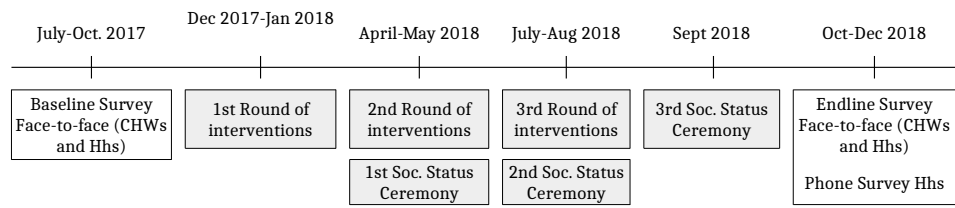
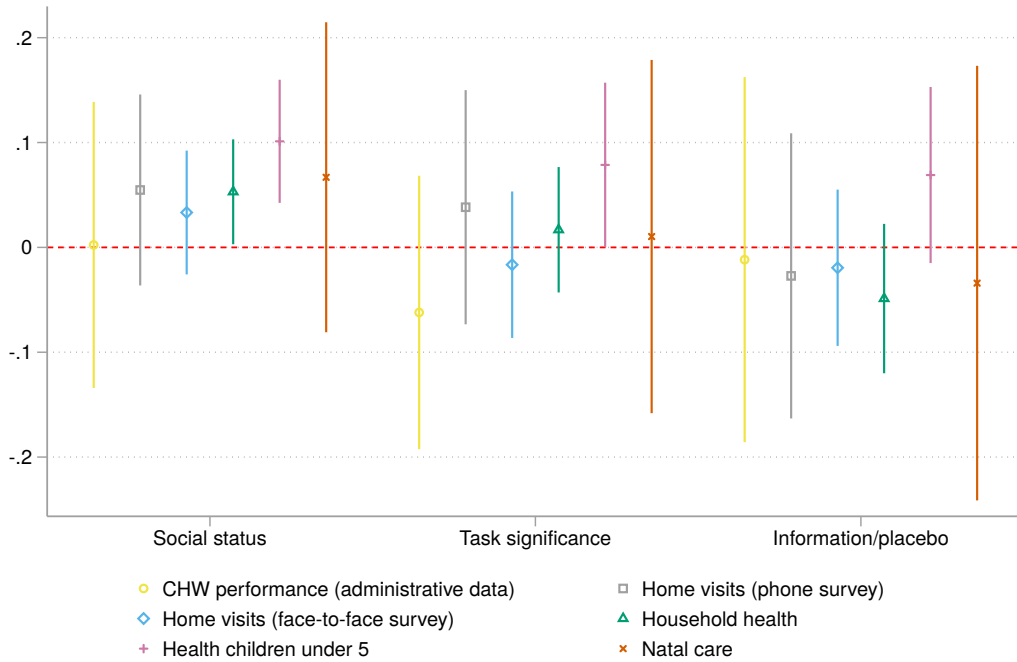
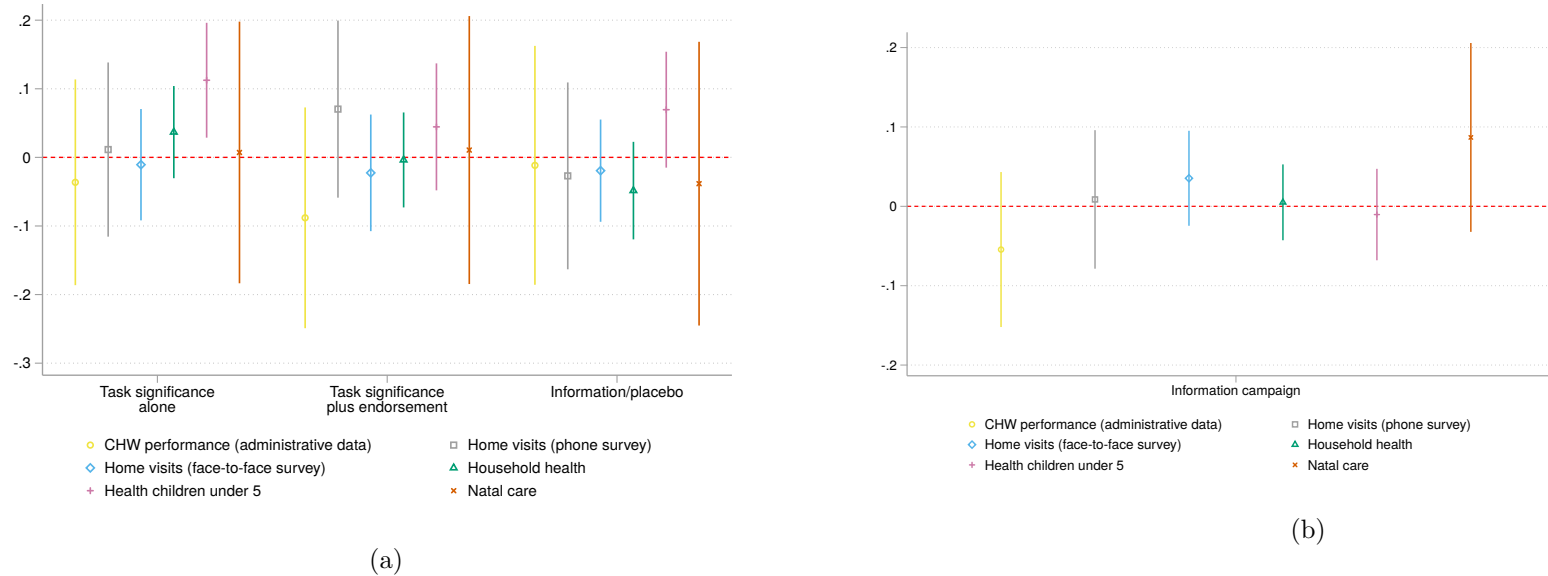


Figure 2: Main treatment effects - aggregated outcomes employing z-scores



Note: Estimates based on OLS regressions using Equation 1. Outcomes are grouped in indices that are built using the procedure in [Kling, Liebman, and Katz \(2007\)](#). We calculate within-sample z-scores for each individual outcome, employing the mean and the standard deviation of the pure control group. We then obtain the unweighted average z-score for each category. The indices are defined by the following outcomes: (1) CHW performance (administrative data): formed from outcomes in columns (1)-(4) of Table 2; (2) Home visits (phone survey): formed from outcomes in columns (5)-(7) of Table 2; (3) Home visits (face-to-face survey): formed from outcomes in columns (8)-(10) of Table 2; (4) Household health (face-to-face survey): formed from the outcomes of Table 3; (5) Health of children under 5 (face-to-face survey): formed from the outcomes in Table 4; (5) Natal care (face-to-face survey): formed from the outcomes in Table 5. All specifications employed include an indicator variable for assignment to the Information campaign treatment, strata fixed effects, and CHW level controls. Specifications in the third to the sixth bar include household level controls. The specification in the fifth bar includes age fixed effects for the children under 5 years old. The specification in the sixth bar includes respondent's age. The full list of controls is presented in Section 4. Confidence intervals are built using statistical significance at the 5 percent level. In the first bar standard errors are clustered at neighborhood level and in the remaining ones at CHW level.

Figure 3: Other treatment effects - aggregated outcomes employing z-scores



(a)

(b)

Note: Estimates based on OLS regressions. (a) presents estimates using Equation 3 and (b) presents estimates using Equation 1. Outcomes are grouped in indices that are built using the procedure in Kling, Liebman, and Katz (2007). We calculate within-sample z-scores for each individual outcome, employing the mean and the standard deviation of the pure control group. We then obtain the unweighted average z-score for each category. The indices are defined by the following outcomes: (1) CHW performance (administrative data): formed from outcomes in columns (1)-(4) of Table 2; (2) Home visits (phone survey): formed from outcomes in columns (5)-(7) of Table 2; (3) Home visits (face-to-face survey): formed from outcomes in columns (8)-(10) of Table 2; (4) Household health (face-to-face survey): formed from the outcomes of Table 3; (5) Health of children under 5 (face-to-face survey): formed from the outcomes in Table 4; (5) Natal care (face-to-face survey): formed from the outcomes in Table 5. All specifications employed include an indicator variable for assignment to the Information campaign treatment, strata fixed effects, and CHW level controls. Specifications in the third to the sixth bar include household level controls. The specification in the fifth bar includes age fixed effects for the children under 5 years old. The specification in the sixth bar includes respondent's age. The full list of controls is presented in Section 4. Confidence intervals are built using statistical significance at the 5 percent level. In the first bar standard errors are clustered at neighborhood level and in the remaining ones at CHW level.

Table 1: Experimental design – number of CHWs per treatment group

	Social status		Total
	Information campaign	Control	
Task significance alone	64	59	123
Task significance plus endorsement	61	63	124
Information/placebo	63	67	130
Control	60	64	124
Total	248	253	501

	Information campaign		Control		Total
	Information campaign	Control	Information campaign	Control	
Task significance alone	63	68	63	68	262
Task significance plus endorsement	61	64	65	64	254
Information/placebo	63	60	64	60	247
Control	60	63	67	63	253
Total	247	255	259	255	1,016

Table 2: Direct CHW performance

	Administrative data									
	Phone survey					Face-to-face survey				
	Home visits		Home visits		Home visits		Home visits		Home visits	
CHW dropout	CHW reports submitted - share	CHW test score - training	CHW evaluation score by supervisor	Total	Total - conditional on being visited	Household satisfaction with the CHWs	Total	Total - conditional on being visited	Household satisfaction with the CHWs	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
Social status	0.01 (0.03)	-0.03 (0.03)	0.09* (0.05)	0.07* (0.04)	0.38* (0.23)	0.39 (0.25)	0.12 (0.07)	0.17 (0.21)	0.66* (0.39)	0.26** (0.10)
Task significance	0.04 (0.03)	-0.02 (0.03)	-0.10 (0.09)	0.06 (0.07)	0.00 (0.28)	0.03 (0.30)	0.20** (0.08)	0.12 (0.24)	0.68 (0.44)	-0.11 (0.11)
Information/placebo	0.02 (0.04)	-0.02 (0.03)	-0.09 (0.10)	0.10 (0.11)	-0.29 (0.34)	-0.20 (0.36)	0.03 (0.10)	-0.03 (0.25)	-0.13 (0.47)	-0.10 (0.12)
Observations	1015	1015	939	936	1819	1443	1465	1645	775	685
R <sup>2</sup>	0.10	0.15	0.09	0.10	0.10	0.11	0.12	0.09	0.19	0.18
Mean (control group)	0.16	0.62	-0.00	0.01	2.90	3.74	-0.00	1.80	3.64	0.00
<i>P-values:</i>										
Joint test all treatments	0.515	0.630	0.286	0.344	0.327	0.456	0.028	0.541	0.067	0.136
Joint test video	0.416	0.690	0.526	0.644	0.527	0.700	0.017	0.802	0.149	0.584
Social status = Task significance	0.450	0.891	0.054	0.838	0.260	0.334	0.460	0.854	0.963	0.020
Information/placebo = Task significance	0.484	0.897	0.897	0.627	0.269	0.401	0.044	0.535	0.078	0.891

