RURAL PRACTICE PREFERENCES AMONG HEALTH WORKERS IN SELECTED HEALTH FACILITIES IN LUSAKA, CHIBOMBO, AND CHONGWE DISTRICTS IN ZAMBIA: A DISCRETE CHOICE EXPERIMENT

By;

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ABSTRACT

The shortage of health workers in the areas where they are most needed is a significant problem for health systems. Over the past decade, countries have introduced strategies to address the unequal distribution of health workers in rural and remote areas. Evidence to date on the effectiveness of these interventions is only moderate at best (WHO, 2014). Discrete Choice Experiments (DCE) presents an effective way for evaluating the effectiveness of these strategies (Rockers et al., 2012).

The study used Discrete Choice Experiments method (DCE); a quantitative technique for eliciting individual's preferences. This technique helps to uncover how individuals' value particular attributes of an alternative by asking them to state their preferred choice over hypothetical alternatives. The methodology represents an integration of several theoretical areas, mainly the random utility framework. They are also consistent with Lancaster's characteristics theory of demand which argues that consumers have preferences for and derive utility from attributes, rather than goods per se. Using a DCE, this study sought to estimate the relative importance of different job attributes for health worker's in Chibombo. Chongwe, and Lusaka districts preference to work in rural areas, the trade-off among these job attributes, and the total satisfaction or benefits respondents derive from working in rural areas.

A total of 355 self-administered questionnaires were distributed, of which 353 were returned (response rate 99%). The study found that respondents prefer salary increment, training/career development, support from the manager, housing and quality of facility as part of their incentive package. In particular, Salary increases the preference of working in the rural areas by 3.5, providing training by 0.43, support from the manager by 0.46, providing housing by 0.57 and the quality of facility by 0.54. Further, Respondents were give up 20% of their salary given housing was provided, 15% of their salary for a more improved quality of the facility and 10% of their salary for supportive management. Assuming that we want to improve preference to work in rural areas, an incentive package that includes provision of training, supportive management, increased salary, provision of housing and improved quality of facilities gives the highest benefit score of 2.89 with an associated cost increase of 82 percent.

Keywords: Discrete Choice Experiment, Health workers, Utility

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ABBREVIATIONS

DCE	Discrete Choice Experiment
HRH	Human Resource for Health
HRSP	Human Resource Strategic Plan
MCDMCH	Ministry of Community Development, Mother and Child Health Mother and Child Health
MoH	Ministry of Health
WHO	World Health Organization
WTP	Willingness to Pay
ZHWRS	Zambia Health Workers Retention Scheme

CHAPTER ONE

INTRODUCTION

1.1 Background

The shortage of health workers in the areas where they needed the most presents serious challenges for health systems. Patients who have the greatest need for health care tend to live in remote and rural areas, but attracting skilled health workers to such areas and retaining them there has proved difficult (Goma et al., 2014). Zambia is one of the countries that have been identified to be in a human resource for health (HRH) crisis (WHO, 2015). The HRH crisis is far-reaching, impacts every area of the health sector, and is most severe in remote and rural areas. Approximately 50% of the global population lives in rural areas, but these regions are served by only 38% of the total nursing workforce and less than a quarter of the total physician workforce (WHO, 2013). According to the World Bank (2015) about 60% of Zambians live in rural areas, however, the rural areas are served by less than 30% of the health workers (Ferinho et al., 2011). This unequal distribution of health workers contributes directly to the global burden of ill health and inequity in health outcomes. Thus, it will not be possible to improve health outcomes globally unless more health professionals are attracted to work in rural and remote areas (Ministry of Community Development, Mother and Child Health, 2012).

Over the past decade, countries have introduced a number of strategies to address the unequal distribution of health workers, and improve the recruitment and retention of health workers in rural and remote areas (Martineau et al., 2006). Some of the more commonly reported interventions range from salary increases or bonuses, regulatory policies such as compulsory service, non-monetary incentives such as access to continuing medical education, and to preferential selection of students from rural areas into training programs (Lehmann et al., 2008). However, evidence to date on the effectiveness of these interventions is only moderate at best (WHO, 2014). In 2003, the Zambian Health Workers Retention Scheme (ZHWRS) was initiated to attract Medical Officers to work in the rural and remote areas of the country. In 2007 the ZHWRS was expanded to include other health workers. The award payments of the ZHWRS ranged from 30-75% of the healthcare worker's basic salary per year, based on the level of remoteness of the health facility to which the healthcare worker has been placed. In addition, Health workers on the ZHWRS who successfully completed the three-year contract were

awarded with a bonus payment of an amount nine times their monthly allowance (Goma et al., 2014). This scheme was however, phased out in 2013 due to its financial unsustainability. Although the Government of Zambia has incorporated incentives within its salary schedule to attract and retain staff in the Public service (i.e. Recruitment and Retention allowance for degree holders, which is 20% of basic salary; Rural and Remote Hardship allowance of 20-25% of basic salary), these allowances have not been sufficient to attract a suitable number of health workers to rural areas (HRSP, 2010).Discrete Choice Experiments (DCE) presents a feasible way for evaluating the effectiveness of health worker and retention strategies (Rockers et al., 2012). They have the ability to estimate the relative importance of job preferences and also quantify the value respondents attach to one attribute compared to another (Ryan et al., 2007), in other words, they allow for the estimation of Willingness To Pay (WTP). Using a Discrete Choice Experiment, this study sought to estimate different job attributes that increase the preference of health workers in selected clinics of Lusaka, Chibombo and Chongwe districts of Zambia to work in rural areas.

1.2 Statement of the problem

One of the biggest challenges that policy makers face in the health sector in Zambia is how to attract qualified human resource to the rural and remote parts of the country. Since independence, the availability of health workers in sufficient numbers, with adequate skills, in the rural areas has been a critical issue (HRSP, 2010). The distribution of the employed health workers within the country is characterized by geographical imbalance as shown in Table 1.

Although there has been an improvement during the past decade, Zambia continues to suffer from an inequitable distribution of health workers, at the disadvantage of rural provinces. There still exists a great discrepancy between the clinical staff to population ratio among the various provinces: the clinical staff to population ratio in Lusaka is more than double to that of Northern Province. Further discrepancies exist among districts within each province (NHRH, 2011). All cadres of health workers are in short supply and below the recommended establishment, whether in urban or rural areas. The urban provinces of Lusaka and Copperbelt have relatively better staffing levels than the less urban provinces of Central and Southern provinces. The remaining rural provinces (Eastern, Luapula, Northern, North Western and Western Provinces) have a relatively more severe shortage of workers than the urban provinces.

