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Do-gooders and go-getters

Career incentives, selection, and performance in public service delivery

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DO-GOODERS AND GO-GETTERS: CAREER INCENTIVES, SELECTION, AND PERFORMANCE IN PUBLIC SERVICE DELIVERY*

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Abstract

We study how career incentives affect who selects into public health jobs and, through selection, their performance while in service. We collaborate with the Government of Zambia to design a field experiment embedded in the national recruitment campaign for a new health worker position. To identify the selection effect of incentives we experimentally vary the salience of career incentives at the recruitment stage, which triggers selection responses, but we offer the same incentives to all recruited agents, which mutes effort responses. Career incentives attract health workers who provide more inputs (29% more household visits, twice as many community meetings) and this is matched by an increase in institutional deliveries, breastfeeding, immunizations, deworming and a 5pp reduction in the share of underweight children. The results allay the concern that extrinsic rewards worsen public service delivery by crowding out pro-social agents.

JEL classification: J24, 015, M54, D82.

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1 Introduction

The effectiveness of public services crucially depends on the agents who deliver them.[1] Governments thus face the challenge of designing incentives that attract strong performers, a particularly important task given that performance differences between observationally similar agents are very large.[2] Besides talent, which determines the marginal product of effort, performance in public service delivery depends on the agents' social preferences, that is the extent to which they internalize the utility of the recipients of the services. A tension then arises if extrinsic rewards attract talented agents, whose effort is more productive, at the expense of pro-social agents who, other things equal, exert more effort. This is the extensive margin equivalent of motivation crowding-out, whereby extrinsic rewards can reduce performance by reducing the agent's intrinsic motivation [Bénabou and Tirole (2003); Benabou and Tirole (2006)]. This tension also underpins a frequent argument made by policymakers that extrinsic rewards should be kept low so as to draw in agents who care sufficiently about delivering services per se.

This paper tests whether extrinsic rewards, in the form of career incentives, attract agents who improve the delivery of community health services. We collaborate with the Government of Zambia to implement a nationwide field experiment in the context of a recruitment drive for a new position to deliver primary health care, the Community Health Assistant (CHA).[3] Due to the shortage of medical staff, hiring the "right" CHAs can potentially make a great difference for the quality of health services and, ultimately, health outcomes in these communities. This setting is ideal for our purposes because the successful delivery of services requires medical talent as well as community trust and connection, that is, agents who internalize the needs of the service recipients (hence-forth, pro-social agents).[4] In this settting, the extrinsic rewards available to the government to attract talent are career incentives. The question of interest is then whether career incentives improve service delivery by attracting talented agents or worsen it by displacing pro-social agents.

The answer to this question requires addressing a key challenge in identifying the selection effect of incentives in general, namely that any incentive scheme that affects selection at the recruitment stage also affects motivation once agents are hired (see, for instance, Muralidharan and

[1] We use the term "public service delivery" to denote jobs that have a positive externality or pro-social component. Whether the government is the employer is neither necessary nor sufficient, as other types of organizations deliver public services, and the government also employs people for jobs that have no pro-social component, such as customs officers. To the extent that these offer opportunities for rent-seeking, they might attract agents who are more prone to corruption (Gorodnichenko and Peter, 2007; Hanna and Wang, 2013).

[2] This is a very well-established finding in the literature on teacher effectiveness (see, e.g., the review in Staiger and Rockoff, 2010 for extensive evidence from the U.S. and Araujo et al (2016) for a developing country context). The finding that observables do not predict performance has motivated recent attention to the effect of incentive design at the recruitment stage on teachers selection (Rothstein 2015)

[3] In the average community in our sample, the arrival of two CHAs represents a 133% increase in health staff.

[4] See, for example, Cherrington A, Ayala GX, Elder JP, Arredondo EM, Fouad M, Scarinci I. Recognizing the Diverse Roles of Community Health Workers in the Elimination of Health Disparities: From Paid Staff to Volunteers. Ethnicity & disease. 2010;20(2):189-194. We discuss these positions and the policy debate in further detail in Section 2.1

Sundararaman (2011); Duflo et al. (2012); Miller et al. (2012)). Our identification strategy relies on the fact that, since the CHA position is new, potential applicants do not have information about the potential for career advancement. This allows us to experimentally vary the salience of career incentives at the recruitment stage, while providing the same actual incentives to all agents once hired. At that point, all agents move to the same training school where they are trained together for one year and given the same information about the job, including career benefits. Thus, all CHAs have the same information and face the same incentives once they start their jobs. The difference in performance between agents recruited with salient career incentives and those recruited without identifies the effect of career incentives on performance through selection.

To implement this design we randomize the main job advertisements at the district level. We designed the job advertisements to make the contrast between extrinsic rewards and pro-social benefits as stark as possible. In treated districts, the advertisements make career possibilities salient by highlighting that CHAs are part of the Ministry of Health (MoH)'s hierarchy and that this gives them potential access to further training and promotion to higher-ranked positions such as nurse, clinical officer, and doctor. In control districts, the advertisements make salient benefits to the community, by highlighting that the main benefit of being a CHA is to serve the community.

Our analysis follows the three steps in the causal chain that links service delivery to outcomes, allowing us to measure the full impact different types of CHAs have. First, we measure the effect of recruiting with career incentives on the inputs provided by the CHAs once hired—i.e., the quantity and quality of services they deliver. Second, we use administrative data to test whether recruiting CHAs with career incentives affects facility utilization in the areas where the CHAs operate. Third we survey households to measure the effect on health practices and health outcomes. Besides their inherent importance, the effect on facility utilization and health outcomes reflects both observable and unobservable inputs chosen by the CHAs, thus measuring the overall effect of career incentives.

The first stage of the analysis follows the CHAs in the field over the course of 18 months to measure their performance in delivering health services. The CHAs' main task is to visit households to conduct environmental inspections, counsel on women's and children's health, and refer them to the health post as needed (e.g., for routine checks for children and pregnant women, or for giving birth). Our core performance measure is the number of household visits completed over the study period. We find that CHAs recruited with career incentives conduct 29% more household visits and they do not neglect less visible dimensions– such as the duration of visits, targeting of women and children, or visiting hard-to-reach households– or performance on secondary tasks. Importantly, since the program requires that CHAs must belong to the community they want to work in, treatment and control communities draw from their own separate pools, thus career incentives cannot draw in talent from control areas.

The second stage of the analysis tests whether the selection induced by career incentives affects outcomes that are related to the services delivered by the CHAs, but not directly chosen by them.

Given that CHAs are supposed to focus on maternal and child health, we use administrative data on government facilities to test whether our treatment affects women's and children's use of health services (as it should if CHAs are doing their job effectively). Difference-in-difference estimates based on the comparison of treated and control areas before and after CHAs started working reveal that treatment increased the number of women giving birth at the health center by 30%, and the number of children under 5 undergoing health checks by 24%, being weighed by 22% and receiving immunization against polio by 20%.

The third stage of the analysis measures treatment effects on health practices and outcomes. To do so, we survey 738 households in 47 communities located in each of the 47 districts served by the CHAs. We find consistent increases in a number of health practices: breastfeeding and proper stool disposal increase by 5pp and 12pp, deworming treatments by 15% and the share of children on track with their immunization schedule by 5pp (relative to a control mean of 5%). These changes are matched by changes in outcomes as the share of under 5s who are underweight falls by 5pp. These results rule out that control CHAs take unobservable actions that compensate for the lower inputs of visits and community meetings that we observe.

Finally, we assess whether the observed performance gap can be explained by selection on observables, which informs whether the effect of incentives can be mimicked by a change in the eligibility criteria. We find no evidence that pro-social agents are displaced: CHAs in the two groups score similarly on psychometric scales that measure pro-sociality and donate similar amounts in a contextualized dictator game. However, career incentives do attract different types: CHAs in the treatment group have better skills (as measured by test scores during the training program), stronger career ambitions (as measured by psychometric scales), and are more likely to choose career over community as the main reason to do the job, although only a handful do so. We find that several of these characteristics correlate with performance and that differences in observables explain 43% of the performance gap. The finding that the selection effect acts through both observable and unobservable traits echoes the importance of unobservables in explaining differences in teachers' performance (Araujo et al 2016, Chetty et al 2014, Staiger and Rockoff, 2010) and in other settings where agents self-select such as in applying for welfare programs (Alatas et al., 2015) or purchasing health products (Ashraf et al., 2010). In those settings, like in ours, self-selection cannot be mimicked by targeting on observable traits.

The study of how individuals sort into jobs according to their preferences, skills, and the jobs' own attributes has a long tradition in economics (Roy, 1951) and recent theoretical contributions show how differences in pro-social preferences can explain how individuals sort into mission-driven compared to profit-driven organizations (Akerlof and Kranton (2005); Besley and Ghatak (2005)).We contribute evidence that extrinsic incentives can attract talented individuals to these organisations without displacing agents with pro-social preferences. This is consistent with the recent findings of Dal Bó et al., 2013 that higher salaries for civil service jobs attracts better qualified

candidates with the same level of pro-social preferences.[5] In addition, our experiment is designed to measure the effect of this selection on performance, which allows to take into account sorting on all the attributes, observable and unobservable, that determine productivity on the job.[6]

Our findings complement the large literature that evaluates the effect of material incentives on the performance of agents in the private and public sectors. This literature stresses the importance of the effect of incentives on selection but empirical studies focus on the effect of incentives on agents' behavior after these have been hired (Lazear and Oyer, 2012, Oyer and Schaefer, 2011); we provide the first experimental evidence that incentives affect who sorts into these jobs in the first place, and that this selection affects performance.

The rest of the paper is organized as follows. Section 2 describes the context and research design. Section 3 evaluates the treatment effect on performance in delivering health services. Section 4 evaluates the treatment effect on health behaviors and outcomes using administrative and survey data. Section 5 assesses the extent to which the observed performance gap can be explained by selection on observables. Section 6 concludes with a discussion of external validity, welfare implications and general equilibrium effects relevant for program scale-up.

2 Context and Research Design

2.1 Context and Data

The history of community health work goes back at least to the early 17th century, when a shortage of doctors in Russia led to training community volunteers in providing basic medical care to military personnel. This training later became the foundation of China's "barefoot doctors", laypeople who sometimes could not afford shoes but were trained to meet primary health needs in rural areas, and then became widespread in Latin America, in the United States and, in the past two decades, across Africa. In 2010, the Government of Zambia sought to formalize and professionalize a position similar to community-based lay health workers that are common in rural Zambia, in response to a dire shortage of health care professionals. These informal positions had been the primary providers of health services to rural populations, and the Government of the Republic of Zambia (GRZ) launched a program to create a new civil service cadre called the Community Health Assistant (CHA).

[5] That higher wages attract better-quality applicants is also found in a related literature on wages and job queues in the private sector (Holzer et al., 1991) and on the effect of wages on the selection of politicians (Ferraz and Finan, 2011; Gagliarducci and Nannicini, 2011).

[6] Our findings also relate to Deserranno (2014), who studies agents taking on a job that encompasses both commercial activities and service delivery activities, in an NGO in Uganda. She demonstrates that randomly generated variation in expectations of earnings on the job signals that commercial sales, rather than services delivery, are the more important component of the job, and thus discourage the more pro-social candidates from applying. This signalling mechanism is muted in our setting because the job we study, as most public service delivery jobs, consists only of tasks related to health service delivery.

CHAs are recruited from the communities where they will eventually work, trained together for one year in a central location and posted back to their communities after that. CHAs are expected to devote 80% of their time (4 out of 5 working days per week) to household visits. The visits' main goals are to provide advice on women's health—including family planning, pregnancy, and postpartum care—and child health, including nutrition and immunizations. In addition, CHAs are expected to inspect the household and provide advice on health-related practices such as safe water practices, household waste management, sanitation, hygiene and ventilation. During visits, CHAs are also tasked with providing basic care to any sick persons and referring them to the health post as needed. In the remaining time, CHAs are expected to assist staff at the health post (the first-level health facility in rural Zambia) by seeing patients, assisting with antenatal care, and maintaining the facility. They are also supposed to organize community meetings such as health education talks at the health post and in schools.

The CHA position confers career benefits because it is an entry point into the civil service from which agents can advance to higher-ranked and better paid cadres. Promotion into higher-ranked cadres within the Ministry of Health from the position of CHA requires additional training (for example, nursing or medical school). Being part of the civil service, CHAs are eligible for "in-service training," meaning that they attend school as a serving officer and the government pays their tuition for all of their training.

In the program's first year, GRZ sought to recruit, train, and deploy roughly 330 Community Health Assistants across the seven most rural of Zambia's nine provinces. Within these seven provinces, based on population density, GRZ chose the 48 most rural of the 58 constituent districts. Finally, across these 48 districts, GRZ identified 169 health posts that were deemed to be facing the most severe health worker shortages. From each community that surrounded each health post, the intention was to recruit two CHAs. We collaborated with GRZ at each stage of the recruitment process in all 48 districts as described below.

Stage 1: Job Ads and Application Requirements

The recruitment and selection process occurred at the community (health post) level, with on-the-ground implementation coordinated by district health officials. In each community, paper advertisements for the job were posted in local public spaces, such as schools, churches, and the health post itself. District health officials were responsible for ensuring that the recruitment posters were posted. To ensure that the recruitment process was carried out in a uniform manner across all the communities, GRZ included detailed written instructions in the packets containing the recruitment materials (posters, applications, etc.) that were distributed to district health officials (see Appendix C).

The recruitment poster provided information on the position, the application requirements and process. The posters specified that applicants had to be Zambian nationals, aged 18-45 years,

with a high school diploma and two "O-levels."[7,8] All recruitment in the seven provinces occurred between August and October 2010. The recruitment drive yielded 2,457 applications, an average of 7.3 applicants for each position.

Stage 2: Interviews and Selection by Panels

Once the application window closed, all completed application forms were taken to the district Ministry of Health office. There, district health officials screened applications to ensure that eligibility requirements were met. No discretion was given at this stage; applicants who did not meet the objective criteria were rejected, and those who did were invited for interviews. Overall, 1,804 (73.4%) applicants passed the initial screening and were invited for interviews; of these 1,585 (87.9%) reported on their interview day and were interviewed; of these, 48% came from the career incentives treatment and 52% from the control group. District officials were in charge of organizing interview panels at the health post level.[9] GRZ explicitly stated a preference for women and for those who had previously worked as community health workers, but the ultimate choice was left to the panels.

Stage 3: Final Selection, Training, and Deployment

Out of the 1,585 interviewees, the panels nominated 334 applicants as "top 2" candidates and 413 as reserves. The nominations were reviewed centrally by GRZ, and 334 final candidates were invited to join a yearlong CHA training.

Of these, 314 applicants accepted the invitation and, in June 2011, moved to the newly built training school in Ndola, Zambia's second-largest city. All applicants lived on site and were trained together for one year, during which treatment and control CHAs received the same information on the job, including the same information on career possibilities. Of the applicants who joined the

[7] O-levels are written subject exams administered in the final year of secondary school. They are the primary entry qualification into tertiary education. The Examinations Council of Zambia requires candidates to take a minimum of six O-levels, of which English and mathematics are compulsory. Exam performance is rated on a nine-point scale, ranging from "distinction" to "unsatisfactory;" all but the lowest point-score are considered passing.

[8] The posters instructed eligible applicants to retrieve application forms from the health center associated with the health post. Applicants were to hand in their application forms, along with photocopies of their national registration cards and high school transcripts, to the health center within two weeks of the posters being posted. In line with the principle that CHAs should be members of the communities that they serve, the application form also required applicants to obtain the signed endorsement of a representative of the applicant's "neighborhood health committee" (NHC), followed by the signed verification of the application by the health worker in charge of the associated health center. The NHC is a parastatal institution at the community level in rural Zambia. It is comprised of elected volunteer community representatives, whose collective responsibility is to coordinate community health efforts, such as immunization campaigns and village meetings about common health issues.

[9] Each selection panel had five members: the district health official, a representative from the health post's associated health center, and three members of the local neighborhood health committee. These committees vary in size, but they typically have more than 10 members.

program, 307 graduated and started working as CHAs in August 2012. All CHAs were deployed to their communities of origin.

2.2 Experimental Design

The experiment aims to identify the effect of career incentives on performance through selection. We use the recruitment posters described above and the information materials distributed to health officers to experimentally vary the salience of career incentives at the recruitment stage. All applicants are then given the same information on career possibilities once recruited.

Career prospects are the main rewards for employees of the Ministry. The Ministry periodically asks the district medical officers to nominate a number of candidates who are then offered fully paid in-service training and promotion to the next rung of the hierarchy. The district officers are asked to nominate candidates on merit but there is no mechanical link between quantitative measures of performance (say the number of visits that a CHA makes) and nominations. In this context, recruiting with career incentives can potentially improve service delivery by attracting more talented agents who have a higher chance to climb the career ladder. What is not known, however, is whether talent can compensate for a lower relative weight on the utility of the recipients of the services. In other words, agents solely motivated by the impact of health services on community welfare might perform better. Besides the possibility of exerting lower effort, agents attracted by career incentives might focus on the activities that are most visible to their superiors while neglecting other, perhaps more important, tasks; or they might engage in influence activities that take time away from service delivery.

