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# Motivating Volunteer Health Workers in an African Capital City

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**Abstract**

Community Health Workers (CHWs) are central to health systems. Still, they are typically unpaid volunteers in Sub-Saharan Africa. 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 health indicators. We analyze two randomized interventions for CHWs: (i) an honorific award aimed at raising their social status; (ii) a video treatment aimed at increasing their perceived task significance. While employing administrative and survey data, we find that the social status intervention, differently from the task significance one, causes clear improvements in household health, particularly for young children.

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

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

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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 citizens and for public policy around the world. At the same time, substantial health challenges persist (Report of the UN Secretary-General on the Sustainable Development Goals, 2020): in the latest years available, 5.3 million children under 5 years of age died with almost half of these deaths occurring in the first month of life; close to 295 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 (Glassman and Temin, 2016). 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 giving direct health support to their communities.[1] CHWs facilitated the spread of simple technologies allowing the prevention and treatment of prevalent health problems. As a result, many avoidable deaths have in fact been avoided (Björkman Nyqvist et al., 2019).

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 show that 69 percent of these workers do not receive a regular salary, and that 46 percent do not receive any type of monetary compensation.[2] 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.[3] 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

[1] 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).

[2] Data Tool, One Million Community Health Workers Campaign, 2019.

[3] 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.

CHWs. First, by improving the social status of CHWs in their communities. Second, by increasing the perceived task significance of CHWs. We follow the full contingent of 1,015 CHWs in Bissau, the capital city of Guinea-Bissau during 2017-2019. Note that these CHWs cover the whole population of Bissau, with each of them assigned to a pre-defined grouping of households. 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's strategy to address these challenges.

We employ a field experiment where CHWs faced randomized interventions. The first main intervention is defined by CHW access to honorific awards for good performance, which is assigned to CHWs at the neighborhood level. These awards are distributed in ceremonies with the presence of local authorities and representatives of international organizations; text messages announcing the award then follow to the households assigned to 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 individual level, of a video recorded from the perspective of a CHW on a day of work, where the task significance of the CHW is emphasized through an interactive decision and the observation of its dramatic consequences.

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. 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. 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 monitoring of CHWs, as well as household survey data on home visits, collected both face-to-face and by phone, and household satisfaction. We collected health-related indicators through administrative data on health-related appointments from the logbooks of all health centers and major hospitals in Bissau, as well as from household surveys. The latter 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 (namely in the case of households) 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, 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 observe similar results on children under 2 years old using data from hospitals' and health centers' logbooks. When employing household data, we also identify effects on lowering the probability of children being sick. Related to natal care, we find positive effects on the probability of giving birth at a health facility and on the number of post-natal care visits (both from the administrative logbooks), as well as on newborn nutrition (from survey data). Overall, the pattern of results is consistent with a mechanism by which encouraging CHWs to elicit effort on learning leads to better performance in a wide range of tasks, including incentivized and non-incentivized activities, i.e., beyond those considered for the honorific awards.

We do not find systematic treatment effects for the task significance video. The clearest effects we encounter are 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 the strong benchmark video treatment. Finally, we do not find statistically significant effects for the addition of endorsements to the videos and only limited evidence in favor of complementarity between incentive types.

Our paper relates to different strands of the literature. First of all, it relates to the theoretical literature on incentives and motivation.[4] 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 financial incentives crowding-out motivation. Related, the concept of mission, as opposed to profit and as a fundamental driver of motivation and performance, is proposed by Besley and Ghatak (2005). Bénabou and Tirole (2006) are 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.[5]

Our study contributes to the vast and diverse literature on incentives in organizations (Kamenica, 2012; Ashraf and Bandiera, 2018). Our social status intervention relates directly to recent field experiments finding that social status and recognition have powerful effects on a range of behaviors including pro-social ones.[6] In this context, purely symbolic awards for voluntary work have shown significant pos-

[4]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, we refer to Gagné (2014).

[5]We define an individual to be intrinsically motivated if willing to perform a task even in the absence of any reward or monitoring, similarly to Gagné and Deci (2005)

[6]See the recent review by Bursztyn and Jensen (2017). Indeed, social recognition has been found to play an important role in very diverse settings, ranging from academic research in economics (Chan et al., 2014) to fighter pilots squadrons during World War II (Ager, Bursztyn, and Voth, 2017).

itive effects on effort and performance (Kosfeld and Neckermann, 2011; Neckermann, Cueni, and Frey, 2014). Furthermore, these awards can be effective even if they have no impact on future career opportunities (Gallus, 2017).[7] Our intrinsic motivation intervention, focused on task significance[8] has received less attention in the economics literature. However, from psychology, Grant (2008) provides evidence that manipulations of perceived task significance can have a positive effect on performance at work in different contexts. Following the work of DellaVigna and Pope (2017), who have tested the impact of a number of non-monetary inducements from psychology in a large-scale, real-effort experiment, taking task significance as a trigger of pro-social behavior to the real world is one of the contributions of our paper.

Our paper is related to recent empirical contributions to the study of incentives and motivation in the context of health workers and developing countries. The contributions by Ashraf et al. (2020) and Deserranno (2019) are devoted to analyzing the selection of health workers as well as the potential tradeoff between pro-sociality and talent. 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 about a new health-promoter position in Uganda. Both studies find that financial incentives reduce the ability to recruit the most socially motivated agents, although the first only reports this pattern for low-talented individuals.

A few studies test different incentive schemes for existing health workers. Björkman Nyqvist et al. (2019) 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, as well as to 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 hairdressers and barbers (working on-the-job as health agents) in promoting HIV prevention and selling condoms in Zambia. Incentives similar to our social status treatment are found to be more effective than financial rewards at improving the direct performance of the referred agents. In a study with a one-year training program for health workers in Zambia, Ashraf, Bandiera, and Lee (2014) unbundle public (non-financial) awards and find that employer recognition and positive social visibility are the main drivers of trainees' test scores.[9] Incentives on intrinsic motivation of health workers have also emerged as effective in improving the performance of those workers in a few contemporaneous studies to ours.[10]

[7] 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 because they intrinsically dislike appearing unfair, either to themselves or others.

[8] Task significance signals agents that their efforts have an impact on the well-being of other people (Grant, 2007).

[9] Gauri et al. (2021) underline the possibility that effectiveness of public awards is context-specific.

[10] In a rural health worker program in India, Lee (2018) finds that a novel mobile app that makes effort more intrinsically rewarding leads to a substantial increase in workers' performance (home visits). Khan (2020) finds that making salient the organization's public health mission can improve health workers' performance across incentivized (home visits) and non-incentivized tasks. In contrast, piece-rate financial incentives improved

Our paper adds to the literature by (i) studying the full contingent of CHWs in the capital city of Guinea-Bissau, by (ii) contrasting the impacts of non-financial incentives based on social status with those based on intrinsic motivation driven by task significance, as well as by (iii) adopting a set of administrative and survey measures of not only the direct performance of CHWs, but also and crucially, a comprehensive range of households' health outcomes.

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 in current USD was 697 in 2019, ranking 199 in 213 countries.[11] The population of Guinea-Bissau is estimated at 1.92 million of which 56 percent live in rural areas and 30 percent live 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, as well as child and youth health.[12] The country's life expectancy is 58 years, which is lower than the average in Sub-Saharan Africa.[13] 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 diarrheal diseases (6 percent).[14] The country's health system faces persistent challenges related to inadequate supply of health workers, low public spending, and poor infrastructure.[15]

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[16] and recent efforts across Sub-Saharan Africa - see for instance the One Million Community Health Workers Campaign.

performance only on incentivized tasks. Finally, Banuri, Keefer, and De Walque (2018) find that task-based motivation beats mission-based motivation in eliciting effort among medical and nursing students in Burkina Faso.

[11] World Development Indicators, World Bank, 2020.

[12] At the time of the launching of this project (2016), Guinea-Bissau scored 7th globally for Neonatal Mortality Rate with 38 deaths per 1,000 live births, 8th for Maternal Mortality Rate with 679 deaths per 100,000 live births, and 17th for Under 5 Mortality Rate with 87 deaths per 1,000 live births (UNICEF Data Warehouse, 2021).

[13] Latest available years, World Development Indicators, World Bank, 2020.

[14] Latest available years, World Health Organization, 2019.

[15] See 'Guinea-Bissau: Service Delivery Indicators Report–Health,' World Bank, June 2019.

[16] 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.

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, which has been 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 of 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.[17]

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 they perform : this is approximately USD 0.2 per household visited each month. CHWs are expected to visit each one of the households within the pre-defined group of households they are allocated to (which is typically composed of around 50 households per CHW). There is also a small monetary award every semester for achieving pre-established health goals at the health area level: this is at most USD 21 per semester.[18] 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 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

[17] Table A1 in the Online Appendix shows the 16 Essential Family Practices promoted by the program.
[18] We use the average exchange rate for 2017 and 2018: 1 USD = 577.831 XOF (West African CFA franc)

attributed by CHWs to their role/task. Third, we also follow an information campaign about the role of CHWs in their communities. There were three rounds of treatment for each one of the interventions. Figure B1 in the Online Appendix 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.[19] 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. Figure C1 in the Online Appendix presents the distribution of the neighborhoods in the city of Bissau by treatment status.

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;[20] (ii) test scores from short exams submitted to CHWs every month during the monthly CHW general meeting and refresher training sessions;[21] and (iii) supervisors' evaluations of CHWs' performance.[22] The specific threshold was never made public to CHWs during the three rounds of awards. However, all along, CHWs were informed that the three referred sources of data would be used to decide the awards.[23]

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

[19] Deserranno, Kastrau, and León Ciliotta (2021) show the importance of ensuring that the evaluation of health workers is perceived as meritocratic. In a field experiment in partnership with the Ministry of Health in Sierra Leone, these authors find that promotions perceived as meritocratic lead to higher productivity. However, promotions that are perceived as non-meritocratic reduce productivity by triggering a negative morale effect.

[20] Each CHW is expected to submit a monthly report with aggregate information on the number of households visited, and a headcount of children 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.

[21] These meetings were typically held at the level of the health unit.

[22] 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. There where 26 supervisors from VIDA in total. 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.

[23] The specific joint 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 15 out of 20 or more in the quizzes submitted during the monthly meetings; (iii) CHWs had to be given an average score of 4.5 out of 5 or higher in the supervisors' reports.

between rounds, associated with community honor.[24] 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 had been given a performance award.[25] Note that in each of the three rounds of awards all CHWs in treated neighborhoods had the possibility of winning the award (18 percent of all CHWs treated won at least one round of awards).

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. 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 a 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 covers a different health problem arising on a given day of the CHW activity, directly related to the Essential Family Practices promoted by the program. 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.[26]

The full video has three components, which we describe as follows.[27]

1. **Presentation**: The video begins by showing a CHW visiting a household where he/she encounters a household member facing an 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 follows a low-effort decision by the CHW and involves the death of that person. After the decision is taken by 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 (dramatic) consequences of his/her actions during household visits.

3. **Endorsement of traditional healers**: A group of eminent traditional healers from outside

[24] See Section C.1 in the Online Appendix for photos of these objects and of the ceremonies.

[25] Section C.1 in the Online Appendix reproduces the specific contents of the text messages that were sent to the households.

[26] After watching the video, treated CHWs participated in focus groups to discuss the content of the video and the main messages.

[27] In the Online Appendix to this paper, in Section C.2, we show video snapshots and online links to the videos.

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. Traditional healers are labeled as such in the video. 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 a strong 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.

We also designed an additional intervention aiming 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.[28]

## 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 clustered 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

[28]Prior to the beginning of the program, NGO VIDA completed a census of the Autonomous District of 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 C.3 of the Online Appendix reproduces all the text messages sent to the households.

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 in relation to 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) 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 D1 of the Online Appendix. 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 of 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 per CHW 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 managing the CHWs; (ii) baseline and endline CHW surveys; (iii) baseline and endline household face-to-face surveys; (iv) a household phone survey administered after the end of the interventions; and (v) daily health-provision activities from hospitals' and health centers' logbooks from October 2017 to October 2018. 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, test scores before and after the training sessions, and evaluation records of CHWs by their supervisors. We also employ as auxiliary data the 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 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.

The research team visited all 10 health centers and the three hospitals in Bissau and digitized logbooks with registries on vaccination, post-natal care, and family planning from October 2017 to November 2018. Logbooks are homogeneous across facilities. Since patient identifiers in the logbooks were imperfectly registered, we opted for merging these data at the level of the place of residence. This allowed matching these data to neighborhoods and evaluating the impact of the Social status treatment.

All outcome questions employed in our study, structured by data source, are fully described in Section E 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 mainly interested in assessing impacts on CHWs' performance and on households' health outcomes. Hence, our main hypotheses are the following.

**Hypothesis 1:** The incentive treatment on Social status (award, ceremony, and SMS) improves 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:** The incentive treatments on the Task significance video (blending the groups with and without endorsement by traditional healers) improves 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.

We are also able to test a number of auxiliary hypotheses in our experimental design. These are bundled together in Hypothesis 3 as follows.

**Hypothesis 3a:** Task significance improves on Placebo/information with regards the performance

of CHWs and the health outcomes of the households. In other words, the visualization of CHW impact in community health (through the video) is impactful.

**Hypothesis 3b:** 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 3c:** The Information campaign (SMS) improves the performance of CHWs as well as the health outcomes at the level of the households.

**Hypothesis 3d:** 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.

$$y_i = \alpha + \beta_1 \mathrm{SS}_i + \beta_2 \mathrm{TS}_i + \beta_3 \mathrm{IP}_i + \beta_4 \mathrm{IC}_i + X_i'\gamma + \epsilon_i \tag{1}$$

where $y_i$ is the outcome of interest at the endline, i.e., related to CHW performance or household health (assumed to be measured in such 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. $X_i$ is a set of controls including strata fixed effects.[29] $\epsilon_i$ is an idiosyncratic error term. To account for possible correlation in outcomes within neighborhoods, the error term is clustered at the neighborhood level.

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

[29]Control variables include CHW characteristics (gender, age, and education) and households characteristics when interviewed face-to-face (age and gender of the household head as well as 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 individual.

$$y_i = \alpha + \beta_1 \text{SS}_i + \beta_2 \text{TS}_i + \beta_3 \text{IP}_i + \beta_4 \text{IC}_i + X_i'\gamma + \delta y_{i0} + \epsilon_i \tag{2}$$

where $y_{i0}$ is the baseline value of the dependent variable.[30]

Specifications 1 and 2 allow testing Hypotheses 1 ($\beta_1 > 0$), 2 ($\beta_2 > 0$), 3a ($\beta_2 > \beta_3$), and 3c ($\beta_4 > 0$).

