

Where, Why And For How Much: Diversity In Career Preferences Of Future Health Workers In Rwanda

Tomas Lievens, Pieter Serneels and Damas Butera

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Executive Summary

1. **The Government of Rwanda has identified human resources for health as one of its policy priorities. This study aims to contribute to building a better understanding of health worker choice and behaviour, and to improve evidence based policies.**
 - a. This **quantitative study** was undertaken by The Ministry of Health in a collaborative effort with the World Bank. The study builds on the results of a qualitative pre-research and is the **first wave of a cohort survey** with medical and nursing students.
 - b. **The study uses data collected from nursing and medical students.** The sample consists of 288 nursing students and 124 medical students representing 53% and 77% respectively of their cohort. The survey used a self-administered questionnaire, a test on medical knowledge, and two behavioural games.
 - c. **Respondents come from all over Rwanda (and some from abroad). Medical students tend to come from comparatively richer households than nursing students. 60% of nursing students carried out practical work in urban areas, compared to 84% for medical students.** The majority of nursing students (68%) is female, while the majority of medical students (73%) is male.
2. **The large majority of nursing students (90%) and medical students (63%) state they knew at the age of 12 that they wanted to become a health worker.** Those who knew also state more that they have been influenced by parents, teachers or a health worker when making their career choice. They also cite more often that they entered the profession to help people.
 - a. **More than three quarter of nursing students and about half of the medical students state they entered the health sector to help people.** For only one tenth of nursing students and one fifth of medical students the reason was that they wanted a job, or a job that pays well.
3. **The Government is by far the main funder for health students' tuition fee, living expenses and accommodation.**
 - a. Medical students receive more Government support compared to nursing students; and students coming from a poor background receive more government support than those coming from better off households.
 - b. **One third of students receiving support state they do not have an obligation to fulfil in return.** Most of those who believe they have an obligation to fulfil expect this will take the form of

working for the Government; the others report they have to repay a loan. But students not necessarily plan to fulfil the work obligation as **43% of nursing students and 27% of medical students report they will simply renege on the obligation** and one third reports it is possible to buy oneself out.

4. **The public sector is the biggest employer in the Rwandese health sector, but not necessarily the most popular one.**
 - a. In the long term, only 40% of nursing students and 31% of medical students expect to work in the public sector. About half of the students report that they expect to still be working for the public sector in 5 years time.
 - b. **Health students generally have expectations about the salary that exceed the salary of a typical first public sector job.** Nursing students expect 80% more, while medical students expect 50% more. Moreover, 25% of nursing and 50% of medical students expect significant salary top ups from job-related bonuses and some expect extra income from health work on the side.
 - c. **Those expecting to be working outside the public sector, in urban areas, in public health, abroad or outside the health sector also expect higher earnings.**
5. **The willingness to work in a rural area varies considerably across students** with medical students generally less inclined than nursing students to work in a rural area.
 - a. **The difference in preference for rural service, measured by the reservation wage to work in a rural area using contingent valuation methods, shows substantial variation.**
 - b. **The vast majority of students would like to work in an urban centre** in the long term, but a substantial part expects to still be working in a rural area in 5 years time. **More than a third of both medical and nursing students are keen to start their career in a rural setting.**
 - c. A simple simulation suggests that, **if the government would like to get 80% of the nursing students to take up a rural post current average salaries would have to increase with 80%.** However, **a substantial number of nursing students (24%) is willing to take up a rural post for a salary below the current starting salary,** and reservation wages are lower for those nursing and medical students who indicate that the first reason to take up a rural post is to 'help the poor'.
 - d. **To make rural posts more attractive to those currently opting for an urban job, positions in rural areas should provide additional job attributes like access to further training and specialisation, a good working environment, and adequate access to schooling for children.**

6. **In comparison with other African countries, migration of health workers abroad may be less of a problem for Rwanda.**
 - a. The study finds that 80% of nursing and medical students report to have no intention to migrate abroad in the coming five years.
 - b. Using a contingent valuation method to measure the reservation wage to migrate, we find that **at the current public sector starting salary more than half the students would choose a job in Kigali instead of going abroad.**
 - c. **But there is considerable heterogeneity in the willingness to work abroad** with students who are married or engaged having lower reservation wages to move abroad and therefore more likely to stay in Rwanda. Younger medical students require a higher average salary to stay in Rwanda compared to older students.

7. Although Rwanda has a relatively low HIV prevalence compared to other African countries, **there are problems with attitudes to HIV/AIDS, although the attitudes differ greatly between students, with medical students consistently more positive than nurses.**
 - a. **Medical students do better than nurses in medical knowledge about and familiarity with HIV/AIDS.** They score higher on the medical knowledge related to HIV/AIDS, have higher levels of self-reported knowledge on AIDS, and are also more familiar with HIV.
 - b. Health students are generally averse to take up work in high HIV prevalence areas but preferences vary widely as is reflected in the wide span of reservation wages to accept a job in a high HIV prevalence area.
 - c. Students are less willing to work in high HIV prevalence areas than to take up rural service.

8. **There is considerable heterogeneity in health students' general attitudes towards risk.**
- a. We find that nursing students are more risk averse than medical students, that younger students are less risk averse than older students and those who have grown up in poorer households are more risk averse than those who have grown up in relatively better off households, but there is no difference between male and female students.
9. **Intrinsic motivation** can be described as the inclination to provide medical care for its own sake, independent of extrinsic incentives. **Intrinsic motivation affects performance in the sense that more motivated health workers tend to perform better.**
- a. **We measure intrinsic motivation through survey questions and an economic game**, and investigate three possible measures of intrinsic motivation: (i) whether students have chosen a career in health to help people; (ii) whether they prefer to work in a rural area in order to help the poor; and (iii) whether they act altruistically in a behavioural game (the dictator game). The different measures are positively associated as expected, but the relationship between them is not always significant, **highlighting the complex nature of intrinsic motivation and calling for a deeper analysis.**
 - b. Whatever measure for intrinsic motivation we consider, **we observe substantial heterogeneity in intrinsic motivation across health workers.**
 - c. We find that **religion, gender and profession (medical or nursing student) tend to be highly correlated with intrinsic motivation.** Those who knew at the age of 12 that they would become a health worker also tend to have higher intrinsic motivation.
 - d. Intrinsic motivation is also correlated with a number of career preferences. Comparatively **more altruistic students have a higher propensity to work in a rural area, have lower income expectations, are less interested in a job outside the health sector if pay were better, are less likely to engage in dual practice or do non-health work on the side to earn extra money. They have a higher preference for the public sector in the long term, require (on average) a lower salary to accept a job in Kigali as opposed to a job abroad, and require (on average) a lower salary to accept a job in a high HIV prevalence area.**

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¹ The findings, interpretations and conclusions expressed in this paper are entirely those of the authors and do not necessarily represent the views of the World Bank, its Executive Directors, or the countries they represent.