Note: Estimates based on OLS regressions. Columns (1)-(10) present estimates using Equation 1. Estimation sample in columns (1)-(4) consists of CHWs for whom we have administrative records; estimation sample in columns (5)-(7) consists of households interviewed in the endline phone survey; estimation sample in columns (8)-(10) consists of households interviewed in the endline face-to-face survey. Depending on the column the dependent variables are defined by the following. (1) CHW dropout: indicator variable equal to 1 if the CHW dropped out the program by February 2019. (2) CHW reports submitted - share: number of monthly reports submitted by the CHW divided by the number of months that the CHW was active from October 2017 to November 2018. (3) CHW test score - training: average score in the monthly meetings' examinations from May to October 2018; score ranges from 0 to 20 and is normalized (z-score) within supervisor. (4) CHW evaluation score by supervisor: average score from supervisors' monthly report on CHW's performance, from January to November 2018; score ranges from 1 to 5 and is normalized (z-score) within supervisor. (5) and (8) Home visits - total: total number of CHW home visits received since the start of the program. (6) and (9) Home visits - conditional on being visited: total number of CHW home visits received since the start of the program conditional on being visited at least once. (7) and (10) Household satisfaction with the CHWs: respondent's level of satisfaction with the activity of the CHW conditional on being visited at least once by a CHW; this variable is normalized (z-score) relative to the pure control group. All specifications include an indicator variable for assignment to the Information campaign treatment, strata fixed effects, and CHW level controls. Specifications (8)-(10) include household level controls. The full list of controls is presented in Section 4. Standard errors are reported in parentheses. In columns (1) to (4) standard errors are clustered at neighborhood level and in columns (5) to (11) at CHW level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 3: Household health

	Face-to-face survey													
	Knowledge 16 EFPs	Household treats water	Number of mosquito nets	Use of latrines	(1)	(2)	(3)	(4)	(5)	(6)	(7)			
Social status	0.41*** (0.09)	-0.03 (0.02)	-0.04** (0.02)	-0.03 (0.08)	-0.05 (0.08)	0.01 (0.03)	0.00 (0.03)	1744	1752	1749	1752	1719	1752	1749
Task significance	0.01 (0.11)	0.00 (0.02)	-0.00 (0.02)	0.04 (0.10)	0.04 (0.10)	0.02 (0.03)	0.02 (0.03)	0.01 (0.12)	0.01 (0.12)	-0.03 (0.04)	0.02 (0.04)	0.02 (0.04)	0.02 (0.04)	0.02 (0.04)
Information/placebo	-0.24* (0.13)	-0.01 (0.03)	-0.01 (0.03)	0.05 (0.12)	0.01 (0.12)	-0.03 (0.04)	-0.03 (0.04)	0.05 (0.12)	0.01 (0.12)	-0.03 (0.04)	-0.03 (0.04)	0.01 (0.12)	-0.03 (0.04)	-0.03 (0.04)
Observations	1744	1752	1749	1752	1719	1752	1749	1752	1719	1752	1749	1719	1752	1749
R <sup>2</sup>	0.24	0.07	0.10	0.42	0.44	0.14	0.10	0.42	0.44	0.14	0.10	0.44	0.14	0.14
Mean (control group)	23.18	0.32	0.32	3.87	3.87	0.53	0.32	3.87	3.87	0.53	0.32	3.87	0.53	0.53
<i>P-values:</i>														
Joint test all treatments	0.000	0.442	0.215	0.979	0.969	0.684	0.215	0.979	0.969	0.684	0.215	0.969	0.684	0.685
Joint test video	0.084	0.894	0.944	0.893	0.922	0.381	0.944	0.893	0.922	0.381	0.944	0.922	0.381	0.374
Social status = Task significance	0.005	0.281	0.206	0.623	0.504	0.803	0.206	0.623	0.504	0.803	0.206	0.504	0.803	0.735
Information/placebo = Task significance	0.034	0.637	0.769	0.870	0.783	0.165	0.769	0.870	0.783	0.165	0.769	0.783	0.165	0.162
ANCOVA specification	No	No	Yes	No	Yes	No	Yes	No	Yes	No	No	Yes	No	Yes

Note: Estimates based on OLS regressions. Columns (1), (2), (4), and (6) present estimates using Equation 1, columns (3), (5), and (7) present estimates using Equation 2, which includes the lagged dependent variable (ANCOVA). Estimation sample consists of households interviewed in the endline face-to-face survey. Depending on the column the dependent variables are defined by the following. (1) Knowledge 16 EFPs: number of correct answers to 28 questions measuring household knowledge of the 16 basic essential family practices and of family planning; this variable ranges from 0 to 28. (2)-(3) Household treats water: indicator variable that takes value of 1 for households who report treating water with bleach or chlorine. (4)-(5) Number of mosquito nets: total number of mosquito nets available in the house. (6)-(7) Use of latrines: indicator variable that takes value of 1 for households who report using latrines. All specifications include an indicator variable for assignment to the Information campaign treatment, strata fixed effects, as well as CHW and household level controls. The full list of controls is presented in Section 4. Standard errors are reported in parentheses. Standard errors are clustered at CHW level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 4: Health of children under 5 years old

	Face-to-face survey					
	Vaccination index (5 vaccines)			Observed bulletin		
	Self-reported	Observed bulletin	Sick in the last 15 days	Observed bulletin	Sick in the last 15 days	Took a malaria test if sick
(1)	(2)	(3)	(4)	(5)	(6)	
Social status	0.02* (0.01)	0.02* (0.01)	0.03 (0.02)	0.04** (0.02)	-0.07*** (0.02)	0.14* (0.07)
Task significance	0.03** (0.01)	0.03** (0.01)	0.06** (0.03)	0.06** (0.02)	-0.01 (0.03)	0.02 (0.08)
Information/placebo	0.02* (0.01)	0.02* (0.01)	0.06** (0.03)	0.05** (0.03)	-0.01 (0.04)	-0.06 (0.08)
Observations	1378	1377	999	810	1460	316
R <sup>2</sup>	0.22	0.23	0.21	0.27	0.16	0.22
Mean (control group)	0.89	0.89	0.77	0.77	0.23	0.41
<i>P-values:</i>						
Joint test all treatments	0.086	0.072	0.032	0.035	0.034	0.303
Joint test video	0.063	0.046	0.033	0.041	0.971	0.545
Social status = Task significance	0.423	0.331	0.321	0.567	0.073	0.251
Information/placebo = Task significance	0.486	0.322	0.954	0.839	0.960	0.290
ANCOVA specification						
	No	Yes	No	Yes	No	No

Note: Estimates based on OLS regressions. Columns (1), (3), (5), and (6) present estimates using Equation 1, columns (2) and (4) present estimates using Equation 2, which includes the lagged dependent variable (ANCOVA). Estimation sample in columns (1), (2), (5) and (6) consists of children under 5 years old living in households interviewed in the endline face-to-face survey; estimation sample in columns (3) and (4) is restricted to children under 5 years old with a vaccination bulletin. Depending on the column the dependent variables are defined by the following: (1)-(4) Vaccination index (5 vaccines): index variable averaging 5 indicator variables for taking each of the following vaccines: BCG, polio, DTcoq (diphtheria-tetanus-pertussis), MMR, and yellow fever; columns (1) and (2) employ self-reported data, columns (3) and (4) employ information directly observed in the vaccination bulletins. (5) Sick in the last 15 days: indicator variable that takes value 1 for children who were reported to be sick (had any fever or diarrhea) in the 15 days previous to the interview. (6) Took a malaria test if sick: indicator variable that takes value 1 for children who had malaria symptoms and took a malaria test, and 0 for children who had malaria symptoms but who did not take a malaria test. All specifications include an indicator variable for assignment to the Information campaign treatment, strata fixed effects, CHW and household level controls, as well as children's age fixed effects. The full list of controls is presented in Section 4. Standard errors are reported in parentheses. Standard errors are clustered at CHW level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



Table 5: Family planning and natal care

	Face-to-face survey						
	Use of family planning	Number of pre-natal visits	Pre-natal care index	Post-natal visit	Nursing	Administered vitamin A in the 45 days after giving birth	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Social status	0.03 (0.02)	0.01 (0.02)	0.07 (0.29)	0.06 (0.05)	-0.02 (0.08)	0.07 (0.06)	0.06** (0.03)
Task significance	0.02 (0.02)	0.01 (0.02)	-0.15 (0.34)	-0.04 (0.05)	0.10 (0.09)	0.07 (0.08)	0.02 (0.04)
Information/placebo	0.03 (0.03)	0.03 (0.03)	-0.29 (0.41)	-0.04 (0.07)	0.04 (0.11)	0.05 (0.08)	0.07 (0.07)
Observations	3182	2589	208	209	209	209	209
R <sup>2</sup>	0.10	0.16	0.34	0.28	0.42	0.33	0.37
Mean (control group)	0.36	0.36	5.12	0.95	0.56	0.94	0.00
<i>P-values:</i>							
Joint test all treatments	0.499	0.778	0.635	0.562	0.552	0.517	0.374
Joint test video	0.504	0.473	0.778	0.730	0.477	0.661	0.586
Social status = Task significance	0.883	0.995	0.613	0.157	0.288	0.996	0.412
Information/placebo = Task significance	0.879	0.366	0.644	0.883	0.536	0.822	0.348
ANCOVA specification	No	Yes	No	No	No	No	No