The recruitment posters are shown in Figures 1.A and 1.B. The treatment poster makes career incentives salient. To do so, it lists, as the main benefit, the opportunity to ascend the civil-service career ladder to higher and better-paid positions, which are illustrated and enumerated in the poster—e.g., environmental health technician, nurse, clinical officer, and doctor. This incentive is summarized in a bold caption stating, "Become a community health worker to gain skills and boost your career!" In this setting, the pay gradient associated with career advancement is steep, as the starting monthly wage is USD 290 for CHAs, USD 530 for entry-level nurses, USD 615 for environmental health technicians, and USD 1,625 for resident doctors.[10] Importantly, since there are shortages of health staff at every level, advancing to higher cadres does not require leaving the community.

[10] At the time of the launch of the recruitment process in September 2010, GRZ had not yet determined how much the CHAs would be formally remunerated. Accordingly, the posters did not display any information about compensation. Although the CHA wage was unknown to applicants at the time of application (indeed, unknown even to GRZ), applicants would likely have been able to infer an approximate wage, or at least an ordinal wage ranking, based on the "community health" job description and the relatively minimal educational qualifications required, both of which would intuitively place the job below facility-based positions in compensation. In Section 2.3, we present evidence against the hypothesis that wage perceptions may have differed by treatment.

The control poster makes community benefits salient. Benefits include "[gaining] the skills you need to prevent illness and promote health for your family and neighbors" and "[being] a respected leader in your community." The message is summarized in a caption stating, "Want to serve your community? Become a community health worker!". To ensure that the treatment poster capture the effect of career benefits rather than any benefits per se, the control poster has exactly the same structure except the wording of the benefits. To increase the chance to be able to detect differences in selection on pro-sociality, the control poster stresses pro-social benefits, making the new government CHA jobs look similar to the informal community health worker jobs that represent the status quo in these communities.[11]

Since recruitment for the CHA position was organized by district officials, we randomized treatment at the district level in order to maximize compliance with the experimental assignment, evenly splitting the 48 districts into two groups. This implies that each district official is only exposed to one treatment and is unaware of the other. As district officials are the main source of information for aspiring CHAs, randomization at the district level minimizes the risk of contamination. Randomization at the district level also mitigates the risk of informational spillovers between communities, as the distance between health posts in different districts is considerably larger. Random assignment of the 48 districts is stratified by province and average district-level educational attainment.[12] To ensure compliance with the randomization protocol, we worked closely with GRZ to standardize the information given to the district officials to organize the recruitment process.[13]

To assess the power of the treatment, it is important to note that in these communities government jobs are scarce and, as we formally show in Section 2.4, the majority of the eligibles are either not in paid employment or in jobs below their skills level. In this context, therefore, a poster advertising a government job, whether in the hierarchy of the Ministry of Health or as a stand-alone community position, is likely to be highly visible. To reinforce the treatment, we also include a basic written script that the district officials are invited to use to orient health centers and neighborhood health committees on the CHA program and recruitment process. In the career incentives treatment, the script describes the new program as follows: "This is an opportunity for qualified Zambians to obtain employment and to advance their health careers. Opportunities for

[11] When the recruitment process was launched, the position was called "Community Health Worker" or "CHW" in both treatment and control areas. It was later renamed "Community Health Assistant" everywhere to avoid confusion with informal community health workers.

[12] We stratify by the proportion of adults in the district who have a high school diploma, as reported in the most recent World Bank LCMS, conducted four years prior in 2006. We sort districts by province and, within each province, by high school graduation rate. Within each sorted, province-specific list of districts, we take each successive pair of districts and randomly assign one district in the pair to the career incentives treatment and the other to the control group. For provinces with an odd number of districts, we pool the final unpaired districts across provinces, sort by educational attainment, and randomize these districts in the same pair-wise manner.

[13] District officials are given a packet containing 10 recruitment posters and 40 application forms for each health post and are asked to distribute each packet to the respective health center and, from there, to ensure that recruitment posters are posted, application forms are made available, and so forth. We conduct a series of follow-up calls over several weeks to the district point-persons to ensure that the recruitment process is conducted as planned.

training to advance to positions such as Nurse and Clinical Officer may be available in the future." In contrast, in the control group, the script states, "This is an opportunity for local community members to become trained and serve the health needs of their community." (see Appendix C).

Once recruited, all CHAs lived and were trained together for one year during which they received the same information about job characteristics. Most importantly, all of them were told the benefits they were entitled to as civil servants, including career opportunities in the Ministry. As treatment and control CHAs face the same incentives once hired, performance differences, if any, are due to selection.

2.3 Experimental Checks

The experiment aims to create differences in the salience of career incentives at the application stage and then to eliminate these after candidates have been hired. To provide evidence on whether this indeed happened we ask all agents about perceived benefits of the CHA job when they first arrive at the training school and then again twenty months later, that is after they completed the one year training. To elicit this information, we give each CHA a bag of 50 beans and ask them to allocate the beans to different cards describing potential benefits of the job in proportion to the weight they give to each. This method has two desirable features: (i) it forces respondents to take into account the trade-off between different motives, namely that giving more weight to one motive necessarily implies that other motives will be given less weight; (ii) it allows us to test whether the treatment affected other motives besides career advancement and community service.

There are two sources of potential desirability bias, which might affect the magnitude of the treatment effects but not their sign. First, the fact that respondents say what they think the enumerators want to hear based on the information given on the posters does not invalidate this exercise whose aim is precisely to test whether the information they have matches that given on the posters. Second, the fact that this is a community based position, named "Community Health Assistant" might lead CHAs to overstate community benefits. This will bias the share put on community benefits upwards and the difference between treatments downwards, making it less likely for us to be able to detect a difference between treatment and control. This should be kept in mind when interpreting the magnitudes reported below.

The answers tabulated in Table A.1 show that differences in the reported benefits match those advertised in treatment and control posters when CHAs first arrive at the school and then disappear after CHAs are exposed to the training program. Table A.1, Panel A, shows that service to the community is listed as the main benefit in both groups. This might truly reflect their preferences or be inflated by desirability bias as discussed above. Despite the fact that this biases treatment effects towards zero, we find that the treatment group places 38% more weight on career benefits (16.5% vs. 12.0%, p=.002) and lower weight on both "allows me to serve the community" and "earn respect and status in the community" (39.6% vs. 43.2%, p=.050 and 3.7% vs. 5.7%, p=.048,

respectively). All other motivations to apply are balanced across groups, suggesting that the poster did not convey different expectations about pay or the nature of the job.

Table A.1, Panel B, shows that the answers converge after exposure to training and there are no significant differences between the two groups. In line with the fact that control CHAs receive information about career benefits during training, the weight they give to career benefits raises by 25% (from 12% to 15%) while the weight they give to service to the community falls from 43% to 37%. In contrast, treatment CHAs, who receive no new information during training, do not change their answers.

Taken together the evidence in Table A.1 validates our experimental design as it shows that the posters convey different information on career benefits and that the intensive training program, during which all CHAs live and study together for one year, eliminates this difference, as control CHAs learn about career benefits from their teachers and their fellow students .

2.4 Context Descriptives and Balance

Table 1 describes three sets of variables that can affect the supply of CHAs, the demand for their services, and their working conditions. For each variable, the table report the means and standard deviations in treatment and control, as well as the p-value of the test of means equality, with standard errors clustered at the level of randomization, the district. Table 1 show that the randomization yielded a balanced sample as all p-values of the test of equality are above .05. As treatment and control means are very close throughout, we comment on treatment group values in the rest of this section.

Panel A reports statistics on the eligible population drawn from the 2010 Census. This shows that the eligibles—namely, 18-45 year-old Zambian citizens with at least Grade 12 education—account for 4.4% of the district population, and that among them 37% are female. The majority (54%) were either out of work or in unpaid employment over the past twelve months.[14] Among the 46% engaged in income generating activities (either as employees or self-employed), fewer than one third were employed in high skills occupations (such as teachers, which account for 9% of the eligible population) and about half are employed in low skills occupations, mostly in agriculture which accounts for 18% of the eligible population. Taken together, the evidence suggests that, despite their educational achievements, the majority of eligible population are either out of work or employed in occupations below their skill level. This indicates that the CHA program can draw talent from these areas without crowding out other skilled occupations.

Panel B illustrates the characteristics of the catchment areas. These variables are drawn from surveys administered to district officials and the CHAs themselves. Three points are of note. First, health posts are poorly staffed in both the treatment and control groups; the average number of

[14]The 28% who were out of work are either unemployed (13%), housewives (7.5%), or full time students (8.5%). Most (65%) of the unpaid jobs are in agriculture. These are balanced across treatments.

staff (not including the CHA) is 1.5. Given that the aim is to assign two CHAs to each health post, the program more than doubles the number of health staff in these communities. Second, the areas vary in the extent to which households live on their farms or in villages, but the frequency of either type is similar in the treatment and control groups. This is relevant as travel times between households depend on population density and are higher when households are scattered over a large area, as opposed to being concentrated in a village. Third, over 90% of the catchment areas in both groups have at least some cell network coverage, which is relevant for our analysis, as some performance measures are collected via SMS messages.

Panel C illustrates the characteristics of the target population that are relevant for the demand for CHA services. First, population density is fairly low in both groups, which implies that CHAs have to travel long distances between households. This also implies that the ability to plan and efficiently implement visits is likely to play a key role in determining the number of households reached. Second, children under 5, who (together with pregnant women) are the main targets of CHAs, account for 19% of the population. Third, Panel C shows that access to latrines and—most noticeably—protected water supply is limited in these areas. Lack of latrines and protected water supply favor the spread of waterborne infections, to which pregnant women and children are particularly vulnerable and, through this, the demand for CHAs' services.

3 The Effect of Career Incentives on Performance via Selection

3.1 Measuring Performance in Service Delivery

The CHAs' main task, to which they are required to devote 80% of their time, or 4 out of 5 days per week, is to visit households. Our performance analysis focuses on the number of visits completed over the course of 18 months, from August 2012 (when CHAs started work) until January 2014. The number of household visits is akin to an attendance measure for teachers or nurses: CHAs are supposed to work in people's houses, and we measure how often they are there. Naturally, differences in the number of visits can be compensated by behavior on other dimensions; we discuss this possibility after establishing the main results in Section 3.3.

Our primary measure of household visits is built by aggregating information on each visit from individual receipts. All CHAs are required to carry receipt books and issue each household a receipt for each visit, which the households are asked to sign. CHAs are required to keep the book with the copies of the receipts to send to GRZ when completed. They are also required to send all information on these receipts—consisting of the date, time, and duration of the visit, as well as the client's phone number—via text message to the Ministry of Health. These text messages are collected in a central data-processing facility, which we manage. CHAs know that 5% of these visits are audited.

Since visits are measured by aggregating text messages sent by the CHAs themselves, identification can be compromised by the presence of measurement error that is correlated with treatment. For instance, CHAs in the career treatment might put more effort in reporting visits via text messages or might report visits that never took place, leading to a positive bias in the estimated treatment effect. Outright cheating is made difficult by the fact that CHAs would need to falsify the household signature on the official receipt to report a visit that did not happen. While the SMS submissions carry no signature, CHAs are required to send their household visit receipt books containing carbon copies of the receipts to the Ministry of Health for cross-checking. Fabricating receipts thus entails a potentially high cost for no direct benefit. Nevertheless, the estimated treatment effect might be upward biased because of differential effort in reporting.

We validate our visits measure by comparing it to administrative data and households' own reports of CHA activity. The administrative data is drawn from the Health Management and Information System (HMIS), which is the Ministry of Health's system for reporting, collecting, and aggregating routine health services data at government facilities. These are reported at the end of each month and sent electronically to the Ministry via a mobile platform, jointly by the two CHAs and the other staff working in each health post. While HMIS visit data are also collected by the CHAs themselves, the effort required is considerably lower since HMIS reports are compiled monthly rather than on every visit, and cheating is more difficult as the reports are compiled jointly by the two CHAs and the health post staff. As HMIS data are only available aggregated at the health post level—i.e., summed over the two CHAs in each health post—we regress these on our visit measure, also aggregated at the health post level. Columns 1 and 2 in Table A.2 shows that the two measures are strongly correlated (r=.766) and that the correlation is the same in treatment and control, which contradicts the differential reporting hypothesis.

The households' reports are collected via a survey that we administered to 16 randomly chosen households in each of 47 randomly selected communities chosen from the set of 161 communities where CHAs operate, stratified by district. For each CHA, we ask respondents whether they know the CHA (97% do), whether they have ever been visited (43% of them have), and their level of satisfaction with each CHA. Columns 3-6 show a precisely estimated correlation between our visit measure and the probability that a household reports a visit, as well as their level of satisfaction with the CHA's performance. Again, there is no significant difference between the treatment and control groups, casting doubt on the relevance of differential reporting.

Taken together, the findings in Table A.2 validate our visits measure. Ultimately, however, we will not be able to detect a treatment effect on households' health outputs in Section 4 if measured differences in visits capture differences in reporting rather than in actual visits.

3.2 Treatment Effect on Household Visits

Table 2 reports the estimates of

$$v_{ihdp} = \alpha + \beta C_{id} + Z_h\gamma + \delta E_d + \rho_p + \epsilon_{ihdp} \tag{3.1}$$

where v_{ihdp} is the number of visits completed by CHA i in catchment area h district d and province p, C_{id} equals 1 if agent i is recruited and operates in a district assigned to the career incentives treatment. Z_h is a vector of area characteristics, which includes the number of staff at the health post, cell network coverage, and the distribution of households between farms and villages described in Table 1. We control for the stratification variables, district-level high school graduation rate E_d and provinces indicators ρ_p throughout. Standard errors are clustered at the level of randomization—the district.

The coefficient of interest is β, which measures the effect of making career incentives salient at the recruitment stage on the number of visits completed over 18 months. Given that all CHAs are given the same information on career incentives during the yearlong training, β captures the effect of career incentives on performance through selection. Note that selection can affect performance by increasing productivity for a given level of effort or by increasing the marginal return to effort. An example of the former is talent for logistics: for the same amount of effort, a more talented CHA plans better and reaches more households in the same amount of time. An example of the latter is the utility weight put on career advancement: CHAs who value career more draw a higher marginal benefit from a given unit of effort and therefore exert more effort.

The causal effect of career incentives on performance can be identified under the assumptions that (i) C_{id} is orthogonal to ϵ_{ihdp}, (ii) there are no spillovers between the two groups, and (iii) the salience policy itself does not affect behavior directly. Orthogonality is obtained via random assignment, but measurement error in visits correlated to C_{id} can bias the estimates. We return to this in section 3.3 below.

Spillovers via movements of CHAs between treatment and control areas are ruled out by the program requirement that CHAs must have been residing in the community they want to work in prior to applying. This implies that career incentives cannot draw in talent from control areas as treatment and control communities draw from their own separate pools. Spillovers of information, caused, e.g., by potential applicants in control seeing the treatment poster, would introduce a downward bias because they would reduce the information differences between treatment and control. Information spillovers are minimized by design, as recruitment messages were randomized at the district level, which, given the travel distance between rural communities in different districts, makes it very unlikely that applicants in one group might have seen the poster assigned to the other group. Importantly, information cannot spillover through the district officials that implement the program or through the recruitment panels, as these are only exposed to one treatment only.

Finally, in Section 3.3 we present evidence to allay the concern that β captures the effect of the salience policy rather than career incentives themselves.

Column 1 reveals a large and precisely estimated effect of career incentives on household visits: CHAs recruited by making career incentives salient do 94 more visits (29% more than control) over the course of 18 months. The median treatment effect is 104 (bootstrapped s.e. 43.1). The magnitude of the difference is economically meaningful: if each of the 147 CHAs in the social treatment had done as many visits as their counterparts in the career treatment, 13,818 more households would have been visited over the 18-month period. Given that for most of these households CHAs are the only providers of health services, the difference between treatments is likely to have implications for health outputs in these communities. We return to this issue in Section 4.

3.3 Identification

The experimental design allows us to identify the effect of career incentives on performance through selection if the salience of career incentives at the recruitment stage does not affect the agents' behavior directly once the real career benefits are known by both treatment and control CHAs. Since career benefits are greater than or equal to the values agents knew at the application stage, we need to rule out behavioral biases that make agents value a given benefit differently if its value exceeds their expectation. This assumption might fail for two reasons. First, if agents are made worse off by discovering that the actual value of a given benefit is larger than the value advertised, agents for whom the participation constraint is met ex-ante but not ex-post would drop out once hired, and differences in performance among stayers would not be interpretable as the effect that career incentives have on performance through their effect on the applicant pool. Reassuringly, the drop-out rate at the relevant stage is minimal. Namely, 314 agents join training informed by the salience policy. They are then told about the actual benefits of the job at the start of the one-year training program. Contrary to the implication that some are made worse off by discovering that the actual value of a given benefit is larger than the value advertised by the salience policy, 98% of selected candidates stay on after discovering the actual benefits and complete the training program.

