Promotions and Productivity: The Role of Meritocracy and Pay Progression in the Public Sector

Erika Deserranno, Philipp Kastrau, and Gianmarco León-Ciliotta*

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Abstract

We study promotion incentives in the public sector through a field experiment with the Ministry of Health in Sierra Leone. The experiment introduces exogenous variation in the meritocracy of promotions from health worker to supervisor positions and in health workers' perceptions of pay progression upon promotion. Ten months later, our findings reveal that enhancing the meritocratic nature of promotions leads to a 22% increase in health workers' productivity. Greater perceived pay progression in a meritocratic system boosts productivity by 23%, whereas in a less meritocratic system, it decreases productivity by 27%. This reduction is consistent with a negative morale effect.

JEL Codes: M51, M52, J31, D73. **Keywords**: Promotions, Meritocracy, Pay Progression, Worker Productivity

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1 Introduction

Public sector organizations often refrain from directly linking promotions to performance, instead opting for rigid criteria based on seniority or discretionary systems susceptible to favoritism (Sahling, Schuster, and Mikkelsen 2018; Shepherd 2003). Does this trend stem from a lack of receptiveness of public sector workers to merit-based promotions? Leveraging a field experiment with a large public sector organization, we show that public sector workers are indeed responsive to merit-based promotions, uncovering considerable potential to enhance public service delivery. We argue that the implementation of a more meritocratic promotion system is particularly important in settings with high salary progression, where higher-level officials earn substantially more than their lower-level counterparts. In such settings, the absence of a merit-based system may be perceived as unfair and demotivate employees at the lower tiers. Overall, this paper underscores the importance for organizations to strike a balance between offering large promotion rewards and adhering to performance-based promotion rules to increase the productivity of lower-tier workers.

We design a large field experiment in collaboration with the Ministry of Health in Sierra Leone in nearly 400 health units across the country. Each health unit comprises an average of eight Community Health Workers (CHWs), who provide basic health services to households in their community, and one Peer Supervisor (PS), who advises and monitors the CHWs. Whenever a PS position becomes vacant, one CHW in that health unit is offered the job. Prior to our experiment, promotion decisions were at the discretion of the local health authority, and were subject favoritism. The experimental design creates random variation in the *actual* promotion rule by transitioning half of the health units to a new promotion system, which promotes CHWs based on the quantity of health services provided and their quality (visit length). This change significantly alters workers' perceptions of meritocracy: under the original promotion system, only half of the CHWs viewed

the system as meritocratic, compared to 80% in the new system. This random variation in the promotion rule is cross-randomized with variation in *perceived* pay progression. Given the low initial awareness of PS pay, where over two-thirds of CHWs were unaware of PS pay, we informed a random subset of CHWs about the actual PS compensation, prompting them to adjust their beliefs towards the truth and influencing their perceived pay progression.

We utilize our 2×2 research design to evaluate how workers' motivation to ascend the organization's ladder – and consequently, their productivity – is influenced by (i) the extent to which promotion rules are performance-based (meritocracy), (ii) the size of the expected rewards from promotions (perceived pay progression), and (iii) the interaction between the two. The effects are evaluated by gathering data on worker performance from a random sample of households ten months after the implementation of the new promotion rule. Performance is assessed broadly, encompassing measures incentivized under the meritocratic promotion system, such as the number and length of visits, as well as other aspects like household targeting, which are not directly incentivized.

We present two main sets of results. First, we show that a more meritocratic promotion rule increases the number of visits provided by the average worker by 22%. The productivity boost is stronger for high-performing workers with better chances of promotion in a meritocratic regime. The effect is stronger for workers who expect the value of the promotion to be large – i.e., those who are likely to see the PS retire soon and those who perceive pay progression to be steep at baseline. Importantly, the increase in visits does not compromise service quality: there is no reduction in visit length or worse household targeting.

Second, we show that steeper perceived pay progression has diverging effects: in the new meritocratic system, it raises the number of visits by 23%; in the old (less meritocratic) system, it reduces visits by 27%. This indicates that steeper perceived pay progression motivates the workers to climb the organization's ladder and prompts an increase in effort only when promotions are performance-based. When

promotions are not performance-based, steeper perceived pay progression instead demotivates workers. We provide suggestive evidence that this is because workers perceive the large pay gap as unfair if the system does not reward highly-productive workers, leading to a negative morale effect that decreases their motivation.

This paper contributes to different strands of the literature. First, it adds to recent literature on the personnel economics of the state. This literature often attributes low productivity of public-sector workers to weak incentives, insufficient monitoring, or inadequate selection (Finan, Olken, and Pande 2017; Deserranno 2019; Xu et al. 2023). Our findings indicate that in the public sector of developing countries, the fact that pay progression is often steeper than in higher-income countries and that promotions are less meritocratic (see Figure A.1) may constrain these government's capacity to provide high-quality public services. Our results also indicate that, to the extent that meritocratic promotions are infeasible, rules-based systems may dominate discretion (or non-meritocratic systems) due to morale effects.

Second, this paper extends the literature on promotion incentives, which has largely been theoretical (Lazear and Rosen 1981; Rosen 1986; Gibbons and Murphy 1992; Gibbons and Waldman 1999a,b). Recent empirical studies have observed the positive effects of increased upward mobility on worker performance when a new senior position becomes "attainable," while keeping the promotion rule constant (Karachiwalla and Park 2017; Nieddu and Pandolfi 2022; Bertrand et al. 2020; Li 2020). We complement this literature by assessing the causal impact of a more meritocratic promotion rule on worker productivity and its interaction with perceived pay progression.

Finally, this study contributes to the literature on pay inequality and worker performance. Existing empirical research primarily focuses on *horizontal* pay inequalities among workers in the same layer of an organization, while shutting down dynamic incentives (Card et al. 2012; Mas 2017; Breza, Kaur, and Shamdasani 2017). In contrast to these studies, and in line with Cullen and Perez-Truglia (2022), we

shift our attention to *vertical* pay inequalities between upper- and lower-tier workers for which the theoretical predictions are less clear. While steeper pay progression can potentially demotivate workers who are averse to vertical pay inequalities, it can also prompt an increase in effort through career incentives. Understanding which of the two effects prevails is of policy relevance given the recent rapid growth of the manager-worker pay ratio (Ashraf and Bandiera 2018; Shepherd 2003).

2 Context and Research Design

2.1 The Community Health Worker Program in Sierra Leone

In 2012, Sierra Leone's Ministry of Health and Sanitation (MoHS) established its first national community health worker (CHW) program. The program is organized around Peripheral Health Units (PHUs), small health posts staffed with doctors and nurses. Each PHU has typically a catchment area of seven to ten villages with one Community Health Worker (CHW) per village and one Peer Supervisor (PS) per PHU.[1]

The role of the CHWs is to provide a basic package of healthcare services at the community level through home visits. They support expecting mothers and young children by providing health education, pre- and post-natal check-ups, basic medical care, and referrals to health clinics.

CHWs are hired locally and typically have no experience in the health sector before joining the program. The role of the PS is to ensure that each CHW acquires the skills and knowledge necessary to provide primary care services. They do so by training them monthly and accompanying them on household visits. Almost all PSs have previous experience as a CHW, and have thus already acquired health knowledge.

CHWs and PSs are part-time employees who typically have a secondary occupa-

[1]The CHW program was reorganized in February 2017. The updated program effectively re-employed all previously engaged CHWs and PSs from the earlier program and expanded by recruiting additional staff.

tion such as farming, or small shop-keeping. In our sample, CHWs and PSs report dedicating an average of 18 and 11 hours per week, respectively, to their CHW/PS roles. CHWs are paid 150,000 SLL per month (17.5 USD) while PSs are paid 250,000 SLL (29.2 USD). Despite working fewer hours, PSs earn 67% more than CHWs, resulting in a pay gap. Based on self-reported hours, the hourly wage of PSs is 2.7 times higher than that of CHWs.

As with most public-sector employees, CHWs and PSs are seldom fired. PSs usually leave their jobs at retirement when they turn 55 years old (Social Security Administration Report 2019). When a PS position becomes available, one of the CHWs in that PHU is promoted. The competition for a promotion thus happens within the PHU and PSs are never pushed out by "upstart" high-performing CHWs.

The District Health Management Teams (DHMTs), which oversee the implementation of the CHW program at the district level, are in charge of the promotions, but they typically delegate these decisions to the head of the PHU (the "PHU in-charge"), who is responsible for personnel and administrative matters. The system is reportedly subject to patronage and nepotism. Our data indicate that CHWs perceive this system as only partially meritocratic, and believe that connections to the PHU in-charge is a key predictor of promotions. Indeed, only 41% of the CHWs surveyed reported that the PS was the best-performing CHW when promoted, and 50% reported perceiving the system as non-meritocratic at baseline, a finding we revisit in Section 3.1.

2.2 Research Design

Our experiment took place in 372 PHUs spread across Sierra Leone and covers 372 PSs and 2,009 CHWs. These PHUs were cross-randomized into two treatment arms: (1) the "meritocratic promotions treatment" (T_{merit}), which introduced a more meritocratic promotion regime and (2) the "pay progression information treatment" (T_{pay}), which provided information to CHWs about the supervisor's pay, and which

created variation in workers' *perceived* pay progression.[2]

Meritocratic promotions treatment. In November 2018, we collaborated with the MoHS and the DHMTs to transition a random 186 PHUs to a more meritocratic promotion system ($T_{merit} = 1$), while the status-quo was unaltered in the remaining 186 PHUs ($T_{merit} = 0$).

In the new promotion regime, the DHMTs committed to promote CHWs based on objective measures of CHW performance collected by the research team. Performance data were collected in $T_{merit} = 1$ and $T_{merit} = 0$ by measuring the number of visits and the average visit length through a household survey and unannounced spot checks with potential patients. Every time a vacancy became available in a treated PHU ($T_{merit} = 1$), we provided the DHMTs with information on the number and average length of the visits provided by each CHW in the PHU, which is used to decide on whom to promote. No information on performance was shared with DHMTs in the control PHUs ($T_{merit} = 0$).

Two weeks after the new promotion system was introduced, we provided information on this new system to CHWs in the 186 PHUs assigned to $T_{merit} = 1$. The information was provided by phone operators trained to read the following script:

> *"I would like to tell you about a new policy of how promotions from CHW to PS will be done. From now on, the number of services and the quality of services a CHW provides every month will be the key criteria for promotion decisions. The next time a new PS vacancy comes up at a PHU, the best-performing CHW at the PHU will be recommended to the DHMT for promotion to PS."*

To keep the saliency of promotions constant between the treatment and control groups, we reminded CHWs in the 186 control PHUs about the status-quo promotion system ($T_{merit} = 0$). The following script was read to workers in the control group:

[2]The randomization was performed at the PHU level because promotions are decided at that level, as well as to limit spillovers. We stratified the randomization by district and presence of temporary performance-based incentives in a sub-sample of the PHUs (which is the focus of Deserranno et al. (2022)). See Appendix B for details.

> *"I would like to tell you about the official policy of how promotions from CHW to PS should be done. The PHU in-charge or the PHU CHW Focal can nominate one of the CHWs as the new PS to the DHMT. This means that the decision whether a CHW gets promoted depends mainly on whether the PHU in-charge thinks highly of the CHW."*

During the ten months of our study, only nine of the 372 PS positions in our sample became vacant. Therefore, this paper quantifies the effect of meritocracy on CHW performance in *anticipation* of future promotions. The four CHWs we see promoted to the PS position in $T_{merit} = 1$ ranked ten times higher in terms of performance compared to the five CHWs promoted in $T_{merit} = 0$. Despite the small sample size, this confirms that the DHMTs in $T_{merit} = 1$ used the information we provided to them.[3]

Pay progression information treatment. PSs and CHWs are paid 250,000 SLL and 150,000 SLL per month, respectively. Importantly, this pay gap was unknown to most CHWs before we revealed the information: only one third of the CHWs guessed the PS pay correctly, while the remaining two-thirds either over or under-estimated PS pay (see Section 3.2). We took advantage of this lack of information to create random variation in *perceived* pay progression. Cross-randomizing by the meritocratic promotions treatment, we informed CHWs in a random selection of 186 PHUs of the true pay differential between their own salary and their supervisor's ($T_{pay} = 1$). The information was provided immediately after informing them about the promotion system:

> *"CHWs are entitled to 150,000 SLL per month. PSs are entitled to 250,000 SLL per month, which is 100,000 SLL more per month than CHWs."*

To keep the saliency of pay constant across all treatment groups, we reminded CHWs in the remaining 186 PHUs ($T_{pay} = 0$) about their own pay:

[3] See Appendix B for details on the implementation.

"CHWs are entitled to 150,000 SLL per month."

2.3 Data and Timeline

The treatments were implemented in November 2018, roughly 6 years after the CHW program was first established in Sierra Leone in 2012. We leverage three sources of data.

1. CHW and PS surveys. 372 PSs and 2,009 CHWs in the 372 PHUs were surveyed on their demographic background and job at two points in time: (i) at baseline in April-May 2018, roughly 6 month before the implementation of the treatments; and (ii) at endline in July-September 2019, roughly ten months after the implementation.