Note: Estimates based on OLS regressions. Columns (1) and (3)-(7) present estimates using Equation 1, column (2) presents estimates using Equation 2, which includes the lagged dependent variable (ANCOVA). Estimation sample in columns (1) and (2) consists of women between the ages of 12 and 49, sexually active, and living in households interviewed in the endline face-to-face survey; estimation sample in columns (3)-(7) consists of women living in households interviewed in the endline face-to-face survey with children born alive in the two years previous to the interview. Depending on the column the dependent variables are defined by the following. (1)-(2) Use of family planning: indicator variable that takes value 1 for women who report having used a family planning method in the last 12 months. (3) Number of pre-natal visits: number of pre-natal visits to a health facility during pregnancy, (4) Pre-natal care index: index variable averaging 4 indicator variables for the following pre-natal care exams and vaccine: blood pressure, blood test, urine test, and tetanus vaccine. (5) Post-natal visit: indicator variable that takes value 1 for women who attended a post-natal visit to a health center after giving birth. (6) Nursing: indicator variable that takes value 1 for women who breast fed after giving birth. (7) Administered vitamin A in the 45 days after giving birth: indicator variable that takes value 1 for women whose newborn was given vitamin A 45 days after birth. All specifications include an indicator variable for assignment to the Information campaign treatment, strata fixed effects, CHW and household level controls, as well as women age. The full list of controls is presented in Section 4. Standard errors are reported in parentheses. Standard errors are clustered at CHW level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 6: Complementarity between incentive treatments - aggregated outcomes employing z-scores

	Administrative data		Phone survey		Face-to-face survey			
	CHW performance		Home visits		Home visits	Household health	Health of children under 5 years old	Natal care
	(1)	(2)	(3)	(4)	(5)	(6)	(6)	(6)
Social status	0.07 (0.11)	-0.05 (0.10)	0.02 (0.06)	0.00 (0.05)	0.07 (0.07)	-0.12 (0.16)		
Task significance	-0.04 (0.10)	-0.04 (0.09)	-0.04 (0.05)	-0.01 (0.04)	0.05 (0.06)	-0.10 (0.14)		
Social status×Task significance	-0.05 (0.13)	0.14 (0.12)	0.04 (0.07)	0.05 (0.06)	0.06 (0.08)	0.20 (0.19)		
Information/placebo	0.07 (0.10)	-0.09 (0.10)	-0.00 (0.06)	-0.10* (0.05)	0.07 (0.06)	-0.22 (0.17)		
Social status×Information/placebo	-0.16 (0.17)	0.13 (0.14)	-0.04 (0.08)	0.10 (0.07)	-0.00 (0.09)	0.32* (0.19)		
Observations	1015	2034	1748	1752	1460	210		
R <sup>2</sup>	0.12	0.09	0.09	0.26	0.17	0.29		
Mean (control group)	-0.02	-0.08	-0.16	-0.00	0.10	1.52		
<i>P-values:</i>								
Joint test social status	0.470	0.150	0.801	0.067	0.207	0.071		
Joint test task significance	0.310	0.169	0.955	0.343	0.047	0.377		
Joint test placebo	0.526	0.706	0.469	0.983	0.281	0.332		
Social status×Task significance = Social status×Information/placebo	0.475	0.906	0.277	0.465	0.366	0.453		

Note: Estimates based on OLS regressions using equation 4. Outcomes are grouped in indices that are built using the procedure in Kling, Liebman, and Katz (2007). We calculate within-sample z-scores for each individual outcome, employing the mean and the standard deviation of the pure control group. We then obtain the unweighted average z-score for each category. Depending on the column, the indices are defined by the following outcomes: (1) CHW performance (administrative data); formed from outcomes in columns (1)-(4) of Table 2; (2) Home visits (phone survey): formed from outcomes in columns (5)-(7) of Table 2; (3) Home visits (face-to-face survey): formed from outcomes in columns (8)-(10) of Table 2; (4) Household health (face-to-face survey): formed from the outcomes of Table 3; (5) Health of children under 5 years old (face-to-face survey): formed from the outcomes in Table 4; (5) Natal care (face-to-face survey): formed from the outcomes in Table 5. All specifications employed include an indicator variable for assignment to the Information campaign treatment, strata fixed effects, and CHW level controls. Specifications in columns (3)-(6) include household level controls. The specification in column (5) includes age fixed effects for the children under 5 years old. The specification in column (6) includes respondent's age. The full list of controls is presented in Section 4. Standard errors are reported in parentheses. In column (1) standard errors are clustered at neighborhood level and in the remaining ones at CHW level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 7: Complementarity between incentive treatments and the information campaign - aggregated outcomes employing z-scores

	Administrative data		Phone survey		Face-to-face survey		
	CHW performance	Home visits	Home visits	Household health	Health of children under 5 years old	Natal care	
	(1)	(2)	(3)	(4)	(5)	(6)	(6)
Social status	-0.06 (0.09)	0.06 (0.06)	0.07 (0.04)	0.03 (0.04)	0.07 (0.04)	0.17 (0.11)	0.17 (0.11)
Social status×Information campaign	0.13 (0.09)	-0.00 (0.09)	-0.06 (0.06)	0.04 (0.05)	0.06 (0.06)	-0.17 (0.14)	-0.17 (0.14)
Task significance	-0.04 (0.09)	-0.02 (0.08)	0.02 (0.05)	0.01 (0.04)	0.07 (0.06)	0.07 (0.13)	0.07 (0.13)
Task significance×Information campaign	-0.06 (0.13)	0.12 (0.12)	-0.07 (0.07)	0.00 (0.06)	0.02 (0.08)	-0.11 (0.19)	-0.11 (0.19)
Information/placebo	-0.02 (0.12)	-0.07 (0.09)	-0.05 (0.05)	-0.07 (0.05)	0.12* (0.06)	0.20 (0.13)	0.20 (0.13)
Information/placebo×Information campaign	0.02 (0.17)	0.08 (0.14)	0.06 (0.08)	0.05 (0.07)	-0.09 (0.09)	-0.45** (0.20)	-0.45** (0.20)
Information campaign	-0.10 (0.09)	-0.07 (0.11)	0.08 (0.06)	-0.03 (0.05)	-0.02 (0.07)	0.36** (0.17)	0.36** (0.17)
Observations	1015	2034	1748	1752	1460	210	210
R <sup>2</sup>	0.12	0.09	0.09	0.26	0.17	0.32	0.32
Mean (control group)	-0.02	-0.08	-0.16	-0.00	0.10	1.52	1.52
<i>P-values:</i>							
Joint test social status	0.378	0.440	0.904	0.033	0.002	0.990	0.990
Joint test task significance	0.341	0.229	0.334	0.688	0.102	0.749	0.749
Joint test information/placebo	0.986	0.879	0.843	0.663	0.663	0.091	0.091
Joint test information campaign	0.996	0.412	0.863	0.398	0.691	0.097	0.097
Task significance×Inf. campaign=Information/placebo×Inf. campaign	0.599	0.721	0.079	0.461	0.127	0.039	0.039

Note: Estimates based on OLS regressions using equation 5. Outcomes are grouped in indices that are built using the procedure in Kling, Liebman, and Katz (2007). We calculate within-sample z-scores for each individual outcome, employing the mean and the standard deviation of the pure control group. We then obtain the unweighted average z-score for each category. Depending on the column, the indices are defined by the following outcomes: (1) CHW performance (administrative data): formed from outcomes in columns (1)-(4) of Table 2; (2) Home visits (phone survey): formed from outcomes in columns (5)-(7) of Table 2; (3) Home visits (face-to-face survey): formed from outcomes in columns (8)-(10) of Table 2; (4) Household health (face-to-face survey): formed from the outcomes of Table 3; (5) Health of children under 5 years old (face-to-face survey): formed from the outcomes in Table 4; (5) Natal care (face-to-face survey): formed from the outcomes in Table 5. All specifications employed include, strata fixed effects, and CHW level controls. Specifications in columns (3)-(6) include household level controls. The specification in column (5) includes age fixed effects for the children under 5 years old. The specification in column (6) includes respondent's age. The full list of controls is presented in Section 4. Standard errors are reported in parentheses. In column (1) standard errors are clustered at neighborhood level and in the remaining ones at CHW level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table 8: LATE of the video treatments - aggregated outcomes employing z-scores

	Administrative data		Phone survey		Face-to-face survey		
	CHW performance	Home visits	Home visits	Household health	Health of children under 5 years old	Natal care	
	(1)	(2)	(3)	(4)	(5)	(6)	
Task significance alone	0.38*** (0.10)	0.03 (0.07)	0.05 (0.05)	0.03 (0.04)	0.13*** (0.05)	-0.12 (0.09)	
Task significance plus endorsement	0.39*** (0.11)	0.09 (0.07)	0.05 (0.05)	-0.03 (0.04)	0.05 (0.05)	-0.15 (0.10)	
Information/placebo	0.41*** (0.11)	-0.02 (0.07)	0.04 (0.04)	-0.05 (0.04)	0.06 (0.05)	-0.19** (0.09)	
Observations	1015	2034	1748	1752	1463	209	
Mean (control group)	-0.02	-0.08	-0.16	-0.00	0.10	1.52	
<i>Test of weak instruments - F-statistic</i>							
Task significance alone	63068.2	16203.6	39907.5	39792.4	16254.0	1538.7	
Task significance plus endorsement	18083.4	29787.2	18315.4	18544.3	4938.7	321.2	
Information/placebo	45352.4	20136.1	27301.7	27921.8	9422.9	575.5	
<i>P-values:</i>							
Task significance alone=Task significance plus endorsement	0.902	0.331	0.899	0.113	0.051	0.796	
Task significance alone=Information/placebo	0.766	0.469	0.766	0.042	0.105	0.388	
Task significance plus endorsement=Information/placebo	0.830	0.082	0.877	0.632	0.688	0.576	