Second, if agents are made better off by discovering that the actual value of a given benefit is larger than the value advertised by the salience policy, they may react to the positive surprise by working harder. This would imply, for instance, that the effect of career incentives on effort would be stronger in the control group, to whom career benefits are revealed after being hired, than in the treatment group, who knew about career benefits all along. Given that treatment CHAs do more visits, the only way in which our estimates overstate the effect of career incentives is if the "surprise" effect is actually negative for agents in the control group (i.e., their effort response to finding out about career benefits is negative and larger–in absolute value–than what it would have been had they known the career benefits at the outset).

While we cannot measure the surprise effect directly, we can exploit the long time series of performance data to test whether the treatment effect changes with time in a manner that is consistent with there being a "surprise" effect. Specifically, if estimated differences between treatment and

control are overstated due to the "surprise" effect, we expect treatment effects to shrink with time as the surprise wanes.

To test this implication, in columns 2-4, we divide the 18-month period into three semesters. We find that the estimated treatment effect is identical in the three sub-periods: in each semester, the average CHA recruited under the career salience policy does between 30 and 34 more visits. Since the number of visits falls over time, the percentage effect *increases* with time from 20% to 51%. This casts doubt on the interpretation that CHAs' behavioral responses to differences between salience policy and actual incentives lead us to overstate the effect of career incentives on performance through selection.

Finally, the fact that treatment CHAs find out about career incentives at the recruitment stage and control CHAs at the training stage might directly affect their behavior if the power of career incentives depends on how long they have been known for. Alternatively, it might be that agents put more emphasis on the first information they are given, so that treatment CHAs continue to believe that they face larger career benefits even after all CHAs are given the same information at training. In both cases, the difference in the salience of career incentives at the recruitment stage creates an actual difference in perceived incentives on the job and can therefore create differences in performance even if there is no difference in selection. Table A.1 allays both of these concerns as it shows that treatment and control CHAs put the same weight on career benefits once they are given the same information.

3.4 Compensation Mechanisms and Work Styles

Table 3 investigates the hypothesis that CHAs in the control group take other actions that compensate for the lower number of visits. Column 1 tests whether career incentives improve performance at the expense of retention—e.g., whether they attract individuals who leave with their newly acquired skills as soon as it is feasible to do so. In our context, the CHAs are bonded to their position for one year.[15] Thus, we measure retention by the number of CHAs who make at least one visit after the one-year commitment has elapsed. We find that, by this measure, 18% of CHAs drop out, though some of this may be due to a combination of malfunctioning phones and the rainy season (falling between months 15-18 in our analysis window) making travel to cell network-accessible areas difficult. This attrition rate is balanced across treatments. It is important to note that according to the Ministry's rule, CHAs have to wait two years before applying for higher-ranked positions, such that none of those who left their positions did so for career progression. It is possible that career incentives will affect retention rates after the two-year mark. As we discuss in the Conclusion, the welfare implications of this effect (were it to materialize) are ambiguous.

[15]The CHAs were told that, if they quit before one year of service, they would be required to pay monthly wages for any months not worked (rather than simply relinquishing pay) to compensate the government for the free one-year training that they received.

Columns 2 and 3 investigate whether CHAs in the control group compensate by spending more time with each household or are better at reaching those they are supposed to target. The results show that CHAs in both groups devote the same time to a single visit, on average, and are equally likely to target their primary clients—women and children.

Columns 4 and 5 decompose the number of total visits into the number of unique households visited and the average number of visits per household to test whether CHAs in the career treatment do more visits because they cover a smaller number of easy-to-reach households. Contrary to this, columns 4 and 5 show that CHAs in the career incentive treatment reach more households and make more follow-up visits. The point estimates indicate that just over one-third (36/94) of the total treatment effect is due to career CHAs visiting more households and two-thirds to them visiting the same household more than once. This is consistent with the two groups of CHAs having a similar number of households in their catchment area and visiting them at least once, but treatment CHAs doing more follow-up visits. Note that longitudinal follow-up with households is considered an integral part of the CHA job, in view of which Ministry of Health guidelines state CHAs should attempt to visit each household on a quarterly basis. Column 5 indicates that CHAs in both groups fall short of this target, suggesting that differences in performance are relevant to welfare.

The results in columns 4 and 5 also cast doubt on the hypothesis that observed differences are driven by measurement error, because it is equally costly to send SMSs for first or repeated visits, but differences are larger for the latter.

Besides household visits, CHAs are expected to assist staff at the health post by seeing patients, assisting with antenatal care, and maintaining the facility. They are also supposed to organize community meetings such as health education talks at the health post and in schools. Columns 6-7 investigate whether differences in household visits are compensated by differences in secondary tasks using HMIS data on the number of community meetings CHAs organize and the number of patients they attend to at the health post. The latter should be seen as a proxy of the quantity of services delivered by CHAs at the health post, as seeing patients is mostly a nurse's job. We find that CHAs recruited by making career incentives salient organize twice as many meetings over 18 months (43 vs. 22), and the difference is precisely estimated. The effect of career incentives on the number of patients CHAs see at the health post is also positive but small and not precisely estimated.

To provide further evidence on possible compensation mechanisms, we administer a time use survey that is meant to capture differences in work style. We surveyed CHAs in May 2013, nine months after they started working.[16] The survey asked CHAs to report the frequency of emergency visits typically done outside of working hours. The median CHA does one emergency call per week, and column 8 shows that this holds true for CHAs in both groups.

[16]To implement this survey, we took advantage of a refresher course organized by GRZ in the CHA School in Ndola. Of the 307 CHAs, 298 (97%, equally split by treatment groups) came to training and took part in the survey.

The time use survey is designed to collect information on hours worked and the time allocated to different activities. This allows us to assess whether the differences in performance documented above are due to differences in time allocation across tasks; namely, whether treatment CHAs do more visits because they devote more time to that task. To collect information on the latter, CHAs were given 50 beans and asked to allocate the beans in proportion to the time devoted to each activity within each task. Besides household visits, community meetings and time at the health post, we allow for two further activities: traveling and meeting with supervisors. For each activity, we calculate the share of time devoted to each activity by dividing the number of beans allocated to that activity by the total number of beans allocated to all activities. The share of time allocated to these five activities is .32, .22, .16, .22 and .09, respectively. We then estimate a system of equations for hours worked and share of time devoted to each task, omitting traveling. Table 4 reports our findings.

Column 1 shows that the average CHA reports working 43 hours per week in the typical week and there is no difference in reported working hours by treatment. This suggests that CHAs in the control group do not compensate for visiting fewer households by devoting more hours to other, possibly informal, tasks. It also provides further assurance that CHAs in the career treatment do not have differential incentives to overstate their contribution, as self-reported hours are unverifiable and hence easy to "game."

Columns 2-5 show that CHAs in the two groups allocate their time in a similar manner; thus, observed performance differences are not driven by differences in time allocation. Two, possibly complementary, explanations are possible. First, treatment CHAs might work more effective hours—e.g., by taking shorter breaks over the 43 weekly hours. Second, treatment CHAs might be more efficient at their jobs. Household visits take place in remote, low-density areas: the median 78 square km area has 200 households, with an interquartile range of 130 to 360. It is thus rather time consuming to go from house to house, and this is compounded by the fact that roads are bad. In this setting, the ability to plan—e.g., by making appointments with specific households or collecting information as to whether members are likely to be home before setting out to visit them—is an important determinant of completing visits successfully. These effects might be strengthened by peer externalities because each CHA works alongside another CHA hired through the same treatment, thus CHAs in the treatment group are more likely to have a highly productive peer than CHAs in the treatment group. Peer effects might be driven by imitation, social comparison or a perception that the other CHA competes for the same promotion.

Finally, Appendix Table A.3 tests whether CHAs in the two groups allocate their time differently within each activity, namely whether they have different work "styles." Panel A shows that CHAs in the control group devote more time to counseling, inspections, and visiting sick members, but, taken one-by-one, these differences are small and not precisely estimated. CHAs in the career incentives treatment devote 1.6% less time to filling in forms and receipts and submitting SMSs,

but the difference is not precisely estimated at conventional levels. Because the quality of reports is the same, this implies that career CHAs are more productive at this task. Panel B shows a similar pattern for time allocation during work at the health post: collecting data and filling in reports is an important component of the job, which takes 23% of the CHAs' time in the control group, but only 18% in the career treatment. As with household visits, there is no evidence that CHAs in the career treatment collect fewer data at the health post level or that these data are of worse quality. CHAs in the two groups are equally likely to submit HMIS reports in a given month, and these are equally accurate. Thus, the evidence suggests that CHAs in the career treatment are more productive, and this frees time for other tasks.

4 The Effect of Career Incentives on Facility Utilization, Health Practices and Outcomes

The CHA program leads to a substantial increase in the number of health staff operating in the communities where CHAs are deployed: the number of staff associated with the community health post increases on average from 1.5 to 3.5. Given the size of the increase and the magnitude of the treatment effect on household visits and community mobilization meetings, it is reasonable to expect treatment to affect health outcomes in these communities. CHAs can directly affect facility utilization and health practices by increasing both demand, e.g., by providing information and promoting behavioral changes, and supply, e.g., by helping cover staff shortages at the health post or delivering medical treatments to the households. In turn, improved facility utilization and practices should lead to better outcomes.

Besides their intrinsic importance for the welfare of these communities, treatment effects on facility utilisation and household outcomes allow us to shed light on whether CHAs in the control group perform better on dimensions we cannot observe enough to improve outcomes. To provide evidence on whether treatment affected facility utilization, we use data from the Ministry's HMIS administrative records; to measure effects on health practices and outcomes we survey households residing in the communities where CHAs operate. As the main remit of the CHA job is mother and child health, we focus on this throughout.

4.1 Impact on Facility Utilization

The Ministry's HMIS administrative records are compiled by facilities' senior staff and transmitted to MoH via an electronic platform. Two level of facilities serve these communities: health centers and health posts.[17] CHAs are supposed to encourage women to give birth at the closest health

[17]Health facilities in Zambia are structured according to a population-based hierarchy. Health posts are the first-level health facility for most rural communities and provide basic medical care (no inpatient or surgical services). Health centers, which typically serve a population encompassing four to five health posts, provide both outpatient and

center and to bring in children for regular visits and immunizations at the closest facility (health center or health post). The importance of institutional deliveries in this context cannot be understated: Zambia's maternal mortality rates are very high and health centers have the equipment and medical supplies that can prevent these deaths. Regular children's visits ensure that conditions such as diarrhea are treated before they become dangerous. Immunizations protect children from potentially fatal illnesses.

To test whether the treatment affected facility utilization, we obtain information on institutional deliveries, children's visits, and immunizations for the period January 2011-June 2014 and estimate the following difference-in-difference specification:

$$y_{hdpt} = \alpha + \beta C_{hd} + \gamma A_t + \delta C_{hd} * A_t + Z_h\theta + E_d\phi + \rho_p + \xi_{hdpt}$$

where y_{hdpt} is the outcome in health facility h in district d and province p at quarter t.[18] h represents the lowest level of government facility to which the CHAs can refer their patients. This is the health post if it is operational; if not, the closest health center. The only exception is childbirths that are always measured at the health center level, as that is where they are supposed to take place. C_{hd}=1 if facility h is located in a district where CHAs were recruited via career incentives. We have data for 14 quarters, equally divided before and after the CHAs' arrival, and A_t=1 after the CHAs' arrival (4th quarter of 2012). To minimize composition bias and to test for robustness to facility fixed effect models we restrict the sample to the facilities for which we have at least three observations before and after the CHAs' arrival.[19] Z_h is a vector of area characteristics, which includes the number of staff at the health post, cell network coverage, and the distribution of households between farms and villages described in Table 1. We control for the stratification variables, district-level high school graduation rate E_d, and provinces indicators ρ_p throughout. Standard errors are clustered at the level of randomization—the district.

The parameter of interest is δ, the difference in differences between facilities in treatment and control districts before and after the CHA's arrival. Under the parallel trend assumption, δ captures the effect of career incentives for CHAs on these outputs.

Table 5 shows that indeed, career incentives improved clinic utilization outputs. In particular, the number of women giving birth at the health center increases by 30% relative to the mean in control areas at baseline. The effect on institutional deliveries is thus the same order of magnitude as the effect of performance pay for clinics as evaluated in Rwanda (23%Basinga et al., 2011) and

inpatient services, including labor and delivery and minor surgical procedures. District hospitals in turn encompass several health center catchment areas and are primarily focused on inpatient care.

[18]HMIS data should be transmitted to MoH monthly, but in practice (due to poor connectivity), reports are missing for some months and the information added to the following month. We aggregate the data at the quarterly level to smooth out monthly fluctuations due to this.

[19]This restriction keeps 77% of the health posts and 70% of the health centers in the sample.

Cambodia (25%Van de Poel et al., 2014). Selection and incentive effects of similar magnitudes (22% each) are also found in the only firm study that identifies the two separately (Lazear, 2000).

Table 5 also shows that the number of children under age five visited increases by 24%, the number of children under five weighed increases by 22%, and the number of children under 12 months of age receiving polio vaccination increases by 20%. The effects on postnatal visits for women, BCG, and measles vaccinations are also positive and in the 8-22% magnitude range, but are not precisely estimated. The average standardized treatment effect (Kling et al., 2007) over all outcomes is .277, significantly different from zero at the 1% level. Reassuringly, there are no significant differences between treatment and control areas in any of these outcomes before the CHAs' arrival: all the estimated β coefficients are small and not significantly different from zero.

To provide support to our identifying assumption, in Table A.4 (Panel A) we run a placebo test where we split the pre-CHA period in two halves and test whether outcomes improve in treatment areas over time even in the absence of CHAs. Reassuringly, they do not. Finally, Table A.4 (Panel B) estimates (2) with facility fixed effects; the fact that all estimated δ coefficients remain stable provides evidence that they are not biased by time-invariant facility unobservables correlated with treatment.

4.2 Impact on Health Practices and Outcomes

To provide evidence on the effect of treatment on health practices and outcomes, we survey households in 47 randomly chosen communities located in each of the 47 districts where the CHAs operate. We randomly choose 16 households in each community, surveying 738 in total.[20] These surveys are administered by a team of enumerators who are trained by us and unconnected to the CHAs or the Ministry of Health. As the main focus of the CHA job is mother and child health, we only survey households that contain at least one child under five. The survey contains modules on health and sanitation knowledge, health practices, incidence of illnesses and anthropometrics for the youngest child. Knowledge, practices, and illnesses are self-reported; deworming and immunization data are drawn from the child health card, and anthropometrics are measured by trained enumerators. We interview the main carer of the child, which is their mother in 90% of the cases and either a grandparent or a sibling in the remaining 10%. All questions are drawn from the DHS Zambia questionnaire, with the exception of the health knowledge module which we designed based on the CHA curriculum, and mid-upper arm circumference, which the DHS does not measure.

Table 6 reports the estimates of:

[20]The sample frame had 752 households. The 14 households difference is due to several factors. In some communities, safety concerns related to local political tensions forced the survey team to leave the community before completing surveying. In other communities, especially low-density communities where travel times between households could exceed one hour, the survey team was unable to find 16 eligible households within the allotted survey time. One household interview was lost due to malfunction of the mobile device on which the interview was recorded. The minimum number of households surveyed in a community was 13.

$$y_{idp} = \alpha + \beta C_{id} + D_i\gamma + \delta E_d + \rho_p + \epsilon_{idp} \tag{4.1}$$

where y_{idp} is the outcome of child (or respondent) i in district d and province p, C_{id} equals 1 if child (or respondent) i lives in a district that is assigned to the career incentives treatment. D_i is a vector of child, respondent and household characteristics that include child age and gender, household size and number of assets, and the education level of the respondent. As above, we control for the stratification variables, district-level high school graduation rate E_d and provinces indicators ρ_p throughout and cluster standard errors at the district level.

Column 1 shows that the average respondent answers 74% of the knowledge questions correctly and this is does not differ by treatment status. In contrast, treatment affects all the health practices we collect information on. In particular, Columns 2 and 3 show that children under 2 living in treatment areas are 5 percentage points more likely to be breastfed,[21] and their stools are 12 percentage points more likely to be safely disposed; these effects represent a 8% and 20% increase from the control group mean, respectively. Columns 4 and 5 show that treatment also increases the incidence of deworming treatments by 16% and the likelihood that the child is on track with the immunization schedule by 4.7 percentage points, which is 81% of the control group mean (5.8%).[22] Importantly, the treatment affects the incidence of immunizations for children who are young enough to have been exposed to CHAs when their immunization period started (as shown in Column 5) but not for those that were too old to start the cycle when the CHAs started working. This echoes the findings in Table 5 that show no difference in immunization rates between treatment and control areas before the CHAs started working.

