Non-Financial Incentives of Community Health Workers in Guinea-Bissau

Abstract

Community Health Workers (CHWs) programs are becoming increasingly popular in sub-Saharan Africa. In recent years, community health workers have become an essential part of national and international health strategies on the delivery of health care in the region. At the same time, there is a concern that the low motivation of CHWs may threaten the potential benefits of investing in CHW programs. This study wants to investigate to what extent a model in which non-financial incentives are offered on top of basic monetary benefits can result in a sustainable and effective system to incentivize CHWs. First, we study incentives activating intrinsic motivation of the agents, related to the pro-social characteristics of the CHW role and non-monetary rewards targeting the extrinsic motivation of the agents, such as social recognition in the community. Second, this study wants also to test whether the dissemination of information on CHWs' work in targeted communities could improve the effectiveness of the program. Finally, we will also devote attention to the possible complementarity between the different non-financial incentive schemes, as well as to the complementarity between incentive schemes and more informed beneficiaries.

Interventions

1. Intrinsic Motivation: The treatment on intrinsic motivation has as objective to increase the performance of the agents through an alteration in what we claim is their level of intrinsic motivation, i.e. doing something because it is inherently interesting or enjoyable. We will intervene through a manipulation of task significance level using an first-person recorded interactive video making salient the Social Impact of the CHW task (Grant 2008). Social Impact understood as the extent to which employees feel that their own actions improve the welfare of others. The video replicates daily activities of an agent, and

offers different stories that materialize as the CHW plays the video. During the video, the agent faces a single central-interactive decision on how much effort to elicit virtually Depending on the choice, different consequences will come up. Within this treatment, a group of agents also visualize a short video in which a traditional healer endorse the CHW role in the community. In addition, another group of agents visualize a placebo-static video in which they do not have to make any decision.

2. Social Status: This intervention aim to test the effect of social recognition in the general effort of agents. All agents participating in this intervention who reach an established performance threshold will receive an award in a public ceremony. The prize is symbolic and has no monetary value. On top of the prize and the ceremony, all the households assigned to a winner CHW receive a text message to inform them that such an agent outperforms and won an award.

3. Information Campaign: All the households assigned to an agent in this treatment receive 3 distinct messages with information about the CHW work. This intervention aims to facilitate the introduction of the agents to the household, and at the same time increase households' interest and understanding about CHW work.

We implemented 3 rounds of each intervention.

Experimental Design

The identification of the causal effects of the incentive schemes and the information campaign is based on random assignment of the treatments at the individual level (intrinsic motivation and information campaign) and the neighborhood level (social status). By comparing different groups of individuals, we can isolate the effects of each intervention and shed light on the fundamental questions posed above, without being plagued by methodological problems related to endogeneity of incentives and information.

The interventions in this project are as follow:

- Neighborhood-level treatment assignment allowing the identification of the effects of Social Status Incentives on CHWs' performance (all SAB-76 neighborhoods):

    1. Control Group (C) (38 neighborhoods)
    2. Social Status Treatment (TSS) (38 neighborhoods)

- First level of agent-level treatment assignment within neighborhoods in groups C and TSS: We will randomly assign all agents in the 76 neighborhoods to one of the following 2 interventions:

    1. Individual level control group (Ca). These agents will have no intervention related to information campaign (508 CHWs).
    2. Information Campaign (TIC). Households assigned to CHW in this group receive information about CHW program through a set of text messages (507 CHWs).

- Second level of agent-level treatment assignment within neighborhoods and Information Campaign Treatment groups.

    1. Intrinsic Motivation control group (CIMa): These agents will have no intervention related to intrinsic motivation incentives (254 CHWs)
    2. Intrinsic Motivation Incentives (TIM)-Placebo: Agents are exposed to a static version of the interactive video in which they do not have to make any decision (254 CHWs)
    3. Intrinsic Motivation Incentives (TIM): Agents are exposed to an interactive video (254 CHWs)
    4. Intrinsic Motivation Incentives (TIM)-Traditional Healer. Agents are exposed to an interactive video and to a message from a traditional healer supporting CHWs activities (254 CHWs)