Note: Estimates based on Two-stage Least Squares (2SLS) estimation, where random assignment to Task significance alone, Task significance plus endorsement, and Information/placebo are used as instrumental variables for (respectively) having visualized the interactive video on task significance, the interactive video on task significance plus the endorsements by the traditional healers, and the information/placebo video. The specification of the second stage is given by equation 3). The F-statistics of the tests of weak instruments are displayed at the bottom of the table. Outcomes are grouped in indices that are built using the procedure in Kling, Liebman, and Katz (2007). We calculate within-sample z-scores for each individual outcome, employing the mean and the standard deviation of the pure control group. We then obtain the unweighted average z-score for each category. Depending on the column, the indices are defined by the following outcomes: (1) CHW performance (administrative data): formed from outcomes in columns (1)-(4) of Table 2; (2) Home visits (phone survey): formed from outcomes in columns (5)-(7) of Table 2; (3) Home visits (face-to-face survey): formed from outcomes in columns (8)-(10) of Table 2; (4) Household health (face-to-face survey): formed from the outcomes of Table 3; (5) Health of children under 5 years old (face-to-face survey): formed from the outcomes in Table 4; (6) Household health (face-to-face survey): formed from the outcomes in Table 5. All specifications employed include an indicator variable for assignment to the Information campaign treatment, strata fixed effects, and CHW level controls. Specifications in columns (3)-(6) include household level controls. The specification in column (5) includes age fixed effects for the children under 5 years old. The specification in column (6) includes respondent's age. The full list of controls is presented in Section 4. Standard errors are reported in parentheses. In column (1) standard errors are clustered at neighborhood level and in the remaining ones at CHW level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

ONLINE APPENDIX

**A CHW program details**

Table A1: Essential family practices - CHWs

EFP1	The mother feeds her baby through exclusive breastfeeding until the 6th month and administers vitamin A (mono-dose) 45 days after birth.
EFP2	The mother introduces her baby to adequate complementary food starting at 6 months and continues with breastfeeding until the 24th month after birth.
EFP3	The mother must regularly weigh her child until the 5th year of age.
EFP4	Children between 0 and 59 months and all pregnant women sleep under a bed net.
EFP5	The members of the family wash their hands with soap and water after having used the toilet, before preparing food, and before feeding the child.
EFP6	Families use latrines to eliminate excrement (feces, diapers of the children, etc).
EFP7	Families treat potable water with ammonia or chlorine tabs.
EFP8	The members of the family know the practices to prevent tuberculosis (ionized preventive therapy) and HIV/AIDS.
EFP9	The mother gives SRO/zinc to the child in case of diarrhea.
EFP10	The family gives Coartem to the child for simple malaria.
EFP11	The family give Amoxicillin to the child with cough/flu/pneumonia.
EFP12	The mother ensures essential care-taking to the recently born.
EFP13	The mother makes sure her child gets proper and complete vaccination until the 11th month.
EFP14	The mother gives vitamin A to her child starting from the 6th month and deworms her child starting from the 12th month.
EFP15	The pregnant woman goes through the four prenatal control visits before giving birth.
EFP16	The family recognizes alert signals of the recently born and of sick children, the obstetric risks, and seeks preventive care.

## B Interventions

### B.1 Social Status

In each round of treatment, all awarded CHWs received an honorific prize in the form of an artisan vassal named *cabaça* in Portuguese.

Figure 4: Example of a social status award



All households assigned to an awarded CHW received in the days after the ceremony the following text message personalized with their CHW's name: *Your CHW (name of the CHW) deserves to be congratulated! He/she was awarded a prize for having reached outstanding results in Bissau. Praise him/her for the good job he/she did. He/she deserves!*

### B.2 Task significance

To test the effect of task significance on CHWs' performance, we designed, in collaboration with NGO VIDA, a video that replicates daily activities of a CHW, shot from the point of view of the CHW. There were three different versions of this video, each one related to a different health problem. The video was recorded in the Biombo region, neighboring Bissau city, and all the characters were interpreted by local individuals. The plot and the script were developed in close collaboration with the health authorities, and the language employed in the dialogues was Creole, the *lingua franca* in Guinea-Bissau. The video is composed of the following parts:

1. Presentation: This is an introductory part showing a CHW getting ready for a round of home visits. It includes some elements that help the person who is viewing the video to identify him/herself with the main character. For example, the video shows the notebook, backpack, and bike of the CHW program. During one of the home visits, the agent faces a health problem related to the essential family practices covered by the program. The next figure shows the household head and the health problem (child with fever). This part of the video lasts 3-4 minutes.

Figure 5: Presentation

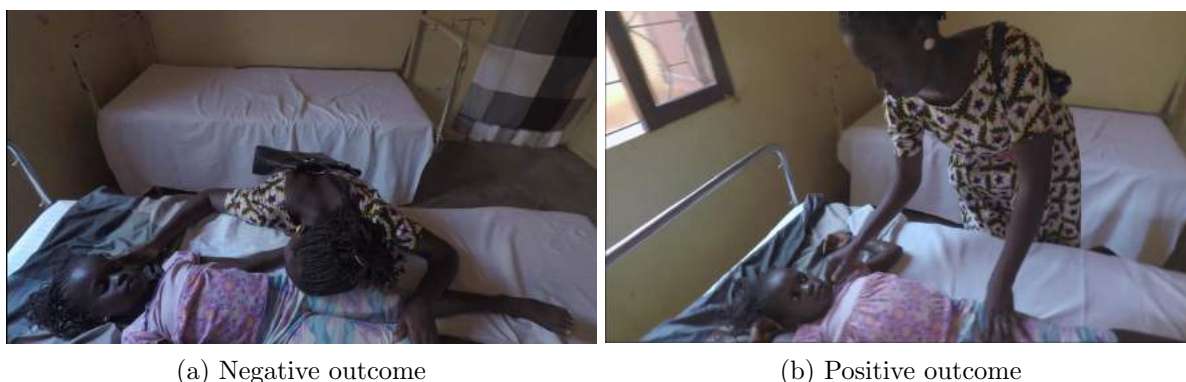


2. Interactive decision and ending: After the presentation, the video stops and the screen offers the CHW visualizing the video two options on how to proceed to solve the health problem. One option entails exerting/inducing more effort than the other option. In the next figure, we show these options for the case of the girl with fever/malaria: give rapid treatment or take the child to the health center. Depending on the choice taken by the CHW, the video follows a different path and reaches a different ending. One ending is positive (healthy child) and the other is negative (child dies) - see figure below. This part of the video lasts 3-4 minutes. After choosing one of the options and watching the corresponding ending, the CHW is asked to visualize the alternative ending.

Figure 6: Interactive choice



Figure 7: Ending



3. Endorsement of traditional healers: This part of the video includes a group of traditional healers, i.e., eminent figures in the sphere of tradition and spirituality who employ a broad range of methods to solve health and life problems. They provide an endorsement of CHWs' activities, which could also include messages of gratitude to CHWs. This part of the video lasts three minutes. The figure shown below is for one of traditional healers endorsing the CHW program.

Figure 8: Endorsement by traditional healers



There are three versions of the full video, with each version regarding a different health problem. Here are the links to parts 1 and 2 of each of the three videos:



- **Round 1:** Assistance to pregnant woman: [Android version](#) (interactive component activated) and [PC version](#) (linear mode).
- **Round 2:** Treatment of diarrhea: [Android version](#) (interactive component activated) and [PC version](#) (linear mode).
- **Round 3:** Treatment of severe malaria: [Android version](#) (interactive component activated) and [PC version](#) (linear mode).

### B.3 Information campaign

The text messages employed in the information campaign were grouped in three rounds as follows.

#### First round

- *The Regional Health Directorate and NGO VIDA are proud to promote the program to improve mother and child health in Bissau. The CHWs (Community Health Workers).*
- *All the CHWs received full training on 16 fundamental practices of family health. They are ready and available to support the health of your family!*

#### Second round

- *The CHWs benefit the health of mother and child. Open your door to the CHW and take note of his/her phone number.*
- *Your CHW is ready to treat your child when he/she has malaria, diarrhea and pneumonia. Call or send him/her an SMS every time you need him/her!*
- *Your CHW is prepared to take care of pregnant women before, during, and after birth. Trust your CHW to help your family during pregnancy!*

#### Third round

- *With CHWs in Bissau more childbirths are assisted by qualified personnel and more children are completely vaccinated before completing one year of age. Let's keep improving community health together with CHWs! Make sure you are in contact with yours!*
- *Every family has the right to be accompanied by a CHW! Make sure you are in contact with yours or speak with your neighbors to get one!*

## C List of variables

### C.1 Administrative data

- **CHW dropout:** indicator variable equal to 1 if the CHW dropped out the program by February 2019.
- **CHW reports submitted - share:** number of monthly reports submitted by the CHW divided by the number of months that the CHW was actively working from October 2017 to November 2018.
- **CHW test score – training:** average score in the monthly meetings examinations from May to October 2018. The score ranges from 0 to 20. The exams covered theoretical and applied knowledge of the 16 EFP and family planning. The variable is normalized (z-score) within supervisor.
- **CHW evaluation score by supervisor:** average score from the supervisor’s report on CHW’s performance. Includes reports from January to November 2018. The score ranges from 1 to 5. The evaluation report measures CHW performance in the following dimensions: knowledge of the health practices, relationship with the households, compliance with the home visit guidelines, ability to disseminate information on the health practices, and management skills. The variable is normalized (z-score) within supervisor.

### C.2 CHW face-to-face survey

- **Age in 2017:** age at the time of the interview.
- **Female (=1):** indicator variable equal to 1 if the CHW is female.
- **Completed 12 years of schooling (=1):** indicator variable equal to 1 if the CHW has completed 12 or more years of education.
- **Currently studying (=1):** indicator variable equal to 1 if the CHWs was studying at the time of the interview.
- **Has university studies (=1):** indicator variable equal to 1 for CHWs with some university studies.
- **Catholic (=1):** indicator variable equal to 1 if the CHW is Catholic.
- **Muslim (=1):** indicator variable equal to 1 if the CHW is Muslim.
- **Owns bank account (=1):** indicator variable equal to 1 if the CHW owns a bank account.
- **Owns house (=1):** indicator variable equal to 1 for CHW whose households owns the house.