Several positions at the Health Centre level, especially in the rural areas and remote rural health Centre's are served with under-skilled staff (MCDMCH, 2012). This is further confirmed by a study conducted by Ferrinho et al., (2011) who found that the highest relative concentration of all categories of workers was observed in Northern, Eastern, Lusaka, Western and Luapula provinces. This unequal distribution was reflected in the ratio of population per cadre. The provincial distribution of personnel showed a skewed staff distribution in favour of urbanized provinces, for example, in Lusaka's doctor: population ratio was 1:6,247 compared to Northern Province's ratio of 1: 65,763 (Ferrinho et al., 2011).

Table 1: Provincial Distribution of Health Workforce in 2005 and 2010

	2005			**2010**			**5-year change**
	Population	**Clinical staff**	**Clinical staff to 1, 000 pop**	**population**	**Clinical staff**	**Clinical staff to 1, 000 pop**	
Northern	1,445,730	559	0.39	1,759,600	1,191	0.68	+0.29
Luapula	903,746	545	0.60	958,976	807	0.84	+0.24
Eastern	1,530,118	1,119	0.73	1,707,731	1,385	0.81	+0.08
Western	863,294	720	0.83	881,524	998	1.12	+0.29
Central	1,180,124	1,126	0.95	1,267,803	1,442	1.14	+0.19
Southern	1,207,433	1,625	1.15	1,606,793	2,477	1.54	+0.39
Northwestern	683,367	870	1.27	706,462	1,033	1.46	+0.19
Copperbelt	1,820,443	2,899	1.59	1,958,623	3,260	1.66	+0.07
Lusaka	1,579,769	2,665	1.69	2,198,996	3,648	1.66	-0.03
TOTAL	**11,441,461**	**12,128**	**1.06**	**13,046,508**	**16,227**	**1.24**	**+0.18**

Source: Ministry of Health – National Human Resource for Health Strategic Plan 2010 -2015 (2011)

The observed shortage and mal-distribution of health workers has direct effect on delivery of health care service to a large segment of the population, of which over 50% live in rural areas (WHO, 2013). Since 2003, the government has introduced several strategies such as the ZHWRS

but this has not been sufficient to attract health workers to rural areas and has since been phased out due to its financial unsustainability. However, it is not known as to what is the relative importance of different job attributes or incentives (financial or non-financial) for health workers while eliciting their choices for particular place; particularly their attraction to rural and remote areas.

1.3 Justification

Gaining understanding into incentives that increase the preference of health workers to work in particular location is an important policy contribution to Ministry of Health and other policy makers through designing policy strategy that aim at improving their attraction in rural areas and hence solve the problems associated with geographical distribution of HRH within the country. It is expected that the results of this study will give additional information to policy makers with regards incentive packages that increase the preference of health workers to work in rural areas within the local context.

1.4 Objectives

General objective

To estimate job attributes that influence the choice of health workers in selected clinics of Lusaka, Chobombo, and Chongwe Districts of Zambia to work in rural areas.

Specific objectives

i. To estimate the relative importance of different job attributes for working in rural areas.
ii. To estimate the trade-off among these job attributes for working in rural areas
iii. To estimate total satisfaction or benefits respondents derive from working in rural areas

1.5 Organization of Dissertation

This dissertation is organised in six chapters. Chapter one introduces the study by providing a background to health workforce preferences for working in rural areas its effects on health

systems. This is followed by the statement of the problem, together with the justification, objectives and the outline of the dissertation. Chapter two provides literature review on studies that have been conducted on the preferences of health workers to serve in rural and remote areas. Chapter three presents information on the methodological aspects of the study. It begins by providing the study site, stating the research methodology and design adopted, while justifying their selection. In addition, the chapter describes the population, sample, sampling strategies and methods of data collection and analysis. The final section of the chapter addresses ethical considerations and limitations. Chapter four focuses on the main findings of the study. Chapter five presents an in-depth analysis of the findings presented in chapter four. It discusses major findings that emerged from the study whilst contrasting them with data from the literature. Finally, chapter six provides a summary and implications of the main findings, as well as the recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

A number of studies have been conducted on health workers preferences to serve in rural and remote areas, as well as on attraction and retention. Literature reveals multiple factors that influence health workers preferences regarding decisions to relocate, stay, or leave a post in rural or remote areas. According to the World Health Organization (2010) the factors are complex and often interconnected and can be linked to health professional's characteristics and preferences, related to health systems organization and wider social, political and economic environment.

2.2 Studies on mal-distribution of health workers

Gobler (2010) reports that the common factors include inadequate management and unsupportive supervision, poor working environments, low salaries, lack of opportunities for training and career development and limited availability of drugs and equipment among others. A study by Rafiei (2015) reaffirms this through a discrete choice experiment (DCE) with a sample of Iranian neurosurgeons selected from five provinces. The attributes of the DCE scenarios included income, dual practice opportunities, workload, proximity to family, clinical infrastructure, housing, educational facilities, and work location. The study used Probit regression model to estimate the importance of the different job attributes and examine the extent to which neurosurgeons were willing to tradeoff between monetary and nonmonetary attributes. The results for random effects model found that seven attributes including location, income, dual practice, workload, educational facilities, clinical infrastructure, and housing were statistically significant, meaning that the neurosurgeons thought these attributes were important in helping them to decide on the job choice. These findings are consistent with a similar study conducted by Hanson and Jack (2008) in Ethiopia who found that the most characteristic for doctors was dual practice as private practice was not allowed at the time of the study. Salary, provision of housing, being posted to the capital city Addis Ababa compared to more rural areas, provision of improved housing and better clinical equipment were also important attributes in this study. Doctor's least valued compulsory service in the public sector as compensation for being trained, in the same study, the researchers found that nurses had different preferences. An increased salary was the most important attribute for nurses followed by the possibility of being posted to a

more urban area. Also unlike doctors' preferences, nurses gave more importance to the availability of better clinical equipment than provision of housing for themselves. This shows the intricacy in determining job packages for attracting health workers as a whole and calls for policy formulation that is context specific to the cadre as well as the health system.

