

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

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Abstract

State capacity to provide public services depends on the motivation of the agents recruited to deliver them. We design an experiment to quantify the effect of agent selection on service effectiveness. The experiment, embedded in a nationwide recruitment drive for a new government health position in Zambia, shows that agents attracted to a civil service career have more skills and ambition than those attracted to “doing good”. Data from a mobile platform, administrative records, and household surveys show that they deliver more services, change health practices, and produce better health outcomes in the communities they serve.

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1 Introduction

Modern states deliver public services via professional bureaucracies, and these enable the institutionalization of state capacity that is central to development (Weber 1922; North 1991; Besley and Persson 2010). Yet, motivating bureaucrats to deliver effective services is challenging because standard contracting tools, such as performance pay, are of limited use when agents' effort cannot be easily mapped to measurable outcomes. For this reason, it is often argued that effective delivery requires hiring agents with preferences that motivate them to exert effort in the absence of financial incentives (Besley and Ghatak 2005; Prendergast 2007; Brehm and Gates 1999; Wilson 1989).

Much of the recent focus has been on altruistic preferences, that is on selecting agents who value the welfare of beneficiaries. The architects of modern bureaucracy, in contrast, stressed the value of a departure from altruistically driven provision of public services and the value of having agents motivated by career progression (Northcote and Trevelyan 1853; Weber 1922).¹ This fosters an identity based on fidelity to the civil service rather than attachment to the beneficiaries (Akerlof and Kranton 2005; Bénabou and Tirole 2011).²

This paper provides the first experimental evidence on whether these identities attract different agents and whether this selection determines the effectiveness of service delivery. We test whether agents attracted by a career in the civil service perform differently than those attracted solely by “doing good,” both in terms of the services they deliver and the outcomes of the beneficiaries.³ This is crucial to inform theory and to settle the policy debate on whether rewards for service delivery agents should be kept low so as to screen out individuals with low social preferences. Yet the identification of causal effects has proven elusive as it requires both an exogenous variation in agent selection, as well as performance measures that capture the effect of this selection on the services delivered and on the beneficiaries' outcomes.

We design a nationwide recruitment experiment that addresses both of these challenges. We collaborate with the Government of Zambia as they formalize primary health care in remote rural areas by creating a new health worker position in the civil service. This cadre is meant to replace informal service provision by religious and other charitable organizations, thereby following the

¹Weber (1922) considered “the opportunity of a career that is not dependent upon mere accident and arbitrariness” to be “the optimum for the success and maintenance of a rigorous mechanization of the bureaucratic apparatus” (p.968) and stated “bureaucracy develops the more perfectly, the more it is dehumanized, the more completely it succeeds in eliminating from official business love, hatred, and all purely personal, irrational, and emotional elements which escape calculation.”(p.975) One of the three recommendations of the Northcote and Trevelyan (1853)'s report on the organisation of civil service was “To encourage industry and foster merit, by teaching all public servants to look forward to promotion (...) and to expect the highest prizes in the service if they can qualify themselves for them”.

²This echoes the tension between intrinsic and extrinsic motivation on the job (Bénabou and Tirole 2003, 2006).

³The idea of ambition, with both its ability to attract the most able but also the most self-interested, has a long history and was used by Romans, as *ambitio*, exclusively to refer to those in public life. Cicero referred to *ambitio* as a “malady” that can cause individuals to “lose sight of their claims to justice”, but it is a malady that seems to draw “the greatest souls” and “most brilliant geniuses” (*De Officiis*). Quintilian, illustrating the uses of ambition, writes “Though ambition may be a fault in itself, it is often the mother of virtues”. (King, William Casey, *Ambition, A History: From Vice to Virtue* (2013)). The dilemma of ambition is, in many ways, the subject of our paper.

typical evolution of the modern State wherein the delivery of public services is transferred to a professional bureaucracy. These are ideal circumstances to evaluate the effect of introducing a civil servant identity on agent selection and, through this, the performance of the individual agents. The stakes are high because, due to the shortage of medical staff, hiring effective agents can make a great difference for the quality of health services and, ultimately, health outcomes in these communities.

The new health worker position effectively adds career opportunities to a job with social impact. A simple conceptual framework makes precise that doing so affect performance by changing incentives and selection. We show that the incentive effect is positive to the extent that agents value career opportunities, while the sign of the selection effect is ambiguous a priori. Career opportunities attract types who value them either intrinsically because of ambition or because they have the skills needed to advance to higher positions. These types, who only apply when career incentives are offered, reduce the average level of pro-sociality in the applicant pool. This selection effect is then positive (negative) if the marginal benefit of effort due to career opportunities is larger (smaller) than the marginal benefit of effort due to social impact.

The framework also makes precise how our experiment separates the selection effect, the fact that these jobs attract agents with different traits, from the incentive effect, the fact that career opportunities increase effort for given types. To parse out the selection effect, we exploit the fact that this position is new to potential applicants to vary the salience of a career in civil service at the recruitment stage. In control districts the recruitment ads reflects the status quo before the new position, when local health services were provided by individuals hired by NGOs or other charitable organizations. The ads thus highlight community attachment: helping the community is listed as the main benefit and local agents are listed as peers. In treatment districts the ads are designed to highlight the civil servant identity: career advancement is listed as the main benefit, and doctors and nurses are listed as peers. Treatment and control only differ in the salience of career opportunities, while all factors such as application requirements and earnings expectations are kept equal. We show that treatment induces the expected selection responses: applicants in treated districts have better skills, stronger career ambitions, and put lower weight on social impact.

To isolate the effect of selection on performance we must sever the link between treatment and the marginal return to effort on the job. To this purpose, all hired agents are given the same information on career opportunities and social impact when they move to the same training school where they are trained together for one year. Differences in performance on the job, if any, must then be due to the fact that the prospect of a career in the civil service draws in agents with different traits. A survey administered before and after the training program validates our design: before training treatment and control agents differ in the perceived relevance of career benefits; after training these perceptions converge.

The impact of treatment on service delivery is evaluated by combining three data sources: real time data on service delivery in remote areas collected through a mobile platform, administrative

data on health facility utilization, and our own survey of household health practices and outcomes, including immunization records and anthropometrics. This allows us to link the services delivered by the newly recruited health workers to the outcomes of the households who receive those services and, ultimately, their health impact. Besides enabling us to link inputs to outputs, these three independent data sources allow us to cross-check the findings, while data on final outcomes allow us to measure the effect of altruism and ambition that might not manifest in measured inputs.

We find strong evidence that agents drawn by a career in the civil service are more effective at each step of the causal chain from the inputs they provide to the outcomes of the recipients. They provide more inputs (29% more household visits, twice as many community meetings) at the same cost. They increase facility utilization rates: the number of women giving birth at the health center is 30% higher, and the number of children undergoing health checks 24% higher, being weighed 22% higher and receiving immunization against polio 20% higher. They improve a number of health practices among the households they serve: breastfeeding and proper stool disposal increase by 5pp and 12pp, deworming treatments by 15% and the share of children on track with their immunization schedule by 5pp (relative to a control mean of 5%). These changes are matched by changes in health outcomes: the share of under 5s who are underweight falls by 5pp.

Taken together, these results indicate first, that the selection effect on performance in service delivery is sizeable, and second, that offering a civil service position with career opportunities attracts agents who deliver services with remarkable health impact in the communities. The fact that we get consistently positive impacts from three distinct and entirely independent data sources further strengthens our confidence in the findings.

In light of the evidence of poor bureaucratic performance in low income countries (Collier 2009; Muralidharan et al. 2011) our findings suggest that this is not due to the fact that civil service careers attract poor performers when these jobs are first created. In contrast, it must be that once a bureaucracy, like any organization, has acquired low effort norms it will attract agents who enjoy those norms. This underscores the importance of making the organization congruent with the mission advertised at the recruitment stage to ensure positive selection in the long run.

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). More recently this has been enriched by the study of job missions as a selection and motivation mechanism (Besley and Ghatak 2005) and identity or self-image as components of preferences (Akerlof and Kranton 2005 ; Bénabou and Tirole 2011). Our findings provide empirical support to these contributions as we show that the identity associated with the job affects those drawn to it and that this selection affects performance.

The fact that career opportunities affect performance *through selection* complements the recent findings of Bertrand et al. (2016) that, on the intensive margin, better promotion prospects improve the effectiveness of Indian civil servants. Our findings also complement a large literature on the impact of financial incentives. On the selection margin, Dal Bó et al. (2013) and Deserranno (2014)

study the effect of earnings levels on the traits of applicants for government and NGO jobs⁴ while several papers evaluate the effect of performance pay on the performance of agents after these have been hired either for the delivery of health services (Ashraf et al. 2014; Miller et al. 2012; Miller and Babiarz 2014; Celhay et al. 2015) or education (Muralidharan and Sundararaman 2011; Duflo et al. 2012; Glewwe et al. 2010; Fryer 2013; Rockoff et al. 2012; Staiger and Rockoff 2010). Our contribution is to provide the first experimental evidence that selection affects performance in public services delivery. In particular, we show that job design, of which incentives are a component, affects who sorts into these jobs in the first place, and that the effect of this selection on performance is of the same order of magnitude as the largest incentive effects estimates.^{5,6}

The rest of the paper is organized as follows. Section 2 develops a conceptual framework to make precise the trade-off associated with career opportunities. Section 3 describes the context and research design. Section 4 evaluates the treatment effect on performance in delivering health services. Section 5 evaluates the treatment effect on facility utilization, health behaviors and outcomes. Section 6 concludes with a discussion of external validity, welfare implications and general equilibrium effects relevant for program scale-up.

2 Conceptual Framework

This section provides a stylized framework that illustrates the basic trade-off created by career opportunities in public service delivery jobs; namely that attracting agents motivated by these opportunities might displace agents who care about social impact per se. The framework makes precise: (i) the effect of selection on performance, including the conditions that determine its sign, and (ii) how our experimental design identifies this selection effect.

2.1 Set up

Individuals decide whether to apply for a service delivery position and, if hired, the level of effort $e \in (0, 1)$ they devote to reaching beneficiaries. The position has social impact S on the beneficiaries of the services and, potentially, career opportunities $C \in \{0, 1\}$.

⁴Dal Bó et al. (2013) find that higher salaries for civil service jobs attracts better qualified candidates with the same level of pro-social preferences. Deserranno (2014) finds that expectations of higher earnings discourage pro-social candidates from applying for an NGO job that encompasses both commercial and health promotion activities. While consistent with these selection effects, our experiment focuses on measuring the effect of selection on agents' performance and beneficiaries' outcomes, which encompass the effect of all the attributes that determine effectiveness.

⁵There is a corresponding literature that studies the same issues in the private sector. This literature stresses the importance of the effect of incentives on selection but empirical studies focus on incentives on the job (Lazear and Oyer, 2012; Oyer and Schaefer, 2011).

⁶Rothstein (2015) uses a model-based approach that simulates the selection effect alternative teachers contracts. He finds that bonus policies have small effects on selection while reductions in tenure rates accompanied by substantial salary increases and high firing rates can have larger effects.

The probability of obtaining social impact and career benefits depends on the level of effort devoted to public services according to $p(e)$ and $q(e)$, respectively, where $p(\cdot)$ and $q(\cdot)$ are increasing and concave and $p(0) = \underline{p} > 0$, $q(0) = \underline{q} > 0$, $p(1) < 1$, $q(1) < 1$. The framework accommodates bureaucracies that differ in the extent to which promotions are based on performance in service delivery; in particular, $p_e = 0$ corresponds to the case where promotions are independent of performance, either due to corruption or inefficiency, while the link gets stronger as p_e gets larger.⁷

All individuals have the same disutility of effort $d(e)$, increasing and convex; thus the utility of agent i is given by:

$$U_i = \alpha_i p(e_i) C + \sigma_i q(e_i) S - d(e_i) \quad (2.1)$$

where the first term is the utility the agent derives from career benefits: it depends on the level of benefits C , the probability of getting them $p(e_i^*)$ and α_i . This measures “career ambition”, that is, how much utility the agent derives from career progression. It also captures talent because the return to career opportunities is increasing in skills/talent, for instance because more highly ranked positions require more advanced degrees. The second term is the utility the agent derives from doing good, and has a similar structure: σ_i measures social preferences, that is the weight agent i puts on social impact. Equation 2.1 makes precise that career ambition and social preferences are two alternative sources of motivation and that their relative strength depends on the agents’ preferences and the rate at which effort yields benefits $p(\cdot)$ and $q(\cdot)$. Note also that the framework accommodates “identity” benefits, that is agents derive utility from C and S even if they do not devote any effort to attain them, that is $p(0) = \underline{p} > 0$, $q(0) = \underline{q} > 0$. The latter can be interpreted as “warm glow” as agents derive utility from a job with social impact even if they themselves do not contribute to it.