- **Worked in the last 12 months (=1):** indicator variable equal to 1 if the CHWs worked in the 12 months previous to the interview.
- **Worked in non-agriculture (=1):** indicator variable equal to 1 if the CHW worked in the 12 months previous to the interview in the non-agricultural sector.
- **Skilled non-agriculture (=1):** indicator variable equal to 1 if the CHW worked in the 12 months previous to the interview in a skilled position in the non-agricultural sector.
- **Currently has a business (=1):** indicator variable equal to 1 if the CHW had a business at the time of the interview.
- **Volunteer at a health center (=1):** indicator variable equal to 1 if the CHW had experience as volunteer in health centers.
- **Any position in the community (=1):** indicator variable equal to 1 if the CHW has hold any position in the community.
- **Community position at the start of the program (=1):** indicator variable equal to 1 if the CHW had a position in the community a the start of the program.

### Motivation scales

All scales came from validated scales used in employment surveys on pro-social motivation and career orientation studies. Each variable is the average of the item scores within each scale and it represents the average level of agreement with the included items. All items used a 5-point Likert-type scale variable with anchors of 1 (strongly disagree) to 5 (strongly agree).

- **Monetary rewards:** adapted from [Amabile et al. \(1994\)](#). This measure provides an index of the degree to which a CHW’s activity is oriented toward a monetary compensation or reward. The scale consists of the following items: *“I am strongly motivated by the money I can earn”*, *“I seldom think about salary.”* (reversed), *“As long as I can do what I enjoy, I’m not that concerned about exactly what I’m paid.”* (reversed) and *“I’m less concerned with what work I do than what I get for it.”*
- **Social recognition:** adapted from [Amabile et al. \(1994\)](#). This measure provides an index of the degree to which an individual’s activity is oriented toward the recognition of others. The scale consists of the following items: *“I am strongly motivated by the recognition I can earn from other people.”*, *“I want other people to find out how good I really can be at my work.”* and *“I believe that there is no point in doing a good job if nobody else knows about it.”*
- **Social impact:** adapted from [Grant and Campbell \(2007\)](#). This measure provides an index of the degree to which individuals feel that their actions benefit other people. The scale consists of the following items: *“My work really makes others’ lives better.”*, *“I have positive impact on others in my work on a regular basis.”* and *“My work has positive impact on a large number of people.”*

### C.3 Household phone survey

- **Home visits - total:** total number of CHW home visits received since the start of the program.
- **Home visits - conditional on being visited:** total number of CHW home visits received since the start of the program conditional on being visited at least once.
- **Household satisfaction with the CHWs:** respondent's level of satisfaction with the activity of the CHW conditional on being visited at least once by a CHW. 5-point Likert-type scale variable with anchors of 1 (Not Satisfied at all) to 5 (Highly Satisfied). This variable is normalized (z-score) relative to the pure control group.

### C.4 Household survey face-to-face

- **Home visits - total:** total number of CHW home visits received since the start of the program.
- **Home visits - conditional on being visited:** total number of CHW home visits received since the start of the program conditional on being visited at least once.
- **Household satisfaction with the CHWs:** Respondent's level of satisfaction with the activity of the CHW conditional on being visited at least once by a CHW. 5-point Likert-type scale variable with anchors of 1 (Not Satisfied at all) to 5 (Highly Satisfied). This variable is normalized (z-score) relative to the pure control group.
- **Knowledge 16 EFPs:** number of correct answers to 28 questions measuring household knowledge of the 16 basic essential family practices and of family planning, this variable ranges from 0 to 28. <sup>19</sup>
- **Household treats water:** indicator variable that takes value of 1 for households who report treating water with bleach or chlorine.
- **Number of mosquito nets:** total number of mosquito nets available in the house.
- **Use of latrines:** indicator variable that takes value of 1 for households who report using latrines.
- **Vaccination index (5 vaccines) - self-reported:** index variable averaging 5 indicator variables for taking each of the following vaccines: BCG, polio, DTcoq (diphtheria-tetanus-pertussis), MMR and yellow fever. Self-reported data.
- **Vaccination index (5 vaccines) - observed bulletin:** index variable averaging 5 indicator variables for taking each of the following vaccines: BCG, polio, DTcoq (diphtheria-tetanus-pertussis), MMR and yellow fever. Information directly observed in the vaccination bulletin.

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<sup>19</sup>See table A1 for a list of the 16 basic essential family practices.

- **Sick in the last 15 days:** indicator variable that takes value of 1 for children who were reported to be sick (had any fever or diarrhea) in the 15 days previous to the interview.
- **Took a malaria test if sick:** indicator variable that takes value of 1 for children who had malaria symptoms and took a malaria test, and zero for children who had malaria symptoms but who did not take a malaria test.
- **Use of family planning:** indicator variable that takes value 1 for women who report having used any of the following family planning methods in the last 12 months: female sterilization, male sterilization, intrauterine contraceptive device, contraceptive injection (Depo - Provera), birth control implant, monthly contraceptive pill, male condom, female condom and diaphragm.
- **Number of pre-natal visits:** number of prenatal visits to a health facility during pregnancy.
- **Pre-natal care index:** index variable averaging 4 indicator variables for the following prenatal care exams and vaccine: blood pressure, blood test, urine test, and tetanus vaccine.
- **Post-natal visit:** indicator variable that takes value of 1 for women who attended a postnatal visit to a health center after giving birth.
- **Nursing:** indicator variable that takes value of 1 for women who breast fed after giving birth.
- **Administered Vitamin A in the 45 days after giving birth:** indicator variable that takes value of 1 for women whose newborn was given Vitamin A 45 days after giving birth.

#### Household head characteristics:

- **Age in 2017:** household head age at the time of the interview.
- **Female (=1):** indicator variable equal to 1 if the household head is female.
- **Completed 12 years of schooling (=1):** indicator variable equal to 1 if the household head has completed 12 or more years of education.
- **Currently studying (=1):** indicator variable equal to 1 if the household head was studying at the time of the interview.
- **Worked in the last 12 months (=1):** indicator variable equal to 1 if the household head worked in the 12 months previous to the interview.
- **Catholic (=1):** indicator variable equal to 1 if the household head is Catholic.
- **Muslim (=1):** indicator variable equal to 1 if the household head is Muslim.

- **Balanta (=1):** indicator variable equal to 1 if the household head belongs to the Balanta ethnic group.
- **Papeis (=1):** indicator variable equal to 1 if the household head belongs to the Papeis ethnic group.
- **Fula (=1):** indicator variable equal to 1 if the household head belongs to the Fula ethnic group.

#### Household characteristics:

- **Households members:** number of households members living in the household at the time of the interview.
- **Number of women 12-49 years old:** number of women between the ages of 12 and 49 years living in the household at the time of the interview.
- **Number of children under years old:** number of children under 5 years old living in the household at the time of the interview.
- **Number of household assets:** asset index averaging ownership of the following assets: a generator, a solar panel, a radio, a television, a parabolic antenna, a telephone, a cell phone, a bicycle, a motor-bike, a car, a fishing boat, a fridge, a computer, a watch, and a carriage.
- **Number of mosquito nets (per capita):** Number of mosquito nets in the house divided by the number of household members.
- **Piped water (=1):** indicator variable equal to 1 if the household has access to piped water.
- **Use of latrines (=1):** indicator variable equal to 1 if the household has access to latrines.

# D Balance

Table D1: Characteristics of CHWs

	Pure control	Social status	Video treatments					All treatments
			Task significance alone	Task significance plus endorsement	Information/placebo	Information/campaign	Information/campaign	
mean	diff.	diff.	diff.	diff.	diff.	diff.	diff.	joint test (p-value)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(7)	
Age in 2017	26.08	0.50 (0.43)	-0.19 (0.27)	-0.47 (0.29)	-0.04 (0.28)	0.41** (0.19)	0.220	
Female (=1)	0.48	0.03 (0.03)	0.01 (0.04)	0.01 (0.04)	0.02 (0.04)	-0.01 (0.04)	0.925	
Completed 12 years of schooling (=1)	0.76	0.01 (0.02)	0.05* (0.03)	0.05 (0.04)	0.02 (0.03)	-0.01 (0.03)	0.308	
Currently studying (=1)	0.51	-0.02 (0.03)	0.02 (0.04)	0.02 (0.04)	-0.01 (0.04)	0.01 (0.02)	0.923	
Has university studies (=1)	0.24	-0.00 (0.02)	0.01 (0.04)	0.01 (0.04)	-0.01 (0.04)	0.01 (0.02)	0.945	
Catholic (=1)	0.49	-0.03 (0.02)	0.00 (0.04)	0.05 (0.05)	0.06 (0.04)	0.02 (0.03)	0.190	
Muslim (=1)	0.38	0.03 (0.03)	0.01 (0.04)	-0.02 (0.04)	-0.02 (0.04)	0.02 (0.03)	0.527	
Owns bank account (=1)	0.63	-0.03 (0.03)	-0.00 (0.05)	-0.02 (0.05)	0.03 (0.05)	0.02 (0.04)	0.771	
Owns house (=1)	0.71	0.00 (0.02)	-0.01 (0.03)	-0.02 (0.04)	-0.00 (0.04)	0.01 (0.03)	0.991	
Worked in the last 12 months (=1)	0.51	0.02 (0.02)	0.01 (0.04)	0.01 (0.03)	0.03 (0.04)	0.01 (0.03)	0.921	
Worked in non-agriculture (=1)	0.46	0.01 (0.03)	0.03 (0.04)	0.01 (0.04)	0.01 (0.04)	0.02 (0.03)	0.912	
Currently has a business (=1)	0.11	0.02 (0.02)	0.08* (0.04)	0.07* (0.04)	0.02 (0.04)	-0.00 (0.03)	0.289	
Volunteer at a health center (=1)	0.62	0.05 (0.04)	0.03 (0.05)	-0.04 (0.05)	-0.02 (0.04)	-0.01 (0.03)	0.193	
Any position in the community (=1)	0.81	0.03 (0.03)	0.01 (0.04)	-0.03 (0.04)	-0.02 (0.03)	0.01 (0.02)	0.208	
Community position at the start of the program (=1)	0.71	0.03 (0.03)	0.03 (0.04)	-0.02 (0.04)	-0.01 (0.03)	0.03 (0.02)	0.402	

