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Do-Gooders and Go-Getters

Career Incentives, Selection, and Performance in Public Service Delivery

Nava Ashraf
Oriana Bandiera
Scott S. Lee

Do-gooders and go-getters: career incentives, selection, and performance in public service delivery

Nava Ashraf, Oriana Bandiera and Scott S. Lee[*]

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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 experimentally vary the salience of career vs. social benefits of a newly created health worker position when recruiting agents nationally. We follow the entire first cohort from application to performance in the field and measure impacts at every stage. We find that making career incentives salient attracts more qualified applicants with stronger career ambitions without displacing pro-social preferences, which are high in both treatments. Health workers attracted by career incentives are more effective at delivering health services and are equally likely to remain in their posts over the course of 18 months. Career incentives, far from selecting the "wrong" types, attract talented workers who deliver health services effectively.

1 Introduction

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). Recent theoretical contributions highlight that differences in pro-social preferences explain how individuals sort into mission-driven compared to profit-driven organizations (Akerlof and Kranton, 2005; Besley and Ghatak, 2005). In line with this, a large empirical literature in both economics and psychology finds that survey and experimental measures of pro-social preferences are correlated with the choice to work in public service delivery.[1,2]

Pro-social preferences align the interests of the agents with those of the organization and thus can interact with other sources of motivation, such as the attainment of material benefits through financial gain or career advancement. Understanding the nature of this interaction is crucial to identifying how best to attract and motivate agents engaged in pro-social tasks. The observation that material incentives are less common in mission-driven organizations is consistent with the fact that pro-social preferences can be an alternative source of motivation to material incentives, but it does not provide information on how the two interact to determine selection and performance.[3] Do material benefits leverage pro-social preferences and attract qualified agents who deliver public services effectively? Or do they crowd out pro-social preferences and attract agents who use their skills mostly to pursue their private interests at the expense of service quality?

In this paper, we test whether material incentives, in the form of promotion prospects and career advancement, affect the pro-social preferences and skills of the applicants who self-select into a public health care job and, through selection, their performance while in service. We collaborate with the Government of Zambia to create district-level exogenous variation in whether career or social incentives were offered to applicants for a new health worker position, the Community Health Assistant (CHA). We follow the entire first cohort of applicants to the CHA position and measure

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[1]The study of public employees' motivation is the topic of extensive research in public administration and social policy; see, e.g., Perry et al. (2010); Le Grand (2003). Recent empirical contributions in economics include Lagarde and Blaauw (2013), who find that, in an adapted dictator game, giving to patients predicts student nurses' subsequent decisions to take rural, hardship posts in South Africa; Smith and Cowley (2011), who find a correlation between intrinsic motivation and public sector employment in World Value Surveys; and Dohmen and Falk (2010), who find that German teachers trust more and are less negatively reciprocal than other employees.

[2]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 (Hanna and Wang, 2013; Gorodnichenko and Peter, 2007).

[3]Reinikka and Svensson (2010) show that wages and a religion-driven mission are negatively correlated among health care facilities in Uganda. Delfgaauw et al. (2011) show that management practices that reward performance are less common in non-profit vs. for-profit nursing homes. A large theoretical literature suggests reasons why material incentives might reduce performance on pro-social tasks; see, e.g., Benabou and Tirole (2006), Delfgaauw and Dur (2008), and Francois (2007).

impacts on their skills and pro-social preferences, and, crucially, on their performance over the course of their first 18 months of service.

The key challenge in identifying the selection effect of incentives on performance is that any incentive scheme that affects selection at the application stage also affects effort once agents are hired (Lazear, 2000). Our identification strategy relies on the fact that, since the CHA position is new, the potential for career advancement is unknown to potential applicants.[4] This allows us to experimentally vary the salience of career and social incentives at the recruitment stage, while providing the same actual incentives to all agents once hired. The difference in performance between agents recruited through the career incentives treatment and those recruited through the social incentives treatment identifies the effect of career incentives on performance through selection.

To guide the empirical analysis, we develop a simple framework that illustrates how making career incentives salient can attract applicants with different traits, and how this selection can affect the production of the social good. In the model, agents have different ability, and different preferences for social and career benefits. The distribution of ability and preferences are uncorrelated. If hired, agents choose how to allocate effort between the production of the social good and influence activities that solely promote their career.

The model yields predictions on the effect of salience policy on the social preferences and ability of applicants and on the production of the social good. We show that career incentives might attract higher-ability applicants, and that they attract applicants who, on average, give a lower weight to social benefits and/or a higher weight to career benefits. The effect on social output is thus ambiguous because, other things equal, high ability leads to high output, while a low relative ratio of social to career preferences leads to low output.

The first stage of the empirical analysis shows that, indeed, making career incentives salient attracts applicants who are more qualified (as measured by high-school test scores) and have a stronger scientific background (as measured by the number of natural science courses taken and passed). The distribution of test scores shows that the average differences are driven by the fact that career incentives attract more qualified applicants, as opposed to discouraging less qualified applicants. This has important implications for the skill level of those who are eventually selected for the job, as qualified candidates can be chosen only if they apply.

The analysis also shows that the share of applicants who display pro-social preferences is high in both treatments, suggesting that career incentives do not displace pro-social motivation. Nevertheless, applicants under career incentives give a higher weight to career benefits.[5] Taken together,

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[4] The new cadre formalizes and professionalizes lay health worker positions (e.g., village health workers, traditional birth attendants, barefoot doctors) and is placed at the lowest rung of the hierarchy in the Ministry of Health. By virtue of this, successful applicants will have access to a career path in the civil service, leading to higher-ranked positions such as nurse, clinical officer, and doctor.

[5] To measure preferences, we draw on the literature in organizational behavior that correlates individual psychometric traits with job attributes and performance (Amabile et al., 1994; Wrzesniewski et al., 1997; Barrick et al., 2001; Wageman, 2001; Barrick et al., 2002; Grant, 2008; Gebauer and Lowman, 2008; Duckworth et al., 2007).

the findings on ability and preferences indicate that the effect on performance in service delivery is a priori ambiguous.

The second stage of the analysis follows the CHAs in the field over the course of 18 months to measure their performance in delivering health services. At this stage, CHAs in both treatments are similarly aware of career and social benefits, and thus performance differences, if any exist, cannot be driven by differences in incentives on the job.

The CHAs' main task is to visit households to conduct environmental inspections, counsel on women's and child health, and refer sick cases to the health post. Our core performance measure is the number of household visits, which 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. In addition to visits, CHAs are supposed to devote one day per week to work at the health post and to organize community meetings. We measure the numbers of patients seen and meetings organized.

We find that CHAs recruited with career incentives conduct 29% more household visits and organize over twice as many community meetings, while the difference in the number of patients seen at the health post is also positive but not precisely estimated. Supplementary evidence suggests that the difference is not due to measurement error and is not compensated by improvements on other dimensions, such as the duration of visits, targeting of women and children, or visiting hard-to-reach households. Quantile treatment effects reveal that the difference between CHAs in the two treatment groups is driven by a group of strong performers in the career incentives group, in line with the earlier finding that career incentives attract agents from the right tail of the ability distribution.

Our findings provide the first integrated evidence of the effect of material incentives on the characteristics of agents who apply for a public service delivery job and, crucially, how differences in selection translate into differences in performance. We contribute to a small literature that analyzes the effect of material incentives on the selection of workers in the public sector. Our findings on the effect of career incentives on applicant traits are in line with Dal Bó et al. (2013), who exploit two randomized wage offers for a civil servant job in Mexico and show that higher wages attract more qualified applicants without displacing pro-social preferences.[6]Importantly, we show that, while the effect of this selection pattern on output is theoretically ambiguous, in our setting, material incentives lead to higher performance. The performance findings are in line with Propper and Van Reenen (2010), who exploit centralized wage setting for medical staff in the UK to demonstrate that high wages increase hospital productivity and reduce mortality rates.

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[6]The finding that material incentives, via career benefits, attract more qualified applicants echoes findings that pay-for-performance attracts more productive and more skilled employees in the private sector (Bandiera et al., 2013; Lazear, 2000). 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; Marinescu and Wolthoff, 2013) and on the effect of wages on the selection and performance of politicians (Ferraz and Finan, 2011; Gagliarducci and Nannicini, 2011).

Our analysis complements the literature that evaluates the effect of introducing material incentives for existing public-sector employees in developing countries, especially for teachers (Duflo et al., 2012; Miller et al., 2012; Muralidharan and Sundararaman, 2011), by showing the effect of material incentives on the traits of the agents who sort into these jobs in the first place, and how this selection affects performance.

The paper is organized as follows: Section 2 presents the theoretical framework; Section 3 describes the context and research design; Sections 4, 5, and 6 evaluate the effect of career incentives on the applicant pool, selected pool, and performance, respectively. Section 7 concludes.

2 Framework

2.1 Set up

This section develops a simple theoretical framework to illustrate how different job attributes attract applicants with different skills and preferences, and how this selection can affect the production of the social good. The model also makes precise the assumptions under which differences in salience policy can be used to identify the effect of career incentives on performance through selection.

The model is explicitly tailored to our context, where the Government (the principal) hires agents for the newly created Community Health Assistant (CHA) position to produce a social good—i.e., to deliver health services to people in rural areas. In addition to a fixed monthly wage, the CHA position has two main attributes that determine the benefits agents can draw from it. First, CHAs are a new cadre of civil servants and therefore a new entry point in the civil service. CHAs are eligible for promotions into higher-ranked cadres, who receive higher pay.– We refer to this as the "career benefits" of the job. Second, CHAs are hired to deliver health services in communities with severe shortages of health staff, and, as such, their impact on community welfare is potentially very large. We refer to this as the "social benefits" of the job.

Principal's Choice

Denote by C (S) the true magnitude of career (social) benefits, with no assumption about which benefit of the job is larger. At an earlier stage, the principal chooses the monthly wage and the magnitude of career benefits C -i.e., by choosing how easily CHAs can access higher positions. We do not model these choices, as they are made prior to the experimental phase. At the recruitment stage, the principal chooses salience policy $j \in \{\pi, \sigma\}$, which determines the agents' perceived career (social) benefits $\hat{C}_j$ ($\hat{S}_j$) prior to applying for the job. While salience can affect agents' choices even in settings where agents are informed or can easily access information from other sources (Chetty et al., 2009; Bordalo et al., 2013), in our context, the salience policy entirely determines the agents'

perception of job attributes when applying. This is because CHA positions are newly created and advertised for the first time; hence, agents have no information and cannot access information other than through the Government.

If career benefits are made salient, agents perceive benefits $(\hat{C}_\pi, \hat{S}_\pi)$, whereas if social benefits are made salient, agents perceive $(\hat{C}_\sigma, \hat{S}_\sigma)$ where $\hat{C}_\sigma \leq \hat{C}_\pi$, $\hat{S}_\sigma > \hat{S}_\pi$. For simplicity, we assume $\hat{C}_\pi = C$, $\hat{S}_\pi = 0$ and $\hat{C}_\sigma = 0$, $\hat{S}_\sigma = S$. The agents' application decision will depend on their anticipated optimal effort choice given these perceived benefits. If hired, agents find out all details of the job and perceive benefits correctly, that is, (C, S).

Agents' Choice

Agents differ on two dimensions: *ability* and *mission*. These are independently drawn across individuals. Agent i has ability a_i distributed uniformly on $[0, 1]$ and reservation utility va_i (agent i's payoff when not applying or not obtaining the position), $v > 0$. The higher the agent's ability the higher his/her reservation utility. Agent i's mission determines (c_i, s_i), the weight agent i puts on career and social benefits.

For simplicity, we restrict the analysis to three missions types. We assume that there are $n_s \geq 0$ "social mission" agents, who only value social benefits ($c_i = 0, s_i = 1$); $n_c \geq 0$ "career mission" agents, who only value career benefits ($c_i = 1, s_i = 0$); and $n_h \geq 0$ "hybrid mission" agents, who value both social and career benefits ($c_i = 1, s_i = 1$). We thus assume that the weights agents put on career and social benefits are independent of the level of the benefits themselves or their interaction. We focus on the more interesting case where agents' mission preferences are heterogeneous, that is where at least two of (n_s, n_c, n_h) are strictly positive.

We assume that both career and social benefits have a fixed component, which we normalize to 1, and a variable component that depends on the effort agents devote to pursue career and social goals.[7] We assume that agents have one unit of effort that they must allocate between a task that furthers their careers, such as influence activities that increase the expected utility of the agent and take time away from productive activities (Milgrom, 1988), and a task that contributes to the social good. For sharper focus, we assume that allocating effort to the social good does not foster the agents' career; relaxing this assumption leaves the results qualitatively unchanged as long as there is scope for influence activities to attain career benefits.

The output of either task is increasing in effort (at a decreasing rate) and ability. Denote by e_i the effort that agent i devotes to the social task. Then, the output of the social task is equal to $a_i\sqrt{e_i}$, and the output of the career task is $a_i\sqrt{1 - e_i}$. Effort is non-contractible.

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[7]The fixed component is meant to capture the benefits that accrue to all agents regardless of their effort—e.g., the warm glow from having a socially useful job or the value of being eligible for promotions into higher-ranked cadres. The variable component captures benefits that depend on the effort the agents devote to tasks that can promote their career and those that produce social output—e.g., the probability that patients heal.

