



Contents lists available at ScienceDirect

World Development

journal homepage: www.elsevier.com/locate/worlddev

Designing feasible anti-corruption strategies in the Nigerian health system: A latent class analysis of a discrete choice experiment



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ARTICLE INFO

Article history:

Accepted 29 January 2023

Available online 24 February 2023

Keywords:

Anti-corruption

Nigeria

Health system

Absenteeism

Primary health care

ABSTRACT

Health worker absenteeism is a major form of corruption in the Nigerian health system, reducing the impact of healthcare investment and disproportionately affecting vulnerable communities. Top-down governance and accountability measures to improve attendance have had limited effect, potentially because they have not addressed underlying incentives driving health worker behaviour. To inform feasible interventions to reduce absenteeism, we sought to investigate how potential interventions targeting key drivers of absenteeism could influence behaviour through a discrete choice experiment with 412 primary health care workers in Enugu State, Nigeria. The experiment included six attributes drawing on a literature review, qualitative research and stakeholder consultation: facility relationship with the community, method of supervision, attendance-related rewards or punishments, flexible working policy, posting location and financial incentives. Respondent choices were analysed with mixed multinomial logistic and latent class models and used to simulate job uptake under different policies. We found all attributes significantly influenced choices: workers strongly preferred jobs that facilitated supportive community relationships ($\beta = 0.37$), had a financial incentive worth 10 % of a worker's salary ($\beta = 0.39$), rewarded attendance with credit towards promotion ($\beta = 0.25$) or placement in training ($\beta = 0.14$), and offered flexible work conditions ($\beta = 0.14$). Using latent class analysis, we identified two sub-groups of workers who differed in their willingness to accept a job and preferences over specific attributes, suggesting some may be more susceptible to feasible interventions to improve attendance. We argue that focusing on the needs of these groups may offer a path to incrementally, but sustainably, reduce absenteeism across the system. Our findings build on frameworks developed in anti-corruption research in other sectors only recently been applied to the health sector. The work represents some of the only empirical evidence to inform anti-corruption strategies in Nigeria and internationally, with findings relevant to other low- and middle-income countries seeking to combat absenteeism among primary health care workers.

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1. Introduction

Health worker absenteeism is a pervasive problem in many low and middle-income countries including Nigeria (Chaudhury et al., 2006; García, 2019; Naher et al., 2020). It reduces the impact of

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health expenditure, disproportionately impacts the most vulnerable and has been classified as a major form of health system corruption by Transparency International (Transparency International, 2021). While system-wide data are scarce on the extent of health worker absenteeism in Nigeria, it has been estimated that 34 % of primary care posts are absent at any one time and a recent priority-setting process with key stakeholders ranked health worker absenteeism as the form of corruption having the biggest detrimental impact on the Nigerian health system (Kress et al., 2016; Onwujekwe et al., 2020). Conventional approaches to address absenteeism, as with other forms of corruption in public service delivery, have been developed based on economic models that sees rule breaking as a moral issue, related to distortions of the contractual relationship between a principal and an agent contracted to deliver services or as a result of perverse social norms (Hutchinson et al., 2020). As such, interventions to overcome absenteeism have historically been focused on strengthening the monitoring and punishment of absenteeism through top-down, vertical measures, such as transparency and accountability interventions and law and regulatory enforcement including sanctions for offenders (Hutchinson et al., 2020). In Nigeria, for example, this has included the installation of biometric scanners in some facilities and local government headquarters, unannounced visits to monitor attendance and punishment for repeat offenders. Efforts to understand the impact of these measures, however, have found limited evidence that they have been effective in Nigeria, reflecting a similar lack of evidence globally, and health worker absenteeism remains prevalent in Nigeria (Gaitonde et al., 2016; Holeman et al., 2016; Kisakye et al., 2016).

In light of this lack of progress, we have sought to recast absenteeism as a structural, rather than moral problem (Hutchinson et al., 2020; Khan, 2012). Structural factors (such as the political economy, social networks and health systems investments) shape incentives and the possibility for health workers to follow the formal rules (Angell et al., 2021; Hutchinson et al., 2020; Khan, 2008; 2012). This research is based on an alternative conceptualisation of corruption that argues where the rule of law is weak, anti-corruption approaches that rely on detecting violations and enforcing formal accountability systems are unlikely to yield substantive results. This is based on a historical institutionalist reading of the structural transition that developing countries are going through and not on a model that considers the rule of law outcome of currently high-income countries as the benchmark (Khan, 2008; 2012). Results are likely to be significantly better when the focus is on instances of corruption where it is possible to incentivize sufficiently powerful and capable actors engaged in that activity to support anti-corruption in their own interest. Key gaps that this research addresses, and builds on earlier work in the area, are ensuring the long-term sustainability of policy reform via peer-driven or horizontal monitoring and developing complementary frameworks to transparency and accountability based mechanisms (Gaventa & McGee, 2013; Joshi, 2013; Kolstad & Wiig, 2009; World Bank, 2016).

Effective anti-corruption has to seek out opportunities where the anti-corruption effect is implementable because it is feasible to incentivize. The power, capability and interest driven framework has been used to identify feasible and impactful anti-corruption solutions in sectors as diverse as electricity generation, skills development, education and climate change infrastructure (Agwu et al., 2022; Khan, Watkins, Aminuzzaman, et al., 2022; Khan, Watkins, & Zahan, 2022). The evidence-based approaches involve a mix of reducing legitimate reasons for violations, enhancing peer-driven monitoring and where possible creating opportunities for such monitoring. Where generalised, top-down measures have historically failed to overcome absenteeism in Nigeria and other nations, measures that recognise the underlying

drivers of absenteeism offer the prospect for more pragmatic and incremental improvements in levels of attendance across the system (Hutchinson et al., 2020; Khan, 2018).