Columns (1) reports sample mean of the pure control group. Columns (2), (3), (4), (5) and (6) report estimates for each treatment indicator variable in Equation 3. Standard errors clustered at neighborhood level are reported in parentheses.\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table D2: Household characteristics, face-to-face survey

	Video treatments						
	Pure control	Social status	Task significance alone	Task significance plus endorsement	Information/placebo	Information/campaign	All treatments
mean	diff.	diff.	diff.	diff.	diff.	diff.	joint test (p-value)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	
<b>Household head characteristics:</b>							
Age in 2017	44.51	-0.25 (0.52)	-0.38 (0.75)	-0.46 (0.79)	-0.31 (0.75)	0.26 (0.52)	0.967
Female (=1)	0.33	0.01	-0.01	0.02	0.01	0.04**	0.314
Completed 12 years of schooling (=1)	0.24	0.04*	-0.00	-0.01	-0.01	-0.01	0.542
Worked in the last 12 months (=1)	0.69	-0.00	0.06*	0.03	0.03	0.02	0.140
Catholic (=1)	0.41	0.03	-0.05	-0.08**	0.01	0.01	0.026**
Muslim (=1)	0.37	-0.03	0.02	0.03	0.03	0.02	0.306
Balanta (=1)	0.20	-0.01	-0.00	0.04	-0.00	0.01	0.426
Papeis (=1)	0.14	0.01	-0.02	0.01	0.02	-0.00	0.566
Fula (=1)	0.19	0.01	-0.02	-0.01	-0.01	-0.01	0.939
		(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	
<b>Household characteristics:</b>							
Household members	6.63	-0.11 (0.17)	0.21 (0.24)	0.13 (0.24)	0.19 (0.22)	0.08 (0.16)	0.884
Number of women 12-49 years old	2.13	0.05	0.05	0.01	0.16*	0.05	0.427
Number of children under 5 years old	1.03	-0.03	0.01	0.04	0.01	-0.02	0.948
Number of household assets (max 15)	4.29	0.11	-0.27	0.06	0.06	0.04	0.069*
Number of mosquito nets (per capita)	0.48	0.01	0.17	-0.09	0.19	-0.14	0.633
Piped water (=1)	0.81	0.01	-0.00	0.00	0.01	0.01	0.728
Use of latrines (=1)	0.03	-0.00	-0.03	-0.02	-0.02	-0.01	0.991
		(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	

Columns (1) reports sample mean of the pure control group. Columns (2), (3), (4), (5) and (6) report estimates for each treatment indicator variable in Equation 3. Standard errors clustered at CHW level are reported in parentheses.\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



# E Attrition

Table E1: Data availability and attrition

	Video treatments						
	Pure control	Social status	Task significance alone	Task significance plus endorsement	Information/ placebo	Information campaign	All treatments
mean	diff.	diff.	diff.	diff.	diff.	diff.	joint test (p-value)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	
<b>CHW data:</b>							
Available administrative data	0.90	-0.01 (0.02)	-0.00 (0.02)	-0.04* (0.02)	0.02 (0.02)	-0.02 (0.02)	0.142
Interviewed in the endline survey	0.86	-0.02 (0.01)	0.01 (0.03)	0.02 (0.03)	0.04 (0.03)	-0.01 (0.02)	0.258
<b>Household data:</b>							
CHW with at least one household interviewed in the phone survey	0.48	0.01	0.03	-0.07*	-0.00	-0.02	0.123
Households interviewed in the phone survey per CHW	1.86	(0.04) 0.02 (0.16)	(0.04) 0.21 (0.16)	(0.04) -0.22 (0.18)	(0.05) 0.08 (0.20)	(0.03) -0.10 (0.12)	0.252
Interviewed in the endline face-to-face survey	0.88	-0.01 (0.01)	0.01 (0.02)	0.02 (0.02)	-0.00 (0.02)	-0.01 (0.01)	0.654

Columns (1) reports sample mean of the pure control group. Columns (2), (3), (4), (5) and (6) report estimates for each treatment indicator variable in Equation 3. Standard errors clustered at neighborhood level are reported in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## F Compliance

Table F1: Video treatments: compliers

Number of treatment rounds	Task significance alone	Task significance plus endorsement	Information/ placebo	Control
0	7.09	10.67	7.87	100
1	13.78	11.86	7.87	0
2	34.25	27.27	31.10	0
3	44.88	50.20	53.15	0
Mean number of rounds	2.17	2.19	2.30	0.00

## G Auxiliary results

Table G1: CHW motivation - main treatment effects

	Face-to-face Survey					
	Monetary rewards		Social recognition		Social impact	
	(1)	(2)	(3)	(4)	(5)	(6)
Social status	0.02 (0.03)	0.02 (0.03)	0.03 (0.03)	0.03 (0.03)	0.05*** (0.02)	0.05*** (0.02)
Task significance	0.01 (0.05)	0.01 (0.05)	-0.05 (0.05)	-0.06 (0.05)	0.01 (0.03)	0.01 (0.03)
Information/placebo	-0.03 (0.07)	-0.02 (0.07)	-0.09 (0.06)	-0.09 (0.06)	0.01 (0.03)	0.01 (0.03)
Observations	903	902	903	902	901	900
R <sup>2</sup>	0.09	0.10	0.09	0.09	0.11	0.12
Mean (control group)	2.80	2.80	4.22	4.22	4.80	4.80
<i>P-values:</i>						
Joint test all treatments	0.903	0.880	0.498	0.461	0.131	0.087
Joint test video	0.810	0.828	0.284	0.269	0.920	0.908
Social status = Task significance	0.844	0.859	0.155	0.134	0.264	0.268
Information/placebo = Task significance	0.518	0.544	0.548	0.558	0.783	0.779
ANCOVA specification	No	Yes	No	Yes	No	Yes

Note: Estimates based on OLS regressions. Columns (1), (3), (5), (7) and (9) present estimates using Equation 1, columns (2), (4), (6), (8) and (10) present estimates using Equation 2 which includes the lagged dependent variable (ANCOVA). Estimation sample consists of CHWs interviewed in the endline face-to-face survey. Depending on the column the dependent variables are defined by the following. (1)-(2) Monetary rewards: measures the degree to which a CHW's activity is oriented toward a monetary compensation or reward (Amabile et al., 1994). (3)-(4) Social recognition: measures the degree to which an individual's activity is oriented toward the recognition by others (Amabile et al., 1994). (5)-(6) Social impact: measures the degree to which individuals feel that their actions benefit other people (Grant and Campbell, 2007). Each measure represents the average level of agreement with a set of proposed statements. All statements/questions employed a 5-point Likert-type scale with anchors of 1 (strongly disagree) to 5 (strongly agree) (see appendix C for details). All specifications include an indicator variable for assignment to the information campaign treatment, strata fixed effects, and CHW level controls. The full list of controls is presented in Section 4. Standard errors are reported in parentheses and clustered at neighborhood level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table G2: CHW motivation - other treatment effects

	Face-to-face Survey					
	Monetary rewards			Social recognition		
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A</b>						
Task significance alone	-0.02 (0.06)	-0.01 (0.06)	-0.03 (0.06)	-0.03 (0.06)	0.06* (0.03)	0.06* (0.03)
Task significance plus endorsement	0.04 (0.06)	0.04 (0.06)	-0.08 (0.06)	-0.08 (0.06)	-0.05 (0.04)	-0.05 (0.04)
Information/placebo	-0.03 (0.07)	-0.02 (0.07)	-0.09 (0.06)	-0.09 (0.06)	0.01 (0.03)	0.02 (0.03)
Observations	903	902	903	902	901	900
R <sup>2</sup>	0.09	0.10	0.09	0.09	0.12	0.13
<i>P-values:</i>						
Task significance alone = Task significance plus endorsement	0.362	0.419	0.521	0.505	0.001	0.001
Task significance alone = Information/placebo	0.907	0.897	0.381	0.381	0.141	0.143
Task significance plus endorsement = Information/placebo	0.282	0.326	0.844	0.864	0.081	0.077
<b>Panel B</b>						
Information campaign	0.02 (0.04)	0.03 (0.04)	0.00 (0.05)	0.00 (0.05)	-0.01 (0.02)	-0.00 (0.02)
Observations	903	902	903	902	901	900
R <sup>2</sup>	0.09	0.10	0.09	0.09	0.11	0.12
Mean (control group)	2.80	2.80	4.22	4.22	4.80	4.80
ANCOVA specification	No	Yes	No	Yes	No	Yes

Note: Estimates based on OLS regressions. Columns (1), (3), (5), (7) and (9) present estimates using Equation 1, columns (2), (4), (6), (8) and (10) present estimates using Equation 2 which includes the lagged dependent variable (ANCOVA). Estimation sample consists of CHWs interviewed in the endline face-to-face survey. Depending on the column the dependent variables are defined by the following. (1)-(2) Monetary rewards: measures the degree to which a CHW's activity is oriented toward a monetary compensation or reward (Amabile et al., 1994). (3)-(4) Social recognition: measures the degree to which an individual's activity is oriented toward the recognition by others (Amabile et al., 1994). (5)-(6) Social impact: measures the degree to which individuals feel that their actions benefit other people (Grant and Campbell, 2007). Each measure represents the average level of agreement with a set or proposed statements. All statements/questions employed a 5-point Likert-type scale with anchors of 1 (strongly disagree) to 5 (strongly agree) (see appendix C for details). All specifications include an indicator variable for assignment to the information campaign treatment, strata fixed effects, and CHW level controls. The full list of controls is presented in Section 4. Standard errors are reported in parentheses and clustered at neighborhood level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table G3: Essential family practices: household knowledge