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1 Study rationale

Summary

1. With health outcomes amongst the worst in the world, **the Government of Rwanda has identified human resources for health as one of its policy priorities**. Shortages of skilled labour, low availability of workers in rural areas, and problems of poor performance and low morale are some of the key problems and the Government recognises that they can be dealt with by providing adequate incentives and improve human resource policies. **To improve policies based on evidence a better understanding is needed of health worker choice and behaviour**. This study aims to contribute to that insight.
 2. This paper reports the **results of a quantitative study** undertaken by The Ministry of Health in a collaborative effort with the World Bank. The study builds on the results of a qualitative pre-research and is the first wave of a cohort survey with medical and nursing students.
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1.1 Motivation

Despite tremendous efforts by the Government of Rwanda health outcomes in Rwanda are amongst the worst in the world. In 2002, life expectancy at birth was 38 years, maternal mortality was 1,071 per 100,000 live births and infant mortality rate was 107 per 1,000 live births (Government of Rwanda 2005). The Government of Rwanda addresses these challenges through seven complementary policy programmes. Human resources in health is one of the priority programmes.

Insufficient numbers of adequately trained health workers are one of the major challenges facing the human resources in health sector. However, human resource challenges go beyond mere shortages of health workers. The health sector in Rwanda is suffering from imbalances in the distribution of health workers in favour of urban areas, migration of workers to the private sector, and low levels of motivation and performance in the public sector. Currently 75% of all doctors and more than 50% of nurses work in Kigali (Government of Rwanda 2005) causing severe inequity in access to health services. Low morale and motivation affects the quality of services and contribute towards high levels of absenteeism and shirking.

The Government recognises that performance problems, mal-distribution and low morale are the consequences of an inappropriate incentive structure and is determined to design policies to impact health worker behaviour. Outstanding challenges comprise the refinement and practical implementation of these policy directions. This indirectly calls for a better understanding of the analytical and empirical foundations of health worker choice behaviour.

This study attempts to contribute to this insight. It is one component of a collaborative Ministry of Health – World Bank programme of analytical work on human resource issues in the health sector in Rwanda. The study

also builds on a similar one carried out in Ethiopia (for design specifications see (Serneels, Lindelow et al. 2005)), aiming for informative cross-country comparison.

Within this programme in Rwanda we carried out qualitative pre-research in 2005. The work was designed to explore a broad range of issues and to identify key hypotheses and areas of focus for further work, and to understand the nature and relative importance of different human resource issues. Focus group discussions were organized with different types of health workers and health users (Serneels and Lievens 2008; Lievens, Lindelow et al. 2009).

The qualitative analysis finds suggestive evidence that some health workers get frustrated through the actual post-allocation policy, that most health workers lack career perspectives, and motivation and job-satisfaction varies significantly within the workforce. We also find that many health workers, especially doctors in urban areas, combine public and private sector work – often at the cost of the quality of public sector health care delivery and are often absent from work. Both the performance-pay initiatives (which were then piloted) and the involvement of community representatives in the management of lower level health facilities were seen to make a positive contribution to health worker performance, but are also not without challenges of their own. The pre-research underlines that the assumptions on which human resource policies are often based do not necessarily hold. Health workers are not passive actors in the health system, but rather make choices about where, when, and how to work on the basis of personal characteristics and circumstances, and the institutional and organizational environment in which they operate. Health workers are also not uniform: they vary in motivation and commitment. Not taking this reality into account can result in misguided human resource policies.

Rwanda is not alone in lacking empirical evidence to inform HR policy. Despite an international consensus on the importance of health worker behaviour for health system performance, there are gaps in our understanding of these issues. Much of the literature on human resources has focused on ‘macro-issues’ concerning, for example, the number, skill mix, and distribution of the work force (Martinez and Martineau 1998). These policy concerns remain important. However, there is also a growing body of evidence that low levels of effort and opportunistic behaviour by health workers is hampering both quality and efficiency in service delivery. This is not merely wasteful; quality problems can also have a deleterious impact on both service utilization and health outcomes (Collier, Dercon et al. 2002). In response to these concerns, a growing literature focuses on the coping strategies of health workers². However, many of these studies rely on qualitative data or small samples. In consequence, they do not provide information about the magnitude of the problem, and do not enable testing for a causal relationship.

² See, e.g. Ferrinho and Van Lerberghe (Ferrinho and Van Lerberghe 2000; Ferrinho and Van Lerberghe 2002) for an overview of coping strategies of health workers; Ferrinho et al (1998) for a discussion of absenteeism; Ensor and Witter (2001) and Killingsworth et al. (1999) for evidence on informal payments; McPake et al. (1999) provide a detailed and quantified assessment of the extent and implications of informal economic activities of health workers in Uganda.

This survey of nursing and medical student represents an effort to strengthen the empirical basis for policy making. The study is concerned with understanding the labour market choices of future health workers. The data provide detailed descriptive and analytical information that will contribute to the improved policy design and dialogue. Although the findings reported here refer to a single point in time, the intention is that the students who were interviewed for the study will be followed over time as they enter the labour market. A future round of the cohort study will provide information on real life career choices and outcomes, as well as their determinants. This report should hence be seen as the first step in a longer term effort. Many of the questions phrased above can ultimately only be investigated by surveying and observing health workers in their job. This will be the aim of the second wave of the cohort study.

The focus of the report is on the descriptive results and future analysis will investigate the causality of observed relationships.

The remainder of the report is structured as follows. Section 2 provides some details on the sampling strategy. The following section describes the characteristics of the respondents, their exposure to practical work in the health sector and their medical knowledge. Section four is about health sector entry and tries to understand why students chose for the health sector and who funded their studies. The fifth section focuses on health students' preferences. We give an overview of their preferences for area and sector of work amongst others and look into their income expectations. Sections six, seven and eight are entirely devoted to the topics of rural service, international migration and HIV and AIDS respectively. The last section provides some options for further research about intrinsic motivation and the relationship between risk preferences and labour market choices.