Columns 6-8 measure treatment effects on the incidence of three main illness symptoms: fever, diarrhea and cough. These are fairly common, as 47%, 26% and 45% of children in control areas had experienced them in the past two weeks. As it is widely acknowledged, self-reported symptoms can actually worsen as knowledge improves and individuals learn how to recognize them, so these effects are lower bounds. We find that treatment reduces the incidence of cough symptoms by 7 percentage points while leaving the others unchanged. Finally, Columns 9-12 show treatment effects on anthropometric measurements. We report weight-for-age z-scores and mid-upper arm circumference (MUAC). The combination of these two allows us to measure both chronic and acute malnutrition.[23] Following WHO's guidelines, we use the -2SD and -3SD thresholds for weight-for-

[21] WHO recommends breastfeeding until the age of two years.

[22] A child is defined to be on track if she has completed all immunizations required for her age. At age 3 months, this includes BCG, OPV 0-2, PCV 1-2, DPT-HepB-Hib 1-2, and rotavirus 1-2. At 4 months, this includes, additionally, OPV 3, PCV 3, and DPT-HepB-Hib 3. At 9 months, this includes OPV 4 if OPV 0 was not given, and measles 1. The immunization series is complete at age 18 months with measles 2. Finally, we consider a child to be on track for vitamin A supplementation if she has ever been supplemented.

[23] We did not measure weight-for-height, an alternative to MUAC for assessing acute malnutrition, for three reasons. First, compared to weight and MUAC, height measurement is more invasive, requiring, for children under two, laying the child down on a height board and having two enumerators hold the child while collecting the measurement.

age z-scores to measure moderate and severe underweight, respectively, and 12.5cm and 11.5cm for MUAC to measure moderate and severe wasting, respectively (Food and Nutrition Technical Assistance Project, 2011). According to these measures, 21% of the children in control areas are underweight, and 5% severely so. The incidence of wasting is much lower, with 3.6% of the children exhibiting some wasting and 1.4% severe wasting. These data, which match the corresponding DHS figures for rural Zambia (Government of Zambia, 2014), suggest that these areas are characterized by high rates of chronic malnutrition but low rates of acute malnutrition.

The findings in columns 9-10 show that children in treatment areas are 5 percentage points less likely to be underweight (25% of the control group mean) and 3 percentage points less likely to be severely underweight (55% of the control group mean). In line with this, columns 11 and 12 show a large percentage reduction in wasting, but given the limited occurrence of this in our sample, the effects are not precisely estimated.

The average standardized treatment effect across all variables (coded so that higher values correspond to better outcomes) is .108, significantly different from zero at the 1% level.

Taken together, the findings in this and the previous section show that differences in the inputs provided by treatment and control CHAs are matched by differences in facility utilization and household health practices. The selection effect of career incentives is strong enough to generate discernible differences in household behaviors and child health outcomes.

5 The Effect of Career Incentives on CHAs' Traits

Advertising career incentives at the recruitment stage might affect performance even if all agents face the same incentives once hired if they attract agents with traits that lead to better performance or agents who put more value on career incentives. Both are selection effects that affect performance because they imply that agents in the control group have worse traits and/or respond less to career incentives even if they face the same incentives once hired. We now analyze whether career incentives attract agents who differ on observable traits and the extent to which this selection on observables can explain the performance gap identified above.

Table 7 measures the effect of career incentives on CHAs' traits that can affect performance. We group these in four categories: skills, preferences, outside option, and demographics. For each variable, the table reports the means and standard deviations in treatment and control, as well as the p-value of the test of means equality, controlling for the stratification variables and with standard errors clustered at the level of randomization—the district.

To measure skills, we use the CHAs' test scores in the examinations they took during the one-year training program. These examinations test the material taught in the program that will

During survey piloting, many respondents (and the children themselves) balked at this procedure. Second, accurate height measurement is made difficult by high measurement error relative to standard effect sizes (Mwangome et al., 2012). Finally, MUAC is a more accurate predictor of mortality (Myatt et al., 2006).

directly inform the work of the CHAs in the field. As all trainees are informed about career incentives at the beginning of the training program, differences in test scores solely reflect the selection effect of career incentives. We complement these test scores with MoH's records of the CHAs' high school results. Panel A shows that career incentives attract higher-skilled candidates: treatment CHAs' test score are 18% of a standard deviation higher than control CHAs'. Differences in test scores date back to high school as treatment CHAs' O-level scores are 9% of a standard deviation higher, and the number of O-level exams passed in the natural sciences is 10% of a standard deviation higher, although these differences are not precisely estimated. Finally, our baseline survey asks CHAs about their past experience in the health sector. We find that 30% of CHAs in the treatment group held a health job in the past against 15% of the control group (p=.02).

Panel B measures two sources of motivation that are relevant in this context: career ambition and pro-sociality. Differences in career ambitions and pro-sociality can drive differences in performance if more ambitious CHAs work harder to reach their goals and more pro-social CHAs work harder because they put a larger weight on the welfare of the individuals they serve. To measure these preferences, we give trainees a battery of psychometric tests using validated scales commonly used in employment surveys. Full descriptions of these variables can be found in Appendix B.4. We also implement a contextualized dictator game to measure the strength of pro-social preferences.[24] Finally, we measure the relative strength of career vs. pro-social preferences by asking trainees to choose whether they see "career advancement " or "service to community" as the main goal of the CHA job. While both career ambitions and pro-sociality can lead to higher performance, there might be cases in which a tradeoff arises between the two goals, and the effect on performance is ambiguous *a priori*.[25]

The data in Panel B shows that CHAs in the two groups look similar on all the measures of pro-social motivation.[26] Treatment CHAs, however, have a higher score on the career orientation measure and are more likely to choose "career advancement" over "service to community," as the job's main goal (14% vs 6%, p=.015). Taken together, Panel A and B suggest that career incentives attract individuals who put a larger weight on career advancement relative to community benefits. Table (3.1) tests whether these preferences are correlated with performance.

[24] In the dictator game, we gave trainees 25,000 Kwacha (approximately USD 5; half of a CHA's daily earnings) and invited each to donate any portion (including nothing) to the local hospital to support needy patients. This donation decision occurred privately and confidentially in concealed donation booths. Previous work has found dictator games adapted for specific beneficiary groups to be predictive of performance on pro-social tasks Ashraf et al., 2014.

[25] To interpret the results in Panel B, we need to keep in mind that these measures are self-reported and CHAs might give answers that are consistent with the recruitment poster rather than express their true preferences. Two considerations allay this concern: (i) the measures are collected after CHAs have been selected, so they have no incentive to modify their answers to affect the probability of selection, and (ii) psychometric tests are not straightforward to game.

[26] Table A.5 shows that CHAs in the two groups look similar on measures of intrinsic motivation and other potentially relevant personality traits.

Panel C reports CHAs' occupation at the time of application. This is relevant both because it allows us to assess whether the CHA program crowds out talent from other sectors, and because CHAs with worse outside options might work harder to keep their CHA job (although, given the low frequency of dismissals of government employees, this effect is unlikely to be strong). Four categories account for over 90% of occupations and all four are similar in treatment and control. Over two-thirds of applicants in both treatment and control groups are farmers. This is more than double the share of farmers in the general population of eligibles (Table 1). The two other occupations listed by respondents are "trader" and "teacher," both of which are likely to have a higher return to skills than farming. These are slightly, but not significantly, more common in the treatment group and substantially lower than in the general population of eligibles. Housework is slightly, but not significantly, more common in the control group and higher than in the general population of eligibles. Noticeably, only 13% of the sample reports being unemployed, but in the absence of information on hours worked, we cannot rule out that the data in Panel C hides underemployment. Regardless of the true share of unemployed, Panel C makes clear that a large majority of CHAs were not in jobs fit to their skill levels. The program might crowd out some agricultural production, but it is not drawing talent from other professions.

Finally, Panel D shows that treatment CHAs are older and more likely to be male, but have similar socio-economic status as the control CHAs.

Taken together, the data in Table 7 and A.6 reveal that individuals in the two groups differ on some relevant traits. In the Appendix, we show that this is driven by differential sorting, namely by the fact that career incentives attracted different types, rather than by differential selection by recruitment panels. In short, panels in the treatment and control groups put the same weight on the same traits, but they face different applicant pools.

To assess the effect of these differences on performance we augment specification (3.1) by adding the individual traits that differ significantly between treatment and control groups. Table A.6, column 1 replicates the baseline estimates in Table 2. Columns 2 to 5 add skills, preferences, and demographics, individually and then jointly. Overall, we find that individual traits have the expected signs: skills are positively correlated with performance while putting one's career over service to the community is negatively correlated with performance.[27]It is noteworthy that the treatment effect of career incentives remains large and precisely estimated, suggesting that our measures of talent and social preferences are imperfect proxies of the true differences.

To conclude we establish the extent to which differences in performance identified in Section 3 are due to selection on observables vs unobservables. We search for the vector of observables, among those listed in Table 7, that explains the largest possible share of variation of performance in the control group and use the estimated coefficients to predict performance in the treatment group.

[27]Further analysis, not reported, shows that the effect of observable traits on performance is the same in both groups, suggesting that these traits affect performance directly rather than by determining the response to career incentives—the sole exception is age, which is associated with performance only in the control group.

This yields the predicted difference between treatment and control on the basis of the observables that best predict performance.[28] The best predictors explain 31% of the observed variation in control and the predicted difference between treatment and control is 43 visits. Given that the actual, unconditional, performance gap is 101, differences in observables explain 43% of it. The remaining 57% is due to traits we do not measure well or at all.

The finding that observables have limited power in explaining performance differences echoes the well established finding that differences in teachers effectiveness are large and only weakly correlated to observable traits.

Taken together, the findings imply that if the Ministry had access to the information on the best predictors at the selection stage, they could potentially include these in the eligibility criteria and improve performance by 13% without offering career incentives at recruitment, as opposed to 31% with career incentives. This comparison, however, relies on the assumption that the Ministry is able to measure and verify this information and to attract agents who meet the new eligibility criteria without career incentives. Besides being twice as effective at improving performance, advertising career incentives at the recruitment stage thus has the advantage of reducing information requirements and attracting agents who would have not applied otherwise.

6 Conclusion

Attracting effective employees is a core objective for all organizations. Our analysis shows that offering career incentives at the recruitment stage draws in individuals who perform well in the health sector. Importantly, the selection effect deriving from incentives cannot be mimicked by a modification of the eligibility criteria, which highlights the importance of incentive design at the recruitment stage.

The findings suggest that estimates of the effects of incentives on performance obtained by strengthening incentives for a given set of agents might understate their true impact, both because they do not take into account the selection effect and because they measure the response of agents who have self-selected into jobs with low-powered incentives, and hence might be less responsive to high-powered incentives in the first place.

The findings also allay the concern that offering material rewards for public service delivery jobs displaces applicants with desirable social preferences, and ultimately worsens the quality of services provided. Naturally, the type of material benefit offered—a career in the Ministry of Health—was unlikely to attract purely selfish types, since government service implies some pro-social benefit.

[28] To implement this, we run a regression of visits on area characteristics and every possible combination of controls from the set reported in Table 7. We then choose the specification with the highest adjusted R-squared. This exercise reveals that the best predictors are age, years living in the community, number of dependents, wealth and whether the CHA was previously working as a trader. The first three are positively correlated with the number of visits, the last two are negatively correlated.

The findings do not rule out the possibility that there exists a level of financial compensation that attracts callous types, but rather they suggest that the material benefits that can be reasonably associated with these jobs have no drawbacks in terms of pro-social motivation and performance. The findings have implications for policy strategies based on this concern, such as maintaining the volunteer status of community-based work, or low salaries and lack of career incentives in teaching and health professions (World Health Organization, 2006; Lehmann and Sanders, 2007).

Our research provides evidence on factors that inform the welfare analysis of providing career incentives, but is not designed to conduct a full welfare analysis for three reasons. First, due to political constraints, all agents had to be paid the same amount. This implies that we cannot judge whether agents attracted by career incentives have a higher reservation wage, such that their higher performance comes at a price; in other words, the government could get the agents in the control group to work for a lower wage. A priori, the difference in reservation wages between applicants in the two treatments is difficult to sign: that applicants to the career incentives treatment are more skilled suggests that it might be positive, whereas the fact that they expect to move on to better-paid positions suggests that it might be negative (like interns are typically willing to forego compensation for the sake of career opportunities). Regardless, our results suggest that higher wages and career incentives can be substitutes for drawing candidates with better outside options and consequently higher skills. However, career incentives may be cheaper for the organization if the organization also requires higher-level positions to be filled, and has trouble filling them.

Second, while retention rates after 18 months are the same in the two groups, agents in the career incentives treatment might leave their posts for higher-ranked positions sooner than those in the control group. Whether this entails a welfare cost depends on whether they can be easily replaced and whether the government can use their skills in other jobs. In our context, replacement is straightforward; the number of applicants per post was above seven, and the government faces scarcity of health staff at all levels, such that promoting high-performing CHAs to nursing and other higher-level cadres is likely to be welfare-improving. In contexts where retention in the original post is more important, the welfare cost of attracting agents who expect to move on will be higher.

Third, since over 80% of CHAs were engaged in subsistence farming or housework, we cannot quantify the opportunity cost of the CHAs' time, namely the value of the activities they give up to become full time health workers and the size of this difference between treatment and control. If productivity in these alternative occupations is increasing in the same qualities that make a CHA productive, the findings imply that the opportunity cost is higher in the career treatment; namely, the career treatment draws in more productive farmers or houseworkers. By revealed preferences, we know that the private value of the CHA jobs must be at least equal to the private value of these activities (otherwise these individuals would have not switched occupations), but we cannot quantify the extent to which the social value produced by career CHAs in their new jobs exceeds the loss in social value from agriculture and housework. Finally, the fact that CHAs are recruited

locally from the communities where they are meant to serve implies that there is no competition for talent across communities. This has implications for the scale-up of the program as career incentives can be offered in each community without losing effectiveness as each community can only hire from their own pool, and most communities in these areas have access to a pool of skilled individuals who are either unemployed or in low skills jobs. More generally, in a context of nearly full employment when different organizations compete for the same pool of talent, focusing on incentive design at the recruitment stage might still be valuable to the extent that it improves the quality of the match between employees and organizations.

A Differences in sorting vs. differences in recruitment

A.1 Methodology

The goal of this section is to assess whether CHAs in treatment and control differ because career incentives attract different types, because recruitment panels choose different candidates, or both. To do so, we first test whether applicants differ along the dimensions discussed in Section 5 and compare them to the candidates chosen by the recruitment panels. To aid the comparison, we also test whether recruitment panels put different weights on these traits when choosing which candidates to nominate.

Recruitment panels have five members: the district health official, a representative from the health post's associated health center, and three members of the local neighborhood health committee. Recruitment panels are exposed to the salience policy as they see the same posters as the candidates. This notwithstanding, they know much more about the actual job attributes and who would be suitable for the positions. Indeed, contrary to the applicants (whose only source of information was the recruitment poster), the two more senior panel members—the district health official and the health center representative—are employees of the Ministry of Health, and hence familiar with career progression rules regardless of salience policy. The salience policy treatment is likely not as powerful, or perhaps entirely moot, for them.[29]

Table A.7 reproduces the key variables presented in Table 7 for the 1585 candidates who interviewed for the CHA jobs (Part I) and for the 334 candidates who are chosen by the panels (Part II). The final 314 CHA trainees differed from the 334 nominees in two ways: (i) to obtain gender balance, GRZ replaced all male nominees (i.e., men ranked 1 or 2 by the interview panels) with female reserves (i.e., women ranked 3 to 5) when available, resulting in 68 changes (22% of the total), and (ii) 13 applicants who were ranked "top 2" declined, and were replaced by reserves. By the time training commenced, twenty spots remained empty.

The data is drawn from MoH's administrative data on the applicants' high school test scores and from a survey that we asked candidates to fill in at the interview stage. We mostly use the same measures as in Table 7, except for the psychometric scales that were too complex to be administered at the interview stage. As in Table 7, we report mean values in the two treatment groups and the p-value of the difference from a regression of the outcome of interest on the career treatment and the stratification variables, with errors clustered at the level of randomization, the district.[30] To shed light on the differences between Part I and Part II, Table A.8 estimates the probability that candidate i in health post h is chosen by the recruitment panels as follows:

[29] Further analysis, available upon request, shows that treatment does not affect panel composition.