In Nigeria, health workers have been shown to be absent for a wide variety of reasons, including the caring responsibilities of workers, supervisory arrangements, and the job satisfaction of staff among others (Obodoechi et al., 2021). Qualitative work for this project highlighted a range of factors including a desire or need to better their financial situation by engaging in private practice, transportation difficulties, family responsibilities, and organisational and managerial challenges driving health worker absenteeism (Agwu et al., 2020; Onwujekwe, Orjiakor, et al., 2019). Significantly, workers who were more connected politically were reported to be able to obtain more desirable job placements such as those in urban areas and protect themselves from sanction for unauthorised absences (Omwujekwe, 2020).

Many of these drivers of health worker absenteeism are complex, interconnected and difficult to generalise. Addressing them will require paying attention to underlying characteristics of the health system and the broader political economy. In this case, a first step is to identify the preferences of health workers, in particular those who would attend their duties if possible or if there were improvements in job characteristics. This could substantially reduce absenteeism among workers who do not have political connections but are discouraged from attending by prevailing incentives. As the number of workers preferring to be present rises, we can expect this group to act as 'insiders' who have both the capability and interest to uphold rules: in this case to be present. In other sectors such supportive policies have allowed for forms of collective action and horizontal peer monitoring that work to further reduce the extent and impact of rule-breaking (Khan et al., 2019).

The current experience in Nigerian health system, however, is not readily amenable to horizontal monitoring as there is limited incentive to monitor peers when most workers are themselves absent. This is what makes the corruption 'networked' as a majority of actors in the sector are benefiting from corruption and there is little incentive to change behaviour. Our previous qualitative research shows that this is not a problem of poor governance, but a result of complex and manifold drivers including logistical, infrastructural, and political. The solution, we propose, is to look for feasible disruption or 'exit' from networked corruption – that is to build situations where individual workers can choose to act in ways that benefit themselves, but also the system, rather than continuing to act within the corrupt network.

Our approach is to look for such exit strategies by revealing preferences, identifying the profound drivers of absenteeism, as well as the preferences that specific health workers have for features of their jobs related to these drivers and the trade-offs they are willing to make between them. This will allow to designing policies that target these specific incentives among particular provider groups. Discrete choice experiments (DCEs) offer a means to elicit these values and have been used to inform policy development in a range of areas including health worker motivation and retention in many countries (Mandeville et al., 2014). We recently undertook a DCE to examine drivers of doctor absenteeism in rural Bangladesh, identifying groups of rural doctors with distinct preferences for potential interventions (Angell et al., 2021). Some doctors were found to be unlikely to alter their behaviour in response to feasible levels of incentives and were not influenced by the prospect of punishment for poor attendance, mirroring the historical experience of a lack of impact of stringent monitoring policies. Others, however, appeared open to potentially feasible interventions. These doctors particularly valued jobs with facilities that enabled positive relationships with the local community, were safe and secure, and provided benefits to doctors with good attendance.

They disliked punishment for poor attendance, however, this was shown to be outweighed by the presence of more supportive policy settings. The authors argued that addressing the needs of these particular groups of doctors offers the best chance of achieving incremental, but real reductions in absenteeism. Importantly, if such heterogeneity exists and is ignored, it can lead to high-cost interventions that still fail to achieve significant reductions in absenteeism if they do not meet the needs of those who wish to be present at work. While many incentives may be commonly valued across different contexts, the preferences of health workers are also likely to be dependent on local factors such as supportive community relationships and particular health system features (e.g. level of monitoring and expectation of enforcement). Our study seeks to investigate these issues through a DCE with primary healthcare workers in Enugu State, Nigeria to generate context-specific data on the key drivers and potential solutions to absenteeism.

2. Methods

We used a DCE to assess the preferences of primary health care frontline health workers (also referred to as providers) in Enugu state, Nigeria over potential areas for policy intervention to overcome absenteeism. There are three levels of healthcare in Nigeria and these are the primary, secondary and tertiary. Primary Health Care (PHC) is the epicenter of the health systems in Nigeria and is comprised of an integrated system of health clinics and health centers that are located within urban and rural areas. The frontline health workers at the PHC level comprise mostly of nurses, midwives, community health extension workers and community health officers. The National Primary Healthcare Development Agency (NPHCDA) represented in all States in Nigeria, and the Local Government Areas share the primary responsibility for PHC level. This study was conducted by the anti-Corruption Evidence Research Partnership Consortium (SOAS-ACE) and forms part of a mixed-methods study examining the absenteeism of primary healthcare workers in Enugu State. Approval to undertake the study was provided by the Enugu State Primary Health Development Agency (ENSPHCDA) and ethical approval was obtained from the Research Ethics Committee of the University of Nigeria Teaching Hospital and the London School of Hygiene and Tropical Medicine Ethics Committee. All participants provided informed consent.

2.1. Attribute development

We followed best-practice recommendations to develop the attributes for the experiment, using a multi-stage process that included a literature review, qualitative research in our target population, and multiple rounds of stakeholder consultation (Coast et al., 2012; Lancsar & Louviere, 2008). The review examined corrupt practices in Anglophone West-African nations to identify motivators and drivers of corrupt practices involving frontline health workers, their managers, and other stakeholders as well as interventions that have been used to overcome them (Onwujekwe, Agwu, et al., 2019). The review found absenteeism was the most prevalent form of corruption studied. This was reiterated through a nominal group technique consensus-building exercise carried out with 21 frontline workers who prioritised absenteeism as having the largest impact on the Nigerian health system as well as being the most feasible to address (Onwujekwe et al., 2020). The findings of this process were presented to 25 policy-makers who provided insight into the feasibility of interventions to overcome absenteeism.