2 Survey Method and Sample Description

Summary

1. **This study uses data collected from nursing and medical students.** The sample consists of 288 nursing students, specializing in clinical nursing, midwifery or mental health, and 124 medical students. They represent 53% and 77% respectively of their corresponding cohort. The students come from both government and NGO owned schools. The survey used a self-administered questionnaire, a test on medical knowledge, and two behavioural games.
 2. **Respondents come from all over Rwanda and with some from abroad. Medical students tend to come from comparatively richer households than nursing students. Nursing students did on average 5 months of practical work, medical students 4 months. 60% of nursing students carried out their practical work in urban areas, compared to 84% for medical students.**
-

2.1 Sampling Method

The objective of the study is to understand career preferences and expectations of young health professionals before they enter the labour market³. The sampling strategy targets nursing and medical students from across different schools, and from different years. This allows us to get an insight in their current preferences while revisiting them in the future will elicit changes in their preferences and attitudes over time.

Table 2.1 provides an overview of the sample. For nursing students we followed a two step sampling strategy, first selecting the schools and then the students. Apart from the major government owned nursing school, Kigali Health Institute, there are five smaller nursing schools located outside Kigali which train mainly general nurses.⁴ While all these schools receive government funding, two of them belong to the faith based NGOs. One private for profit nursing school was excluded from the sample because it was not accredited, nor was accreditation envisaged in the near future.

To reflect the difference in ownership we select, apart from Kigali Health Institute, one government owned (Nyagatara) and one NGO owned nursing school (Rwamagana) outside Kigali. We also leave out the schools that we used for piloting the survey instruments. All selected schools are accredited, offering a three year

³ It is important that participants in the survey do not have direct work experience yet since work experience is likely to have a significant effect on their career preferences and expectations; the impact of work experience could be directly addressed in the future by collecting a second wave of data on the same cohort of students and comparing the respondents' answers as students and as health professionals. It is also important that the participants in the survey are as close as possible to the end of their program of study, so that they are likely to have an understanding of their future job characteristics and their career prospects.

⁴ These schools are located in the towns of Kibungo, Byumba, Gitarama, Rwamagana and Nyagatara.

program for general clinical nursing (A1), midwifery, or mental health nursing. Within each school students we surveyed that were present at the day of the interview, focusing as much as possible on final year students.

Medical students in Rwanda all attend the National University, which is located in Butare, the second largest city in the country. Medical school lasts 6 years, with the first 2 years offering general training and the last 4 years labelled as ‘doctorate’, or ‘medical’ training (Doc1-4). During the final year (Doc4) students do an internship in a health facility; we survey students before they enter their internship and surveyed all students who were present at the day of survey visit, sampling more students of the final year before doing their internship.⁵

Our final sample of students consists of 288 nursing students, specializing in clinical nursing, midwifery or mental health, and representing 53% of the total corresponding cohort. Our sample of medical students counts 124 students, representing 77% of the cohort. ⁶

Table 2.1 The sample of nursing and medical students

		Number of students surveyed	
		Nursing	Medical
Rwamagana Nursing School	General nursing	64	-
Nyagatare Nursing School	General nursing	72	-
Kigali Health Institute	General nursing, midwifery and mental health	152	-
National University of Rwanda	Medicine	-	124
Total		288	124

The survey uses three different instruments: a self-administered questionnaire, a test on medical knowledge, and two behavioural games, which were piloted and revised. The survey took around one and a half hour to complete, while the medical test lasted 30 minutes. Students were given the choice between Francophone and Anglophone data collection instruments. The games took an additional 45 minutes. Selected students were first explained the functioning of the Dictator Game, which results in a measure of social preferences, and a Lottery Game which measures risk attitude and then asked to play both of the games. To avoid contamination regarding

⁵ We found no indication that there was self-selection in the sample of nurses or doctors that showed up that day.

⁶ We conducted several pilots involving 112 nursing students and 12 medical students. Pilot subjects from younger years and/or other schools were subsequently excluded from the survey in order to avoid contamination in survey questions, tests and games. For full details of the pilot see Serra (2008).

the survey questions, test and games, the students were surveyed in four back to back sessions per day, with no more than 20 students in each session. The survey was implemented between April 15 and May 2nd, 2008.

2.2 Demographic and socio-economic profile of students

To better understand who our subjects are, we give a brief overview of their demographic and socio-economic characteristics. Table 3.1 summarises the statistics.

The mean age of medical students in the sample is 27 and that of nursing students 26. As expected both distributions are skewed to the left with few older students enrolling. Nurses are overwhelmingly female (68%) while medical students are mostly male (73%). Nursing students are more often married or engaged than medical students (35% versus 31%) and about one out of four nursing students (24%) and one out seven medical students (15%) has at least one child. Of those that don't have children the great majority (86%) plans to have children in the future and anticipates having children on average 4 years after leaving school.

The distribution across religions is very similar for nursing and medical students, and about four fifth of both the nursing and medical students reports that religion is important or very important in their life.

The distribution of the geographical origin is similar for nursing and medical students with two exceptions: while 20% of nursing students come from the East, only 4% of medical students do, and while only 7% of nursing students come from abroad, 21% of medical students do. The latter, we expect, may have a direct effect on the questions related to international migration.