Agents use ex-ante utility, based on perceived benefits, to decide whether to apply. The ex-ante utility of agent i under salience policy j is given by:

$$U_{ij} = w + c_i \hat{C}_j (1 + a_i \sqrt{1 - e_i}) + s_i \hat{S}_j (1 + a_i \sqrt{e_i})$$

where w is the wage, the second term represents career benefits, and the third term social benefits. Note that the second and third terms are positive if and only if agent i's mission is congruent with salience policy j—that is, if agent i puts positive weight on the attribute made salient by policy j. The salience policy determines who applies because it determines expected payoffs at the application stage.

We assume that agents face application cost k, which captures the cost of both collecting documents and forsaking one year's earnings by attending unpaid training. Finally, we assume that agents are selected with a fixed exogenous probability, which we normalize to 1.[8]

2.2 Solution

Agent i under salience policy j applies if and only if:

$$U_{ij} - k \geq va_i \tag{2.1}$$

For simplicity, we assume that $w - k < 0$ such that agents whose mission is not congruent with the salience policy do not apply for the job. In other words, the wage by itself is not high enough to make it worthwhile for agents to bear the application cost, and thus a necessary condition for agents to apply is that the job fits their mission. All implications are qualitatively unaffected if we relax this assumption as long as the wage is not high enough such that it is worthwhile for all applicants to apply regardless of their mission preferences and the attributes of the job, i.e. as long as $w - k < v$. We also assume that $w + min(C, S) - k > 0$, which guarantees a positive number of applications under either policy. Finally, we assume that $v - max(C, S) > 0$, namely the returns to ability are higher in the outside option than they are in the CHA job.

To decide whether to apply, agents compare the utility on the job under the optimal effort level to the outside option. Under the career salience policy, $U_i = w - k < 0 < va_i$ for all agents for whom $c_i = 0$, so these do not apply. Agents for whom $c_i > 0$ choose e_i to maximize $U_{i\pi} = w + c_i C(1 + a_i \sqrt{1 - e_i})$ subject to $e \in [0, 1]$ and are therefore in a corner solution at $e_i = 0$. If hired, their utility is $w + C(1 + a_i) - k$ which is higher than their outside option if and only

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[8]In practice, the number of successful candidates is fixed, and thus the probability of being selected depends on the number of applicants and the agent's ability relative to the other applicants. However, individual applicants are unaware of the number of applications for a given post and of the ability distribution of their fellow applicants, hence they take the probability of being recruited as exogenous.

if $a_i \leq \hat{a}_\pi = \min\left[\frac{w+C-k}{v-C}, 1\right]$. Symmetrically, under the social salience policy, social-mission and hybrid-mission agents expect to choose $e_i = 1$ and apply if and only if $a_i \leq \hat{a}_\sigma = \min\left[\frac{w+S-k}{v-S}, 1\right]$ while career-mission agents do not apply.

2.3 The Effect of Career Incentives on the Applicant Pool

The framework yields three results on the number of applicants, their ability and mission preferences.

Result 1: Numbers. *Making career benefits salient increases the number of applicants if it increases the ability threshold ($\hat{a}_\pi > \hat{a}_\sigma$) and the number of agents with career preferences is sufficiently large relative to agents without.*

When career benefits are made salient, a fraction $\hat{a}_\pi$ of agents with a career or hybrid mission apply, and the total number of applicants is $\hat{a}_\pi(n_c + n_h)$; when social benefits are made salient, a fraction $\hat{a}_\sigma$ of agents with a social or hybrid mission apply and the total number of applicants is $\hat{a}_\sigma(n_s + n_h)$. If the ability threshold is higher under career incentives ($\hat{a}_\pi > \hat{a}_\sigma$) the number of applicants will be higher if and only if $\hat{a}_\pi n_c + (\hat{a}_\pi - \hat{a}_\sigma)n_h > \hat{a}_\sigma n_s$, that is if the number of agents who value career benefits ($n_c + n_h$) is sufficiently large relative to those who do not n_s. Thus career incentives might attract more qualified applicants but fewer of them.

Result 2: Ability. *Making career benefits salient weakly increases the ability of the average applicant if and only if career benefits are larger than social benefits ($C > S$).*

Intuitively, the value of career and social benefits determines the agents' expected utility on the job, and hence the ability threshold, that is the threshold beneath which all applicants apply: the larger the benefit, the higher the threshold, and hence the higher the ability of the average applicant. Under salience policy j, $U_{ij} - k \geq v a_i$ if and only if $a_i \leq min[\frac{w+z-k}{v-z}, 1]$ for $z \in \{C, S\}$. Average ability is $\bar{a}_j = \frac{1}{2}\left(\frac{w+z-k}{v-z}\right)^2$ if $\min\left[\frac{w+z-k}{v-z}, 1\right] = \frac{w+z-k}{v-z}$, and otherwise $\bar{a}_j = \frac{1}{2}$. Thus, if $\frac{w+S-k}{v-S} < 1$ and $\frac{w+C-k}{v-C} < 1$ then $\bar{a}_\pi > \bar{a}_\sigma$ if and only if $C > S$.

Result 3: Mission Preferences. *Making career benefits salient decreases the average weight put on social benefits and/or it increases the average weight put on career benefits but not necessarily both.*

When career benefits are made salient, candidates only apply if they value career benefits; among these, only applicants with a hybrid mission value social benefits, so the average weight put on social benefits is $\frac{n_h}{(n_h+n_c)} \leq 1$. When social benefits are made salient, all agents who apply value social benefits so the average weight put on social benefits is 1. Symmetrically, when career benefits are made salient all agents who apply value career benefits so the average weight put on

career benefits is 1; when social benefits are made salient only those with a hybrid mission value career benefits, so the average weight put on career benefits is $\frac{n_h}{(n_h+n_s)} \leq 1$.

Note that if $n_c = 0$ the average weight put on social benefits is equal to 1 under both salience policies but the assumption that agents' mission preferences are heterogeneous implies that when $n_c = 0$, both $n_h > 0$ and $n_s > 0$. Hence, the average weight put on career benefits is necessarily higher under the career salience policy. Symmetrically, if $n_s = 0$ the average weight put on career benefits is equal to 1 under both salience policies but the assumption that agents' mission preferences are heterogeneous implies that when $n_s = 0$, both $n_h > 0$ and $n_c > 0$. Therefore, the average weight put on social benefits is necessarily lower under the career salience policy.

Note that selection can create a correlation between mission types and ability among the applicants, even though mission types and ability are uncorrelated in the population. In particular, when career benefits are made salient and $C > S$, the average applicant will value career benefits more and their ability will also be higher.[9]

2.4   The Effect of Career Incentives on Social Output

Next, we derive predictions on how making career incentives salient affects the production of social output through selection—that is, by attracting applicants who differ in ability and social preferences. The salience policy allows us to identify the effect of career incentives on performance through selection if it mimics the effect of career incentives throughout, namely if salience itself does not directly affect the applicants' effort on the job and their decision to retain the job after finding out about its real benefits. We need:

Assumption 1: Salience policy does not affect the utility that agents draw from the actual value of career and social benefits.

In other words, the value that agent i derives from C (S) only depends on his preference c_i (s_i) rather than what he expected C (S) to be when he applied. As both C and S are greater than or equal to the values agents perceived at the application stage, assumption 1 rules out behavioral biases that make agents value a given benefit differently if its value exceeds their expectation, so that the effort response to the career (social) salience policy only captures the response to career (social) incentives rather than the response to the difference between the expected and actual incentives. Under assumption 1, agent i chooses effort to maximize:

$$U_i = w + c_i C(1 + a_i \sqrt{1 - e_i}) + s_i S(1 + a_i \sqrt{e_i})$$

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[9]Assuming that type and ability are correlated would strengthen the result if the correlation between career preference c and ability has the same sign as $C - S$. Thus, when $C > S$, if agents who value career benefits are more likely to be higher-skilled, or if career benefits are likely to be higher for those with higher skills, making career benefits salient would mechanically attract a higher-skilled pool.

career-mission and social-mission agents will thus choose the same level of effort they had anticipated when they applied—that is, $(e_i^* = 0)$ and $(e_i^* = 1)$, respectively, because they put zero weight on the benefit that was not made salient. In contrast, hybrid-mission agents will change their original choice to $e_i^* = \frac{S^2}{S^2+C^2} \in (0,1)$. Whether career incentives reduce social output depends on the balance between their effect on effort and on the ability of those they attract, as summarized below.

Result 4: Social output. *Making career benefits salient increases social output if it increases average ability and if the correlation between career and social preferences in the population is positive and sufficiently large; otherwise, it reduces social output.*

Making career benefits salient attracts two types of agents: those who only care about their career and devote no effort to the production of the social good $(e_i^* = 0)$ and those who value both career and social benefits, who choose $e_i^* = \frac{S^2}{S^2+C^2} \in (0,1)$. Making social benefits salient attracts agents who only care about social benefits and devote all of their effort to the production of the social good $(e_i^* = 1)$ and those who value both career and social benefits, who choose $e_i^* = \frac{S^2}{S^2+C^2} \in (0,1)$. Thus, the effort that the average applicant devotes to the social good is unambiguously higher under the social salience policy.

Expected social output is the average of individuals' social output weighted by the probability that each individual applies and the size of the individual's mission type group. So, under career incentives the fraction of n_c and n_h who have $a_i < \hat{a}_\pi$ apply and expected social output is

$Y^\pi = n_c Pr\{a_i < \hat{a}_\pi\} \int_0^{\left(\frac{w+C-k}{v-C}\right)} \sqrt{e_i} a_i da_i + n_h Pr\{a_i < \hat{a}_\pi\} \int_0^{\left(\frac{w+C-k}{v-C}\right)} \sqrt{e_i} a_i da_i.$ Under social incentives, the fraction of n_s and n_h who have $a_i < \hat{a}_\sigma$ apply and expected social output is $Y^\sigma = n_s Pr\{a_i < \hat{a}_\sigma\} \int_0^{\left(\frac{w+S-k}{v-S}\right)} \sqrt{e_i} a_i da_i + n_h Pr\{a_i < \hat{a}_\sigma\} \int_0^{\left(\frac{w+S-k}{v-S}\right)} \sqrt{e_i} a_i da_i.$

It follows that, if making career benefits salient lowers the ability of the average applicant, then social output is unambiguously higher under social incentives because both the effort and the ability of the average applicant is higher in the social salience policy than in the career salience policy. Indeed, substituting the optimal effort choices e_i^* in the expected social output functions yields that under career incentives, the expected social output is equal to $Y^\pi = n_h \sqrt{\frac{S^2}{S^2+C^2}} \bar{a}_\pi \hat{a}_\pi$, while under social incentives it is $Y^\sigma = [n_h \sqrt{\frac{S^2}{S^2+C^2}} + n_s] \bar{a}_\sigma \hat{a}_\sigma$. If $\hat{a}_\pi < \hat{a}_\sigma$ (and hence $\bar{a}_\pi \hat{a}_\pi < \bar{a}_\sigma \hat{a}_\sigma$), then $Y^\sigma > Y^\pi$.

If, however, making career benefits salient raises the ability of the average applicant, then effort is lower under career incentives, but ability is higher, and the effect on social output is ambiguous. The comparison hinges on whether career and social preferences are positively or negatively correlated in the population, which, given our assumptions about the distribution of mission preferences, hinges on the comparison between the number of hybrid-mission agents and the number of career- and social-mission agents. If $\hat{a}_\pi > \hat{a}_\sigma$ and the correlation between career and social preferences is 1 (i.e., $n_h > n_c = n_s = 0$) then $Y^\pi = n_h \sqrt{\frac{S^2}{S^2+C^2}} \bar{a}_\pi \hat{a}_\pi > Y^\sigma = n_h \sqrt{\frac{S^2}{S^2+C^2}} \bar{a}_\sigma \hat{a}_\sigma.$

If $\hat{a}_\pi > \hat{a}_\sigma$ and the correlation between career and social preferences is -1 (i.e., $n_h = 0, n_c > 0, n_s > 0$) then $Y^\pi = 0 < Y^\sigma = n_s \bar{a}_\sigma \hat{a}_\sigma$. Generally, $\frac{\partial(Y^\pi - Y^\sigma)}{\partial n_c} < 0$, $\frac{\partial(Y^\pi - Y^\sigma)}{\partial n_s} < 0$, $\frac{\partial(Y^\pi - Y^\sigma)}{\partial n_h} > 0$. In summary, the framework illustrates that making career benefits salient can attract higher-ability applicants, but the effect that this has on social output is ambiguous and it depends on the social preferences of these higher-ability agents.

3   Context and Research Design

3.1   Context and Data

In 2010, the Government of Zambia (GOZ) launched a program to create a new civil service cadre called the Community Health Assistant (CHA). The goal of this program was to create an "adequately trained and motivated community-based health workforce, contributing towards improved service delivery [and] the attainment of the Millennium Development Goals (MDGs) and national health priorities" (Government of Zambia, 2010). GOZ sought to formalize and professionalize a position similar to other lay health worker positions (e.g., village health workers, traditional birth attendants, barefoot doctors) in which work is done primarily in the community. CHAs are supposed to devote 80% of their time (4 out of 5 working days per week) to household visits. 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. Mapping back to the theoretical framework, household visits, patients and community meetings constitute "social output" that (i) depends on the CHAs' effort; (ii) brings benefits to the community and directly to the CHAs who put a positive weight on these benefits.