We assume that σ and α can be high or low, and we normalize the low value to zero so $\sigma \in \{0, \bar{\sigma}\}$ and $\alpha \in \{0, \bar{\alpha}\}$ and that there are $n_{ij} > 0$ agents in the economy who have $\alpha = i$ and $\sigma = j$; below we show that it is this heterogeneity of values among potential applicants that makes the effect of career opportunities ambiguous a priori.

2.2 The effect of career opportunities on the applicant pool

Potential applicants evaluate on-the-job utility at the optimal level of effort and apply if this is larger than u . For simplicity we assume that $S = 1$ and $C \in \{0, 1\}$; that the reservation utility is the same for all potential applicants; that they take the probability of being hired as exogenous; and that the application is costless. The participation constraint for individual i is:

$$\alpha_i p(e_i^*) C + \sigma_i q(e_i^*) - d(e_i^*) \geq u \quad (2.2)$$

Where $e_i^*(C, \alpha_i, \sigma_i)$ solves the first order condition:

⁷In a model with multidimensional effort, e.g. where agents can devote effort to influence activities as well as service delivery, the probability of promotion might be increasing in the former and decreasing in the latter.

$$\alpha_i p_e(e_i^*)C + \sigma_i q_e(e_i^*) = d_e(e_i^*) \quad (2.3)$$

which yields optimal effort $e_i^*(C, \alpha_i, \sigma_i)$. Thus both career and social benefits lead to higher effort, and their relative strength depends on the traits α_i and σ_i and the marginal benefit of effort $p_e(\cdot)$ and $q_e(\cdot)$. The participation constraint makes clear that changes in C change on-the-job utility and hence the traits of those who apply. To evaluate the effect of career prospects on performance through selection we focus on the case in which selection is affected. We assume that $\bar{\alpha}p > u$ and $\bar{\sigma}q > u$, so that the participation constraint is always met for individuals with strong social preferences ($\sigma = \bar{\sigma}$), it is met when $C = 1$ for agents with strong career ambition ($\alpha = \bar{\alpha}$), while it is never met for agents with $\alpha = \sigma = 0$.

Jobs that have no career opportunities ($C = 0$) will appeal to all the agents agents with $\sigma = \bar{\sigma}$. Among these $n_{0\sigma}$ agents have no ambition and $n_{\alpha\sigma}$ do, so the average level of α is $\frac{n_{\alpha\sigma}}{n_{\alpha\sigma} + n_{0\sigma}}\bar{\alpha} < \bar{\alpha}$. Offering ($C = 1$) will attract all the agents with $\sigma = \bar{\sigma}$ as well as those with $\alpha = \bar{\alpha}$. Among these $n_{\alpha 0}$ agents have no social preferences and $n_{\alpha\sigma}$ do, so the average level of σ is $\frac{n_{\alpha\sigma} + n_{0\sigma}}{n_{\alpha\sigma} + n_{\alpha 0} + n_{0\sigma}}\bar{\sigma} < \bar{\sigma}$ while the average level of α is $\frac{n_{\alpha\sigma} + n_{\alpha 0}}{n_{\alpha\sigma} + n_{\alpha 0} + n_{0\sigma}}\bar{\alpha} < \bar{\alpha}$. This is higher than the average level of α under $C = 0$ as long as $n_{\alpha 0} > 0$ and $n_{0\sigma} > 0$. Summarizing:

Result 1 *Career opportunities reduce the average level of pro-sociality and increase the average level of career ambition and talent in the applicant pool.*

The result thus makes precise that career opportunities attract different types. The next subsection evaluates the effect of this selection on performance.

2.3 The selection and incentive effect of career opportunities

Combining $e_i^*(C, \alpha_i, \sigma_i)$ from 2.3 and Result 1 above the average effort when $C = 1$ is:

$$\tilde{e}_1 = s_{\alpha\sigma}e^*(1, \bar{\alpha}, \bar{\sigma}) + s_{\alpha 0}e^*(1, \bar{\alpha}, 0) + s_{0\sigma}e^*(1, 0, \bar{\sigma}) \quad (2.4)$$

where s_{ij} is the share of applicants with $\alpha = i$ and $\sigma = j$. Note that $e^*(1, \bar{\alpha}, \bar{\sigma}) > e^*(1, \bar{\alpha}, 0)$ and $e^*(1, \bar{\alpha}, \bar{\sigma}) > e^*(1, 0, \bar{\sigma})$, that is when the job entails both career benefits and social impact, agents motivated by both factors choose a higher level of effort than agents motivated by one factor alone.⁸ From 2.3 we can also see that the average effort when $C = 0$ is equal to $\tilde{e}_0 = e^*(0, 0, \bar{\sigma}) = e^*(0, \bar{\alpha}, \bar{\sigma})$, because when there are no career opportunities the level of career ambition does not affect effort.⁹

⁸When $C = 1$, agents motivated by both benefits choose $e^*(1, \bar{\alpha}, \bar{\sigma})$ that solves $\bar{\alpha}p_e(e^*(1, \bar{\alpha}, \bar{\sigma})) + \bar{\sigma}q_e(e^*(1, \bar{\alpha}, \bar{\sigma})) = d_e(e^*(1, \bar{\alpha}, \bar{\sigma}))$ while those motivated by career alone choose $e^*(1, \bar{\alpha}, 0)$ that solves $\bar{\alpha}p_e(e^*(1, \bar{\alpha}, 0)) = d_e(e^*(1, \bar{\alpha}, 0))$. The marginal benefit on the LHS is smaller while the marginal cost on the RHS is the same thus $e^*(1, \bar{\alpha}, \bar{\sigma}) > e^*(1, \bar{\alpha}, 0)$. By a similar argument we can show that $e^*(1, \bar{\alpha}, \bar{\sigma}) > e^*(1, 0, \bar{\sigma})$.

⁹When $C = 0$ agents motivated by both benefits choose $e^*(0, \bar{\alpha}, \bar{\sigma})$ that solves $\bar{\sigma}q_e(e^*(0, \bar{\alpha}, \bar{\sigma})) = d_e(e^*(0, \bar{\alpha}, \bar{\sigma}))$ and those motivated by social impact alone choose $e^*(0, 0, \bar{\sigma})$ that solves $\bar{\sigma}q_e(e^*(0, 0, \bar{\sigma})) = d_e(e^*(0, 0, \bar{\sigma}))$. That is the first order conditions are the same.

The net effect of career opportunities is then¹⁰:

$$\tilde{e}_1 - \tilde{e}_0 = s_{\alpha 0}^1(e^*(1, \bar{\alpha}, 0) - e^*(0, 0, \bar{\sigma})) + s_{\alpha \sigma}^1(e^*(1, \bar{\alpha}, \bar{\sigma}) - e^*(0, \bar{\alpha}, \bar{\sigma})) \quad (2.5)$$

The first term captures the selection effect, namely the fact that agents with $\alpha = \bar{\alpha}$ and $\sigma = 0$, who choose $e^*(1, \bar{\alpha}, 0)$, only apply when $C = 1$ while agents with $\alpha = 0$ and $\sigma = \bar{\sigma}$, who choose $e^*(0, 0, \bar{\sigma})$, always apply and choose the same level of effort regardless of C . Thus the selection effect captures the fact that career opportunities attract ambitious/talented agents who would not apply otherwise. The selection effect is then stronger when the share of these types ($s_{\alpha 0}^1$) is larger.¹¹ The sign of the selection effect depends on whether these agents exert more effort than those solely motivated by social impact who apply anyway, that is if $(e^*(1, \bar{\alpha}, 0) - e^*(0, 0, \bar{\sigma})) > 0$. This depends on whether the marginal benefit of career opportunities for the former ($\bar{\alpha}p_e(e^*(1, \bar{\alpha}, 0))$) is larger than the marginal benefit of social impact for the latter ($\bar{\sigma}q_e(e^*(0, 0, \bar{\sigma}))$). This in turn depends on the ambition parameter α relative to the social preference parameter σ and on the sensitivity of promotion to effort p_e relative to q_e as illustrated by 2.3. We thus have:

Result 2 *Career opportunities create a selection effect by attracting agents with high career ambition and talent who would not apply otherwise. The selection effect is positive if and only if the marginal value of career opportunities is larger than the marginal value of social impact.*

The second term captures the incentive effect of career opportunities on agents who value both benefits and hence apply regardless of whether these are offered. It is positive because career opportunities increase the marginal return to effort and hence $e^*(1, \bar{\alpha}, \bar{\sigma}) > e^*(0, \bar{\alpha}, \bar{\sigma})$ as shown above. This effect is stronger when the share of agents who value both benefits is larger because those who only value social impact do not respond to career incentives. We thus have:

Result 3 *Career opportunities create an incentive effect by increasing the marginal return to effort. The incentive effect is always non-negative.*

Summing up, offering career opportunities for jobs with social impact affects performance both by changing the traits of the applicants and by changing the level of effort they choose. The first effect can be negative, leading to a negative effect overall. Our experiment aims to isolate the first of these effects as summarized in the next sub-section.¹²

¹⁰The difference is equal to $s_{\alpha \sigma}^1 e^*(1, \bar{\alpha}, \bar{\sigma}) + s_{\alpha 0}^1 e^*(1, \bar{\alpha}, 0) + s_{0 \sigma}^1 e^*(1, 0, \bar{\sigma}) - e^*(0, 0, \bar{\sigma})$. Using the fact that the shares sum to 1 and $e^*(0, 0, \bar{\sigma}) = e^*(1, 0, \bar{\sigma})$ gives the expression in the text.

¹¹Results are similar if we assume that agents who solely care about social impact only apply when $C = 0$

¹²In a more general model where applicants are chosen on the basis of observable traits and where application is costly, offering career opportunities has a further effect on the composition of the applicant pool if pro-social agents with $\alpha = 0$ do not apply in expectation that selectors will prefer high talent/more ambitious types.

2.4 Parsing out the selection effect

The new health worker position created by the Government of Zambia effectively added career opportunities to a job with social impact. Equation 2.5 makes precise that the effect on effort is a combination of the change in the types of agents who apply and the change in incentives for those who would have applied anyway. To identify the former we first advertise different benefits at the recruitment stage to attract different types. This opens the selection channel. In treatment units where career opportunities are advertised we attract agents motivated by social impact alone ($\alpha = 0, \sigma = \bar{\sigma}$), by career opportunities alone ($\alpha = \bar{\alpha}, \sigma = 0$) and by the two together ($\alpha = \bar{\alpha}, \sigma = \bar{\sigma}$). In control units where career opportunities are not advertised we only attract agents motivated by social impact, either by itself ($\alpha = 0, \sigma = \bar{\sigma}$) or with career opportunities ($\alpha = \bar{\alpha}, \sigma = \bar{\sigma}$). Once agents are recruited, we offer career opportunities to all of them regardless of the recruitment method. Thus agents with ($\alpha = \bar{\alpha}, \sigma = \bar{\sigma}$) who applied under $C = 0$ expecting to choose $e^*(0, \bar{\alpha}, \bar{\sigma})$ will instead choose $e^*(1, \bar{\alpha}, \bar{\sigma}) > e^*(0, \bar{\alpha}, \bar{\sigma})$. This shuts down the incentive channel, that is the second term of 2.5 goes to zero as treatment and control agents face the same incentives. The difference in performance between those recruited with career opportunities and those recruited without identifies the first term of 2.5, the selection effect.

From Result 2 we know that a positive selection effect implies that the marginal benefit of career opportunities is larger than the marginal benefit of social impact. The sign of the selection effect thus tells us whether attracting agents with career ambition and talent leads to better performance than attracting agents solely motivated by social impact.

3 Context and Research Design

3.1 Context: health services in rural communities

Delivering health services to remote rural areas is challenging at every level of development because trained medical staff are reluctant to be posted there and turnover rates are high (Lopez et al 2015).¹³ The government community-level health worker position was created as a solution to this challenge. The rationale behind it was that recruiting individuals with strong links to their communities and training them would create a formalized, adequately trained medical cadre that would maintain a tight connection with the community. The position is effectively a formalization of existing informal community health workers who are employed, often as volunteers, by religious and other non-profit organizations. Before this program, informal community health workers were the primary providers of health services to rural populations in Zambia. In line with this, in

¹³The U.S. Health Resources and Services Administration estimates that approximately sixty million Americans live in medically underserved, under-resourced communities with a shortage of primary care physicians (PCPs), dental or mental health providers, and with a population-to-physician ratio greater than 3,500 to one. This ratio is similar in low income countries like Equatorial Guinea, Sudan, Gabon, and Botswana.

Section 3.3 we show that before the Health Workers arrived, the average health post (the first-level government health facility in rural Zambia) had 1.5 staff from the Ministry of Health, including those not permanently based there.

The history of community health work goes back at least to the early 17th century, when a shortage of doctors in Russia led to training community volunteers in providing basic medical care to military personnel. This training later became the foundation of China’s “barefoot doctors”, laypeople who sometimes could not afford shoes but were trained to meet primary health needs in rural areas, and then became widespread in Latin America, in underserved areas in the United States and, more recently, across Africa. The original programs emphasized community self-reliance and participation. Like much of informal public services delivery, for example in the United Kingdom in the 18th and 19th century, these are provided by religious institutions, grass-roots movements, and, more recently, non-governmental organizations. For this reason, however, they are often uncoordinated, lower-skilled efforts.