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.

$$y_i = \alpha + \beta_1 \text{SS}_i + \beta_{2a} \text{TSA}_i + \beta_{2b} \text{TSE}_i + \beta_3 \text{IP}_i + \beta_4 \text{IC}_i + X_i'\gamma + \epsilon_i \tag{3}$$

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

We then test Hypothesis 3d in a specification analogous to 1, but adding the interaction terms of interest. These are the interactions between the incentive treatments or the interactions between the incentive treatments and the information campaign. Hypothesis 3d implies these interaction terms are positive.

Finally, we modify Equation 1 to analyze the treatment effects of Social status on health related outcomes from hospitals' and health centers' logbooks. We employ the following specification:

$$y_{ig} = \alpha + \beta_1 \text{SS}_g + X_{gi}'\gamma + \epsilon_g \tag{4}$$

where $y_{gi}$ is the outcome of interest for patient $i$ in neighborhood $g$. $X_{gi}$ is a set of controls including strata fixed effects and a vector of neighborhood-specific characteristics.[31] This specification allows revisiting Hypothesis 1 ($\beta_1 > 0$).

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

[30] If the autocorrelation of the outcome variable is low, which is the case for most survey outcomes, this specification maximizes statistical power in field experiments (McKenzie, 2012).

[31] Control variables include averages of CHWs characteristics at the neighborhood level (gender, age, and education), number of households targeted by CHWs in the neighborhood, and the average of households' size at the neighborhood level. In addition, when analyzing vaccine records, controls include children's age fixed effects and number of children under 2 years old living in the neighborhood. When analyzing post-natal care records, controls include quarter fixed effects for date of visit and the number of births in the neighborhood. When analyzing family planning records, controls include quarter fixed effects for date of visit, and the number of women in fertile age living in the neighborhood.

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 apply two strategies. First, 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. Second, 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 (2005a) and Romano and Wolf (2005b). This method is stepdown like other improvements over Bonferroni (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.

# 5 Results

## 5.1 Balance and descriptive statistics

We show balance tests in Section F of the Online Appendix. Our randomization procedure was able to identify comparable groups, namely in terms of demographic characteristics of both CHWs and households. Appendix Table F1 presents balance tests on baseline characteristics for the full set of CHWs across the three main treatment arm dimensions, 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 significance in only four cases.

We can also employ Table F1 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. Seventy-six percent have completed 12 years of schooling, and 51 percent were studying at the time the CHW program started. Fifty-one percent worked in the 12 months previous to the beginning of the CHW program and 11 percent had a business when the program started. Sixty-two 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 F2 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.

Table F2 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. Twenty-four percent have completed 12 years of schooling, and 69 percent worked in the 12 months previous to the beginning of the CHW program. Twenty 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.[32]

An analysis of attrition is given in Section G in the Online Appendix. Table G1 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, we have at least one household interviewed by phone at the endline for 48 percent of the CHWs in the pure control group. 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 rates for CHWs and households are not significantly different across treatment arms. The exceptions, which yield marginal significance, are 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).

Tables G2 - G3 in the Online Appendix verify that the CHWs and households surveyed face-to-face at endline, i.e., after attrition, are similar in treatment and control groups.

A final note goes to the logbooks of health centers and hospitals. The final matching rates on the basis of place of residence are 34 percent for the logbook on vaccines, 37 percent for the post-natal care logbook, and 24 percent for the family planning logbook. A potential concern is whether the number of records matched differs by treatment groups. To analyze whether this is the case, we use information on the number of households living in each neighborhood and the composition of these households. Table G4 in the Online Appendix shows that the differences between the Social status treatment group and its control are not statistically significant for any of the population variables analyzed.

## 5.2 Treatment effects of incentives - main outcomes

### 5.2.1 CHW performance

We start by devoting attention to our measures of direct CHW performance. We employ specification 1 but focus attention on the the effects of the incentive treatments, i.e., 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 Hypotheses 1 and 2. We also explicitly show the treatment effect of the Information/placebo video, which allows

[32] When employing the census data for Bissau (2009), we find a similar overall picture. The average age of the household head is 43 years, 31 percent are female, and 44 percent are Catholic. 20 percent have completed 12 years of schooling. 20 percent are Balanta, 16 percent Papeis and 19 percent Fula. The average number of household members is 7.

testing Hypothesis 3a, on the difference between the Task significance treatments over that of the first component of the video. Our treatment effects are shown in Table 1. 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, consistently with Hypothesis 1. This is clearly the case for performance scores of CHWs from administrative data, and household satisfaction with the CHWs. We observe that test scores improve by 0.09 standard deviation units and that supervisory scores improve by 0.07 standard deviation units, with both statistically significant at the 10 percent level. Household satisfaction increases by 0.22 standard deviation units (phone survey) and by 0.25 standard deviation units (face-to-face survey) - these effects are statistically significant at the 10 percent level. Other treatment effects of Social status are generally 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, consistently with Hypothesis 2. 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 3a, 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. The treatment effects of the Information/placebo video are never statistically significant.

A potential concern with performance-based incentives is the presence of multitasking problems, i.e., effort allocated toward targeted indicators may come at the expense of other, non-incentivized indicators (Holmstrom and Milgrom, 1991). On treatment effects related to the direct performance of CHWs, we conclude that Social status incentives were clearly effective in improving incentivized outcomes, i.e., test scores and evaluation scores, as well as non-incentivized outcomes, i.e., number of visits and households' satisfaction with the CHWs. Among the three targeted indicators in assessing CHW performance for the honorific awards, the Social status intervention had the largest impact on test scores in the context of refresher training, suggesting effects on learning and improved skills, which are confirmed when looking at specific components of these test scores.[33] Results relating to the Task

[33]We show in the Online Appendix treatment effects on specific components of both the test scores in the

significance video are not as clear when comparing to those of the Social status treatment. This means that only Hypothesis 1 is systematically verified.

### 5.2.2 Household health - survey

We now turn to measures of household health from the endline face-to-face household survey we conducted. Here, we seek to identify the treatment effects of both types of incentives in our design to inform on Hypotheses 1, 2, and 3a (like in the previous section). Table 2 depicts results on outcome variables related to the whole surveyed household, i.e., at the household level. Specifically, we analyze knowledge of health practices by the survey respondent, whether the household treats water with bleach or chlorine, the number of mosquito nets impregnated with insecticide in the household, and whether the household uses latrines. Note that for most of these outcomes, beyond specification 1, we can employ baseline data, 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 0.23 standard deviation units, statistically significant at the 1 percent level. 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 5 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. 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, we observe a positive and significant effect of Task significance for knowledge of the essential family practices, over that of Information/placebo.

In Table 3 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. 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 (columns (1) and (2)) and observation of vaccination bulletins for individual children (columns (3) and (4)). We also explore results on whether children are reported to

context of monthly meetings and the evaluation of supervisors. Table H1 shows treatment effects on test scores by topic. We find a positive effect of Social status on knowledge of the protocol for home visits, which is in line with the findings on the satisfaction of households with CHW performance during home visits. We also report an increase in scores measuring knowledge about prevention of illnesses and their identification. These results open the possibility that the Social status intervention impacts health outcomes at the household level. Table H2 shows treatment effects on supervisors' evaluation score of CHWs by component (theoretical knowledge, relationship with families, protocol for home visits, transfer of know-how, as well as management and monitoring protocol). We find that the positive Social status treatment effect observed on supervisors' evaluation score of CHWs is driven by an increase of 0.9 standard deviations on theoretical knowledge.

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 positive effects of both incentive treatments on the probability of getting all five vaccines. These are 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, in the case of Task significance. Note that levels of vaccination are relatively high: 76-87 percent of control children get all five vaccines. Magnitudes are 4 percentage points for the Social status treatment (observed bulletins, ANCOVA specification), significant at the 10 percent level, and 5 to 9 percentage points for the Task significance treatment, significant at the 1 percent level. Differences across the two incentive treatments are statistically significant when baseline dependent variables are not employed as controls. Interestingly, also the Information/placebo video has significant impacts of the same range (3 to 6 percentage points), which are distinguishable from the effects of task significance in the case of the self reported measure (ANCOVA specification). 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 8 percentage points - this effect is significant at the 5 percent level of statistical confidence. The probability of taking a malaria test decreases by 3 percentage points (significant at the 10 percent level), but in case symptoms of malaria appear, it increases by 7 percentage points, although not significantly at standard levels. This result suggests that the negative effect of Social status on taking a malaria test is driven by a lower probability of getting sick. 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 4 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). We restrict the analysis to the household head or the spouse of the household head. In the case of the remaining columns, women in our sample 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 treatment variables under consideration.

We conclude that Social status incentives had several important positive effects on household health as measured in the context of our survey implementation. Knowing that the prospective of receiving employer and community recognition led to higher levels of CHW direct performance as measured in both incentivized and non-incentivized outcomes, including important aspects of CHW learning about how to effectively interact with households (shown in the previous section), it is not surprising that we find positive treatment effects of Social status on non-incentivized indicators of household health: specifically on knowledge about health practices in the household, vaccination of children, likelihood that children are not sick, and administration of vitamin A to newborns. Note that apart from positive effects on vaccination of children, we do not find clear impacts of the Task significance intervention on household health. This means Hypothesis 1 for Social status is clearly verified when considering household health. We find less evidence in favor of Hypothesis 2, which is limited to vaccination of children, and even less on the added effect of Task significance over that of the first component of the video.

### 5.2.3 Household health - logbooks from health centers and hospitals

We now turn to analyzing health records from all health centers' and the main hospitals' logbooks in the city of Bissau. The analysis is restricted to the Social status intervention (see Section 3.3 for details). Table 5 depicts the corresponding results. Column (1) shows treatment effects of Social status on an index measuring the take-up of the five most important vaccines as defined previously in Table 3. Our estimations are at the level of children who were two years or younger in October 2018 while having received a first vaccine at a health center or hospital in Bissau after September 2017.[34] Columns (2) to (4) are devoted to postnatal care. Our sample is formed by women visiting a health center or hospital for a post-natal check-up in 2018. We analyze results on whether the births happened at home, on the time elapsed between delivery and post-natal check-up, and on whether a post-natal check-up happened in the 10 days after giving birth. Column (5) takes as sample those women visiting a health center or hospital for a family planning appointment in 2018. It shows results on an indicator variable for first visits of this kind.

We find positive and significant effects of Social status on the probability of getting all five vaccines. This result supports our previous findings employing the survey-based measurements. Indeed, the magnitude of the effect is very similar, around 2 percentage points, significant at the 5 percent level. Turning to the outcome variables taken from the post-natal logbook, we also find several statistically

[34] Each child getting a vaccine in a health center or hospital is registered at the date of the first visit, with all the follow-up visits recorded in the same logbook page. Thus, older children's vaccination records are included in previous years's logbooks, to which we did not have access.

significant impacts of the Social status treatment. Specifically, the probability of giving birth at home decreases by 3 percentage points, which is significant at the 10 percent level. We also report a drop of 12 days on the number of days elapsed between delivery and a post-natal check-up, and an increase of 9 percentage points on the probability of attending a post-natal check-up in the first 10 days after birth. These estimates are statistically significant at the 1 or 5 percent levels, respectively. Finally, we do not find effects of the Social status treatment on the probability of visiting for the first time a health center or hospital for an appointment on family planning.

We conclude that the Social status intervention had important treatment effects on actual health indicators related to immunization of children as well as natal and post-natal health care. These findings reinforce the validity of Hypothesis 1 on the positive impact of incentives related to Social status.

### 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 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 1; home visits, using the phone survey at the level of the household, built from outcomes in columns (5)-(7) of Table 1; home visits, utilizing the face-to-face survey at the level of the household, built from outcomes in columns (8)-(10) of Table 1; health indicators at the level of the household, employing the face-to-face survey data, built from the outcomes of Table 2; health of children under 5 years old, using the face-to-face survey data at the level of the child in the household, built from the outcomes in Table 3; vaccination of children, using health records from all health centers' and the main hospitals' logbooks, as defined previously in Table 5; family planning and natal care, utilizing the face-to-face survey data at the level of the woman, built from the outcomes in Table 4; family planning, using health records from the logbooks, as defined previously in Table 5; and natal care, employing records from the referred logbooks, built from outcomes in columns (2)-(4) of Table 5.

Figure 1 shows treatment effects of Social status analogous to the ones shown in the previous section on the aggregate indices we describe above.[35] We employ specification 1 for indices built using outcomes from Tables 1-4. For outcomes built from health records (Table 5) we employ specification 4. Confidence intervals are built using statistical significance at the 5 percent level. Given the standardization of outcome variables embedded in the procedure we adopted, all treatment effects are in standard deviation units.

[35] See Table H3 in the Online Appendix for the full table corresponding to this graph.

We find significant effects for the Social status treatment in the case of home visits (phone survey), health indicators at the level of the household, health of children under 5 years old, vaccination of children (logbooks), and natal care (logbooks). The magnitudes of these effects vary between 0.09 and 0.16 standard deviation units. These findings reassure us about the validity of Hypothesis 1.

Figure 2 shows treatment effects of Task significance on the aggregate indices built using administrative data, as well as phone and face-to-face survey data.[36] Effects for Task significance are much less clear than effects for Social status. However, driven by the outcome variables on vaccinations of children, we find a treatment effect of 0.09 standard deviations, (significant at the 5 percent levels) 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, i.e., the SMS information campaign. We undertake the analysis by employing aggregate indices and displaying the corresponding treatment effects in Table H5 in the Online Appendix.

The specification employed for the analysis of all the video treatment effects, in panel (a) of the table, is described in Equation 3 above. The specification used for estimating the treatment effect of the Information campaign, in panel (b) of the table, is the same as for Figure 1.

The results we encounter show some statistically significant differences across the video treatment effects. For some of our outcomes of interest, we find smaller effect sizes for the Placebo/information video and for the full video on Task significance plus endorsements than for the simpler treatment on Task significance alone. This is the case for health indicators at the level of the household, health of children under 5 years old, and family planning and natal care. This implies Hypothesis 3a on a positive difference between Task significance alone and Information/placebo is partially verified, while Hypothesis 3b on a positive difference between Task significance plus endorsement and Task significance alone is partially going the other way around. These findings suggest that the visualization of CHW impact in community health (through an interactive video) could be beneficial to household health outcomes, while the endorsements of traditional healers could actually be detrimental. 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 3c. Possible interpretations for this null result are that: (i) SMSs did not reach households to the extent we expected; (ii) households were sufficiently aware of CHWs activity; and (iii) CHWs did not use increased trust by the households to improve their productivity.

[36] See Table H4 in the Online Appendix for the full table corresponding to this figure.