In addition to social benefits, 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 order to be eligible, they need to ensure that they are included in the in-training plan for the district for the upcoming year and that they are accepted into the school. CHAs can devote time and effort to learning about how to get into the in-training plan for the district and into the school and to influence those that make these decisions. In terms of the model this is the effort devoted to the career task that takes time away from the social output.

In the program's first year, GOZ sought to recruit, train, and deploy roughly 330 Community Health Assistants across seven of Zambia's nine provinces.[10] Within these seven provinces, based on population density, GOZ chose the 48 most rural of the 58 constituent districts. Finally, across these 48 districts, GOZ identified 165 health posts that were deemed to be facing the most severe health worker shortages.[11] From each community that surrounded each health post, the intention was to recruit two CHAs. We collaborated with GOZ 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 the 165 communities, GOZ included detailed written instructions in the packets containing the recruitment materials (posters, applications, etc.) that were distributed to district health officials (see Appendix D).

The recruitment poster provided information on the position – varied experimentally as described below – and 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 passing "O-levels."[12] The posters instructed eligible applicants to retrieve application forms from the health center associated with the health post.[13] The application form included questions covering basic demographics (gender, date of birth, village of residence, educational qualifications), previous health experience, and the means by which the applicant first learned of the CHA job opportunity. In keeping with the principle that CHAs should be members of the communities that they serve, the application form also required applicants to obtain two signatures before submission: the signed

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[10]The two other provinces, Lusaka and Copperbelt, were excluded by GOZ on grounds that they are the most urbanized of Zambia's provinces.

[11]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 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.

[12]Ordinary levels, or O-levels, are written subject exams administered to Zambian students in their 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-level exams, including English and mathematics as compulsory subjects that have to be passed. There are currently 33 O-level subjects, such as biology, chemistry, civic education, woodworking, and accounting. Exam performance is rated on a nine-point scale, ranging from "distinction" to "unsatisfactory;" all but the lowest point-score are considered passing. The cost of taking O-level exams comprises a registration fee of roughly USD 16 and an exam fee of USD 10 per subject.

[13]This decision was made because the former was consistently staffed, whereas the latter was not. The median distance between health centers and health posts in our sample is 24 kilometers.

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.[14] 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. All recruitment in the seven provinces occurred between August and October 2010.

In total across the full sample, 2,457 applications were received. After the recruitment process was complete, we collected and entered all application forms and recorded whether the two signatures were obtained and whether the photocopies were attached.

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.

District officials were in charge of organizing interview panels at the health post level, such that a district with multiple participating health posts would have multiple interview panels. 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.[15] After interviews were complete, panels were asked to nominate and rank the top two candidates and up to three reserves. GOZ 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.[16]

At the interviews, all candidates were asked to complete a brief questionnaire that collected further information on demographic background, community health experience, social capital, and work preferences and motivations.

Of the 1,804 eligible applicants, 1,585 (87.9%) reported on their interview day and were interviewed. After the recruitment process was complete, we collected and entered the selection panel nomination forms as well as the ranking sheets containing each panelist's rankings of his or her top five candidates.

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[14]The neighborhood health committee is a para-statal institution at the community level in rural Zambia. The NHC 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.

[15]Neighborhood health committees vary in size, but they typically have more than 10 members.

[16]In addition to submitting panel-wide nominations, individual panel members were instructed to rank their top five preferred candidates independently and, to this end, were given ranking sheets to be completed privately. Specifically, the ranking sheet instructions stated: "This ranking exercise should occur BEFORE panel members formally deliberate and discuss the candidates. Note that the ranking sheets are private and individual. Each panel member should fill out the ranking sheet confidentially so as to encourage the most honest responses. This step must be completed before the panel discussion."

Stage 3: Final Selection, Training and Deployment

Out of the 1,585 interviewees, for the 165 health posts, the panels nominated 334 applicants as "top 2" candidates and 413 as reserves. The nominations were reviewed centrally by GOZ, 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-most populated city.[17]

Upon arrival at the training school, we administered a detailed questionnaire to all trainees in order to collect standard psychometric scales to measure pro-social preferences and career orientation. We also implemented a modified dictator game that has been shown to predict performance on pro-social tasks (Ashraf et al., 2013) and choices by public-sector nurses to locate to rural areas (Lagarde and Blaauw, 2013).

Of the 314 applicants who joined the program, 307 graduated and started working as CHAs in August 2012. All CHAs were deployed to their communities of origin, and we collected performance measures on household visits and other tasks over the course of eighteen months. At this stage, applicants from the two treatments had the same information about job attributes, including career and social benefits. Thus, any difference in behavior observed after this stage can only be due to differences in the selection procedure.

3.2 Experimental Design

The experiment aims to identify the effect of career vs. social incentives on selection and through this, the performance of CHAs. We use the recruitment posters described above to experimentally vary the salience of the two incentives at the recruitment stage so as to engineer an exogenous change in selection. Once recruited, all CHAs face the same incentives; thus performance differences, if any, are due to selection. The posters, shown in Figures 1a and 1b, are identical except for the list of benefits and the main recruitment message.

To make career incentives salient, the career poster lists, as the main benefit, the opportunity to ascend the civil-service career ladder to higher and better-paid positions—e.g., environmental health technician, nurse, clinical officer. This incentive is summarized in a caption stating, "Become a community health worker to gain skills and boost your career!"[18] 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

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[17]The final 314 CHA trainees differed from the 334 "top 2" nominees in two ways: (i) to obtain gender balance, GOZ 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, and (ii) some of the applicants who were ranked "top 2" declined and were replaced by reserves. By the time training commenced, sixteen spots remained empty despite efforts to fill them with reserves.

[18]When the recruitment process was launched, the position was called "Community Health Worker" or "CHW." It was later renamed "Community Health Assistant."

resident doctors.[19] Importantly, since there are shortages of health staff at every level, advancing to higher cadres does not require leaving the community.

To make social incentives salient, the community poster lists, as the main benefit, the opportunity to contribute to one's community, such as "[gaining] the skills you need to prevent illness and promote health for your family and neighbors" and "[being] a respected leader in your community." This incentive is summarized in a caption stating, "Want to serve your community? Become a community health worker!"

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 treatment 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.[20]

To ensure compliance with the randomization protocol, we worked closely with GOZ to standardize the information given to the district officials to organize the recruitment process.[21] 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 training to advance to positions such as Nurse and Clinical Officer

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[19]At the time of the launch of the recruitment process in September 2010, GOZ 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 GOZ), 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 5.2, we present evidence against the hypothesis that wage perceptions may have differed by treatment.

[20]We stratify by the proportion of adults in the district who have a high school diploma, as reported in the most recent World Bank Living Conditions Measurement Survey, 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 social incentives treatment. 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.

[21]District officials are given a packet containing 10 recruitment posters and 40 application forms for each health post and are asked to physically 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. The packets are sealed and labeled according to the health post and health center for which it should be used. GOZ provides fuel allowances to the district officials to enable the districts to follow through on the protocol. 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.

may be available in the future." In contrast, in the social incentives treatment, the script states, "This is an opportunity for local community members to become trained and serve the health needs of their community."

Table 1 illustrates that the randomization yielded a balanced sample on all observable health-post and area characteristics that might affect the work conditions of the CHAs. Four points are of note. First, health posts are poorly staffed in both treatment arms. Second, in line with these being in rural areas, population density and the extent to which households live on their farms instead of villages is similar in both treatments. This is relevant as travel times between households depend on population density and are higher when they are scattered over a large area, as opposed to being concentrated in a village. Third, take-up of basic health products and practices (insecticide-treated nets and latrines) is low, but again balanced across treatments. Finally, over 90% of the catchment areas in both treatment groups have at least some cell network coverage, which is relevant for our analysis, as some performance measures are collected via SMS text message.

4 The Effect of Career Incentives on the Applicant Pool

4.1 Number of Applications and Samples

The recruitment drive yielded 2,457 applications, an average of 7.4 applicants for each position. Both the total number of applicants and their distribution across health posts is similar in the two treatment groups: career incentives attract 1,232 applicants in total and an average of 7.2 per position, while social incentives attract 1,225 applicants in total and an average of 8.0 per position.The theoretical framework makes precise that the effect of career incentives on the number of applicants is ambiguous, as it depends on the number of individuals who value career benefits in the population and on the ability threshold below which these apply.

All the applications received were pre-screened by district officials, and all applicants who met eligibility criteria were invited to be interviewed by selection panels. District officials had no discretion at this stage, and screening was based purely on objective requirements. Overall, 1,585 candidates met the requirements and were interviewed, 48% of whom came from the career incentives treatment and 52% from the social incentives treatment. These 1,585 candidates form our main sample for the analysis below, as data on applicants' traits other than basic demographics and education measures were collected at the interview stage. All results reported below are robust to using the entire sample of applicants for measures that are available for both samples.

The rest of this section estimates the effect of career incentives on the applicants' skills, mission preferences and other traits. Throughout, 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. Whenever we have more than one measure for the same outcome we report average standarized

treatment effects by outcome family to account for multiple inference. To probe the robustness of the statistical inference we also report 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.

4.2 Ability

Part I of Table 2 provides evidence on whether the ability threshold for applicants differs in the two treatment groups. Part II presents the same information for selected candidates and will be discussed in the next section once we review the selection process.

To measure ability we collected detailed information on all applicants' high school results, based on the extensive literature that finds test scores strongly correlate with cognitive ability and earnings (Neal and Johnson, 1996; Murnane et al., 1995). As noted above, applicants were required to have finished grade 12 with two passed O-levels. The Examinations Council of Zambia requires that candidates take a minimum of six O-level exams, with English and mathematics being compulsory. In addition, students choose among subjects in the natural sciences, arts and humanities, and business studies. Admission to university requires passing five O-levels with at least two "credits" (grades 1-6 on a 1-9 scale).

Table 2, Panel A shows that applicants in both treatments exceed the required two O-level threshold as over 70% of applicants have passed at least five and qualify for university admission. Table 2, Panel A also shows that making career incentives salient attracts more qualified candidates. Applicants in the career treatment are 6 percentage points more likely to qualify for university admission (p=.013), which is relevant if they plan to move up to positions that require a university degree, have a higher total score (p=.019), and have a stronger scientific background (p=.006), which is directly relevant to medical practice. The average standarized treatment effect is positive and precisely estimated. To investigate whether the average differences are indeed driven by the fact that career incentives attract more qualified applicants, as opposed to discouraging less qualified applicants, Figure 2 plots kernel density estimates of the total O-level score by treatment and reports quantile treatment effect estimates. These graphs illustrate that, in line with the ability threshold being higher, the average difference is mostly driven by applicants on the right tail, which is thicker and longer in the career treatment. The fact that career incentives attract a pool of qualified applicants who would not apply otherwise has important implications for the skill level of those who are eventually selected for the job, as qualified candidates can be chosen only if they apply.

Panel B reports applicants' occupations at the time of application. The omitted category is unemployed/housewives. Over two-thirds of applicants in both treatments are farmers, as is expected in rural areas. Estimating individual earnings from farming is notoriously difficult and

beyond the scope of our questionnaire; we are thus unable to assess differences in earnings. 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 and both are more prevalent in the career treatment (p=.088, and p=.030). The average standarized treatment effect is positive and precisely estimated. While our proxies for the applicants' outside opportunities are coarse, the evidence is broadly consistent with the interpretation that the career treatment attracts more qualified applicants with better outside options.

4.3 Mission Preferences

Part I of Table 3a provides evidence on the mission preferences of the applicants. As above, Part II presents the same information for selected candidates and will be discussed in the next section. Panel A shows that the share of applicants who display preferences for social benefits and attachment to the community is high and similar in the two treatments. Our main measure of social preferences is based on the adapted "Inclusion of Others in Self (IOS) scale" (Aron et al., 2004), 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 (Schultz, 2002) and connectedness to the community (Mashek et al., 2007). The measure is coded as 0-1, where 1 implies highest overlap.[22] Panel A 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. We complement this measure with a standard measure of social capital (participation in groups) and with a proxy for the agents' attachment to the community. Panel A shows that about half of the applicants belong to social groups and aim to remain in the community in 5-10 years, and career incentives do not affect either margin. Keeping qualified health staff in rural areas is a major challenge, as illustrated by the fact that just under half of all applicants in both treatments aspire to leave. That applicants attracted by career incentives are not differentially likely to want to leave their communities is consistent with the fact that there are shortages at every level, so that promotion to a higher cadre does not require leaving the community. The average standarized treatment effect on the three measures is small and not significantly different from zero at conventional levels.