The newly created government health worker position is the lowest cadre in the Ministry of Health. Career advancement from such a position implies different, often more, responsibilities and better pay. The pay gradient is steep as the starting monthly wage is USD 290 for health workers, USD 530 for entry-level nurses, USD 615 for environmental health technicians, and USD 1,625 for resident doctors.¹⁴ Promotion into higher-ranked cadres within the Ministry requires additional training (for example, nursing or medical school). Being part of the civil service, the health workers are eligible for “in-service training,” meaning that they attend school as a serving officer and the government pays the tuition for all of their training. The official policy of the Ministry is to periodically ask the district medical officers to nominate a number of candidates on merit, but there is no mechanical link between quantitative measures of performance (say the number of visits that a health worker makes) and nominations. Promotions to higher cadres are therefore not automatic but the expected payoff is high even with low success rates, especially because job opportunities that allow for a career in central government are rare in the remote communities where the health workers are recruited from.

The health workers’ tasks and skill set

The health workers are expected to devote 80% of their time (4 out of 5 working days per week) to household visits. The visits’ main goals are to provide advice on women’s health—including family planning, pregnancy, and postpartum care—and child health—including nutrition and immuniza-

¹⁴At the time of the launch of the recruitment process in September 2010, the Government had not yet determined how much the Health Workers would be formally remunerated. Accordingly, the posters did not display any information about compensation. Although the Health Worker wage was unknown to applicants at the time of application (indeed, unknown even to GRZ), applicants would likely have been able to infer an approximate wage, or at least an ordinal wage ranking, based on the “community health” job description and the relatively minimal educational qualifications required, both of which would intuitively place the job below facility-based positions in compensation. In Section 3.2, we present evidence against the hypothesis that wage perceptions may have differed by treatment.

tions. In addition, the health workers are expected to inspect the household and provide advice on health-related practices such as safe water practices, household waste management, sanitation, hygiene, and ventilation. During visits, the health workers are also tasked with providing basic care to any sick persons and referring them to the health post as needed. In the remaining time, the health workers 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. The job thus require both medical and social skills, and both are equally important as detailed in a recent WHO 2008 study that outlines the skills necessary for effective primary health delivery to communities. Medical skills include weighing, taking vital signs, filling out patient registries, and determining whether a patient is pregnant. Social skills include counseling, supporting, advising, and educating patients and other lay people. The former skills demand technical competence; the latter what we might call “soft social skills”: rapport, trust, empathy, the ability to communicate effectively. The latter are necessary for the type of behavior change that is often necessary both for preventative care (such as decreasing diarrhea and infant mortality) and curative care and facility utilization (such as convincing mothers to give birth in clinics).¹⁵

The recruitment process

In 2010, the program’s first year, the Government sought to recruit, train, and deploy two health workers to each of 167 communities located in the 48 most rural of the 58 constituent districts within the country. The recruitment and selection process occurred at the community (health post) level between August and October 2010. The recruitment drive yielded 2,457 applications, an average of 7.3 applicants for each position. 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, which provided information on the position and the application requirements, were posted. To ensure that the recruitment process was carried out in a uniform manner across all the communities, the Government included detailed written instructions in the packets containing the recruitment materials (posters, applications, etc.) that were distributed to district health officials (see Appendix E). Overall, 1,804 (73.4%) applicants met the eligibility requirements and were invited for interviews;¹⁶ of these 1,585 (87.9%) reported on their interview day. District officials were in charge of organizing interview panels at the health

¹⁵This skill mix is not that different in all of medicine: the importance of having both hard technical skills and soft social skills has been emphasized in many studies related to healthcare workers (Roter and Hall 1993; Roter 2000; Carpiac-Claver and Levy-Storms 2007)

¹⁶All completed application forms were taken to the district Ministry of Health office where district health officials checked that 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.

post level.¹⁷ The Government 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.

Out of the 1,585 interviewees, the panels nominated 334 applicants as “top 2” candidates and 413 as reserves. The nominations were reviewed centrally by the government of Zambia, and 334 final candidates were invited to join a yearlong medical training. Of these, 314 applicants accepted the invitation and, in June 2011, moved to the training school in Ndola, Zambia’s second-largest city. Of the applicants who joined the program, 307 graduated and started working in August 2012. All the health workers were deployed back to their communities of origin.

3.2 Experimental Design

Government-funded community health worker programs vary in the extent to which they integrate the health workers into the civil service. At one extreme there are programs that mimic the informal model with financing provided by the government and all other decisions including hiring, monitoring, and firing left to the community. At the other extreme is the model adopted in Zambia where health workers are a cadre of civil servants and can advance to higher-ranked and better paid cadres. The Government chose the latter model in the hope of attracting agents with strong technical skills to do community work. Nevertheless they were fully aware that the focus on career advancement could have severed the much needed ties with the community, making the health workers ineffective.¹⁸ This trade-off led to the experiment we describe in this section.

Our experiment aims to assess whether agents attracted by a career in civil service have traits that differ from those of agents attracted by doing good and whether this selection affects performance. This is not only immediately relevant for the design of health delivery services in remote areas, but also more to evaluate the role of selection in public service delivery, in general, and to assess which traits are more conducive to effective delivery. The key challenge is to separate the effect of selection from the effect of incentives on the job. We tackle this in two steps: the first opens the selection channel, and the second shuts down the incentive channel .

Experimental Design, Step I: Opening the Selection Channel

To open the selection channel we use the recruitment posters and the information materials distributed to health officers. The recruitment posters are shown in Figures 1.A and 1.B. Both posters specify that applicants have to be Zambian nationals, aged 18-45 years, with a high school diploma

¹⁷Each selection panel had five members: the district health official, a representative from the health post’s associated health center, and three members of the local neighborhood health committee. These committees vary in size, but they typically have more than 10 members.

¹⁸Mr. Mwila, then HR Director at MoH, expressed this trade-off clearly when he asked us: “What is going to happen now that they (potential health workers) will see themselves as civil servants? Will they be connected to the community?”

and two “O-levels.”^{19,20} The posters however highlight different aspects of the job, both of which are relevant in practice: career opportunities and social impact.

The treatment poster stresses the civil service identity of the new position. It lists as the main benefit of the job the opportunity to ascend the civil-service career ladder to higher and better-paid positions such as environmental health technician, nurse, clinical officer, and doctor. This incentive is summarized in a bold caption stating, “Become a community health worker to gain skills and boost your career!” The poster also explicitly leverages a sense of belonging to the civil service by stating “become a highly trained member of Zambia’s health care system”. Finally it sets “experts in medical fields” as the peer group candidates can aspire to interact with.

The control poster stresses the social identity of the position by making salient community impact such as “[gaining] the skills you need to prevent illness and promote health for your family and neighbors”. The message is summarized in a caption stating, “Want to serve your community? Become a community health worker!” Finally, it lists local health post staff as the peer group candidates can expect to interact with.

Two points are of note. First, the social identity poster functions as control because the community health worker jobs that represent the status quo in this and many other similar settings do not have career opportunities. Second, to ensure that the treatment poster isolates the effect of career opportunities, the control poster has exactly the same structure except the wording of the benefits. We chose this over a “neutral” control poster with no benefits whatsoever because in that case the treatment effect would conflate the effect of interest with the effect of advertising benefits per se. While this might be of intrinsic interest, it would not allow us to answer the more general question of how agents who are attracted by a career in the civil service differ from those attracted by social impact and how this selection affects performance.

Since recruitment was organized by district officials, we randomized treatment at the district level in order to maximize compliance with the experimental assignment, evenly splitting the 48 districts into two groups. This implies that each district official is only exposed to one treatment and is unaware of the other. As district officials are the main source of information for aspiring health workers, randomization at the district level minimizes the risk of contamination. Randomization

¹⁹O-levels are written subject exams administered in the final year of secondary school. They are the primary entry qualification into tertiary education. The Examinations Council of Zambia requires candidates to take a minimum of six O-levels, of which English and mathematics are compulsory. Exam performance is rated on a nine-point scale, ranging from “distinction” to “unsatisfactory;” all but the lowest point-score are considered passing.

²⁰The posters instructed eligible applicants to retrieve application forms from the health center associated with the health post. Applicants were to hand in their application forms, along with photocopies of their national registration cards and high school transcripts, to the health center within two weeks of the posters being posted. In line with the principle that Health Workers should be members of the communities that they serve, the application form also required applicants to obtain the signed endorsement of a representative of the applicant’s “neighborhood health committee” (NHC), followed by the signed verification of the application by the health worker in charge of the associated health center. The NHC is a parastatal institution at the community level in rural Zambia. It is comprised of elected volunteer community representatives, whose collective responsibility is to coordinate community health efforts, such as immunization campaigns and village meetings about common health issues.

at the district level also mitigates the risk of informational spillovers between communities, as the distance between health posts in different districts is considerably large. Random assignment of the 48 districts is stratified by province and average district-level educational attainment.²¹ To ensure compliance with the randomization protocol, we worked closely with the Government to standardize the information given to the district officials to organize the recruitment process.²²

To assess the power of the treatment, it is important to note that in these communities government jobs are scarce and, as we formally show in Section 3.3, the majority of the eligibles are either not in paid employment or in jobs below their skill level. In this context, therefore, a poster advertising a government job, whether in the hierarchy of the Ministry of Health or as a stand-alone community position, is likely to be highly visible.²³

The recruitment campaign attracted 2,457 applicants of which 1,232 applied in treatment and 1,225 in control. The fact that the number of applications is similar in treatment and control, but the distribution of traits is different in the applicant pools, suggests that neither of the two job advertisements is more attractive, but, rather each is attractive to different people. Table 1 provides evidence that the recruitment materials indeed attracts applicants with different qualities.²⁴ Guided by the conceptual framework, we collect measures of talent, career ambition and social preferences. Talent is measured by high school test scores and exam performance during the year-long training. Preferences are elicited through two survey instruments; one covering all candidates before interview and another one covering all recruited agents when they arrive at the training school. One caveat is of note: while exam score data come from official transcripts, career ambitions and pro-sociality are self-reported and applicants might have responded in a way consistent with the posters to maximize the chance of being hired. The psychometric measures, however, are collected almost one year later from successful applicants, who have no strategic motive to misrepresent their preferences.

²¹We stratify by the proportion of adults in the district who have a high school diploma, as reported in the most recent World Bank LCMS, conducted four years prior in 2006. We sort districts by province and, within each province, by high school graduation rate. Within each sorted, province-specific list of districts, we take each successive pair of districts and randomly assign one district in the pair to the career opportunities treatment and the other to the control group. For provinces with an odd number of districts, we pool the final unpaired districts across provinces, sort by educational attainment, and randomize these districts in the same pair-wise manner.

²²District officials are given a packet containing 10 recruitment posters and 40 application forms for each health post and are asked to distribute each packet to the respective health center and, from there, to ensure that recruitment posters are posted, application forms are made available, and so forth. We conduct a series of follow-up calls over several weeks to the district point-persons to ensure that the recruitment process is conducted as planned.

²³To reinforce the treatment, we also include a basic written script that the district officials are invited to use to inform health centers and neighborhood health committees on the Health Worker program and recruitment process. In the career opportunities 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 may be available in the future.” In contrast, in the control group, the script states, “This is an opportunity for local community members to become trained and serve the health needs of their community.” (see Appendix E).

²⁴To probe the robustness of the statistical inference we also computed p-values based on randomization inference. To compute these we simulate 1,000 placebo random assignments of districts to treatment, estimate the career treatment effect in each of these 1,000 placebo assignments for each variable and report the share of placebo coefficients that are larger or equal to the actual treatment effects. The results are unchanged.

Panel A shows that making career opportunities salient attracts more qualified candidates: their total high-school final exam score is 16% of a standard deviation higher ($p=.019$), and they have a stronger scientific background (the number of science exams passed is 22% of one standard deviation higher, $p=.006$), which is directly relevant to medical practice. This also emerges from their performance on the exams at the training school, where treatment agents score on average 18% of a s.d. higher. Panel A is consistent with the interpretation that career opportunities are more valuable for those who are sufficiently talented to progress in the career ladder, so that very talented individuals only apply in treatment areas while only less skilled individuals apply in control areas. Turning to career ambition, Panel B shows that the treatment attracted applicants with stronger ambitions, as the share of applicants who aspire to be in a highly-ranked position is 31% higher in treatment ($p=.026$). This is confirmed by the scores on the psychometric test administered at training: treatment agents score 23% of one s.d. higher.