	Face-to-face Survey								
	Newborn care	Nutrition	Wash hands	Use of latrines	Water treatment	Preventive measures - tuberculosis and HIV	Pre-natal care	Recognition of alert signals of illnesses	Family planning
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Social status	0.04*** (0.01)	0.05*** (0.01)	0.03*** (0.01)	0.00 (0.00)	-0.01* (0.01)	0.00 (0.01)	-0.00 (0.01)	0.01 (0.01)	0.02 (0.02)
Task significance	-0.00 (0.01)	-0.01 (0.02)	-0.00 (0.01)	-0.00 (0.00)	0.00 (0.01)	-0.01 (0.01)	-0.00 (0.01)	0.01 (0.01)	0.02 (0.02)
Information/placebo	-0.00 (0.01)	0.00 (0.02)	-0.01 (0.01)	-0.00 (0.01)	-0.01 (0.01)	-0.01 (0.01)	0.00 (0.01)	-0.01 (0.01)	-0.01 (0.02)
Observations	1743	1743	1743	1741	1741	1743	1741	1743	1741
R <sup>2</sup>	0.22	0.20	0.18	0.08	0.11	0.23	0.04	0.12	0.27
Mean (control group)	0.81	0.80	0.86	0.98	0.87	0.93	0.99	0.94	0.18
<i>P-values:</i>									
Joint test all treatments	0.000	0.005	0.001	0.668	0.335	0.591	0.605	0.272	0.416
Joint test video	0.945	0.873	0.616	0.828	0.550	0.350	0.837	0.239	0.283
Social status = Task significance	0.003	0.007	0.005	0.279	0.202	0.197	0.901	0.914	0.779
Information/placebo = Task significance	0.857	0.659	0.436	0.918	0.276	0.606	0.552	0.094	0.143

Note: Estimates based on OLS regressions. All columns in the table present estimates using Equation 1. Estimation sample consists of households interviewed in the endline face-to-face survey. Depending on the column the dependent variables are defined by the following. (1) Newborn care: share of correct answers to 4 questions measuring household knowledge of newborn care (EFPs 1 and 12). (2) Nutrition: share of correct answers to 2 questions measuring household knowledge of nutrition (EFPs 2, 3),(3) Wash hands: share of correct answers to 4 questions measuring household knowledge of hygiene (EFP 5). (4) Use of latrines: share of correct answers to 2 questions measuring household knowledge of the use of latrine (EFP 6). (5) Water treatment: share of correct answers to 5 questions measuring household knowledge of water treatment (EFP 7). (6) Preventive measures - tuberculosis and HIV: share of correct answers to 5 questions measuring household knowledge of preventive measures of tuberculosis and HIV (EFP 8). (7) Pre-natal care: indicator variable that takes value of 1 for households answering correctly 1 question on pre-natal care (EFP 15). (8) Recognition of alert signals of illnesses: share of correct answers to 3 questions measuring household knowledge of alert signals of illnesses (EFP 16). (9) Family planning: indicator variable that takes value of 1 for households answering correctly 1 question on family planning. See Table A1 for the full list of the EFPs. All specifications include an indicator variable for assignment to the information campaign treatment, strata fixed effects, CHW level controls, and household controls. The full list of controls is presented in Section 4. Standard errors are reported in parentheses and clustered at CHW level. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

## H Robustness of estimates to control variables

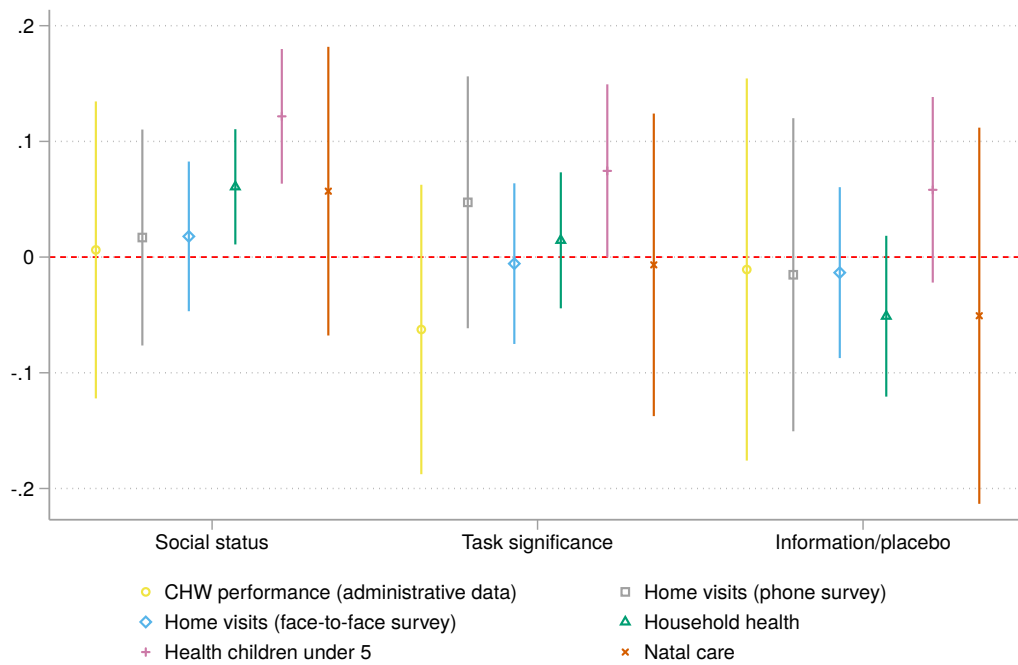
Table H1 presents the set of variables included in the Post-Double Selection (PDS) LASSO procedure. The sampling strata are partialled out. Figure H1 and Tables H2-H5 present estimates of treatment effects on the main outcomes.

Table H1: Variables included in the Post-Double Selection (PDS) LASSO procedure

<b>Administrative Data</b>	
Supervisor characteristics	Age (in number of years), gender, highest grade completed, foreign language indicator variables.
<b>CHW face-to-face survey</b>	
Demographics	Age (in number of years), gender indicator variable, education, religion, ethnic group, native language, relation with the household head, and civil status indicator variables. Indicator variable for whether the CHW was studying at the start of the program. Number of household members.
Occupation	Indicator variables for whether the CHW worked in the 12 months previous to the interview, for whether he/she was self-employed or wage employed in the agricultural sector, for whether he/she was self-employed or wage employed in the non-agricultural sector, for whether he/she was a skilled or unskilled worker. The number of weeks worked in the 12 months previous to the interview. Indicator variables for whether the CHW was running a business at the time of the interview and for whether the CHW owned a business in the 12 months previous to the interview.
Wealth	Number of assets owned by the CHW's household. Indicator variables for whether the CHW owns a bank account, the property of the house and any land. Indicator variables for whether the house in which the CHW is living has good floor, good walls, good roof, latrines and piped water. Number of rooms in the house.
Activity in the community	Indicator variables for whether the CHW reported that he/she trusted his/her community, for whether in the 7 days previous to the interview the CHW talked to the community leader, a religious leader, a doctor. Number of times the CHW met the community leader in the 7 days previous to the interview. Indicator variables for whether the CHW has hold a position at the community, has volunteered at the health center and for whether any other member of his/her household has held a position in the community. Number of positions held in the community by the CHW or by any other member of the household.
<b>Household face-to-face survey</b>	
Demographics	Same variables included in CHW demographics, but measured at the level of the household head.
Occupation	Same variables included in CHW demographics, but measured at the level of the household head.
Wealth	Same variables included in CHW demographics, but measured at the level of the household head.

Note: All continuous variables are also included in their squared term and are standardized. Missing values are replaced by the value 0 and an indicator variable equal to 1 is introduced if the observation had a missing value. Household characteristics are included only in the PDS LASSO procedure for outcomes from the household face-to-face survey.

Figure H1: Main treatment effects - aggregated outcomes employing z-scores - Lasso controls



Note: This figure replicates Figure 2. The difference is that specifications include CHW-level and, depending on the unit of analysis, household-level controls which are selected using the Post-Double Selection LASSO procedure.

Table H2: Direct CHW performance - Lasso controls

	Administrative data					Phone survey				Face-to-face survey				
	CHW dropout	CHW reports submitted - share	CHW test score - training	CHW evaluation score by supervisor	Total	Home visits		Household satisfaction with the CHWs	Total - conditional on being visited	Home visits		Household satisfaction with the CHWs	Total - conditional on being visited	Household satisfaction with the CHWs
						(3)	(4)			(5)	(6)			
Social status	0.01 (0.03)	-0.02 (0.03)	0.09* (0.05)	0.08** (0.04)	0.22 (0.24)	0.29 (0.26)	0.10 (0.07)	0.07 (0.23)	0.76** (0.39)	0.29*** (0.10)	0.10 (0.07)	0.07 (0.23)	0.76** (0.39)	0.29*** (0.10)
Task significance	0.05 (0.03)	-0.02 (0.02)	-0.09 (0.09)	0.06 (0.07)	0.04 (0.28)	0.07 (0.31)	0.17** (0.08)	0.19 (0.24)	0.69* (0.40)	-0.10 (0.11)	0.17** (0.08)	0.19 (0.24)	0.69* (0.40)	-0.10 (0.11)
Information/placebo	0.02 (0.04)	-0.02 (0.03)	-0.08 (0.09)	0.10 (0.11)	-0.25 (0.35)	-0.22 (0.39)	-0.01 (0.10)	0.00 (0.25)	-0.13 (0.45)	-0.08 (0.12)	-0.01 (0.10)	0.00 (0.25)	-0.13 (0.45)	-0.08 (0.12)
Observations	1015	1015	939	936	1819	1443	1465	1645	775	685	1465	1645	775	685
Mean (control group)	0.16	0.62	-0.00	0.01	2.90	3.74	-0.00	1.80	3.64	0.00	-0.00	1.80	3.64	0.00
<i>P-values:</i>														
Joint test all treatments	0.415	0.604	0.224	0.210	0.592	0.551	0.040	0.583	0.045	0.065	0.040	0.583	0.045	0.065
Joint test video	0.320	0.630	0.579	0.577	0.539	0.591	0.020	0.637	0.108	0.669	0.020	0.637	0.108	0.669
Social status = Task significance	0.374	0.986	0.053	0.831	0.595	0.559	0.466	0.704	0.890	0.014	0.466	0.704	0.890	0.014
Information/placebo = Task significance	0.417	0.969	0.948	0.635	0.267	0.307	0.030	0.420	0.061	0.860	0.030	0.420	0.061	0.860

Note: This table replicates Table 2. The difference is that specifications include CHW-level and, depending on the unit of analysis, household-level controls which are selected using the Post-Double Selection LASSO procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.