As the findings in Panel A indicate that the share of applicants with social preferences is similarly high in both treatments, our framework makes precise that the share of applicants who value career benefits must be larger under career incentives. In line with this, Table 3b, Panel B shows that the share of applicants who aspire to be in a highly-ranked position (environmental

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[22]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.

health technician, clinical officer, or doctor) within the Government in 5-10 years' time is higher in the career treatment. The difference between treatment groups is 6 percentage points (32% of the control group mean) and precisely estimated (p=.026). Taken together, the findings in Tables 3a and 3b suggest that making career incentives salient attracts agents who—in absolute terms— display a similar level of pro-social preferences, but care relatively more about career advancement.[23]

Note that the findings on applicant numbers, ability and mission preferences are jointly consistent with Results 1-3 of the model. In particular, the fact that the number of applicants per post is slightly lower in the career treatment despite the ability threshold being higher is consistent with the fact that applicants to both treatments have the same social preferences, i.e. that the number of applicants who solely care about career benefits is zero. Using the notation of the model, the number of applicants in the career treatment is thus $\hat{a}_\pi n_h$, while the number of applicants in the social treatment is $\hat{a}_\sigma(n_s + n_h)$, therefore $\hat{a}_\pi n_h$ can be smaller than $\hat{a}_\sigma(n_s + n_h)$ even if $\hat{a}_\pi > \hat{a}_\sigma$ provided that the number of social mission agents is sufficiently large ($n_s > \frac{(\hat{a}_\pi - \hat{a}_\sigma)}{\hat{a}_\sigma} n_h$).

To conclude, Table A.2 tests whether applicants in the two treatment groups differ on other dimensions that might have unintentionally been made salient by the two posters. Most notably, the career poster might have conveyed different expectations about tenure or gender. We find that this is not the case.[24]

5   The Effect of Career Incentives on the Selected Pool

Career incentives can affect the selected candidate pool both because they affect the applicant pool as we have demonstrated above and because they might affect the way selection panels choose candidates. If panel choices are orthogonal to the salience policy, our research design identifies the effect of career incentives on performance solely through their effect on the applicant pool ("self-selection"). The first sub-section shows that this is indeed the case. The second sub-section describes how differences in the applicant pool translate into differences among selected candidates.

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[23]In Appendix A, we assess whether there is a tradeoff between skills and mission preferences. A.1 provides evidence on the correlation between ability and mission preferences among the applicants, and, most importantly, whether this differs by treatment group. We find that career preferences are correlated with ability in the applicant pool, while social preferences are not. Selection panels thus face no trade-off between selecting high-skill candidates and candidates with social preferences but selecting high-skill candidates will bring in applicants with stronger career ambitions. Reassuringly these correlations are the same across treatments so panels face similar choices.

[24]First, over 90% of applicants in both treatment groups expect to be working for the Government in 5-10 years' time. Second, the share of women is 29% in both treatments, suggesting that, in this setting, women do not shy away from career-oriented occupations and do not display stronger preferences for community-oriented jobs. Third, to the extent that career jobs are perceived to be more lucrative, they might have attracted more politically connected applicants; the evidence in Table A.2 does not support this hypothesis.

5.1 Selection panels

Selection 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. Selection 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.

To provide evidence on this issue, we test whether salience policy affects panel composition and whether it affects how panels choose among candidates. The first exercise, reported in Appendix B, reveals that treatment does not affect panel composition. To shed light on the second we estimate the probability that candidate i in health post h is chosen as follows:

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

where $s_{ih} = 1$ if i is one of the two selected 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 social incentives treatment. X_i^j are individual characteristics, and the set J includes variables that the framework indicates should be affected by salience policy (skills, pro-social preferences, career preferences) and variables that GOZ explicitly requested to be given weight in the selection (gender and previous experience in the health sector). The coefficients of interest are α_j^c and α_j^s, which measure the weight given to trait j in the career and social treatments, 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. As shown in Section 4 panels in the career treatment see more qualified applicants and applicants with stronger career preferences but the correlation among these traits is the same in the two treatments. We can therefore test whether panels in the two treatments give different weights to the same trait by controlling 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 4 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 $\bar{X}_h^j$. The findings indicate that panels in the two treatments give similar weights to the same traits. The strongest determinant of appointment is ability; panels are between 18 and 23 percentage points more likely

to appoint candidates at the top of the O-level exam score distribution within their health post. As in the average health post, 21% of candidates are appointed, and being at the top of the O-level exam score distribution doubles the probability of being selected. This validates the use of O-level scores as a measure of ability as the panels have access to the O-levels scores, but plausibly they also have other information that is not available to the econometrician.

We note that, other things equal, panels are between 8 and 11 percentage points more likely to select candidates that aim for higher positions in the Ministry of Health and between 3 and 10 percentage points more likely to appoint applicants with strong social preferences. This is the largest difference between treatments, but it is not significantly different from zero at conventional levels (p=.241). Finally, in line with GOZ's directives, panels are more likely to choose women and candidates with work experience in the health sector. Both traits are given equal weight in the two treatments. Taken together, the evidence suggests that the salience policy does not affect how selection panels make their choices, but their choices determine how selected candidates differ from the applicants. We provide evidence on this next.

5.2 The ability and mission preferences of selected candidates

Ability

In line with the finding that panels are more likely to appoint candidates with high O-level exam scores in both treatments, Part II of Table 2 shows that selected candidates have higher qualifications than the average applicant on all three measures of academic achievement. This also reduces the gap in O-level score and science background among selected candidates in the two treatments. In line with the earlier finding that candidates with very high scores only apply in the career treatment, Part II of Table 2 shows that selected candidates in the career treatment have higher O-level scores and more science O-levels but the difference is not precisely estimated. Panels are thus able to reduce skills differentials on the measures that are observable to them. To assess whether panel selection eliminates medical skills differentials we use the candidates' performance on an exam that was administered at the beginning of the training program to test their level of basic medical knowledge. This was a three hour exam with 100 questions that covered all aspects of the CHAs' job description. Part II of Table 2 shows that candidates in the career treatment perform considerably better in this test: their average score is 26% of a standard deviation higher and the difference is significant at conventional levels (p=.005). This indicates that the selection process does not eliminate skills differences between the two groups and that CHAs recruited by career incentives display higher skills on dimensions that are directly relevant for their jobs.

Part II of Table 2 also shows that differences in outside options between selected candidates mirror the differences among applicants, but treatment effects are not precisely estimated in this smaller sample.

Social Preferences

Moving on to the mission preferences of the selected candidates, Part II of Table 3a, Panel A, shows that career incentives do not crowd out pro-social preferences. This is consistent with the fact that applicants to both treatments have similar levels of pro-social preferences (Part I, Table 3a) and there is no trade-off between ability and social preferences (Table A.1).

The second part of Panel A reports measures of pro-social preferences collected at training. As this was held in a central location for all selected candidates (as opposed to interviews held locally in the districts), we were able to implement a contextualized dictator game and a battery of psychometric tests to measure the strength of pro-social preferences. Contrary to applicants, trainees have no incentive to modify their answers to affect the probability of selection, and the measures we collect are harder to game.

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., 2013) and choices of public sector nurses to locate to rural areas (Lagarde and Blaauw, 2013). Panel A shows that the average trainee donates 16% of their endowment and this is equal across treatments.[25] The psychometric measures draw from validated scales used in employment surveys on pro-social preferences and career orientation. Full descriptions of these variables can be found in Appendix C.3. The comparison of all four measures across treatment groups reveals that trainees in both groups exhibit a high level of pro-social preferences.

Career preferences

Part II of Table 3b, Panel B, shows that differences in career preferences among applicants are maintained among selected candidates. In addition to the self-assessed career goals, applicants in the career incentive treatment have a significantly higher score on the career psychometric scale (p=0.018) and the average standarized treatment effect of this and our earlier measure of career preferences is positive and significantly different from zero at conventional levels.

Part II of Table 3b, Panel C, provides evidence on the relative importance of career vs. social benefits among trainees. We measure this in two ways. First, we asked trainees to choose whether their main goal as CHAs is community service or career advancement. In line with the earlier findings on social preferences, the vast majority of trainees chooses community service but trainees in the career treatment are significantly less likely to do so (86.3% vs. 94.1%, p=.020). Second, to

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[25]Meta-analysis of dictator games run around the world show a mean donation amount of 28.3%. This masks significant heterogeneity across studies; large stakes combined with low subject wealth, as in our study, lowers this mean amount (Engel, 2011).

measure the relative weight given to different benefits, trainees were given a bag of 50 beans and asked to allocate them to different cards describing potential benefits of the job in proportion to the weight they gave to each benefit when deciding whether to apply. In line with the evidence in Panels A and B, "service to the community" is a strong motivator but relatively less so for applicants in the career treatment. The average share of beans allocated by trainees in the career treatment is 39.6% while it is 43.2% in the community treatment (p=.050). The weight given to "obtain respect from the community", a proxy for reputation-based pro-social preferences, is small in both treatments but lower in the career treatment (3.7% vs. 5.7%, p=.048). In contrast, the weight on career benefits is significantly higher in the career treatment (16.5% vs. 12%, p=.002).

Other motivators

While the two posters contained the same information about pay, expected lifetime earnings are likely to be higher in the career treatment, and this might have played a role in the application decision. Using the same "beans" questions, Table A.2 shows that wage earnings play a limited role in the application decision; both "good wages" and "stable earnings" are given about 3% of the weight or less in both groups. Importantly, over three-quarters of applicants think CHAs should be paid, and the difference between treatment groups is small and not significant (p=.247).

6 The Effect of Career Incentives on Performance

Taken together, the effect of career incentives on the applicant pool is such that the effect of career incentives on performance through selection is ambiguous. While career incentives attract higher-ability applicants, the fact that their relative ratio of career-to-social preferences is higher implies they will devote less effort to the social good. To interpret the effect of the career salience policy on performance as the effect of career incentives through self-selection, however, we need to assume that salience policy itself does not directly affect the applicants' utility once the real career and social benefits are known. The next subsection provides evidence in support of this assumption, while the following sections report treatment effects and evidence on the mechanisms underlying these.

6.1 Identifying assumption

The theoretical framework makes precise that to identify the effect of career incentives on performance through selection, we need to assume that salience policy itself does not directly affect the applicants' utility once the real career and social benefits are known. 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 by the salience policy, agents for whom the participation

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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 then are told about the actual benefits of the job at the start of the 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, and 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 social salience treatment than in the career salience treatment. We present evidence on the relevance of this issue in Section 6.3.

6.2 Treatment Effect on Performance and Retention

The CHAs' main task is to visit households, and our performance analysis focuses on these visits. The visits' main goals are to inspect the household and provide advice on health-related practices such as: safe water practices, household waste management, sanitation, hygiene, ventilation, women's health (including family planning, pregnancy, and postpartum care), and child health (including nutrition and immunizations). During visits, CHAs are also tasked with providing basic care to any sick persons and referring them to the health post as needed.

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 6.3.

CHAs are supposed to devote 80% of their time (4 out of 5 working days per week) to household visits. In the remaining time, 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. We measure CHAs' activities in the field over the course of 18 months, from August 2012 (when CHAs started work) until January 2014.

Main Task: Household Visits

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 GOZ 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.

In interpreting this data it important to note that these visits take place in remote, low-density areas. The median 78 square km area has 200 households; the 25th percentile area has 130; the 75th percentile 360 households. It is thus rather difficult to plan and move from house to house, compounded by the fact that roads are bad: 10km takes between 1.5 hours and 4.5 hours to traverse on bike (CHAs either walk or use bikes to do their household visits).

Since household visits are the main component of the CHAs' job, our first measure of performance is the number of visits that each CHA completes in 18 months, obtained by summing all visits for which the Ministry received a text receipt. To validate this measure, we use visit data from the Health Management and Information System (HMIS), 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 working in each health post. HMIS data are currently available in electronic form for 129 out of the 161 health posts where CHAs work, equally distributed across treatment groups.[26]

Table 5 reports the estimates of

$$v_{ih} = \alpha + \beta C_i + X_i \gamma + Z_h \delta + \epsilon_{ih} \tag{6.1}$$

where v_{ih} is the number of visits completed by CHA i in area h. C_i equals 1 agent i is in the career incentives treatment. X_i is a vector of individual characteristics, which includes the same variables as above plus a measure of the CHA's exam performance during the training program, and an indicator that equals 1 if the CHA was appointed through the government affirmative-action policy (see Footnote 17) instead of being nominated by the selection panel. Z_h is a vector of area characteristics, which includes cell network coverage and the number of staff at the health post. The coefficient of interest is β, which measures the effect of making career incentives salient at the selection stage on the number of visits completed over 18 months. Under the assumption that, after completing one year of training, all CHAs have the same information on career incentives, β captures the effect of career incentives on performance through selection. That is, career incentives affect the effort of CHAs in both groups as they all have the same information on career prospects when they start working, but only affect the selection of CHAs in the career treatment. β then

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[26]Of the 32 missing observations, 16 are due to hardware malfunctions, while the other 16 are for unknown reasons. Both categories are equally distributed across treatment groups.

measures the effect that unobservable CHA traits (including unobservable variation in ability) have on performance through selection, both directly and through the response to career incentives.

The causal effect of career incentives on performance can be identified under the assumptions that C_i is orthogonal to ϵ_{ih} and that there are no spillovers between the two groups. Orthogonality is obtained via random assignment. 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.

Columns 1 and 2 estimate (6.1) with and without controls. Both columns reveal a large and precisely estimated effect of career incentives on household visits: CHAs recruited by making career incentives salient do 29% more visits over the course of 18 months (column 1); after controlling for individual characteristics that we know differ by treatment (e.g., qualifications, career orientation) and by area characteristics that might affect the cost of doing visits, the coefficient implies a 28% difference. This suggests that besides differences in observables, CHAs recruited by making career incentives salient also differ on unobservables that drive performance on the field. 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 months period. Given that for most of these households CHAs are the only providers of health services, the difference between treatments is likely to have substantial welfare implications.