These findings informed in-depth interviews with thirty-six frontline workers to examine absenteeism and its drivers. The

respondents were purposively selected based on their knowledgeability, availability, and willingness to offer useful information during the interview. The focus was on health workers with at least five years of experience to ensure health workers had experienced transfers and reasonable familiarity with absenteeism-related behaviour. Emerging themes from the interviews and stakeholder workshops were used as the basis for attributes that were iteratively refined by the authors.

This sequential process—review of evidence followed by consensus building and in-depth qualitative work—led to the development of seven candidate attributes for piloting (Table 1). These attributes were also designed keeping in mind our theoretical framework which envisages that when incentives can be feasibly changed, some players in the sector will behave in more rule-abiding ways as this is in their interest.

2.2. DCE design

The choice sets were designed using Ngene software V.1.2.1. We specified a d-efficient, fractional factorial design with no interaction terms included. Estimated coefficients for each level were derived from pilot data and used as prior estimates to generate the final survey tool (all prior coefficients were estimated to be 0 for the design of the pilot survey). The final survey consisted of 24 unlabelled choice sets blocked into two questionnaires such that each respondent was asked to complete 12 scenarios. Each scenario asked participants to choose between two hypothetical jobs that varied in levels of the attributes outlined in Table 2. An opt-out option was provided, allowing participants to select neither job if they would prefer to not accept either presented (participants were asked to select neither if they preferred their current job conditions). If respondents opted-out, they were asked a follow-up forced-choice question asking which job presented they preferred. Fig 1 shows an example choice scenario presented to respondents.

2.3. Pilot

The DCE was piloted with 30 frontline health workers (including nurses, community health workers and officers in charge) at five primary health centres facilities in two local government areas in Enugu State (three facilities were in urban areas and two in rural). Feedback from the pilot highlighted problems with the length of the survey, so the number and level of attributes were reduced to those presented in Table 2 with the transportation, posting location and accommodation attributes combined. The revised DCE was then piloted in a further 15 health workers across three primary health centres. No further changes were made to the attributes following this pilot.

2.4. Data collection

The DCE was conducted in 2020 in 125 primary health care centres across 10 local government areas in Enugu State, in the South-eastern part of Nigeria. The local government areas were purposively selected to cover urban, rural and *peri*-urban areas. A comprehensive list of primary healthcare facilities in the selected 10 local government areas was provided by the ENSPHCDA. Together with the Heads of the Health Departments in each local government area at least 10 facilities were purposively selected from the comprehensive list, taking into consideration the security of locations. Respondents were primary healthcare workers comprising resident doctors, nurses, midwives, Community Health Officers, and Community Health Extension Workers. Face to face interviews were used to collect data and at least 2 health workers from each facility were included in the study. We targeted a sample

Table 1
Candidate attributes for pilot study and reason for inclusion.

Attribute	Reason for inclusion	Expected impact
Relationship with community	Qualitative interviews found that health workers felt that a good relationship with the community was a key determinant of staff absenteeism, affecting how manageable their work demands were, increasing accountability of service workers to the community and allowing health facility committees to act in the interests of the community. Policy makers raised increasing the involvement of health facility committees (intermediary between the communities and the PHC facilities) as a potential intervention to reduce absenteeism. Having connections to and support from locally influential people was found to be important and helps to protect workers if they break the rules (voluntary or involuntary). The survey respondents reported the importance of connections to important people to seek help related to their careers and many reported having such connections to various people such as powerful family members (39 %), friends with connections to powerful people (21 %) or Godfather/Godmother relationships (11 %), however almost half (46 %) reported having no access to such powerful people.	Workers were expected to prefer facilities that enabled a strong relationship with the local community.
Monitoring and Supervision	Current experiences of workers highlighted poor monitoring and supervision by local government health administrators (uncoordinated with health facility committees). Shortcomings with current strategies including check-in registers and biometric monitoring were raised including rigid systems that sometimes prevented staff from checking in, poorly staffed compliance and monitoring teams and the local government level and a limited ability to impose sanctions at the facility level.	Some workers were expected to be wary of increased effective local monitoring.
Formal absenteeism policy (rules and enforcement)	The literature review, qualitative work and stakeholder consultations highlighted that current arrangements to punish absent staff are poorly enforced for a range of reasons including acceptance of absenteeism, differing levels of responsibility for enforcement between facility and government levels and in some cases because some staff are politically protected through relationships with powerful people. Better enforcement of punishment but also better inducements to attend are likely to induce some workers to attend.	Workers were expected to respond to initiatives tied to attendance (positively to inducements and negatively to punishments) if accompanied by appropriate monitoring of absenteeism.
Posting location, transportation and living quarters	The qualitative interviews found that difficulties reaching facilities was a major driver of absenteeism in frontline health workers. Posting workers near their families, providing a transportation allowance to travel to the facility or providing living quarters at facilities for workers and their families were suggested as potential interventions to address these issues.	Workers were expected to prefer jobs with minimal barriers to attendance.
Flexible working	Health workers highlighted that inflexible work arrangements often led to absences as they were unable to attend due to caring and family support responsibilities. Some suggested that flexible arrangements that allow workers some leeway to be absent for legitimate and essential reasons could reduce overall absenteeism.	Workers were expected to prefer jobs with flexible arrangements available.
Incentive	Posting workers to rural areas and other hard to reach areas was found to be unattractive because of lack or inadequacy of basic and social amenities. However, providing monetary incentives in form of percentage increase to basic salary could motivate primary healthcare workers to accept to work in rural areas. Further, the qualitative work highlighted that many workers had to take on second jobs to be financially secure, which was another driver of absenteeism.	Workers were expected to prefer jobs with higher incentive payments.

Table 2
Final attributes used in experiment.