Table H3: Household health - Lasso controls

	Face-to-face survey						
	Knowledge 16 EFPs	Household treats water	Number of mosquito nets	Use of latrines			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Social status	0.42*** (0.09)	-0.04** (0.02)	-0.05** (0.02)	-0.03 (0.08)	-0.05 (0.08)	0.03 (0.03)	0.03 (0.03)
Task significance	0.01 (0.11)	0.00 (0.02)	0.00 (0.02)	-0.02 (0.09)	-0.01 (0.09)	0.01 (0.03)	0.01 (0.03)
Information/placebo	-0.23* (0.13)	-0.01 (0.03)	-0.00 (0.03)	0.03 (0.11)	0.00 (0.11)	-0.02 (0.03)	-0.02 (0.03)
Observations	1744	1752	1749	1752	1719	1752	1749
Mean (control group)	23.18	0.32	0.32	3.88	3.88	0.52	0.52
<i>P-values:</i>							
Joint test all treatments	0.000	0.251	0.100	0.981	0.985	0.403	0.443
Joint test video	0.076	0.925	0.966	0.881	0.993	0.590	0.591
Social status = Task significance	0.004	0.188	0.090	0.958	0.760	0.465	0.529
Information/placebo = Task significance	0.029	0.697	0.793	0.617	0.921	0.307	0.307
ANCOVA specification	No	No	Yes	No	Yes	No	Yes

Note: This table replicates Table 3. The difference is that specifications include CHW-level and household-level controls which are selected using the Post-Double Selection LASSO procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table H4: Health of children under 5 years old - Lasso controls

	Face-to-face survey					
	Vaccination index (5 vaccines)					
	Self-reported	Observed bulletin	Sick in the last 15 days	Observed bulletin	Sick in the last 15 days	Took a malaria test if sick
(1)	(2)	(3)	(4)	(5)	(6)	
Social status	0.02** (0.01)	0.02** (0.01)	0.04* (0.02)	0.04* (0.02)	-0.09*** (0.02)	0.14** (0.07)
Task significance	0.03** (0.01)	0.03** (0.01)	0.06** (0.02)	0.06** (0.02)	-0.00 (0.03)	0.02 (0.07)
Information/placebo	0.02 (0.01)	0.02 (0.01)	0.05** (0.03)	0.06** (0.02)	0.00 (0.03)	-0.06 (0.08)
Observations	1382	1381	1002	813	1464	319
Mean (control group)	0.89	0.89	0.77	0.77	0.23	0.41
<i>P-values:</i>						
Joint test all treatments	0.056	0.049	0.026	0.028	0.003	0.169
Joint test video	0.062	0.045	0.046	0.019	0.988	0.514
Social status = Task significance	0.549	0.436	0.546	0.463	0.019	0.210
Information/placebo = Task significance	0.330	0.249	0.897	0.947	0.879	0.253
ANCOVA specification	No	Yes	No	Yes	No	No

Note: This table replicates Table 4. The difference is that specifications include CHW-level and household-level controls which are selected using the Post-Double Selection LASSO procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Table H5: Family planning and natal care - Lasso controls

	Face-to-face survey						
	Use of family planning	Number of pre-natal visits	Pre-natal care index	Post-natal visit	Nursing	Administered Vitamin A in the 45 days after giving birth	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Social status	0.03 (0.02)	0.01 (0.02)	0.08 (0.25)	0.06 (0.04)	-0.02 (0.06)	0.06 (0.05)	0.07** (0.03)
Task significance	0.01 (0.02)	-0.00 (0.02)	-0.15 (0.27)	-0.05 (0.04)	0.11 (0.07)	0.06 (0.07)	0.02 (0.04)
Information/placebo	0.01 (0.02)	0.01 (0.03)	-0.28 (0.33)	-0.04 (0.06)	0.06 (0.09)	0.04 (0.07)	0.08 (0.06)
Observations	3184	2591	209	210	210	210	210
Mean (control group)	0.36	0.36	5.12	0.95	0.56	0.94	0.00
<i>P-values:</i>							
Joint test all treatments	0.630	0.937	0.294	0.389	0.185	0.461	0.149
Joint test video	0.799	0.852	0.693	0.542	0.302	0.698	0.324
Social status = Task significance	0.633	0.723	0.536	0.090	0.167	0.944	0.269
Information/placebo = Task significance	0.890	0.605	0.610	0.872	0.471	0.808	0.152
ANCOVA specification	No	Yes	No	No	No	No	No

Note: This table replicates Table 5. The difference is that specifications include CHW-level and household-level controls which are selected using the Post-Double Selection LASSO procedure. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

# I Multiple hypothesis testing

Table II: Multiple hypothesis testing. Romano and Wolf (2016)

Outcome	Data source	ANCOVA specification	P-value	Social status	Video treatments	
					Task significance	Information/placebo
<b>Table 2: Direct CHW performance</b>						
CHW dropout	Administrative data	No	Conventional	0.808	0.194	0.627
CHW reports submitted	Administrative data	No	Romano-Wolf	0.766	0.446	0.656
			Conventional	0.391	0.419	0.472
CHW evaluation score by supervisor	Administrative data	No	Romano-Wolf	0.455	0.687	0.656
			Conventional	0.090	0.270	0.347
CHW test score – training	Administrative data	No	Romano-Wolf	0.423	0.452	0.656
Home visits - total	Phone survey	No	Conventional	0.084	0.448	0.371
			Romano-Wolf	0.455	0.687	0.656
Home visits-conditional on being visited	Phone survey	No	Conventional	0.100	0.998	0.391
			Romano-Wolf	0.132	0.999	0.507
Households satisfaction with the CHWs	Phone survey	No	Conventional	0.122	0.912	0.577
			Romano-Wolf	0.132	0.982	0.737
Home visits - total	Face-to-face survey	No	Conventional	0.106	0.012	0.798
			Romano-Wolf	0.132	0.016	0.758
Home visits-conditional on being visited	Face-to-face survey	No	Conventional	0.405	0.623	0.894
			Romano-Wolf	0.388	0.646	0.949
Households satisfaction with the CHWs	Face-to-face survey	No	Conventional	0.096	0.123	0.783
			Romano-Wolf	0.141	0.314	0.949
Households satisfaction with the CHWs	Face-to-face survey	No	Conventional	0.013	0.324	0.432
			Romano-Wolf	0.017	0.513	0.775

Note: Estimates based on OLS regressions using Equation 1. For each outcome variable we show p-values for both individual-coefficient t-test (conventional p-value) and for multiple hypothesis testing (Romano and Wolf p-value). The latter corresponds to jointly testing coefficients grouped by rows (treatment arms) and source of data (administrative data, phone survey and face-to-face household survey) from Tables 2-5. Refer to these tables for the definition of the dependent variables.

Table I2: Multiple hypothesis testing. Romano and Wolf (2016)

Outcome	Data source	ANCOVA specification	P-value	Social status	Video treatments	
					Task significance	Information/placebo
<b>Table 3: Household health</b>						
Knowledge 16 EFP	Face-to-face survey	No	Conventional	0.000	0.932	0.064
Household treats water	Face-to-face survey	No	Romano-Wolf	0.000	0.991	0.161
		Yes	Conventional	0.120	0.895	0.772
Number of mosquito nets	Face-to-face survey	No	Romano-Wolf	0.338	0.991	0.859
		Yes	Conventional	0.039	0.954	0.761
		No	Romano-Wolf	0.135	0.956	0.942
		Yes	Conventional	0.761	0.712	0.653
Use of latrines	Face-to-face survey	No	Romano-Wolf	0.937	0.981	0.859
		Yes	Conventional	0.567	0.712	0.958
		No	Romano-Wolf	0.808	0.921	0.953
		Yes	Conventional	0.811	0.617	0.475
Took a malaria test if sick	Face-to-face survey	No	Romano-Wolf	0.937	0.966	0.810
		Yes	Conventional	0.889	0.595	0.490
			Romano-Wolf	0.877	0.906	0.824

Table 4: Health of children under 5 years old

Vaccination index (5 vaccines)- self reported	Face-to-face survey	No	Conventional	0.064	0.013	0.100
Vaccination index (5 vaccines)- observed bulletin	Face-to-face survey	Yes	Romano-Wolf	0.043	0.004	0.080
		No	Conventional	0.056	0.019	0.083
		Yes	Romano-Wolf	0.086	0.016	0.176
		No	Conventional	0.045	0.017	0.029
Being sick in the last 15 days	Face-to-face survey	Yes	Romano-Wolf	0.040	0.008	0.064
		No	Conventional	0.156	0.014	0.021
		Yes	Romano-Wolf	0.129	0.018	0.078
		No	Conventional	0.002	0.797	0.815
Took a malaria test if sick	Face-to-face survey	No	Romano-Wolf	0.003	0.945	0.777
		Yes	Conventional	0.055	0.853	0.444
			Romano-Wolf	0.098	0.945	0.701

Table 5: Natal care. Women with children born alive in the previous two years

Number of pre-natal visits	Face-to-face survey	No	Conventional	0.816	0.657	0.471
Prenatal care index	Face-to-face survey	No	Romano-Wolf	0.929	0.860	0.835
		Yes	Conventional	0.252	0.418	0.576
Post-natal visit	Face-to-face survey	No	Romano-Wolf	0.502	0.740	0.838
		Yes	Conventional	0.760	0.250	0.776
Nursing	Face-to-face survey	No	Romano-Wolf	0.929	0.737	0.838
		Yes	Conventional	0.233	0.373	0.509
Administered Vitamin A - 45 days after giving birth	Face-to-face survey	No	Romano-Wolf	0.502	0.737	0.838
		Yes	Conventional	0.049	0.663	0.326
			Romano-Wolf	0.502	0.860	0.733

Note: Estimates based on OLS regressions using Equation 1. For each outcome variable we show p-values for both individual-coefficient t-test (conventional p-value) and for multiple hypothesis testing (Romano and Wolf p-value). The latter corresponds to jointly testing coefficients grouped by rows (treatment arms) and source of data (administrative data, phone survey and face-to-face household survey) from Tables 2-5. Refer to these tables for the definition of the dependent variables.