[30] To probe the robustness of the statistical inference we also computed p-values based on randomization inference. To compute these we simulate 1,000 placebo random assignments of districts to treatment, estimate the career treatment effect in each of these 1,000 placebo assignments for each variable and report the share of placebo coefficients that are larger or equal to the actual treatment effects. The results are unchanged.

$$s_{ih} = \sum_{j \in J} \alpha_j^c C_h X_i^j + \sum_{j \in J} \alpha_j^s (1 - C_h) X_i^j + \sum_{j \in J} \beta_j \bar{X}_h^j + \gamma N_h + \zeta_{ih}$$

where $s_{ih} = 1$ if i is one of the two nominated candidates and 0 otherwise; and C_h equals 1 if health post h is in the career incentives treatment and 0 if it is in the control group. X_i^j are individual characteristics, and the set J includes variables that are affected by salience policy (skills, pro-social preferences, career preferences) as well as age and gender, as GRZ requires giving preference to women. The coefficients of interest are α_j^c and α_j^s, which measure the weight given to trait j in the career and control groups, respectively. Differences, if any, could be due to the fact that panels think that a given trait is more important for a career (community) job, or to the fact that panels in the two treatments face different pools. To account for this, we control for the average traits of the applicants in the same health post $\bar{X}_h^j$ for all $j \in J$. To measure the strength of competition, we include the number of interviewed candidates in the same health post N_h. As in earlier specifications, we control for the stratification variables and cluster standard errors at the district level. Table 3 reports the estimates of α_j^c and α_j^s for all $j \in J$ and the p-value of the test of equality. We estimate the model with and without the characteristics of the applicant pool $\bar{X}_h^j$.

A.2 Results

The recruitment campaign attracts 2,457 applicants of which 1,232 in treatment and 1,225 in control. In both cases the number of applicants per job exceeds 7, which indicates a strong interests for these positions. The fact that the number of applications is similar in treatment and control suggests that neither of the two job advertisements is more attractive but rather each is attractive to different people.

Table A.7, Panel A.I shows that making career incentives salient attracts more qualified candidates; thus, the differences we see among CHAs in Table 7 are at least partly due to differences in the applicant pools. Applicants in the career treatment have a higher total score (p=.019), and have a stronger scientific background (p=.006), which is directly relevant to medical practice. Table A.8 shows that the strongest determinant of appointment is ability in both treatment and control groups: panels are between 17 and 23 percentage points more likely to appoint candidates at the top of the O-level exam score distribution within their health post. In the average health post, 21% of candidates are appointed; being at the top of the O-level exam score distribution doubles the probability of being selected. Panel A.II, Table A.7, confirms that the recruitment process screened in the most skilled applicants, as both total scores and the number of O-Levels in science are higher for the selected CHAs than they are for the average applicant, and the difference between treatments is not precisely estimated. Recruitment panels were thus able to reduce differences in observable measures of skill, but as we know from Table 7, unobservable differences

remained and CHAs recruited with career incentives had significantly higher test scores during the training program.

Panel B reports motivations and preferences. We see that the differences in career ambitions reported in Table 7 were already present in the applicant pool. Panel B.I shows that the share of applicants who aspire to be in a highly-ranked position (environmental health technician, clinical officer, or doctor) within the Government in 5-10 years' time is higher in the career treatment. The difference between treatment and control groups is 6 percentage points (32% of the control group mean) and precisely estimated (p=.026). Our main measure of social preferences at the interview stage is based on the adapted "Inclusion of Others in Self (IOS) scale"[31], which measures the extent to which individuals perceive community and self-interest as overlapping. IOS has been validated across a wide variety of contexts, and adapted versions are found to be strongly correlated with environmental behavior[32] and connectedness to the community.[33] The measure is coded as 0-1, where 1 implies highest overlap.[34] Panel B.I shows that 84% of the applicants in both treatments perceive their interests to be aligned with the community's, suggesting that career incentives do not displace this type of pro-social preference in the applicant pool. Table A.8 shows that recruitment panels in both treatment and control are more likely to appoint applicants with career ambitions and with pro-social preferences. As a consequence, appointed candidates in Panel B.II have both stronger career ambitions and stronger pro-social preferences. The differences between treatment and control reflect the differences in the applicant pool, and these in turn determine the differences we observe in Table 7: CHAs in the treatment group have stronger career ambitions, but the same level of pro-sociality.

Interestingly, panels face no trade-off between skills, career ambitions and pro-sociality in either group. In particular, applicants with top O-level scores have stronger career ambitions and the same level of pro-sociality, and this holds in both the treatment and control group. Similarly, there is no trade-off between career ambitions and pro-sociality in either group.

Turning to demographics, Panel C.I shows no difference in either gender or age in the applicant pool, in contrast with the fact that selected CHAs in the treatment group are older and more likely to be male. Table A.8 shows that recruitment panels in both treatment and control are about 9pp more likely to appoint women as directed by GRZ, yet the share of women drops by 2pp from applicant to nominated candidates in the treatment group and increases by 5pp in the control group. To shed light on this, we note that recruitment panels in the two groups face a

[31] Aron, Arthur and others, "Including Others in the Self", European Review of Social Psychology 15, 1 (2004), pp. 101-132.

[32] Schultz, P. Wesley, "Inclusion with Nature: The Psychology Of Human-nature Relations", Psychology of Sustainable Development (2002), pp. 61-78.

[33] Mashek, Debra and Lisa Cannaday and June Tangney, "Inclusion of Community in Self Scale: A Single-item Pictoral Measure of Community Connectedness", Journal of Community Psychology 35 (2007), pp. 257-275.

[34] Applicants are asked to choose between four pictures, each showing two circles (labeled "self" and "community") with varying degrees of overlap, from non-overlapping to almost completely overlapping. This variable equals 1 if the respondent chooses the almost completely overlapping picture, 0 otherwise.

different trade-off between gender and skills: among the candidates with top O-level scores, the share of women is 25% in the control group and 17% in the treatment group (p=.025). This creates a difference in gender balance between nominated candidates that gets further reinforced by MoH's affirmative action policy, bringing the share of women among deployed candidates to 44% in the treatment group and 57% in the control group, as seen in Table 7. Regarding age, Table A.8 shows that this is the only dimension where panels seem to differ: treatment panels put a small positive weight on age (1 SD increase in age increases the probability of nomination by 7pp) while control panels do not, and the difference is precisely estimated. The trade-off between age and skill is also different in the two groups as applicants with top O-level scores are younger in the control group (25.7 vs 26.5, p=.09) but not in the treatment group. Taken together, these imply that nominated and selected CHAs in the treatment group are on average one year older than those in the control group.

Ultimately, the evidence in this Section shows that career incentives attract applicants who differ on the key dimensions of skill and career ambition, but not the weight that recruitment panels put on these attributes, so that appointed CHAs differ on these traits because they came from different pools, rather than having been chosen differently by the recruitment panels.

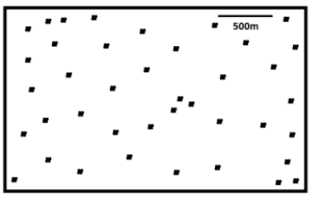
B Data Appendix

In this section, we describe each of the variables used in our analysis, including its source, unit of measurement, and data source. Because we used a number of different data sources, we describe each of them below. We collect data at each stage of the program: application, selection, training, and performance in the field. Each variable indicates which data source it is generated from. A description of each source, including the sample, can be found in Section B.5.

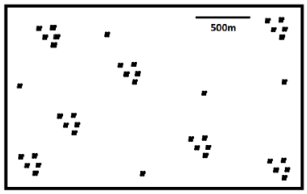
B.1 Eligible population and catchment area characteristics

- *Number of staff in health post* (source: district health officials survey, by phone) - Total number of nurses, environmental health technicians, and clinical officers assigned to the health post, as reported by district health officials we surveyed by phone.

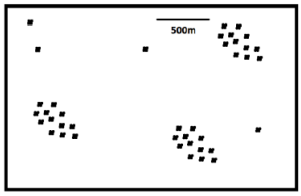
- *Geographical distribution of households in catchment area* (CHA survey, in person, at refresher training) - CHAs were shown stylized maps accompanied by the description above and asked to choose the one that most closely resembled the catchment area of their health post. Questions were asked to each CHA individually so that two CHAs from the same health post could give different answers. For the 5 out of 161 cases in which the two CHAs gave different answers, we used the information provided by supervisors to break the tie.



MAP 1: Almost all people live on their farms. There are few or no real villages with concentrated households.



MAP 2. Villages are made up of a few (5-10) households, and there are many of such small villages. Some households live on their farms.



MAP 3. Most people live in medium to large villages (>10 households). There are several of these larger villages in the catchment area. Some households live on their farms.

- *Poor cell network coverage* (source: attempted phone calls) - We attempted to call all CHAs after deployment. We made daily calls for 118 consecutive days. The health post was classified as having poor coverage if we did not manage to reach either of its two CHAs during this period.

B.2 Experiment Validation

- Relative weight variables are derived from a survey question (CHA survey, in person, at training) that asked the trainees to allocate 50 beans between different potential motivations for applying to the CHA position: "good future career," "allows me to serve the community,"

"earns respect and high status in the community," "pays well," "interesting job," "allows me to acquire useful skills," and "offers stable income."

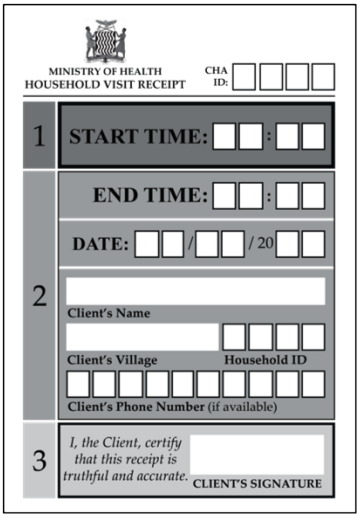
- *Expects to be employed in MoH in 5-10 years* (source: CHA survey, in person, at interview) - Circled any combination of being a "Community Health Worker," "nurse," "environmental health technician," "clinical officer," or "doctor" in response to the question, "When you envision yourself in 5-10 years' time, what do you envision yourself doing?"

B.3 Performance in Service Delivery

Household Visits

Source: SMS Receipts

- *Unique households visited*
- *Number of visits per household*
- *Average visit duration, in minutes*



Source: HMIS (monthly reports)

Each reported variable is the sum of each indicator's monthly values from September 2012 to January 2014.

- *Number of households visited*
- *Number of women and children visited per household visit*
- *Number of patients seen at HP*

- *Number of community mobilization meetings*

Time Use

Source: CHA survey, in person, at refresher training

- *Number of hours worked in a typical week* - CHAs were asked "In a typical week, how many total hours do you spend doing CHA work? Please count work that you do at the health post and in the village, including moving from household to household."

- *Frequency of out-of-hours calls in a typical week* - CHAs were asked "In a typical week, how often do you have to leave your house at night and do CHW work due to emergencies like a pregnancies or accidents?" Possible responses were "5-7 days per week," "3-4 days per week," "1-2 days per week," "2-3 times per month," "Once per month," "Sometimes, but less than once per month," and "Never."

- *Share of time allocated to* - To obtain time allocations, CHAs were asked to allocate 50 beans between different activities. The instructions were as follows:

  Please use the beans to show how much time you spend doing each activity. If you spend more time in an activity, you should place more beans on the card. If you never do an activity, you should place no beans on the card. Place the beans any way you would like. For instance, you can place all beans on one card, or 0 beans on any card.

  Household visits - Now I would like you to think about household visits specifically. Here are some cards that list different activities you may do during household visits.

  - *greeting household members*
  - *assessing and referring sick household members*
  - *reviewing and discussing the household's health profile and goals*
  - *asking questions about household health behaviors and knowledge*
  - *providing health counseling*
  - *doing household inspections (waste disposal, latrines, etc.)*
  - *documentation (filling registers/books and sending visit receipts via SMS)*

  Health Post - Now here are some cards that list different activities you may do at the HEALTH POST OR RURAL HEALTH center.

  - *seeing sick patients at the OPD*
  - *dispensing medications from the pharmacy*

- *helping with ANC visits*
- *cleaning and maintaining the facility*
- *assisting with deliveries and other procedures when needed*
- *documentation (filling registers/books and sending monthly reports through HMIS)*

In the Community - Now here are some cards that list different activities you may do as a CHA.

- *campaigns for polio, measles, child health, and other health issues*
- *health talks and other community mobilization activities*
- *school health talks and other school activities*
- *meeting with NHC and volunteer CHWs for planning*

B.4 CHAs' observable traits

Skills

- *Average test score at training [0-100]*- Average score in 11 tests on basic medical practices taken during the training program.
- *O-levels total exam score* (source: MOH application files) - This variable is constructed as the sum of inverted O-levels scores (1=9, 2=8, and so on) from all subjects in which the applicant wrote the exam, so that larger values correspond to better performance.
- *O-levels passed in biology and other natural sciences* (source: MOH application files) - Includes biology, chemistry, physics, science and agricultural science.

Applicants' Preferences and Motivations

- *Donation to local hospital (dictator game)* (source: baseline survey) - In the modified dictator game, trainees were given 25,000 Kwacha (approximately USD 5; half of a CHA's daily earnings) and invited to donate any portion (including nothing) to the local hospital to support needy patients. This donation decision occurred privately and confidentially in concealed donation booths. Previous work has found dictator games adapted for specific beneficiary groups predictive of performance on pro-social tasks (Ashraf et al., 2014).

> I am happy to inform you that we have recently received a small donation from an outside donor to support the Community Health Assistants. In a moment, you will each receive an equal portion of this outside donation.
>
> While the money is yours to keep, the donor has also requested that we provide you with an opportunity for you to share this gift with the community. This is an opportunity to support people in this community who are sick but are unable to afford the health care that they need. As you know, there are many such people in the communities from where you come from and also here in Ndola. They get sick, but because they are very poor, they are not able to get the health care that they need.

Because we want to protect your privacy, we have set up a donation booth in the next room. There you will see a collection box where you can deposit your donation, if you choose to donate. You do not have to give anything if you don't want to. No one here will know if you decide not to give anything. Your donation will be recorded, but we will not have access to this information. Once everyone has had an opportunity to give, IPA will collect any donations made to this cause, and we will donate the total amount to Ndola Central Hospital to directly support patients who are unable to pay for their medicines and treatment.

In a moment, we will give you the money, and you will come to this desk where you will be able to donate to help needy patients if you wish.

I am happy to announce now that the donor is able to provide each of you with 25,000 Kwacha.

In a moment, I will ask each of you to come to the registration table one-by-one. When you come to the table, that is when I will give you the money. I will also give you an envelope in case you want to support the patients at Ndola Central Hospital.

If you want to give any amount of money to help needy patients in the community, place the money in the envelope. Then seal the envelope, and place that envelope in the "Help Needy Patients in the Community" box. Please be sure to place the money INSIDE the envelopes before placing it in the cash box. Do not put any loose bills into the cash box. Whatever money you have remaining, you can keep in your main envelope.

- *Main goal is "service to community" vs. "career advancement"* (source: baseline survey) - Asked of all trainees: "In terms of your new CHA position, which is more important to you?" with two possible responses: "serving community" and "promoting career."

- *Perceives community interests and self-interest as overlapping* (source: CHA survey, in person, at interview) - Based on the "Adapted Inclusion of Others in Self (IOS) scale"[35] which measures the extent to which individuals perceive community- and self-interest as overlapping. The Inclusion of Other in the Self scale was originally designed by Dr. Art Aron and colleagues[36] as a measure of self-other inclusion and relationship closeness. The Continuous IOS makes use of the basic design of the original IOS,[37] but allows for (a) the measure to be embedded within a web-based questionnaire, (b) the output values to be continuously scaled, and (c) modifications in the appearance and behavior of the measure. IOS has been validated across a wide variety of contexts, and adapted versions are found to be strongly correlated with environmental behavior[38] and connectedness to the community.[39] The measure is coded as 0-1, where 1 implies highest overlap. Applicants are asked to choose between sets of pictures, each showing two circles (labeled "self" and "community") with varying degrees of overlap, from non-overlapping to almost completely overlapping. This variable equals 1 if the respondent chooses the almost completely overlapping picture (D), 0 otherwise.

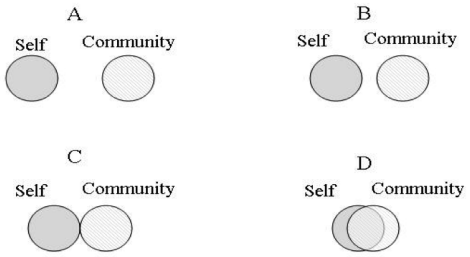
[35] Aron, Arthur and others, "Including Others in the Self", European Review of Social Psychology 15, 1 (2004), pp. 101-132.

[36] Aron, Arthur and Elaine N. Aron and Danny Smollan, "Inclusion of Other in the Self Scale and the Structure of Interpersonal Closeness", Journal of Personality and Social Psychology 63, 4 (1992), pp. 596.

[37] http://www.haverford.edu/psych/ble/continuous_ios/originalios.html

[38] Schmuck, Peter and Schultz, Wesley P, Psychology of sustainable development (Springer Science & Business Media, 2012).