## 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 a specification analogous to 1 adding interaction terms allows testing Hypothesis 3d 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 statistically significant interaction coefficients, except for home visits (phone survey), where the interaction coefficient between Social status and Task significance is positive with magnitude 0.24 standard deviations, (significant at the 5 percent level). However, this interaction effect is indistinguishable (statistically) from that of the interaction between Social status and Information/placebo. These results suggest that if anything both incentive treatments were complementary. We report the results on complementarity between the incentive treatments and the information campaign in Table H6 in the Online Appendix. We do not find any significant interaction effect.

We conclude that there is no systematic evidence in favor of complementarities between interventions, despite residual evidence in favor positive complementarities between incentive treatments. A possibility is that limited statistical power, together with limited impacts of the Task significance intervention, prevent 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. Table H7 in the Online Appendix shows the number of treatment rounds actually attended 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 7 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 dedicated to task significance alone. These are effects on CHW performance as well as on Health of children under 5 years old. Magnitudes are 0.39 and 0.10 standard deviation units (respectively), statistically significant at the 1 and the 5 percent levels of confidence. There are positive and statistically significant differences between Task significant alone and Placebo/information when employing the index on health at the household level, the index on health of children under 5 years old, and the index on family planning and natal care. 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 health indicators at household level and for health of children under 5 years old.

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 clearer LATE when compared 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 H of the Online Appendix.

First, we analyze treatment effects on self-reported CHW motivation. This is assessed through standard survey questions on the role of monetary awards and social recognition (Amabile et al., 1994), as well as of social impact (Grant and Campbell, 2007) in motivating CHWs. These questions were submitted in both baseline and endline face-to-face surveys of CHWs. Hence, we are able to employ ANCOVA specifications when using these data as dependent variables. Table H8 is devoted to the estimation of the main treatment effects, i.e., on the impact of Social status and Task significance.[37]

We find positive and significant effects of Social status on CHWs motivation through social impact. In other words, CHWs rationalize additional motivation in face of the Social status intervention, consistently with the main treatment effects we document in this paper, through a perception that their impact in their communities has increased. Magnitudes are 1 percent of the scale employed, with confidence levels at the 1 percent. These effects are however indistinguishable from those of task significance. We also observe positive and significant differences between the simple Task significance video treatment and the full video treatment (with endorsements) on social impact, consistently with negative marginal effects of endorsements of traditional figures.

Second, we report in Table H10 the main treatment effects on different dimensions of household

[37] Table H9 reports on the other treatment effects in our design.

knowledge about the health practices conveyed by CHWs to households as part of their CHW mandate. This is disaggregating the outcome variable of regression (1) in Table 2. The outcomes are constructed from questions in the endline face-to-face household survey.[38] 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 of Social status on knowledge about newborn care and washing hands. These effects range from 3 to 4 percentage points, significant at the 5 or 10 percent levels.

Third, we provide evidence that the effects of the incentives schemes are not contaminated by spillovers, namely by agents in other treatments reacting to not having had the possibility of getting an award or visualizing the task significance video. We exploit CHWs' networks within the program at the baseline to test whether individuals in the control group, who know CHWs assigned to the treatments and therefore are more likely to be affected by spillovers, show different levels of the outcome variables. Figure H1 in the Online appendix shows that the number of CHWs known in each treatment group by the individuals in the control group does not affect outcomes' aggregate indices.

Fourth, we study whether our performance-based, Social status incentive, creates heterogeneous effects for those who have a lower chance of winning the award. To assess this possibility, we allow the effects of Social status to differ between those who won the award and those who did not. Figure H2

in the Online Appendix shows larger treatment effects for those who were awarded, of 0.15-0.18 standard deviations on home visits (significant at the 5 percent level), and of 0.09 standard deviations on health of children under 5 (significant at the 5 percent level). Ours results suggest that both groups (awarded and non-awarded) performed at a similar level when considering health indicators at the household level, and natal care.[39] We can then conclude for some limited evidence of heterogeneous effects of Social status.

A final note goes to robustness exercises we conduct on the choice of control variables for CHWs and households, as well as on multiple hypothesis testing. In Section I 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 J 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.

[38] The full list of questions is included in Section E in the Online Appendix.

[39] Consistently, we find that treatment effects spread over the whole distribution of the main performance indicator we employed (Figure H3 in the Online Appendix).

# 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.

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. We find positive effects of the task significance video, particularly for compliers, which are difficult to distinguish from the basic video treatment. Endorsements of traditional healers are not improving our outcomes of interest.

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's learning about health practices, is an effective strategy to improve their performance and impact on relevant dimensions of household health. The implied policy recommendation is clear in face of the negligible costs of this type of intervention. More work is needed on understanding the triggers of intrinsic motivation for pro-social behavior by CHWs.

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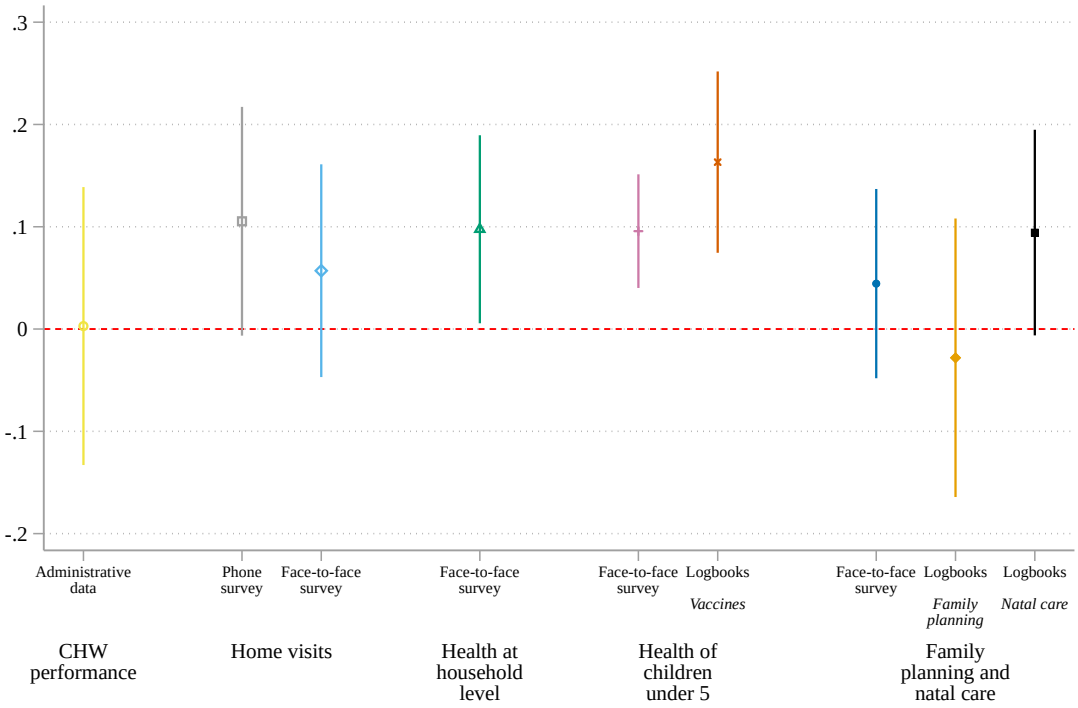
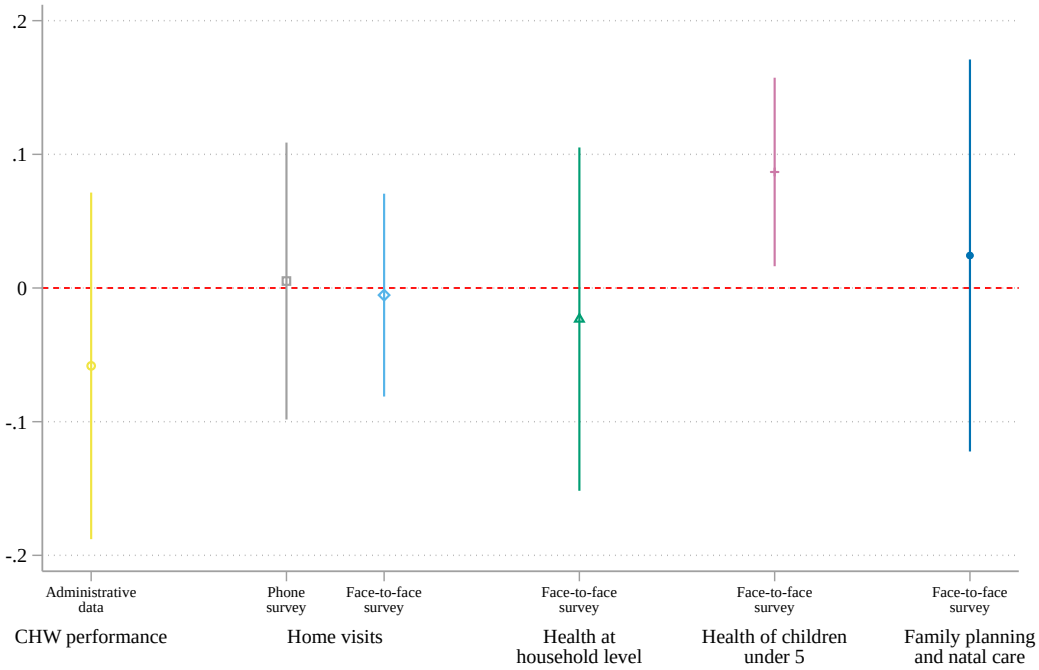
## Figures and tables

Figure 1: Main treatment effects - aggregated outcomes employing z-scores - Social status




Note: Estimates based on OLS regressions. The first to fifth, and seventh bars present estimates using Equation 1. The sixth, eighth, and ninth bars present estimates 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. The indices are defined by the following outcomes: (1) CHW performance (administrative data): formed from outcomes in columns (1)-(4) of Table 1; (2) Home visits (phone survey): formed from outcomes in columns (5)-(7) of Table 1; (3) Home visits (face-to-face survey): formed from outcomes in columns (8)-(10) of Table 1; (4) Health at household level (face-to-face survey): formed from the outcomes of Table 2; (5) Health of children under 5 (face-to-face survey): formed from the outcomes in Table 3; (6) Vaccination of children (logbooks): index measuring the take-up of the five most important vaccines as defined in Table 5; (7) Family planning and natal care (face-to-face): formed from the outcomes in Table 4; (8) Family planning (logbooks): indicator variable that takes value of 1 for women visiting for the first time a health center or hospital for an appointment on family planning, as defined previously in Table 5; (9) Natal care (logbooks): formed from outcomes in columns (2)-(4) of Table 5. Specifications in the first to the fifth bar and specification in the seventh bar include an indicator variable for assignment to the Task significance treatment, an indicator variable for assignment to the Information/Placebo treatment, an indicator variable for assignment to the Information campaign treatment, strata fixed effects, and CHW level controls. Specifications in the third to the fifth bar and specification in the seventh 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 seventh bar includes respondent's age. Specifications in the sixth, eighth, and ninth bars include neighborhood characteristics. The full list of controls is presented in Section 4. Confidence intervals are built using statistical significance at the 5 percent level. Standard errors are clustered at neighborhood level.

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




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 1; (2) Home visits (phone survey): formed from outcomes in columns (5)-(7) of Table 1; (3) Home visits (face-to-face survey): formed from outcomes in columns (8)-(10) of Table 1; (4) Health at household level (face-to-face survey): formed from the outcomes of Table 2; (5) Health of children under 5 (face-to-face survey): formed from the outcomes in Table 3; (6) Family planning and natal care (face-to-face): formed from the outcomes in Table 4. Specifications employed include an indicator variable for assignment to the Social status treatment, an indicator variable for assignment to the Information/Placebo treatment, 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. Standard errors are clustered at neighborhood level.

Figure C3: Social status ceremony

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!*

## C.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/malaria). This part of the video lasts 3-4 minutes.

Figure C4: 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 C5: Interactive choice

Figure C6: Ending

(a) Negative outcome (b) Positive outcome

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 C7: 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, 2 and 3 of each of the three videos:

- **Round 1:** Assistance to pregnant woman: Android version (interactive component ac-

tivated), PC version (continuous with both endings), PC version and English transcripts (endorsement by traditional healers).

- **Round 2:** Treatment of diarrhea: Android version (interactive component activated), PC version (continuous with both endings), PC version and English transcripts (endorsement by traditional healers).

- **Round 3:** Treatment of severe malaria: Android version (interactive component activated), PC version (continuous with both endings), PC version and English transcripts (endorsement by traditional healers).

## C.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!*

# D Randomization

Table D1: Experimental design – number of CHWs per treatment group

| | Social status | | Control | | |
|---|---|---|---|---|---|
| | Information campaign | Control | Information campaign | Control | Total |
| Task significance alone | 64 | 59 | 63 | 68 | 254 |
| Task significance plus endorsement | 61 | 63 | 65 | 64 | 253 |
| Information/placebo | 63 | 67 | 64 | 60 | 254 |
| Control | 60 | 64 | 67 | 63 | 254 |
| Total | 248 | 253 | 259 | 255 | 1,015 |

# E List of outcome variables

## E.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 EFPs and family planning. The variable is normalized (z-score) within supervisor.
- **CHW evaluation score by supervisor:** average score from the supervisor's report on CHWs' 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.

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

**Motivation measures**

All measures come from validated standard questions used in employment surveys on pro-social motivation and career orientation. Each variable is an average of item scores, i.e., it represents the average level of agreement with the included statements (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 is an index of the degree to which a CHW 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 is an index of the degree to which an individual is oriented toward recognition by 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 is 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."*.

### E.3 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. Five-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 of health practices:** number of correct answers to 28 questions measuring household knowledge of the 16 essential family practices and of family planning. This variable ranges from 0 to 28.[40] The questions are the following. They ask the respondent to select the correct statement, except in the last questions which are true/false.

  1. The contraceptive pill:
     (a) is distributed free of charge at the health centers in the family planning visit.
     (b) is purchased at the health centers in the family planning visit.
     (c) is prohibited by law in Guinea-Bissau.
  2. A pregnant woman:
     (a) must attend at least 4 pre-natal visits at the health center.
     (b) who is already a mother, only needs to attend one pre-natal visit.
  3. Exclusive breastfeeding consists of:
     (a) feeding the baby only with breast milk until 6 months of age.
     (b) feeding the baby with breast milk and water or tea, until 6 months of age.
     (c) feeding the baby with breast milk and enriched porridge.
  4. In the context of exclusive breastfeeding:
     (a) the baby is not breastfeeding enough when he or she presents diluted urine.
     (b) the baby is not breastfeeding enough when he or she has hard, dry, or green feces.
  5. A 10 month old child:
     (a) in addition to breast milk, should eat enriched porridge and the family dish.
     (b) should only be breastfed, so that he/she is well nourished.
     (c) should eat only rice.
  6. Vitamin A administration is important:

[40] See table A1 for the list of the 16 essential family practices.