Armstrong (2015) conducted a study among nurses in South Africa and found that doubling salaries increased the preference of a job. Better equipment and facility management were also important while being well staffed and having social amenities were least appreciated in determining the job preference. The study also found that younger nurses and those working in urban hospitals were more sensitive to salary level while those working in rural facilities were more concerned with facility management. Similarly, Mangham (2007) conducted a DCE study on nurses in the public sector in Malawi which found that graduate nurses' valued higher pay, an opportunity to upgrade their qualifications and provision of housing when choosing a job. Nurses with a rural background indicated strong preference for jobs in the rural areas. This is an important aspect of policy formulation as policy makers can tailor policy that attract more rural based students to apply for health courses.

Rockers (2012) Discrete Choice Experiment explored preferences for working in rural clinics among final year medical, nursing, pharmacy, and laboratory students at select universities in Uganda. A tailor made DCE for each group of respondents was administered to elicit responses for potential job positions they were likely to be given after completion. The attributes for these jobs included salary, quality of the facility, housing, length of commitment to the particular area, manager support, tuition for advanced training, and dual practice opportunities. A random effects model was used to estimate stated preferences for these attributes. Data was collected from a total of 246 medical students. The study found that both financial and non-financial incentives may be effective in attracting health workers to underserved areas. Better quality facilities and supportive managers were important to all students.

In a cross sectional study conducted in Burkina Faso using a DCE, Bocoum (2014) investigated the preference for incentive packages among health workers recruited under the regionalized policy. The attributes and levels in this study were informed by in-depth interviews and focus group discussions with health personnel working in the East and Sahel regions. The attributes identified included the regionalized recruitment policy, health insurance, work equipment,

housing, and specific incentive compensation. A multinomial logistic regression was used to determine the influence of socio-demographic characteristics on choice of a given option. A total of 315 participants were included and for all the participants, job choice was strongly influenced by length of commitment to the area and provision of housing. Sex and number of years worked also influence job preferences as the study found that women were twice more likely to choose an incentive package with free housing and the cancellation of the regional policy.

In a study to ascertain the Human Resource for Health situation in Zambia Ferrinho (2011) describe the way the HRH establishment is distributed in the different provinces and assessed the dimension of shortages and of imbalances in the distribution of health workers by province and by level of care. Secondary data was used from the payroll data base including all public health workers on the payroll of the Ministry of Health and the National Health Service facilities and computed rates and ratios which they compared. The highest relative concentration of all categories of workers was observed in Northern, Eastern, Lusaka, Western and Luapula provinces (in decreasing order of number of health workers). The ratio of clinical officers to general medical officer varied from 3.77 in the Lusaka to 19.33 in the Northwestern provinces. For registered nurses, the ratio went from 3.54 in the Western to 15.00 in Eastern provinces and for enrolled nurses from 4.91 in the Luapula to 36.18 in the Southern provinces. This unequal distribution was reflected in the ratio of population per cadre. This reaffirms the need to establish factors and alternatives that would help to have ab equal allocation of resources. Further, Goma (2014) used a modified outcome mapping approach and collected data from health workers and other stakeholders through focus group discussions and individual interview questionnaires and supplemented by administrative data. The study identified nineteen health worker recruitment and retention strategies and participation in each strategy ranged from 0% to 80% of the participants. The study also reports that in as much as a salary top-up for health workers in rural areas was identified as the most effective incentive, almost none of the recruitment and retention strategies were significant predictors of health workers' job satisfaction, likelihood of leaving, or frequency of considering leaving, which were in large part explained by individual characteristics such as age, gender, and profession. These quantitative findings were consistent with the qualitative data, which indicated that existing strategies fail to address major problems identified by health workers such as poor living and working conditions.

2.3 Summary

From the literature reviewed, not much has been done concerning Zambia and it was not clear whether given the situation, the results of health worker preferences to work in rural areas will be similar to those in other countries with similar health systems.

CHAPTER THREE
METHODOLOGY

3.1 Study site

The study was conducted in selected health facilities in Lusaka, Chongwe and Chibombo districts. These sites were selected because of the visible discrepancies in staffing levels as shown in the Table 2.

Table 2: Current, Approved and Optimal Staffing for Lusaka, Chongwe, and Chibombo Districts.

Cadre	Doctors	Clinical Officers	Nurse Midwives	Nurses	Pharmacy staff	Laboratory staff	CHAs	All Cadres
Lusaka								
Current staff	41	191	221	858	118	56	0	**1,485**
Approved staff	41	194	231	869	120	57	0	**1,512**
Optimal staff	104	182	285	1,113	172	281	0	**2,137**
Chongwe								
Current staff	10	19	24	125	12	8	0	**198**
Approved staff	11	21	26	129	12	8	0	**207**
Optimal staff	30	35	51	215	44	13	25	**413**
Chibombo								
Current staff	11	18	29	94	8	4	0	**164**
Approved staff	11	19	33	101	8	4	0	**176**
Optimal staff	39	43	73	292	49	29	27	**552**

Source: Ministry of community Development, Mother and Child Health (2012)

This table represents the current, approved and optimal staffing for Lusaka, Chibombo, and Chongwe according to the Workforce Optimization Model. Based on these results, Lusaka District currently has 1,485 health workers and 1,512 approved positions, but requires 2,137 health workers to be optimally staffed. Based on these results, the current staffing level

represents 69% of the optimal staffing level, leaving a gap of 31%. Chongwe currently has 198 health workers and 207 approved positions, but require 413 health workers to be optimally staffed. Based on these results, the current staffing level represents 48% of the optimal staffing level, leaving a gap of 52%. Further, Chibombo currently has 164 health workers and 176 approved positions, but requires 552 health workers to be optimally staffed. Based on these results, the current staffing level represents 30% of the optimal staffing level, leaving a gap of 70% (MCDMCH, 2012).

3.2 Study design

A Discrete Choice Experiment was undertaken to examine the relative importance of five work-related attributes (Salary, Housing, Training (career development), Quality of the facility, and Support from manager).

Discrete Choice Experiment

A Discrete Choice Experiment (DCE) is a quantitative technique for eliciting individual's preferences (de Bekker-Grob et al., 2015). This technique helps to uncover how individuals' value particular attributes of a choice by asking them to state their preferred choice over hypothetical alternatives (Lancsar et al., 2007). The DCE methodology represents an integration of several theoretical areas, mainly the random utility framework (Rao et al., 2013). They also share similar features with the theory of demand advocated by Lancaster (1966) who argued that consumers have preferences for and derive utility from attributes, rather than goods per se. It also relies on the assumptions of economic rationality and the maximization of utility (Hall et al., 2004).