Final attributes used in DCE	Level 1	Level 2	Level 3	Level 4
Relationship with community	Unsupportive relationship with community	Supportive relationship with community		
Monitoring and supervision	Attendance monitored by Officer in Charge (OIC) with register	Unannounced visits by Health Facility Committees (HFCs) to monitor staff and attendance registers	Unannounced visits by Local Government Area Health Authority (LGAHA) to monitor staff and attendance registers	
Additional absenteeism policy	Monthly supportive counselling sessions with Officer in Charge (OIC) and Health Facility Committees (HFCs) for frequently absent staff	Sponsorship for short training courses for providers with good attendance record	Recommendation for promotion for providers with good attendance record	Cancellation of annual leave by Local Government Area Health Authority (LGAHA) for unauthorized leave
Flexible working policy	None	Flexible shifts convenient for family commitments		
Living near facility	Family location taken into account in posting	Transportation allowance provided to staff not living locally	Accommodation provided for staff not living locally	
Incentive for working in a remote facility	No incentive payment, basic salary only	Incentive payment of 5 % of basic salary for posting	Incentive payment of 10 % of basic salary for posting	

Job Feature	Definition
Relationship with community	The type of relationship facility staff have with the local community. It may be a supportive relationship , for example with monthly meetings of health workers, administrators and community leaders such as the Health Facility Committees (HFCs) or an unsupportive relationship where there may be no regular meetings or communication between staff and community representatives. The relationship may also include having support from locally influential actors.
Monitoring and supervision	How staff attendance is monitored within the health facility by either the officer in charge (OIC), Health Facility Committees (HFCs) or Local Government Area Health Authority (LGAHA).
Additional absenteeism policy	These are punishments or rewards related to staff attendance at the facility.
Flexible working policy	Whether a facility has a flexible working policy in place that allows staff some flexibility in their shifts to allow for family commitments.
Living near facility	The facility's policy around staff accommodation.
Incentive for working in this remote facility	Whether there is any additional incentive payment for the job, described as a percentage of staff's base salary.

Please consider the following two jobs.

	Job A	Job B
Relationship with community	Unsupportive relationship with community	Supportive relationship with community
Monitoring and supervision	Unannounced visits by Local Government Area Health Authority (LGAHA) to monitor staff and attendance registers	Unannounced visits by Health Facility Committees (HFCs) to monitor staff and attendance registers
Additional absenteeism policy	Monthly supportive counselling sessions with Officer in Charge (OIC) and Health Facility Committees (HFCs) for frequently absent staff	Cancellation of annual leave by Local Government Area Health Authority (LGAHA) for unauthorized leave
Flexible working policy	None	Flexible shifts convenient for family commitments
Living near facility	Transportation allowance provided to staff not living locally	Family location taken into account in posting
Incentive for working in this remote facility	Incentive payment of 5% of basic salary for posting	Incentive payment of 5% of basic salary for posting

Which job would you take?

Job A	<input type="checkbox"/>
Job B	<input type="checkbox"/>
Neither	<input type="checkbox"/>

If you answered 'neither', we would still like to know which job you prefer?

Job A	<input type="checkbox"/>
Job B	<input type="checkbox"/>

Figure 1. Description of attributes and example question shown to participants.

size of 300 to ensure power to examine differences in preferences across groups in our cohort in line with recommendations and other DCEs conducted in similar cohorts (Angell et al., 2021; de Bekker-Grob et al., 2015; Mandeville et al., 2014; Zhou et al., 2018).

2.5. Analysis

DCEs are grounded in random utility theory where independent, rational actors maximise their individual utility (Hensher & Johnson, 2018). We assume that participants select the job that would maximise their individual benefit which depends on the attributes included in the experiment such that:

$$U(\text{JobAorB}) = \beta_1 * \text{Relationship} + \beta_2 * \text{Monitoring} + \beta_3 * \text{Policy} + \beta_4 * \text{Flex} + \beta_5 * \text{Living} + \beta_6 \text{Incentive} + \varepsilon$$

Where: Relationship = The relationship with the local community; Monitoring = the form of monitoring or supervision at the facility; Policy = the additional absenteeism policy at the facility; Flex = whether the facility has a flexible working policy; Living = the facility travel or accommodation policy; Incentive = the financial incentive that accompanies a job.

For the opt-out choice, all attributes were coded as 0 such that (No job taken) = 0.

Two models were estimated, the first using panel mixed multinomial logit methods to estimate preferences across all participants, and second, latent class analysis to investigate heterogeneity in preferences across our sample. Unforced choice data (with options coded as A, B or neither job) were used for all analysis with the respondents' choices as the dependent variable. All attribute levels were effects coded and, in the mixed model, all parameters were modelled as random with a normal distribution. Constant terms were included to depict respondent preference to not accept either presented job. A two-class model was used in the latent class analysis as the most appropriate to interpret the data as class sizes became too small for meaningful interpretation for larger class models. Finally, we modelled the potential impact of different policy packages on the probability of accepting a rural job first for the entire sample and then for each identified latent class (participants were assigned to groups with highest probability of membership based on the estimated probabilities of the latent class model). All analyses were conducted using NLOGIT software V.6.0.

3. Results

3.1. General characteristics

The general characteristics of respondents are summarised in Table 3. In total 412 primary care workers completed the DCE: the vast majority were female (97 %), most were married (79 %) and had at least one child under 12 (57 %). Almost two-thirds of respondents worked in a rural facility and less than a third rated their financial situation as either good (29 %) or very good (3 %).

3.2. Predictors of choice

The results of the mixed multinomial logistic regression analysis are presented in Table 4 where positive coefficients depict a preference for a job with the respective level and negative coeffi-

Table 3
General characteristics of cohort.