(a) only for children traveling to the regions.
(b) only for children who have had diarrhea recently.
(c) for all children from 6 months old.

7. Whenever possible, a household should:
   (a) replace bread with cookies, because they are enriched with sugar, which is beneficial for children.
   (b) maintain the child's diet balanced.
   (c) replace fruit with sugary juices, because they are enriched with sugar, which is beneficial for children.
8. Malnutrition is the abnormal state of growth or development of the organism caused by:
   (a) insufficient nutrients.
   (b) excess of nutrients.
   (c) a good diet.
9. The symptoms of simple pneumonia in the child are:
   (a) cough as well as rapid breathing, vomiting, and fever.
   (b) swollen legs and feet.
   (c) red spots on the skin with itching, especially on the trunk.
10. The most vulnerable people to malaria are:
    (a) children under the age of 5, and pregnant women.
    (b) elders.
    (c) adults.
11. Diarrhea is:
    (a) evacuation of soft or liquid feces once a day.
    (b) evacuation of soft or liquid feces at least 4 times a day.
    (c) evacuation of malodorous feces.
12. Tuberculosis transmission:
    (a) happens through skin and sweat contact.
    (b) is unlikely to happen.
    (c) happens through contact with saliva when coughing, sneezing, speaking, or singing.
13. To prevent tuberculosis, it is important:
    (a) to use mosquito nets on the windows and sleep under the MILDA.
    (b) to keep the house clean and ventilated, letting in the sun.
    (c) to keep the house clean and ventilated, preventing the sun from entering.
14. The most common symptoms of tuberculosis are
    (a) persistent cough, fever, tiredness, and weight loss.

(b) appetite and insomnia.

(c) headache and joints pain.

15. The human immunodeficiency virus is transmitted:

    (a) through hugging and shaking hands.

    (b) Through sexual intercourse, transfusion of blood and blood products; through intrauterine or vertical transmission, and breast milk.

    (c) through contact with saliva, sweat, and mosquito bites.

16. To prevent HIV/AIDS, you should:

    (a) use a condom and avoid any blood contact.

    (b) avoid handshaking and hugging.

    (c) use spermicide after sexual intercourse.

17. For each of the following statements, declare whether it is true or false:

    (a) It is necessary to wash your hands before preparing a meal.

    (b) A child needs to wash his/her hands after using the latrine.

    (c) It is possible to prevent diarrhea by washing hands in a shared calabash before and after meals.

    (d) A mother should wash her hands before breastfeeding.

    (e) Clean and closed latrines allow reducing disease transmitted by flies.

    (f) After eliminating feces from a baby's diaper in the latrine, it is necessary to cover the latrine.

    (g) Boiling is the only method that makes water potable.

    (h) One of the modes of transmission of diarrhoeal diseases is the consumption of non-potable water.

    (i) One Liter of water should be treated with 1 drop of bleach.

    (j) One Liter of water should be treated with 3 drops of bleach.

    (k) It is necessary to cover the container used to transport water.

    (l) It is necessary to cover the container used for water storage.

- **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 impregnated with insecticide 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 five indicator variables for taking each of the following vaccines: BCG, polio, DTcoq (diphtheria-tetanus-pertussis), MMR (measles-mumps-rubella), and yellow fever. Self-reported data.

- **Vaccination index (5 vaccines) - observed bulletin:** index variable averaging five indicator variables for taking each of the following vaccines: BCG, polio, DTcoq (diphtheria-tetanus-pertussis), MMR (measles-mumps-rubella), and yellow fever. Information directly observed in the vaccination bulletin.

- **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:** indicator variable that takes value of 1 for children who took a malaria test, and zero for children who did not take a malaria test.

- **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 of 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, or diaphragm.

- **Number of pre-natal visits:** number of pre-natal visits to a health facility during pregnancy.

- **Pre-natal care index:** index variable averaging four indicator variables for the following pre-natal 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 post-natal 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 until 45 days after giving birth.

### E.4 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. Five-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.

### E.5 Health centers' and hospitals' logbooks

- **Vaccination index (5 vaccines):** index variable averaging five indicator variables for taking each of the following vaccines: BCG, polio, DTcoq (diphtheria-tetanus-pertussis), MMR (measles-mumps-rubella), and yellow fever.
- **Birth at home:** indicator variable that takes value of 1 for women who gave birth at home.
- **Number of days between giving birth and a post-natal visit:** number of days between the registered date of birth and the visit to the health center/hospital for a post-natal check-up.
- **Post-natal visit in the 10 days after giving birth**: indicator variable that takes value of 1 for women visiting the health center/hospital for a post-natal check-up in the 10 days after giving birth.
- **First visit to the health center/hospital:** indicator variable that takes value of 1 for women visiting a health center or hospital for an appointment on family planning.

# F Balance

Table F1: Characteristics of CHWs

| | Pure control | Social status | Video treatments: Task significance alone | Video treatments: Task significance plus endorsement | Video treatments: Information/ placebo | Information campaign | All treatments |
|---|---|---|---|---|---|---|---|
| | mean | diff. | diff. | diff. | diff. | diff. | joint test (p-value) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Age in 2017 | 26.08 | 0.50 | -0.19 | -0.47 | -0.04 | 0.41** | 0.220 |
| | | (0.43) | (0.27) | (0.29) | (0.28) | (0.19) | |
| Female (=1) | 0.48 | 0.03 | 0.01 | 0.01 | 0.02 | -0.01 | 0.925 |
| | | (0.03) | (0.04) | (0.04) | (0.04) | (0.04) | |
| Completed 12 years of schooling (=1) | 0.76 | 0.01 | 0.05* | 0.05 | 0.02 | -0.01 | 0.308 |
| | | (0.02) | (0.03) | (0.04) | (0.03) | (0.03) | |
| Currently studying (=1) | 0.51 | -0.02 | 0.02 | 0.02 | -0.01 | 0.01 | 0.923 |
| | | (0.03) | (0.04) | (0.04) | (0.04) | (0.02) | |
| Has university studies (=1) | 0.24 | -0.00 | 0.01 | 0.01 | -0.01 | 0.01 | 0.945 |
| | | (0.02) | (0.04) | (0.04) | (0.04) | (0.02) | |
| Catholic (=1) | 0.49 | -0.03 | 0.00 | 0.05 | 0.06 | 0.02 | 0.190 |
| | | (0.02) | (0.04) | (0.05) | (0.04) | (0.03) | |
| Muslim (=1) | 0.38 | 0.03 | 0.01 | -0.02 | -0.02 | 0.02 | 0.527 |
| | | (0.03) | (0.04) | (0.04) | (0.04) | (0.03) | |
| Owns bank account (=1) | 0.63 | -0.03 | -0.00 | -0.02 | 0.03 | 0.02 | 0.771 |
| | | (0.03) | (0.05) | (0.05) | (0.05) | (0.04) | |
| Owns house (=1) | 0.71 | 0.00 | -0.01 | -0.02 | -0.00 | 0.01 | 0.991 |
| | | (0.02) | (0.03) | (0.04) | (0.04) | (0.03) | |
| Worked in the last 12 months (=1) | 0.51 | 0.02 | 0.01 | 0.01 | 0.03 | 0.01 | 0.921 |
| | | (0.02) | (0.04) | (0.03) | (0.04) | (0.03) | |
| Worked in non-agriculture (=1) | 0.46 | 0.01 | 0.03 | 0.01 | 0.01 | 0.02 | 0.912 |
| | | (0.03) | (0.04) | (0.04) | (0.04) | (0.03) | |
| Skilled non-agriculture (=1) | 0.17 | -0.00 | -0.01 | 0.02 | -0.02 | 0.00 | 0.876 |
| | | (0.02) | (0.03) | (0.03) | (0.02) | (0.02) | |
| Currently has a business (=1) | 0.11 | 0.02 | 0.08* | 0.07* | 0.02 | -0.00 | 0.289 |
| | | (0.02) | (0.04) | (0.04) | (0.04) | (0.03) | |
| Volunteer at a health center (=1) | 0.62 | 0.05 | 0.03 | -0.04 | -0.02 | -0.01 | 0.193 |
| | | (0.04) | (0.05) | (0.05) | (0.04) | (0.03) | |
| Any position in the community (=1) | 0.81 | 0.03 | 0.01 | -0.03 | -0.02 | 0.01 | 0.208 |
| | | (0.03) | (0.04) | (0.04) | (0.03) | (0.02) | |
| Community position at the start of the program (=1) | 0.71 | 0.03 | 0.03 | -0.02 | -0.01 | 0.03 | 0.402 |
| | | (0.03) | (0.04) | (0.04) | (0.03) | (0.02) | |

Note: Column (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 are reported in parentheses. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

Table F2: Household characteristics, face-to-face survey

| | Pure control | Social status | Video treatments: Task significance alone | Video treatments: Task significance plus endorsement | Video treatments: Information/ placebo | Information campaign | All treatments |
|---|---|---|---|---|---|---|---|
| | mean | diff. | diff. | diff. | diff. | diff. | joint test (p-value) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **Household head characteristics:** | | | | | | | |
| Age in 2017 | 44.51 | -0.25 | -0.38 | -0.46 | -0.31 | 0.26 | 0.895 |
| | | (0.48) | (0.67) | (0.65) | (0.65) | (0.47) | |
| Female (=1) | 0.33 | 0.01 | -0.01 | 0.02 | 0.01 | 0.04** | 0.188 |
| | | (0.02) | (0.03) | (0.03) | (0.03) | (0.02) | |
| Completed 12 grades (=1) | 0.24 | 0.04** | -0.00 | -0.01 | -0.01 | -0.01 | 0.173 |
| | | (0.02) | (0.03) | (0.04) | (0.03) | (0.02) | |
| Worked last 12 months (=1) | 0.69 | -0.00 | 0.06 | 0.05 | 0.09** | -0.01 | 0.261 |
| | | (0.02) | (0.04) | (0.03) | (0.04) | (0.02) | |
| Catholic (=1) | 0.41 | 0.03 | -0.05 | -0.08* | 0.01 | 0.01 | 0.121 |
| | | (0.03) | (0.03) | (0.04) | (0.04) | (0.02) | |
| Muslim (=1) | 0.37 | -0.03 | 0.02 | -0.01 | -0.04 | -0.01 | 0.470 |
| | | (0.03) | (0.04) | (0.04) | (0.04) | (0.02) | |
| Balanta (=1) | 0.20 | -0.01 | -0.00 | 0.04 | -0.00 | 0.01 | 0.364 |
| | | (0.02) | (0.03) | (0.03) | (0.03) | (0.02) | |
| Papeis (=1) | 0.14 | 0.01 | -0.02 | 0.01 | 0.02 | -0.00 | 0.592 |
| | | (0.02) | (0.03) | (0.03) | (0.03) | (0.02) | |
| Fula (=1) | 0.19 | 0.01 | -0.02 | -0.01 | -0.01 | -0.01 | 0.885 |
| | | (0.01) | (0.02) | (0.03) | (0.03) | (0.01) | |
| **Household characteristics:** | | | | | | | |
| Households members | 6.63 | -0.11 | 0.21 | 0.13 | 0.19 | 0.08 | 0.774 |
| | | (0.11) | (0.25) | (0.26) | (0.24) | (0.14) | |
| Number of women 12-49 years old | 2.13 | 0.05 | 0.05 | 0.01 | 0.16* | 0.05 | 0.362 |
| | | (0.05) | (0.10) | (0.10) | (0.09) | (0.07) | |
| Number of children under 5 years old | 1.03 | -0.03 | 0.01 | 0.04 | 0.01 | -0.02 | 0.906 |
| | | (0.04) | (0.07) | (0.06) | (0.06) | (0.03) | |
| Number of household assets (max 16) | 4.29 | 0.11 | -0.27* | -0.09 | 0.19 | -0.14 | 0.058* |
| | | (0.11) | (0.15) | (0.19) | (0.17) | (0.13) | |
| Number of mosquito nets (per capita) | 0.48 | 0.01* | -0.00 | 0.00 | 0.02 | 0.01 | 0.358 |
| | | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | |
| Piped water (=1) | 0.81 | -0.00 | -0.03 | -0.02 | -0.02 | -0.01 | 0.633 |
| | | (0.03) | (0.02) | (0.02) | (0.03) | (0.01) | |
| Use of latrines - ANCOVA | 0.03 | -0.00 | 0.00 | 0.00 | 0.00 | -0.00 | 0.985 |
| | | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | |

Note: Column (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 are reported in parentheses. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

# G Attrition

Table G1: Data availability and attrition

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

Note: Column (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 are reported in parentheses. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

Table G2: Characteristics of CHWs - After attrition

| | Pure control | Social status | Video treatments: Task significance alone | Video treatments: Task significance plus endorsement | Video treatments: Information/ placebo | Information campaign | All treatments |
|---|---|---|---|---|---|---|---|
| | mean | diff. | diff. | diff. | diff. | diff. | joint test (p-value) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Age in 2017 | 25.78 | 0.54 | -0.02 | -0.35 | -0.02 | 0.49** | 0.156 |
| | | (0.45) | (0.28) | (0.31) | (0.30) | (0.20) | |
| Female (=1) | 0.46 | 0.05 | 0.02 | -0.00 | 0.02 | 0.01 | 0.689 |
| | | (0.03) | (0.05) | (0.04) | (0.05) | (0.04) | |
| Completed 12 years of schooling (=1) | 0.76 | 0.01 | 0.05 | 0.04 | 0.02 | -0.01 | 0.605 |
| | | (0.02) | (0.04) | (0.04) | (0.03) | (0.02) | |
| Currently studying (=1) | 0.54 | -0.01 | 0.00 | 0.02 | -0.01 | 0.01 | 0.988 |
| | | (0.03) | (0.04) | (0.04) | (0.05) | (0.03) | |
| Has university studies (=1) | 0.24 | 0.01 | -0.02 | -0.01 | -0.02 | 0.01 | 0.992 |
| | | (0.03) | (0.04) | (0.04) | (0.04) | (0.02) | |
| Catholic (=1) | 0.54 | -0.04* | -0.03 | 0.04 | 0.04 | 0.03 | 0.059* |
| | | (0.02) | (0.05) | (0.05) | (0.04) | (0.03) | |
| Muslim (=1) | 0.37 | 0.03 | 0.03 | -0.01 | -0.00 | 0.00 | 0.809 |
| | | (0.03) | (0.05) | (0.04) | (0.04) | (0.03) | |
| Owns bank account (=1) | 0.61 | -0.02 | -0.03 | -0.07 | 0.03 | 0.03 | 0.471 |
| | | (0.04) | (0.05) | (0.05) | (0.05) | (0.05) | |
| Owns house (=1) | 0.70 | 0.01 | -0.01 | -0.03 | -0.00 | 0.01 | 0.941 |
| | | (0.03) | (0.04) | (0.04) | (0.04) | (0.03) | |
| Worked in the last 12 months (=1) | 0.50 | 0.02 | -0.03 | -0.02 | 0.01 | 0.02 | 0.892 |
| | | (0.03) | (0.04) | (0.04) | (0.04) | (0.03) | |
| Worked in non-agriculture (=1) | 0.46 | 0.01 | -0.02 | -0.01 | -0.02 | 0.03 | 0.902 |
| | | (0.03) | (0.04) | (0.04) | (0.04) | (0.03) | |
| Currently has a business (=1) | 0.09 | 0.03 | 0.07* | 0.07* | 0.01 | 0.01 | 0.321 |
| | | (0.02) | (0.04) | (0.04) | (0.04) | (0.03) | |
| Volunteer at a health center (=1) | 0.63 | 0.05 | 0.02 | -0.03 | -0.03 | -0.01 | 0.414 |
| | | (0.04) | (0.05) | (0.05) | (0.05) | (0.03) | |
| Any position in the community (=1) | 0.81 | 0.03 | -0.00 | -0.02 | -0.03 | 0.01 | 0.439 |
| | | (0.03) | (0.04) | (0.04) | (0.03) | (0.02) | |
| Community position at the start of the program (=1) | 0.74 | 0.02 | 0.01 | -0.02 | -0.01 | 0.02 | 0.758 |
| | | (0.03) | (0.04) | (0.05) | (0.04) | (0.03) | |