According to Lancsar et al., (2007), DCEs aim at soliciting respondents preferences over sets of hypothetical alternatives. The provided alternatives are described by a set of unique characteristics known as attributes and it is the responses obtained from participants that are used to assign the value of these attributes by individuals. An Individual is assumed to choose an alternative that provides the highest satisfaction or benefit when choosing among alternatives. This is known as utility. Thus, the utility yielded by a chosen alternative is assumed to be in comparison to other utilities provided by several other alternatives from which an individual is

choosing from. Further, DCEs are used to determine the significance of the attributes that describe the good or service and the extent to which individuals are willing to trade one attribute for another (Drummond et al., 2005).

This methodology has been adopted for this study because of its ability to inform the research on job attributes that individuals, in this case, health workers find more appealing when choosing a job. Discrete Choice Experiments offers managers tools to explore hypothetical scenarios that can then be used to select the most likely combination of incentives that would be more appropriate to a specific context. Further, the inclusion of WTP makes this the most effective method has it enables the estimation of how respondents trade-off among several attributes (Ryan, 2000).

Establishing Attributes and levels

The DCE scenario attributes and levels in this study were informed by two activities: a review of the published literature on strategies to attract and retain health workers and focus-group discussions with health workers. A review of literature and discussions with health workers revealed that at least 5 attributes are adequate to be included in the DCE. Table 3 below shows the attributes that were included and their levels.

Table 3: Attributes and levels

Attributes	**Levels**
Salary	Current Government Baseline
	Current Government Baseline + 10%
	Current Government Baseline + 25%
Housing (Basic)	No housing or allowance provided
	Housing allowing provided, enough to afford basic housing
Training(Career Development)	The government will not provide financial assistance for a study program
	The government will provide financial assistance for a study program after a commitment of 3 years
Quality of the facility	Basic (e.g. unreliable electricity, equipment and drugs and supplies not always available)
	Advanced (e.g. reliable electricity, equipment and drugs and supplies are always available)
Support from manager	The Supervisor is not supportive and makes work more difficult
	The Supervisor is supportive and makes work easier

Designing the choice sets

Given the number of attributes and their associated levels (3x2x2x2x2), a total of 48 unique jobs can be derived from different combinations of these attributes and levels, which is called the full factorial design. But administering 48 different choice sets to a respondent can lead to interviewee fatigue and loss of statistical efficiency. Therefore, this study elected to use the D-efficiency Fractional Factorial Design (FFDs) also known as the experimental design where a set of choices are selected which enables the main effects, that is, the effect of each independent variable on the dependent variable and its potential interactions to be estimated (Burgess and Street, 2005), that is to say, the respondents choice of attributes largely depends on the levels of another. Twelve (12) choice sets with two alternatives were then selected; orthogonality and level balance were ensured. Orthogonality is a property that ensures that attributes are statistically independent of one another. Level balance is the property that ensures that levels of attributes appear an equal number of times (de Bekker-Grob et al., 2012). For instance, if a binary DCE (choose job A or Job B) is employed, the profiles generated from the orthogonal design are the choice sets (Street and Burgess, 2005). There are several ways of measuring statistical efficiency but D-efficiency criterion is the most commonly used largely because it is relatively easier to compute (Liang et al., 2005). A user-written command "dcreate" for STATA software was used for the D-efficiency design (Hole, 2007).

Generating and pre-testing the questionnaire

Hypothetical alternatives were generated from the attributes and levels and combined to create choice sets. The choice sets and alternatives formed the basis of the DCE questionnaire design. Each questionnaire has 6 choice sets (or Tasks) with each choice set having two alternatives for a respondent to choose from. The questionnaire also included respondent's socio-demographic data.

The questionnaire was piloted prior to field application, first in Lusaka at Linda clinic and then in Kafue at Kafue District Hospital. Following these pilots, changes were made to the wording of the levels and attributes. The resulting final design is shown in Appendix section and the sample choice set is shown in Table 4.

Table 4: ***Sample choice set***

TASK 1		
	Posting A	**Posting B**
Salary	Current Government Salary	Current Government Salary + 25%
Housing (Basic)	No Housing or Allowance Provided	Housing provided, enough to afford basic housing
Training (Career Development)	The government will not provide you financial assistance for a study program	The government will you with financial assistance for a study program after a commitment of 3 years
Quality of the facility	Basic (e.g unreliable electricity, equipment and drugs, and supplies are not always available)	Advanced (e.g reliable electricity, equipment, drugs, and supplies are always available)
Support from Manager	The District Health Officer is not support and makes work more difficult	The District Health Officer is very supportive and makes work easier
Which job posting would you choose? Mark (X)		

Respondents were presented with a set of 6 choice sets, each choice set containing a pair of jobs that had the same attributes but different levels. The survey used a response design in which the respondent made a choice between the presented job pairs by responding to the question ‘‘which job posting do you prefer?’’. The study used a ‘forced’ choice approach (i.e. respondents were asked to choose between two job profiles: Job A or Job B). While the use of forced choices may result in biases in parameter estimates, that is, respondents are forced to choose a job even when they might say no, there are challenges of using opt-out choices in a DCE such as respondents choosing to opt-out not because it is their best option but because they are avoiding to make the difficult choice among the alternatives. In addition, allowing respondents to opt-out of making a choice provides less information on respondents’ relative preferences for the attributes in the hypothetical alternatives (Ryan et al., 2012).

3.3 Study population

The study targeted health workers in selected public health facilities in Chibombo, Chongwe and Lusaka Districts. This included doctors, nurses, clinical officers, lab technicians and environmental health specialists, and midwives among others.

Inclusion & Exclusion criteria

Only health workers who have been in service for more than one year were included in the study. This is because it was assumed that one year is enough time for one to be comfortable enough to decide whether to work in a rural or urban area. Including those who are just entering the workforce for instance may introduce some bias because they may choose to work anywhere as they want to be employed. The study excluded non-clinical staff like accountants, cooks, and cleaners. This because the interest of this study was to determine factors that influence clinical staff to work in rural areas; Further, private health facilities were not included in the study because factors that influence health workers to work in rural areas may not be the same for public and private institutions.