	412	100
Total respondents	412	100
Female	400	97
Working in rural facility	266	64.6
Training		
Community health worker (CHW, CHEW, CHO, EHW, etc.)	345	84
Registered Nurse or midwife	35	8
Other	32	8
Age group		
Under 30 years	41	10
30–40 years	126	30.6
41–50 years	167	40.5
Over 50 years	78	18.9
Marital status		
Single	53	12.9
Married	327	79.4
Other (divorced, separated, widowed)	32	7.8
Years of schooling		
0–6	323	78.4
7–12	48	11.7
13+	41	10
Any children under 12	233	56.6
Self-rated financial situation		
Very poor	51	12.4
Poor	122	29.6
Neither good nor bad	107	26
Good	120	29.1
Very good	12	2.9
Officer in charge of facility	137	33.3
Reports having another job	161	39.1

Table 4
Mixed multinomial logistic regression results for entire sample.

Variable	Coefficient	Standard error	P-value
Constant for not accepting either job	-2.79***	0.19	<0.01
Supportive community	0.37***	0.04	<0.01
Attendance monitored by Officer in Charge (OIC) with register [§]	0.17***	0.04	<0.01
Unannounced visits by Health Facility Committees (HFCs) to monitor staff and attendance registers	-0.11***	0.04	<0.01
Unannounced visits by Local Government Area Health Authority (LGAHA) to monitor staff and attendance registers	-0.06*	0.03	0.08
Monthly supportive counselling sessions with Officer in Charge (OIC) and Health Facility Committees (HFCs) for frequently absent staff [§]	0.04	0.05	0.73
Sponsorship for short training courses for providers with good attendance record	0.14***	0.04	<0.01
Recommendation for promotion for providers with good attendance record	0.25***	0.04	<0.01
Cancellation of annual leave by Local Government Area Health Authority (LGAHA) for unauthorized leave	-0.43***	0.05	<0.01
Flexible shifts convenient for family commitments	0.14***	0.03	<0.01
Family location taken into account in posting [§]	-0.02	0.03	0.56
Transportation allowance provided to staff not living locally	0.06*	0.03	0.07
Accommodation provided for staff not living locally	-0.08**	0.03	0.02
Incentive payment of 5 % of basic salary for posting	0.10*	0.06	0.07
Incentive payment of 10 % of basic salary for posting	0.39***	0.07	<0.01
Estimated standard deviations for random parameters			
Constant for not accepting either job	2.3***	0.15	<0.01
Supportive community	0.46***	0.03	<0.01
Attendance monitored by Officer in Charge (OIC) with register [§]	0.03	0.08	0.69
Unannounced visits by Health Facility Committees (HFCs) to monitor staff and attendance registers	0.13*	0.6	0.05
Unannounced visits by Local Government Area Health Authority (LGAHA) to monitor staff and attendance registers	0.23***	0.06	<0.01
Monthly supportive counselling sessions with Officer in Charge (OIC) and Health Facility Committees (HFCs) for frequently absent staff [§]	0.27***	0.06	<0.01
Sponsorship for short training courses for providers with good attendance record	0.08	0.1	0.41
Recommendation for promotion for providers with good attendance record	0.2***	0.08	<0.01
Cancellation of annual leave by Local Government Area Health Authority (LGAHA) for unauthorized leave	0.17**	0.09	0.05
Flexible shifts convenient for family commitments	0.18***	0.04	<0.01
Family location taken into account in posting [§]	0.25***	0.05	<0.01
Transportation allowance provided to staff not living locally	0.19***	0.06	<0.01
Accommodation provided for staff not living locally	0.24***	0.05	<0.01
Incentive payment of 5 % of basic salary for posting	0.04	0.13	0.74
Incentive payment of 10 % of basic salary for posting	0.17*	0.1	0.07

*, **, *** denotes significance at p < 0.1, 0.05 and 0.01 respectively. [§]Omitted category coefficient, standard error and p-value estimated using the method outlined in Hauber et al. (Hauber et al., 2016). McFadden's Pseudo R² = 0.24, Log likelihood -4101.7, AICc = 8251.5.

cients represent a dislike for jobs with that level. All attributes were significant predictors of the choices of respondents and participants strongly preferred accepting a job rather than opting out ($\beta = -2.79, p < 0.01$). Participants preferred jobs that facilitated a supportive relationship with the community ($\beta = 0.37, p < 0.01$), provided sponsorship for short courses ($\beta = 0.14, p < 0.01$) or recommended promotion ($\beta = 0.25, p < 0.01$) for workers with good attendance, allowed flexible shifts for family commitments ($\beta = 0.14, p < 0.01$), those with internal attendance monitoring by the officer in charge ($\beta = 0.17, p < 0.01$) and accompanied by bonus payments equivalent to 10 % of a respondents base salary ($\beta = 0.39, p < 0.01$). Participants significantly disliked jobs with monitoring of attendance via unannounced visits from Health Facility Committees ($\beta = -0.11, p < 0.01$), where poor attendance was punished by cancellation of leave by the local government area health authority ($\beta = -0.43, p < 0.01$) and where accommodation was provided for staff not living locally ($\beta = -0.08, p < 0.01$). Choices were not significantly impacted by unannounced visits by the local government area health authority ($p = 0.08$), the provision of a transportation allowance for staff not living locally ($p = 0.07$) or financial incentives worth 5 % of a respondent’s base salary ($p = 0.07$). The estimated standard deviations for the random parameters showed significant heterogeneity in preferences within the sample for most levels, aside from jobs with unannounced visits by health facility committees, that sponsored short training courses for good attendance, and incentive payments.