Table 2.2 Demographic characteristics of survey participants

	Nursing students	Medical students
Mean age	25.58	27.02
Standard deviation	4.97	3.63
Female	68%	27%
Married or engaged	35%	31%
Has children	24%	15%
Religion		
Catholic	48%	53%
Protestant	27%	24%
Other Christian	23%	14%
Other	1%	7%
Religion is very or quite important (5 point Likert scale)	80%	78%

Born in		
East	20%	4%
Kigali	23%	24%
North	13%	12%
South	19%	21%
West	17%	17%
Abroad	7%	21%
Accommodation		
	59%	77%
	26%	15%
Other	15%	11%
Mean distance of house where s/he grew up from closest all-weather road	7.88	5.39
Mean dependency ratio in household where s/he grew up	4.86	4.31
Mean number of persons in the household at age 12	7.56	8.03
Number of rooms in the dwelling where s/he grew up	3.83	4.26
Father completed post secondary education	8%	24%

To measure the wealth of the students and the households in which they grew up we asked questions on asset ownership, which we copied from the most recent Enquête Intégrale sur les Conditions de Vie des ménages (EICV 2), the nationally representative household income and expenditure survey questionnaires.⁷ Using these questions we construct a composite measure of individual and household wealth. We experiment with different measures for individual wealth and find that there is no significant difference in individual wealth between medical and nursing students.⁸

Given the students' young age, the wealth of the household where he or she grew up is probably more discriminatory. Using the same method but now making use of the questions concerning the household where they grew up, we find that nursing students come from relatively poorer households than medical students, whether we use the naïve wealth indicator, which has a mean of 9.00 for medical students and 7.17 for nursing students, which is statistically different ($p=0.01$), or the asset indicator obtained from principal component analysis.⁹

2.3 Medical knowledge test results

To measure the skills and competence of the students we carried out a medical knowledge test, previously developed in the context of Ethiopia and adapted to Rwanda with the help of the medical faculty. The test is different for medical and nursing students but follows the same structure consisting of two parts: the first part tests knowledge of evidence based medicine while the second part measures technical know-how to deliver

⁷ Regressing household expenditures on household assets for this nationally representative data set, we select the assets for which the coefficient is significant or large and include the corresponding asset question in our questionnaire. This enables us to predict household expenditures for the household where the student grew up.

⁸ We consider two different measures. First we construct a naïve wealth index, which is the simple sum of the answers to the asset ownership questions. Second, we use principal component analysis and retain the first three eigenvectors as asset-wealth predictors since together they account for 2/3 of the variance in the 10 asset variables.

⁹ Again, we retain three eigenvectors, which together account for 50% of the variance.

medical interventions.¹⁰ Students were given 30 minutes to complete the test which comprised 53 (52) questions for nursing (medical) students. Not all students were able to complete all questions within half an hour. The table below contains some summary statistics relating to the test.

Test scores for both nursing and medical students are roughly normally distributed. The scores are also positively associated with the students' scholastic results¹¹ ($p < 0.01$ for nursing students; $p = 0.03$ for medical students), which provides further assurance of the validity of the medical test.

Nursing as well as medical students score better on the Evidence Based Module, which may not be surprising since they are still at school and have had but little exposure to practical work. Interestingly, the score on the 'Technical know-how' is positively associated with whether or not the student has been doing some practical work as part of her/his training. The total score on the test for nursing students is further positively ($p = 0.01$) associated with the length of the practical work done during training. The scores for nursing and medical students on a sub-set of questions related to HIV and AIDS displays a pattern very similar to the total scores, suggesting that students' knowledge of HIV and AIDS is at the same level as their overall medical knowledge.

Higher year students, both nursing and medical, score roughly better on the test than lower year students. The test scores do not correlate with the nature of previous schooling (public or private). Interestingly, test scores are negatively correlated ($p = 0.10$) with long-term public sector preference for nursing students: those students that score on average worse on the test tend to prefer to work for the public sector in the long term.

¹⁰ In the 'Evidence based knowledge' part the students were asked to identify the effectiveness of specific interventions on child mortality, maternal mortality, malaria and illness due to HIV and AIDS. In the 'Technical know-how' part students are asked knowledge question about medical facts and interventions. Each answer was given the same weight and scores are obtained through simple addition (1 point per correct answer; 0 for wrong answers).

¹¹ Scholastic performance is measured by the student's last year final mark.

Table 2.3 Medical knowledge test

	Nursing students	Medical students
Evidence Based Medicine	31 (12)	42 (13)
Technical Know How	26 (15)	33 (12)
Total score – year 3	30 (11)	38 (11)
Total score – year 2	30 (11)	36 (3)
Total score – year 1	26 (9)	-
AIDS knowledge	32 (17)	37 (17)

The figures are mean score on 100 with standard deviation reported in brackets. Nursing and medical students took different tests, so a straight forward comparison is not informative.

2.4 Work experience

The vast majority of medical and nursing students has some kind of work experience, mostly because practical work is an important element of the medical and nursing curricula in Rwanda. 85% of nursing students and 88% of medical students have work experience as part of their training, with medical students spending on average 5 months on practical work compared to 4 months for nursing students. Interestingly, medical students have worked predominantly in urban areas as part of their training (84%), while nurses predominantly worked in rural areas (60%).¹² About half of both medical and nursing students expect to get a job in the facility where they have worked as part of their education. Another source of experience comes from working outside the requirements of education with one quarter of nursing students and one fifth of medical students having worked outside the requirements of the training. Those who have worked outside training have done significantly so, with nursing students having more than 3 years experience and medical students almost two years. 6% of nursing students also studies part-time, while all medical students study full time.

Table 2.4 Past work experience

	Nursing students	Medical students
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¹² This is remarkably similar to the eventual work pattern, where more than 75% of medical doctors in Rwanda work in Kigali. This may also be a consequence of the more rural background of nurses, for which the distance of the household in which the student grew up to the nearest all-weather road is significantly smaller compared with medical students (8 km versus 5km; $p=0.02$), although multivariate analysis is needed to test this further.

Did practical work in health during training	85%	88%
Duration of practical work as part of training (mean, (4.5 months)	4 months (4.5 months)	5 months (3.5 months)
Did paid work in health outside training requirements	25%	21%
Duration of paid work outside training (mean, (29)	42 months (29)	20 months (20.5 months)
Practical work as part of training was in urban area	40%	84%
Student expects to get a job in facility where s/he did practical work	58%	48%
Studies part-time	6%	0%

3 The decision to become a health worker

Summary

1. **More than three quarter of nursing students and about half the medical students state they entered the health sector to help people.** For only one tenth of nursing students and one fifth of medical students the reason was that they wanted a job, or a job that pays well.
 2. **90% of nursing students and 63% of medical students state they knew at the age of 12 that they wanted to become a health worker.** Those who state they knew have been influenced more by parents, teachers or a health worker when making their career choice. They also cite more often that they entered the profession to help people.
 3. **The Government is by far the main funder for health students' tuition fee, living expenses and accommodation.** Medical students receive more Government support compared to nursing students; and students from poor backgrounds more than those of richer backgrounds.
 4. **One third of students receiving support state they do not have an obligation to fulfil in return.** Most of those who believe they have an obligation to fulfil expect this will take the form of working for the Government; the others report they have to repay a loan. Some students believe they have to work their entire career for Government. Other students think they can be released, in which case nursing students expect that they have to work 6 years for the government; medical students think this is only 3 years. But students not necessarily plan to fulfil the work obligation as **43% of nursing students and 27% of medical students report they will simply renege on the obligation** and one third reports it is possible to buy oneself out.
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3.1 Choosing a career in health

The majority of nursing and medical students points at their desire to help people as principal motivation to enter a career in the health sector. But there is a difference between nursing and medical students, with 77% of nursing students and 53% of medical students indicating 'to help people' as their first reason to become a health worker. The second most cited reason is to get a job or a job that pays well and is cited by one tenth of nursing and one fifth of medical students (statistically different at $p=0.01\%$).