[39] Mashek, Debra and Lisa Cannaday and June Tangney, "Inclusion of Community in Self Scale: A Single-item Pictoral Measure of Community Connectedness", Journal of Community Psychology 35 (2007), pp. 257-275.



- *Aims to be a higher-rank health professional in 5-10 years* (source: CHA survey, in person, at interview) - Circled any combination of being an "environmental health technician," "clinical officer," or "doctor" in response to the question, "When you envision yourself in 5-10 years' time, what do you envision yourself doing?"

Psychometric Scales

Each measure (source: baseline survey) takes on a value between 1 and 5 and represents, among the statements listed below, the extent to which the applicant agreed, on average. Levels of agreement are 1 (strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), and 5 (strongly agree). The psychometric scales came from validated scales used in employment surveys on pro-social motivation and career orientation. Each variable is the average of the item scores within each psychometric scale. For instance, in a scale with three items, the variable value equals the sum of levels of agreement for all items divided by three. It represents the average level of agreement with the included items.

- *Career orientation* - Adapted from (Wrzesniewski, Amy and others, "Jobs, Careers, and Callings: People's Relations to Their Work", Journal of Research in Personality 31 (1997), pp. 21-33). In contrast to *Calling* below, individuals with high career orientation tend to have a deeper personal investment in their work and mark their achievements not only through monetary gain, but through advancement within the occupational structure. This advancement often brings higher social standing, increased power within the scope of one's occupation, and higher self-esteem for the worker.[40] This scale consists of the following items: "I expect to be in a higher-level job in five years," "I view my job as a stepping stone to other jobs," and "I expect to be doing the same work as a CHA in five years" (reverse-scored).

- *Pro-social motivation (pleasure-based)* - Adapted from (Grant, Adam M., "Does Intrinsic Motivation Fuel the Prosocial Fire? Motivational Synergy in Predicting Persistence, Performance, and Productivity," Journal of Applied Psychology 93, 1 (2008), pp. 48-58) and consists of

[40]Bellah, Robert N. and others, Habits of the Heart: Individualism and Commitment in American Life, p. 66. (University of California Press, Berkeley, CA, 1988).

the following items: “Supporting other people makes me very happy,” “I do not have a great feeling of happiness when I have acted unselfishly” (reverse-scored), “When I was able to help other people, I always felt good afterwards,” and “Helping people who are not doing well does not raise my own mood” (reverse-scored).

- *Desire for positive pro-social impact* - Adapted from (Grant, Adam M., "Does Intrinsic Motivation Fuel the Prosocial Fire? Motivational Synergy in Predicting Persistence, Performance, and Productivity," Journal of Applied Psychology 93, 1 (2008), pp. 48-58). This measure provides an index of the degree to which an individual desires and benefits psychologically from the positive impact of her work on others. The scale consists of the following items: “It is important to me to do good for others through my work,” “I care about benefiting others through my work,” “I want to help others through my work,” “I want to have positive impact on others through my work,” “I get motivated by working on tasks that have the potential to benefit others,” “I like to work on tasks that have the potential to benefit others,” “I prefer to work on tasks that allow me to have a positive impact on others,” “I do my best when I’m working on a task that contributes to the well-being of others,” “It is important to me to have the opportunity to use my abilities to benefit others,” “It is important to me to make a positive difference in people’s lives through my work,” “At work, I care about improving the lives of other people,” and “One of my objectives at work is to make a positive difference in other people’s lives.”

- *Affective commitment to beneficiaries* - Adapted from (Grant, Adam M., "Does Intrinsic Motivation Fuel the Prosocial Fire? Motivational Synergy in Predicting Persistence, Performance, and Productivity," Journal of Applied Psychology 93, 1 (2008), pp. 48-58) and answers the following question: “How much do I care about/committed to the beneficiaries of my work?” The scale consists of the following items: “The people who benefit from my work are very important to me,” and “The people who benefit from my work matter a great deal to me.”

B.5 Data Sources

- **Source: Application** (sample: all applicants) - Applications were submitted from August-September 2010. The initial application stage was comprised of the initial application form, which includes fields for gender, date of birth, village of residence, educational qualifications. The application form also included a question asking through what means the applicant first learned of the CHA job opportunity: recruitment poster, facility health worker, community health worker, government official, word-of-mouth, or “other.”

- **Source: Interview Candidate Questionnaire** (sample: subset of applicants called for an interview) - Ranking questionnaires were filled and collected from September to October

2010. If applicants met the basic criteria noted above, they were invited for interviews, and asked to complete a questionnaire on the interview day. The questionnaire (written in English) included a series of questions about the interviewee's demographic background, community health experience, social capital, and work preferences and motivations. Notably, we included a measure employed by social psychologists, "Inclusion of Others in Self"[41] to measure connection with the community. The questionnaire stated that the answers would not be used for selection purposes but rather as part of a research project, although we cannot rule out that panelists could have seen the questionnaire or referred to it when making their decisions.

- **Source: Ranking Sheet** (sample: members of interview panels) - Ranking sheets were filled and collected from September to October 2010. Each panel consisted of five members: the district health officer, a representative from the health center, and three neighborhood health committee members. Once all interviews were completed, every member of the selection panel completed a private and individual ranking sheet by ranking their top ten candidates. This ranking exercise occurred *before* panel members formally deliberated and discussed the candidates. After interviewing all candidates and deliberating, interview panels were requested to complete and submit a consensus-based "Selection Panel Report" that included fields for the two nominated candidates as well as three alternates.

- **Source: Baseline Survey** (sample: all trainees) - The baseline survey was conducted in June 2011 and consisted of five components:

    1. Questionnaire- Conducted one-on-one by a surveyor and collected information on the trainees' socio-economic background and livelihoods, motivations to apply, and expectations of the program.
    2. Psychometric scales- A self-administered written exercise which gathered alternative information on motivations to apply, determinants of job satisfaction, and other character traits.
    3. Modified dictator game- An experimental game whereby students received a small donation and were given the opportunity to give some of it back for a good cause. It explored the altruistic nature of the students.
    4. Coin game- An experimental game that explored the risk-taking behavior of the students.
    5. Self-assessment- A three-hour exam with multiple choice questions to determine the knowledge on health matters that each student had prior to the training.

[41] Aron, Arthur and others, "Including Others in the Self", European Review of Social Psychology 15, 1 (2004), pp. 101-132.

- **Source: Catchment Area Survey** (sample: all deployed CHWs and supervisors) - Just prior to graduation in July 2012, all CHWs and supervisors were given a short survey that asked about characteristics of their health posts, including population density, rainy-season information, and general community health measures.

- **Source: Time Use Survey** (sample: all deployed CHWs) - This survey was conducted in April/May 2013 in Ndola, Zambia. The respondents were pilot CHAs who reported to Ndola for a supplemental in-service training to introduce new tasks as part of a revised CHA scope of work. The survey was administered by Innovations for Poverty Action, in partnership with the Ministry of Health, the CHA Training School, and the Clinton Health Access Initiative.

- **Source: SMSs** (sample: all deployed CHAs) - All CHAs carry with them receipt books for each visit, which require the signature of the client visited. The information on these receipts–consisting of the data, time, and duration of the visit, as well as the client's phone number–is then SMS'ed in real time to the MoH and our central data-processing facility. 5% of these visits are audited.

C District Instruction Appendix

The CHA program was introduced differently to health centers depending on the treatment group. In each district, the district health official was given a package that contained a script, a memo from the Permanent Secretary, and detailed instructions about the CHA recruitment process. In addition, district health officials received "health center packages" for each participating health center in the district, which contained a set of posters and application forms and instructions for the health center representative on how to post posters and collect applications. The district health officials were to visit each health center and meet with the staff and neighborhood health committee members to introduce the program and distribute the health center packages, using the script provided to them in their packages. The script was only provided to the district health officials, and was addressed directly to them. It is unlikely that the applicants or health center staff were able to read this script themselves.

The following script was given to district health officials in the career-incentives treatment group:

> *To Health center and Neighborhood Health Committee: I would like to you let you know about a new government program to strengthen the country's health workforce. Applications are currently being accepted for a new Community Health Worker position. This is an opportunity for qualified Zambians to obtain employment and to advance their health careers. Opportunities for training to advance to positions such as Nurse and Clinical Officer may be available in the future. Successful applicants will receive 1 year*

of training, both theoretical and practical. All training costs, including transportation, meals and accommodation during the one-year training program, will be covered by the Ministry of Health. Please encourage all qualified persons to apply so that they can benefit from this promising career opportunity.

The district health officials in the control group received the following script:

To Health center and Neighborhood Health Committee: I would like to you let you know about a new government program to improve health care services in your community. Applications are currently being accepted for a new Community Health Worker position. This is an opportunity for local community members to become trained and serve the health needs of their community. The new CHWs will work at the Health Post and community level in coordination with an affiliated Health center. Successful applicants will receive 1 year of training, both theoretical and practical. All training costs, including transportation, meals and accommodation during the one-year training program, will be covered by the Ministry of Health. Please encourage all qualified persons to apply so that they can benefit from this promising community service opportunity.

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Figure 1.A: Recruitment poster: treatment group

REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH

DESIGNATED HEALTH CENTRE:	FOR POSTING AT:

TRAINING OPPORTUNITY

ONE-YEAR COURSE IN COMMUNITY HEALTH

The Ministry of Health of the Republic of Zambia is launching a new national Community Health Worker (CHW) strategy and invites applicants to participate in the inaugural training of community health workers.

The training will begin on **30th August 2010** and will be held at the Provincial level for selected applicants. All participation costs, including transportation, meals and accommodation will be covered by the Ministry of Health.

BENEFITS:

- Become a highly trained member of Zambia's health care system
- Interact with experts in medical fields
- **Access future career opportunities including:**
  - **Clinical Officer**
  - **Nurse**
  - **Environmental Health Technologist**

QUALIFICATIONS:

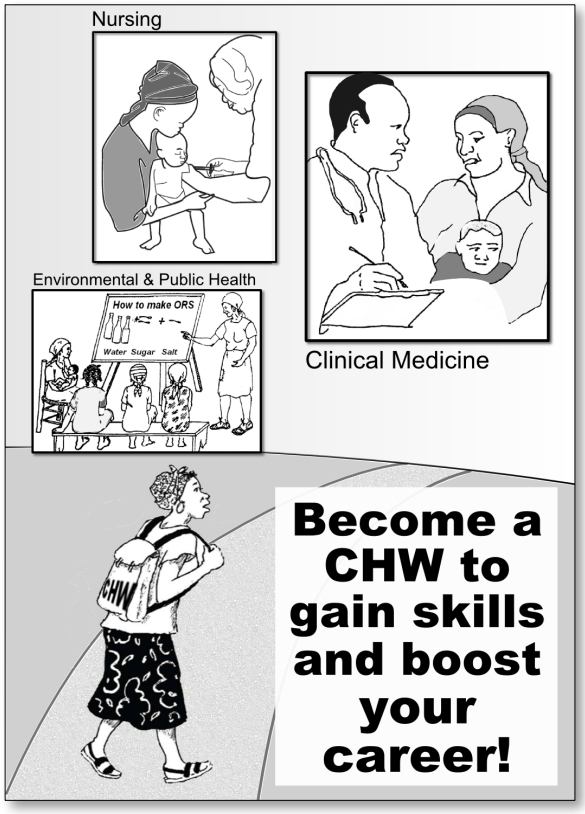
- Zambian National
- Grade 12 completed with two "O" levels
- Age 18-45 years
- Endorsed by Neighborhood Health Committee within place of residence
- Preference will be given to women and those with previous experience as a CHW

APPLICATION METHOD:

Submit to the **DESIGNATED HEALTH CENTRE** indicated above:

- Completed application form with necessary endorsements. If no blank forms are attached to this notice, kindly obtain a blank one at the nearest health centre.
- Photocopy of school certificate documenting completion of Grade 12 and two "O" levels.
- Photocopy of Zambian national registration card.

For more information: Contact the designated health centre indicated above.



CLOSING DATE: 30th JULY 2010.
Only shortlisted candidates will be contacted for interview.

Figure 1.B: Recruitment poster: control group

REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH

DESIGNATED HEALTH CENTRE:	FOR POSTING AT:

TRAINING OPPORTUNITY

ONE-YEAR COURSE IN COMMUNITY HEALTH

The Ministry of Health of the Republic of Zambia is launching a new national Community Health Worker (CHW) strategy and invites applicants to participate in the inaugural training of community health workers.

The training will begin on **30th August 2010** and will be held at the Provincial level for selected applicants. All participation costs, including transportation, meals and accommodation will be covered by the Ministry of Health.

BENEFITS:

- Learn about the most important health issues in your community
- Gain the skills you need to prevent illness and promote health for your family and neighbors
- Work closely with your local health post and health centre
- Be a respected leader in your community

QUALIFICATIONS:

- Zambian National
- Grade 12 completed with two "O" levels
- Age 18-45 years
- Endorsed by Neighborhood Health Committee within place of residence
- Preference will be given to women and those with previous experience as a CHW

APPLICATION METHOD:

Submit to the **DESIGNATED HEALTH CENTRE** indicated above:

- Completed application form with necessary endorsements. If no blank forms are attached to this notice, kindly obtain a blank one at the nearest health centre.
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- Photocopy of Zambian national registration card.

For more information: Contact the designated health centre indicated above.

CLOSING DATE: 30th JULY 2010.
Only shortlisted candidates will be contacted for interview.

Table 1: Eligible population by treatment (randomization balance)

	treatment	control	p-value of the difference
A. Characteristics of the eligible population			
Share of eligibles in the district (18-45 year olds with grade 12 or above)	.044	.043	.917
	(.205)	(.203)	
Share of women among the eligibles	.371	.391	.241
	(.483)	(.488)	
Main activity of eligible candidates during the past 12 months:			
not working	.279	.296	.480
	(.456)	(.448)	
unpaid work	.201	.229	.344
	(.400)	(.420)	
paid work	.457	.437	.353
	(.498)	(.496)	
of which: mid skill	*.240*	*.230*	.705
	(.427)	*(.421)*	
of which: low skill	*.483*	*.453*	.173
	(.499)	*(.498)*	
B. Catchment area characteristics			
Number of staff in health post*	1.49	1.36	.559
	(1.09)	(1.17)	
Geographical distribution of households in catchment area:*			
Most people live in their farms, none in villages	.082	.091	.848
	(.276)	(.289)	
Some people live in farms, some in small villages (5-10hh)	.529	.532	.855
	(.502)	(.502)	
Most people live in medium/large villages (more than 10hh), a few on their farms	.388	.364	.749
	(.490)	(.484)	
Poor cell network coverage*	.082	.065	.675
	(.277)	(.248)	
C. Target population characteristics			
District population density (persons/km^2)	13.58	14.08	.854
	(8.88)	(9.92)	
Share of district population under 5	.187	.187	.915
	(.390)	(.390)	
Main type of toilet: Pit latrine or better **	.718	.667	.494
	(.449)	(.471)	
Household water supply: Protected borehole or better **	.361	.416	.248
	(.480)	(.492)	

Notes: Columns 1 and 2 show means and standard deviations in parentheses. Column 3 reports the p-value of the test of equality of means based on standard errors clustered at the district level. Variables are drawn from the 2010 Census (10% PUMS sample) except those indicated by *, which are drawn from our surveys, and those indicated by **, which are drawn from the 2010 Living Conditions Monitoring Survey (LCMS), which covers 20,000 HHs and is representative at the district level. Activities codes follow the ILO ISCO88 convention. Mid-skill includes ISCO codes between 300 and 599, namely technicians, clerical workers and services and sales workers. Low-skill includes ISO codes below 600, namely agriculture, crafts, basic manufacturing and elementary occupations. Number of staff in health post is the total number of nurses, environmental health technicians, and clinical officers assigned to the health post as reported by district officials surveyed by phone. Information on the geographical distribution of HHs was obtained from a survey of the deployed CHAs before deployment. CHAs were shown stylized maps accompanied by a description and asked to choose the one that most closely resembled the catchment area of their health post. Questions were asked to each CHA individually so that two CHAs from the same health post could give different answers. For the 5 out of 161 cases in which the two CHAs gave different answers, we use the information provided by supervisors to break the tie. To measure cell network coverage we attempt to call all CHAs after deployment. We make daily calls for 118 consecutive days. The health post is classified as having poor coverage if we do not manage to reach either of its two CHAs during this period. Main type of toilet: Pit latrine or better equals 1 if the surveyed household uses a pit latrine, ventilated improved pit (VIP), or flush toilet, and 0 if bucket, other, or no toilet. Household water supply: Protected borehole or better equals 1 if the water supply comes from a protected borehole or well, communal tap, or other piped water systems, and 0 if it comes from an unprotected well or borehole, river/dam/stream, rain water tank, or other.