2. CHW perception surveys. Two weeks before the implementation of the treatments (November 2018) and two weeks after (December 2018), we surveyed each CHW to assess her perception about meritocracy in the promotion system and pay progression.

3. Household surveys. A random sample of nearly 10% of households' female heads were surveyed at endline in each village (July-September 2019). They were asked about the number of visits received by the CHW and the average length of those visits (which are used to measure CHW performance and are hence an input in the promotion decisions in $T_{merit} = 1$), as well as retrospective questions on their demographic background.[4]

Table A.1 reports summary statistics for PS, CHW and households characteristics, and shows that these characteristics are balanced across treatments. Pre-treatment CHW beliefs are also balanced.

[4]In Appendix B, we discuss the sample, the accuracy of the performance measure and the random spot checks. We argue that households are unlikely to misreport visits, even when connected to the CHW.

3 Beliefs Updating

In this section, we establish that our treatments shifted CHWs' beliefs about meritocracy and pay progression.

3.1 Beliefs Updating about Meritocracy

We measure perceived meritocracy using a set of hypothetical survey questions. We asked each CHW which of the following workers she perceived as having a higher chance of being promoted: a CHW who ranks *first* out of 10 in terms of performance but does not know the PHU in-charge outside of work vs. another CHW who ranks X out of 10 and knows the PHU in-charge outside of work, where $X = \{2, 5, 10\}$. Our measure of perceived meritocracy takes a value of 1 if the CHW perceives the system as meritocratic (best-performing worker always promoted), -1 if she perceived it as non-meritocratic (best performing worker never promoted) and 0 for intermediate situations (best-performing worker sometimes promoted).[5]

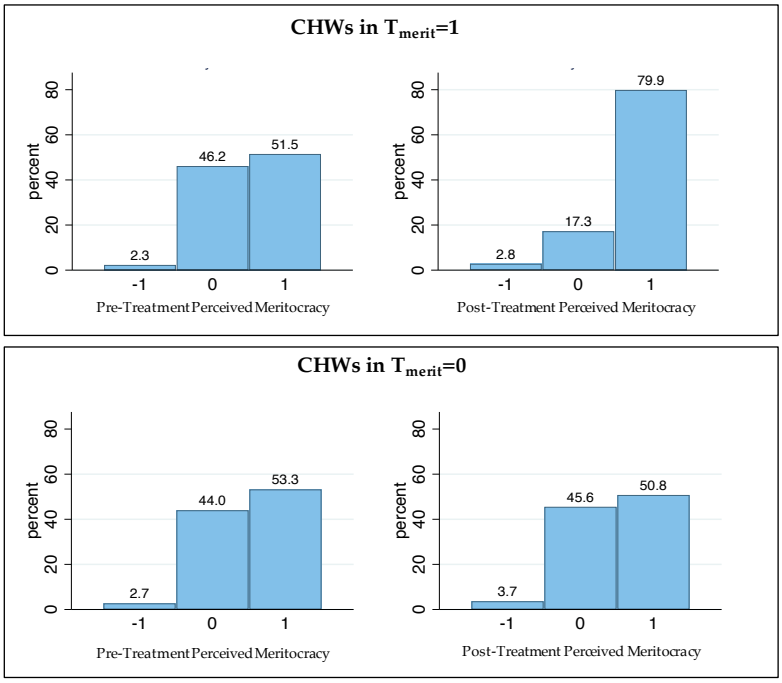
Figure 1 (Panel A) presents the distribution of meritocracy perceptions before and after treatment among CHWs in the meritocratic promotions treatment ($T_{merit} = 1$) and the rest ($T_{merit} = 0$). In line with randomization, perceptions are comparable in $T_{merit} = 1$ and $T_{merit} = 0$ before treatment, with roughly 50% of CHWs perceiving the promotion system as meritocratic (prior of 1). Hence, the status quo promotion system is perceived as only partially meritocratic. After the introduction of the new, more meritocratic promotion system, CHWs updated their beliefs upward in $T_{merit} = 1$, with an extra 28.4% of CHWs perceiving the system as meritocratic. In $T_{merit} = 0$, CHWs did not significantly update their perceptions.

The corresponding regression results on belief updating are presented in Table A.2 (column 1). They reveal that perceived meritocracy increases by 0.296 (+63%) in $T_{merit} = 1$ relative to $T_{merit} = 0$. Columns 2-5 show that the meritocratic promotions treatment did not affect perceptions about other aspects of the job, such as

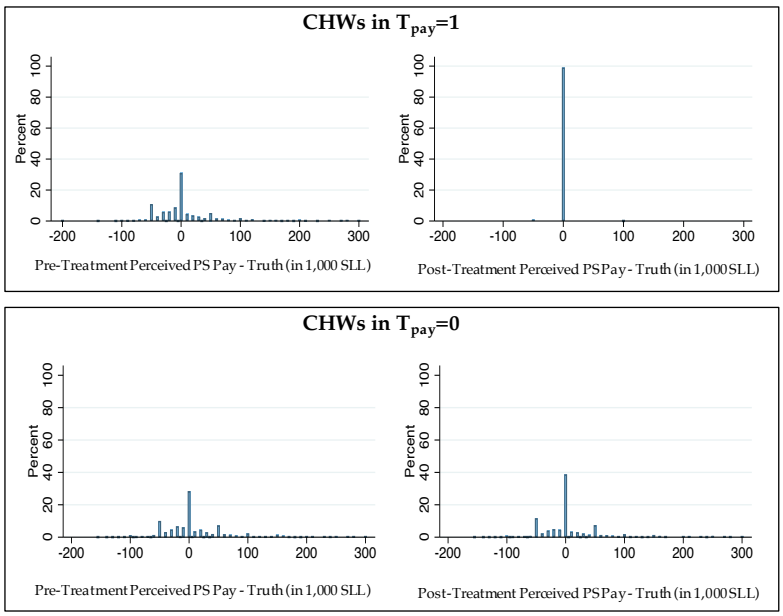
[5]The notes in Figure 1 provide the exact wording of the question and details on the coding.

Figure 1: Beliefs Updating about Meritocracy (Panel A) and Pay progression (Panel B)

Panel A: Beliefs Updating about Meritocracy



Panel B: Beliefs Updating about Pay Progression



Notes: This figure plots the distribution of perceived meritocracy in the promotion system (Panel A) and the distribution of the difference between perceived PS Pay and the truth (Panel B), before and after treatment. To measure meritocracy in Panel A, we asked the following question to each CHW in our sample before and after treatment: "A PHU needs a new PS. Whom of the following two CHWs is most likely promoted to PS? (1) Alpha is the best-performing CHW (out of 10). Alpha does not know the PHU in-charge outside of work. (2) Foday is the second-best/ fifth-best/worst-performing CHW (out of 10). Foday is a very good friend of the PHU in-charge." Our measure of perceived meritocracy takes a value of -1, 0 or 1. It is coded as 1 if the CHW perceives the system as meritocratic, that is if she believes that the best-performing worker (Alpha) is always more likely to be promoted than the well-connected worker, regardless of whether the connected worker (Foday) is ranked second, fifth or tenth. It is coded as -1 if the CHW perceives the system as non-meritocratic, that is if she believes that the best-performing worker (Alpha) is never promoted, even when the connected worker (Foday) is the worst performer (ranked tenth). It is coded as 0 for intermediate situations in which the CHW believes that the best-performing worker is more likely to be promoted only when the well-connected worker has a low enough performance (ranked either fifth or tenth). To measure perceived PS pay in Panel B, we asked each CHW before and after treatment: "How much does your PS earn from the government each month?" We offered a reward of 2,000 SLL if the answer is correct. To avoid revealing the true pay to CHWs who are not in the pay progression treatment, we disbursed the reward only at the end of the study period. We did not ask CHWs about perceptions of their own pay as this information was revealed to everyone at baseline.

the duration until the next promotion and PS pay.

3.2 Beliefs Updating about Pay Progression

Figure 1 (Panel B) plots the difference between perceived and true PS pay before and after treatment among CHWs in the pay progression information treatment ($T_{pay} = 1$) and the rest ($T_{pay} = 0$). Perceptions of PS pay are comparable in $T_{pay} = 1$ and $T_{pay} = 0$ before treatment. In both groups, roughly 30% of the CHWs estimated correctly that PSs earn 250,000 SLL monthly, 37% underestimated PS pay and 33% overestimated it.[6] After receiving information about PS pay, beliefs converge to the true PS pay in $T_{pay} = 1$. Workers who underestimated (resp., overestimated) PS pay at baseline revised them *upward* (resp., *downward*) in $T_{pay} = 1$, and those who correctly estimated it did not revise them. CHWs in $T_{merit} = 0$ instead barely updated their beliefs. The latter corroborates the lack of information spillover across treatments.

The corresponding regression results on belief updating are presented in Table A.3. Column 1 shows that the mean absolute difference between perceived PS pay and the truth is 482 SLL in $T_{pay} = 1$ vs. 35,320 SLL in $T_{pay} = 0$. Columns 2-5 show that T_{pay} has no effect on perceptions about the PS workload (hours), PS work expenses (transportation and communication), or meritocracy.

4 The Effect of Meritocratic Promotions on Worker Productivity

This section assesses the causal effect of a more meritocratic promotion regime (induced by T_{merit}) on CHW productivity. The interaction between T_{merit} and T_{pay} is the focus of Section 5.

[6] Similarly large misperceptions have been documented in other organizations (Cullen and Perez-Truglia 2022; Card et al. 2012). In our context, misperceptions exist because PS pay is not publicized to CHWs, and discussions between colleagues about pay is not the norm. In the baseline data, the size of the misperception about PS pay is correlated with the experience and the age of the CHW, while it is not correlated with connections with the PS or PHU in-charge.

We start by assessing the effect of T_{merit} on *average* performance using the following specification:

$$Y_{ij} = \alpha + \beta T_{merit,j} + \eta Z_j + \varepsilon_{ij}, \tag{1}$$

where Y_{ij} is the performance of worker i in PHU j, Z_j are the stratification variables, and ε_{ij} are standard errors clustered at the PHU level. The coefficient β captures the effect of the meritocratic promotions treatment ($T_{merit,j}$) for the average worker. Our main measure of worker performance is the total number of visits that households report having received from the CHW in the six months prior to the endline survey (mean of 7.9). To obtain this measure, we take the total number of times a household received a routine visit, ante- or post-natal visit, or was treated/referred for sickness, and then average these data at the CHW level. We will also consider visit length, as a measure of visit quality (mean of 15 minutes).

Table 1 (column 1) and the corresponding Figure 2 (Panel A) show that the number of visits provided by the average CHW increases by 1.497 (+22%) in $T_{merit} = 1$ relative to $T_{merit} = 0$.

One possibility is that the CHWs compensate for the higher number of visits by providing shorter visits (by skipping some of the checklist items and thus reducing visit quality), by providing "easier" visits (more routine visits at the expense of fewer natal checks), or by targeting households who are physically or socially close to them (less costly to reach) at the expense of more deserving households. Such a quantity-quality trade-off does not exist in our context: the average visit length increases by 15% in $T_{merit} = 1$ relative to $T_{merit} = 0$ (Table 1, column 8), routine visits increase and most of the other types of visits increase too (Table A.4), and household targeting does not change (Table A.5).

Having established that meritocratic promotions increase the quantity and quality of the visits provided by the average worker, we now test for heterogeneous productivity responses. In standard tournament theory (Lazear and Rosen 1981; Siegel 2010, 2014), where workers compete for promotions through increased effort,

the effect of meritocratic promotions is predicted to be stronger for (i) workers who are highly ranked in terms of performance as they have a higher chance of being promoted in a meritocratic regime, (ii) workers who expect the promotion to materialize soon (higher net present value of the promotion), and (iii) workers with high priors about PS pay (higher value of the promotion).

We test for these heterogeneous effects by estimating:

$$Y_{ij} = \alpha + \beta_1 T_{merit,j} \times X_{ij} + \beta_2 T_{merit,j} \times (1 - X_{ij}) + \delta X_{ij} + \eta Z_j + \varepsilon_{ij}, \qquad (2)$$

where X_{ij} is an indicator for whether a worker is highly ranked at baseline, expects the promotion soon, or has a high prior about PS pay. The coefficients of interest, β_1 and β_2, capture the effect of T_{merit} on the productivity of workers with $X_{ij} = 1$ and $X_{ij} = 0$, respectively.[7] The estimates of β_1 and β_2 can be visualized in Figure 2 and are presented formally in Table 1. At the bottom of Table 1, we present p-values adjusted for multiple hypothesis testing. In Table A.7, we test for the robustness of the estimates to controlling in equation (2) for the correlates of X_{ij} and their interaction with $T_{merit,j}$.