In general, students feel that they have made the decision to enter the health sector largely autonomously as less than half of the students agreed or strongly agreed (on a 5 point Likert scale) that parents, teachers or a health worker had a big influence on their decision, although nursing students have been significantly more influenced

than medical students ($p=0.01$)¹³. The majority of students also indicate that their friends approve of them becoming a health worker (72% for nursing students and 75% for medical students), and close to half of the students agree that the fact that doctors and nurses are highly respected in the society had a big influence to become a health worker (43% for nursing students and 45% for medical students).

Especially nursing students (90%) seem to have known already at age 12 that they wanted to become a health worker – versus 63% of medical students. Those who seem to have known at the age of 12 that they wanted to become a health worker are also much more likely to report that they entered the health sector to help people.¹⁴

Table 3.1 Health sector entry

	Nursing students	Medical students
Most important reason to become a nurse or doctor		
Help people	77%	53%
Get a job / Get a job that pays well	10%	21%
Had a big influence on my decision to become a health worker (agree or strongly agree)		
My parents	46%	26%
My teachers	36%	18%
A health worker I knew	47%	25%
My friends think it is a good idea to become a health worker (agree or strongly agree)	72%	75%
High respect for doctors and nurses in society had a big influence on my decision to become a health worker (agree or strongly agree)	43%	45%
When you were 12 years old what did you want to become later in life?		
Health worker	90%	63%

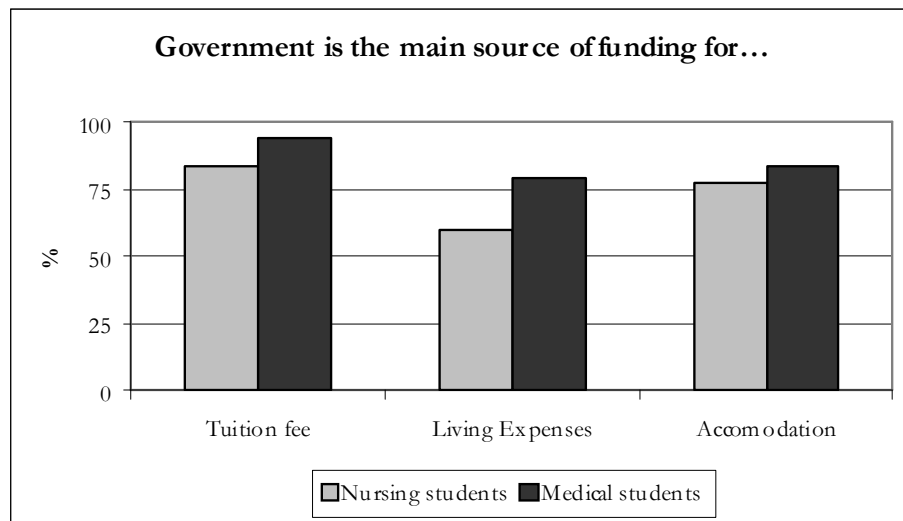
3.2 Who funds the training?

The Government of Rwanda is the most important source of funding for the tuition fees, accommodation and living expenses for both nursing and medical students, but a higher proportion of medical students seem to get its tuition fees and living expenses covered by the Government, compared to nurses. Overall, students coming from a poorer background get more government support for their tuition fees ($p=0.01$), as well as for accommodation ($p=0.03$) and living expenses ($p=0.01$).

¹³ Two-sample Wilcoxon rank-sum test.

¹⁴ If the student knew that s/he would become a health worker at the age of 12, the probability is higher ($p\leq 0.02$) that the decision has been influenced by parents, teachers or a health worker. This pattern also holds for nursing and medical students separately. A regression with a binary response model confirms this pattern partially and only influence from parents and teachers is significant in explaining that a student knew at the age of 12 that s/he would become a health worker. These data are suggestive of a process where students are helped by externals in the decision to become a health worker from young age onwards.

Figure 3.1 Government as source of funding



About half of the nursing and medical students who receive external funding think they have to fulfil an obligation towards the funding party. When the external funder is the Government, about two third of students say they have to fulfil an obligation towards Government; conversely, one third claims they have no obligation to fulfil. When an obligation is assumed, this typically takes the form of having to work in a position proposed by the funding party (62%), but can also mean having to repay the loan (36%). Medical students are more likely to have to repay a loan to Government (52% compared to 29% for nursing students), while nursing students seem more likely to have to take up a job proposed by the government (69% of nursing students compared to 48% of medical students). There also seems to be a difference in the length of the obligation assumed. Some students think they need to work lifelong (30 years or more) for Government (14% nursing students; 5% of medical students). Of those students who think they need to work less than life long, nursing students state they have to work 6 years for Government, whereas medical students state their obligation is to last 3 years.