3.3. Latent class analysis and policy simulations

Latent class analysis identified two distinct groups in the sample (Table 5). The most significant difference was in the direction of the constant indicating whether a respondent preferred to accept or opt out of the jobs presented. Group 1 participants (who we have termed *Traders*), accounting for 81 % of the sample, significantly preferred to accept a job presented ($\beta = -2.79, p < 0.01$). Their preferences over other attributes varied in ways broadly reflective of those of the entire sample with all attributes

and most levels significantly influencing their choices. Group 2 participants (*Holdouts*), however, significantly preferred to not accept a job presented ($\beta = 0.57, p < 0.01$) and were only significantly influenced by the presence of a supportive community ($\beta = 0.41, p < 0.01$) and the punishment of poor attendance by cancellation of leave ($\beta = -0.34, p < 0.01$). The general characteristics of the groups are shown in Table S1 in the Supplementary Appendix. No significant differences were found in the general characteristics and experiences between the two groups.

Figure 2 shows how the overall sample and latent classes identified are predicted to respond to different packages of policy intervention. Even under the most positive scenario modelled, the proportion of *Holdouts* accepting a job presented never rises above 50 %. In contrast, 98 % of the *Traders* were predicted to take a job under the same scenario. *Traders* were consistently more likely to accept a job but can be seen to be trading between the different levels presented and being particularly influenced by the presence of a supportive community, 10 % incentive payment, and absence of a policy of cancelling leave for poor attendance.

4. Discussion

In this paper we used a discrete choice experiment (DCE) to examine the preferences of primary health care (PHC) workers in Enugu State, Nigeria, over key drivers of health worker absenteeism. All included attributes, representing different potential interventions to overcome absenteeism, significantly influenced the choices of respondents suggesting that the interventions could influence the incentives facing health workers if implemented in practice. Notably, there were significant differences in preferences across the sample suggesting there could be similar differences in their response to interventions implemented in practice.

Absenteeism of health workers is widespread in Nigeria and, similarly to health worker retention, has proved difficult to address. A subset of workers who are able to avoid sanction are unlikely to change their behaviour in response to traditionally common initiatives to overcome absenteeism including increased

Table 5
Latent class results.

Variable	Group 1 (Traders) - ~81 % of sample			Group 2 (Holdouts) - ~19 % of full sample		
	Coefficient	Standard error	P-value	Coefficient	Standard error	P-value
Constant for not accepting either job	-2.8***	0.16	<0.01	0.57***	0.12	<0.01
Supportive community	0.34***	0.03	<0.01	0.41***	0.06	<0.01
Attendance monitored by Officer in Charge (OIC) with registers [§]	0.24***	0.04	<0.01	0.03	0.08	0.69
Unannounced visits by Health Facility Committees (HFCs) to monitor staff and attendance registers	-0.17***	0.03	<0.01	< -0.01	0.08	0.95
Unannounced visits by Local Government Area Health Authority (LGAHA) to monitor staff and attendance registers	-0.07**	0.03	0.02	-0.03	0.08	0.73
Monthly supportive counselling sessions with Officer in Charge (OIC) and Health Facility Committees (HFCs) for frequently absent staff [§]	0.11**	0.05	0.02	0.012	0.1	0.88
Sponsorship for short training courses for providers with good attendance record	0.1***	0.04	<0.01	0.19**	0.1	0.04
Recommendation for promotion for providers with good attendance record	0.23***	0.04	<0.01	0.13	0.09	0.16
Cancellation of annual leave by Local Government Area Health Authority (LGAHA) for unauthorized leave	-0.44***	0.05	<0.01	-0.34***	0.1	<0.01
Flexible shifts convenient for family commitments	0.22***	0.04	<0.01	-0.05	0.07	0.43
Family location taken into account in posting [§]	0.02	0.03	0.41	-0.04	0.08	0.58
Transportation allowance provided to staff not living locally	0.05*	0.03	0.09	0.05	0.08	0.56
Accommodation provided for staff not living locally	-0.07**	0.03	0.02	-0.003	0.09	0.97
Incentive payment of 5 % of basic salary for posting	0.02	0.06	0.79	0.19*	0.1	0.06
Incentive payment of 10 % of basic salary for posting	0.5***	0.08	<0.01	0.21*	0.11	0.06

*, **, *** denotes significance at $p < 0.1, 0.05$ and 0.01 respectively. McFadden’s Pseudo $R^2 = 0.21$, Log likelihood -4276.4 , AICc = 8602.9 . [§]Omitted category coefficient, standard error and p-value estimated using the method outlined in Hauber et al. (Hauber et al., 2016).