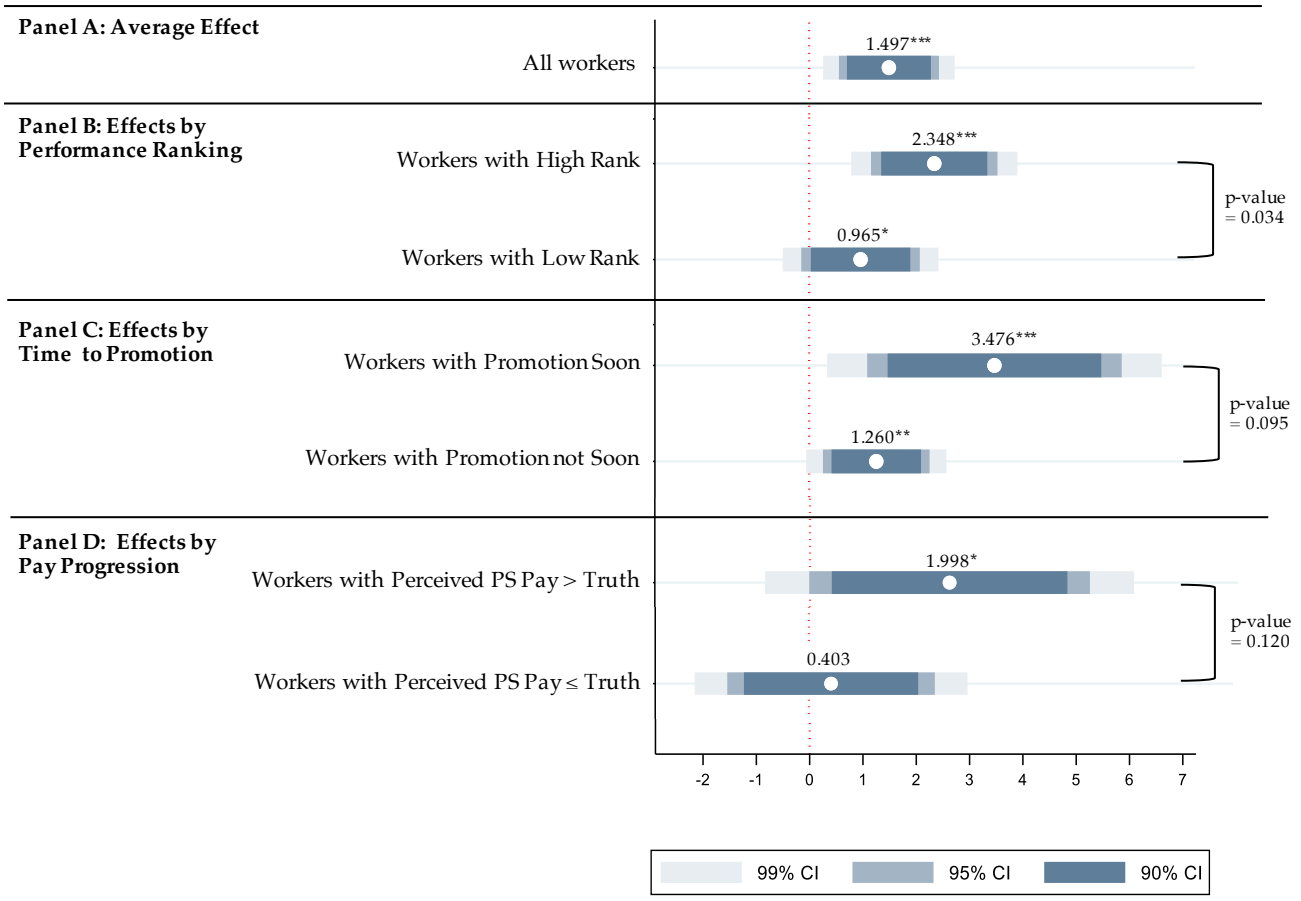
Effects by performance ranking. Our preferred measure for the ranking of each CHW within the PHU is the one reported by the PS at baseline. The PS has frequent interactions with all CHWs and is in the best position to compare and rank her subordinates. The PS also has no incentive to misreport the ranking because she does not decide on promotions (the PHU in-charge does).[8]

Figure 2 (Panel B) and the corresponding Table 1 (column 2) show that increasing meritocracy boosts the number of visits provided by "high-rank" workers (top 3 of their PHU) by 2.348, a 38% increase relative to the average for these workers in

[7] Table A.6 shows that workers with $X_{ij} = 1$ revised their perceptions of meritocracy in $T_{merit} = 1$ similarly as those with $X_{ij} = 0$. The estimates of β_1 and β_2 are hence not driven by differential belief updating.

[8] Ranking – as reported by the PS – is positively correlated with health knowledge, education, experience, and the number of household visits self-reported by the CHW. It is also correlated with the number of years the CHW has known the PS, a variable we control for in Table A.7, while it does not correlate with connections to the PHU in-charge.

FIGURE 2: EFFECT OF MERITOCRACY ON THE NUMBER OF VISITS



Notes: Panel A plots the effect of Tmerit on the number of visits provided by the average worker in our sample (estimate for β from equation 1). Panel B plots the effect of Tmerit for "High Rank" workers (ranked first, second or third in terms of performance by the PS at baseline) and for "Low Rank" workers (ranked fourth or more). These are the estimates for β_1 and β_2 in equation (2) when X_{ij}=High Rank. Panel C plots the effect of Tmerit by whether the supervisor of the CHW is within five years of retirement age at baseline ("Promotion Soon"). These are the estimates for β_1 and β_2 in equation (2) when X_{ij}=Promotion Soon. Panel D plots the effect of Tmerit by whether the prior about PS pay is above the median (SLL 250,000) or not (Prior PS Pay > or ≤ Truth). These correspond to the estimates for $\beta_{above,}$ $\beta_{at/below}$ in equation (3). "Number of visits" is the average number of household visits provided by the CHW (as reported by the households). The p-values reported at the right of the figure are for the difference in the treatment effects across worker types. *** p<0.01, ** p<0.05, * p<0.1.

$T_{merit} = 0$. For "lower-rank" workers, the effect remains positive but is significantly smaller (+0.965 visits). The effects are robust to controlling for the correlates of performance ranking (gender, education, wealth) and their interaction with T_{merit} (Table A.7, column 1). The heterogeneity in the treatment effects can thus be attributed to the ranking rather than its correlates.

Figure A.2 (Panel A) presents the effect of meritocracy on worker productivity for the full distribution of worker ranking. The effect is positive and significant for workers ranked 1^{st}, 2^{nd}, 3^{rd}, and converges to zero afterwards.[9]

Overall, the results indicate that a more meritocratic system increases effort for high-rank workers who have a shot at the promotion, while it does not affect the effort of low-rank workers who have no shot and face the same (low) incentives as in the old system.

Effects by time to promotion. We proxy for "CHWs expecting a PS to leave her position soon" with an indicator for whether the supervisor is within five years of the standard retirement age, and present robustness to other cutoffs.[10]

Figure 2 (Panel C) and the corresponding Table 1 (column 4) show that, for workers who expect a promotion soon, meritocratic promotions increase the number of visits by 3.476 (+45%). The effect for workers who do not expect a promotion soon remains positive but is three times smaller (+1.260 visits).

As expected, the results decline when the PS is expected to retire further in the future: Figure A.2 (panel B) shows that the effect of T_{merit} is stronger for workers who expect the PS to retire within 2 years, while it disappears for workers who expect the PS to retire in 10 years. Overall, the results indicate that the worker productivity response to meritocracy intensifies in the years leading up to promotion eligibility.

[9]The effect is slightly smaller for workers you are ranked 1^{st} instead of 2^{nd} and 3^{rd}, perhaps because they do not observe their competitors' effort and underestimate how hard these competitors try to catch up.

[10]10% of the supervisors are within 5 years of retirement (more than 50 years old).

Effect by pay progression. We now explore the effect of T_{merit} on the productivity of workers whose prior about PS pay is above the median (i.e., above the actual salary of 250,000 SLL) vs. below the median. We limit the comparisons to workers in $T_{pay} = 0$, who did not receive information on PS pay.[11]

Figure 2 (Panel D) and the corresponding Table 1 (column 6) show that the meritocratic promotions treatment increases the number of visits provided by workers with above-median perceived pay progression by 1.998 (+30%). It has no effect on workers with below-median perceived pay progression. The results become even stronger when we control for the correlates of baseline perceived pay progression and their interaction with T_{merit} (column 7).

Figure A.2 (Panel C) presents the effect of more meritocracy for different values of priors about PS pay. The figure confirms that the effect of the meritocracy treatment on worker productivity increases with perceived pay progression.

5 The Effect of Pay Progression on Worker Productivity By Meritocracy

This section studies the impact of pay progression (induced by T_{pay}) on worker productivity in the new meritocratic regime ($T_{merit} = 1$) vis-à-vis the old less meritocratic regime ($T_{merit} = 0$). Unlike other 2×2 experiments, our analysis will *not* rely on a double-interacted specification where productivity is regressed on T_{merit}, T_{pay}, and $T_{merit} \times T_{pay}$. This specification is not informative in our contextbecause we have shown that workers in $T_{pay} = 1$ update their beliefs about pay progression – and hence change their productivity – in opposite directions depending on whether they initially underestimated or overestimated PS pay. Consequently, the average effect of revealing PS pay ($T_{pay} = 1$ vs. $T_{pay} = 0$) on CHW productivity is found

[11] The corresponding comparisons in $T_{pay} = 1$ are uninformative because beliefs converge to the truth in $T_{pay} = 1$ (see Figure 1, panel B), and we would be comparing workers with the same *ex-post* beliefs even though their *ex-ante* beliefs were different. These are the estimate for β_{above}, β_{below} and β_{at} from equation (3).

to be zero.[12] This null effect stems from a similar proportion of workers under and overestimating PS pay at baseline, and the opposing effort responses of these groups that offset each other.

To account for these heterogeneous responses to T_{pay}, we interact T_{merit}, T_{pay}, and $T_{merit} \times T_{pay}$ with indicators for whether workers' priors about PS pay are above, below or at the truth (q_{ij}):

$$Y_{ij} = \alpha + \sum_{q=\{below,above,at\}} \gamma_q[T_{pay,j} \times T_{merit,j} \times q_{ij}] + \sum_{q=\{below,above,at\}} \delta_q[T_{pay,j} \times (1 - T_{merit,j}) \times q_{ij}]$$
$$+ \sum_{q=\{below,above,at\}} \beta_q[T_{merit,j} \times q_{ij}] + \sum_{q=\{below,above\}} \lambda_q q_{ij} + \eta Z_j + \varepsilon_{ij}. \quad (3)$$

The coefficients of interest are the γ's and δ's, which capture the causal effect of revealing PS pay (T_{pay}) in the new system ($T_{merit} = 1$) and in the old system ($T_{merit} = 0$), respectively.[13] Throughout the analysis, we refrain from making across-group comparisons – e.g., γ_{above} vs. γ_{below} or δ_{above} vs. δ_{below} – as these could reflect baseline differences across groups. We focus instead on identifying the effect of revealing PS pay *within a worker type,* which is causal.[14]

The result can be visualized in Figure 3. They are presented formally in Table A.9. In Table 2, we present their robustness to extending equation (3) to include the correlates of baseline perceived pay progression (age and experience of the CHW) and their interaction with T_{pay}, T_{merit}, and $T_{pay} \times T_{merit}$.