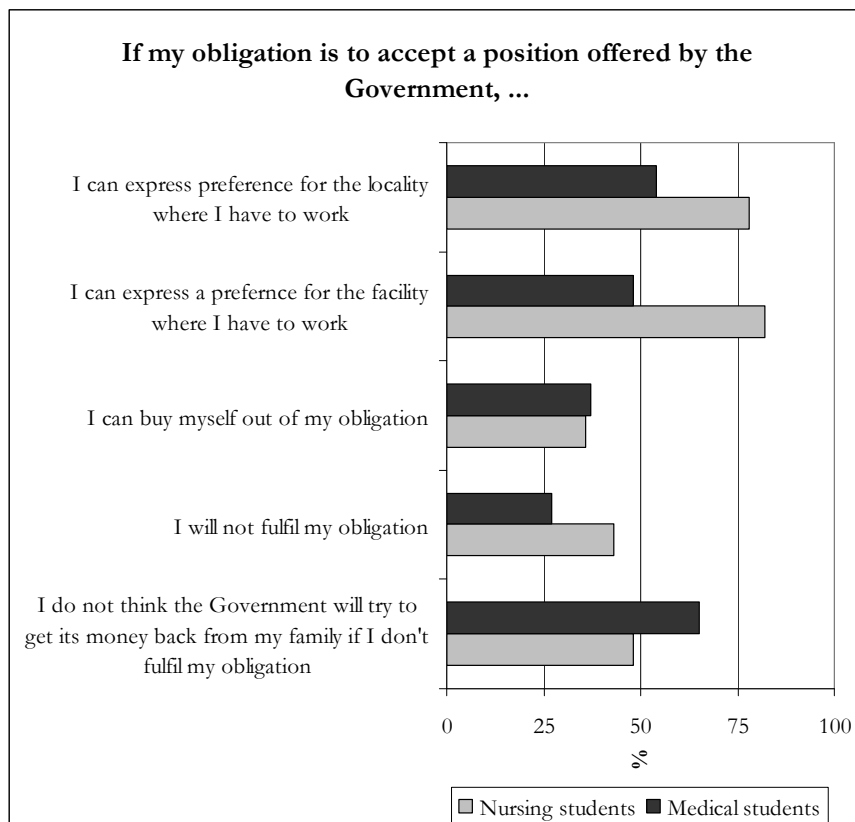
Table 3.2 Funding for health education

	Nursing students	Medical students
Nature of the obligation towards Government that pays for tuition fees		
Working in a position offered by the funding party	69%	48%
Repay the loan to the funding party	29%	52%
Other	2%	0%
I believe I have to work 30 years or longer for Government	10%	2.5%
Number of years that you're expected to work for the Government (mean), if less than 30 years	5.7 (4.7)	3.0 (3.9)
If my obligation is to accept a position offered by the Government, ...		
I can express a preference for the locality where I have to work	78%	54%
I can express a preference for the facility where I have to work	82%	48%
I can buy myself out of my obligation	36%	37%
I will not fulfil my obligation	43%	27%

I do not think the Government will try to get its money back from my family if I don't fulfil my obligation	48%	65%
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On the other hand, 78% (82%) of the nursing students say they can express a preference for the locality (facility) of their work obligation, compared to 54% (48%) of medical students. More than one third of the nursing (36%) and medical (37%) students say they can buy themselves out of any obligation towards the funding party. When asked if they think they will fulfil their obligation, 43% of nursing students say they will not, compared to 27% of medical students. About two third of medical students and half of the nursing students with work obligations thinks the Government will not try to get its money back from them or their family if they decide not to fulfil their obligation.

Figure 3.2 Students' perceptions of their obligations towards the study funding party



4 Long Term Career Preferences and Income Expectations

Summary

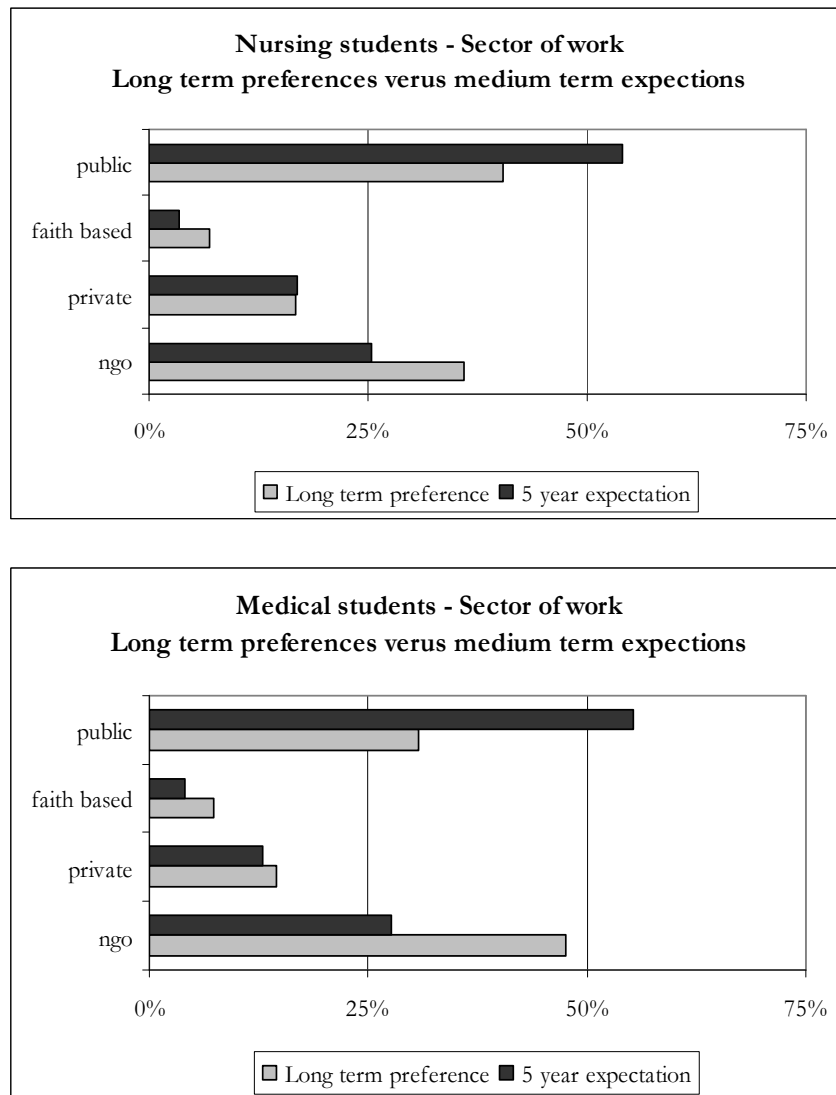
1. **The public sector is the biggest employer in the Rwandese health sector, but not necessarily the most popular one.** In the long term, only 40% of nursing students and 31% of medical students expect to work in the public sector. About half reports that they expect to still be working for the public sector in 5 years time.
 2. **The vast majority of students would like to work in an urban centre** in the long term, but a substantial part expects to still be working in a rural area in 5 years time. **More than a third are keen to start their career in a rural setting** (39% of nursing students and 37% of medical students).
 3. **Health students generally have salary expectations that are above the salary for a first public sector job.** Nursing students expect 80% more; medical students 50%. Moreover, health students expect significant salary top ups from job-related bonuses and some health students (25% of nursing and 50% of medical students) expect extra income from health work on the side.
 4. **Those expecting to be working outside the public sector, in urban areas, in public health, abroad or outside the health sector also expect higher earnings.**
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4.1 Long Term Career Preferences