Panel C measures other-regarding preferences using the “Inclusion of Others in Self (IOS) scale”²⁵, three psychometric measures commonly used in the social psychology literature, and a contextualized dictator game. All these measures consistently show no difference in the level of pro-sociality. Table A.6 shows that agents score similarly on a comprehensive set of psychometric tests on pro-social motivation. Taken together, however, Panels B and C suggest that the relative weight these individuals give to social impact must be lower by definition as they give more weight to career benefits. In line with this when we ask trainees to choose their main motivation to do the job, the share that chooses “career” over “helping the community” is two and a half times larger in the treatment group.

Ultimately, Table 1 suggests that the treatment posters conveyed credible career opportunities, as these attracted applicants with stronger skills and career ambition. But while the average level of pro-sociality is high in both groups, a sizeable minority in the treatment group admits to being driven by career ambition rather than social impact. Our experiment will assess the effect of this selection on performance on the job. To isolate the effect of career opportunities on performance by selection, however, we need to ensure that they do not affect effort on the job other than through different individual traits. We explain how we achieve this below.

²⁵Aron, Arthur and others, "Including Others in the Self", *European Review of Social Psychology* 15, 1 (2004), pp. 101-132. IOS measures the extent to which individuals perceive community and self-interest as overlapping. 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. IOS has been validated across a wide variety of contexts, and adapted versions are found to be strongly correlated with environmental behavior (Schultz, P. Wesley, "Inclusion with Nature: The Psychology Of Human-nature Relations", *Psychology of Sustainable Development* (2002), pp. 61-78.) and connectedness to the community (Mashek, Debra and Lisa Cannaday and June Tangney, "Inclusion of Community in Self Scale: A Single-item Pictorial Measure of Community Connectedness", *Journal of Community Psychology* 35 (2007), pp. 257-275).

Experimental Design, Step II: Closing the Incentive Channel

To close down the incentive channel, all successful applicants were offered career opportunities on the job. Indeed, after being recruited, all agents train together for one year, during which they receive the same information about the career opportunities they were entitled to as civil servants. As treatment and control health workers face the same incentives once hired, performance differences, if any, are attributable to selection as shown in Section 2.4.

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

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

The answers tabulated in Table A.1 show that differences in the reported benefits reported by the health workers when they first arrive at the training school match those advertised in treatment and control posters and then disappear after the health workers are exposed to the training program. Table A.1, Panel A, shows that service to the community is listed as the main benefit in both groups. This might truly reflect preferences or be inflated by desirability bias as discussed above. Despite the fact that this biases treatment effects towards zero, we find that the treatment group places 38% more weight on career opportunities ($p=.002$) and lower weight on both “allows me to serve the community” and “earn respect and status in the community” ($p=.050$ and $p=.048$, respectively). All other motivations to apply are balanced across groups, suggesting that the poster did not convey different expectations about pay or the nature of the job.

Table A.1, Panel B, shows that the answers converge after exposure to training and that there are no significant differences between the two groups. In line with the fact that control health workers receive information about career opportunities during training, the weight they give to career opportunities rises by 25%, while the weight they give to service to the community falls from 17%. In contrast, treatment health workers, who receive no new information during training, do not change their answers.

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

The experimental design allows us to identify the effect of career opportunities on performance through selection if the salience of career opportunities at the recruitment stage does not affect the agents' behavior directly once the real career opportunities are known by both treatment and control health workers. This assumption fails if agents might be made worse off by discovering that the actual value of career opportunities is larger than the value advertised. In this case, agents for whom the participation constraint is met ex-ante but not ex-post would drop out once hired. In practice only 2% do, thus allaying this concern.

3.3 Randomization Balance

Table 2 describes three sets of variables that can affect the supply of health workers, the demand for their services, and their working conditions. For each variable, the table reports the means and standard deviations in treatment and control, as well as the p-value of the test of means equality, with standard errors clustered at the level of randomization, the district. Table 2 shows that the randomization yielded a balanced sample, as all p-values of the test of equality are greater than .05. As treatment and control means are very close throughout, we comment on treatment group values in the rest of this section.

Panel A reports statistics on the eligible population drawn from the 2010 Census. This shows that the eligibles—namely, 18-45 year-old Zambian citizens with at least Grade 12 education—account for 4.4% of the district population, and that among them, 37% are female. The majority (54%) were either out of work or in unpaid employment over the past twelve months.²⁶ Among the 46% engaged in income generating activities (either as employees or self-employed), fewer than one third are employed in high skill occupations (such as teachers, which account for 9% of the eligible population) and about half are employed in low skill occupations, mostly in agriculture which accounts for 18% of the eligible population. Taken together, the evidence suggests that, despite their edu-

²⁶The 28% who were out of work are either unemployed (13%), housewives (7.5%), or full time students (8.5%). Most (65%) of the unpaid jobs are in agriculture. These are balanced across treatments.

cational achievements, the majority of the eligible population is either out of work or employed in occupations below skill level.

Panel B illustrates the characteristics of the catchment areas. These variables are drawn from surveys administered to district officials and the health workers themselves. Three points are of note. First, health posts are poorly staffed in both the treatment and control groups; the average number of staff (not including the new health workers) is 1.5. Given that the aim is to assign two community-based health workers to each health post, the program more than doubles the number of health staff in these communities. Second, the areas vary in the extent to which households live on their farms or in villages, but the frequency of either type is similar in the treatment and control groups. This is relevant as travel times between households depend on population density and are higher when households are scattered over a large area, as opposed to being concentrated in a village. Third, over 90% of the catchment areas in both groups have at least some cell network coverage, which is relevant for our analysis, as some performance measures are collected via SMS messages.

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

Overall, Table 2 shows that the new health workers are recruited from similar areas and will work in similar areas. Given the scarcity of skilled jobs, the program can draw talent from these areas without crowding out other skilled occupations. Indeed, the program might have the added benefit of creating job opportunities in these communities. We return to this issue in the Conclusion.

4 Performance in Service Delivery

4.1 Measuring Performance in Service Delivery

The health workers' main task, to which they are required to devote 80% of their time, or 4 out of 5 days per week, is to visit households. Our performance analysis focuses on the number of visits completed over the course of 18 months, from August 2012 (when the health workers started work) until January 2014. The number of household visits is akin to an attendance measure for teachers or nurses: the health workers 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 4.3.

Our primary measure of household visits is built by aggregating information on each visit from individual receipts. All the health workers are required to carry receipt books and issue each household a receipt for each visit, which the households are asked to sign. The health workers are required to keep the book with the copies of the receipts to send to the Government 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. The health workers know that 5% of these visits are audited.

Since visits are measured by aggregating text messages sent by the health workers themselves, identification can be compromised by the presence of measurement error that is correlated with treatment. For instance, health workers in the career treatment might put more effort in reporting visits via text messages or might report visits that never took place, leading to a positive bias in the estimated treatment effect. Outright cheating is made difficult by the fact that the health workers 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, the health workers are required to send their household visit receipt books containing carbon copies of the receipts to the Ministry of Health for cross-checking. Fabricating receipts thus entails a potentially high cost for no direct benefit. Nevertheless, the estimated treatment effect might be upward biased because of differential effort in reporting.

We validate our visits measure by comparing it to administrative data and households’ own reports of health worker activity. The administrative data is drawn from the Health Management and Information System (HMIS), which is the Ministry of Health’s system for collecting 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 health workers and the other staff working in each health post. While HMIS visit data are also collected by the health workers themselves, the effort required is considerably lower since HMIS reports are compiled monthly rather than on every visit, and cheating is more difficult as the reports are compiled jointly by the two health workers and the health post staff. As HMIS data are only available aggregated at the health post level (summed over the two workers in each health post) we regress these on our visit measure, also aggregated at the health post level. Columns 1 and 2 in Table A.2 show that the two measures are strongly correlated ($r=.766$) and that the correlation is the same in treatment and control, which contradicts the differential reporting hypothesis.

The households’ reports are collected via a survey that we administered to 16 randomly chosen households in each of 47 randomly selected communities chosen from the set of communities where the health workers operate, stratified by district. We ask respondents whether they know each of

the health workers (97% do), whether they have ever been visited (43% of them have), and their level of satisfaction with each health worker. Columns 3-6 show a precisely estimated correlation between our visit measure and the probability that a household reports a visit, as well as their level of satisfaction with the health worker’s performance. There is no significant difference between the treatment and control groups, casting doubt on the relevance of differential reporting.

Taken together, the findings in Table A.2 validate our visits measure. Ultimately, however, we will not be able to detect a treatment effect on households’ health outputs in Section 5 if measured differences in visits capture differences in reporting rather than in actual visits.

4.2 Treatment Effect on Household Visits

Table 3 reports the reduced form effects of treatment on performance, that is the estimates of:

$$v_{ihdp} = \alpha + \beta C_{id} + Z_h \gamma + \delta E_d + \rho_p + \epsilon_{ihdp} \quad (4.1)$$

where v_{ihdp} is the number of visits completed by health worker i in catchment area h district d and province p . C_{id} equals 1 if agent i is recruited and operates in a district assigned to the career opportunities treatment. Z_h is a vector of area characteristics, which includes the number of staff at the health post, cell network coverage, and the distribution of households between farms and villages described in Table 2. We control for the stratification variables, district-level high school graduation rate E_d and province indicators ρ_p throughout. Standard errors are clustered at the level of randomization, the district.

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

The causal effect of career opportunities on performance can be identified under the assumptions that (i) C_{id} is orthogonal to ϵ_{ihdp} , and (ii) there are no spillovers between the two groups. Orthogonality is obtained via random assignment. Spillovers via movements of health workers between treatment and control areas are ruled out by the program requirement that health workers must have been residing in the community they want to work in prior to applying. This implies that career opportunities cannot draw in talent from control areas. Spillovers of information, caused for

example by potential applicants in control seeing the treatment poster, would introduce a downward bias because they would reduce the information differences between treatment and control. Information spillovers are minimized by design, as recruitment messages were randomized at the district level—which, given the travel distance between rural communities in different districts, makes it very unlikely that applicants in one group might have seen the poster assigned to the other group. Importantly, information cannot spillover through the district officials that implement the program or through the recruitment panels, as these are only exposed to one treatment.

Column 1 reveals a large and precisely estimated effect of career opportunities on household visits: health workers recruited by making career opportunities salient do 94 more visits (29% more than control) over the course of 18 months. The median treatment effect is 104 (bootstrapped s.e. 43.1), which allays the concern that the average effect is driven by outliers. The magnitude of the difference is economically meaningful: if each of the 147 health workers in the social treatment had done as many visits as their counterparts in the career treatment, 13,818 more households would have been visited over the 18-month period. Given that for most of these households health workers are the only providers of health services, the difference between treatments is likely to have implications for health outputs in these communities. We return to this issue in Section 5.

Columns 2-4 divide the 18-month period into three and show that the estimated treatment effect is identical in the three semesters. This casts doubt on the alternative hypothesis that agents in the two groups have the same traits but agents in the treatment group perceive stronger career incentives because they have known them for longer (about 2 years vs 1 year for the control group). Such a difference should wane with time, while the difference due to stable traits should be stable.²⁷

To shed light on what treatment health workers do differently, we administer a time use survey to all health workers after they have started working. The findings, reported in detail in the Appendix, indicate that treatment and control health workers work similar hours and allocate their time similarly across similar activities. This indicates that treatment health workers are more efficient at their jobs. Household visits take place in remote, low-density areas: the median 78 square km area has 200 households, with an interquartile range of 130 to 360. It is thus rather time consuming to go from house to house, and this is compounded by the fact that roads are bad. In this setting, the ability to plan—e.g., by making appointments with specific households or collecting information as to whether members are likely to be home before setting out to visit them—is an important determinant of completing visits successfully.

To conclude we establish the extent to which differences in performance are due to selection on observables. We search for the vector of observables that explains the largest possible share of variation of performance in the control group and use the estimated coefficients to predict performance in the treatment group. This yields the predicted difference between treatment and

²⁷The fact that the treatment effect is stable also rules out that it is driven by a negative “surprise” for agents in the control group (i.e., their effort response to finding out about career opportunities is negative and larger—in absolute value—than what it would have been had they known the career opportunities at the outset).

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

The finding that observables have limited power in explaining performance differences echoes the well established finding that differences in teachers' effectiveness are large and only weakly correlated to observable traits. It is also consistent with other settings where agents self-select, such as in applying for welfare programs (Alatas et al. 2015) or purchasing health products (Ashraf et al. 2010). In those settings, like in ours, self-selection cannot be mimicked by targeting on observable traits.

4.3 Beyond Number of Visits: Compensation Mechanisms and Other Activities

Table 4 investigates the hypothesis that health workers in the control group take other actions that compensate for the lower number of visits. Column 1 tests whether control health workers are more likely to be retained while career health workers leave with their newly acquired skills as soon as it is feasible to do so. Since the health workers are bonded to their position for one year,²⁸ we measure retention by the number of health workers who make at least one visit after the one-year commitment has elapsed. We find that, by this measure, 18% of health workers drop out, though some of this may be due to a combination of malfunctioning phones and the rainy season (falling between months 15-18 in our analysis window) making travel to cell network-accessible areas difficult. This attrition rate is balanced across treatments. It is important to note that according to the Ministry's rule, health workers have to wait two years before applying for higher-ranked positions, such that none of those who left their positions did so for career progression. It is possible that career opportunities will affect retention rates after the two-year mark. Whether this entails a welfare cost depends on whether the workers can be easily replaced and whether the government can use their skills in other jobs. In our context, replacement is straightforward; the number of applicants per post was above seven, and the government faces scarcity of health staff at all levels, such that promoting high-performing health workers to nursing and other higher-level cadres is likely to be welfare-improving.