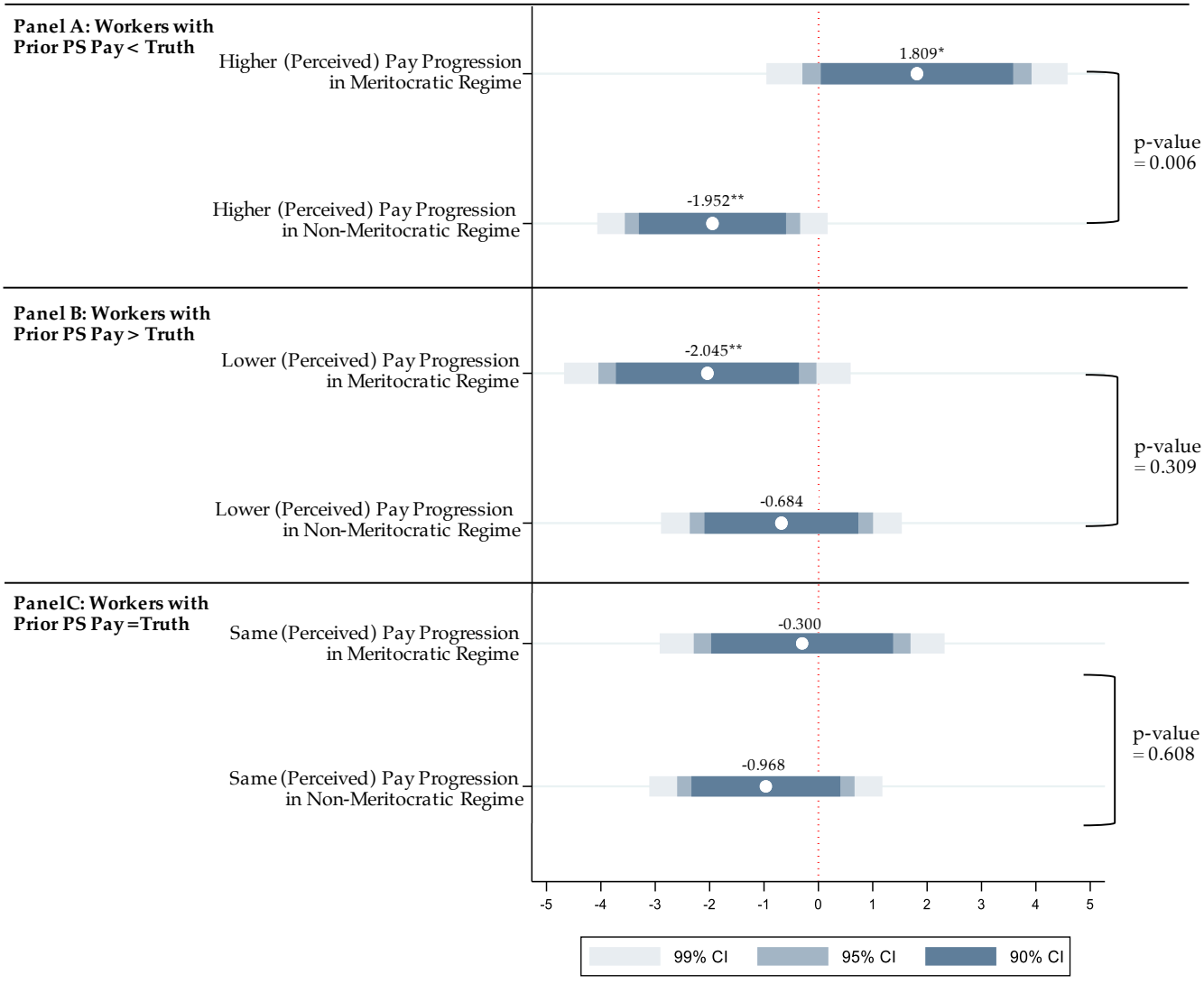
Workers who underestimated PS pay (Prior $<$ Truth). We start by assessing the effect of revealing the true PS pay (T_{pay}) on the productivity of workers who underestimated PS pay at baseline. These correspond to $\hat{\gamma}_{below}$ and $\hat{\delta}_{below}$ from equation (3), and capture the effects of *increased* pay progression in the more vs. less meritocratic regime, respectively.

[12] See Table A.8 where we use a double-interacted model.

[13] The heterogeneity analysis by whether the promotion system is more or less meritocratic was pre-specified in the AEA registry. The heterogeneity by whether workers under, over or correctly estimated PS pay was not pre-specified because we initially expected that most workers would underestimate PS pay. See Appendix A for more details.

[14] CHW characteristics are balanced across treatments within a worker type (Table A.10).

FIGURE 3: EFFECT OF PAY PROGRESSION ON THE NUMBER OF VISITS, BY MERITOCRACY



Notes: This figure plots the effects of Tpay on the number of visits in the new meritocratic regime (Tmerit=1) and in the old non-meritocratic regime (Tmerit=0), for three types of workers: those who underestimated PS pay at baseline and for whom perceived pay progression increased (Panel A), those who overestimated PS pay and for whom perceived pay progression decreased (Panel B), those who correctly estimated PS pay and for whom perceived pay progression did not change (Panel C). Panel A plots γ_{below} and δ_{below} estimated from equation (3). Panel B plots γ_{above} and δ_{above} estimated from equation (3). Panel C plots γ_{at} and δ_{at} estimated from equation (3). "Number of visits" is the average number of household visits provided by the CHW (as reported by the households). The p-values reported at the right of the figure are for the difference in the treatment effects across regime systems within a worker type. *** p<0.01, ** p<0.05, * p<0.1.

In the new, more meritocratic regime, higher pay progression increases the number of visits by 1.809 (+23%), while it *reduces* the number of visits provided by 1.952 (-27%) in the old, less meritocratic regime: see Figure 3 (Panel A) and the corresponding Table 2 (Panel A, column 1). The results on "visit length" go in the same direction but are less precise (columns 3 and 4).

The results indicate that steeper pay progression motivates the workers to climb the organization's ladder and prompts more effort when promotions are performance-based. When promotions are not performance-based, steeper pay progression instead reduces worker performance.

Two potential mechanisms can explain the observed reduction in worker productivity when pay progression increases in a low meritocratic system. The first is a negative morale effect: the organization may be perceived as more unfair if it increases the pay gap between the PSs and the CHWs *without* promoting workers in a meritocratic way, and this may demotivate CHWs. The second is one of lobbying: when pay progression increases, workers may be more interested in a promotion and may start devoting more time to lobbying (talking with the PHU in-charge) to increase their chances of promotion in a non-meritocratic regime (de Janvry et al. 2023). That said, the context we analyze, is one where it is very hard for workers to "lobby" because they are typically located far away from the PHU in-charge and do not work in direct contact with them. In fact, half of the CHWs have never even talked to the PHU in-charge at baseline (Table A.1, Panel B). Moreover, we find no evidence of increased lobbying when pay progression increases: the likelihood that a CHW communicated with the PHU in-charge in the past year, and the fraction of time she reports dedicating to non-patient-related activities, which include communications with the PHU in-charge, did not increase (Table A.11). Overall, the results provide suggestive evidence that, with low meritocracy, increasing pay progression reduces productivity through negative morale effects.

Workers who overestimated PS pay (Prior > Truth). We now turn to the effect of revealing the true PS pay (T_{pay}) on the productivity of workers who overestimated PS pay at baseline. These correspond to $\hat{\gamma}_{above}$ and $\hat{\delta}_{above}$ from equation (3) and capture the effects of *reducing* pay progression in a more vs. less meritocratic regime, respectively.

In the new more meritocratic regime, lower pay progression reduces the number of visits by 2.045 (-21%), while it has no significant effect in the in the old, less meritocratic regime: see Figure 3 (Panel B) and the corresponding Table 2 (Panel B, column 1). This suggests that a reduction in perceived pay progression in a low meritocratic system is not perceived as more fair, or at least does not increase fairness by enough to raise worker productivity.

Overall, the results indicate that lower pay progression reduces performance only in the meritocratic regime, where promotions are linked to performance and the marginal returns to effort are higher.

Workers who correctly estimated PS pay (Prior = Truth). As a placebo check, we look at workers who correctly estimated PS pay at baseline and did not update their perception of pay progression in $T_{pay} = 1$. Revealing the true PS pay has no statistically significant effect on their performance regardless of whether the system is meritocratic: see Figure 3 (Panel C) and Table 2 (Panel C, column 1). This is reassuring as it indicates that providing information about true PS pay does not affect workers' behavior through channels unrelated to reassessing their beliefs.

6 Conclusion

In a field experiment with the Ministry of Health in Sierra Leone, we show that a more meritocratic promotion system increases the productivity of frontline health workers. This is especially true for high-ranked workers with a shot at promotion or those perceiving the promotion reward as large. Higher pay progression also increases the productivity of frontline health workers, but only when promotions are

meritocratic. When promotions are not highly meritocratic, higher (perceived) pay progression appears to demotivate workers, causing a reduction in their productivity. Overall, these findings underscore the importance for organizations to consider the interaction between two important personnel tools: meritocratic promotions and pay progression

Our results also indicate additional important implications for further investigation. First, our analysis evaluates the effects ten months after the introduction of the new meritocratic promotion system, recognizing that the impact of meritocratic promotions may evolve, and potentially amplify, over the long term. While we observe few promotions in the span of our study, in the long run, more workers becoming eligible for a meritocratic promotion could intensify their efforts. Additionally, the quality of higher-level staff may improve and increase lower-tier workers' efforts. A meritocratic promotion system may also enhance the quality of workers in the applicant pool, generating positive effects over time through the selection process. Assessing the long-term effects of meritocratic promotions presents a great avenue for future research.

Second, although our research centers on performance-based promotions, organizations have the option of adopting pay-for-performance schemes that do not necessitate worker competition. Our results show that thanks to the tournament structure, promotion incentives convert only a small fraction of gains into higher wages. Nonetheless, it is essential to conduct further studies to evaluate their cost-effectiveness in comparison to non-tournament-based approaches. From a practical perspective, implementing pay-for-performance schemes can be challenging, often facing opposition from public sector unions. Performance-based promotions might be more viable in public sector settings, given that promotions are inevitable and someone will advance.

Finally, the effectiveness of performance-based promotions (or any type of performance-based incentive) depends on an organization's ability to accurately measure worker performance. The less precise the performance measurement, the less likely it is that

performance pay will effectively boost worker effort. In our study, performance was assessed through a household survey. Although this method is undoubtedly more costly, it likely provides more accuracy than relying on government administrative data, which often depends on (inflated) self-reports (Singh 2020). Additionally, unlike in our study, government administrative data typically focus on quantitative output measures, which are more observable but overlook quality indicators. This suggests that incentive schemes might reward only certain aspects of performance, potentially leading to diminished effort in other aspects when workers are multitasking. Understanding how to improve the measurement of performance on a large scale is a critical challenge for future research. Addressing this issue could enable the implementation of more performance-based human resource management systems in the public sector.

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Table 1: Effect of Meritocracy on Worker Performance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.:	Number of Visits				Visit Length (in minutes)			
Tmerit	1.497***				1.754***			
	(0.479)				(0.651)			
Tmerit × High Rank [i]		2.348***				1.676*		
		(0.605)				(0.880)		
Tmerit × Low Rank [ii]		0.965*				1.640**		
		(0.567)				(0.790)		
Tmerit × Promotion Soon [i]			3.476***				2.559	
			(1.218)				(1.818)	
Tmerit × Promotion not Soon [ii]			1.260**				1.669**	
			(0.510)				(0.685)	
Tmerit × 𝟙(Prior PS Pay > Truth) [i]				1.998*				2.822**
				(1.034)				(1.213)
Tmerit × 𝟙(Prior PS Pay ≤ Truth) [ii]				0.403				0.423
				(0.800)				(1.123)
Observations	1,966	1,830	1,966	1,966	1,868	1,735	1,868	1,868
Mean Dep. Var. if Tmerit=0	6.749	6.749	6.749	6.749	11.99	11.99	11.99	11.99
p-value H_0: [i] - [ii] = 0		0.034	0.095	0.120		0.971	0.644	0.085
p-value MHT correction for [i]		0.004	0.004	0.016		0.024	0.060	0.004
p-value MHT correction for [ii]		0.016	0.004	0.506		0.008	0.004	0.673

Notes: The first column of each outcome variable reports the effect of Tmerit for the average worker (estimate for β in equation 1). The second column of each outcome variable reports the effect of Tmerit for "High Rank" workers (ranked first, second or third in terms of performance by the PS at baseline) and for "Low Rank" workers (ranked fourth or more). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=High Rank. The third column of each outcome variable report the effect of Tmerit by whether the supervisor of the CHW is within 5 years of retirement age at baseline ("Promotion Soon"). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=Promotion Soon. The last column of each outcome variable present the effect of Tmerit by whether the prior about PS pay is above the median (actual salary of SLL 250,000) or not (i.e. "Prior PS Pay > or ≤ Truth"). These correspond to the estimates for β_{above} and $\beta_{at/below}$ in equation (3). Effectively this means that we limit the comparisons to workers in Tpay=0, who did not receive information on PS pay. All regressions control for the stratification variables and for the uninteracted x-variable (High Rank, Promotion Soon, Prior PS Pay depending on the column). "Number of visits" is the average number of household visits provided by the CHW (as reported by the households). "Visit Length" is the average visit length as reported by the households. A visit length of zero is inputed to households that are never visited by the CHW. At the bottom of the table, we present p-values adjusted for multiple hypothesis testing across all columns computed using Romano and Wolf [2016] step-down procedure. *** p<0.01, ** p<0.05, * p<0.1.