Note: Column (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 are reported in parentheses. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

Table G3: Household characteristics, face-to-face survey - After attrition

| | Pure control | Social status | Video treatments: Task significance alone | Video treatments: Task significance plus endorsement | Video treatments: Information/ placebo | Information campaign | All treatments |
|---|---|---|---|---|---|---|---|
| | mean | diff. | diff. | diff. | diff. | diff. | joint test (p-value) |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| **Household head characteristics:** | | | | | | | |
| Age in 2017 | 45.25 | -0.37 | -0.88 | -0.97 | -0.73 | -0.19 | 0.660 |
| | | (0.51) | (0.77) | (0.70) | (0.71) | (0.56) | |
| Female (=1) | 0.35 | -0.00 | -0.03 | 0.02 | -0.01 | 0.04* | 0.196 |
| | | (0.02) | (0.04) | (0.03) | (0.03) | (0.02) | |
| Completed 12 grades (=1) | 0.25 | 0.04** | 0.00 | -0.00 | -0.02 | -0.02 | 0.226 |
| | | (0.02) | (0.04) | (0.04) | (0.04) | (0.02) | |
| Worked last 12 months (=1) | 0.68 | -0.00 | 0.07* | 0.05 | 0.08** | -0.00 | 0.375 |
| | | (0.02) | (0.04) | (0.03) | (0.04) | (0.02) | |
| Catholic (=1) | 0.42 | 0.03 | -0.06 | -0.08* | -0.00 | 0.00 | 0.200 |
| | | (0.03) | (0.04) | (0.04) | (0.04) | (0.02) | |
| Muslim (=1) | 0.35 | -0.03 | 0.03 | 0.00 | -0.04 | -0.00 | 0.494 |
| | | (0.03) | (0.04) | (0.04) | (0.04) | (0.02) | |
| Balanta (=1) | 0.20 | -0.01 | -0.01 | 0.04 | -0.01 | 0.01 | 0.360 |
| | | (0.02) | (0.03) | (0.03) | (0.03) | (0.02) | |
| Papeis (=1) | 0.15 | 0.01 | -0.02 | 0.02 | 0.03 | -0.00 | 0.380 |
| | | (0.02) | (0.03) | (0.03) | (0.03) | (0.02) | |
| Fula (=1) | 0.17 | 0.01 | -0.02 | 0.01 | -0.01 | -0.00 | 0.805 |
| | | (0.01) | (0.03) | (0.03) | (0.03) | (0.01) | |
| **Household characteristics:** | | | | | | | |
| Households members | 6.85 | -0.05 | 0.11 | 0.09 | 0.24 | 0.08 | 0.946 |
| | | (0.11) | (0.23) | (0.24) | (0.27) | (0.16) | |
| Number of women 12-49 years old | 2.24 | 0.05 | 0.05 | -0.01 | 0.17* | 0.08 | 0.239 |
| | | (0.05) | (0.09) | (0.09) | (0.10) | (0.07) | |
| Number of children under 5 years old | 1.03 | -0.00 | -0.00 | 0.05 | 0.01 | -0.03 | 0.873 |
| | | (0.05) | (0.07) | (0.06) | (0.07) | (0.04) | |
| Number of household assets (max 16) | 4.35 | 0.09 | -0.26 | -0.08 | 0.24 | -0.17 | 0.053* |
| | | (0.12) | (0.18) | (0.20) | (0.19) | (0.14) | |
| Number of mosquito nets (per capita) | 0.48 | 0.01 | -0.00 | 0.01 | 0.02 | 0.01 | 0.620 |
| | | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | |
| Piped water (=1) | 0.79 | -0.01 | -0.03 | -0.02 | -0.01 | -0.01 | 0.564 |
| | | (0.03) | (0.02) | (0.02) | (0.03) | (0.01) | |
| Use of latrines - ANCOVA | 0.02 | 0.00 | 0.01 | 0.01 | 0.01 | -0.00 | 0.961 |
| | | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | |

Note: Column (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 are reported in parentheses. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

Table G4: Main characteristics at the neighborhood level - Matched sample of logbooks' entries

| | Observations | Mean-control group | Social status (s.e.) |
|---|---|---|---|
| | (1) | (2) | (3) |
| Post-natal | | | |
| CHWs average age | 1225 | 26.05 | 0.08 |
| | | | (0.86) |
| Proportion of female CHWs | 1225 | 0.50 | -0.00 |
| | | | (0.04) |
| Proportion of CHWs with at least 12 years of education | 1225 | 0.77 | 0.02 |
| | | | (0.05) |
| Proportion of CHWs studying | 1225 | 0.51 | 0.07 |
| | | | (0.05) |
| Number of households visited by CHWs | 1225 | 1182.79 | -221.41 |
| | | | (304.50) |
| Average number of household members | 1225 | 5.90 | 0.23 |
| | | | (0.50) |
| Number of women in fertile age | 1225 | 2382.37 | -563.86 |
| | | | (679.82) |
| Number of pregnant women | 1225 | 50.86 | -5.42 |
| | | | (16.64) |
| Number of births | 1225 | 15.32 | -5.54 |
| | | | (4.24) |
| Number of children under 2 | 1225 | 431.12 | -64.51 |
| | | | (138.39) |
| Vaccines | | | |
| CHWs average age | 4005 | 25.89 | 0.12 |
| | | | (0.72) |
| Proportion of female CHWs | 4005 | 0.50 | -0.01 |
| | | | (0.04) |
| Proportion of CHWs with at least 12 years of education | 4005 | 0.77 | 0.01 |
| | | | (0.05) |
| Proportion of CHWs studying | 4005 | 0.52 | 0.04 |
| | | | (0.05) |
| Number of households visited by CHWs | 4005 | 1123.63 | -184.15 |
| | | | (371.42) |
| Average number of household members | 4005 | 5.77 | 0.45 |
| | | | (0.49) |
| Number of women in fertile age | 4005 | 2134.42 | -364.62 |
| | | | (781.49) |
| Number of pregnant women | 4005 | 50.60 | -4.01 |
| | | | (19.62) |
| Number of births | 4005 | 15.18 | -5.60 |
| | | | (5.16) |
| Number of children under 2 | 4005 | 415.29 | -49.45 |
| | | | (166.30) |
| Family planning | | | |
| CHWs average age | 2336 | 25.86 | 0.27 |
| | | | (0.65) |
| Proportion of female CHWs | 2336 | 0.49 | -0.01 |
| | | | (0.04) |
| Proportion of CHWs with at least 12 years of education | 2336 | 0.76 | 0.04 |
| | | | (0.05) |
| Proportion of CHWs studying | 2336 | 0.53 | -0.01 |
| | | | (0.06) |
| Number of households visited by CHWs | 2336 | 1007.80 | -178.00 |
| | | | (341.80) |
| Average number of household members | 2336 | 5.56 | 0.75 |
| | | | (0.55) |
| Number of women in fertile age | 2336 | 1840.27 | -311.29 |
| | | | (740.64) |
| Number of pregnant women | 2336 | 46.87 | -5.68 |
| | | | (18.24) |
| Number of births | 2336 | 14.37 | -5.74 |
| | | | (4.52) |
| Number of children under 2 | 2336 | 367.50 | -46.68 |
| | | | (155.04) |

Note: Column (1) reports sample mean of the control group. Columns (2) reports the estimate for the Social status treatment indicator variable in Equation 4. Standard errors are reported in parentheses. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

# H Auxiliary results

Table H1: Components of test scores

| | Administrative data - test scores - components | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Home visits | Nutrition | Use of bed nets | Prevent illnesses | Identify illnesses | TBD & HIV | Newborn care | Nursing | Natal care | Family planning |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| Social status | 0.13*** | 0.05 | 0.01 | 0.10** | 0.10* | 0.02 | 0.07 | 0.07 | 0.10* | 0.07 |
| | (0.05) | (0.05) | (0.03) | (0.04) | (0.06) | (0.04) | (0.05) | (0.05) | (0.05) | (0.05) |
| Task significance | -0.01 | -0.08 | -0.08 | -0.08 | -0.04 | -0.08 | -0.04 | -0.03 | 0.05 | -0.05 |
| | (0.09) | (0.08) | (0.09) | (0.08) | (0.08) | (0.10) | (0.08) | (0.08) | (0.11) | (0.12) |
| Information/placebo | 0.01 | -0.06 | -0.03 | -0.13 | -0.11 | 0.08 | -0.08 | -0.08 | 0.01 | 0.06 |
| | (0.11) | (0.10) | (0.10) | (0.09) | (0.10) | (0.11) | (0.10) | (0.10) | (0.11) | (0.12) |
| Observations | 848 | 933 | 927 | 939 | 927 | 669 | 920 | 933 | 669 | 669 |
| $R^2$ | 0.07 | 0.09 | 0.08 | 0.08 | 0.07 | 0.07 | 0.08 | 0.08 | 0.06 | 0.06 |
| Mean (control group) | -0.09 | 0.08 | -0.02 | -0.06 | -0.12 | -0.17 | -0.05 | -0.10 | -0.20 | -0.23 |
| *P-values:* | | | | | | | | | | |
| Joint test all treatments | 0.101 | 0.637 | 0.907 | 0.118 | 0.449 | 0.440 | 0.592 | 0.596 | 0.383 | 0.639 |
| Joint test video | 0.981 | 0.612 | 0.647 | 0.403 | 0.527 | 0.232 | 0.721 | 0.718 | 0.866 | 0.492 |
| Social status = Task significance | 0.139 | 0.162 | 0.342 | 0.046 | 0.151 | 0.370 | 0.256 | 0.306 | 0.687 | 0.372 |
| Information/Placebo = Task significance | 0.863 | 0.817 | 0.593 | 0.560 | 0.389 | 0.091 | 0.574 | 0.517 | 0.656 | 0.235 |
| ANCOVA specification | No | No | No | No | No | No | No | No | No | No |

Note: Estimates based on OLS regressions using Equation 1. Estimation sample consists of CHWs for whom we have administrative records. Depending on the column the dependent variables are defined by the following. (1) Home visits: average score in the monthly meetings' examinations on the protocol for home visits. (2) Nutrition: average score in the monthly meetings' examinations on nutrition. (3) Use of bed nets: average score in the monthly meetings' examinations on the use of bed nets. (4) Prevent illnesses: average score in the monthly meetings' examinations on how to prevent illnesses. (5) Identify illnesses: average score in the monthly meetings' examinations on how to identify illnesses. (6) TBD and HIV: average score in the monthly meetings' examinations on how to deal with tuberculosis and HIV/AIDS. (7) New born care: average score in the monthly meetings' examinations on newborn care. (8) Nursing: average score in the monthly meetings' examinations on nursing. (9) Natal care: average score in the monthly meetings' examinations on natal care. (10) Family planning: average score in the monthly meetings' examinations on family planning. All scores range from 0 to 20 and are normalized (z-score) within supervisor. 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. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

Table H2: Components of evaluation scores by supervisors

| | Administrative data - supervisor evaluation - components | | | | |
|---|---|---|---|---|---|
| | Theoretical knowledge | Relationship with families | Protocol of home visits | Transfer of know-how | Management and monitoring protocol |
| | (1) | (2) | (3) | (4) | (5) |
| Social status | 0.09** | 0.04 | 0.05 | 0.04 | 0.04 |
| | (0.04) | (0.04) | (0.04) | (0.04) | (0.04) |
| Task significance | 0.11 | -0.04 | 0.01 | 0.02 | 0.07 |
| | (0.07) | (0.07) | (0.07) | (0.07) | (0.07) |
| Information/placebo | 0.04 | -0.02 | 0.00 | -0.06 | 0.04 |
| | (0.11) | (0.10) | (0.12) | (0.12) | (0.11) |
| Observations | 923 | 923 | 923 | 923 | 923 |
| $R^2$ | 0.11 | 0.11 | 0.11 | 0.11 | 0.10 |
| Mean (control group) | -0.10 | 0.19 | -0.02 | -0.04 | -0.02 |
| *P-values:* | | | | | |
| Joint test all treatments | 0.090 | 0.837 | 0.785 | 0.594 | 0.660 |
| Joint test video | 0.247 | 0.842 | 0.981 | 0.656 | 0.587 |
| Social status = Task significance | 0.861 | 0.339 | 0.667 | 0.717 | 0.750 |
| Information/Placebo = Task significance | 0.397 | 0.800 | 0.910 | 0.375 | 0.736 |
| ANCOVA specification | No | No | No | No | No |

Note: Estimates based on OLS regressions using Equation 1. Estimation sample consists of CHWs for whom we have administrative records. Depending on the column the dependent variables are defined by the following. (1) Theoretical knowledge: average score from supervisors' monthly report on CHWs' theoretical knowledge of the 16 EFPs. (2) Relationship with the families: average score from supervisors' monthly report on CHWs' relationship with the visited families. (3) Protocol of home visits: average score from supervisors' monthly report on CHWs' level of compliance with the protocol of home visits. (4) Transfer of know-how: average score from supervisors' monthly report on CHWs' availability to transfer knowledge during home visits. (5) Management and monitoring protocol: average score from supervisors' monthly report on CHWs' level of compliance with the management and monitoring protocol of the program. All outcome variables are normalized (z-score) within supervisor. 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. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