3.4 Sample size

Existing theory on the calculation of sample size for stated data does not address the issue of minimum sample size requirements in terms of the statistical power of hypothesis tests on the estimated coefficients (Rose and Bliemer, 2013). de Bekker-Grob et al., (2015) suggests that before the minimum sample size in a DCE can be calculated, five elements are needed: Significance level (α), Statistical power level (1- β), Statistical model used in the DCE analysis, in this case, the mixed logit model, Initial belief about the parameter values, and the DCE design. To begin with, the variance–covariance matrix (AVC) has to be established (de Bekker-Grob et al., 2015). The statistical model, the initial belief on the parameter values, denoted with γ, and the DCE design, are all needed to infer the AVC matrix of the estimated parameters. Once the AVC of the estimated parameters has been established and the confidence level (α), the power level (1- β), and the effect sizes (δ) are set, the minimum required sample size (N) for the estimated coefficients in a DCE can be calculated. The sample size formula by de Bekker-Grob et al., (2015) was used and can be expressed as;

$$N > ((z_{1-\beta} + z_{1-\alpha}) \sqrt{\sum_{\gamma k} / \delta})^2$$

In this study, we assumed: δ=0.3(based on a similar study in Malawi by Blauw et al., (2010) a country with similar characteristics as Zambia), α=0.05, Z1-α=1.96; 1-β =0.8, Z1-β=0.84; var(γk) = standard deviation^2 = 3.5^2. Based on the above assumptions, the minimum sample size required for this study was 350.

3.5 Sampling

The 3 districts were purposively sampled due to staffing shortages as indicated by the Health worker optimization model (MCDMCH, 2012). Chibombo district has a total of 20 health facilities. 10 health facilities were randomly selected. 10 health workers where then randomly selected from each facility using facility based HR Records. 10 health facilities were also randomly selected from Chongwe and 10 health workers randomly selected using the facility based HR Records. 15 health facilities were randomly selected in Lusaka and 10 health workers were randomly selected. Ten health workers from each facility were selected because it is sufficient to satisfy the sample size. The sampling of facilities was proportionate to size.

3.6 Data collection Methods

Data was collected using a self-administered DCE questionnaire to determine the relative importance of a range of incentives (attributes) that would attract trained health workers to work in rural areas. Participants were presented with a self-administered questionnaire and asked to choose between either Job A or Job B with different packages of attributes (see Figure 1).

3.7 Statistical Analysis

After collection, data was entered into Microsoft Excel, checked and cleaned. It was then transferred to Stata version 13 for analysis (StataCorp, 2007). A Mixed logit model was used to estimate the relative importance of attributes on the probability of choosing a particular alternative. Analysis was performed using the “mixlogit” command in STATA created by Hole (2007). Willingness to Pay (WTP), which is the rate at which respondents were willing to give up one unit of an attribute for another was estimated using the ratio of coefficients of the respective attributes. Finally, the total benefit or satisfaction score was calculated for alternative scenarios as the sum of the product of the coefficients and the difference between attribute levels.

3.8 Ethical issues

The study obtained approval from UNZABREC. Further, permission was obtained from the National Health Research Authority, and District Medical Offices from the different study districts. Informed consent was sought and obtained from respondents before they answered the questionnaire. Respondents were also informed about the objectives of the study and that their participation was purely voluntary and they were free to decline or withdraw at any time in the course of the study. There were no physical risks to participating in the study except for the time the participants spent answering the questionnaire. The information provided by participants was kept confidential. Nobody except the researcher and supervisors had access to it. However, the data may be seen by Ethical review committee and may be published in journal and elsewhere without giving participants name or disclosing their identity.

3.9 Limitations

This study had several limitations; firstly, because the study presented only rural options, the results cannot be used to model the uptake of rural versus urban postings. Further, DCEs can only include a restricted set of attributes, which limits their range and realism; and they rely on stated preferences, not actual decisions, but the analysis of revealed preference data is not always straightforward (Kruk et al., 2010).

CHAPTER FOUR

PRESENTATION OF FINDINGS

4.1 Characteristics of respondents

A total of 355 self-administered questionnaires were distributed, of which 353 were returned (response rate 99 percent). The characteristics of study participants are described in Table 5. Among the respondents, Nurses were the most represented (58 percent), followed by Clinical Officers (17%) and Biomedical Officers (8 percent). There were more women than men at 67 percent and 33 percent respectively. Furthermore, the respondents had an average age of 35 years (± 8.2). Among the respondents, 62 percent were married, 23 percent were single, and 4 percent were divorced. The majority (57 percent) of the respondents had been in service for less than 10 years.

4.2 Random coefficient logit regression

Table 6 shows the Random coefficient logit regression results among respondents. Positive coefficients mean that respondents are supportive or are willing to take up a particular attribute. Given the levels and coding in Table 3, the positive sign of the coefficients in Table 5 indicates that all attributes were important for the respondent's decision to work in a rural area. The statistical significance of the coefficient on attributes means that the level of each attribute influences the respondents' choice; in other words, the respondents considered salary, housing, quality of the facility, opportunity for training/career development, and support from manager as important when choosing to work in a rural area. In particular, Salary increases the preference of working in the rural areas by 3.5, training (Career Development) by 0.43, support from the manager by 0.46, providing housing or housing allowance by 0.57 and the quality of facility by 0.54. In this study, Willingness to Pay reflects the percentage of monthly salary that respondents are willing to sacrifice for an aspect of an attribute rather than for other aspects. Respondents were willing to give up 20% of their salary if housing or housing allowance was provided, 20% for a more improved quality of the facility, 10% for training (career development) and 10% for supportive management.

Table 5: Characteristics of the Respondents

Characteristics	Category	Number of Respondents	Percentage(%)
Age (Years)	23-29	105	29.75
	30-39	139	39.38
	40+	109	30.88
Median (Interquartile Range)	34(29, 41)		
Sex	Male	115	32.58
	Female	238	67.42
Religion	Catholic	104	29.46
	SDA	68	19.26
	Pentecostal	116	32.86
	Muslim	4	1.13
	Other	61	17.28
Marital	Single	82	23.23
	Married	218	61.76
	Divorced	15	4.25
	Widowed	16	4.53
	Separated	18	5.1
	Cohabiting	4	1.13
Ethnicity	Tonga	35	9.92
	Bemba	94	26.63
	Lozi	38	10.76
	Ngoni	35	9.92
	Luvale	12	3.4
	Lunda	6	1.7
	Other	133	37.68
Specialization	Medical	12	3.4
	Nurse	206	58.36
	Clinical Officer	57	16.5
	Biomedical Officer	28	7.93
	Other	50	14.16
Length of Stay (Years)	<10	200	56.66
	10-19	100	28.33
	20+	53	15.01
Median (Interquartile Range)	7 (3, 16)		