Table 2: Effect of Pay Progression on Worker Performance by Meritocracy

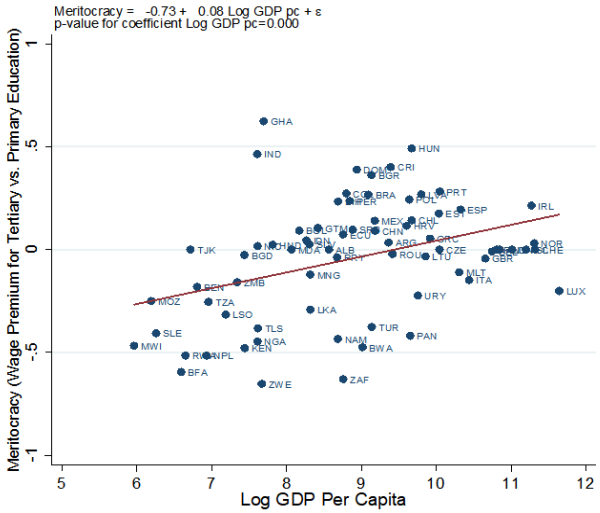
Dep. Var.:	(1) Number of Visits	(2) Visit Length (in minutes)
Panel A: Effects for Workers who Underestimated PS Pay at Baseline [Higher Pay Progression in Tpay=1]		
Tpay × Meritocratic (Tmerit=1) × 𝟙(Prior PS Pay < Truth) [i]	1.809*	1.330
	(1.075)	(1.291)
Tpay × Non-Meritocratic (Tmerit=0) × 𝟙(Prior PS Pay < Truth) [ii]	-1.952**	-1.846
	(0.822)	(1.243)
Panel B: Effects for Workers who Overerestimated PS Pay at Baseline [Lower Pay Progression in Tpay=1]		
Tpay × Meritocratic (Tmerit=1) × 𝟙(Prior PS Pay > Truth) [iii]	-2.045**	-2.186*
	(1.023)	(1.215)
Tpay × Non-Meritocratic (Tmerit=0) × 𝟙(Prior PS Pay > Truth) [iv]	-0.684	-0.639
	(0.860)	(1.316)
Panel C: Effects for Workers who Correctly Estimated PS Pay at Baseline [Same Pay Progression in Tpay=1]		
Tpay × Meritocratic (Tmerit=1) × 𝟙(Prior PS Pay = Truth) [v]	-0.300	1.308
	(1.018)	(1.460)
Tpay × Non-Meritocratic (Tmerit=0) × 𝟙(Prior PS Pay = Truth) [vi]	-0.968	-0.008
	(0.833)	(1.615)
Observations	1,966	1,868
Mean Dep. Var. if Tpay=0	7.965	13.191
p-value H_0: [i] - [ii] = 0	0.006	0.077
p-value H_0: [iii] - [iv] = 0	0.309	0.385
p-value H_0: [v] - [vi] = 0	0.608	0.546

Notes: This table presents the effects of Tpay on the number of visits in the meritocratic regime (Tmerit=1) and in the non-meritocratic regime (Tmerit=0), estimated from equation (3). Panel A reports the estimates for γ_{below} and δ_{below} (effects for workers who underestimated PS pay at baseline). Panel B reports the estimates for γ_{above} and δ_{above} (effects for workers who overestimated PS pay at baseline). Panel C reports the estimates for γ_{at} and δ_{at} (effects for workers who correctly estimated PS pay at baseline). All regressions control for the stratification variables, 𝟙(Prior PS Pay < Truth) and 𝟙(Prior PS Pay > Truth), and these last two variables multiplied with Tmerit (see equation 3). 𝟙(Prior PS Pay < Truth) [resp., 𝟙(Prior PS Pay > Truth)] equals one if the pre-treatment perception about PS salary is below (resp., above) the actual salary of SLL 250,000 and 0 otherwise. "Number of visits" is the average number of household visits provided by the CHW (as reported by the households). "Visit Length" is the average visit length as reported by the households. A visit length of zero is inputed to households that are never visited by the CHW. Differences in the number of observations is due to missing values. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1.

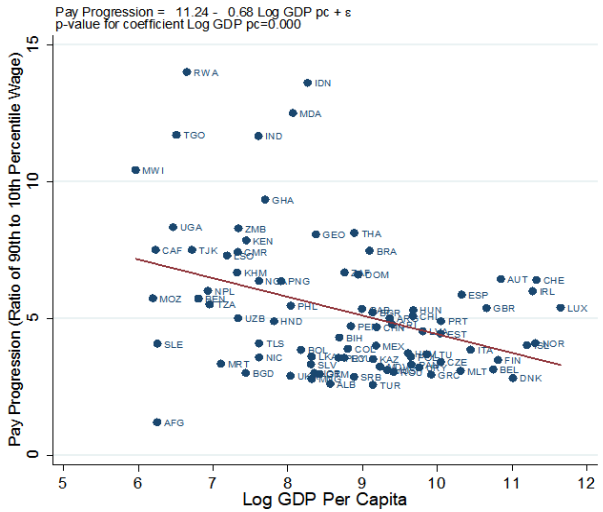
Online Appendix

Figure A.1: Cross-Country Analysis of Meritocracy, Pay Progression and Government Performance by GDP per Capita

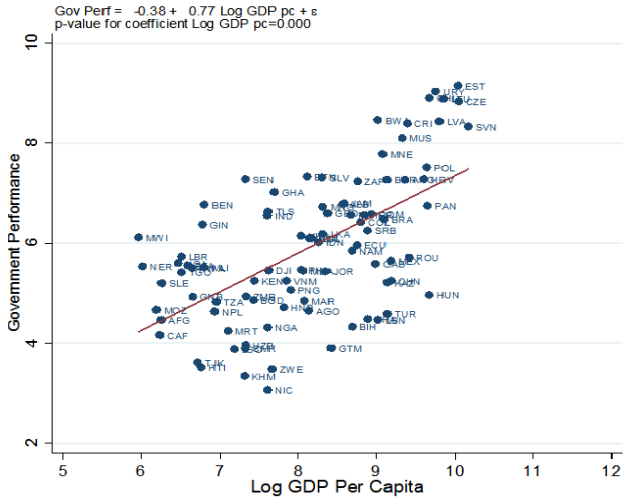
Panel A: Correlation between Meritocracy and GDP per Capita



Panel B: Correlation between Pay Progression and GDP per Capita

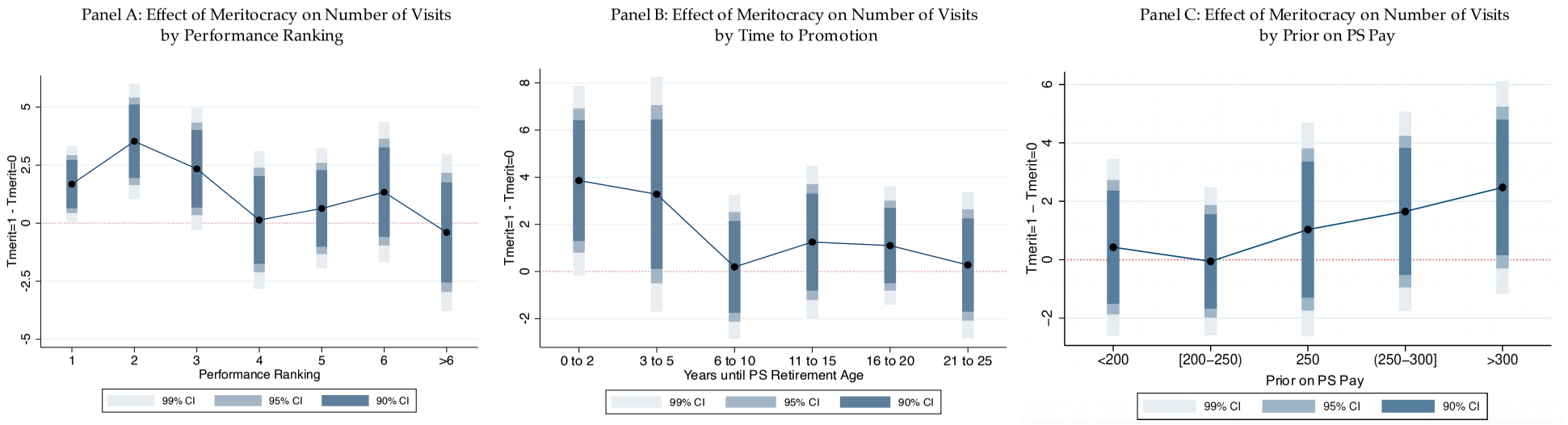


Panel C: Correlation between Government Performance and GDP per Capita



Notes: One observation per country. The red solid line represents the linear regression of meritocracy (Panel A), pay progression (Panel B) and government performance (Panel C) on log GDP per capita, with robust standard errors and no controls. For each country, we use data for the most recent year for which we have information on meritocracy, pay progression, government performance and GDP per capita (2018 or 2017 in most countries). Pay progression is measured by the World Bank's Worldwide Bureaucracy Indicators as the ratio of the 90th percentile wage to the 10th percentile wage in the public sector. Meritocracy is measured by the World Bank's Worldwide Bureaucracy Indicators as the average wage premium for workers with a tertiary education vs. a primary education in the public sector relative to the private sector. (Differences between the public and private sectors are used to hold fixed country-level characteristics such as the fraction of workers with a tertiary or primary education.) Government performance is measured by the Gothenburg's Quality of Government Indicators as an index of 4 government scores (1-10): steering capability, resource efficiency, consensus building, and international cooperation. Log GDP per capita is measured by the World Development Indicators.

Figure A.2: Effect of Meritocracy on the Number of Visits by Performance Ranking, Time to Promotion and Prior PS Pay



Notes: This figure plots the effect of Tmerit by performance ranking (Panel A), time to promotion (Panel B) and prior about PS pay (Panel C). In Panel A, we plot the coefficients from regressing the number of visits on Tmerit, dummy variables for a worker's rank (see x-axis) and the interaction of Tmerit with each dummy variable, controlling for the stratification variables and with standard errors clustered at the PHU level. In Panel B, we plot the coefficients from regressing the number of visits on Tmerit, dummy variables for different times to promotion (see x-axis), and the interaction of Tmerit with each dummy variable, controlling for the stratification variables and with standard errors clustered at the PHU level. In Panel C, we estimate an extended version of equation (3) with five different level of priors PS pay and we report the estimates of the β's coefficients. "Number of Visits" is the average number of household visits provided by the CHW (as reported by the households).

Table A.1: Summary Statistics and Balance Checks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Mean	S.D.	Tmerit		Tpay		Tmerit × Tpay	
			Coeff	S.E.	Coeff	S.E.	Coeff	S.E.
Panel A: PS characteristics (N=372)								
Male = {0, 1}	0.919	0.273	0.043	(0.031)	-0.000	(0.037)	-0.105*	(0.054)
Age (in years)	37.84	8.856	0.433	(1.336)	-1.449	(1.281)	0.715	(1.785)
Completed primary education = {0, 1}	0.739	0.440	-0.001	(0.066)	0.031	(0.065)	0.015	(0.091)
Completed secondary education or above = {0, 1}	0.253	0.435	0.022	(0.065)	-0.010	(0.065)	-0.047	(0.091)
Wealth score (0 to 8)	3.013	1.227	0.128	(0.169)	-0.092	(0.175)	0.117	(0.240)
Health knowledge score (0 to 7)	3.481	1.371	0.045	(0.198)	0.100	(0.202)	-0.119	(0.282)
Number of years as PS	3.529	2.734	-0.139	(0.377)	-0.072	(0.386)	0.122	(0.521)
Number of CHWs PS is responsible for	7.984	2.861	-0.381	(0.405)	-0.441	(0.407)	0.743	(0.575)
Number of hours worked as PS per week	11.16	33.97	-0.420	(5.636)	-5.758	(4.217)	9.114	(7.459)
Number of years as CHW before promotion	1.823	1.978	-0.007	(0.345)	-0.243	(0.338)	-0.284	(0.458)
Ever talked to the PHU in-charge = {0, 1}	1.000	0.000	-	-	-	-	-	-
Number of years PS has known PHU in-charge for	4.073	6.521	1.890	(1.247)	1.038	(1.570)	-1.961	(2.000)
Panel B: CHW characteristics (N=2,009)								
Male = {0, 1}	0.726	0.446	-0.017	(0.034)	-0.023	(0.030)	-0.001	(0.048)
Age (in years)	37.03	11.22	0.111	(0.848)	-0.731	(0.780)	1.255	(1.117)
Completed primary education = {0, 1}	0.713	0.453	-0.024	(0.036)	0.018	(0.035)	0.009	(0.050)
Completed secondary education or above = {0, 1}	0.083	0.275	0.019	(0.020)	-0.018	(0.019)	-0.001	(0.027)
Wealth score (0 to 8)	2.496	1.157	0.084	(0.083)	0.008	(0.068)	0.025	(0.116)
Health knowledge score (0 to 7)	2.895	1.425	-0.065	(0.115)	-0.039	(0.110)	0.111	(0.155)
Number of years as CHW	2.212	2.828	0.346	(0.218)	0.083	(0.180)	-0.164	(0.280)
Number of households CHW is responsible for	56.90	73.98	0.944	(6.278)	-1.014	(5.520)	2.109	(8.457)
Number of hours worked as CHW per week	17.78	34.71	-0.070	(3.010)	-2.410	(2.979)	2.824	(3.832)
Number of household visits provided per week	21.47	19.93	0.350	(1.753)	0.775	(1.606)	-1.488	(2.198)
Satisfied with the PS = {0, 1}	0.762	0.426	0.073**	(0.034)	0.058	(0.036)	-0.040	(0.046)
Number of years CHW has known PS for	7.774	8.430	0.038	(0.706)	-0.283	(0.632)	0.843	(0.949)
Ever talked to the PHU in-charge = {0, 1}	0.530	0.499	-0.022	(0.048)	-0.032	(0.048)	-0.040	(0.067)
Number of years CHW has known PHU in-charge for	2.926	4.645	-0.652	(0.479)	-0.825*	(0.491)	0.613	(0.599)
PS was best-performing CHW when promoted = {0, 1}	0.411	0.492	-0.045	(0.074)	-0.022	(0.075)	0.127	(0.105)
Panel B (continued): CHW perceptions at baseline (N=2,009)								
Prior Meritocracy = {-1, 0, 1}	0.498	0.548	-0.032	(0.030)	-0.041	(0.034)	0.030	(0.044)
Prior PS Pay (in 1,000 SLL)	261.7	64.23	0.352	(3.634)	-4.474	(3.731)	0.744	(5.029)
C. Household characteristics, aggregated at village level (N=2,009)								
Age (in years)	29.15	4.990	0.115	(0.396)	0.288	(0.364)	-0.829	(0.527)
Completed primary education = {0, 1}	0.284	0.292	0.041*	(0.021)	0.024	(0.023)	-0.028	(0.032)
Number of children under 5	0.731	0.280	0.015	(0.022)	-0.020	(0.023)	-0.017	(0.033)
Wealth score (0 to 8)	-0.220	2.175	0.280	(0.194)	0.225	(0.189)	-0.268	(0.259)
Main occupation is farming = {0, 1}	0.605	0.369	-0.017	(0.027)	-0.045	(0.028)	0.011	(0.041)
Knew the CHW at baseline = {0, 1}	0.971	0.121	-0.005	(0.007)	-0.003	(0.007)	0.001	(0.012)
CHW is localed <30 min = {0, 1}	0.870	0.273	-0.002	(0.021)	0.002	(0.022)	0.000	(0.028)
Government hospital is localed <30 min = {0, 1}	0.389	0.409	0.046	(0.037)	0.031	(0.031)	-0.060	(0.047)