The number of visits can hide heterogeneity on a variety of dimensions that can make the health workers less effective in generating health outcomes, such as doing shorter visits, targeting the head of household rather than women and children, or targeting easier-to-reach households. We provide evidence that career health workers do not do worse on any of these dimensions. They devote the same time to a single visit (column 2), and are equally likely to target their primary

²⁸The health workers 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.

clients—women and children (column 3). They also reach more households (column 4) and make more follow-up visits (column 5). The point estimates indicate that just over one-third (36/94) of the total treatment effect is due to career health workers visiting more households, and two-thirds to them visiting the same household more than once. This is consistent with the two groups of health workers having a similar number of households in their catchment area and visiting them at least once, but treatment health workers doing more follow-up visits. Note that follow-ups are considered an integral part of the health worker job, in view of which Ministry of Health guidelines state health workers should attempt to visit each household on a quarterly basis. Finally, Table A.5 shows that treatment health workers allocate their time in a similar way to control health workers during household visits. This allays the concern that health workers who see themselves as health professionals neglect “soft” tasks like counseling.

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

5 Facility Utilization, Health Practices, and Health Outcomes

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

Besides their intrinsic importance for the welfare of these communities, treatment effects on facility utilization and household outcomes allow us to shed light on whether health workers in the control group perform better on dimensions we cannot observe enough to improve outcomes.

For instance, treatment health workers could target households that are more interested in health services and would use facilities when necessary anyway, while control health workers could target households that they need to persuade to change behavior, and that require more work, leading to fewer visits overall. If this were true, treatment would be uncorrelated (or even negatively correlated) with facility utilization and health outcomes.

To provide evidence on whether treatment affected facility utilization, we use data from the Ministry’s HMIS administrative records; to measure effects on health practices and outcomes we survey households residing in the communities where the health workers operate. As the main remit of the health worker job is mother and child health, we focus on this throughout.

5.1 Treatment Effect on Facility Utilization

The Ministry’s HMIS administrative records are compiled by facilities’ senior staff and transmitted to the Ministry of Health (MoH) via an electronic platform. Two levels of facilities serve these communities: health centers and health posts.²⁹ The health workers are supposed to encourage women to give birth at the closest health center and to bring in children for regular visits and immunizations at the closest facility (health center or health post). The importance of institutional deliveries in this context cannot be understated: Zambia’s maternal mortality rates are very high and health centers have the equipment and medical supplies that can prevent these deaths. Regular children’s visits ensure that conditions such as diarrhea are treated before they become dangerous. Immunizations protect children from potentially fatal illnesses.

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

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

where y_{hdpt} is the outcome in health facility h in district d and province p at quarter t .³⁰ h represents the lowest level of government facility to which the health workers can refer their patients. This is the health post if it is operational; if not, the closest health center. The only exception is childbirths, which are always measured at the health center level, as that is where they are supposed to take place. $C_{hd}=1$ if facility h is located in a district randomly assigned to the

²⁹Health 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.

³⁰HMIS data should be transmitted to MoH monthly, but in practice (due to poor connectivity), reports are missing for some months and the information added to the following month. We aggregate the data at the quarterly level to smooth out monthly fluctuations due to this.

career treatment. We have data for 14 quarters, equally divided before and after the health workers' arrival, and $A_t=1$ after the health workers' arrival (4th quarter of 2012). To minimize composition bias and to test for robustness to facility fixed effect models, we restrict the sample to the facilities for which we have at least three observations before and after the health workers' arrival.³¹ Z_h is a vector of area characteristics, which includes the number of staff at the health post, cell network coverage, and the distribution of households between farms and villages described in Table 2. We control for the stratification variables, district-level high school graduation rate E_d , and provinces indicators ρ_p throughout. Standard errors are clustered at the level of randomization, the district.

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

Table 5 shows that indeed, career opportunities improve clinic utilization outputs. In particular, the number of women giving birth at a health center increases by 30% relative to the mean in control areas at baseline. The effect on institutional deliveries is thus the same order of magnitude as the effect of performance pay for clinics as evaluated in Rwanda (23% Basinga et al. 2011) and Cambodia (25% Van de Poel et al. 2014). Selection and incentive effects of similar magnitudes (22% each) are also found in the only firm study that identifies the two separately (Lazear 2000).

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

To provide support to our identifying assumption, in Table A.5 (Panel A) we run a placebo test where we split the pre-health worker period in two halves and test whether outcomes improve in treatment areas over time even in the absence of the health workers. Reassuringly, they do not. Finally, Table A.5 (Panel B) estimates (2) with facility fixed effects; the fact that all estimated δ coefficients remain stable provides evidence that they are not biased by time-invariant facility unobservables correlated with treatment.

5.2 Treatment Effect on Health Practices and Outcomes

To provide evidence on the effect of treatment on health practices and outcomes, we survey households in 47 randomly chosen communities located in each of the 47 districts where the health

³¹This restriction keeps 77% of the health posts and 70% of the health centers in the sample.

workers operate. We randomly choose 16 households in each community, surveying 738 in total.³² These surveys are administered by a team of enumerators who are trained by us and unconnected to the health workers or the Ministry of Health. As the main focus of the health worker job is mother and child health, we only survey households that contain at least one child under five. The survey contains modules on health and sanitation knowledge, health practices, incidence of illnesses and anthropometrics for the youngest child. Knowledge, practices, and illnesses are self-reported; deworming and immunization data are drawn from the child health card, and anthropometrics are measured by trained enumerators. We interview the main carer of the child, which is their mother in 90% of the cases and either a grandparent or a sibling in the remaining 10%. All questions are drawn from the DHS Zambia questionnaire, with the exception of the health knowledge module which we designed based on the health worker curriculum, and mid-upper arm circumference (MUAC), which the DHS does not measure.

Table 6 reports the estimates of:

$$y_{idp} = \alpha + \beta C_{id} + D_i \gamma + \delta E_d + \rho_p + \epsilon_{idp} \quad (5.1)$$

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

Column 1 shows that the average respondent answers 74% of the knowledge questions correctly and that this does not differ by treatment status. In contrast, treatment affects all the health practices we collect information on. In particular, Columns 2 and 3 show that children under 2 living in treatment areas are 5 percentage points more likely to be breastfed,³³ and their stools are 12 percentage points more likely to be safely disposed; these effects represent a 8% and 20% increase from the control group mean, respectively. Columns 4 and 5 show that treatment also increases the incidence of deworming treatments by 16% and the likelihood that the child is on track with the immunization schedule by 4.7 percentage points, which is 81% of the control group mean (5.8%).³⁴ Importantly, the treatment affects the incidence of immunizations for children who are young

³²The sample frame had 752 households. The 14 households difference is due to several factors. In some communities, safety concerns related to local political tensions forced the survey team to leave the community before completing surveying. In other communities, especially low-density communities where travel times between households could exceed one hour, the survey team was unable to find 16 eligible households within the allotted survey time. One household interview was lost due to malfunction of the mobile device on which the interview was recorded. The minimum number of households surveyed in a community was 13.

³³WHO recommends breastfeeding until the age of two years.

³⁴A child is defined to be on track if she has completed all immunizations required for her age. At age 3 months, this includes BCG, OPV 0-2, PCV 1-2, DPT-HepB-Hib 1-2, and rotavirus 1-2. At 4 months, this includes, additionally, OPV 3, PCV 3, and DPT-HepB-Hib 3. At 9 months, this includes OPV 4 if OPV 0 was not given, and measles 1.

enough to have been exposed to the health workers when their immunization period started (as shown in Column 5) but not for those that were too old to start the cycle when the health workers started working. This echoes the findings in Table 5 that show no difference in immunization rates between treatment and control areas before the health workers started working.

Columns 6-8 measure treatment effects on the incidence of three main illness symptoms: fever, diarrhea and cough. These are fairly common, as 47%, 26% and 45% of children in control areas had experienced them in the past two weeks. As it is widely acknowledged, self-reported symptoms can actually worsen as knowledge improves and individuals learn how to recognize them, so these effects are lower bounds. We find that treatment reduces the incidence of cough symptoms by 7 percentage points while leaving the others unchanged. Finally, Columns 9-12 show treatment effects on anthropometric measurements. We report weight-for-age z-scores and mid-upper arm circumference. The combination of these two allows us to measure both chronic and acute malnutrition.³⁵ Following WHO's guidelines, we use the -2SD and -3SD thresholds for weight-for-age z-scores to measure moderate and severe underweight, respectively, and 12.5cm and 11.5cm for MUAC to measure moderate and severe wasting, respectively (Food and Nutrition Technical Assistance Project 2011). According to these measures, 21% of the children in control areas are underweight, and 5% severely so. The incidence of wasting is much lower, with 3.6% of the children exhibiting some wasting and 1.4% severe wasting. These data, which match the corresponding DHS figures for rural Zambia (Government of Zambia 2014), suggest that these areas are characterized by high rates of chronic malnutrition but low rates of acute malnutrition.

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

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

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

The immunization series is complete at age 18 months with measles 2. Finally, we consider a child to be on track for vitamin A supplementation if she has ever been supplemented.

³⁵We did not measure weight-for-height, an alternative to MUAC for assessing acute malnutrition, for three reasons. First, compared to weight and MUAC, height measurement is more invasive, requiring, for children under two, laying the child down on a height board and having two enumerators hold the child while collecting the measurement. During survey piloting, many respondents (and the children themselves) balked at this procedure. Second, accurate height measurement is made difficult by high measurement error relative to standard effect sizes (Mwangome et al. 2012). Finally, MUAC is a more accurate predictor of mortality (Myatt et al. 2006).

6 Conclusion

Attracting effective employees is a core objective for all organizations. This can be a particularly challenging objective to achieve for public organizations because both effective performance (in, for example, generating health impact) and desirable employee attributes are difficult to measure. But the stakes to getting this right are high. Our paper has shown that offering a civil service position with career opportunities for community-based work attracts agents who deliver health services with substantial impact. This significant effect on health and well-being of communities is driven entirely by a selection effect of the types of agents drawn into the position.

The civil service job we study is one sometimes referred to as a “street-level bureaucrat”, a job where internalizing the utility of beneficiaries could be particularly helpful. Yet it was in just such a job that offering a career in the civil service, in posters that clearly attracted ambitious types, provided large impacts. Of course, the career opportunities which attracted ambitious types—a career in the Ministry of Health entail some social benefit, and the community-oriented nature of the job attracted a basic level of altruism across the board. But it is in precisely these types of jobs where it has been argued that adding individualistic-benefits, such as material or career opportunities, might attract the “wrong” type of individual. It is also here where our findings have implications for policy strategies such as maintaining the volunteer status of community-based work, or low salaries and lack of career opportunities in teaching and health professions (World Health Organization 2006; Lehmann and Sanders 2007).

The findings measure the productivity gains that come from effective selection via recruitment: treatment health workers provide more inputs at the same cost, since wages are the same across both treatments.³⁶ The fact that the health workers are recruited locally from the communities where they are meant to serve implies that there is no competition for talent across communities: career opportunities can thus be offered in each community without losing effectiveness, as each community can only hire from their own pool, and most communities in these areas have access to a pool of skilled individuals who are either unemployed or in low skills jobs.

While retention rates after 18 months are the same in the two groups, agents in the career incentives treatment might leave their posts for higher-ranked positions sooner than those in the control group. Whether this entails a welfare cost depends on whether they can be easily replaced and whether the government can use their skills in other jobs. In our context, replacement is straightforward; the number of applicants per post was above seven, and the government faces

³⁶Due to political constraints, all agents had to be paid the same amount. This implies that we cannot judge whether agents attracted by career opportunities have a higher reservation wage, such that their higher performance comes at a price; in other words, the government could get the agents in the control group to work for a lower wage. A priori, the difference in reservation wages between applicants in the two treatments is difficult to sign: that applicants to the career opportunities treatment are more skilled suggests that it might be positive, whereas the fact that they expect to move on to better-paid positions suggests that it might be negative (like interns are typically willing to forego compensation for the sake of career opportunities).

scarcity of health staff at all levels, such that promoting strong performers 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.