Table H3: Main treatment effects - aggregated outcomes employing z-scores - Social status

| | Administrative data | Phone survey | Face-to-face survey | | | Hospitals' and Health centers' logbooks | Face-to-face survey | Hospitals' and Health centers' logbooks | |
|---|---|---|---|---|---|---|---|---|---|
| | CHW performance | Home visits | Home visits | Health at household level | Health of children under 5 years old | Vaccination of children | Family planning and natal care | Family planning | Natal care |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Social status | 0.00 | 0.11* | 0.06 | 0.10** | 0.10*** | 0.16*** | 0.04 | -0.03 | 0.09* |
| | (0.07) | (0.06) | (0.05) | (0.05) | (0.03) | (0.04) | (0.05) | (0.07) | (0.05) |
| Observations | 1015 | 2018 | 1748 | 1765 | 1295 | 3999 | 1427 | 2331 | 1225 |
| $R^2$ | 0.12 | 0.08 | 0.08 | 0.11 | 0.24 | 0.13 | 0.07 | 0.10 | 0.09 |
| Mean (control group) | -0.12 | -0.10 | -0.18 | -0.18 | 0.08 | | 0.06 | | |
| ANCOVA specification | No | No | No | No | No | | No | | |

Note: Estimates based on OLS regressions. Columns (1)-(5), and (7) present estimates using Equation 1; Columns (6), (8), and (9) present estimates 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 1; (2) Home visits (phone survey): formed from outcomes in columns (5)-(7) of Table 1; (3) Home visits (face-to-face survey): formed from outcomes in columns (8)-(10) of Table 1; (4) Health at household level (face-to-face survey): formed from the outcomes of Table 2; (5) Health of children under 5 years old (face-to-face survey): formed from the outcomes in Table 3; (6) Vaccination of children (logbooks): index measuring the take-up of the five most important vaccines as defined in Table 5; (7) Family planning and natal care (face-to-face survey): formed from the outcomes of Table 4; (8) Family planning (logbooks): indicator variable that takes value of 1 for women visiting for the first time a health center or hospital for an appointment on family planning, as defined previously in Table 5; (9) Natal care (logbooks): formed from outcomes in columns (2)-(4) of Table 5. Specifications in columns (1)-(5) and (7) include an indicator variable for assignment to the Task significance treatment, an indicator variable for assignment to the Information/Placebo treatment, an indicator variable for assignment to the Information campaign treatment, strata fixed effects, and CHW level controls. Specifications in columns (3)-(5) and (7) bar include household level controls. The specification in column (5) includes age fixed effects for the children under 5 years old. The specification in column (7) includes respondent's age. Specifications in columns (6) and (8)-(9) include neighborhood characteristics. The full list of controls is presented in Section 4. Standard errors are reported in parentheses. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

Table H4: Main treatment effects - aggregated outcomes employing z-scores - Task significance

| | Administrative data | Phone survey | Face-to-face survey | | | |
|---|---|---|---|---|---|---|
| | CHW performance | Home visits | Home visits | Health at household level | Health of children under 5 years old | Family planning and natal care |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Task significance | -0.06 | 0.01 | -0.01 | -0.02 | 0.09** | 0.02 |
| | (0.07) | (0.05) | (0.04) | (0.06) | (0.04) | (0.07) |
| Observations | 1015 | 2018 | 1748 | 1765 | 1295 | 1427 |
| $R^2$ | 0.12 | 0.08 | 0.08 | 0.11 | 0.24 | 0.07 |
| Mean (control group) | -0.12 | -0.10 | -0.18 | -0.18 | 0.08 | 0.06 |
| ANCOVA specification | No | No | No | No | No | No |

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. 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 1; (2) Home visits (phone survey): formed from outcomes in columns (5)-(7) of Table 1; (3) Home visits (face-to-face survey): formed from outcomes in columns (8)-(10) of Table 1; (4) Health at household level (face-to-face survey): formed from the outcomes of Table 2; (5) Health of children under 5 years old (face-to-face survey): formed from the outcomes in Table 3; (6) Family planning and natal care (face-to-face survey): formed from the outcomes of Table 4. 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. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

Table H5: Other treatment effects - aggregated outcomes employing z-scores

| | Administrative data | Phone survey | Face-to-face survey | | | |
|---|---|---|---|---|---|---|
| | CHW performance | Home visits | Home visits | Health at household level | Health of children under 5 years old | Family planning and natal care |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **Panel A** | | | | | | |
| Task significance alone | -0.03 | 0.01 | 0.01 | 0.04 | 0.12*** | 0.11 |
| | (0.08) | (0.06) | (0.05) | (0.07) | (0.04) | (0.09) |
| Task significance plus endorsement | -0.09 | -0.01 | -0.02 | -0.09 | 0.05 | -0.05 |
| | (0.08) | (0.06) | (0.05) | (0.08) | (0.04) | (0.08) |
| Information/placebo | -0.01 | -0.05 | -0.03 | -0.07 | 0.05 | -0.06 |
| | (0.09) | (0.08) | (0.04) | (0.06) | (0.04) | (0.08) |
| Observations | 1015 | 2018 | 1748 | 1765 | 1295 | 1427 |
| $R^2$ | 0.12 | 0.08 | 0.08 | 0.11 | 0.24 | 0.08 |
| Mean (control group) | -0.12 | -0.10 | -0.18 | -0.18 | 0.09 | 0.07 |
| *P-values:* | | | | | | |
| Task significance alone = Task significance plus endorsement | 0.532 | 0.756 | 0.688 | 0.057 | 0.077 | 0.028 |
| Task significance alone = Information/placebo | 0.834 | 0.309 | 0.391 | 0.092 | 0.048 | 0.049 |
| Task significance plus endorsement = Information/placebo | 0.323 | 0.427 | 0.740 | 0.879 | 0.935 | 0.945 |
| ANCOVA specification | No | No | No | No | No | No |
| **Panel B** | | | | | | |
| Information campaign | -0.05 | 0.01 | 0.04 | 0.02 | -0.02 | 0.06 |
| | (0.05) | (0.04) | (0.04) | (0.04) | (0.02) | (0.06) |
| Observations | 1015 | 2018 | 1748 | 1765 | 1295 | 1427 |
| $R^2$ | 0.12 | 0.08 | 0.08 | 0.11 | 0.24 | 0.07 |
| Mean (control group) | -0.12 | -0.10 | -0.18 | -0.18 | 0.08 | 0.06 |
| ANCOVA specification | No | No | No | No | No | No |

Note: Estimates in Panel A based on OLS regressions using Equation 3. Estimates in Panel B 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. 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 1; (2) Home visits (phone survey): formed from outcomes in columns (5)-(7) of Table 1; (3) Home visits (face-to-face survey): formed from outcomes in columns (8)-(10) of Table 1; (4) Health at household level (face-to-face survey): formed from the outcomes of Table 2; (5) Health of children under 5 years old (face-to-face survey): formed from the outcomes in Table 3; (6) Family planning and natal care (face-to-face survey): formed from the outcomes of Table 4. 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. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

Table H6: 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 | Health at household level | Health of children under 5 years old | Family planning and natal care |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Social status | -0.06 | 0.11 | 0.07 | 0.11* | 0.09** | 0.11 |
| | (0.09) | (0.07) | (0.06) | (0.06) | (0.04) | (0.08) |
| Social status×Information campaign | 0.13 | 0.00 | -0.02 | -0.03 | 0.01 | -0.13 |
| | (0.09) | (0.09) | (0.08) | (0.09) | (0.05) | (0.12) |
| Task significance | -0.03 | -0.03 | 0.04 | -0.01 | 0.10* | 0.14 |
| | (0.09) | (0.07) | (0.06) | (0.09) | (0.06) | (0.09) |
| Task significance×Information campaign | -0.05 | 0.07 | -0.09 | -0.02 | -0.03 | -0.23* |
| | (0.13) | (0.15) | (0.09) | (0.11) | (0.07) | (0.14) |
| Information/placebo | -0.02 | -0.12 | -0.05 | -0.12 | 0.11* | 0.09 |
| | (0.12) | (0.08) | (0.05) | (0.10) | (0.06) | (0.10) |
| Information/placebo×Information campaign | 0.02 | 0.14 | 0.03 | 0.10 | -0.13 | -0.30 |
| | (0.17) | (0.14) | (0.10) | (0.14) | (0.09) | (0.19) |
| Information campaign | -0.10 | -0.06 | 0.09 | 0.02 | 0.02 | 0.32** |
| | (0.09) | (0.12) | (0.09) | (0.11) | (0.06) | (0.14) |
| Observations | 1015 | 2018 | 1748 | 1765 | 1295 | 1427 |
| $R^2$ | 0.12 | 0.08 | 0.08 | 0.11 | 0.24 | 0.08 |
| Mean (control group) | -0.12 | -0.10 | -0.18 | -0.18 | 0.09 | 0.06 |
| *P-values:* | | | | | | |
| Joint test Social status (SS) | 0.373 | 0.168 | 0.476 | 0.202 | 0.004 | 0.773 |
| Joint test Task significance (TS) | 0.370 | 0.695 | 0.399 | 0.695 | 0.082 | 0.413 |
| Joint test Information/placebo (IP) | 0.995 | 0.837 | 0.784 | 0.774 | 0.775 | 0.134 |
| Joint test Information campaign (IC) | 0.980 | 0.397 | 0.976 | 0.645 | 0.186 | 0.094 |
| SS×IC=TS×IC | 0.592 | 0.505 | 0.137 | 0.335 | 0.236 | 0.616 |
| ANCOVA specification | No | No | No | No | No | No |

Note: Estimates based on OLS regressions using Equation 1 including interaction terms between incentive treatments and the information campaign. 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 1; (2) Home visits (phone survey): formed from outcomes in columns (5)-(7) of Table 1; (3) Home visits (face-to-face survey): formed from outcomes in columns (8)-(10) of Table 1; (4) Health at household level (face-to-face survey): formed from the outcomes of Table 2; (5) Health of children under 5 years old (face-to-face survey): formed from the outcomes in Table 3; (6) Family planning and natal care (face-to-face): formed from the outcomes in Table 4. 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. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

Table H7: 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 |

Note: Numbers corresponding to each column and to the number of treatment rounds are in percent of CHWs in the corresponding treatment group.

Table H8: 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 | 0.02 | 0.03 | 0.03 | 0.05*** | 0.05*** |
| | (0.03) | (0.03) | (0.03) | (0.03) | (0.02) | (0.02) |
| Task significance | 0.01 | 0.01 | -0.05 | -0.06 | 0.01 | 0.01 |
| | (0.05) | (0.05) | (0.05) | (0.05) | (0.03) | (0.03) |
| Information/placebo | -0.03 | -0.02 | -0.09 | -0.09 | 0.01 | 0.01 |
| | (0.07) | (0.07) | (0.06) | (0.06) | (0.03) | (0.03) |
| Observations | 903 | 902 | 903 | 902 | 901 | 900 |
| $R^2$ | 0.09 | 0.10 | 0.09 | 0.09 | 0.11 | 0.12 |
| Mean (control group) | 2.79 | 2.79 | 4.20 | 4.20 | 4.79 | 4.79 |
| *P-values:* | | | | | | |
| 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 estimated 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 E 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 H9: CHW motivation - other treatment effects

| | Face-to-face survey | | | | | |
|---|---|---|---|---|---|---|
| | Monetary rewards | | Social recognition | | Social impact | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **Panel A** | | | | | | |
| Task significance alone | -0.02 | -0.01 | -0.03 | -0.03 | 0.06* | 0.06* |
| | (0.06) | (0.06) | (0.06) | (0.06) | (0.03) | (0.03) |
| Task significance plus endorsement | 0.04 | 0.04 | -0.08 | -0.08 | -0.05 | -0.05 |
| | (0.06) | (0.06) | (0.06) | (0.06) | (0.04) | (0.04) |
| Information/placebo | -0.03 | -0.02 | -0.09 | -0.09 | 0.01 | 0.02 |
| | (0.07) | (0.07) | (0.06) | (0.06) | (0.03) | (0.03) |
| Observations | 903 | 902 | 903 | 902 | 901 | 900 |
| $R^2$ | 0.09 | 0.10 | 0.09 | 0.09 | 0.12 | 0.13 |
| Mean (control group) | 2.79 | 2.79 | 4.20 | 4.20 | 4.79 | 4.79 |
| *P-values:* | | | | | | |
| Task significance alone = Task significance plus endorsment | 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 |
| ANCOVA specification | No | Yes | No | Yes | No | Yes |
| **Panel B** | | | | | | |
| Information campaign | 0.02 | 0.03 | 0.00 | 0.00 | -0.01 | -0.00 |
| | (0.04) | (0.04) | (0.05) | (0.05) | (0.02) | (0.02) |
| Observations | 903 | 902 | 903 | 902 | 901 | 900 |
| $R^2$ | 0.09 | 0.10 | 0.09 | 0.09 | 0.11 | 0.12 |
| Mean (control group) | 2.79 | 2.79 | 4.20 | 4.20 | 4.79 | 4.79 |
| ANCOVA specification | No | Yes | No | Yes | No | Yes |