Table 1: Allocation of CHW across treatment arms

	TSS=1		TSS=0	
	TIC=1	TIC=0	TIC=1	TIC=0
TIM-CONTROL	60	64	67	63
TIM-PLACEBO	63	67	64	60
TIM	64	59	63	68
TIM-TRADITIONAL HEALER	61	63	65	64

Primary Outcomes

The outcome variables from the project will be obtained from the following sources:

1. Baseline and endline surveys of all 1,015 agents working in SAB at the time of the start of the intervention in August 2017.
2. Baseline and endline surveys of a random subsample of 2 households per agent.
3. Five minutes phone-calls survey of a random subsample of roughly 8-10 households per agent.
4. Administrative data collected by the local counterpart implementing the project. Data collected from this source includes:
   (a) Monthly reports of agents' activity (self-reported)
   (b) Supervision reports on agents' performance
   (c) Agents' Pre-tests and Post-tests scores performance at every monthly meeting before and after CHW training sessions.
5. Registry books of patients collected by the research team in every health center, clinic and hospital in SAB.

The final use of this data in the analysis would depend on the quality of the matching process between patient administrative records and household baseline data.

The main information to be collected from each of these sources is as follows:

1. CHW survey questions:

    - CHW's self-reported measure of motivation
    - CHW's perceptions about social impact and task significance of agents' activities
    - CHW's self-reported time allocation to CHW activities (visit households, training, monthly meetings) and performance of households visits
    - CHW's involvement in other community activities
    - CHW's labor and educational aspirations

2. Household survey questions:

    - Number of CHW visits
    - Household perceptions about quality of the CHW, relevance of the information received
    - Household trust in the CHW
    - Household's self-reported implementation of the health practices disseminated by the CHW
    - Household's self-reported visits to the health center of kids under 5 and pregnant women
    - Household's self-reported health outcomes on kids under 5 and pregnant women

3. Households call-center survey questions:

- Number of CHW visits
- Household perceptions about quality of the CHW, relevance of the information received
- Household trust in the CHW
- Household's self-reported implementation of the health practices disseminated by the CHW

4. Administrative data:
    - Number and quality of CHWs' monthly reports about household visits
    - Supervisor's assessment on CHWs' performance
    - CHWs' test scores from monthly test on health practices
    - Number of months that each CHW was active
    - Drop-outs
5. Registry books:
    - Households' number of visits to health centers
    - Health outcomes

Number of Observations

1. CHWs: 1,015 agents
2. Households: 2,030 households in SAB to be interviewed in person and between 8,000-10,000 households to be reached by phone.

Analysis Plan

The experiment is designed to study the impact of two distinct non-monetary incentives schemes and an information campaign on CHWs' performance and on household's health outcomes.

We hypothesize that the provision of positive incentives and mechanisms of information dissemination in the community will most facilitate the work of the agents and increase their productivity, leading to a better dissemination of health practices among households visited by highly motivated agents. An increased effort of the CHWs will lead to higher health levels, improving the wellbeing of the target population. The identification of causal effects of non-financial incentives and of an intense information campaign is based on the random assignment of treatments at the CHW level and at the neighborhood level. Comparing the different treatment groups, we will be able to isolate the effects of each aspect of the intervention and establish which intervention has a larger impact on each specific outcome or indicator.

We will also devote attention to the complementarity between informed beneficiaries and appropriate non-incentive schemes (representing potential policy improvements on both the demand and the supply side). We hypothesize that information about CHW activities and non-financial incentives are complementary. This complementarity will be tested through the interaction between agents receiving non-financial incentives and households receiving information about CHWs' work.