The benefits of attracting ambitious and talented individuals to service delivery in remote areas go beyond the positive effect on the provision of public services. Before the program, 80% of the health workers, whose education credentials were sufficient to apply for nursing school, were engaged in subsistence farming or housework. By providing jobs with a career path, idle human capital was put to good use. Of course, we cannot quantify the opportunity cost of the health workers' time, namely the value of the activities they give up to become full time health workers, and the size of this difference between treatment and control. If productivity in these alternative occupations is increasing in the same qualities that make a health worker productive, the findings imply that the opportunity cost is higher in the group treatment; that is, the treatment draws in more productive farmers or houseworkers. By revealed preferences, we know that the private value of the health worker jobs must be at least equal to the private value of these activities. Otherwise these individuals would have not switched occupations. To the extent that the social value produced by career health workers in their new jobs exceeds the loss in social value from agriculture and housework, this is a net positive effect for society.

A career-oriented position for community-based public services delivery allows the Weberian vision of the modern state to meet two goals which fuel each other: economic development, in the form of skilled jobs which attract and train talent nationwide, and the effective provision of public services.

Figure 1.A: Recruitment poster: treatment group

**REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH**



DESIGNATED HEALTH CENTRE:	FOR POSTING AT:

TRAINING OPPORTUNITY

ONE-YEAR COURSE IN COMMUNITY HEALTH

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

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

BENEFITS:

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

QUALIFICATIONS:

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

APPLICATION METHOD:

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

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

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

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

Figure 1.B: Recruitment poster: control group

**REPUBLIC OF ZAMBIA
MINISTRY OF HEALTH**



DESIGNATED HEALTH CENTRE:	FOR POSTING AT:

TRAINING OPPORTUNITY

ONE-YEAR COURSE IN COMMUNITY HEALTH

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

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

BENEFITS:

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

QUALIFICATIONS:

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

APPLICATION METHOD:

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

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

**Want to serve your community?
Become a CHW!**

CLOSING DATE: 30th JULY 2010.

Only shortlisted candidates will be contacted for interview.

Table 1: Treatment Effect on Applicants' Traits

	treatment	control	p-values	sample
Panel A: Talent				
O-levels total exam score	24.8 (9.81)	23.3 (9.35)	.019	applicants
O-levels passed in biology and other natural sciences	1.44 (.858)	1.24 (.888)	.006	applicants
Average test score at training [0-100] *	69.2 (7.23)	68.0 (6.75)	.067	recruited agents
Panel B: Career ambition				
Aims to be a higher-rank health professional in 5-10 years	.246 (.431)	.188 (.391)	.026	applicants
Psychometric scale: Career orientation [1-5]	3.30 (1.050)	3.08 (.939)	.025	recruited agents
Panel C: Other regarding preferences				
Perceives community interests and self-interest as overlapping	.839 (.367)	.842 (.364)	.975	applicants
Psychometric scale: Pro-social motivation	3.64 (.541)	3.63 (.541)	.623	recruited agents
Psychometric scale: Desire for positive pro-social impact [1-5]	4.43 (.444)	4.43 (.509)	.824	recruited agents
Psychometric scale: Affective commitment to beneficiaries [1-5]	3.81 (1.153)	3.83 (1.170)	.873	recruited agents
Donation to local hospital (dictator game)	4063 (4018)	3922 (3937)	.739	recruited agents
Main goal is "career advancement" vs. "service to community"	.138 (.346)	.055 (.228)	.015	recruited agents

Notes: Sample "applicants" includes all the 1585 applicants who were interviewed for the position, sample "recruited agents" includes the 307 agents who were trained and deployed. Treatment=1 if the health worker is recruited in a district where career opportunities were made salient. Columns 1 and 2 show means and standard deviations in parentheses while Column 3 reports the p-values of the null hypothesis that the career treatment effect equals zero conditional on stratification variables and with standard errors clustered at the district level. Ordinary levels or O-levels are administered by the Examinations Council of Zambia (ECZ) to 12th-grade students, the highest grade in the Zambian secondary education system. O-levels total exam score is constructed as the sum of inverted O-levels scores (1=9, 2=8, and so on) from all subjects in which the applicant wrote the exam, so that larger values correspond to better performance. O-levels passed in biology and other natural sciences equals the number of O-levels passed in biology, chemistry, physics, science and agricultural science. Average test score at training equals the average score in 11 tests on basic medical practices taken during the training program. 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?". Career orientation: from Career-Calling Orientation scale (Wrzesniewski, A. et al., "Jobs, Careers, and Callings: People's Relations to Their Work Journal of Research in Personality," 1997, 31, 21-33. The psychometric measures of pro-sociality are taken from Grant, A., "Does Intrinsic Motivation Fuel the Prosocial Fire? Motivational Synergy in Predicting Persistence, Performance, and Productivity," Journal of Applied Psychology, 2008, 93, 48-58. Perceives interests as overlapping: Adapted Inclusion of Others in Self scale (Aron, A. et al., "Including Others in the Self," European Review of Social Psychology, 2004, 15, 101-132). Applicants are asked to choose between sets of pictures, each showing two circles (labeled "self" and "community") with varying degrees of overlap, from non-overlapping to almost completely overlapping. This variable equals 1 if the respondent chooses the almost completely overlapping picture, 0 otherwise. Donation to local hospital: trainees are given 25,000 Kwacha (approximately \$5) and invited to donate any portion (including nothing) to the local hospital to support needy patients. Main goal: trainees are asked to choose between community impact and career advancement as the main reason they do the job.

Table 2: Eligible population by treatment (randomization balance)

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

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

Table 3: The effect of career opportunities on the number of visits

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

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

Table 4: Compensation mechanisms

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

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

Table 5: The effect of career opportunities on facility utilization

Dependent variable: total over each quarter 2011:1-2014:2	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	institutional deliveries	postnatal (0-6 weeks) visits	children under 5 visited	children under 5 weighed	children under 1 receiving BCG vaccinations	children under 1 receiving polio vaccinations	children under 1 receiving measles vaccinations	average standardized effect
Treatment	0.134 (10.37)	-12.75 (9.435)	-65.96 (142.9)	-73.05 (133.5)	10.99 (11.97)	-0.374 (9.145)	1.707 (10.01)	-0.005 (0.156)
After	4.408 (4.253)	15.47*** (5.096)	61.71 (62.82)	108.7* (63.33)	-1.270 (4.540)	-1.177 (3.701)	-1.167 (3.553)	0.043 (0.059)
Treatment*After	13.97** (6.242)	7.919 (9.467)	312.0*** (97.24)	277.9** (109.2)	7.147 (8.838)	14.65*** (4.802)	11.19 (7.229)	.277*** (0.092)
Area characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean of dependent variable in control in year 1	46.7	49.9	1312.8	1261.5	89.8	73.9	73.6	na
Adjusted R-squared	0.553	0.213	0.253	0.253	0.151	0.151	0.118	na
Number of facilities	89	118	123	123	121	120	121	na
Number of observations	1268	1529	1618	1610	1518	1530	1535	1097

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

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

Dependent variable	Information		Health practices		Incidence of illness		Anthropometrics		All			
	% of correct answers in medical knowledge test		=1 if child under 2 yr old is breastfed	=1 if child's stool are safely disposed	=1 if child's deworming treatments	=1 if child is on track with immunization schedule	=1 if child has experienced fever in the last two weeks	=1 if child has experienced cough in the last two weeks		=1 if weight for age z score <2 or severely undernourished	=1 if MUAC <12.5 (moderately or severely wasted)	=1 if MUAC <11.5 (severely wasted)
Treatment	0.002 (0.010)		0.051** (0.023)	0.121*** (0.039)	0.225* (0.129)	0.047** (0.020)	-0.003 (0.037)	0.037 (0.027)	-0.053* (0.030)	-0.028* (0.015)	-0.023 (0.015)	0.108*** (0.036)
Household controls	yes		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Child controls	no		yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Mean of dep var in control	.740		.641	.595	1.44	0.58	.469	.255	.210	.051	.036	.014
Adjusted R-squared	0.057		0.561	0.161	0.263	0.024	0.077	0.017	-0.006	0.003	0.018	0.017
N	738		613	736	659	462	731	731	582	582	581	376

Notes: OLS estimates, standard errors clustered at the district level. Treatment=1 if the health worker is recruited in a district where career opportunities were made salient. The medical knowledge test contains 14 questions on topics that CHAs are supposed to cover; these questions were drafted by the researchers in consultation with CHA program officials and the CHA curriculum. Breastfeeding and stool disposal are self-reported. In line with UNICEF (2019), we define stools as safely disposed if flushed in toilet/larrine. Deworming, immunization data and schedule are as reported in the child health card. A child is defined as on track if they have completed all immunizations required for their age in months. The immunization sample is restricted to children who were 3 months or younger (including unborn) when the CHAs started working. Thresholds for weight-for-age and MUAC are taken from WHO guidelines; following these, data are restricted to children between 6-59 months. Household controls include size, education level of the respondent, and number of assets. Child controls include age and gender. All regressions include the stratification variables. The average standardized treatment effect is computed using the methodology in Kling et al.(2001) after recoding all variables so that higher values indicate better outcomes. For weight-for-age z score and MUAC we use the lowest thresholds.

Table A.1: Experimental checks

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

Notes: Treatment=1 if the health worker is recruited in a district where career opportunities were made salient. To measure the "Weight given to the following reasons," CHAs were given 50 beans and asked to allocate them on cards, listing different reasons in proportion to the importance of each reason for working as CHA. The cards were scattered on a table in no particular order. "At entry" variables are drawn from a survey administered at the beginning of the training program. "on the job" variables are drawn from a survey administered eight months after the CHAs started working. We show means with standard deviations in parentheses and the p-value of the test of equality of means based on standard errors clustered at the district level.

Table A.2: Validation of household visit measures

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

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

References

- Akerlof, George A. and Rachel E. Kranton**, “Identity and the Economics of Organizations,” *The Journal of Economic Perspectives*, 2005, 19 (1), 9–32.
- Alatas, Vivi, Abhijit Banerjee, Rema Hanna, Benjamin Olken, and Ririn Purnamasari**, “Self-Targeting: Evidence from a Field Experiment in Indonesia,” *Journal of Political Economy*, forthcoming, 2015.
- Ashraf, Nava, James Berry, and Jesse M Shapiro**, “Can Higher Prices Stimulate Product Use? Evidence from a Field Experiment in Zambia,” *American Economic Review*, 2010, 100 (5), 2383–2413.
- , **Oriana Bandiera, and B Kelsey Jack**, “No margin, no mission? A field experiment on incentives for public service delivery,” *Journal of Public Economics*, 2014, 120, 1–17.
- Basinga, Paulin, Paul J Gertler, Agnes Binagwaho, Agnes LB Soucat, Jennifer Sturdy, and Christel MJ Vermeersch**, “Effect on maternal and child health services in Rwanda of payment to primary health-care providers for performance: an impact evaluation,” *The Lancet*, 2011, 377 (9775), 1421–1428.
- Bénabou, Roland and Jean Tirole**, “Intrinsic and Extrinsic Motivation,” *Review of Economic Studies*, 2003, 70, 489–520.
- and – , “Incentives and Prosocial Behavior,” *The American Economic Review*, 2006, 96 (5), 1652–1678.
- and – , “Identity, morals, and taboos: Beliefs as assets,” *The Quarterly Journal of Economics*, 2011, 126 (2), 805–855.
- Bertrand, Marianne, Robin Burgess, Arunish Chawla, and Guo Xu**, “The Costs of Bureaucratic Rigidity: Evidence from the Indian Administrative Service,” *mimeo, STICERD, LSE*, 2016.
- Besley, Timothy and Maitreesh Ghatak**, “Competition and Incentives with Motivated Agents,” *American Economic Review*, 2005, 95 (3), 616–636.
- and **Torsten Persson**, *State Capacity, Conflict and Development*, Vol. 78, *Econometrica*, 2010.
- Brehm, John and Scott Gates**, *Working, shirking, and sabotage: Bureaucratic response to a democratic public*, University of Michigan Press, 1999.
- Celhay, Pablo, Paul Gertler, Paula Giovagnoli, and Christel Vermeersch**, “Long-Term Effects of Temporary Incentives on Productivity in Medical Care Clinics,” 2015.
- Collier, Paul**, “Rethinking the Provision of Public Services in Post-Conflict States,” *mimeo CSAE*, 2009.
- Dal Bó, Ernesto, Frederico Finan, and Martin A. Rossi**, “Strengthening State Capabilities: The Role of Financial Incentives in the Call to Public Service,” *The Quarterly Journal of Economics*, 2013, 128 (3), 1169–1218.