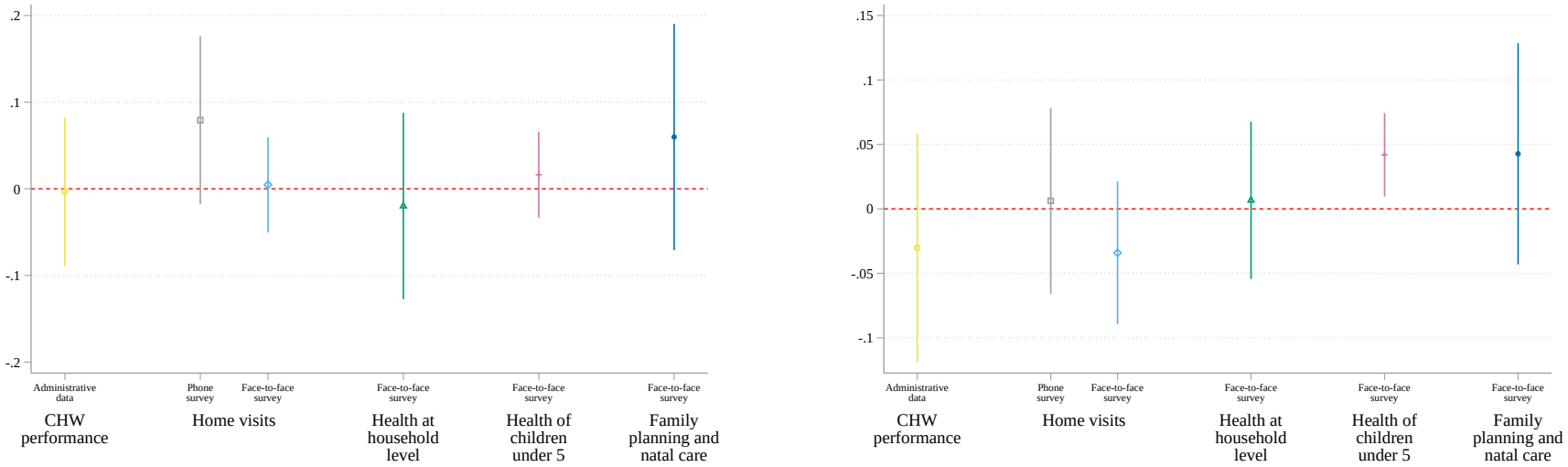
Note: Estimates based on OLS regressions. Columns (1), (3), (5), (7) and (9) present estimates using Equation 1; columns (2), (4), (6), (8) and (10) present estimated using Equation 2 which includes the lagged dependent variable (ANCOVA). Estimation sample consists of CHWs interviewed in the endline 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 E 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 H10: Knowledge of health practices by the household - components

| | 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** | 0.05 | 0.03* | 0.00 | -0.01 | 0.00 | -0.00 | 0.01 | 0.02 |
| | (0.02) | (0.03) | (0.01) | (0.00) | (0.01) | (0.01) | (0.00) | (0.01) | (0.02) |
| Task significance | -0.00 | -0.01 | -0.00 | -0.00 | 0.00 | -0.01 | -0.00 | 0.01 | 0.02 |
| | (0.01) | (0.01) | (0.01) | (0.00) | (0.01) | (0.01) | (0.01) | (0.01) | (0.02) |
| Information/placebo | -0.00 | 0.00 | -0.01 | -0.00 | -0.01 | -0.01 | 0.00 | -0.01 | -0.01 |
| | (0.01) | (0.02) | (0.01) | (0.00) | (0.01) | (0.01) | (0.01) | (0.01) | (0.02) |
| Observations | 1743 | 1743 | 1743 | 1741 | 1741 | 1743 | 1741 | 1743 | 1741 |
| $R^2$ | 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 | 0.85 | 0.99 | 0.87 | 0.93 | 0.99 | 0.94 | 0.17 |
| *P-values:* | | | | | | | | | |
| Joint test all treatments | 0.203 | 0.362 | 0.151 | 0.569 | 0.478 | 0.422 | 0.601 | 0.483 | 0.358 |
| Joint test video | 0.953 | 0.771 | 0.593 | 0.752 | 0.347 | 0.279 | 0.862 | 0.327 | 0.165 |
| Social status = Task significance | 0.035 | 0.118 | 0.107 | 0.298 | 0.263 | 0.176 | 0.880 | 0.923 | 0.762 |
| Information/Placebo = Task significance | 0.851 | 0.559 | 0.395 | 0.913 | 0.154 | 0.601 | 0.590 | 0.140 | 0.061 |
| ANCOVA specification | No | No | No | No | No | No | No | No | No |

Note: Estimates based on OLS regressions 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 latrines (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 for 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 clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

Figure H1: Spillover effects - control group - aggregated outcomes employing z-scores

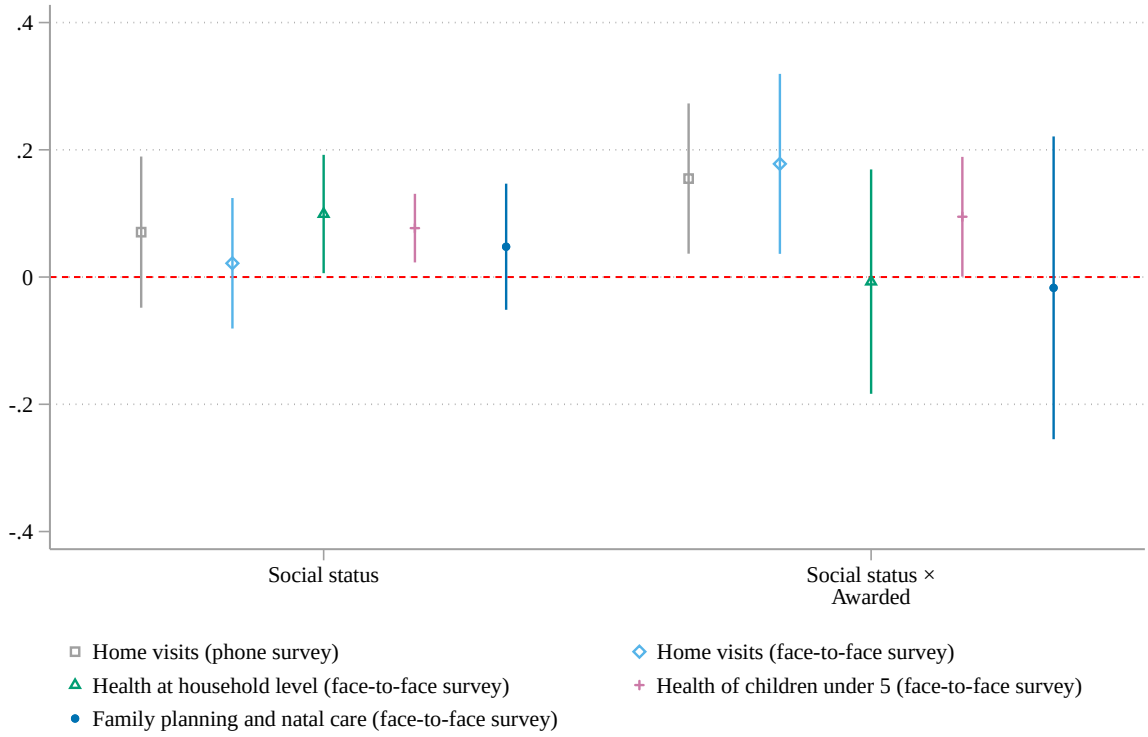



(a) Network assigned to social status

(b) Network assigned to task significance

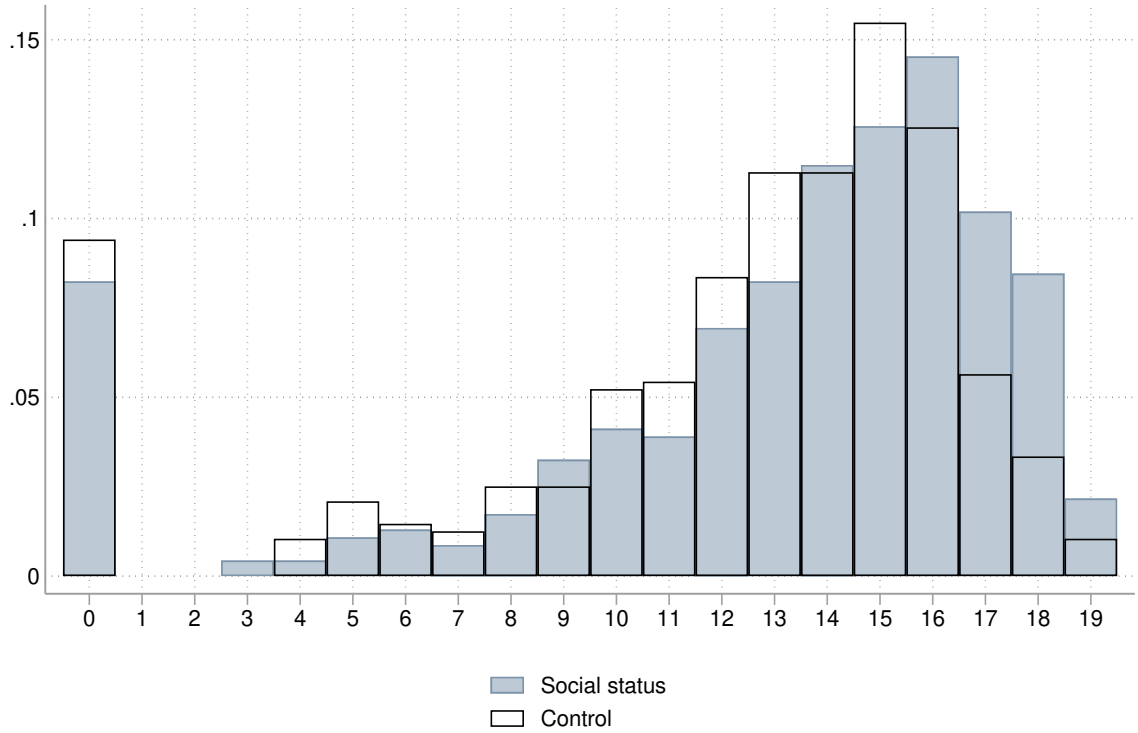
Note: Estimates based on OLS regressions. (a) presents estimates using Equation 1, including in addition as explanatory variable of interest the number of CHWs in one's network belonging to the Social status treatment group. The estimation sample in the first bar is restricted to CHWs who were not assigned to the Social status treatment group. The specifications in the second to the sixth bar are restricted to households visited by CHWs not assigned to the Social status treatment group. (b) presents estimates using Equation 1, including in addition as explanatory variable of interest the number of CHWs in one's network belonging to the Task significance treatment group. The estimation sample in the first bar is restricted to CHWs who were not assigned to the Task significance treatment group. The specifications in the second to the sixth bar are restricted to households visited by CHWs not assigned to the Task significance treatment group. Outcome and control variables are as in Figure 2. Confidence intervals are built using statistical significance at the 5 percent level. Standard errors are clustered at neighborhood level.

Figure H2: Treatment effects of Social status - awarded vs. non-awarded CHWs




Note: Estimates based on OLS regressions using Equation 1, including an indicator variable taking value 1 for awarded CHWs interacted with Social status. Outcome and control variables are as in Figure 2, except that the indicator variable for awarded CHWs enters as a control variable as well. Confidence intervals are built using statistical significance at the 5 percent level. Standard errors are clustered at neighborhood level.

Figure H3: Distribution of CHWs' test scores when training - Social status



# I Robustness of estimates to control variables

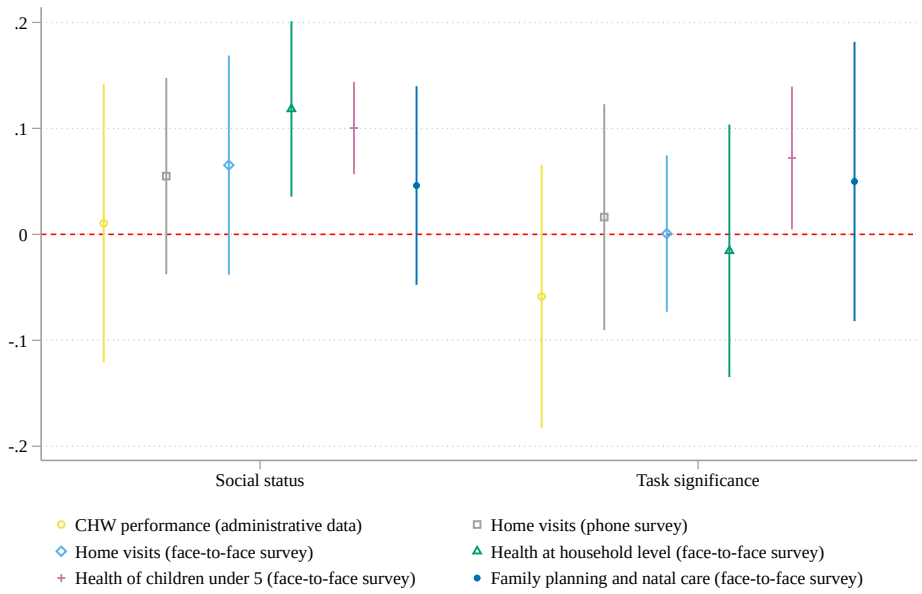
Table I1 presents the set of variables included in the Post-Double Selection (PDS) LASSO procedure. The sampling strata are partialled out. Figure I1 and Tables I2-I3 present estimates of treatment effects on the main outcomes.

Table I1: Variables included in the Post-Double Selection (PDS) LASSO procedure

| | |
|---|---|
| **Administrative Data** | |
| Supervisor characteristics | Age (in number of years), gender, highest grade completed, foreign language indicator variables. |
| **CHW face-to-face survey** | |
| 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. |
| **Household face-to-face survey** | |
| 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 I1: Main treatment effects - aggregated outcomes employing z-scores - Lasso controls




Note: This figure replicates Figures 1 and 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 I2: Comparison with Post-Double Selection LASSO.