Table 6: Random coefficient[2] logit regression results among respondents

Attributes	Coefficient	Standard error	P-value	Marginal willingness to pay [1]
Training	0.4338	0.0548	<0.001	0.1
Support	0.4573	0.0533	<0.001	0.1
Salary	3.5340	0.3375	<0.001	1.0
Housing	0.5717	0.0618	<0.001	0.2
Quality	0.5401	0.0638	<0.001	0.2
Number of individuals	353			
Number of observations	4,324			
Log-likelihood	-1211.4302			

[1] estimated by the ratio of each coefficient to Salary coefficient

[2] housing and quality of facility were allowed to vary between respondent

Table 7: Estimated benefit score for the best incentive package

Attributes	Coefficient (B)	Marginal willingness to pay (ZMW) (W)	Current service (C)	Alternative service (A)	Difference in attribute levels D=(A-C)	Attribute score (=D*B)	Additional amount willing to pay for change (=D*W)
Training	0.4338	0.1	0	1	1	0.43	0.01
Support	0.4573	0.1	0	1	1	0.46	0.01
Salary	3.5340	1.0	1	1.25	0.25	0.88	0.25
Housing	0.5717	0.2	0	1	1	0.57	0.2
Quality	0.5401	0.2	0	1	1	0.54	0.2
Benefit score (= sum of attribute scores)						2.88	0.67

4.3 Estimated benefit score

Table 7 shows estimated benefit score for the best incentive package. Assuming that we want to move from the current service to an alternative service, an incentive package which includes provision of training, supportive management, increased salary, provision of housing and improved quality of facilities gives the highest benefit score of 2.88 with an associated cost increase of 67%. A benefit score and cost greater than zero indicates that the incentive package will increase the preference of health workers to work in rural areas.

CHAPTER 5

DISCUSSION OF FINDINGS

5.1 Overview

This study set out to explore the factors that would influence health workers to choose to work in a rural area, with hypothetical job alternatives with different levels presented to respondents. Discrete Choice Experiments offer policy makers tools to explore hypothetical scenarios that can then be used to select the most likely combination of incentives that would be more appropriate to a specific context in formulating strategies that would attract health workers to take up rural postings. The development of such strategies requires an understanding of the job attributes which are likely to increase the choice for rural posting for health workers. These attributes could help in designing a package of incentives with the potential to attract health workers to rural sites. Although WHO policy guidelines on rural retention offer decision makers a wide range of options for retaining heath workers in rural sites, the appropriateness of these alternative policy options require adaptation to country specific context (WHO, 2010).

5.2 Salary

The study found that salary increase was the most preferred attribute for attracting respondents to rural sites. This is not surprising considering rural and remote areas are characterized by numerous hardships such as lack of proper access to reliable electricity, schools for children, and infrastructure such as roads and shopping malls. Thus, higher salaries act as compensation for accepting the hardships that come with these job postings. Money is a crucial incentive to work and serves as a scorecard by which employees assess the value that the organization places on their services (Furnham, 2012). Employees can also compare their value to others based on their pay. Therefore, when working in a rural area is associated with a higher salary, health workers are likely to be motivated to relocate. This finding is consistent with other studies which found that financial incentives are very important in persuading health workers to choose a rural posting, but only if they are fairly large (Mcoy et al., 2008 and Dambisya, 2007). Despite its increasing importance, salary is not the only factor that respondents considered important when choosing a rural posting (Kruk et al., 2010; Blaauw et al., 2010; Willis-Shattuck et al., 2008).

5.3 Housing

There are other non-financial incentives that influence people's decisions when choosing where to work. Our findings suggest that providing housing is another important attribute for motivating health workers to serve in rural areas. Unfortunately, investment in decent housing, especially in rural areas, has been limited coupled with inadequate social amenities such as water and electricity services (Zambia Human Development Report, 2016). Lack of adequate housing not only compromises development, but eventually also constitutes a security threat from myriad social ills that arise from poor housing, such as compromised health and susceptibility to diseases (Scharer et al., 1990). In the logic of this argument, inadequate housing is therefore retrogressive to the prospects for sustainable livelihoods and is a major disincentive for any health worker with ambition to work in a rural setting. Consistent with development imperatives, the value and comfort that a house provides towards achieving a measure of security (including security of tenure against forced evictions) may be an important incentive for deciding where to work (Vladeck, 1990) . Findings of the studies conducted in Burkina Faso (Bocoum, et al., 2014), Ethiopia (Hanson & Jack, 2008), Ghana (Johnson et al., 2011), Tanzania (Mangham & Hanson, 2008) and Uganda (Rockers et al., 2012) show that decent housing is next to an increase in salary and attractive training schemes as one of the most important factors for the decision to work in the rural areas.

5.4 Quality of Health Facilities

The study also found that better quality health facilities increased the preference for health workers to choose to serve in rural areas. Lack of adequate equipment, medical supplies and services like electricity and water in most facilities demoralizes some health workers as it makes it difficult for them to carry out their duties. Most rural health facilities are poorly equipped and over time, this reduces health workers ability to utilize their skills and ultimately there is no job satisfaction and professional growth (Institute for Health Metrics and Evaluation, 2014). As the saying goes "You're only as good as the tools you use", meaning health workers are only as good as the tools that they use. To motivate health workers to work in rural areas, therefore, rural health facilities should be equipped with devices, equipment, mechanisms, resources, applications that assist in completing tasks. Similarly, Kruk et al., (2010) found that, among medical students in Ghana, improved facility equipment was most strongly associated with job

preference. The researchers found that, rural job attributes (improved infrastructure and equipment) that allowed medical students to carry out their clinical practice and achieve professional growth were approximately as important as a doubling of their starting salary. Similar results are also observed in another DCE study in Ethiopia among Doctors and Nurses, where availability of equipment was crucial for attracting health workers in rural areas (Hanson & Jack, 2010). Qualitative discussions with health workers, in the Hanson and Jack study revealed that health workers were disappointed with the serious gaps between what they were trained in school and the realities in the facilities, and over time had to go for refresher courses in order to utilize certain equipment when they eventually had to use them.