- de Poel, Ellen Van, Gabriela Flores, Por Ir, Eddy Van Doorslaer et al.**, “Can vouchers deliver? An evaluation of subsidies for maternal health care in Cambodia,” *Bulletin of the World Health Organization*, 2014, 92 (5), 331–339.
- Deserranno, Erika**, “Financial Incentives as Signals: Experimental Evidence from the Recruitment of Health Workers,” 2014. Working paper.
- Duflo, Esther, Rema Hanna, and Stephen P. Ryan**, “Incentives Work: Getting Teachers to Come to School,” *The American Economic Review*, 2012, 102 (4), 1241–1278.
- Food and Nutrition Technical Assistance Project**, “Anthropometry: Assessing Children Under 5 Pocket Reference,” 2011.
- Fryer, Roland**, “Teacher Incentives and Student Achievement: Evidence from New York City Public Schools,” *Journal of Labor Economics*, 2013, 31 (2), 373–427.
- Glewwe, Paul, Nauman Ilias, and Michael Kremer**, “Teacher Incentives,” *American Economic Journal: Applied Economics*, 2010, 2, 205–227.
- Government of Zambia**, “Zambia Demographic and Health Survey 2013-14: Preliminary Report,” Technical Report 2014.
- Kling, Jeffrey R, Jeffrey B Liebman, and Lawrence F Katz**, “Experimental analysis of neighborhood effects,” *Econometrica*, 2007, 75 (1), 83–119.
- Lazear, Edward and Paul Oyer**, “Personnel Economics,” *The Handbook of Organizational Economics*, 2012, p. 479.
- Lazear, Edward P.**, “Performance Pay And Productivity,” *American Economic Review*, 2000, 90 (2), 1346–1361.
- Lehmann, Uta and David Sanders**, “Community health workers: What do we know about them? The state of the evidence on programmes, activities, costs and impact on health outcomes of using community health workers,” *World Health Organization*, 2007, 2, 1–42.
- Miller, Grant and Kim Babiarz**, “Pay-for-Performance Incentives in Low- and Middle-Income Country Health Programs,” in “Encyclopedia of Health Economics,” Elsevier, 2014.
- **et al.**, “Effectiveness of Provider Incentives for Anaemia Reduction in Rural China: a Cluster Randomised Trial,” *BMJ: British Medical Journal*, 2012, 345.
- Muralidharan, Karthik and Venkatesh Sundararaman**, “Teacher Performance Pay: Experimental Evidence from India,” *Journal of Political Economy*, February 2011, 119 (1), 39–77.
- , **Nazmul Chaudhury, Jeffrey Hammer, Michael Kremer, and Halsey Rogers**, “Is There a Doctor in the House? Medical Worker Absence in India,” *mimeo*, 2011.
- Mwangome, Martha K., Greg Fegan, Ronald Mbunya, Andrew M. Prentice, and James A. Berkley**, “Reliability and Accuracy of Anthropometry Performed by Community Health Workers Among Infants Under 6 Months in Rural Kenya,” *Tropical Medicine and International Health*, 2012, 17 (5), 622–629.
- Myatt, Mark, Tanya Khara, and Steve Collins**, “A Review of Methods to Detect Cases of

- Severely Malnourished Children in the Community for their Admission into Community-based Therapeutic Care Programs,” *Food and Nutrition Bulletin*, 2006, *27* (3 Supplement), S7–S23.
- North, Douglass C.**, “Institutions,” *The Journal of Economic Perspectives*, 1991, *5* (1), 97–112.
- Northcote, Stafford and C.E. Trevelyan**, “Report on the Organisation of the Permanent Civil Service,” *Report to the House of Commons, London*, 1853.
- Oyer, Paul and Scott Schaefer**, “Chapter 20 - Personnel Economics: Hiring and Incentives,” in “Handbook of Labor Economics,” Vol. 4, Elsevier, 2011.
- Prendergast, Canice**, “The motivation and bias of bureaucrats,” *The American Economic Review*, 2007, pp. 180–196.
- Rockoff, Jonah E, Douglas O Staiger, Thomas J Kane, and Eric S Taylor**, “Information and Employee Evaluation: Evidence from a Randomized Intervention in Public Schools,” *The American Economic Review*, 2012, pp. 3184–3213.
- Rothstein, Jesse**, “Teacher Quality Policy When Supply Matters,” *American Economic Review*, January 2015, *105* (1), 100–130.
- Roy, Andrew D.**, “Some Thoughts on the Distribution of Earnings,” *Oxford Economic Papers*, 1951, *3* (2), 136–146.
- Staiger, Douglas O and Jonah E Rockoff**, “Searching for effective teachers with imperfect information,” *The Journal of Economic Perspectives*, 2010, *24* (3), 97–117.
- Weber, Max**, *Economy and Society*, Vol. 4th Edition, 1956, Tübingen, 1922.
- Wilson, James Q.**, *Bureaucracy: What government agencies do and why they do it*, Basic Books, 1989.
- World Health Organization**, “The world health report 2006: working together for health. Geneva: World Health Organization,” 2006.

WEB APPENDIX (For Online Publication only)

A Differences in sorting vs. differences in recruitment

We have shown that career opportunities attract applicants with different skills and preferences and that these differences persist among recruited health workers. The goal of this section is to assess whether recruited health workers in treatment and control differ also because recruitment panels choose different candidates. To do so, we test whether recruitment panels put different weights on these traits when choosing which candidates to nominate.

Recruitment panels have five members: the district health official, a representative from the health post’s associated health center, and three members of the local neighborhood health committee. Recruitment panels are exposed to the salience policy as they see the same posters as the candidates. This notwithstanding, they know much more about the actual job attributes and who would be suitable for the positions. Indeed, contrary to the applicants (whose only source of information was the recruitment poster), the two more senior panel members—the district health official and the health center representative—are employees of the Ministry of Health, and hence are familiar with career progression rules regardless of salience policy. The salience policy treatment is likely not as powerful, or perhaps entirely moot, for them.³⁷

To test whether treatment affects how panels choose candidates, Table A.7 estimates 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 nominated candidates and 0 otherwise. C_h equals 1 if health post h is in the career opportunities treatment and 0 if it is in the control group. X_i^j are individual characteristics, and the set J includes variables that are affected by salience policy (skills, pro-social preferences, career preferences) as well as age and gender, as the Government requires giving preference to women. The coefficients of interest are α_j^c and α_j^s , which measure the weight given to trait j in the career and control groups, respectively. Differences, if any, could be due to the fact that panels think that a given trait is more important for a career (community) job, or to the fact that panels in the two treatments face different pools. To account for this, we control for the average traits of the applicants in the same health post \bar{X}_h^j for all $j \in J$. To measure the strength of competition, we include the number of interviewed candidates in the same health post N_h . As in earlier specifications, we control for the stratification variables and cluster standard errors at the district level. Table 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 .

³⁷Further analysis, available upon request, shows that treatment does not affect panel composition.

Table A.7 shows that the strongest determinant of appointment is ability in both treatment and control groups: panels are between 17 and 23 percentage points more likely to appoint candidates at the top of the O-level exam score distribution within their health post. In the average health post, 21% of candidates are appointed; being at the top of the O-level exam score distribution doubles the probability of being selected. Still, as we know from Table 1, unobservable differences remained and the health workers recruited with career opportunities had significantly higher test scores during the training program. Table A.7 shows that recruitment panels in both treatment and control are more likely to appoint applicants with career ambitions and with pro-social preferences.

Turning to demographics, Table A.7 shows that recruitment panels in both treatment and control are about 9pp more likely to appoint women as directed by GRZ, yet the share of women drops by 2pp from applicant to nominated candidates in the treatment group and increases by 5pp in the control group. To shed light on this, we note that recruitment panels in the two groups face a different trade-off between gender and skills: among the candidates with top O-level scores, the share of women is 25% in the control group and 17% in the treatment group ($p=.025$). This creates a difference in gender balance between nominated candidates that gets further reinforced by MoH's affirmative action policy, bringing the share of women among deployed candidates to 44% in the treatment group and 57% in the control group. Regarding age, Table A.7 shows that this is the only dimension where panels seem to differ: treatment panels put a small positive weight on age (1 SD increase in age increases the probability of nomination by 7pp) while control panels do not, and the difference is precisely estimated. The trade-off between age and skill is also different in the two groups as applicants with top O-level scores are younger in the control group (25.7 vs 26.5, $p=.09$) but not in the treatment group. Taken together, these imply that nominated and selected health workers in the treatment group are on average one year older than those in the control group.

Ultimately, the evidence in this Section shows that career opportunities attract applicants who differ on the key dimensions of skill and career ambition, but [do] not [affect/change?] the weight that recruitment panels put on these attributes, so that appointed health workers differ because they came from different pools, rather than having been chosen differently by the recruitment panels.

B Time Use

We surveyed the health workers in May 2013, nine months after they started working.³⁸ The survey asked the health workers to report the frequency of emergency visits typically done outside of working hours. The median health worker does one emergency call per week, and Column 8 shows that this holds true for health workers in both groups.

The time use survey is designed to collect information on hours worked and the time allocated to different activities. This allows us to assess whether the differences in performance documented above are due to differences in time allocation across tasks; namely, whether treatment health workers do more visits because they devote more time to that task. To collect information on the latter, health workers were given 50 beans and asked to allocate the beans in proportion to the time devoted to each activity within each task. Besides household visits, community meetings and time at the health post, we allow for two further activities: traveling and meeting with supervisors. For each activity, we calculate the share of time devoted to each activity by dividing the number of beans allocated to that activity by the total number of beans allocated to all activities. The share of time allocated to these five activities is .32, .22, .16, .22 and .09, respectively. We then estimate a system of equations for hours worked and share of time devoted to each task, omitting traveling. Table A.3 reports our findings.

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

Columns 2-5 show that health workers in the two groups allocate their time in a similar manner; thus, observed performance differences are not driven by differences in time allocation. Two, possibly complementary, explanations are possible. First, treatment health workers might work more effective hours—e.g., by taking shorter breaks over the 43 weekly hours. Second, treatment health workers might be more efficient at their jobs. These effects might be strengthened by peer externalities because each health worker works alongside another health worker hired through the same treatment, thus health workers in the treatment group are more likely to have a highly productive peer than health workers in the control group. Peer effects might be driven by imitation, social comparison or a perception that the other health worker competes for the same promotion.

Finally, Table A.4 tests whether health workers in the two groups allocate their time differently within each activity, namely whether they have different work “styles.” Panel A shows that health

³⁸To implement this survey, we took advantage of a refresher course organized by the Government in the health worker School in Ndola. Of the 307 health workers, 298 (97%, equally split by treatment groups) came to training and took part in the survey.

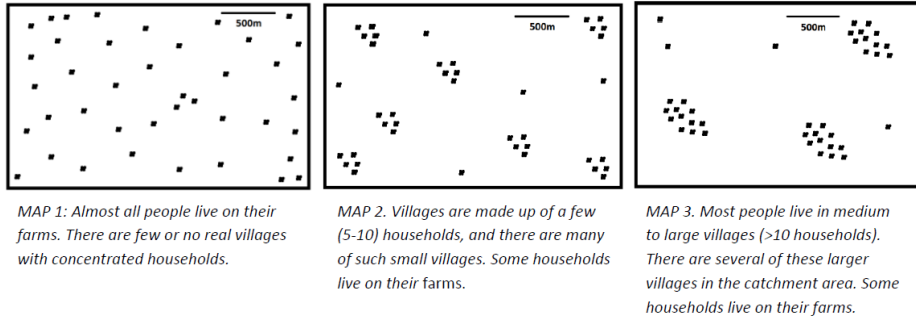
workers in the control group devote more time to counseling, inspections, and visiting sick members, but, taken one-by-one, these differences are small and not precisely estimated. Health workers in the career opportunities treatment devote 1.6% less time to filling in forms and receipts and submitting SMSs, but the difference is not precisely estimated at conventional levels. Because the quality of reports is the same, this implies that career health workers 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 health workers' time in the control group, but only 18% in the career treatment. As with household visits, there is no evidence that health workers in the career treatment collect fewer data at the health post level or that these data are of worse quality. Health workers in the two groups are equally likely to submit HMIS reports in a given month, and these are equally accurate. Thus, the evidence suggests that health workers in the career treatment are more productive, and this frees time for other tasks.

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. 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 D.

Eligible population and catchment area characteristics

- *Number of staff in health post* (source: district health officials survey, by phone) - Total number of nurses, environmental health technicians, and clinical officers assigned to the health post, as reported by district health officials we surveyed by phone.
- *Geographical distribution of households in catchment area* (health worker survey, in person, at refresher training) - Health workers 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 health worker individually so that two health workers from the same health post could give different answers. For the 5 out of 161 cases in which the two health workers gave different answers, we used the information provided by supervisors to break the tie.



- *Poor cell network coverage* (source: attempted phone calls) - We attempted to call all health workers 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 health workers during this period.

Experiment Validation


- Relative weight variables are derived from a survey question (health worker survey, in person, at training) that asked the trainees to allocate 50 beans between different potential motivations for applying to the health worker position: “good future career,” “allows me to serve the community,” “earns respect and high status in the community,” “pays well,” “interesting job,” “allows me to acquire useful skills,” and “offers stable income.”
- *Expects to be employed in MoH in 5-10 years* (source: health worker survey, in person, at interview) - Circled any combination of being a “community health worker,” “nurse,” “environmental health technician,” “clinical officer,” or “doctor” in response to the question, “When you envision yourself in 5-10 years’ time, what do you envision yourself doing?”