Like in most countries the public sector is the dominant employer in the health sector, but this is not entirely reflected in the career preferences of health workers. 40% of nursing students prefer to work for the public sector in the long term; 31% for an NGO. Medical students in contrast prefer to work for an NGO (48%) rather than the public sector (31%) in the long term. But the students distinguish these long term preferences from what they expect will happen in the medium term, as more than half of medical and nursing students think they will still be working for the public sector in five years time (55% and 54% respectively); and inversely, only about a quarter of medical and nursing students expect to work for an NGO in five years time (28% and 25% respectively).¹⁵

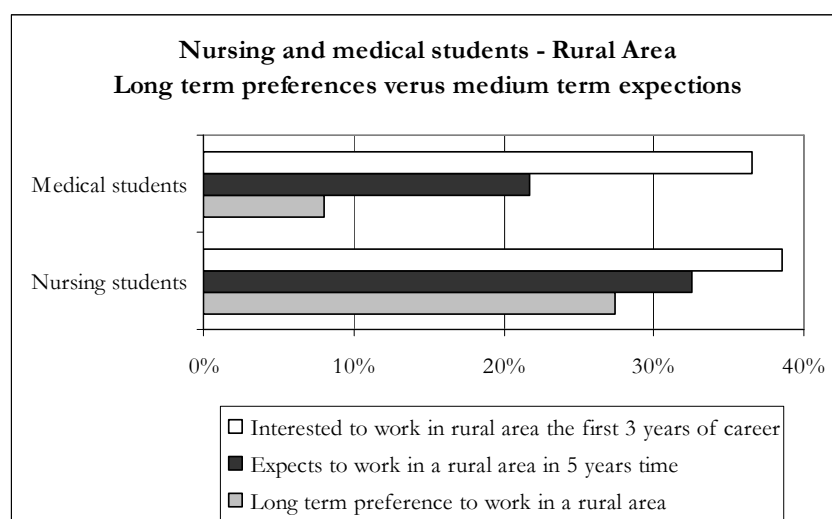
¹⁵ A further breakdown shows that those who express a preference to work for an NGO also prefer to work in an urban area, suggesting that work for NGOs is predominantly perceived as being work in an urban area.

Figure 4.1 Long term sector preferences versus medium term expectations



What about the preferences to work in an urban or rural area? In the long run, 78% of the health worker students would prefer to work in an urban area. This is as high as 92% for medical students, compared to 73% for nursing students (significantly different at $p=0.01$). In five years time, however, only 68% of nursing students and 78% of medical students believe they will be working in urban areas. At the same time about 4 out of 10 students is interested to work in a rural area for the first three years of their career and subsequently take up a post in Kigali (39% for nursing students and 37% of medical students), indicating that a substantial group of students accepts to start their career in a rural post and move to an urban area over time.

Figure 4.2 Rural Area long term preference versus medium term expectation



A cross tabulation of students’ expectations about the type of job they will have in 5 years time shows that working in the public sector is more than the other sectors associated with employment in a rural area (38%), a job in clinical health care (78%) – as opposed to public health, and work in Rwanda (93%). At the other extreme, working for an NGO is more than the other sectors associated with working in an urban area and in public health, while a job in a faith based organization is associated most with working abroad. Further analysis indicates that those who plan to leave the health sector are most likely to move to the private sector (13%), or an NGO (12%).

Table 4.1 Cross-table: five-year from now expectations regarding sector of work and other job characteristics¹⁶

<i>In five years I expect to work in ...</i>	A rural area	A clinical job	In Rwanda
Public sector	38%	78%	93%
Faith-based sector	36%	64%	64%
Private sector	19%	69%	66%
NGO	16%	48%	70%

¹⁶ This table reads as follows: of those that expect to work in the public sector, 38% expects to also work in a rural area (and consequently 62% in an urban area); and so on.

Table 4.2 Long term job preferences and medium term job expectations

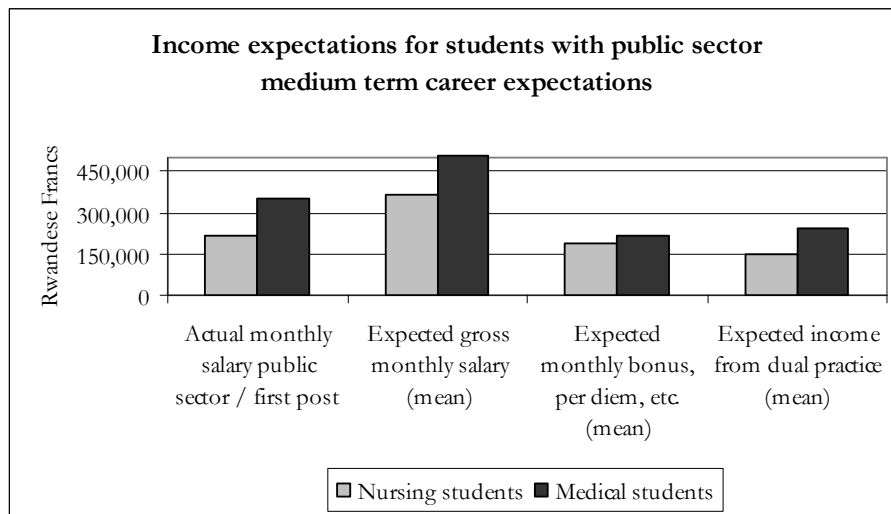
	Nursing students	Medical students
In the long term prefers to work in...		
Public sector	40%	31%
Private sector	17%	15%
NGO	36%	48%
Faith-based sector	7%	7%
Urban Area	73%	92%
In five years time I think my employment situation will be...		
Public sector	54%	55%
Private sector	17%	13%
NGO	25%	28%
Faith-based sector	4%	4%
Urban area	68%	78%
Clinical health	65%	76%
Public health	35%	24%
I'm interested to work the first 3 years of my career in a rural area (and then take up work in Kigali)	39%	37%

4.2 Expectations about Income

When asked how much they expect to earn gross per month (excluding benefits and before taxes), nursing students expect to earn on average 390,000 RWF (about 700 USD) per month; medical students expect on average 532,000 RWF (about 970 USD)¹⁷ This is well above the actual monthly gross salary when entering the public sector, which is about 215,000 RWF for nurses and 350,000 RWF for doctors. The public sector is of course not the only employer for health workers in Rwanda and a fair share of health students has reported that they intend to seek employment outside the public sector where they expect wages to be higher (see below).