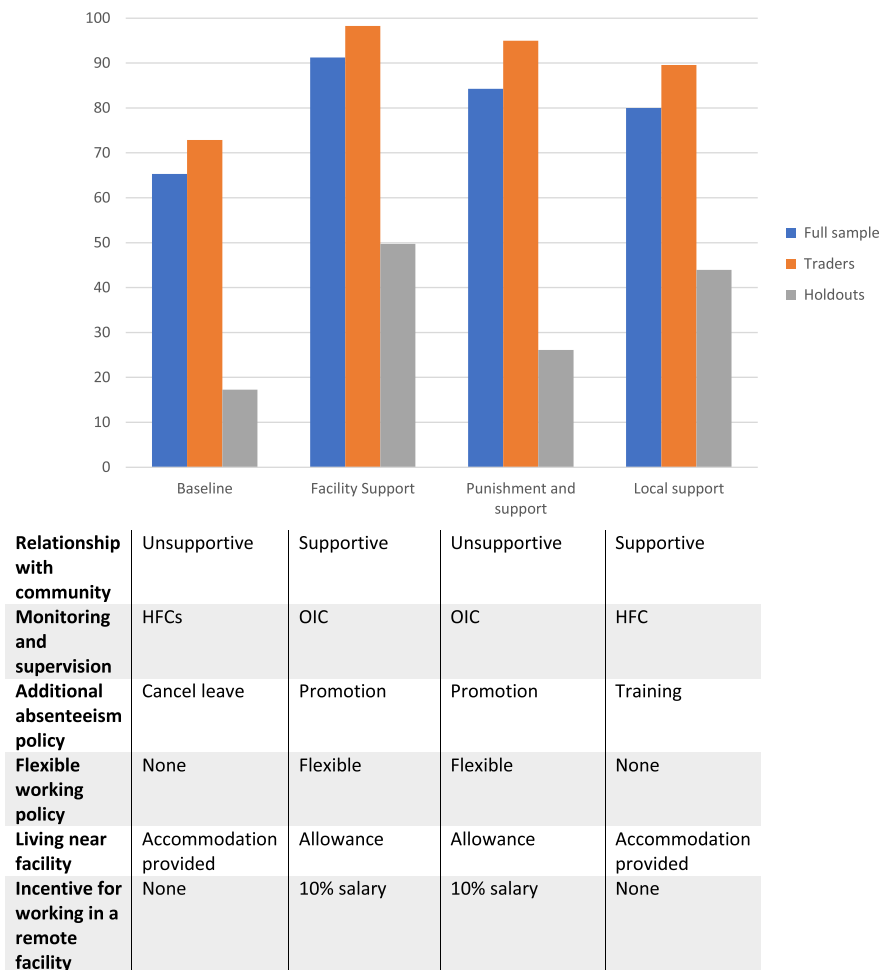


Figure 2. Policy simulations for latent class groups and cohort.

monitoring or punishment for infringements as such interventions do not address other underlying drivers of behaviour. In keeping with our theoretical framework, other groups who may be less politically connected or those with less influential social networks may respond to policy intervention. This group tended to self-report a weaker financial situation or held only their public health jobs while the other group mainly held additional jobs for instance. If interventions could be implemented that health workers would respond positively to, to reduce absenteeism and increase the numbers of those who wish to be present, this would leave a much smaller group as rule-violators (prone to absenteeism). This also leaves open the possibility of these insiders organizing themselves via networks and acting together (horizontal enforcement) thus pressures that are likely to further reduce absenteeism.

Our work suggests that a combination of local monitoring, facilitating improved relationships with the community, and a mix of rewards and sanctions tied to attendance are likely to impact the incentives facing PHC workers and thus offer feasible paths to influence their behaviour. Through latent class analysis, we identified a large segment of the cohort who appear susceptible to intervention to improve attendance. We argue that targeting the key incentives facing these workers offers the best prospect of feasible policy interventions to make tangible inroads into reducing absen-

teeism at primary health care facilities in Nigeria by addressing the needs of workers who wish to be at work. On the other hand, we found a core group of service workers who were generally unwilling to accept job placements even with targeted interventions to improve work conditions. This finding is consistent with Nigeria's historical experience of health worker absenteeism, which has persisted despite of decades of policy attention. By not accounting for the incentives facing health workers and the different preferences of health workers, interventions may not meet their needs and fail to achieve reductions in the level of absenteeism across the system. This is one of the most crucial findings of our work in a field that has tended to rely on top-down solutions that are assumed to apply to a uniform set of workers and aligns closely with recent data from Bangladeshi doctors (Angell et al., 2021).

By examining the preferences of healthcare workers, we hope to contribute to moving anti-corruption approaches beyond a sole focus on top-down, accountability and carrot and stick interventions, which have had limited success in reducing absenteeism in practice. Instead, our work begins to generate the evidence necessary to develop measures that account for the key incentives driving behaviour at the provider level, which represent the best opportunity to finally achieve progress in overcoming health worker absenteeism in Nigeria. The policy implications of our find-

ings are summarised in Box 1 and suggest that targeting scarce health system resources at supporting rather than monitoring or punishing health workers could have a bigger impact in overcoming health worker absenteeism. This support needs to be for individual health workers but also embedded into the communities as demonstrated by the importance of community relationships seen in our results. Well-functioning health facilities have a history of collective action especially in enabling projects for community development. Community members for instance, build health facilities, sunk boreholes for communities and health facilities and most times choose their representatives at the health facility committees and these are the people they know and have access too often. Locally powerful people are often involved or support these structures although more research is needed in this area. This exhibits a good relationship between health workers and community members, which is one of the strong reasons they would prefer this attribute. Furthermore, facilities that enabled a supportive relationship with the community were strongly preferred across the cohort and both latent classes. The qualitative work for this project identified the strong value that health workers derive from a supportive community across a range of areas including fundraising for facilities, accommodation and transport for workers and a range of other support. Respondents suggested that in many situations, community support was able to make up for funding and other shortcomings in government support. This aligns with existing literature that has highlighted the importance of trust and relationships between the community and health facilities in Nigeria through the operation of health facility committees, and the challenges facing centres where a good relationship does not exist (Uzochukwu et al., 2011).

Box 1 – Summary of Policy Implications of this study

- A combination of locally-based monitoring, facilitating improved relationships with the community, and rewards and sanctions tied to attendance are likely to impact the incentives facing PHC workers and thus offer feasible paths to influence their behaviour in practice
- Feasible evidence-based responses to ‘reasonable’ causes of absenteeism (security, amenities, hardship, training, community relationships etc) can directly raise attendance and create effective horizontal checks. Our findings suggest that targeting scarce health system resources at these rather than monitoring or punishing health workers could have a bigger impact in overcoming health worker absenteeism.
- Improving relationships with communities appear particularly important to those susceptible to intervention to improve attendance. Policymakers and researchers should prioritise identifying appropriate interventions to do so in their own contexts.
- Improved pay or incentive payments will likely improve attendance, however, our findings suggest that there is a threshold for this with 5% of respondents salaries not being high enough to alter their choices.