Performance in Service Delivery

Household Visits

Source: SMS Receipts

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

 MINISTRY OF HEALTH HOUSEHOLD VISIT RECEIPT		CHA ID: <input type="text"/>
1	START TIME: <input type="text"/> : <input type="text"/> : <input type="text"/>	
	END TIME: <input type="text"/> : <input type="text"/> : <input type="text"/>	
	DATE: <input type="text"/> / <input type="text"/> / 20 <input type="text"/>	
2	Client's Name <input type="text"/>	
	Client's Village <input type="text"/>	Household ID <input type="text"/>
	Client's Phone Number (if available) <input type="text"/>	
	I, the Client, certify that this receipt is truthful and accurate. CLIENT'S SIGNATURE <input type="text"/>	

Source: HMIS (monthly reports)

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

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

Time Use

Source: health worker survey, in person, at refresher training

- *Number of hours worked in a typical week* - Health workers were asked "In a typical week, how many total hours do you spend doing health worker 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* - Health workers 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 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, health workers 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 health worker.

- 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*

Health workers' observable traits

Skills

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

Applicants' Preferences and Motivations

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

I am happy to inform you that we have recently received a small donation from an outside donor to support the Community Health Assistants. In a moment, you will each receive an equal portion of this outside donation.

While the money is yours to keep, the donor has also requested that we provide you with an opportunity for you to share this gift with the community. This is an opportunity to support people in this community who are sick but are unable to afford the health care that they need. As you know, there are many such people in the communities from where you come from and also here in Ndola. They get sick, but because they are very poor, they are not able to get the health care that they need.

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

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

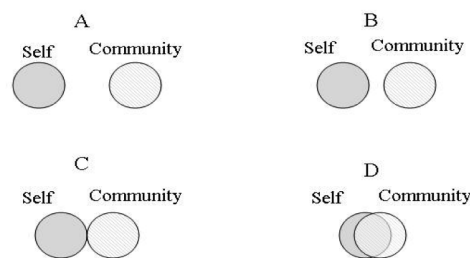
I am happy to announce now that the donor is able to provide each of you with 25,000 Kwacha.

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

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

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

- *Perceives community interests and self-interest as overlapping* (source: health worker survey, in person, at interview) - Based on the “Adapted Inclusion of Others in Self (IOS) scale”³⁹ 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 colleagues⁴⁰ as a measure of self-other inclusion and relationship closeness. The Continuous IOS makes use of the basic design of the original IOS,⁴¹ 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 behavior⁴² and connectedness to the community.⁴³ 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.



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

Psychometric Scales

Each measure (source: baseline survey) takes on a value between 1 and 5 and represents, among the statements listed below, the extent to which the applicant agreed, on average. Levels of agreement

³⁹Aron, Arthur and others, "Including Others in the Self", *European Review of Social Psychology* 15, 1 (2004), pp. 101-132.

⁴⁰Aron, Arthur and Elaine N. Aron and Danny Smollan, "Inclusion of Other in the Self Scale and the Structure of Interpersonal Closeness", *Journal of Personality and Social Psychology* 63, 4 (1992), pp. 596.

⁴¹http://www.haverford.edu/psych/ble/continuous_ios/originalios.html

⁴²Schmuck, Peter and Schultz, Wesley P, *Psychology of sustainable development* (Springer Science & Business Media, 2012).

⁴³Mashek, Debra and Lisa Cannaday and June Tangney, "Inclusion of Community in Self Scale: A Single-item Pictorial Measure of Community Connectedness", *Journal of Community Psychology* 35 (2007), pp. 257-275.

are 1 (strongly disagree), 2 (disagree), 3 (neither agree nor disagree), 4 (agree), and 5 (strongly agree). The psychometric scales came from validated scales used in employment surveys on pro-social motivation and career orientation. Each variable is the average of the item scores within each psychometric scale. For instance, in a scale with three items, the variable value equals the sum of levels of agreement for all items divided by three. It represents the average level of agreement with the included items.

- *Career orientation* - Adapted from (Wrzesniewski, Amy and others, "Jobs, Careers, and Callings: People's Relations to Their Work", *Journal of Research in Personality* 31 (1997), pp. 21-33). In contrast to *Calling* below, individuals with high career orientation tend to have a deeper personal investment in their work and mark their achievements not only through monetary gain, but through advancement within the occupational structure. This advancement often brings higher social standing, increased power within the scope of one's occupation, and higher self-esteem for the worker.⁴⁴ 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 health worker in five years" (reverse-scored).
- *Pro-social motivation (pleasure-based)* - Adapted from (Grant, Adam M., "Does Intrinsic Motivation Fuel the Prosocial Fire? Motivational Synergy in Predicting Persistence, Performance, and Productivity," *Journal of Applied Psychology* 93, 1 (2008), pp. 48-58) and consists of the following items: "Supporting other people makes me very happy," "I do not have a great feeling of happiness when I have acted unselfishly" (reverse-scored), "When I was able to help other people, I always felt good afterwards," and "Helping people who are not doing well does not raise my own mood" (reverse-scored).
- *Desire for positive pro-social impact* - Adapted from (Grant, Adam M., "Does Intrinsic Motivation Fuel the Prosocial Fire? Motivational Synergy in Predicting Persistence, Performance, and Productivity," *Journal of Applied Psychology* 93, 1 (2008), pp. 48-58). This measure provides an index of the degree to which an individual desires and benefits psychologically from the positive impact of her work on others. The scale consists of the following items: "It is important to me to do good for others through my work," "I care about benefiting others through my work," "I want to help others through my work," "I want to have positive impact on others through my work," "I get motivated by working on tasks that have the potential to benefit others," "I like to work on tasks that have the potential to benefit others," "I prefer to work on tasks that allow me to have a positive impact on others," "I do my best when I'm working on a task that contributes to the well-being of others," "It is important to me to have the opportunity to use my abilities to benefit others," "It is important to me to make a

⁴⁴Bellah, Robert N. and others, *Habits of the Heart: Individualism and Commitment in American Life*, p. 66. (University of California Press, Berkeley, CA, 1988).

positive difference in people's lives through my work," "At work, I care about improving the lives of other people," and "One of my objectives at work is to make a positive difference in other people's lives."

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

D Data Sources

- **Source: Application** (sample: all applicants) - Applications were submitted from August-September 2010. The initial application stage was comprised of the initial application form, which includes fields for gender, date of birth, village of residence, educational qualifications. The application form also included a question asking through what means the applicant first learned of the health worker job opportunity: recruitment poster, facility health worker, community health worker, government official, word-of-mouth, or "other."
- **Source: Interview Candidate Questionnaire** (sample: subset of applicants called for an interview) - Ranking questionnaires were filled and collected from September to October 2010. If applicants met the basic criteria noted above, they were invited for interviews, and asked to complete a questionnaire on the interview day. The questionnaire (written in English) included a series of questions about the interviewee's demographic background, community health experience, social capital, and work preferences and motivations. Notably, we included a measure employed by social psychologists, "Inclusion of Others in Self"⁴⁵ to measure connection with the community. The questionnaire stated that the answers would not be used for selection purposes but rather as part of a research project, although we cannot rule out that panelists could have seen the questionnaire or referred to it when making their decisions.
- **Source: Ranking Sheet** (sample: members of interview panels) - Ranking sheets were filled and collected from September to October 2010. Each panel consisted of five members: the district health officer, a representative from the health center, and three neighborhood health committee members. Once all interviews were completed, every member of the selection panel completed a private and individual ranking sheet by ranking their top ten candidates. This

⁴⁵Aron, Arthur and others, "Including Others in the Self", *European Review of Social Psychology* 15, 1 (2004), pp. 101-132.

ranking exercise occurred *before* panel members formally deliberated and discussed the candidates. After interviewing all candidates and deliberating, interview panels were requested to complete and submit a consensus-based “Selection Panel Report” that included fields for the two nominated candidates as well as three alternates.

- **Source: Baseline Survey** (sample: all trainees) - The baseline survey was conducted in June 2011 and consisted of five components:
 1. Questionnaire- Conducted one-on-one by a surveyor and collected information on the trainees’ socio-economic background and livelihoods, motivations to apply, and expectations of the program.
 2. Psychometric scales- A self-administered written exercise which gathered alternative information on motivations to apply, determinants of job satisfaction, and other character traits.
 3. Modified dictator game- An experimental game whereby students received a small donation and were given the opportunity to give some of it back for a good cause. It explored the altruistic nature of the students.
 4. Coin game- An experimental game that explored the risk-taking behavior of the students.
 5. Self-assessment- A three-hour exam with multiple choice questions to determine the knowledge on health matters that each student had prior to the training.

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

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

- **Source: SMSs** (sample: all deployed health workers) - All health workers 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.

E District Instruction Appendix

The health worker 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 health worker recruitment process. In addition, district health officials received “health center packages” for each participating health center in the district, which contained a set of posters and application forms and instructions for the health center representative on how to post posters and collect applications. The district health officials were to visit each health center and meet with the staff and neighborhood health committee members to introduce the program and distribute the health center packages, using the script provided to them in their packages. The script was only provided to the district health officials, and was addressed directly to them. It is unlikely that the applicants or health center staff were able to read this script themselves.

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

To Health center and Neighborhood Health Committee: I would like to you let you know about a new government program to strengthen the country’s health workforce. Applications are currently being accepted for a new Community Health Worker position. This is an opportunity for qualified Zambians to obtain employment and to advance their health careers. Opportunities for training to advance to positions such as Nurse and Clinical Officer may be available in the future. Successful applicants will receive 1 year of training, both theoretical and practical. All training costs, including transportation, meals and accommodation during the one-year training program, will be covered by the Ministry of Health. Please encourage all qualified persons to apply so that they can benefit from this promising career opportunity.

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

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

Table A.3: The effect of career opportunities on time allocation

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

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

Table A.4: Treatment effect on time use

Panel A: Time allocation during household visits

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

Panel B: Time allocation during work at the health post

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

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

Table A.5: The effect of career opportunities on facility utilization-robustness checks

Panel A. Placebo test		dependent variable: total over each quarter 2011:1-2014:2						
	women giving birth at the health center	postnatal (0-6 weeks) visits	children under 5 visited	children under 5 weighed	children under 1 receiving BCG vaccinations	children under 1 receiving polio vaccinations	children under 1 receiving measles vaccinations	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
Treatment	-1.778 (1.44)	-11.96 (9.500)	-6.543 (179.6)	-6.708 (161.2)	12.01 (13.55)	-3.588 (10.63)	3.288 (10.29)	
After	0.974 (3.841)	15.43*** (4.401)	91.98 (77.12)	153.3*** (72.91)	2.657 (5.049)	3.840 (3.901)	-2.953 (3.761)	
Treatment*After	12.37** (5.364)	8.603 (9.650)	363.9*** (116.2)	335.3*** (136.7)	7.946 (9.986)	11.76** (5.196)	12.65 (8.355)	
Placebo After	7.279*** (2.351)	0.0860 (4.539)	-64.40 (81.46)	-94.45 (66.40)	-8.334* (4.526)	-10.58** (5.209)	3.734 (4.280)	
Treatment*Placebo After	3.518 (6.015)	-1.476 (5.202)	-111.2 (141.4)	-123.6 (137.7)	-1.823 (7.674)	6.147 (7.853)	-3.057 (8.429)	
Area characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Mean of dependent variable in control in year 1	46.7	49.9	1312.8	89.8	73.9	73.9	73.6	
Adjusted R-squared	0.355	0.212	0.253	0.254	0.152	0.152	0.117	
Number of facilities	89	118	123	123	121	120	121	
Number of observations	1268	1528	1618	1610	1518	1530	1535	

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

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

Table A.6: Psychometric tests

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

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

Table A.7: Effect of career opportunities on candidate selection by panels

	=1 if		=1 if		
	nominated	p-value	nominated	p-value	
High relative exam score X treatment	0.235*** (0.0405)		0.201*** (0.0399)		
High relative exam score X control	0.174*** (0.0369)	2.56	0.148*** (0.0349)		.304
Aims to be a higher-rank health worker in 5-10 years X treatment	0.111*** (0.0363)		0.138*** (0.0404)		
Aims to be a higher-rank health professional in 5-10 years X control	0.0778** (0.0309)	.489	0.109*** (0.0378)		.565
Perceives interests as overlapping X treatment	0.0203 (0.0397)		0.0126 (0.0446)		
Perceives interests as overlapping X control	0.0981** (0.0392)	.169	0.0729* (0.0388)		.266
Female X treatment	0.0913** (0.0354)		0.113*** (0.0393)		
Female X control	0.0854*** (0.0311)	.901	0.0926** (0.0361)		.689
Age X treatment	0.0125*** (0.00355)		0.0134*** (0.00423)		
Age X control	0.00320 (0.00280)	.043	0.00463 (0.00301)		.079
Number of interviewees in health post	-0.0103*** (0.00358)		-0.00256 (0.00338)		
Applicant pool controls		no		yes	
Adjusted R-squared		0.149		0.141	
N		1269		1230	

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