Table 2: The effect of career incentives on the number of visits

dependent variable	Household visits			
source	SMS receipts	SMS receipts	SMS receipts	SMS receipts
time horizon	months 1-18	months 1-6	months 7-12	months 13-18
unit of observation	CHA	CHA	CHA	CHA
	(1)	(3)	(4)	(5)
Career incentives	93.95**	33.93**	29.56**	30.46**
	(37.19)	(15.97)	(13.49)	(12.92)
Area characteristics	Yes	Yes	Yes	Yes
Mean of dependent variable in control	318.6	167.1	92.1	59.8
Adjusted R-squared	0.112	0.115	0.064	0.105
N	307	307	307	307

Notes: OLS Estimates, standard errors clustered at the district level. The dependent variable is total number of households visited over the relevant time horizon. SMS receipts are sent by individual CHAs to MOH for each visit. All regressions include the stratification variables (province dummies and share of high school graduates in the district). Area characteristics include: number of staff in the health post, geographical distribution of households in the catchment area, and an indicator variable that equals 1 if the CHA reports to have good cell network coverage most of the time or all the time.

Table 3: Compensation mechanisms

dependent variable	retention	visit duration	no of women and children visited per HH	no of unique HHs visited	no of visits per HH	community mobilization meetings	patients seen at health post	emergency calls
source	SMS receipts	SMS receipts	HMIS records	SMS receipts	SMS receipts	HMIS records	HMIS records	Time use survey
unit of observation	CHA	CHA	health post	CHA	CHA	health post	health post	CHA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Career incentives	0.0469	0.265	0.0437	36.35**	0.488*	17.06***	31.79	0.0469
	(0.0582)	(1.850)	(0.0947)	(15.49)	(0.246)	(5.220)	(260.4)	(0.0582)
Area characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent variable in control	0.796	33.9	2.06	179.4	1.817	20.32	1126.6	0.457
Adjusted R-squared	0.041	0.011	0.006	0.121	0.125	0.072	0.027	0.002
N	307	307	142	307	307	146	146	298

Notes: OLS Estimates, standard errors clustered at the district level. Retention=1 if CHA still reports visits after 1 year. Visit duration is computed as end time minus start time in minutes. Emergency calls=1 if the CHA takes at least 1 out of hours call in a typical week. SMS receipts are sent by individual CHAs to MOH for each visit. The Health Management and Information System (HMIS) is the Zambian Ministry of Health's system for reporting health services data at government facilities. The two CHAs are required to submit monthly reports that summarize their activities at the health post/community level. The number of observations varies because some health posts do not submit the reports; these are equally distributed between treatments. The time use survey was administered in May 2013 during a refresher training program. All regressions include the stratification variables (province dummies and share of high school graduates in the district). Area characteristics include: number of staff in the health post, geographical distribution of households in the catchment area, and an indicator variable that equals 1 if the CHA reports to have good cell network coverage most of the time or all the time.

Table 4: The effect of career incentives on time allocation

dependent variable	Hours worked	Share of time spent in:			
		HH visits	Health Post	Community meetings	Meeting with supervisor
	(1)	(2)	(3)	(4)	(5)
Career incentives	-.588	.007	-.021*	.011	-.001
	(1.19)	(.014)	(.012)	(.011)	(.008)
Area characteristics	yes	yes	yes	yes	yes
Mean of dependent variable in control	42.8	.312	.171	.213	.085
Adjusted R-squared	.071	.055	.081	.031	.063
N	298	298	298	298	298

Notes: Column 1 OLS Estimates, standard errors clustered at the district level. Columns 2-5 SURE Estimates, standard errors clustered at the district level bootstrapped with 1500 replications. Data source is the Time Use Survey that was administered in May 2013 during a refresher training program. Hours worked is defined as the number of hours worked in a typical week as reported by the CHAs. To measure the "Share of time spent in," CHAs were given 50 beans and asked to allocate them on cards listing the different activities listed above plus travel. The cards were scattered on a table in no particular order. All regressions include the stratification variables (province dummies and share of high school graduates in the district). Area characteristics include: number of staff in the health post, geographical distribution of households in the catchment area, and an indicator variable that equals 1 if the CHA reports to have good cell network coverage most of the time or all the time.

Table 5: The effect of career incentives on facility utilization

Dependent variable: total over each quarter 2011:1-2014:2	institutional deliveries	postnatal (0-6 weeks) visits	children under 5 visited	children under 5 weighed	children under 1 receiving BCG vaccinations	children under 1 receiving polio vaccinations	children under 1 receiving measles vaccinations	average standardized effect
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Career incentives	0.134	-12.75	-65.96	-73.05	10.99	-0.374	1.707	-0.005
	(10.37)	(9.435)	(142.9)	(133.5)	(11.97)	(9.145)	(10.01)	(0.156)
After	4.408	15.47***	61.71	108.7*	-1.270	-1.177	-1.167	0.043
	(4.253)	(5.096)	(62.82)	(63.33)	(4.540)	(3.701)	(3.553)	(0.059)
Career incentives*After	13.97**	7.919	312.0***	277.9**	7.147	14.65***	11.19	.277***
	(6.242)	(9.467)	(97.24)	(109.2)	(8.838)	(4.802)	(7.229)	(0.092)
Area characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent variable in control in year 1	46.7	49.9	1312.8	1261.5	89.8	73.9	73.6	na
Adjusted R-squared	0.353	0.213	0.253	0.253	0.151	0.151	0.118	na
Number of facilities	89	118	123	123	121	120	121	na
Number of observations	1268	1529	1618	1610	1518	1530	1535	1097

Notes: OLS Estimates, standard errors clustered at the district level. Data source is the Health Management and Information System (HMIS) available monthly from January 2011 until June 2014. Health center and health post staff are required to submit monthly reports that summarize their activities at the health post/community level. These are aggregated at the quarter level in the regressions. The variable in Column (1) is defined at the health center level because health centers are equipped for child births and health posts are not. The variables in Columns (2)-(7) are defined at the health post level if this reports data, at the health center otherwise. The average standardized treatment effect is computed using the methodology in Kling et al. (2001). After=1 after September 2012 (from 2012:4 onwards), when CHAs started working. All regressions include the stratification variables (province dummies and share of high school graduates in the district). Area characteristics include: number of staff in the health post, geographical distribution of households in the catchment area, and an indicator variable that equals 1 if the CHA reports to have good cell network coverage most of the time or all the time.

Table 6: The effect of career incentives on health practices and outcomes

	Information	Health practices				Incidence of Illness			Anthropometrics				All
Dependent variable	% of correct answers in medical knowledge test	=1 if child under 2 yr old is breastfed	=1 if child's stool are safely disposed	number of deworming treatments	=1 if child exposed to CHA is on track with immunization schedule	= if child has experienced fever in the last two weeks	= if child has experienced diahrrea in the last two weeks	= if child has experienced cough in the last two weeks	=1 if weight for age z score <2 SD (moderately or severely undernourished)	=1 if weight for age z score <3 SD (severely undernourished)	=1 if MUAC<12.5 (moderately or severely wasted)	=1 if MUAC<11.5 (severely wasted)	average standardized effect
Career incentives	0.002	0.051**	0.121***	0.225*	0.047**	-0.003	0.037	-0.070**	-0.053*	-0.028*	-0.023	-0.014	0.108***
	(0.010)	(0.023)	(0.039)	(0.129)	(0.020)	(0.037)	(0.027)	(0.033)	(0.030)	(0.015)	(0.015)	(0.014)	(0.036)
Household controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Child controls	no	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Mean of dep var in control	.740	.641	.595	1.44	.058	.469	.255	.450	.210	.051	.036	.014	
Adjusted R-squared	0.057	0.561	0.161	0.263	0.024	0.077	0.017	0.021	-0.006	0.003	0.018	0.017	
N	738	613	736	659	462	731	731	731	582	582	581	581	376

Notes: OLS estimates, standard errors clustered at the district level. The medical knowledge test contains 14 questions on topics that CHAs are supposed to cover; these questions were drafted by the researchers in consultation with CHA program officials and the CHA curriculum. Breastfeeding and stool disposal are self-reported. In line with UNICEF (2014), we define stools as safely disposed if flushed in toilet/latrine. Deworming, immunization data and schedule are as reported in the child health card. A child is defined as on track if they have completed all immunizations required for their age in months. The immunization sample is restricted to children who were 3 months or younger (including unborn) when the CHAs started working. Thresholds for weight-for-age and MUAC are taken from WHO guidelines; following these, data are restricted to children between 6-59 months. Household controls include size, education level of the respondent, and number of assets. Child controls include age and gender. All regressions include the stratification variables. The average standardized treatment effect is computed using the methodology in Kling et al.(2001) after recoding all variables so that higher values indicate better outcomes. For weight-for-age z score and MUAC we use the lowest tresholds.

Table 7: The effect of career incentives on CHA's traits

	treatment	**control**	p-values
Panel A: Skills			
Average test score at training [0-100] *	69.2	68.0	.067
	(7.23)	(6.75)	
O-levels total exam score *	25.3	24.5	.559
	(9.92)	(8.70)	
O-levels passed in biology and other natural sciences *	1.47	1.39	.801
	(.868)	(.824)	
Panel B: Motivation and preferences			
Psychometric scale: Pro-social motivation	3.64	3.63	.623
	(.541)	(.541)	
Psychometric scale: Desire for positive pro-social impact [1-5]	4.43	4.43	.824
	(.444)	(.509)	
Psychometric scale: Affective commitment to beneficiaries [1-5]	3.81	3.83	.873
	(1.153)	(1.170)	
Donation to local hospital (dictator game)	4063	3922	.739
	(4018)	(3937)	
Psychometric scale: Career orientation [1-5]	3.30	3.08	.025
	(1.050)	(.939)	
Main goal is "career advancement" vs. "service to community"	.138	.055	.015
	(.346)	(.228)	
Panel C: Outside opportunity			
Farmer (=1 if yes)	.717	.659	.441
	(.452)	(.476)	
Houseworker (=1 if yes)	.103	.141	.586
	(.025)	(.030)	
Trader (=1 if yes)	.090	.081	.928
	(.287)	(.275)	
Teacher (=1 if yes)	.041	.015	.108
	(.200)	(.121)	
Panel D: Demographics and socio-economic status			
Gender (=1 if female)	.450	.585	.083
	(.499)	(.494)	
Age (years)	28.66	26.93	.005
	(6.42)	(5.49)	
Married (=1 if yes)	.462	.510	.156
	(.500)	(.502)	
Number of dependents	3.50	3.26	.369
	(2.54)	(2.56)	
Aims to remain in the same community in 5-10 years (=1 if yes)	.575	.612	.392
	(.496)	(.489)	
Poor (self reported) (=1 if yes)	.219	.204	.507
	(.419)	(.404)	
Number of household assets	5.07	5.22	.477
	(2.58)	(3.11)	
Owns transport (=1 if yes)	.781	.741	.651
	(.439)	(.415)	

Notes: Columns 1 and 2 show means and standard deviations in parentheses. Column 3 reports the p-values of the null hypothesis that the career treatment effect equals zero conditional on stratification variables and with standard errors clustered at the district level. Variables denoted by * are drawn from MOH administrative data, all other variables are drawn from surveys administered to CHAs at the interview or during the training program. The sample is the 307 CHAs deployed. Average test score at training equals the average score in 11 tests on basic medical practices taken during the training program. Ordinary levels or O-levels are administered by the Examinations Council of Zambia (ECZ) to 12th-grade students, the highest grade in the Zambian secondary education system. O-levels total exam score is constructed as the sum of inverted O-levels scores (1=9, 2=8, and so on) from all subjects in which the applicant wrote the exam, so that larger values correspond to better performance. O-levels passed in biology and other natural sciences equals the number of O-levels passed in biology, chemistry, physics, science and agricultural science. Career orientation: from Career-Calling Orientation scale (Wrzesniewski, A. et al., "Jobs, Careers, and Callings: People's Relations to Their Work Journal of Research in Personality," 1997, 31, 21-33), which consists of three items: "I expect to be in a higher-level job in five years," "I view my job as a stepping stone to other jobs," and "I expect to be doing the same work as a CHA in five years," each scored on a five-point scale from "strongly disagree" to "strongly agree." The psychometric measures of pro-sociality are adopted from (Grant, A., "Does Intrinsic Motivation Fuel the Prosocial Fire? Motivational Synergy in Predicting Persistence, Performance, and Productivity," Journal of Applied Psychology, 2008, 93, 48-58). Each measure takes on a value between 1 and 5 and represents, among the statements listed below, the extent to which the applicant agreed, on average. Levels of agreement are 1 (strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), and 5 (strongly agree). Statements for the other variables are as follows: Desire for positive pro-social impact includes "It is important to me to do good for others through my work," "I care about benefiting others through my work," "I want to help others through my work," "I want to have positive impact on others through my work," "I get motivated by working on tasks that have the potential to benefit others," "I like to work on tasks that have the potential to benefit others," "I prefer to work on tasks that allow me to have a positive impact on others," "I do my best when I'm working on a task that contributes to the well-being of others," "It is important to me to have the opportunity to use my abilities to benefit others," "It is important to me to make a positive difference in people's lives through my work," "At work, I care about improving the lives of other people," and "One of my objectives at work is to make a positive difference in other people's lives." Sees self as pro-social: "I see myself as caring," "I see myself as generous," and "I regularly go out of my way to help others." Affective commitment to beneficiaries includes "The people who benefit from my work are very important to me" and "The people who benefit from my work matter a great deal to me." Donation to local hospital: trainees are given 25,000 Kwacha (approximately $5) and invited to donate any portion (including nothing) to the local hospital to support needy patients. This donation decision occurs privately and confidentially in concealed donation booths.

Table A.1: Experimental checks

Weight [0,1] given to the following reasons for working as CHA	**at entry (June 2011)**			**on the job (May 2013)**		
	treatment	**control**	p-value of the difference	**treatment**	**control**	p-value of the difference
Good future career	.165	.120	.002	.159	.151	.576
	(.157)	(.112)		(.122)	(.108)	
Allows me to serve the community	.396	.432	.050	.363	.371	.744
	(.226)	(.239)		(.181)	(.178)	
Earns respect and status in the community	.037	.057	.048	.039	.038	.905
	(.094)	(.109)		(.069)	(.061)	
Interesting job	.150	.152	.784	.132	.138	.654
	(.162)	(.140)		(.103)	(.106)	
Allows me to acquire useful skills	.181	.160	.214	.216	.219	.840
	(.168)	(.136)		(.132)	(.111)	
Offers stable income	.027	.024	.469	.038	.039	.913
	(.057)	(.054)		(.069)	(.061)	
Pays well	.031	.025	.442	.051	.043	.464
	(.092)	(.057)		(.089)	(.067)	

Notes: To measure the "*Weight given to the following reasons,"* CHAs were given 50 beans and asked to allocate them on cards, listing different reasons in proportion to the importance of each reason for working as CHA. The cards were scattered on a table in no particular order."At entry" variables are drawn from a survey administered at the beginning of the training program. "on the job" variables are drawn from a survey administered eight months after the CHAs started working. We show means with standard deviations in parentheses and the p-value of the test of equality of means based on standard errors clustered at the district level.

Table A.2: Validation of household visit measures

dependent variable	Number of visits from HMIS records		"=1 if HH reports a visit by CHA"		HH satisfaction: overall CHA's services	
source	HMIS		HH survey		HH survey	
unit of observation	Health post		HH		HH	
	(1)	(2)	(3)	(4)	(5)	(6)
Number of visits (in 00s) reported by CHA via SMS receipts	0.767***	0.644***	0.0208**	0.0154	0.0393**	0.0444***
	(0.0672)	(0.119)	(0.00830)	(0.0173)	(0.0194)	(0.0162)
Number of visits (in 00s) reported by CHA via SMS receipts* Treatment		0.192		0.00991		-0.00261
		(0.145)		(0.0192)		(0.0356)
Mean of dependent variable	643.6		0.438		4.329	
Adjusted R-squared	0.473	0.473	0.014	0.013	0.013	0.018
N	145	145	1284	1284	1253	1253

Note: OLS estimates, standard errors clustered at the health post level in Columns 3-6. The independent variable is visits reprted by SMS between 9/12 and 1/14. The dependent variable in Columns 1 and 2 is the total number of visits done by the two CHAs in the health post drawn from HMIS administrative data over the period between 9/12 and 1/14. The dependent variables in Columns 3-6 are drawn from a HH survey administered to 16 HHs in each of in 47 communities where CHAs are active. Satisfaction measures range from 1 (very dissatisfied) to 5 (very satisfied).