CHWs' outcomes

Our basic treatment effects specification to capture the ITT effect of non-financial incentives and the information campaign on CHWs' outcomes is:

$$y_i = \alpha + \beta_1 TSS_i + \beta_2 TIM_i^{Plac} + \beta_3 TIM_i + \beta_4 TIM_i^{TrdH} + \beta_5 TIC_i + X_i'\gamma + \epsilon_{ib} \quad (1)$$

where y_i is the outcome of interest for CHW i measured at endline. TSS_i is a treatment indicator that takes value 1 for CHWs who were assigned to the social status treatment and 0 otherwise; $TIM_i^{Plac}, TIM_i, TIM_i^{TrdH}$ are three treatment indicators corresponding to the three different videos of the intrinsic motivation treatment: the static video, the interactive video and the interactive video plus traditional healer speech; TIC_i is a treatment indicator that takes value 1 for CHWs who were assigned to the information campaign and 0 otherwise. The omitted category is the

group of agents who did not receive either of the treatments. X_i is a set of controls including health area and supervisors fixed effects. ϵ_{ib} is an idiosyncratic error term. To account for possible correlation in outcomes within neighborhoods, the error term is clustered at the neighborhood level, reflecting the dual level randomization at the neighborhood level and within-neighborhood (individual) level.

When possible, we will use ANCOVA and Difference-in-Difference (DID) models where baseline values of the outcome are available:

1. ANCOVA:

$$\begin{aligned} y_i = \alpha + \beta_1 TSS_i + \beta_2 TIM_i^{Plac} + \beta_3 TIM_i + \beta_4 TIM^{TrdH} \\ + X_i'\gamma + \delta y_{i0} + \epsilon_{ib} \end{aligned} \tag{2}$$

   where y_{i0} is the outcome variable for CHW i at baseline.

2. DID:

$$\begin{aligned} y_{it} = \alpha + \beta_1 TSS_i + \beta_2 TIM_i^{Plac} + \beta_3 TIM_i + \beta_4 TIM^{TrdH} \\ + \beta_1^A TSS_i * A + \beta_2^A TIM_i^{Plac} * A + \beta_3^A TIM_i * A + \beta_4^A TIM^{TrdH} * A \\ + X_i'\gamma + \delta A + \epsilon_{ib} \end{aligned} \tag{3}$$

   where y_{it} is the outcome variable for CHW i at time t, and A is a binary variable that takes value 1 if t is equal to 2018 and 0 otherwise.

The complementary impact of the three cross-randomized treatment arm we will conducted by estimating the following equation:

$$y_i = \sum_{k=1}^{16} \beta_k T_i^{smc} + X_i'\gamma + \epsilon_{ib} \tag{4}$$

where y_i is the outcome of interest for CHW i measured at endline. T_i^k are 16 treatment indicator variables that take value 1 for CHWs who were assigned to arm s in the Social Status intervention ($s = 0, 1$), arm m in the Intrinsic Motivation intervention ($m = 0, TIM^{Plac}, TIM, TIM^{TrdH}$) and arm c in the Information Campaign

intervention ($c = 0, 1$). X_i is a set of controls including health area and supervisors fixed effects. ϵ_{ib} is an idiosyncratic error term. To account for possible correlation in outcomes within neighborhoods, the error term is clustered at the neighborhood level, reflecting the dual level randomization at the neighborhood level and within-neighborhood (individual) level.

When possible, we will use ANCOVA and DID models where baseline values of the outcome are available:

1. ANCOVA:

$$y_i = \sum_{k=1}^{16} \beta_k T_i^{smc} + X_i'\gamma + \delta y_{i0} + \epsilon_{ib} \tag{5}$$

   where y_{i0} is the outcome variable for CHW i at baseline.

2. DID:

$$\begin{aligned} y_{it} = &\sum_{k=1}^{16} \beta_k T_i^{smc} + \sum_{k=1}^{16} \beta_k^A T_i^{smc} * A \\ &+ X_i'\gamma + \delta A + \epsilon_{ib} \end{aligned} \tag{6}$$

   where y_{it} is the outcome variable for CHW i at time t, and A is a binary variable that takes value 1 if t is equal to 2018 and 0 otherwise.