Notes: This table presents summary statistics and balance checks for PS, CHW and household characteristics. PS and CHW characteristics are measured at baseline. Household characteristics are measured at endline (retrospective questions). Each row states the sample mean and standard deviation of a variable, as well as the estimates from a regression, where the variable is regressed on an indicator for Tmerit, Tpay and Tmerit × Tpay. All regressions control for stratification variables and cluster standard errors at the PHU level. *** p<0.01, ** p<0.05, * p<0.1

Table A.2: Effect of the Meritocracy Treatment on Beliefs Updating

	(1)	(2)	(3)	(4)	(5)
	Post-Treatment Perceptions				
Dep. Var.:	Perceived Meritocracy = {-1, 0, 1}	Number of Months until Next Promotion	PS Pay (in 1,000 SLL)	PS Number of Hours Worked	PS Work-Related Expenses (in 1,000 SLL)
Tmerit	0.296***	0.653	2.848	0.104	1.840
	(0.025)	(5.049)	(1.880)	(0.594)	(3.015)
Observations	1,982	1,387	2,009	1,940	1,932
Mean Dep. Var. if Tmerit=0	0.471	46.35	253.8	14.14	95.43

Notes: All regressions control for stratification variables. "Work-related expenses" include communication and transportation costs. The sample size varies across columns because of CHWs answering "don't know" and their answer being coded as missing. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1

Table A.3: Effect of the Pay Progression Treatment on Beliefs Updating

Dep. Var.:	(1)	(2)	(3)	(4)	(5)	(6)
	Post-Treatment Perceptions					
	|PS Pay - Truth| (in 1,000 SLL)	PS Number of Hours Worked	PS Work-Related Expenses (in 1,000 SLL)	Prior Meritocracy = {-1, 0, 1}	Number of Months until Next Promotion	PS Pay (in 1,000 SLL)
Tpay	-34.838***	0.832	4.499	-0.035	-4.081	
	(1.480)	(0.600)	(2.999)	(0.030)	(5.039)	
Tpay × 𝟙(Prior PS Pay < Truth)						29.043***
						(1.823)
Tpay × 𝟙(Prior PS Pay > Truth)						-59.685***
						(3.427)
Tpay × 𝟙(Prior PS Pay = Truth)						0.848
						(0.929)
Observations	2,009	1,940	1,932	1,982	1,387	2,009
Mean Dep. Var. if Tpay=0	35.32	13.79	94.30	0.643	49.46	260.7
… & 𝟙(Prior PS Pay < Truth)						220.7
… & 𝟙(Prior PS Pay > Truth)						309.7

Notes: All regressions control for the stratification variables. Column (6) also controls for two dummy variables: 𝟙(Prior PS Pay < Truth) and 𝟙(Prior PS Pay > Truth). 𝟙(Prior PS Pay < Truth) [resp., 𝟙(Prior PS Pay > Truth)] equals one if the PS salary pre-treatment perception of the CHW is below (resp., above) the actual salary of SLL 250,000 and 0 otherwise. "Work-related expenses" include communication and transportation costs. The sample size varies across columns because of CHWs answering "don't know" and their answer being coded as missing. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1

Table A.4: Effect of Meritocracy on the Number of Each Type of Visit

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)
Dep. Var.:	Number of Routine Visits				Number of Cases Treated				Number of Cases Referred				Number of Ante-natal Visits				Number of Post-natal Visits			
Tmerit	1.084**				0.874***				0.297***				0.040				-0.012			
	(0.522)				(0.333)				(0.101)				(0.092)				(0.022)			
Tmerit × High Rank [i]		1.403				1.216*				0.465***				-0.042				0.001		
		(0.978)				(0.632)				(0.155)				(0.232)				(0.028)		
Tmerit × Low Rank [ii]		0.827				0.724**				0.232*				0.069				-0.022		
		(0.563)				(0.344)				(0.131)				(0.054)				(0.034)		
Tmerit × Promotion Soon [i]			1.749				2.538**				0.665*				0.580*				0.092	
			(1.228)				(1.193)				(0.356)				(0.345)				(0.057)	
Tmerit × Promotion not Soon [ii]			1.013*				0.681*				0.251**				-0.023				-0.024	
			(0.576)				(0.351)				(0.102)				(0.091)				(0.023)	
Tmerit × 𝟙(Prior PS Pay > Truth) [i]				3.240*				2.238**				0.237				0.328				-0.024
				(1.653)				(0.986)				(0.263)				(0.243)				(0.056)
Tmerit × 𝟙(Prior PS Pay ≤ Truth) [ii]				0.303				0.350				0.203				-0.199				-0.007
				(0.823)				(0.552)				(0.189)				(0.237)				(0.024)
Observations	1,966	1,830	1,966	1,966	1,966	1,830	1,966	1,966	1,966	1,830	1,966	1,966	1,966	1,830	1,966	1,966	1,966	1,830	1,966	1,966
Mean Dep. Var. if Tmerit=0	3.658	3.658	3.658	3.658	2.573	2.573	2.573	2.573	0.676	0.676	0.676	0.676	0.222	0.222	0.222	0.222	0.073	0.073	0.073	0.073
p-value H_0: [i] - [ii] = 0		0.574	0.597	0.061		0.472	0.141	0.045		0.224	0.265	0.911		0.641	0.089	0.120		0.615	0.055	0.787

Notes: The first column of each outcome variable reports the effect of Tmerit for the average worker (estimate for β in equation 1). The second column of each outcome variable reports the effect of Tmerit for "High Rank" workers (ranked first, second or third in terms of performance by the PS at baseline) and for "Low Rank" workers (ranked fourth or more). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=High Rank. The third column of each outcome variable reports the effect of Tmerit by whether the supervisor of the CHW is within 5 years of retirement age at baseline ("Promotion Soon"). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=Promotion Soon. The last column of each outcome variable presents the effect of Tmerit by whether the prior about PS pay is above the median (actual salary of SLL 250,000) or not (i.e. "Prior PS Pay > or ≤ Truth"). These correspond to the estimates for β_{above} and $\beta_{at/below}$ in equation (3). All regressions control for the stratification variables and for the uninteracted x-variable (High Rank, Promotion Soon, Prior PS Pay depending on the column). The outcome variable is reported by the households. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.5: Effect of Meritocracy on Household Targeting

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Household Targeting											
Dep. Var.:	% Visits to Households Living Within 30 Minutes Walk of the CHW				Median Distance Between the Visited Households and the CHW				% Visits to Friends/Family of the CHW			
Tmerit	0.004				0.251				0.022			
	(0.016)				(0.512)				(0.020)			
Tmerit × High Rank [i]		0.013				0.525				0.011		
		(0.027)				(0.926)				(0.027)		
Tmerit × Low Rank [ii]		-0.004				0.201				0.024		
		(0.020)				(0.652)				(0.025)		
Tmerit × Promotion Soon [i]			-0.016				-0.855				0.049	
			(0.039)				(1.034)				(0.036)	
Tmerit × Promotion not Soon [ii]			0.005				0.389				0.019	
			(0.018)				(0.572)				(0.022)	
Tmerit × 𝟙(Prior PS Pay > Truth) [i]				-0.009				-0.126				0.030
				(0.027)				(0.627)				(0.033)
Tmerit × 𝟙(Prior PS Pay ≤ Truth) [ii]				0.035				0.450				0.028
				(0.033)				(0.772)				(0.039)
Observations	1,868	1,739	1,868	1,868	1,441	1,338	1,441	1,441	1,903	1,770	1,903	1,903
Mean Dep. Var. if Tmerit=0	0.879	0.879	0.879	0.879	2.069	2.069	2.069	2.069	0.439	0.439	0.439	0.439
p-value H_0: [i] - [ii] = 0		0.584	0.609	0.275		0.772	0.312	0.549		0.676	0.473	0.957

Notes: The first column of each outcome variable reports the effect of Tmerit for the average worker (estimate for β in equation 1). The second column of each outcome variable reports the effect of Tmerit for "High Rank" workers (ranked first, second or third in terms of performance by the PS at baseline) and for "Low Rank" workers (ranked fourth or more). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=High Rank. The third column of each outcome variable reports the effect of Tmerit by whether the supervisor of the CHW is within 5 years of retirement age at baseline ("Promotion Soon"). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=Promotion Soon. The last column of each outcome variable presents the effect of Tmerit by whether the prior about PS pay is above the median (actual salary of SLL 250,000) or not (i.e. "Prior PS Pay > or ≤ Truth"). These correspond to the estimates for β_{above} and $\beta_{at/below}$ in equation (3). All regressions control for the stratification variables and for the uninteracted x-variable (High Rank, Promotion Soon, Prior PS Pay depending on the column). The outcome variables aggregate household-level data at the CHW level. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.6: Heterogeneous Effects of the Meritocracy and Pay Progression Treatment on Beliefs Updating

	(1)	(2)	(3)	(4)	(5)	(8)
	Post-Treatment Perceptions					
Dep. Var.:	Perceived Meritocracy = {-1, 0, 1}				|PS Pay - Truth| (in 1,000 SLL)	
Definition of Z	Prior Meritocracy	High Rank	Promotion Soon	Prior PS Pay	|Prior PS Pay - Truth|	Tmerit
Z	0.739***	0.018	0.010	0.002	0.774***	0.690
	(0.028)	(0.036)	(0.050)	(0.003)	(0.048)	(2.889)
Tmerit	0.574***	0.322***	0.297***	0.274***		
	(0.030)	(0.032)	(0.026)	(0.093)		
Tmerit × **Z**	-0.543***	-0.053	-0.016	0.001		
	(0.039)	(0.047)	(0.074)	(0.004)		
Tpay					-3.449**	-33.956***
					(1.524)	(2.161)
Tpay × **Z**					-0.769***	-1.714
					(0.049)	(2.999)
Observations	1,933	1,842	1,982	1,982	2,009	2,009
Mean Dep. Var. if Tmerit=0	0.626	0.626	0.626	0.626		
Mean Dep. Var. if Tpay=0					17.90	17.90

Notes: All regressions control for stratification variables."High Rank" equals 1 if the CHW is ranked first, second or third in terms of performance by the PS at baseline and 0 otherwise. "Promotions Soon" equals 1 if the supervisor of the CHW is within 5 years of retirement age at baseline. "Prior PS Pay" is expressed in 10,000 SLL. |Prior PS Pay - Truth|" is also expressed in 1,000 SLL. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1

Table A.7: Effect of Meritocracy on Worker Performance – Extra Controls

Dep. Var.:	(1)	(2)	(3)	(4)	(5)	(6)
	Number of Visits			Visit Length (in minutes)		
Tmerit × High Rank [i]	2.329***			1.713*		
	(0.602)			(0.903)		
Tmerit × Low Rank [ii]	0.992*			1.642**		
	(0.563)			-0.796		
Tmerit × Promotion Soon [i]		3.478***			2.824	
		(1.240)			(1.896)	
Tmerit × Promotion not Soon [ii]		1.251**			1.611**	
		(0.510)			(0.686)	
Tmerit × 𝟙(Prior PS Pay > Truth) [i]			2.073**			2.825**
			(1.038)			(1.243)
Tmerit × 𝟙(Prior PS Pay ≤ Truth) [ii]			0.365			0.334
			(0.810)			(1.130)
Observations	1,812	1,959	1,951	1,717	1,861	1,853
Mean Dep. Var. if Tmerit=0	6.749	6.749	6.749	11.99	11.99	11.99
p-value H_0: [i] - [ii] = 0	0.042	0.100	0.101	0.945	0.545	0.077
p-value MHT correction for [i]	0.004	0.004	0.008	0.024	0.060	0.004
p-value MHT correction for [ii]	0.008	0.004	0.554	0.008	0.004	0.777

Notes: The first column of each outcome variable reports the effect of Tmerit for the average worker (estimate for β in equation 1). The second column of each outcome variable reports the effect of Tmerit for "High Rank" workers (ranked first, second or third in terms of performance by the PS at baseline) and for "Low Rank" workers (ranked fourth or more). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=High Rank. The third column of each outcome variable reports the effect of Tmerit by whether the supervisor of the CHW is within 5 years of retirement age at baseline ("Promotion Soon"). These correspond to the estimates for β_1 and β_2 in equation (2) when X_{ij}=Promotion Soon. The last column of each outcome variable present the effect of Tmerit by whether the prior about PS pay is above the median (actual salary of SLL 250,000) or not (i.e. "Prior PS Pay > or ≤ Truth"). These correspond to the estimates for β_{above} and $\beta_{at/below}$ in equation (3). Effectively this means that we limit the comparisons to workers in T_{pay}=0, who did not receive information on PS pay. All regressions control for the stratification variables and for the uninteracted x-variable (High Rank, Promotion Soon, Prior PS Pay depending on the column). The regressions also control for the CHW characteristics that are correlated with the uninteracted x-variable and their interaction with Tmerit. The correlates of High Rank are: CHW gender, education, wealth, health knowledge, experience, number of visits (self-reported), number of households she is responsible for. The correlates of Promotion Soon are: CHW age, health knoweldge, and years she has known the PS. The correlates of Prior PS Pay are: CHW age and experience."Number of visits" is the average number of household visits provided by the CHW (as reported by the households). "Visit Length" is the average visit length as reported by the households. A visit length of zero is inputed to households that are never visited by the CHW. At the bottom of the table, we present p-values adjusted for multiple hypothesis testing across all columns computed using Romano and Wolf [2016] step-down procedure. *** p<0.01, ** p<0.05, * p<0.1.