Table A.3: Treatment effect on time use

Panel A: Time allocation during household visits

share of time allocated to:	counseling	inspections	filling in receipts and forms	asking questions about health behaviors and knowledge	discussing health profile and goals	visiting sick household members
	(1)	(2)	(3)	(4)	(5)	(6)
Career incentives	.006	.007	-.016	-.011	-.003	.010
	(.012)	(.015)	(.010)	(.009)	(.012)	(.009)
Mean of dependent variable in social treatment	0.207	0.196	0.146	0.137	0.122	0.100
Area characteristics	no	no	no	no	no	no
R-squared	.030	.041	.049	.026	.014	.027
N	292	292	292	292	292	292

Panel B: Time allocation during work at the health post

share of time allocated to:	seeing sick patients	filling in forms	dispensing medications	helping with ante natal care visits	cleaning and maintaining the health post
	(1)	(2)	(3)	(4)	(5)
Career incentives	-.002	-.050***	.006	.019	.019
	(.011)	(.018)	(.012)	(.019)	(.013)
Mean of dependent variable in social treatment	0.262	0.228	0.207	0.160	0.104
Area characteristics	no	no	no	no	no
R-squared	.051	.104	.091	.095	.133
N	271	271	271	271	271

Notes: System estimates (SURE), bootstrapped standard errors clustered at the district level in parenthesis. All regressions include the stratification variables (province dummies and share of high school graduates in the district). All 298 participants in the refresher training program were given 50 beans and asked to allocate the beans to show how much time they spent doing each activity within each task. They were instructed to place more beans on a card if they spent more time on an activity, to place no beans if they never do an activity, and to place the beans any way they would like, including placing all beans on one card, or 0 beans on any card. Panel A activities are: greeting household members, assessing and referring sick household members, reviewing and discussing the household's health profile and goals, asking questions about health behaviors and knowledge, providing health education and counseling, doing household inspections (waste disposal, latrines, etc.), and documentation (filling registers/books and sending SMS visits). The omitted category in Panel A is "greetings." The sample in Panel A covers the 292 out of 298 CHAs who reported spending time doing visits. Panel B activities are: seeing sick patients in the health post, dispensing medications from the pharmacy, helping with ANC visits, cleaning and maintaining the facility, assisting with deliveries and other procedures when needed, and documentation (filling registers/books and sending monthly reports through DHIS2). The omitted category in Panel B is "assisting with deliveries." The sample in Panel B covers the 271 out of 298 CHAs who reported spending time at the health post. Area characteristics include: number of staff in the health post, geographical distribution of households in the catchment area, and an indicator variable that equals 1 if the CHA reports to have good cell network coverage most of the time or all the time.

Table A.4: The effect of career incentives on facility utilization–robustness checks

Panel A. Placebo test

dependent variable: total over each quarter 2011:1-2014:2	women giving birth at the health center	postnatal (0-6 weeks) visits	children under 5 visited	children under 5 weighed	children under 1 receiving BCG vaccinations	children under 1 receiving polio vaccinations	children under 1 receiving measles vaccinations
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Career incentives	-1.778	-11.96	-6.543	-6.708	12.01	-3.588	3.288
	(11.44)	(9.500)	(179.6)	(161.2)	(13.55)	(10.63)	(10.29)
After	0.974	15.43***	91.98	153.3**	2.657	3.840	-2.953
	(3.841)	(4.401)	(77.12)	(72.91)	(5.049)	(3.901)	(3.761)
Career incentives*After	12.37**	8.603	363.9***	335.3**	7.946	11.76**	12.65
	(5.364)	(9.630)	(116.2)	(136.7)	(9.986)	(5.196)	(8.355)
Placebo After	7.279***	0.0860	-64.40	-94.45	-8.334*	-10.58**	3.734
	(2.351)	(4.539)	(81.46)	(66.40)	(4.526)	(5.209)	(4.280)
Career incentives*Placebo After	3.518	-1.476	-111.2	-123.6	-1.823	6.147	-3.057
	(6.015)	(5.202)	(141.4)	(137.7)	(7.674)	(7.853)	(8.429)
Area characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent variable in control in year 1	46.7	49.9	1312.8	1261.5	89.8	73.9	73.6
Adjusted R-squared	0.355	0.212	0.253	0.254	0.152	0.152	0.117
Number of facilities	89	118	123	123	121	120	121
Number of observations	1268	1528	1618	1610	1518	1530	1535

Panel B. Health post fixed effects.

dependent variable: total over each quarter 2011:1-2014:2	women giving birth at the health center	postnatal (0-6 weeks) visits	children under 5 visited	children under 5 weighed	children under 1 receiving BCG vaccinations	children under 1 receiving polio vaccinations	children under 1 receiving measles vaccinations
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
After	5.009	15.46***	63.77	106.9	-1.094	-1.299	-1.024
	(4.201)	(5.205)	(65.80)	(65.49)	(4.724)	(3.885)	(3.819)
Career incentives*After	13.55**	8.800	306.3***	278.4**	8.409	15.41***	11.59
	(6.490)	(9.940)	(107.0)	(118.9)	(8.805)	(5.319)	(7.805)
Area characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent variable in control in year 1	46.7	49.9	1312.8	1261.5	89.8	73.9	73.6
Adjusted R-squared	0.819	0.663	0.618	0.591	0.496	0.565	0.445
Number of facilities	89	118	123	123	121	120	121
Number of observations	1268	1528	1618	1610	1518	1530	1535

Notes: OLS Estimates, standard errors clustered at the district level. Data source is the Health Management and Information System (HMIS) available monthly from January 2011 until June 2014. Health center and health post staff are required to submit monthly reports that summarize their activities at the health post/community level. These are aggregated at the quarter level in the regressions. The variable in Column (1) is defined at the health center level because health centers are equipped for child births and health posts are not. The variables in columns (2)-(7) are defined at the health post level if this reports data, at the health center otherwise. After=1 after September 2012 (from 2012:4 onwards), when CHAs started working. Placebo After=1 after September 2011, halfway through the period before the CHAs started working. All regressions include the stratification variables (province dummies and share of high school graduates in the district). Area characteristics include: number of staff in the health post, geographical distribution of households in the catchment area, and an indicator variable that equals 1 if the CHA reports to have good cell network coverage most of the time or all the time.

Table A.5: Psychometric tests

	treatment	**control**	p-values
Average Scores:			
Social Desirability	.353	.397	.100
	(.019)	(.022)	
Autonomy	2.244	2.102	.065
	(.048)	(.046)	
Internal Motivation	4.392	4.372	.851
	(.055)	(.063)	
Extrinsic Motivation	3.189	3.230	.215
	(.039)	(.038)	
Intrinsic Motivation	3.706	3.749	.448
	(.031)	(.034)	
Calling Orientation	4.049	4.063	.451
	(.040)	(.041)	
Status Striving	3.502	3.412	.305
	(.063)	(.054)	
Accomplishment Striving	4.285	4.332	.148
	(.033)	(.036)	
Consistent Interest	2.266	2.255	.589
	(.051)	(.055)	
Grit	2.083	2.063	.477
	(.036)	(.039)	
Persistent Effort	1.900	1.887	.734
	(.046)	(.048)	
Proactive Personality	3.582	3.591	.820
	(.056)	(.056)	
Personal Prosocial Identity	4.257	4.319	.375
	(.049)	(.051)	
Company Prosocial Identity	4.382	4.502	.030
	(.049)	(.043)	
Perceived Prosocial Impact	4.090	4.141	.303
	(.053)	(.055)	
Perceived Antisocial Impact	1.678	1.701	.698
	(.068)	(.073)	
Perceived Social Worth	4.100	4.087	.830
	(.057)	(.066)	

Notes: Scores are calculated as averages of a series of questions scaled 1 to 5, except for Social Desirability (Hays, RD, "A Five-item Measure of Socially Desirable Response Set," Educational and Psychological Measurement, Vol. 49, 1989, pp. 629-636), which is calculated as the average of 15 questions, scaled 0 to 1. Autonomy scales are taken from questions in (Wageman, Ruth, "Interdependence and group effectiveness,"Administrative Science Quarterly (1995), pp. 145--180). Internal Motivation is from (Edmondson, Amy, "Psychological Safety and Learning Behavior in Work Teams," Administrative Science Quarterly 44, 2 (1999), pp. 350-383.) Extrinsic Motivation and Intrinsic Motivation are from (Amabile,Teresa M. and others, "The Work Preference Inventory: Assessing Intrinsic and Extrinsic Motivational Orientations," Journal of Personality and Social Psychology 66, 5 (1994), pp. 950-967). Calling Orientation is from (Wrzesniewski, Amy and others, "Jobs, Careers, and Callings: People's Relations to Their Work", Journal of Research in Personality 31 (1997), pp. 21-33). Status Striving, and Accomplishment Striving are from (Barrick, Murray R. and Greg L. Stewart, and Mike Piotrowski, "Personality and Job Performance: Test of the Mediating Effects of Motivation Among Sales Representatives," Journal of Applied Psychology 87, 1 (2002), pp. 43-51). Consistent Interest, Grit, and Persistent Effort are from (Duckworth, Angela L. and others, "Grit: Perseverance and Passion for Long-term Goals," Journal of Personality and Social Psychology 92, 6 (2007), pp. 1087-1101). Proactive personality is from (Claes, Rita and Colin Beheydt and Björn Lemmens, "Unidimensionality of Abbreviated Proactive Personality Scales Across Cultures," Applied Psychology 54, 4 (2005), pp. 476-489). Personal Prosocial Identity and Company Prosocial Identity are from (Grant, Adam M., "Does Intrinsic Motivation Fuel the Prosocial Fire? Motivational Synergy in Predicting Persistence, Performance, and Productivity," Journal of Applied Psychology 93, 1 (2008), pp. 48-58).Perceived Prosocial Impact, Perceived Antisocial Impact, and Perceived Social worth are from (Grant, A. M., & Campbell, E., "Doing good, doing harm, being well and burning out: The interactions of perceived prosocial and antisocial impact in service work." Journal of Occupational and Organizational Psychology, 80 (2007): 665-691) and (Grant, A. M., "The significance of task significance: Job performance effects, relational mechanisms, and boundary conditions," Journal of Applied Psychology, 93 (2008): 108-124).

Table A.6: The effect of career incentives on performance, conditional on observables.

	Household visits				
	(SMS receipt data: Total August 12-January 14)				
	(1)	(2)	(3)	(5)	(6)
Career incentives	93.95**	89.08**	97.10**	83.05**	85.69**
	(37.19)	(37.46)	(37.98)	(38.57)	(38.74)
Average test score at training		4.185**			3.013
		(2.001)			(1.997)
Main goal is "career advancement" vs. "service to community"			-57.79*		-63.75*
			(32.12)		(32.54)
Psychometric scale: Career orientation [1-5]			6.458		8.576
			(15.33)		(15.12)
Female				7.842	17.26
				(35.75)	(36.41)
Age				6.240**	5.382**
				(2.251)	(2.238)
Area characteristics	Yes	Yes	Yes	Yes	Yes
p-value of the test that individual controls are jointly=0		0.04	0.17	0.03	0.00
Mean of dependent variable in control	318.6	318.6	318.6	318.6	318.6
Adjusted R-squared	0.112	0.122	0.106	0.128	0.126
N	307	307	307	307	307

Notes: OLS Estimates, standard errors clustered at the district level. The dependent variable is total number of households visited between August 12 and January 14. SMS receipts are sent by individual CHAs to MOH for each visit. Average test score at training equals the average score in 11 tests on basic medical practices taken during the training program. Career orientation: from Career-Calling Orientation scale (Wrzesniewski, A. et al., "Jobs, Careers, and Callings: People's Relations to Their Work Journal of Research in Personality," 1997, 31, 21-33), which consists of three items: "I expect to be in a higher-level job in five years," "I view my job as a stepping stone to other jobs," and "I expect to be doing the same work as a CHA in five years," each scored on a five-point scale from "strongly disagree" to "strongly agree." All regressions include the stratification variables (province dummies and share of high school graduates in the district). Area characteristics include: number of staff in the health post, geographical distribution of households in the catchment area, and an indicator variable that equals 1 if the CHA reports to have good cell network coverage most of the time or all the time.

Table A.7: Applicants vs. nominated candidates

	Part I: Applicants (N=1585)			Part II: Nominated Candidates (N=334)		
	treatment	**control**	p-values	**treatment**	**control**	p-values
Panel A: Skills						
O-levels total exam score	24.8	23.3	.019	27.14	25.65	.173
	(9.81)	(9.35)		(10.95)	(8.81)	
O-levels passed in biology and other natural sciences	1.44	1.24	.006	1.55	1.47	.642
	(.858)	(.888)		(.890)	(.805)	
Panel B: Motivation and preferences						
Aims to be a higher-rank health professional in 5-10 years	.246	.188	.026	.354	.253	.031
	(.431)	(.391)		(.479)	(.436)	
Perceives community interests and self-interest as overlapping	.839	.842	.975	.865	.887	.685
	(.367)	(.364)		(.342)	(.317)	
Panel C: Demographics and socio-economic status						
Gender (=1 if female)	.292	.294	.458	.273	.345	.237
	(.016)	(.016)		(.447)	(.477)	
Age	26.0	26.2	.745	27.85	26.64	.040
	(.200)	(.205)		(6.63)	(5.99)	

Notes: For each part of the Table, Columns 1 and 2 show means and standard deviations in parentheses while Column 3 reports the p-values of the null hypothesis that the career treatment effect equals zero conditional on stratification variables and with standard errors clustered at the district level. Ordinary levels or O-levels are administered by the Examinations Council of Zambia (ECZ) to 12th-grade students, the highest grade in the Zambian secondary education system. O-levels total exam score is constructed as the sum of inverted O-levels scores (1=9, 2=8, and so on) from all subjects in which the applicant wrote the exam, so that larger values correspond to better performance. O-levels passed in biology and other natural sciences equals the number of O-levels passed in biology, chemistry, physics, science and agricultural science. Aims to be a higher-rank health professional in 5-10 years: equals 1 if the candidate chooses any combination of being an "environmental health technician," "clinical officer," or "doctor" in response to the question, "When you envision yourself in 5-10 years' time, what do you envision yourself doing?" Perceives interests as overlapping: Adapted Inclusion of Others in Self scale (Aron, A. et al., "Including Others in the Self," European Review of Social Psychology, 2004, 15, 101-132). Applicants are asked to choose between sets of pictures, each showing two circles (labeled "self" and "community") with varying degrees of overlap, from non-overlapping to almost completely overlapping. This variable equals 1 if the respondent chooses the almost completely overlapping picture, 0 otherwise.

Table A.8: Effect of career incentives on candidate selection by panels

	=1 if nominated	p-value	=1 if nominated	p-value
High relative exam score X treatment	0.235***		0.201***	
	(0.0405)	.256	(0.0399)	.304
High relative exam score X control	0.174***		0.148***	
	(0.0369)		(0.0349)	
Aims to be a higher-rank health worker in 5-10 years X treatment	0.111***		0.138***	
	(0.0363)	.489	(0.0404)	.565
Aims to be a higher-rank health professional in 5-10 years X control	0.0778**		0.109***	
	(0.0309)		(0.0378)	
Perceives interests as overlapping X treatment	0.0203		0.0126	
	(0.0397)	.169	(0.0446)	.266
Perceives interests as overlapping X control	0.0981**		0.0729*	
	(0.0392)		(0.0388)	
Female X treatment	0.0913**		0.113***	
	(0.0354)	.901	(0.0393)	.689
Female X control	0.0854***		0.0926**	
	(0.0311)		(0.0361)	
Age X treatment	0.0125***		0.0134***	
	(0.00355)	.043	(0.00423)	.079
Age X control	0.00320		0.00463	
	(0.00280)		(0.00301)	
Number of interviewees in health post	-0.0103***		-0.00256	
	(0.00358)		(0.00338)	
Applicant pool controls	no		yes	
Adjusted R-squared	0.149		0.141	
N	1269		1230	

Notes: OLS estimates. All regressions include the stratification variables (province dummies and share of high school graduates in the district) and standard errors clustered at the district level. Independent variables are interacted with each treatment (social and career incentives). High relative exam score: equals 1 if the applicant's exam score is one of the 3 highest (4 in case of tie) among applicants to the same health post. Aims to be a higher-rank health professional in 5-10 years: equals 1 if the candidate chooses any combination of being an "environmental health technician," "clinical officer," or "doctor" in response to the question, "When you envision yourself in 5-10 years' time, what do you envision yourself doing?" Perceives interests as overlapping: Adapted Inclusion of Others in Self scale (Aron, A. et al., "Including Others in the Self," European Review of Social Psychology, 2004, 15, 101-132). Applicants are asked to choose between sets of pictures, each showing two circles (labeled "self" and "community") with varying degrees of overlap, from non-overlapping to almost completely overlapping. This variable equals 1 if the respondent chooses the almost completely overlapping picture, 0 otherwise. Number of interviewees in health post: total candidates interviewed per health post. Applicant pool controls include the following variables, all computed over applicants to the same health post: top 3 (4 in case of tie) exam scores, the share of applicants who aims to be a higher-rank health professional in 5-10 years; the share of applicants who perceive interests as overlapping; the share of applicants who are female; the average age.

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