5.5 Supportive Management

The relationship with the supervisor is a very good incentive to improve the motivation level of the health worker. For instance, support from the manager is another important attribute that increased health workers preference to serve in rural clinics. Supervision is an excellent opportunity to provide further training to improve performance and to solve other systemic problems that contribute to poor quality of care. While supervision can be an interactive process, traditional supervision focus on the inspection and the discovery of faults instead of problem solving to improve performances (Ludwick et al., 2018). Health workers often receive little advice or guidance on how to improve their results and are often left unsupervised without a clear definition of objectives which makes it difficult to maintain the motivation. Regular supportive supervision is likely to influence performance because these activities provide opportunities for interactions, clarifications, and receiving feedback, which can act as social glue for holding staff members together (Cummings et al., 2010). A study by Drach- Zahavy (2004) found similarly that the interaction of primary nursing with supervisor support was more predictive of performance: if supervisor support was high, performance was substantially higher than if supervisor support was low. Good leadership and management can help to ensure structural investments are used as best they can be and to support and encourage frontline staff to feel they can make a difference even when they are working in difficult conditions (Heller et al., 2004). A systematic review conducted by Cummings (2010) also found that studies reporting leadership styles that were focused on people and relationships were associated with higher job satisfaction, while studies reporting leadership styles focused on tasks were associated with

lower job satisfaction. These findings highlight the importance of managers in ensuring that health systems function at their optimum. In addition to strengthening health facility operations and potentially improving health worker performance, investments in programs that strengthen health facility management may have additional benefits with regard to attracting health workers to underserved areas (Dieleman & van der Wilt, 2009).

5.6 Continuing Professional Development

Providing opportunities for training and career development was an important incentive for the respondents. This finding is consistent with previous research such as results from Barnighausen & Bloom (2009) that has shown that tuition support strategies have been successful in attracting health workers to underserved areas. Kolstard (2011) in Tanzania also looked at the preference of the Clinical Officers to work in rural areas and found that, training for upgrading alone significantly influenced the choices of the rural job. It is not surprising that training becomes a strong factor for attracting health workers in rural areas due to the fact that it provides future economic returns; i.e. training will result in increased salaries, promotion and other conditions of service, and therefore, compensating for all other job attributes. The drive for career development could also be attributed to the harmonization of government workers salaries where public sector workers are paid according to their level of educational attainment, for instance, degree holders have a different pay grade from those with diplomas (GRZ, 2002). In a study on employment preferences of public sector nurses in Malawi, Hanson (2008) revealed that, most nurses were willing to trade-off among the different attributes, with opportunities to upgrade professional qualifications. Despite upgrading being an important factor some health workers discussed with in the course of our study expressed worry in terms of the fairness in allocating these study opportunities equally, they lamented that when such opportunities are provided by NGOs for instance; those in management or superior positions always take up these opportunities. There is need, therefore, to ensure that the process for allocating career development opportunities, to health workers, should be transparent and based on merit to all health workers.

5.7 Summary

It should be noted however that, evidence from other studies indicates that health workers preferences vary significantly within and across various countries depending on characteristics of cadres (Rockers et al., 2012). Findings from this research provide an opportunity to develop evidenced based rural package options that would apply to the Zambian context.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Different strategies to attract health workers to rural areas have been proposed and applied in several settings but most remain ineffective as the focus has been on financial incentives which have proved to be expensive and therefore unsustainable. Although WHO policy guidelines on rural retention offer decision makers a wide range of options for retaining heath workers in rural sites, the appropriateness of these alternative policy options require adaptation to country specific context and Discrete Choice Experiments offer policy makers this tool to explore hypothetical scenarios that can then be used to select the most likely combination of incentives that would be more appropriate to a specific context. In this study, the respondents considered salary, housing, quality of the facility, opportunity for training/career development, and support from manager as important when choosing to work in a rural area.

6.2 Recommendations

Assuming that policy makers want to create a new incentive package that will attract health workers to work in rural areas in Zambia, the inclusion of provision of housing, training, advanced quality of facilities and managerial support gives a benefit score of 2.88 with an associated cost increase of 67% from the current baseline. Therefore, the introduction of these incentives would attract health workers to work in rural areas.

Packages of interventions are likely to be more effective than individual policies in attracting health workers to rural areas not only because individual policies have an additive effect, but because different subgroups of health workers respond differently to different components. Future studies can incorporate subgroup analysis to compare these differential effects of how different cadres of health workers in Zambia will respond. A policy experiment in the future that measures the uptake of rural postings that provide two or more of the valued job attributes validated in this study would be more informative. Whatever package is selected, it would need to be assessed not only in terms of recruitment but also of health worker satisfaction and retention in rural areas.

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APPENDICES

Appendix I: Questionnaire

SECTION A: BACKGROUND INFORMATION					
No	**Questions**	**Response**	**Tick [√]**		**Official use only**
Q.1	Sex	1. Male 2. Female	[ ] [ ]		[ ]
Q.2	Age	……..			
Q.3	What is your marital status?	1. Single 2. Married 3. Divorced 4. Widowed 5. Separated 6. Cohabiting 7. Other ……	[ ] [ ] [ ] [ ] [ ] [ ]		[ ]
SECTION B: SOCIO-ECONOMIC BACKGROUND					
Q.4	What is your religious denomination?	1. Catholic 2. Seventh Day Adventist (SDA) 3. Pentecostal 4. Muslim 5. Other specify: …….….	[ ] [ ] [ ] [ ] [ ]		[ ]
Q.5	Highest educational level attained.	1. No Education 2. Primary 3. Secondary 4. Tertiary	[ ] [ ] [ ] [ ]		[ ]
Q.6	Ethnicity	1. Tonga 2. Bemba 3. Lozi 4. Ngoni 5. Luvale 6. Lunda 7. Other specify……..	[ ] [ ] [ ] [ ] [ ] [ ]		[ ]

Q.7	Specialization	Medical Doctor Nurse Clinical Officer Biomedical officers Other (specify) …….	[ ] [ ] [ ] [ ] [ ]		[ ]
Q.8	Length of stay in the position	…….			[ ]

Please tell us which job posting you would prefer between Posting A and Posting B below

TASK 1

	Posting A	**Posting B**
Salary	Current Government Salary	Current Government Salary + 25%
Housing (Basic)	No Housing or Allowance Provided	Housing provided, enough to afford basic housing
Training (Career Development)	The government will not provide you financial assistance for a study program	The government will you with financial assistance for a study program after a commitment of 3 years
Quality of the facility	Basic (e.g. unreliable electricity, equipment and drugs, and supplies are not always available)	Advanced (e.g. reliable electricity, equipment, drugs, and supplies are always available)
Support from Manager	The Manager is not support and makes work more difficult	The Manager is very supportive and makes work easier
Which job posting would you choose? Mark (X)		