TABLE A.8: 2 × 2 SPECIFICATION

Dep. Var.:	(1) Number of Visits	(2) Visit Length (in minutes)
Tmerit [i]	0.978	1.295
	(0.745)	(0.944)
Tpay [ii]	-1.227**	-0.847
	(0.596)	(0.942)
Tmerit × Tpay [iii]	1.048	0.925
	(0.929)	(1.301)
Observations	1,966	1,868
Mean Dep. Var.	7.560	12.925
Mean Dep. Var. if Tpay=0 & Tmerit=0	7.455	12.479
p-value H_0: [i] + [iii] = 0	<0.001	0.014
p-value H_0: [ii] + [iii] = 0	0.803	0.932

Notes: All regressions control for the stratification variables. "Number of Visits" is the average number of household visits provided by the CHW (as reported by the households). "Visit Length" is the average visit length as reported by the households. A visit length of zero is inputed to households that are never visited by the CHW. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.9: Effect of Pay Progression on Worker Performance by Meritocracy – Extra Controls

Dep. Var.:	(1) Number of Visits	(2) Visit Length (in minutes)
Panel A: Effects for Workers who Underestimated PS Pay at Baseline [Higher Pay Progression in Tpay=1]		
Tpay × Meritocratic (Tmerit=1) × 𝟙(Prior PS Pay < Truth) [i]	1.637	1.296
	(1.122)	(1.280)
Tpay × Non-Meritocratic (Tmerit=0) × 𝟙(Prior PS Pay < Truth) [ii]	-1.993**	-2.118*
	(0.838)	(1.221)
Panel B: Effects for Workers who Overerestimated PS Pay at Baseline [Lower Pay Progression in Tpay=1]		
Tpay × Meritocratic (Tmerit=1) × 𝟙(Prior PS Pay > Truth) [iii]	-2.386**	-2.741**
	(1.016)	(1.219)
Tpay × Non-Meritocratic (Tmerit=0) × 𝟙(Prior PS Pay > Truth) [iv]	-0.730	-0.667
	(0.838)	(1.320)
Panel C: Effects for Workers who Correctly Estimated PS Pay at Baseline [Same Pay Progression in Tpay=1]		
Tpay × Meritocratic (Tmerit=1) × 𝟙(Prior PS Pay = Truth) [v]	-0.343	1.476
	(1.025)	(1.441)
Tpay × Non-Meritocratic (Tmerit=0) × 𝟙(Prior PS Pay = Truth) [vi]	-0.278	0.444
	(0.823)	(1.630)
Observations	1,938	1,840
Mean Dep. Var. if Tpay=0	7.965	13.191
p-value H_0: [i] - [ii] = 0	0.210	0.246
p-value H_0: [iii] - [iv] = 0	0.010	0.055
p-value H_0: [v] - [vi] = 0	0.960	0.636

Notes: This table presents the effects of Tpay on the number of visits in the meritocratic regime (Tmerit=1) and in the non-meritocratic regime (Tmerit=0), estimated from equation (3). Panel A reports the estimates for γ_{below} and δ_{below} (effects for workers who underestimated PS pay at baseline). Panel B reports the estimates for γ_{above} and δ_{above} (effects for workers who overestimated PS pay at baseline). Panel C reports the estimates for γ_{at} and δ_{at} (effects for workers who correctly estimated PS pay at baseline). All regressions control for the stratification variables, 𝟙(Prior PS Pay < Truth) and 𝟙(Prior PS Pay > Truth), and these last two variables multiplied with Tmerit (see equation 3). They also contol for the correlates of priors about PS pay and their interactions with Tpay, Tmerit and Tpay × Tmerit. 𝟙(Prior PS Pay < Truth) [resp., 𝟙(Prior PS Pay > Truth)] equals one if the pre-treatment perception about PS salary is below (resp., above) the actual salary of SLL 250,000 and 0 otherwise. "Number of visits" is the average number of household visits provided by the CHW (as reported by the households). "Visit Length" is the average visit length as reported by the households. A visit length of zero is inputed to households that are never visited by the CHW. Differences in the number of observations is due to missing values. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.10: Summary Statistics and Balance Checks by PS Pay Priors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Mean	S.D.	Tmerit		Tpay		Tmerit × Tpay	
			Coeff	S.E.	Coeff	S.E.	Coeff	S.E.
Panel A: CHW characteristics for CHWs with Prior PS Pay > Truth (N=673)								
Male = {0, 1}	0.736	0.441	0.008	(0.048)	-0.023	(0.049)	-0.002	(0.072)
Age (in years)	38.28	11.50	1.052	(1.339)	-0.627	(1.267)	2.042	(1.845)
Completed primary education = {0, 1}	0.689	0.463	0.034	(0.057)	0.054	(0.057)	-0.062	(0.081)
Completed secondary education or above = {0, 1}	0.068	0.253	-0.014	(0.027)	-0.051**	(0.025)	0.048	(0.038)
Wealth score (0 to 8)	2.366	1.064	0.191	(0.121)	-0.010	(0.116)	-0.177	(0.171)
Health knowledge score (0 to 7)	3.007	1.414	0.013	(0.167)	0.050	(0.168)	0.092	(0.231)
Number of years as CHW	2.534	3.041	0.346	(0.374)	0.099	(0.304)	-0.124	(0.512)
Number of households CHW is responsible for	56.39	80.98	6.446	(9.043)	-2.135	(8.216)	0.505	(12.702)
Number of hours worked as CHW per week	16.61	29.40	1.467	(3.858)	-5.572*	(3.248)	0.741	(4.269)
Number of household visits provided per week	21.81	21.90	2.667	(2.836)	1.807	(3.120)	-5.510	(3.717)
Satisfied with the PS = {0, 1}	0.761	0.427	0.058	(0.052)	0.022	(0.054)	-0.006	(0.075)
Number of years CHW has known PS for	8.215	8.654	-0.751	(1.048)	-1.454	(0.903)	1.103	(1.411)
Ever talked to the PHU in-charge = {0, 1}	0.508	0.500	-0.024	(0.066)	-0.074	(0.067)	0.031	(0.094)
Number of years CHW has known PHU in-charge for	2.657	4.469	-0.274	(0.615)	-0.330	(0.619)	0.022	(0.802)
Panel B: CHW characteristics for CHWs with Prior PS Pay = Truth (N=598)								
Male = {0, 1}	0.734	0.442	0.024	(0.053)	0.041	(0.048)	-0.122*	(0.070)
Age (in years)	35.54	10.69	0.018	(1.210)	-1.393	(1.118)	0.699	(1.675)
Completed primary education = {0, 1}	0.747	0.435	-0.032	(0.055)	0.066	(0.057)	0.002	(0.077)
Completed secondary education or above = {0, 1}	0.100	0.301	0.027	(0.044)	-0.053	(0.040)	-0.004	(0.054)
Wealth score (0 to 8)	2.599	1.162	-0.019	(0.141)	-0.104	(0.114)	0.182	(0.186)
Health knowledge score (0 to 7)	2.940	1.373	-0.080	(0.161)	-0.027	(0.154)	0.406*	(0.217)
Number of years as CHW	2.110	2.798	0.271	(0.294)	-0.244	(0.276)	0.218	(0.405)
Number of households CHW is responsible for	53.48	70.71	3.405	(10.761)	-8.216	(6.223)	1.765	(12.681)
Number of hours worked as CHW per week	17.96	23.28	3.300	(2.917)	1.636	(2.796)	-4.023	(4.071)
Number of household visits provided per week	22.97	21.61	-0.517	(3.418)	-1.949	(2.482)	1.070	(4.138)
Satisfied with the PS = {0, 1}	0.766	0.424	0.063	(0.055)	0.082	(0.056)	-0.064	(0.073)
Number of years CHW has known PS for	7.532	8.225	0.050	(0.943)	-0.581	(0.989)	0.567	(1.328)
Ever talked to the PHU in-charge = {0, 1}	0.538	0.499	0.031	(0.066)	0.001	(0.067)	-0.143	(0.091)
Number of years CHW has known PHU in-charge for	2.981	4.524	-0.994	(0.628)	-1.066*	(0.632)	0.810	(0.775)
Panel C: CHW characteristics for CHWs with Prior PS Pay < Truth (N=738)								
Male = {0, 1}	0.710	0.454	-0.085	(0.052)	-0.082	(0.052)	0.105	(0.075)
Age (in years)	37.10	11.25	-0.855	(1.246)	-0.418	(1.232)	1.489	(1.694)
Completed primary education = {0, 1}	0.706	0.456	-0.077	(0.050)	-0.055	(0.051)	0.077	(0.074)
Completed secondary education or above = {0, 1}	0.081	0.273	0.047*	(0.027)	0.042	(0.028)	-0.049	(0.043)
Wealth score (0 to 8)	2.533	1.224	0.061	(0.123)	0.132	(0.119)	0.069	(0.181)
Health knowledge score (0 to 7)	2.757	1.467	-0.097	(0.173)	-0.082	(0.160)	-0.165	(0.235)
Number of years as CHW	2.001	2.622	0.338	(0.291)	0.319	(0.291)	-0.426	(0.393)
Number of households CHW is responsible for	60.14	69.68	-9.165	(8.201)	3.420	(9.200)	7.861	(11.979)
Number of hours worked as CHW per week	18.70	45.32	-3.740	(4.396)	-3.044	(4.702)	10.453	(6.751)
Number of household visits provided per week	19.93	16.20	-1.565	(1.688)	2.292	(1.683)	-0.332	(2.415)
Satisfied with the PS = {0, 1}	0.760	0.427	0.090*	(0.050)	0.064	(0.054)	-0.046	(0.068)
Number of years CHW has known PS for	7.569	8.383	0.621	(1.077)	1.058	(0.974)	0.963	(1.470)
Ever talked to the PHU in-charge = {0, 1}	0.543	0.498	-0.072	(0.061)	-0.038	(0.056)	-0.005	(0.085)
Number of years CHW has known PHU in-charge for	3.126	4.888	-0.916	(0.667)	-1.204*	(0.635)	1.113	(0.851)

Notes: This table presents summary statistics of CHW characteristics in the three sub-samples: CHWs who overestimated PS pay at baseline (Panel A), CHWs who guessed PS pay correctly (Panel B), CHWs who underestimated PS pay (Panel C). Each row states the sample mean and standard deviation of a variable, as well as the estimates from a regression, where the variable is regressed on an indicator for Tmerit, Tpay and Tmerit × Tpay. All regressions control for stratification variables and cluster standard errors at the PHU level. All variables reported in this table are measured at baseline. *** p<0.01, ** p<0.05, * p<0.1

TABLE A.11: EFFECT OF PAY PROGRESSION ON LOBBYING

Dep. Var.:	(1) Talked to PHU In-Charge = {0,1}	(2) Fraction of Time on Non-Patient-Related Activities
Effects for Workers who Underestimated PS Pay at Baseline [Higher Pay Progression in Tpay=1]		
Tpay × Meritocratic (Tmerit=1) [i]	-0.043	-0.000
	(0.063)	(0.016)
Tpay × Non-Meritocratic (Tmerit=0) [ii]	-0.038	0.020
	(0.056)	(0.018)
Observations	738	715
Mean Dep. Var. if Tpay=0	0.556	0.210
p-value H_0: [i] - [ii] = 0	0.954	0.391