On the other hand, monitoring by health facility committees were significantly disliked by respondents, while the similar level of local government monitoring was not a significant predictor of choice. Participants significantly preferred facilities where the monitoring was carried out by the Officer in Charge of the facility. Qualitative research highlighted some reasons as to why workers may dislike monitoring by Health Facility Committees including

feelings that they often meddled in the operation of centres and there were often conflicts of interests in small communities such that committees were sometimes perceived as biased in favouring workers they knew or leading to awkward situations when they attempted to sanction service workers. Random visits from higher levels of government were said to be widely reported prior to arrival and thus of limited benefit for the purpose of monitoring absenteeism. Taken together, these results suggest that, if properly supported and empowered by the local community, monitoring of attendance at a local level will be more influential in affecting the behaviour of health workers than similar monitoring at the district level. This is again consistent with the lack of evidence for top-down measures as effective anti-absenteeism interventions and supported by findings of an empirical survey also conducted through this work where within facility supervision was associated with a 48 % decrease in reported absenteeism but external supervision was associated with a small but significant increase in absenteeism (Obodoechi et al., 2021).

These results demonstrate the importance of facilitating strong relationships between local communities and health care facilities, however, the exact nature of the interventions to do so will need to be developed considering local conditions and contexts. Similarly, the potential for flexibility in work shifts was shown to be valued by respondents. The vast majority (97 %) of our sample were women, who our qualitative work demonstrated were often required to face many competing demands for their time with regard to family responsibilities that often impacted their ability to attend work at certain times. How such shifts could operate in practice would need to be determined by local facilities, however, it again demonstrates the importance of measures to support workers and the role that a supportive environment could play in reducing absenteeism across the system. Prior work has highlighted the role that insufficient salaries play in driving absenteeism in Nigeria (Agwu et al., 2020). Our findings empirically demonstrate this, with participants preferring jobs accompanied by financial incentives. The results suggest, however, that there appears to be a threshold for such incentives to impact behaviour – provider choice was not significantly impacted by the presence of a 5 % incentive, only one worth 10 % of their base salary. While a universal increase in wages of 10 % might not be politically feasible in Nigeria at this stage, the relative importance that respondents placed on other attributes indicating they would be willing to forgo an incentive of that size in return for more positive working conditions is instructive. Policy interventions to either reward good attendance or punish poor attendance significantly influenced provider choices, suggesting they may be effective in altering incentives in practice. Participants liked jobs that rewarded good attendance with preferential consideration for promotion or education opportunities and disliked those with punishment for poor attendance. Our results suggest that a combination of rewards and punishments could be acceptable to workers. Specifically, for most health workers, while the punishment level was a significant negative driver of choice (and thus likely to impact behaviour), they would be willing to accept jobs with punishment if also accompanied by rewards or the supportive policy settings described above.

While the qualitative work for this project highlighted the importance of transportation and accommodation barriers in driving health worker absenteeism, the results of the study suggest that these concerns were less important to respondents than the other attributes presented. Interestingly, the provision of accommodation was significantly disliked by participants. While we were unable to explore the reasons underlying this result, some participants in the qualitative interviews highlighted some issues with existing accommodation including poor quality housing and increased work demands as the local community expected workers

to be on call at all times when living on the facility premises. It is possible that the results of this study reflect these existing negative perceptions.

Our study had several limitations. As with all DCEs, our results are based on respondents' stated preferences rather than observing actual behaviour. If the stated choices differ from how the health workers would behave in practice our results could be biased. This could be a particular issue in an area as sensitive as absenteeism. We attempted to minimise the impact of such bias through a range of measures including an opt-out option, and an extensive attribute development process followed by piloting. This ensured that the attributes captured the key drivers of absenteeism and job characteristics valued by health workers and were clearly understood by participants. Respondents represented different types of health workers including community health workers and nurses meaning that their current job conditions differ which likely affects their interpretation of the attributes presented, particularly the incentive attribute. Our sample was drawn from across a number of facilities, in a number of local government areas but may not be representative of the broader Nigerian primary care workforce. In particular, the sample was drawn entirely from Enugu State so there are potentially systemic differences with the workforce from other areas. Our sample was also 97 % female which is very high, though it is known that a large proportion of the primary care workforce in Nigeria is female, including for example over 87 % of the country's nurses (World Health Organization, 2022). Nonetheless, we have proposed a novel approach to the insidious problem of health worker absenteeism, a pervasive problem undermining access to and quality of care in Nigeria and many other low- and middle-income nations. Historical efforts involving top-down regulatory and managerial approaches have had limited success in overcoming the problem. In contrast, we believe understanding the perspectives service of workers about the difficulties they face at work and capturing their preferences on different aspects of their jobs can inform pragmatic and feasible solutions to reduce absenteeism.

5. Conclusion

We have been able to generate data that points to a feasible way forward in addressing the pervasive problem of health worker absenteeism in Nigeria. Top-down approaches have had limited impact in overcoming the problem in Nigeria or in other nations. Instead we propose that interventions that account for the preferences of service workers and the contexts and challenges they face in their jobs can inform pragmatic measures to feasibly reduce absenteeism in Nigeria.

Author contributions

OO PR DB BA conceptualised the study; PR DB obtained funding for the study; CN DO PA AO CO data curation; BA led formal analysis with supervision from KM DB MIM and OO; all authors were involved in validation of findings; BA wrote original draft of this paper; all authors contributed to the review and writing of the final paper.

Data availability

Data uploaded with submission - we can upload to a repository if the article is accepted and the journal prefers

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

This publication is an output of the SOAS Anti-Corruption Evidence (ACE) research consortium funded by UK aid from the UK Government (Contract P07073). The views presented are those of the author(s) and do not necessarily reflect the UK government's official policies or the views of SOAS-ACE or other partner organisations. For more information on SOAS-ACE, visit www.ace.soas.ac.uk.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.worlddev.2023.106208>.

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