Figure 3 provides evidence of treatment effects on the distribution of household visits. Both the comparison of kernel density estimates and quantile treatment effect estimates reveal that the difference between the two treatments is driven by a group of strong performers in the career incentive treatment. The effect of career incentives is smaller than the average effect up to the median and then increases rapidly thereafter. The difference at the 70th, 80th and 90th percentile is 144, 145, and 217 visits, that is 45%, 46% and 68% of the control group mean, respectively. The quantile estimates indicate that career incentives lead to better performance, not by making each CHA in the performance distribution work homogeneously harder, but by attracting a group of individuals who perform much better than the average CHA and who do not apply when social incentives are made salient.

Since visits are measured by aggregating text messages sent by the CHAs themselves, identification can be compromised by the presence of measurement error in v_{ih} that is correlated with C_i. For instance, CHAs in the career treatment might put more effort in reporting visits via text messages, leading to a positive bias in β. To allay this concern, columns 3 and 4 estimate (6.1) using visit data from the Health Management and Information System (HMIS). While these are also collected by the CHAs themselves, the effort required is considerably lower, since HMIS reports are compiled monthly rather than on every visit. As HMIS data are aggregated at the health post

level, the estimates in columns 3 and 4 measure the effect of career incentives on both CHAs and include the area characteristics Z_h but not individual controls X_i. The estimated β coefficients are consistent across measures: HMIS data show that on average, a CHA in the career treatment does 189 more visits, 36% more than the average CHA in the social treatment. While this is reassuring, the HMIS data are more prone to measurement error deriving from recall bias, which might be correlated with treatment. We provide more evidence on this issue in Section 6.3 below.

Secondary Tasks: Community Meetings and Health Post Visits

Columns 5-8 of Table 5 investigate whether differences in household visits are compensated by differences in secondary tasks using data on community meetings and patient visits at the health post from the HMIS. We find no evidence to support this hypothesis. On the contrary, CHAs recruited by making career incentives salient organize more than twice as many meetings over 18 months (39 vs. 17), and the difference is precisely estimated. The effect of career incentives on the number of patients seen at the health post is positive and large (53% of the control group mean) but is not precisely estimated. Taken together, the evidence in Table 5 suggests that CHAs recruited by making career incentives salient perform better on the two tasks—household visits and community meetings—which depend almost exclusively on the their own initiative, and do at least equally well on the third task—number of patients seen at the health post—which depends on demand as well as the CHAs' own effort. The outstanding question is whether the number of household visits and community meetings are valid measures of performance. This is the topic of Section 6.3.

Retention

Columns 9 and 10 of Table 5 test 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.[27] 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, 20% 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. Most interestingly, this is balanced across treatments, and the difference is very small and precisely estimated.

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

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[27]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.

for career progression. It is possible that career incentives will affect retention rates at the two-year mark. As we discuss in the Conclusion, the welfare implications of this effect (were it to materialize) are ambiguous.

6.3   Interpretation

Responses to Salience vs. Responses to Actual Incentives

The theoretical framework makes clear that our design identifies the effect of career incentives on performance through selection if the salience policy itself does not affect the utility that agents draw from the actual value of career and social benefits. Since both career and social benefits are greater than or equal to the values agents knew at the application stage, effectively we need to rule out behavioral biases that make agents value a given benefit differently if its value exceeds their expectation. For instance, this requires that the value that social-mission agents put on career benefits be the same regardless of their knowledge of these benefits when they applied or after having been selected.

To be precise, our estimates overstate the effect of career incentives if this "surprise" effect is positive for agents who applied under the career salience policy (i.e., their effort response to finding out about social benefits is positive and larger than what it would have been had they known the social benefits at the outset) and/or negative for agents who applied under the social salience policy (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 treatments are overstated due to the "surprise" effect, we expect treatment effects to shrink with time as the surprise wanes.

To test this implication, in Table 6, columns 1-3, 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 29 and 32 more visits. Since the number of visits falls over time due to the drop-outs discussed above, the percentage effect *increases* with time from 19% to 49%. 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.

Measurement Error

Measurement error can lead us to overestimate the effect of career incentives on the number of household visits if CHAs in the career treatment group are more likely to fabricate visits or to put

more effort in reporting them. Outright cheating is made difficult by the fact that 5% of reported visits are audited and 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. In addition, the estimated difference is the same regardless of whether we use SMS data—which are sent privately by individual CHAs—or HMIS reports, which are visible to all staff at the health post. To the extent that the two CHAs and the other health post staff cannot perfectly collude to fabricate visits, this evidence casts doubt on the practical relevance of cheating.

Differences in reporting effort might also lead to a positive bias if CHAs in the career treatment group devote more time or effort to compile accurate reports. That estimates obtained with the SMS receipt data, which need to be reported at each visit, match those obtained with the HMIS data—which are only reported monthly and therefore require less effort—is a piece of evidence against this form of measurement error. Moreover, we find that the share of SMSs containing errors, a proxy for the effort CHAs put into writing these messages, is 10% in both treatments.

Work Styles and Compensation Mechanisms

Table 6 investigates the hypothesis that CHAs in the social treatment take other actions that compensate for the lower number of visits. 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 out to more households and make more follow-up visits. The point estimates indicate that just under one-third (29/94) 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 CHAs in the career incentives treatment 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.

Columns 6 and 7 show that the 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. Therefore, the

results do not support the hypothesis that CHAs in the social treatment compensate by spending more time with each household or are better at reaching those they are supposed to target.

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, taking advantage of a refresher course organized by GOZ 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. Column 8 shows that there is no difference in reported working hours, which provides further assurance that CHAs in the career treatment do not have differential incentives to overstate their contribution and suggests that CHAs in the social treatment do not compensate for visiting fewer households by devoting more hours to other, possibly informal, tasks. The average CHA reports working 42 hours per week in the typical week.

In addition to hours worked, 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 9 shows that this holds true for CHAs in both groups.

The time use survey is designed to collect detailed information on the time devoted to different activities while doing visits or working at the health post. To do so, CHAs were given 50 beans and asked to allocate the beans in proportion to the time devoted to each activity within each task. For each task, 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 different activities within a task. We then estimate a system of equations for each task, omitting the least frequent category. Table 7 reports our findings.

Panel A shows that, in line with the CHA job description, counseling and inspections are the main activities, each taking 20% of the time in a given visit. Filling in forms and receipts and submitting SMSs comes third, taking 15% of the time. In this context, accurate reports are a key element of the CHA job, as CHAs are the primary source of information on rural health data for GOZ.

Panel A also shows that CHAs in the career incentives treatment devote more time to counseling, inspections, and visiting sick members, but, taken one-by-one, these differences are small and not precisely estimated. In contrast, CHAs in the career incentives treatment devote 11 to 14% less time to filling in forms and receipts and submitting SMSs—a difference that is 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 social treatment, but only 18% in the career treatment. As for 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

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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.

7   Conclusion

The successful delivery of public services depends critically on the skills and motivation of the agents engaged in it. We have shown that career incentives play an important role in attracting applicants who are highly qualified, pro-socially motivated, and effective at delivering health services. The two main sources of motivation that attract applicants to these jobs—material benefits in the form of career prospects and intrinsic utility due to helping the community—do not clash.

Two features of our setting are relevant to inform the external validity of the findings. First, 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. 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 thus cast doubt on the concern that offering material rewards displaces applicants with desirable social preferences and ultimately worsens the quality of services provided (Benabou and Tirole, 2006; Georgellis et al., 2011). 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).

Second, the application process was designed to screen out applicants not known to the community. This requirement was put in place to ensure that successful candidates would be willing to stay in the community, and as such, can affect retention rates. Without this requirement, CHAs in the career treatment might have left earlier, but the welfare implications of attrition are ambiguous, as discussed below.

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 two 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 social treatment 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 (in the manner that 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 requires higher-level positions filled, too, and has trouble filling them. If we relax the assumption made throughout the paper that attraction to career benefits is uncorrelated with skill, career benefits could also be more likely to attract individuals with latent skill—those who believe their skill will be manifest and rewarded in this job—than higher wages would.

Second, while retention rates after 18 months are the same in the two groups, agents in the career incentives treatment might still leave their posts for higher-ranked positions sooner than those in the social incentives treatment. Whether this entails a welfare cost depends on whether they can be easily replaced and whether their 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.

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Figure 1a: Recruitment poster: Career incentives treatment

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.

Nursing

Environmental & Public Health

How to make ORS

Water Sugar Salt

Clinical Medicine

Become a CHW to gain skills and boost your career!

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

Figure 1b: Recruitment poster: Social incentives treatment

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.
- 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.

Counseling and Support

Care and Treatment

Health Education

How to make ORS

Water Sugar Salt

CHW

Want to serve your community? Become a CHW!

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Figure 2: Average treatment effects on exam score
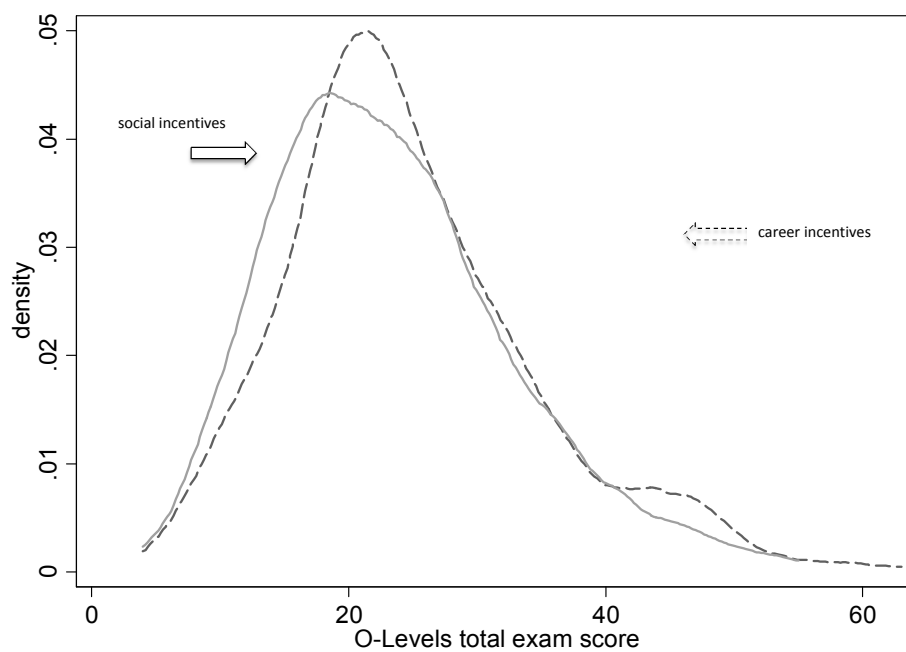
Quantile treatment effects on O-levels exam score at selected percentiles

	Percentile	5th	10th	25th	50th	75th	90th	95th
Quantile treatment effect of career incentives		1.02	0.751	0.98	0.858	1	2.87**	2.68
Bootstrapped SE (clustered at the district level)		(.756)	(.731)	(.743)	(.615)	(.863)	(1.22)	(1.81)

Figure 3: Average treatment effects on job performance

Panel A: Kernel density estimates of visits by treatment
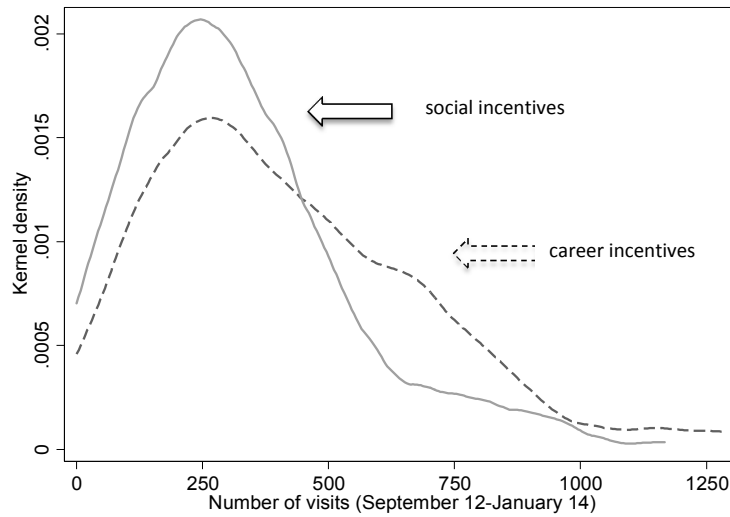
Panel B: Quantile treatment effect estimates
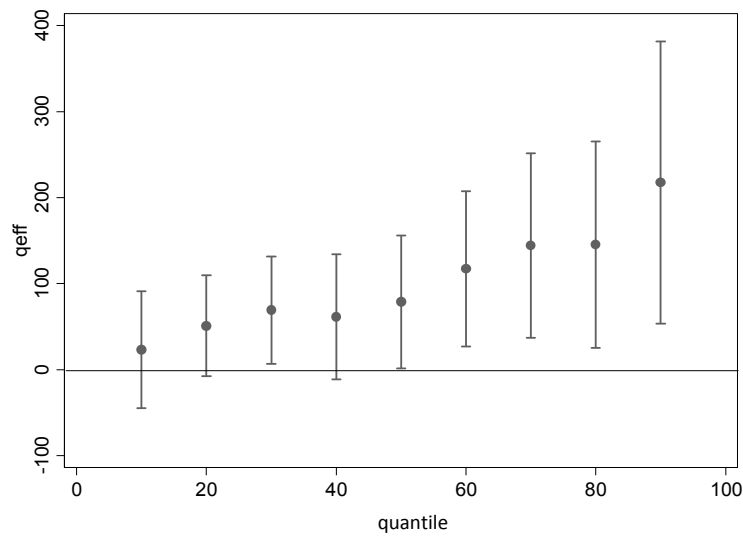
Notes: Total number of household visited, aggregated from individual SMS receipts sent by individual CHAs to MOH. Panel A plots kernel density estimates. Panel B reports quantile treatment effects using the same covariates as in Column 2, Table 6. Each point represents the treatment effect at the decile on the x-axis, each bar represents the 90% confidence interval. Confidence intervals are based on bootstrapped standard errors with 500 replication clustered at the district level.