TASK 2

	Posting A	**Posting B**
Salary	Current Government Salary +10%	Current Government Salary + 25%
Housing (Basic)	Housing provided, enough to afford basic housing	No Housing or Allowance Provided
Training (Career Development)	The government will you with financial assistance for a study program after a commitment of 3 years	The government will not provide you financial assistance for a study program
Quality of the facility	Advanced (e.g. reliable electricity, equipment, drugs, and supplies are always available)	Basic (e.g. unreliable electricity, equipment and drugs, and supplies are not always available)
Support from Manager	The Manager is not support and makes work more difficult	The Manager is very supportive and makes work easier
Which job posting would you choose? Mark (X)		

TASK 3

	Posting A	**Posting B**
Salary	Current Government Salary	Current Government Salary + 10%
Housing (Basic)	Housing provided, enough to afford basic housing	No Housing or Allowance Provided
Training (Career Development)	The government will you with financial assistance for a study program after a commitment of 3 years	The government will not provide you financial assistance for a study program
Quality of the facility	Basic (e.g. unreliable electricity, equipment and drugs, and supplies are not always available)	Advanced (e.g. reliable electricity, equipment, drugs, and supplies are always available)

Support from Manager	The Manager is very supportive and makes work easier	The Manager is not support and makes work more difficult
Which job posting would you choose? Mark (X)		

TASK 4

	Posting A	**Posting B**
Salary	Current Government Salary	Current Government Salary + 10%
Housing (Basic)	Housing provided, enough to afford basic housing	No Housing or Allowance Provided
Training (Career Development)	The government will not provide you financial assistance for a study program	The government will you with financial assistance for a study program after a commitment of 3 years
Quality of the facility	Advanced (e.g. reliable electricity, equipment, drugs, and supplies are always available)	Basic (e.g. unreliable electricity, equipment and drugs, and supplies are not always available)
Support from Manager	The Manager is very supportive and makes work easier	The Manager is not support and makes work more difficult
Which job posting would you choose? Mark (X)		

TASK 5

	Posting A	**Posting B**
Salary	Current Government Salary + 25%	Current Government Salary +10%
Housing (Basic)	No Housing or Allowance Provided	Housing provided, enough to afford basic housing
Training (Career Development)	The government will you with financial assistance for a study program after a commitment of 3 years	The government will not provide you financial assistance for a study program
Quality of the facility	Advanced (e.g. reliable electricity, equipment, drugs, and supplies are always available)	Basic (e.g. unreliable electricity, equipment and drugs, and supplies are not always available)
Support from Manager	The Manager is very supportive and makes work easier	The Manager is not support and makes work more difficult
Which job posting would you choose? Mark (X)		

TASK 6

	Posting A	**Posting B**
Salary	Current Government Salary	Current Government Salary + 25%
Housing (Basic)	No Housing or Allowance Provided	Housing provided, enough to afford basic housing
Training (Career Development)	The government will you with financial assistance for a study program after a commitment of 3 years	The government will not provide you financial assistance for a study program
Quality of the facility	Basic (e.g. unreliable electricity, equipment and drugs, and supplies are not always available)	Advanced (e.g. reliable electricity, equipment, drugs, and supplies are always available)
Support from Manager	The Manager is not support and makes work more difficult	The Manager is very supportive and makes work easier
Which job posting would you choose? Mark (X)		

THE END - THANK YOU VERY MUCH FOR YOUR PARTICIPATION

Appendix II: Consent Form

CONSENT FORM

What does your signature (or thumbprint/mark) on this consent form mean?

Your signature (or thumbprint/mark) on this form means:

- You have been informed about the program's purpose, procedures, possible benefits and risks.
- You have been given the chance to ask questions before you sign.

You have voluntarily agreed to be in this program

AUTHORIZATION

I have read and understand this consent form, and I volunteer to participate in this research study. I understand that I will receive a copy of this form. I voluntarily choose to participate, but I understand that my consent does not take away any legal rights in the case of negligence or other legal fault of anyone who is involved in this study.

I understand that I am free to choose whether to participate in the study or not. I am also free to skip any questions without any consequences. I may also withdraw from the study at any time without any problems.

Participant's Signature or thumb impression: ……

Date: ……

Principal Investigator's Signature: …….

Date: ……...

Appendix III: information sheet

THE UNIVERSITY OF ZAMBIA
SCHOOL OF MEDICINE
DEPARTMENT OF PUBLIC HEALTH

INFORMATION SHEET

Title of study: Health Workers preferences to serve in rural clinics in Chibombo, Lusaka, and Chongwe Districts of Zambia: A Discrete Choice Experiment

Principal investigator: Leonard Mangani Zulu

Institute: University of Zambia, School of Medicine

Purpose of research project

The researcher, Leonard Mangani Zulu is conducting research to determine the different attributes that motivate health workers to work in rural areas of Lusaka, Chibombo and Chongwe districts of Zambia. This study is a contribution towards fulfillment of the completion of my Master of Public Health program which I am studying at the University of Zambia. The acute shortages and inequitable distribution of health workers within countries is a major barrier to increasing coverage of health interventions to those most in need. The lack of health workers is a major factor in the deaths of large numbers of individuals who would survive if they had access to health care. The health worker shortage is further exacerbated by the severe imbalances in the distribution across and within countries. Throughout the world, there is a tendency for the health workforce to be concentrated in affluent urban areas rather than in rural and poorer areas.

Why you are being asked to participate?

Potential participants for the study include all health workers who have been employed for more than one year. You have been randomly selected to participate because you fit these descriptions.

Procedures

If you agree to take part in this study; I will ask you to answer a questionnaire that will take you less than 15 minutes to complete. This type of questionnaire will ask you to choose between jobs A or B based on different attributes that are given to a job.

Risks/discomforts

There are no physical risks to participating in the study. However, I recognize some information you may tell me or enter in the questionnaires may be personal or may be sensitive to other stakeholders. However, I would like to assure you, that the information that I get from you will not be shared with anyone outside the research team.

Benefits

There are no direct benefits to you for participating in this study. However, the results of the study may help policy makers to better formulate incentive packages that will attract and retain health workers to rural areas.

Confidentiality

The information provided by you will remain confidential. Nobody except the researcher and supervisors will have access to it. Your name and identity will also not be disclosed at any time. However the data may be seen by Ethical review committee and may be published in journal and elsewhere without giving your name or disclosing your identity.

Right of refusal to participate and withdrawal

You are free to choose to participate or not in the study. You are also free to skip any questions without any consequences. You may also withdraw any time from the study without any problems.

For more information

Call or contact the University of Zambia Biomedical Research Ethics Committee office for any ethical queries. The Ethics Committee contact information is:

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