We will also estimate heterogeneous effects on the treatment based on the following variables measured at baseline:

(a) Gender

(b) Religion/ethnicity

(c) CHW's involvement in the community

(d) CHW's self-reported measure of motivation

(e) CHW's perceptions about social impact and task significance of agent's activities

Households' outcomes

Our basic treatment effects specification to capture the ITT effect of non-financial incentives and the information campaign on households' outcomes is:

$$y_{hi} = \alpha + \beta_1 TSS_i + \beta_2 TIC_i + \beta_3 TIM_i^{Plac} + \beta_4 TIM_i + \beta_5 TIM_i^{TrdH} + X'_{hi}\gamma + \epsilon_{hib} \quad (7)$$

where y_{hi} is the outcome of interest for household h visited by CHW i measured at endline. TSS_i is a treatment indicator that takes value 1 for CHWs who were assigned to the social status treatment and 0 otherwise; TIC_i is a treatment indicator that takes value 1 for CHWs who were assigned to the information campaign and 0 otherwise; $TIM_i^{Plac}, TIM_i, TIM_i^{TrdH}$ are three treatment indicators corresponding to the three different videos of the intrinsic motivation treatment: the static video, the interactive video and the interactive video plus traditional healer speech. The omitted category is the group of agents who did not receive either of the treatments. X_{hi} is a set of household h and CHW i controls including health area and supervisors fixed effects. ϵ_{hib} is an idiosyncratic error term. To account for possible correlation in outcomes within neighbors, the error term is clustered at the neighborhood level, reflecting the dual level randomization at the neighborhood level and within-neighborhood (individual) level.

When possible, we will use ANCOVA and DID models where baseline values of the outcome are available:

1. ANCOVA:

$$\begin{aligned} y_{hi} = {} & \alpha + \beta_1 TSS_i + \beta_2 TIM_i^{Plac} + \beta_3 TIM_i + \beta_4 TIM^{TrdH} \\ & + X'_{hi}\gamma + \delta y_{hi0} + \epsilon_{hib} \end{aligned} \quad (8)$$

where y_{hi0} is the outcome variable for household h visited by CHW i at baseline.

2. DID:

$$\begin{aligned} y_{hit} = \alpha &+ \beta_1 TSS_i + \beta_2 TIM_i^{Plac} + \beta_3 TIM_i + \beta_4 TIM^{TrdH} \\ &+ \beta_1^A TSS_i * A + \beta_2^A TIM_i^{Plac} * A + \beta_3^A TIM_i * A + \beta_4^A TIM^{TrdH} * A \\ &+ X'_{hi}\gamma + \delta A + \epsilon_{hib} \end{aligned} \tag{9}$$

where y_{hit} is the outcome variable for household h visited by CHW i at time t, and A is a binary variable that takes value 1 if t is equal to 2018 and 0 otherwise.

The complementary impact of the three cross-randomized treatment arm we will conducted by estimating the following equation:

$$y_{hi} = \sum_{k=1}^{16} \beta_k T_i^{smc} + X'_{hi}\gamma + \epsilon_{hib} \tag{10}$$

where y_{hi} is the outcome of interest for household h visited by CHW i measured at endline. T_i^k are 16 treatment indicator variables that take value 1 for households visited by a CHW who was assigned to arm s in the Social Status intervention ($s = 0, 1$), arm m in the Intrinsic Motivation intervention ($m = 0, TIM^{Plac}, TIM, TIM^{TrdH}$) and arm c in the Information Campaign intervention ($c = 0, 1$). X_{hi} is a set of households h and CHW i controls including health area and supervisors fixed effects. ϵ_{hib} is an idiosyncratic error term.

When possible, we will use ANCOVA and DID models where baseline values of the outcome are available:

1. ANCOVA:

$$y_{hi} = \sum_{k=1}^{16} \beta_k T_i^{smc} + X'_{hi}\gamma + \delta y_{hi0} + \epsilon_{hib} \tag{11}$$

where y_{hi0} is the outcome variable for household h visited by CHW i at baseline.

2. DID:

$$y_{hit} = \sum_{k=1}^{16} \beta_k T_i^{smc} + \sum_{k=1}^{16} \beta_k^A T_i^{smc} * A + X'_{hi}\gamma + \delta A + \epsilon_{hib} \tag{12}$$

where y_{hit} is the outcome variable for household h visited by CHW i at time t, and A is a binary variable that takes value 1 if t is equal to 2018 and 0 otherwise.

We will also estimate heterogeneous effects on the treatment based on the following variables measured at baseline:

(a) Gender

(b) Religion/ethnicity

(c) CHW's involvement in the community

(d) CHW's self-reported measure of motivation

(e) CHW's perceptions about social impact and task significance of agent's activities