Table 1: Area characteristics by treatment (randomization balance)

recruitment poster makes salient	**career**	**social**	p-value of the difference
	(1)	(2)	(3)
Number of health posts	85	77	-
Number of staff in health post	1.49	1.36	.559
	(1.09)	(1.17)	
District-level population density (persons/km^2)	13.58	14.08	.854
	(8.88)	(9.92)	
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)	
Share of households using ITNs	.319	.331	.738
	(.187)	(.206)	
Share of households using their own pit latrine	.343	.328	.627
	(.227)	(.214)	
Poor cell network coverage	.082	.065	.675
	(.277)	(.248)	

Notes: Columns 1 and 2 show means and standard deviations in parentheses. *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. *District-level population density* (persons per square kilometer) is based on data from the 2010 national census for the 48 districts participating in the program. 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 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 use the information provided by supervisors to break the tie. To measure *the share of households using ITNs/pit latrines* we ask CHAs to choose among four intervals (0-25, 25-50, 50-75, 75-100) and then take the midpoint of the interval to compute the mean. In case of disagreement (20/162 for ITNs, 22/162 for pit latrines) we take the average across the two CHAs. When answers do not match, the two CHAs typically chose contiguous intervals, and the supervisor generally agrees with one of the two. 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.

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Table 2: Treatment effects on traits of applicants and trainees: skills and outside option

recruitment poster makes salient	Part I: Applicants (N=1585)			Part II: Selected Trainees (N=314)		
	career	social	p-values (see notes)	career	social	p-values (see notes)
	(1)	(2)	(3)	(1)	(2)	(3)
Panel A: Skills						
Applicant qualifies for university admission	.765	.708	.013 (.038)	.795	.796	0.998 (.500)
	(.424)	(.456)		(.405)	(.404)	
O-levels total exam score	24.8	23.3	.019 (.049)	25.3	24.5	0.517 (.318)
	(9.81)	(9.34)		(9.90)	(8.81)	
O-levels passed in biology and other natural sciences	1.44	1.24	.006 (.038)	1.47	1.39	0.748 (.408)
	(.857)	(.888)		(.866)	(.823)	
Basic medical knowledge test score				61.5	59.2	0.005 (.016)
				(8.77)	(8.87)	
Average standardized treatment effect	2.21***			.895		
	(.847)			(.771)		
Panel B: Occupation at time of application						
Farmer	.714	.684	.408 (.207)	.717	.660	.448 (.256)
	(.452)	(.465)		(.452)	(.476)	
Trader	.077	.051	.088 (.088)	.090	.078	.783 (.422)
	(.267)	(.221)		(.287)	(.269)	
Teacher	.064	.043	.030 (.039)	.041	.021	.225 (.124)
	(.245)	(.204)		(.200)	(.145)	
Average standardized treatment effect	1.29**			.651		
	(.469)			(.553)		

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 effec *Applicant qualifies for university admission* to the University of Zambia if they pass 5 O-levels with at least two credits (grades 1-6 in a 1-9 scale). The ECZ requires that candidates write a minimum of 6 O-level exams and English and mathematics are compulsory in most schools. In addition, students can choose options in the natural sciences, arts and humanities and business studies. *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. *Basic medical knowledge test score* equals the number of correct answers in a 100 question test administered at the start of the training program to test the trainees knowledge of basic medical practices needed for the CHA job.

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Table 3a: Treatment effects on traits of applicants and trainees: pro-social preferences

	Part I: Applicants (N=1585)			Part II: Selected Trainees (N=314)		
recruitment poster makes salient	career	social	p-values (see notes)	career	social	p-values (see notes)
	(1)	(2)	(3)	(1)	(2)	(3)
Panel A: Applicants' pro-social motivation						
Perceives community interests and self-interest as overlapping	.839 (.367)	.842 (.364)	.975 (.514)	.848 (.360)	.854 (.354)	.943 (.481)
Aims to remain in the same community in 5-10 years	.507 (.500)	.566 (.496)	.228 (.182)	.571 (.496)	.608 (.490)	.412 (.274)
Belongs to village committee or self-help group	.446 (0.497)	.474 (.500)	.331 (.184)	.586 (.494)	.383 (.488)	.000 (.002)
Donation to local hospital (dictator game)				4047 (4093)	3944 (3898)	.842 (.440)
Psychometric scale: Desire for positive pro-social impact [1-5]				4.43 (.445)	4.230 (.503)	.832 (.430)
Psychometric scale: Sees self as pro-social [1-5]				4.25 (.616)	4.38 (.605)	.251 (.199)
Psychometric scale: Affective commitment to beneficiaries [1-5]				3.82 (1.15)	3.82 (1.17)	.912 (.453)
Psychometric scale: Pro-social motivation (Pleasure-based)				3.67 (.603)	3.71 (.654)	.595 (.482)
Psychometric scale: Pro-social motivation (Pressure-based)				3.57 (.703)	3.54 (.677)	.636 (.322)
Average standardized treatment effect	-0.499 (0.601)			.382 (.452)		

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. Column 3 also reports randomization inference p-values (in parentheses) obtained by simulating 1,000 placebo treatment assignments, estimating placebo treatment effects in each using the specification above and computing the probability that the placebo treatment effects are larger than the actual treatment effect. *Perceives community and self-interest as overlapping*: Adapted Inclusion of Others in Self scale (Aron et al., 2004). 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. *Belongs to any village committees or self-help groups*: 1 if the applicant belongs to any. *Donation to local hospital*: In the modified dictator game, 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. The psychometric variables are adopted from Grant (2008). 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 or disagree), 4 (agree), 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 get motivated by working on tasks that have the potential to benefit others," "I prefer to work on tasks that have the potential to benefit others," "I like 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." *Pressure-based pro-social motivation includes* "I feel that I have to perform selfless acts towards others," "I feel I must stand up for other people," "I regard it as my duty to act selflessly," and "I feel a strong duty to help other people in every situation where it is possible for me." *Pleasure-based pro-social motivation* includes "Supporting other people makes me very happy," "I do have a great feeling of happiness when I have acted unselfishly," "When I was able to help other people, I always felt good afterwards," and "Helping people who are not doing well raises my own mood."

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Table 3b: Treatment effects on traits of applicants and trainees: career preferences

	Part I: Applicants (N=1585)			Part II: Selected Trainees (N=314)		
recruitment poster makes salient	**career**	**social**	p-values (see notes)	**career**	**social**	p-values (see notes)
	(1)	(2)	(3)	(1)	(2)	(3)
Panel B: Applicants' career motivation						
Aims to be a higher-rank health professional in 5-10 years	0.246	.187	.026 (.029)	.254	.189	.160 (.120)
	(.431)	(.391)		(.034)	(.032)	
Psychometric scale: Career orientation [1-5]				3.31	3.07	.018 (.033)
				(1.047)	(.929)	
Average standardized treatment effect				1.66**		
				(.697)		
Panel C: Applicants' relative career vs social motivation						
Relative weight given to "career prospect" when applying				.165	.120	.002 (.007)
				(.157)	(.112)	
Relative weight given to "service to community" when applying				.396	.432	.050 (.061)
				(.226)	(.239)	
Relative weight given to "respect from community" when applying				.037	.057	.048 (.051)
				(.094)	(.109)	
Main goal is "service to community" vs "career advancement"				.863	.941	.020 (.022)
				(.345)	(.237)	

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 the social treatment effect. *Aims to be a higher-rank health professional in 5-10 years* : equals 1 if the applicant 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?" *Career orientation* : from Wrzensniewski et al.'s (1997) Career-Calling Orientation scale, 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." *Relative Weight* variables: CHAs were asked to allocate 50 beans between 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." *Main Goal* : equals 1 if applicant chooses "service to community" instead of "career advancement" in answer to the question "In terms of your new CHA position, which is more important to you?"

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Table 4: Effect of career incentives on candidate selection by panels

	(1)	(2)	(3)	(4)
	=1 if selected	p-value	=1 if selected	p-value
High relative exam score X career	.229***		.187***	
	(.040)		(.038)	
High relative exam score X social	.178***	.351	.152***	.352
	(.037)		(.035)	
Aims to be a higher-rank health professional in 5-10 years X career	.111***		.141***	
	(.037)		(.042)	
Aims to be a higher-rank health professional in 5-10 years X social	.075**	.474	.100**	.474
	(.031)		(.038)	
Perceives interests as overlapping X career	.034		.033	
	(.039)		(.044)	
Perceives interests as overlapping X social	.099**	.241	.072*	.246
	(.038)		(.038)	
Female X career	.071**		.089**	
	(.033)		(.0356)	
Female X social	.088***	.691	.099***	.691
	(.029)		(.033)	
Any relevant experience X career	.071*		.116**	
	(.036)		(.044)	
Any relevant experience X social	.098***	.537	.129***	.537
	(.025)		(.031)	
Number of interviewees in health post	-.011***		-.002	
	(.003)		(.003)	
Applicant pool controls	no		yes	
Adjusted R-squared	.144		.139	
N	1270		1228	

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 variable 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 et al., 2004). 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. *Any relevant experience*: equals 1 if the candidate reports any experience in "health" on their application. *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 share of applicants with any relevant experience.

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Table 5: Effect of career incentives on field performance and retention

Total between August 2012-January 2014	Household visits (Receipt data, Health worker level)		Household visits (HMIS data, Health post level)		Community mobilization meetings (HMIS data, Health post level)		Patients seen at health post (HMIS data, Health post Level)		Retention (=1 if CHA is active after 1 year)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Career incentives	93.973**	89.575**	188.733**	183.554*	22.375***	22.776***	438.559	431.796	0.008	0.023
	(36.162)	(35.808)	(91.544)	(94.865)	(5.638)	(5.665)	(270.784)	(273.913)	(0.050)	(0.046)
CHA characteristics	no	yes	no	yes	no	no	no	no	no	no
Area characteristics	no	yes	no	yes	no	yes	no	yes	no	yes
Mean of dependent variable in social treatment	318.6		518.1		17.1		829.7		0.8	
Adjusted R-squared	0.101	0.144	0.082	0.058	0.080	0.086	0.003	0.017	0.041	0.057
N	307	304	128	127	129	128	129	128	307	304

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. Dependent variables are: (i) total number of household visited, aggregated from individual SMS receipts sent by individual CHAs to MOH (cols 1 and 2); (ii) total number of households visited, from HMIS data at the health post level (cols 3 and 4); (iii) number of patients seen at the health post, from HMIS data at the health post level (cols 5 and 6); (iv) number of community mobilization meetings, from HMIS data at the health post level (cols 7 and 8); and (v) whether the CHA visited at least one household after the initial 12 months, from SMS receipts sent by individual CHAs to MOH (cols 9 and 10). The Health Management and Information System (HMIS) is the Zambian Ministry of Health's system for reporting, collecting, and aggregating routine health services data at government facilities. CHAs are required to submit monthly reports that summarize their activities at the health post/community level. Each reported variable is the sum of each indicator's monthly values from August 2012 to January 2014. CHA characteristics include: gender, O-level total score, average training exams score and whether the CHA had previous experience in the health sector. Area characteristics include: number of staff in the health post, geographical distribution of households in the catchment area, percentage of HH using insecticide-treated mosquito nets, and percentage of HH using their own pit latrine. Columns 1, 2, 9, and 10 also include an indicator variable that equals 1 if the CHA reports to have good cell network coverage most of the time or all the time. The number of observations drops when controls are included because O level score is missing for one observation and percentage of HH using insecticide-treated mosquito nets is missing for two observations.