| Outcome | Data source | ANCOVA specification | Controls | Social status Coeff. | Social status (s.e.) | Video treatments: Task significance Coeff. | Video treatments: Task significance (s.e.) | Video treatments: Information/ placebo Coeff. | Video treatments: Information/ placebo (s.e.) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | (1) | (2) | (3) | (4) | (5) | (6) |
| **Table 1: Direct CHW performance** | | | | | | | | | |
| CHW dropout | Administrative data | No | Benchmark | 0.008 | (0.032) | 0.044 | (0.033) | 0.019 | (0.039) |
| | | | LASSO | 0.004 | (0.032) | 0.047 | (0.032) | 0.020 | (0.037) |
| CHW reports submitted | Administrative data | No | Benchmark | -0.026 | (0.030) | -0.020 | (0.025) | -0.024 | (0.033) |
| | | | LASSO | -0.020 | (0.029) | -0.023 | (0.024) | -0.024 | (0.032) |
| CHW test score – training | Administrative data | No | Benchmark | 0.090* | (0.051) | -0.082 | (0.090) | -0.088 | (0.096) |
| | | | LASSO | 0.094* | (0.049) | -0.070 | (0.088) | -0.081 | (0.093) |
| CHW evaluation score by supervisor | Administrative data | No | Benchmark | 0.074* | (0.042) | 0.056 | (0.073) | 0.098 | (0.109) |
| | | | LASSO | 0.053 | (0.042) | 0.066 | (0.070) | 0.107 | (0.107) |
| Home visits - total | Phone survey | No | Benchmark | 0.365 | (0.244) | 0.013 | (0.278) | -0.294 | (0.363) |
| | | | LASSO | 0.413* | (0.234) | 0.033 | (0.271) | -0.252 | (0.371) |
| Home visits-conditional on being visited | Phone survey | No | Benchmark | 0.367 | (0.260) | 0.100 | (0.281) | -0.249 | (0.345) |
| | | | LASSO | 0.377 | (0.255) | 0.147 | (0.273) | -0.161 | (0.351) |
| Households satisfaction with the CHWs | Phone survey | No | Benchmark | 0.220* | (0.115) | 0.184** | (0.086) | -0.004 | (0.118) |
| | | | LASSO | 0.230** | (0.109) | 0.182** | (0.079) | -0.036 | (0.117) |
| Home visits - total | Face-to-face survey | No | Benchmark | 0.174 | (0.272) | 0.117 | (0.210) | -0.033 | (0.190) |
| | | | LASSO | 0.209 | (0.273) | 0.147 | (0.208) | -0.028 | (0.185) |
| Home visits-conditional on being visited | Face-to-face survey | No | Benchmark | 0.657 | (0.545) | 0.685 | (0.454) | -0.130 | (0.453) |
| | | | LASSO | 0.772 | (0.538) | 0.685 | (0.420) | -0.158 | (0.419) |
| Households satisfaction with the CHWs | Face-to-face survey | No | Benchmark | 0.255* | (0.129) | -0.110 | (0.105) | -0.095 | (0.117) |
| | | | LASSO | 0.287** | (0.130) | -0.089 | (0.101) | -0.079 | (0.111) |
| **Table 2: Health indicators at the level of the household** | | | | | | | | | |
| Knowledge of health practices | Face-to-face survey | No | Benchmark | 0.233*** | (0.077) | -0.019 | (0.078) | -0.147* | (0.076) |
| | | | LASSO | 0.259*** | (0.076) | -0.004 | (0.074) | -0.144* | (0.074) |
| Household treats water | Face-to-face survey | No | Benchmark | -0.031* | (0.018) | 0.003 | (0.025) | -0.008 | (0.028) |
| | | | LASSO | -0.037** | (0.018) | 0.000 | (0.024) | -0.005 | (0.029) |
| | | Yes | Benchmark | -0.040** | (0.018) | -0.001 | (0.024) | -0.007 | (0.027) |
| | | | LASSO | -0.045** | (0.018) | 0.002 | (0.024) | -0.003 | (0.027) |
| Number of mosquito nets | Face-to-face survey | No | Benchmark | 0.229 | (0.152) | -0.046 | (0.106) | -0.039 | (0.130) |
| | | | LASSO | 0.228 | (0.151) | -0.089 | (0.106) | -0.052 | (0.114) |
| | | Yes | Benchmark | 0.221 | (0.154) | -0.043 | (0.104) | -0.075 | (0.128) |
| | | | LASSO | 0.220 | (0.153) | -0.078 | (0.104) | -0.075 | (0.113) |
| Use of latrines | Face-to-face survey | No | Benchmark | 0.006 | (0.037) | 0.016 | (0.030) | -0.026 | (0.028) |
| | | | LASSO | 0.022 | (0.035) | 0.011 | (0.029) | -0.020 | (0.030) |
| | | Yes | Benchmark | 0.004 | (0.037) | 0.017 | (0.030) | -0.025 | (0.028) |
| | | | LASSO | 0.019 | (0.035) | 0.012 | (0.029) | -0.019 | (0.030) |

Note: Estimates based on OLS regressions using Equation 1. For each outcome variable we show point estimates and standard errors from the benchmark specifications in Section 4, and from specifications including controls selected using the Post-Double Selection LASSO procedure. Refer to table 1 for the definition of the dependent variables. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

Table I3: Comparison with Post-Double Selection LASSO.

| Outcome | Data source | ANCOVA specification | Controls | Social status Coeff. | Social status (s.e.) | Video treatments: Task significance Coeff. | Task significance (s.e.) | Information/ placebo Coeff. | Information/ placebo (s.e.) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | (1) | (2) | (3) | (4) | (5) | (6) |
| **Table 3: Health of children under 5 years old** | | | | | | | | | |
| Vaccination index (5 vaccines)- self reported | Face-to-face survey | No | Benchmark | 0.013 | (0.014) | 0.051*** | (0.016) | 0.035** | (0.017) |
| | | | LASSO | 0.005 | (0.012) | 0.047*** | (0.016) | 0.039** | (0.017) |
| | | Yes | Benchmark | 0.017 | (0.014) | 0.049*** | (0.014) | 0.031* | (0.016) |
| | | | LASSO | 0.022 | (0.014) | 0.049*** | (0.013) | 0.032** | (0.015) |
| Vaccination index (5 vaccines)- observed bulletin | Face-to-face survey | No | Benchmark | 0.024 | (0.021) | 0.089*** | (0.026) | 0.063** | (0.024) |
| | | | LASSO | 0.007 | (0.020) | 0.074*** | (0.024) | 0.064*** | (0.024) |
| | | Yes | Benchmark | 0.043* | (0.023) | 0.075*** | (0.026) | 0.055** | (0.026) |
| | | | LASSO | 0.035* | (0.021) | 0.072*** | (0.023) | 0.063** | (0.026) |
| Being sick in the last 15 days | Face-to-face survey | No | Benchmark | -0.077** | (0.038) | 0.002 | (0.032) | 0.005 | (0.034) |
| | | | LASSO | -0.078** | (0.038) | 0.002 | (0.031) | 0.011 | (0.032) |
| Took a malaria test - if sick | Face-to-face survey | No | Benchmark | -0.032* | (0.019) | -0.005 | (0.029) | 0.002 | (0.030) |
| | | | LASSO | -0.035* | (0.019) | -0.005 | (0.027) | 0.005 | (0.029) |
| Took a malaria test - all | Face-to-face survey | No | Benchmark | 0.066 | (0.046) | -0.005 | (0.067) | -0.069 | (0.071) |
| | | | LASSO | 0.061 | (0.043) | 0.011 | (0.065) | -0.062 | (0.070) |
| **Table 4: Family planning and natal care** | | | | | | | | | |
| Use of family planning | Face-to-face survey | No | Benchmark | 0.020 | (0.020) | 0.019 | (0.032) | -0.010 | (0.033) |
| | | | LASSO | 0.016 | (0.022) | 0.025 | (0.030) | -0.009 | (0.032) |
| | | Yes | Benchmark | 0.022 | (0.019) | 0.014 | (0.031) | -0.010 | (0.035) |
| | | | LASSO | 0.016 | (0.020) | 0.024 | (0.028) | -0.003 | (0.035) |
| Number of pre-natal visits | Face-to-face survey | No | Benchmark | 0.072 | (0.263) | -0.151 | (0.339) | -0.290 | (0.442) |
| | | | LASSO | 0.053 | (0.227) | 0.026 | (0.261) | -0.170 | (0.335) |
| Pre-natal care index | Face-to-face survey | No | Benchmark | 0.064 | (0.052) | -0.043 | (0.060) | -0.035 | (0.109) |
| | | | LASSO | 0.069* | (0.042) | -0.053 | (0.046) | -0.047 | (0.083) |
| Post-natal visit | Face-to-face survey | No | Benchmark | -0.018 | (0.057) | 0.101 | (0.083) | 0.041 | (0.101) |
| | | | LASSO | -0.030 | (0.053) | 0.106 | (0.079) | 0.042 | (0.088) |
| Nursing | Face-to-face survey | No | Benchmark | 0.071 | (0.053) | 0.070 | (0.078) | 0.055 | (0.096) |
| | | | LASSO | 0.072* | (0.043) | 0.049 | (0.069) | 0.034 | (0.085) |
| Administered Vitamin A - 45 days after giving birth | Face-to-face survey | No | Benchmark | 0.061** | (0.026) | 0.019 | (0.042) | 0.067 | (0.063) |
| | | | LASSO | 0.066*** | (0.022) | 0.016 | (0.037) | 0.079 | (0.048) |

Note: Estimates based on OLS regressions using Equation 1. For each outcome variable we show point estimates and standard errors from the benchmark specifications in Section 4, and from specifications including controls selected using the Post-Double Selection LASSO procedure. Refer to table 1 for the definition of the dependent variables. Standard errors are clustered at neighborhood level. *** p<0.01, ** p<0.05, * p<0.1.

# J Multiple hypothesis testing

Table J1: Multiple hypothesis testing. Romano and Wolf (2016)

| Outcome | Data source | ANCOVA specification | P-value | Social status | Video treatments: Task significance | Video treatments: Information/ placebo |
|---|---|---|---|---|---|---|
| **Table 1: Direct CHW performance** | | | | | | |
| CHW dropout | Administrative data | No | Conventional | 0.808 | 0.194 | 0.627 |
| | | | Romano-Wolf | 0.744 | 0.522 | 0.951 |
| CHW reports submitted | Administrative data | No | Conventional | 0.391 | 0.419 | 0.472 |
| | | | Romano-Wolf | 0.505 | 0.804 | 0.930 |
| CHW test score – training | Administrative data | No | Conventional | 0.083 | 0.365 | 0.364 |
| | | | Romano-Wolf | 0.260 | 0.772 | 0.910 |
| CHW evaluation score by supervisor | Administrative data | No | Conventional | 0.084 | 0.448 | 0.371 |
| | | | Romano-Wolf | 0.260 | 0.804 | 0.910 |
| Home visits - total | Phone survey | No | Conventional | 0.140 | 0.964 | 0.421 |
| | | | Romano-Wolf | 0.261 | 0.951 | 0.930 |
| Home visits-conditional on being visited | Phone survey | No | Conventional | 0.163 | 0.723 | 0.474 |
| | | | Romano-Wolf | 0.281 | 0.816 | 0.930 |
| Households satisfaction with the CHWs | Phone survey | No | Conventional | 0.061 | 0.036 | 0.975 |
| | | | Romano-Wolf | 0.200 | 0.097 | 0.974 |
| Home visits - total | Face-to-face survey | No | Conventional | 0.523 | 0.579 | 0.861 |
| | | | Romano-Wolf | 0.611 | 0.816 | 0.974 |
| Home visits-conditional on being visited | Face-to-face survey | No | Conventional | 0.232 | 0.136 | 0.774 |
| | | | Romano-Wolf | 0.307 | 0.389 | 0.974 |
| Households satisfaction with the CHWs | Face-to-face survey | No | Conventional | 0.053 | 0.295 | 0.421 |
| | | | Romano-Wolf | 0.194 | 0.713 | 0.930 |
| **Table 2: Health indicators at the level of the household** | | | | | | |
| Knowledge of health practices | Face-to-face survey | No | Conventional | 0.003 | 0.808 | 0.057 |
| | | | Romano-Wolf | 0.003 | 0.954 | 0.107 |
| Household treats water | Face-to-face survey | No | Conventional | 0.093 | 0.895 | 0.772 |
| | | | Romano-Wolf | 0.097 | 0.954 | 0.929 |
| | | Yes | Conventional | 0.032 | 0.972 | 0.786 |
| | | | Romano-Wolf | 0.032 | 0.960 | 0.929 |
| Number of mosquito nets | Face-to-face survey | No | Conventional | 0.136 | 0.667 | 0.767 |
| | | | Romano-Wolf | 0.097 | 0.954 | 0.929 |
| | | Yes | Conventional | 0.155 | 0.677 | 0.557 |
| | | | Romano-Wolf | 0.097 | 0.954 | 0.753 |
| Use of latrines | Face-to-face survey | No | Conventional | 0.868 | 0.591 | 0.352 |
| | | | Romano-Wolf | 0.831 | 0.954 | 0.637 |
| | | Yes | Conventional | 0.923 | 0.576 | 0.367 |
| | | | Romano-Wolf | 0.890 | 0.949 | 0.655 |

Note: Estimates based on OLS regressions using Equation 1. For each outcome variable we show p-values for both the p-value corresponding to the conventional t-test and for multiple hypothesis testing (Romano and Wolf p-value). The latter corresponds to jointly testing coefficients grouped by rows (treatment arms) from Tables 1-4. Refer to these tables for the definition of the dependent variables.

Table J2: Multiple hypothesis testing. Romano and Wolf (2016)

| Outcome | Data source | ANCOVA specification | P-value | Social status | Video treatments: Task significance | Video treatments: Information/ placebo |
|---|---|---|---|---|---|---|
| **Table 3: Health of children under 5 years old** | | | | | | |
| Vaccination index (5 vaccines)- self reported | Face-to-face survey | No | Conventional | 0.338 | 0.001 | 0.040 |
| | | | Romano-Wolf | 0.339 | 0.003 | 0.080 |
| | | Yes | Conventional | 0.222 | 0.001 | 0.061 |
| | | | Romano-Wolf | 0.339 | 0.002 | 0.103 |
| Vaccination index (5 vaccines)- observed bulletin | Face-to-face survey | No | Conventional | 0.256 | 0.001 | 0.011 |
| | | | Romano-Wolf | 0.339 | 0.002 | 0.023 |
| | | Yes | Conventional | 0.066 | 0.005 | 0.039 |
| | | | Romano-Wolf | 0.218 | 0.007 | 0.080 |
| Being sick in the last 15 days | Face-to-face survey | No | Conventional | 0.048 | 0.947 | 0.874 |
| | | | Romano-Wolf | 0.177 | 0.997 | 0.966 |
| Took a malaria test - if sick | Face-to-face survey | No | Conventional | 0.095 | 0.853 | 0.941 |
| | | | Romano-Wolf | 0.268 | 0.989 | 0.966 |
| Took a malaria test - all | Face-to-face survey | No | Conventional | 0.156 | 0.946 | 0.337 |
| | | | Romano-Wolf | 0.339 | 0.997 | 0.516 |
| **Table 4: Family planning and Natal care** | | | | | | |
| Use of family planning | Face-to-face survey | No | Conventional | 0.321 | 0.551 | 0.753 |
| | | | Romano-Wolf | 0.653 | 0.894 | 0.961 |
| | | Yes | Conventional | 0.248 | 0.653 | 0.767 |
| | | | Romano-Wolf | 0.630 | 0.936 | 0.961 |
| Number of pre-natal visits | Face-to-face survey | No | Conventional | 0.786 | 0.659 | 0.514 |
| | | | Romano-Wolf | 0.939 | 0.936 | 0.940 |
| Pre-natal care index | Face-to-face survey | No | Conventional | 0.228 | 0.477 | 0.748 |
| | | | Romano-Wolf | 0.630 | 0.889 | 0.961 |
| Post-natal visit | Face-to-face survey | No | Conventional | 0.753 | 0.229 | 0.686 |
| | | | Romano-Wolf | 0.939 | 0.693 | 0.961 |
| Nursing | Face-to-face survey | No | Conventional | 0.184 | 0.373 | 0.569 |
| | | | Romano-Wolf | 0.630 | 0.848 | 0.940 |
| Administered Vitamin A - 45 days after giving birth | Face-to-face survey | No | Conventional | 0.023 | 0.656 | 0.291 |
| | | | Romano-Wolf | 0.145 | 0.936 | 0.764 |

Note: Estimates based on OLS regressions using Equation 1. For each outcome variable we show p-values for both the p-value corresponding to the conventional t-test and for multiple hypothesis testing (Romano and Wolf p-value). The latter corresponds to jointly testing coefficients grouped by rows (treatment arms) from Tables 1-4. Refer to these tables for the definition of the dependent variables.