Notes: Sample restricted to workers who underestimated PS pay at baseline ("Prior PS Pay < Truth") for whom perceived pay progression increases in Tpay=1. All regressions control for stratification variables and for a dummy variable for "Meritocratic" (Tmerit=1). "Talked to PHU In-Charge" is self-reported by the CHW at endline. "Non-Patient Related Activities" include administrative tasks and liaising with PHU staff. The time spent on different tasks is self-reported by the CHW at endline. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.12: Incentives and Perceptions

Dep.Var.:	(1)	(2)	(3)	(4)
	Post-Treatment Perceived Meritocracy = {-1, 0, 1}		|Post-Treatment Prior PS Pay - Truth| (in 1,000 SLL)	
Supv Incentives	0.018	0.043	-1.409	-2.399
	(0.043)	(0.042)	(3.125)	(2.724)
Worker Incentives	0.023	0.042	0.389	3.740
	(0.041)	(0.040)	(3.254)	(2.902)
Shared Incentives	-0.005	0.027	2.517	4.140
	(0.041)	(0.038)	(3.273)	(2.872)
Tmerit		0.317***		
		(0.044)		
Tmerit × Supv Incentives		-0.007		
		(0.062)		
Tmerit × Worker Incentives		-0.013		
		(0.059)		
Tmerit × Shared Incentives		-0.035		
		(0.062)		
Tpay				-32.367***
				(2.578)
Tpay × Supv Incentives				2.760
				(3.460)
Tpay × Worker Incentives				-2.899
				(3.500)
Tpay × Shared Incentives				-2.333
				(3.642)
Observations	1,933	1,933	2,009	2,009
Mean Dep. Var. in Omitted Group	0.615	0.448	18.157	34.405

Notes: All regressions control for district fixed effects and the baseline value of the outcome variable. Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1

TABLE A.13: MAIN RESULTS, INTERACTIONS WITH INCENTIVES

	(1)	(2)	(3)	(4)
Dep. Var.:	Number of Visits			
Definition of Z:	-	High Rank	Promotion Soon	𝟙(Prior PS Pay > Truth)
Tmerit	0.849			
	(1.670)			
Tpay	-1.761			
	(1.474)			
Tpay × Tmerit	1.312			
	(2.067)			
Tmerit × Supv Incentives	2.772			
	(2.167)			
Tpay × Supv Incentives	0.378			
	(1.786)			
Tpay × Tmerit × Supv Incentives	-3.235			
	(2.675)			
Tmerit × Worker Incentives	-1.920			
	(2.296)			
Tpay × Worker Incentives	1.123			
	(1.967)			
Tpay × Tmerit × Worker Incentives	2.824			
	(2.869)			
Tmerit × Shared Incentives	-0.755			
	(1.833)			
Tpay × Shared Incentives	0.546			
	(1.682)			
Tpay × Tmerit × Shared Incentives	-0.527			
	(2.373)			
Tmerit × Z		1.945	1.127	1.958
		(1.301)	(1.212)	(1.438)
Tmerit × 1-Z		0.911	1.663	1.021
		(1.186)	(1.168)	(1.124)
Tmerit × Z × Supv incentives		0.937	2.309	1.007
		(1.752)	(1.630)	(1.932)
Tmerit × 1-Z × Supv incentives		1.909	0.044	1.784
		(1.599)	(1.803)	(1.510)
Tmerit × Z × Worker incentives		0.329	0.748	-1.776
		(1.647)	(1.778)	(1.849)
Tmerit × 1-Z × Worker incentives		-0.674	-1.516	0.622
		(1.689)	(1.570)	(1.651)
Tmerit × Z × Shared Incentives		0.215	-0.671	-1.778
		(1.540)	(1.402)	(1.586)
Tmerit × 1-Z × Shared Incentives		-0.872	-1.130	-0.385
		(1.370)	(1.368)	(1.289)
Observations	1,966	1,830	1,966	1,966
Mean Dep. Var.	7.560	7.560	7.560	7.560

Notes: Columns (2) to (4) control for the uninteracted Z variable, defined in the column heading. "Number of Visits" is the average number of household visits provided by the CHW (as reported by the households). Standard errors are clustered at the PHU level. *** p<0.01, ** p<0.05, * p<0.1.

Appendix Sections

A Ethics Appendix

Following Asiedu et al. (2021), we detail key aspects of research ethics.

Pre-Analysis Plan The study was pre-registered on the AEA RCT Registry with the number 0003993. We follow the pre-analysis closely. The outcomes variables we use in the paper were mentioned in the AEA RCT Registry. In the pre-analysis plan, we specified that we would use the number of SMS reports, described in Appendix B.6, as a secondary measure of worker performance. We ended up not using this variable because the average worker is found to underreport the visits provided. This measure is hence uninformative about worker performance. We decided to focus only on the primary measure of worker performance based on households' responses in the household survey.

The AEA registry is centered on the interaction between meritocracy and (perceived) pay progression. It also explicitly mentions the possible heterogeneous effect of the meritocratic treatment by performance ranking and social connections. In the paper, we put less emphasis on the latter because of the lack of a clear theoretical prediction. For sake of transparency, we describe the results here. We find that the meritocratic promotions treatment leads to an increase of 2.3 visits (35%) for workers not connected to the PHU in-charge (significant at the 1% level) and an increase of 0.8 visits for workers connected to the PHU in-charge, although this estimate is not significant. The difference between the two estimates is statistically significant at the 1% level.

IRB and Research Ethics The project received IRB from the University of Pompeu Fabra (CIREP Approval 107) and from the Sierra Leone Ethics and Scientific Review Committee (no IRB number assigned by this local institution).

We obtained informed consent from all participants prior to the study. The consent form described the participants' risks and rights, confidentiality, and contact information. Research staff and enumerator teams were not subject to additional risks in the data collection process. None of the researchers have financial or reputation conflicts of interest with regard to the research results. No contractual restrictions were imposed on the researchers limiting their ability to report the study findings.

On policy equipoise and scarcity, there was uncertainty regarding the net benefits from our treatments for any worker. The interventions under study did not pose any potential harm to participants and non-participants. The intervention rollout took place according to the evaluation protocol.

On potential harms to participants or nonparticipants, our data collection and research procedures adhered to protocols around privacy, confidentiality, risk-management, and informed consent. Participants were not considered particularly vulnerable (beyond some households residing in poverty). Besides individual consent from study participants, consultations were conducted with local representatives at the district levels. All the enumerators involved in data collection were recruited from the study districts to ensure they were aware about implicit social norms in these communities.

The presentation of the findings from the project to district and national level authorities in Sierra Leone was done in September 2022. No activity for sharing results to participants in each study village is planned due to resource constraints. We do not foresee risks of the misuse of research findings. Policy briefs have been created based on this project and have been distributed to policymakers through IGC, J-PAL and CEGA.

B Institutional Details

B.1 Extra Details on the Location of the Experiment

The experiment took place in 372 PHUs across six districts of Sierra Leone. One district is located in the south (Bo), one in the east (Kenema), three in the north (Bombali, Tonkolili and Kambia) and one in the west (Western Area Rural). Out of the existing 823 PHUs across the six districts, we excluded half because no up-to-date and verified list of health workers was available, and selected 372 PHUs from the remaining eligible PHUs to be part of the experiment. The 372 PHUs were cross-randomized into T_{merit} and T_{pay}, stratifying by district and the presence of temporary performance-based incentives, which are described below.

B.2 Extra Details on the Sample Size

The surveys cover 372 PSs and 2,009 CHWs, which were surveyed at baseline and endline.[15] At endline, we also surveyed three eligible households per household, which account for nearly 10% of the households in the village. The respondent of the survey was the female household head, who is typically the most knowledgeable about health topics. In the absence of a full listing of households in each village, the sampling was done through a random walk starting from the house of the CHW and with pre-specified sampling intervals between households. To cover a random sample of households across the entire village (and not only households who live near the CHW), the intervals were calculated based on the total number of households in the community. In order to be eligible for the household survey, the respondent had to be female, one of the primary caregivers, between 18 and 49 years old, and have lived in the household for at least 6 months during the study period. We set these eligibility criteria so that sampled households would belong to the group targeted to receive the services of the CHW.

[15] 72 CHWs we contacted by phone refused to be interviewed at baseline and were excluded from the sample.

B.3 Extra Details on Script Reading

The scripts in $T_{merit} = 1$ and $T_{merit} = 0$ were read by the same operator and were delivered by phone. The operators were hired by the research team and were trained to read the script in similar ways across the two treatments. Before reading the script, the phone operators explicitly mentioned that the information they were conveying was officially approved by the DHMT and the MoHS. The fact that CHWs in $T_{merit} = 1$ updated their perception of meritocracy upward after receiving the information in the script (see Figure 1, Panel A), indicates that CHWs trusted and understood the information. The scripts in $T_{pay} = 1$ and $T_{pay} = 0$ were also read by the same operator. The script was read immediately after the "T_{merit} script."

B.4 Extra Details on the Accuracy of the Performance Measure and Collusion with Households

All CHWs (both in $T_{merit} = 1$ and $T_{merit} = 0$) were made aware at baseline that we would measure their performance by interviewing households on the visits they received. As explained, the CHWs in $T_{merit} = 1$ were also aware that this information would then be used by the DHMTs to decide on promotions.

To avoid collusion with the households on misreporting visits, CHWs were not informed about how many households we would interview, which ones, and when. In line with the absence of collusion, we show in Table A.5 that the share of respondents who report having received a visit is comparable among friends or family members (higher probability of collusion) than among the rest of the respondents. To limit collusion, a random 25% of households each week were "back-checked" either by phone or in-person (unannounced visits) by a team of field monitors, who asked the households to confirm the date and the type of the household visit.

Importantly, the effectiveness of performance-based promotions (or any other type of performance-based incentives) depends on the organization's ability to measure worker performance accurately. The noisier is the measure of performance,

the lower is the worker incentive to exert effort. While our measure of worker performance is not entirely accurate – as it relies on the visits received by a random sample of the potential patients rather than the full population – it is likely more accurate than in the many settings in which it is measured by governments that lack resources to monitor workers closely. The fact that worker performance was measured by outside researchers may also have helped maintain fidelity to the design (Banerjee, Duflo, and Glennerster 2008; De Ree et al. 2018). In Section 4, we show that the measure of performance is accurate enough to affect CHW effort in $T_{merit} = 1$.

B.5 Extra Details on the Promotion System

The set of skills required for the PS and CHW jobs do not perfectly overlap – e.g., the PS position requires managerial skills that the CHW position does not require. As a result, promoting CHWs based on their current performance (as in the new meritocratic system discussed below) is not necessarily the best possible system to select high-performing PSs; e.g., see the "Peter Principle" (Peter, Hull et al. 1969; Benson, Li, and Shue 2019). It might be more effective, for example, to promote CHWs based on their "potential" as a good manager. Such systems are however more subjective and have been shown to lead to more discrimination (Benson, Li, and Shue 2021). Understanding which promotion system leads to selecting the best supervisor is outside the scope of this paper and a good avenue for future research.

That said, the promotion system we implement in $T_{merit} = 1$ is likely more effective than the status-quo system in $T_{merit} = 0$, which puts more weight on connections. The PS work is indeed mostly independent of the PHU in-charge and having a connection to the PHU in-charge has limited added value in our context. In contrast, promoting a high-performing CHW presumably implies selecting someone who is highly motivated and with good health knowledge, both of which predict PS performance in our sample of workers.

B.6 Extra Details on the Temporary Performance-Based Incentives

A subsample of the CHWs and PSs in this study received a temporary performance-based incentive scheme paid by an external organization which is the focus of Deserranno et al. (2022). This incentives randomization was done at the PHU level. In the Shared Incentives Treatment, CHWs received an incentive of 1,000 SLL for each service performed and the PS received an incentive of 1,000 SLL for each service performed by a CHW under her supervision. In the Worker Incentives Treatment, CHWs received an incentive of 2,000 SLL for each service performed while the PS received no incentives. In the Supervisor Incentives Treatment, the PS received an incentive of 2,000 SLL for each service performed by a CHW under her supervision while the CHWs received no incentives. In the control group, neither the CHWs nor the PS received an incentive. In each treatment, the number of services a CHW provided was measured with an SMS reporting system, which required the CHW to report the date and type of service and the contact information of the patient by sending an SMS to a toll-free number. This reporting system played no role in the main experiment of this paper.

As mentioned in the body of the paper, the randomization of the meritocracy and pay progression information treatments was stratified by the above-mentioned incentives treatments. Still, one may be concerned that the main effects shown in the paper are driven by specific interactions between the treatments in the two projects. We address this concern directly in Table A.12, where we first show that the impact of the meritocratic promotion and pay progression information treatments on perceptions of meritocracy and pay progression are orthogonal to the presence of these incentives. This is not surprising as these incentives are short-run and are provided by an external organization with no connection with the government, and thus should not affect the perceptions about the promotion criteria or perceptions about the pay PSs receive from the government. Accordingly, Table A.13 shows

that the effects of the meritocracy and pay progression information treatments on the number of visits do not interact with the incentives treatments (column 1). The effects of the meritocracy treatment by high rank, promotion expected soon or perceived PS pay – which we presented in Section 4 – also appear orthogonal to the incentives treatments (columns 2-4).