Table 6: Effect of career incentives on performance: Mechanisms I

	Household visits, months 1-6	Household visits, months 7-12	Household visits, months 13-18	Unique household visited	Number of visits per household	Average visit duration, in minutes	Number of women and children visited per household visit	Number of hours worked in a typical week	Frequency of out of hours calls in a typical week
source	SMS	SMS	SMS	SMS	SMS	SMS	HMIS	Time use survey	Time use survey
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Career incentives	31.614*	28.640**	29.321**	28.919*	0.515**	-0.201	-0.056	-0.908	0.051
	(15.820)	(13.291)	(12.587)	(15.420)	(0.221)	(1.901)	(0.100)	(1.083)	(0.060)
CHA controls	yes	yes	yes	yes	yes	yes	no	yes	yes
Area controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
Mean of dependent variable in social treatment	167	92	60	176	1.59	34.75	2.21	42.81	0.457
Adjusted R-squared	0.136	0.077	0.145	0.136	0.095	-0.008	0.037	0.038	0.001
N	304	304	304	304	304	301	125	296	296

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. Dependent variables are: (i) total number of household visited by individual CHAs to MOH (cols 1-3); (ii) total number of unique households visited, aggregated from individual SMS receipts sent by individual CHAs to MOH (col 4); (iii) average number of visits per household, aggregated from individual SMS receipts sent by individual CHAs to MOH (col 5); (iv) average visit duration, aggregated from individual SMS receipts sent by individual CHAs to MOH (col 6); (v) total number of women and children visited over total household visits, from HMIS data at the health post level (col 7); (vi) number of hours worked, from CHA time use survey (col 8); and (vii) an indicator variable=1 if the CHA takes at least one emergency call per week in the typical week, from CHA time use survey (col 9). The Health Management and Information System (HMIS) is the Zambian Ministry of Health's system for reporting, collecting, and aggregating routine health services data at government facilities. CHAs are required to submit monthly reports that summarize their activities at the health post/community level. CHAs were asked how many total hours they spend doing CHA work in a typical week, and encouraged to count work that they did at the health post and in the village, including moving from household to household. All totals between September 1, 2012 and January 31, 2014. CHA characteristics include: age, gender, O-level total score, average training exams score and whether the CHA had previous experience in the health sector. Area characteristics include: number of staff in the health post, geographical distribution of households in the catchment area, percentage of HH using insecticide-treated mosquito nets, and percentage of HH using their own pit latrine. Columns 1 to 6 also include 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 7: Effect of career incentives on performance: Mechanisms II

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)	(7)	(8)	(9)	(10)	(11)	(12)
Career incentives	0.007	0.004	0.007	.012	-0.016*	-.020*	-0.012	-.011	-.003	-.002	.009	.010
	(0.011)	(0.012)	(0.015)	(.014)	(0.009)	(.011)	(.008)	(.009)	(.012)	(.012)	(.009)	(.010)
Mean of dependent variable in social treatment	0.207		0.196		0.146		0.137		0.122		0.100	
CHAs and area controls	no	yes	no	yes	no	yes	no	yes	no	yes	no	yes
R-squared	.002	.031	.005	.027	.013	.025	.005	.038	.007	.027	.007	.024
N	292	289	292	289	292	289	292	289	292	289	292	289

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)	(6)	(7)	(8)	(9)	(10)
Career incentives	-0.003	-0.001	-0.052***	-0.052***	0.006	0.006	0.022	0.014	0.017	0.023*
	(0.012)	(0.012)	(0.018)	(0.019)	(0.013)	(0.013)	(0.20)	(0.021)	(0.13)	(0.012)
Mean of dependent variable in social treatment	0.262		0.228		0.207		0.160		0.104	
CHAs and area controls	no	yes	no	yes	no	yes	no	yes	no	yes
R-squared	.000	0.037	.044	.116	.000	.047	.015	.113	.013	.138
N	271	268	271	268	271	268	271	268	271	268

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 A covers the 271 out of 298 CHAs who reported spending time at the health post. CHA controls include: age, gender, O-level total score, average training exams score and whether the CHA had previous experience in the health sector. Area controls include: number of staff in the health post, geographical distribution of households in the catchment area, percentage of HH using insecticide-treated mosquito nets, and percentage of HH using their own pit latrine. The number of observations drops when controls are included because O-level score is missing for one observation and percentage of HH using insecticide-treated mosquito nets is missing for two observations.

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Appendix

A Bivariate Distribution: ability by mission preferences

To assess whether there is a trade-off between skills and mission preferences, Table A.1 provides evidence on the correlation between ability and mission preferences among the applicants, and, most importantly, whether this differs by treatment group. Part I reports data on the applicants and Part II on the selected trainees.

Panel A, Part I reports the three measures of ability presented in Table 2 separately for the two treatments and for applicants who display social preferences (IOS scale=1) and for those who do not (IOS scale=0).[28] The table also reports the p-value of the difference in difference between the two applicant types in the two treatments. We find that applicants who display social preferences score somewhat higher on all three measures of ability and the difference is not significant across treatments.

Panel B, Part I shows that career preferences are correlated with ability as applicants with career ambitions (measured as in Table 3b) score substantially higher on all ability measures. Importantly, however, this difference is the same in the two treatments.

Taken together, the findings in Part I, Table A.1 suggest that career preferences go hand in hand with ability while social preferences do not. Selection panels thus face no trade-off between selecting high-skill candidates and candidates with social preferences, but selecting high-skill candidates will bring in applicants with stronger career ambitions. Reassuringly, these correlations are the same across treatments so panels face similar choices.

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[28]Results are unchanged if we use the other two measures of social preferences, namely social capital and attachment to community.

Table A.1: Treatment effects on traits of applicants and trainees: skills by mission preferences

recruitment poster makes salient	Part I: Applicants (N=1585)			Part II: Selected Trainees (N=314)		
	career	social	p-value	career	social	p-value
	(1)	(2)	(3)	(1)	(2)	(3)
Panel A: Skills by social preferences						
Applicant qualifies for university admission & social preferences=0	.702 (.460)	.663 (.475)		.864 (.351)	.750 (.444)	
Applicant qualifies for university admission & social preferences=1	.770 (.421)	.720 (.450)	.815	.772 (.421)	.784 (.413)	.434
O-levels total exam score & social preferences=0	24.6 (10.83)	22.5 (8.83)		26.9 (8.89)	25.0 (9.43)	
O-levels total exam score& social preferences=1	24.5 (9.59)	23.6 (9.69)	.530	24.8 (9.97)	24.3 (8.86)	.782
O-levels passed in biology and other natural sciences & social preferences=0	1.34 (.899)	1.16 (.923)		1.77 (.922)	1.45 (.826)	
O-levels passed in biology and other natural sciences & social preferences=1	1.43 (.874)	1.25 (.886)	.864	1.39 (.874)	1.34 (.856)	.520
Panel B: Skills by career preferences						
Applicant qualifies for university admission & career preferences=0	.741 (.438)	.694 (.461)		.767 (.425)	.797 (.404)	
Applicant qualifies for university admission & career preferences=1	.842 (.366)	.769 (.423)	.906	.878 (.331)	.793 (.412)	.266
O-levels total exam score & career preferences=0	23.8 (.9.23)	22.7 (8.89)		24.3 (9.79)	24.7 (8.82)	
O-levels total exam score & career preferences=1	27.7 (10.4)	25.8 (10.8)	.868	28.2 (9.77)	23.5 (8.82)	.057
O-levels passed in biology and other natural sciences & career preferences=0	1.38 (8.61)	1.20 (.891)		1.38 (.842)	1.41 (.809)	
O-levels passed in biology and other natural sciences & career preferences=1	1.63 (8.24)	1.43 (.852)	.950	1.71 (.901)	1.31 (.891)	.106

Notes: Columns 1 and 2 show means and standard deviations in parentheses. Column 3 reports the p-values of the null hypothesis that the interaction coefficient between treatment and social (career) preferences equals zero. This is estimated in a regression of skills on treatment, preferences, their interaction and the stratification variables 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 are the primary entry qualification into formal tertiary, college or university education. Applicant qualifies for university admission to the University of Zambia if they pass 5 O-levels with at least two credits (grades 1-6 in a 1-9 scale). The ECZ requires that candidates write a minimum of 6 O-level exams and English and mathematics are compulsory in most schools. In addition, students can choose options in the natural sciences, arts and humanities and business studies. 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.

Table A.2: Treatment effects on applicants' traits: demographic and other motivations

recruitment poster makes salient	career	social	p-value, based on SE clustered at the district level	p-value, based on randomization inference	survey stage (obs)
	(1)	(2)	(3)	(4)	(5)
Expects to be employed in MoH in 5-10 years	.909 (.287)	.925 (.263)	.293	.228	interview (1584)
Gender (=1 if female)	.292 (.455)	.294 (.456)	.486	.325	interview (1584)
Age	26.0 (5.53)	26.3 (5.83)	.446	.368	interview (1584)
Born in the community	.544 (.499)	.519 (.500)	.515	.289	interview (1584)
Has relative who is a political leader or village elder	.441 (.497)	.444 (.497)	.573	.344	interview (1584)
Relative weight given to "good wages" when applying	.031 (.092)	.025 (.057)	.442	.273	training (314)
Relative weight given to "stable income" when applying	.027 (.057)	.024 (.054)	.469	.275	training (314)
Relative weight given to "interesting job" when applying	.150 (.162)	.152 (.140)	.784	.430	training (314)
Relative weight given to "gain useful skills" when applying	.181 (.168)	.160 (.136)	.214	.197	training (314)
Believes CHAs should be paid	.826 (.380)	.783 (.414)	.247	.181	training (314)

Note: Columns 1 and 2 show means and standard deviations in parentheses. Column 3 reports the p-value of the null hypothesis that the career treatment effect equals zero conditional on stratification variables and with standard errors clustered at the district level. Column 4 reports randomization inference p-values obtained by simulating 1000 placebo treatment assignments, estimating placebo treatment effects in each using the specification above, and computing the probability that the placebo treatment effects are larger than the actual treatment effect. *Expects to be employed in MoH in 5-10 years* equals 1 if the applicant chooses any MOH position (CHA, nurse, EHT, clinical officer, doctor) in response to the question, "When you envision yourself in 5-10 years' time, what do you envision yourself doing?" *Relative weight given to ...* variables are derived from a survey question that asks 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." *Believes CHAs should be paid* equals 1 if the applicant answers "yes" to the question "Do you feel that community health workers in Zambia should be paid?"

B The Effect of Career Incentives on Panel Composition

Table A.A.3 estimates the effect of career incentives on panel composition. The first row shows that most panels comprise five individuals as expected; a handful have four members, and these are equally distributed by treatment. The district official and the health center representative are civil servants and are therefore required to participate; the members of the local neighborhood health committee are volunteers and might choose not to. The second row shows that making career incentives salient does not change their incentives to take part in the CHA selection. For 75% of the panels, we have information on the gender of each panelist. The third row shows that most panelists are men; the share of women is 22% in the career treatment and 17% in the social treatment, and the difference is not significantly different from zero. Rows 4 and 5 test whether making career benefits salient affects the degree to which different panel members have different opinions about the same candidate. Recall that after interviews were completed, individual panel members were supposed to complete individual ranking sheets in private. To the extent that committee members complied with these instructions, we can measure the extent to which their preferences are aligned. For each interviewed candidate, we compute all possible pairwise rank differences across pairs of panel members. We then compute the mean and the maximum of these differences for each candidate and aggregate these statistics at the panel (health post) level by taking the average across candidates in the same panel. The statistics, reported in rows 4 and 5, show that panel members are mostly in agreement. The average mean difference is less than 1 and the average maximum difference is around 1.5. Neither statistics differ by treatment, indicating that treatments did not differentially attract committee members with different preferences.

Table A.3: Effect of career incentives on the composition of selection panels

recruitment poster makes salient	career	social	p-value of the null that difference of means equals zero (SE clustered at the district level)
	(1)	(2)	(3)
Panel size	4.89	4.85	.650
	(.345)	(.533)	
Number of NHC members	2.91	2.85	.555
	(.293)	(.533)	
Share of women	.224	.167	.167
	(.213)	(.215)	
Mean-mean rank difference across members pairs	.825	.948	.436
	(.724)	(.608)	
Mean-max rank difference across members pairs	1.58	1.66	.782
	(1.39)	(1.02)	

Note: Columns 1 and 2 show means and standard deviations in parentheses. Data is at the panel level. There is one panel per health post. 85 in the career treatment and 80 in the community treatment. *Panel size* equals the number of panel members. Panels were supposed to have five members. NHC stands for Neighborhood Health Committee. Panels were supposed to have 3 NHC members. *Share of women* equals the number of women divided by the number of members. For each interviewed candidate we compute all possible pairwise rank differences across pairs of panel members. We then compute the mean and the max of these differences for each candidate and aggregate these statistics at the panel (health post) level by taking the mean across candidates in the same panel.
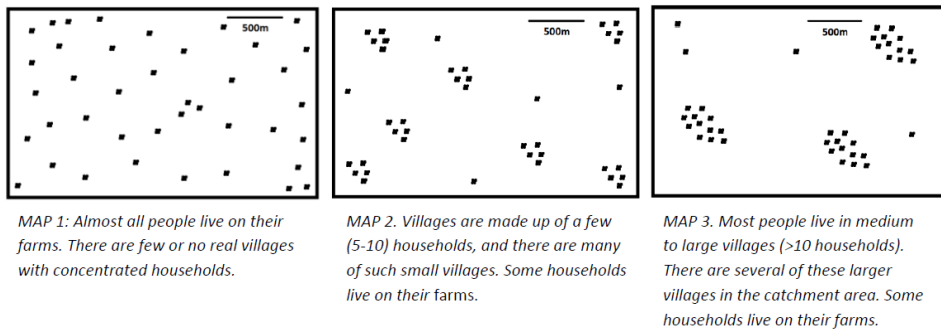
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C Data Appendix

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 C.7.

C.1 Demographic Characteristics

Health Post Level

- *Number of staff in health post* (source: phone survey) - 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* (source: Ndola Survey) - 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.

- *Share of households using ITNs* (source: catchment area survey) - We asked CHAs to choose among four intervals (0-25, 25-50, 50-75, 75-100) and then took the midpoint of the interval to compute the mean. In cases of disagreement (20/162), we took the average across the two CHAs. When answers did not match, the two CHAs typically chose contiguous intervals, and the supervisor generally agreed with one of the two.

- *Share of households using their own pit latrine* (source: catchment area survey) - We asked CHAs to choose among four intervals (0-25, 25-50, 50-75, 75-100) and then took the midpoint of the interval to compute the mean. In cases of disagreement (22/162), we took the average

across the two CHAs. When answers did not match, the two CHAs typically chose contiguous intervals, and the supervisor generally agreed with one of the two.

- *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.

CHA Level

- *Expects to be employed in MoH in 5-10 years* (source: candidate questionnaire) - 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?"

- *Born in the community* (source: candidate questionnaire) - After being asked "For how many years have you lived in the community where you currently live?" candidates were asked "Were you born in this community?" Variable equals 1 if they responded "Yes."

- *Has relative who is a political leader or village elder* (source: candidate questionnaire) - Equals 1 if the candidate indicated that they have a relative or member of their household that is either a "Political Leader" or "Village Committee Member."

- *Gender (=1 if female)* (source: application)

- *Age* (source: application)

CHA Level (skills)

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 are the primary entry qualification into formal tertiary, college, or university education. The ECZ requires that candidates write a minimum of six O-level exams, and English and mathematics are compulsory in most schools. In addition, students can choose options in the natural sciences, arts and humanities and business studies. CHW applicants were required to have passed grade 12 with two O-levels. Dependent variables are normalized by the mean and standard deviation of the career treatment group.

- *Applicant qualifies for university admission* (source: application) - Admission to the University of Zambia requires passing 5 O-levels with at least two credits (grades 1-6 in a 1-9 scale).

- *O-levels total exam score* (source: application) - 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: application) - Includes biology, chemistry, physics, science and agricultural science.

- *O-levels passed in arts and humanities* (source: application) - Includes English literature, foreign and local languages, religious studies, civic education, history, art, music, and fashion.

- *O-levels passed in business studies* (source: application) - Includes commerce, accounting and household management.

CHA Level (occupation at time of application)

- *Farmer* (source: application)

- *Trader* (source: application)

- *Teacher* (source: application)

- *Housewife* (source: application)

C.2 Applicants' Preferences and Motivations

- *Perceives community interests and self-interest as overlapping* (source: candidate questionnaire) - Based on the "Adapted Inclusion of Others in Self (IOS) scale" (Aron et al., 2004) 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 (Aron et al., 1992) as a measure of self-other inclusion and relationship closeness. The Continuous IOS makes use of the basic design of the original IOS, 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 (Inclusion of Nature in the Self, Schmuck and Schultz, eds 2002) and connectedness to the community (Inclusion of Community in Self, Mashek et al. 2007). 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.

A

Self   Community

B

Self   Community

C

Self   Community

D
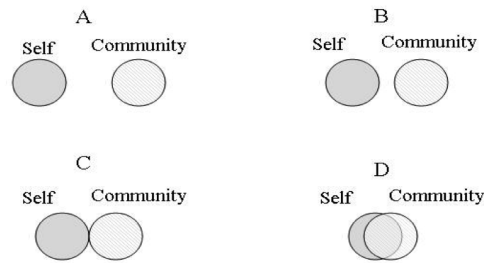
Self   Community

- *Aims to remain in the same community in 5-10 years* (source: candidate questionnaire) - When asked "When you envision yourself in 5-10 years' time, where do you most see yourself?" answered "same community where I am now" as opposed to "working at district level," "working at province level," or "working in Lusaka."

- *Belongs to village committee or self-help group* (source: candidate questionnaire) - When asked "How many Village Committees or Self-Help Groups do you belong to?" answered greater than 0.

- *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., 2013) and choices of public sector nurses to locate to rural areas (Lagarde and Blaauw, 2013).

> 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.

- *Aims to be a higher-rank health professional in 5-10 years* (source: candidate questionnaire) - 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?"

- *Believes CHAs should be paid* (source: baseline survey) - Trainees were asked directly if they felt that community health workers in Zambia should be paid.

- *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."

Relative weight variables are derived from a survey question (source: candidate questionnaire) 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."

- *Relative weight given to "career prospect" when applying*

- *Relative weight given to "service to community" when applying*

- *Relative weight given to "respect from community" when applying*

- *Relative weight given to "good wages" when applying*

- *Relative weight given to "stable income" when applying*

- *Relative weight given to "interesting job" when applying*

- *Relative weight given to "gain useful skills" when applying*

C.3 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), 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 et al. (1997). 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 (Bellah et al., 1988). 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).

- *Calling* - Adapted from Wrzesniewski et al. (1997). Individuals with high "calling" find that their work is inseparable from their life. They do not work for financial gain or career advancement, but instead for the fulfillment that doing the work brings to the individual. The scale consists of the following items: "I am eager to retire in the next few years (reverse-scored)," "Community health work makes the world a better place," "I would choose to apply for this position again if I had the opportunity," "I enjoy talking about community health work to others," "My primary reason for working is financial—to support my family and lifestyle (reverse-scored)," "If I was financially secure, I would continue with my current line of work even if I was no longer paid," and "My work is one of the most important things in my life."

- *Desire for positive pro-social impact* - Adapted from Grant (2008). 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."

- *Sees self as pro-social* - Adapted from Grant (2008) and consists of the following items: "I see myself as caring," "I see myself as someone who shares with others," and "I regularly go out of my way to help others."

- *Affective commitment to beneficiaries* - Adapted from Grant (2008) 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."

- *Pro-social motivation (pleasure-based)* - Adapted from Grant (2008) and consists of 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).

- *Pro-social motivation (pressure-based)* - Adapted from Grant (2008) and consists of the following items: "I do not feel that I have to perform selfless acts towards others" (reverse-scored), "I feel I must stand up for other people," "I do not regard it as my duty to act selflessly" (reverse-scored), "I feel a strong duty to help other people in every situation where it is possible for me."

    - Concept: Both pleasure- and pressure- based pro-social motivations (PSM) are positively related to helping behavior (correlated with Rushton Altruism Scale, 20 listed behaviors related to helpfulness). Pleasure-based PSM (intrinsic; pleasure-seeking through self-actualization/innate psychological needs) is related to self-actualization, self-esteem, life satisfaction, while pressure-based PSM (extrinsic; pain-avoiding) is positively related to negative affect.

- *Intrinsic motivation* - Adapted from Amabile et al. (1994) and consists of the following items: "I enjoy trying to solve difficult problems," "I enjoy simple, straightforward tasks" (reverse-scored), "I enjoy tackling problems that are completely new to me," "What matters most to me is enjoying what I do," "It is important for me to be able to do what I most enjoy," "The more difficult the problem, the more I enjoy trying to solve it," "I want my work to provide me with opportunities for increasing my knowledge and skills," "I like to figure things out for myself," "No matter what the outcome of a project, I am satisfied if I feel I gained a new experience," "Wanting to know more is the driving force behind much of what I do," "I prefer work I know I can do well over work that goes beyond what I can manage" (reverse-scored), "I'm more comfortable when I can set my own goals," "I enjoy doing work that is so involving that I forget about everything else," "It is important for me to have space to express myself," and "I want to find out how good I really can be at my work."

- *Extrinsic motivation* - Adapted from Amabile et al. (1994) and consists of the following items: "I am not that concerned about what other people think of my work" (reverse-scored), "I

prefer having someone set clear goals for me in my work, "I am very much aware of the income goals I have for myself," "To me, success means doing better than other people," "I am very much aware of the career promotion goals I have for myself," "I'm less concerned with what work I do than what I get for it," "I'm concerned about how other people are going to react to my ideas," "I rarely think about salary and promotions" (reverse-scored), "I believe that there is no point in doing a good job if nobody else knows about it," "I am strongly motivated by the money I can earn," "I prefer working on projects with clearly specified procedures," "As long as I can do what I enjoy, I'm not that concerned about exactly what I'm paid" (reverse-scored), "I am strongly motivated by the recognition I can earn from other people," "I have to feel that I'm earning something for what I do," and "I want other people to find out how good I really can be at my work."

– Concept: The Work Preference Inventory (WPI) assesses individual differences in intrinsic and extrinsic motivational orientations. This includes major elements of intrinsic motivation (self-determination, competence, task involvement, curiosity, enjoyment, and interest; "challenge and enjoyment") and extrinsic motivation (concerns with competition, evaluation, recognition, money or other tangible incentives, and constraint by others; "compensation and outward orientation"). The instrument is scored on two primary scales (intrinsic versus extrinsic), each subdivided into two secondary scales: challenge & enjoyment (for intrinsic) and compensation and orientation towards recognition and dictates of others (for extrinsic). The intrinsic and extrinsic scales have been found to be orthogonal in adult US samples. The WPI has meaningful factor structures, adequate internal consistency, good short-term test-retest reliability, and good longer-term stability. WPI scores are predictive of other questionnaire and behavioral measures of motivation, as well as personality characteristics, attitudes, and behaviors.

- *Proactive personality* - Adapted from Claes et al. (2005) and consists of the following items: "If I see something I don't like, I work on it," "No matter what the situation, if I believe in something I will make it happen," "I love being a champion for my ideas, even when others disagree," "I am good at identifying opportunities," "I am always looking for better ways to do things," "If I believe in an idea, nothing will prevent me from making it happen." This six-item Proactive Personality Score (PPS) measures a proactive personality type in an internally consistent manner, across different cultures, and through a single factor.

- *Accomplishment-seeking* - Adapted from Barrick et al. (2002) and consists of the following items: "I often think about getting my work done," "I focus my attention on completing work assignments," "I set personal goals to get a lot of work accomplished," "I spend a lot of time thinking about finishing my work tasks," "I often consider how I can get more work

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done," "I try hard to get things done in my job," "I put a lot of effort into completing my work tasks," "I never give up trying to finish my work," "I spend a lot of effort completing work assignments," "I feel encouraged when I think about finishing my work tasks," and "It is very important to me that I complete a lot of work."

- *Status-seeking* - Adapted from Barrick et al. (2002) and consists of the following items: "I frequently think about ways to advance and obtain better pay or working conditions," "I focus my attention on being the best sales representative in the office," "I set personal goals for obtaining more sales than anyone else,","I spend a lot of time thinking of ways to get ahead of my coworkers," "I often compare my work accomplishments against coworkers' accomplishments," "I never give up trying to perform at a level higher than others," "I always try to be the highest performer," "I get excited about the idea of being the most successful CHW," "I feel happy when I think about getting a higher-status position at work," "I want to perform my job better than my coworkers," and "I get worked up thinking about ways to become the highest performing CHW."

- *Communion-seeking* - Adapted from Barrick et al. (2002) and consists of the following items: "I focus my attention on getting along with others at work," "I spend a lot of time thinking about whether my coworkers like me," "I never give up trying to be liked by my coworkers and supervisors," "I work hard to be seen as someone who is easy to get along with," "I get excited about the prospect of having coworkers who are good friends," "I enjoy thinking about working together with my coworkers and supervisors," "I care a lot about having coworkers and supervisors who are like me," "I am challenged by a desire to be a team player," and "I worry thinking about ways to make sure others like me."

- *Internal motivation* - Adapted from Edmondson (1999) and consists of the following items: "My opinion of myself goes up when I do my job well" and "I feel bad and unhappy when I discover that I have performed less well than I should have in my job."

C.4 Selection Panel Variables

- *=1 if selected (top 2)* (source: ranking sheet984264091

- *=1 if ranked top 5* (source: ranking sheet)

C.5 Household Visits

Once CHAs returned to their community, their performance on a series of tasks is tracked. Formal household visits are the central part of the CHA job. Each CHA would be assigned a caseload of roughly 350 households, each of which he or she was supposed to visit on a quarterly basis. During

household visits, the CHA is to provide health education and counseling, basic care to any sick persons, and referrals to nearby health facilities as needed. CHAs are also expected to inspect the use of mosquito nets and standards of hygiene in food preparation, water use, ventilation, and latrines. We measure the number and duration of these visits through two complementary metrics over the course of eighteen months from September 2012 (when CHAs started work) until August 2013.

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 August 2013.

- *Number of households visited*

- *Number of children visited*

- *Number of women visited*

- *Number of women and children visited per household visit*

- *Number of patients seen at HP*

- *Number of community mobilization meetings*

C.6 Time Use

(Source: Ndola survey)

- *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*

C.7   Data Sources

- **Source: Application** (sample: all applicants) - Applications were submitted from August-September 2010. The initial application stage comprised the initial application form, which includes fields for gender, date of birth, village of residence, educational qualifications, and previous health experience (position, organization, start and end years). 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: 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" from Aron et al. (2004) to measure connection with the community. The questionnaire stated that the answers would not be used for selection purposes but rather are 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, previous experience with health work, 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 donation 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.

- **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: Ndola 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 CHWs) - 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.

- **Source: HMIS** (sample: all deployed CHWs) - CHAs are required to submit monthly reports that summarize their activities at the health post/community level. These reports become part of the Health Management and Information System (HMIS), the Zambian Ministry of Health's system for reporting, collecting, and aggregating routine health services data at government facilities.

D   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 social incentives treatment 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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