¹⁷ All figures in this section are rounded to the nearest 1,000.

Figure 4.3 Income expectations with public sector medium career expectations



Since the public sector is still by far the biggest employer for health workers in Rwanda¹⁸, it is worth zooming into the remuneration expectations of those health students whose 5 year employment expectation is with the public sector. Nursing students that expect to be with the public sector in 5 years' time expect to earn on average 366,000 RWF; medical students expect 509,000 RWF. These students generally also expect some income from bonuses, per diems, and other job-related benefits: nursing students expect RWF 191,000; medical students expect about 216,000 RWF per month. On top of that, 25% (49%) of nursing (medical) students expects to make money from doing health work on the side and those who expect to do so think it will generate an extra 152,000 RWF (242,000 RWF) on average per month.

The gap between expected and actual earnings, and the tendency to do work on the side is confirmed by the fact that about one third of the medical students and one quarter of the nursing students would consider to do non-health work on the side in order to top up their earnings. 42% of the medical students would consider leaving the health sector if pay and opportunities were better elsewhere; while 27% of nursing students would ($p=0.07$).

A closer look at the association between the students' income expectations and their five-year employment expectations sheds light on the driving forces for occupational choice. The figures in the table below indicate that nursing students expecting to be working in the public sector in five years time also expect to earn less compared to those who expect to be working in the private-for-profit, NGO or faith-based sectors ($p=0.01$). Similarly nursing students who expect they will be working abroad have significantly higher income expectations than those who expect to be working within Rwanda. Other differences are not significant for nursing students.

¹⁸ 62% of the health workforce is hired by the MoH; 25% by the faith-based sector (agree); 14% directly by NGOs, districts, etc. No figures are available for the private-for-profit sector but these are assumed to be very small (MoH, Human Resources for Health Strategic Plan 2006/10)

For medical students, those who expect to be working in rural areas in five years time have income expectations that are 34% lower than those who expect to be working in an urban area.

Table 4.3 Current income expectation and employment expectations in 5 years time

	Nursing students			Medical students		
	RWF	% difference	p-value for difference between means	RWF	% difference	p-value for difference between means
Expecting to be working in the Public sector in 5 year time	348,000			489,000		
Expecting to be working in another sector in 5 year time	416,000	19%	0.01	552,000	13%	0.12
Expecting to be working in a rural area in 5 year time	364,000			420,000		
Expecting to be working in an urban area in 5 year time	399,000	10%	0.17	565,000	34%	0.01
Expecting to be working within Rwanda in 5 year time	371,000			533,000		
Expecting to be working abroad in 5 year time	455,000	23%	0.01	527,000	0%	0.91
Expecting to be doing Clinical work in 5 years time	372,000			522,000		
Expecting to be doing public health work in 5 years time	411,000	10%	0.12	565,000	8%	0.31
Expecting to be working in the health sector in 5 years time	383,000			528,000		
Expecting to be working outside the health sector in 5 year time	451,000	18%	0.16	540,000	2%	0.85

Although not all differences are significant, there is a clear pattern in the data that is similar for nursing and medical students, with those expecting to be working outside the public sector, in urban areas, in public health, abroad and outside the health sector expecting higher earnings.

Similarly we find salary expectations of students that do not wish to work the first three years of their career in a rural area are higher compared to those that do wish to work in a rural area the first 3 years of their career.

(402,524 RWF versus 365,382 RWF for nursing students; 577,467 RWF versus 458,111 RWF for medical students)

Table 4.4 Selected indicators for income expectations

	Nursing students	Medical students
Gross monthly salary expectation (mean)	RWF 390,000	RWF 532,000
Monthly bonus and per-diem expectation	RWF 203,000	RWF 236,000
Proportion of students that expects income from dual practice	26%	98%
Average monthly additional income expectation from dual practice	RWF 151,000	RWF 248,000
I may choose a job outside the health sector because the pay and opportunities are better (agree / strongly agree)	27%	42%
I will do health work on the side to earn extra money (agree / strongly agree)	24%	49%
I will do non-health work on the side to earn extra money (agree / strongly agree)	24%	32%

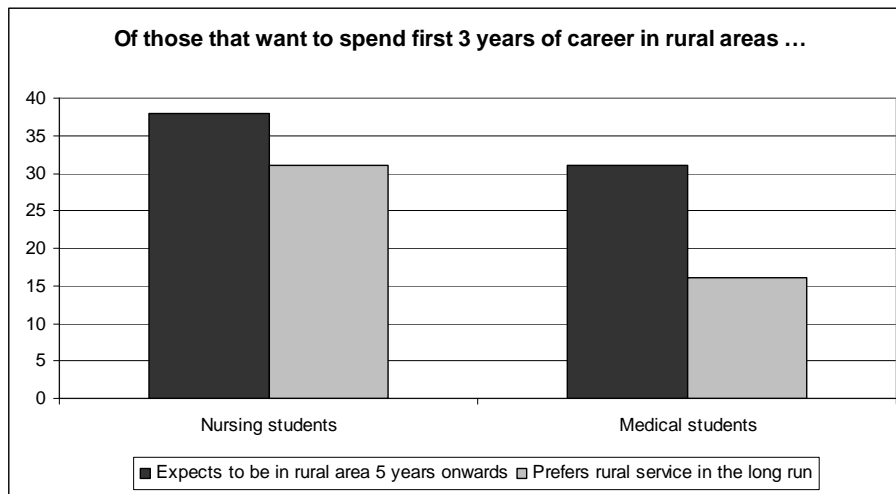
5 Choosing between urban and rural posting

Summary

1. **The willingness to work in a rural area varies considerably across students with medical students generally less inclined than nursing students to work in a rural area, but all students more inclined early on in their career.**
 2. The difference in preferences for rural service are reflected in the different reservation wages to work in a rural area, which shows substantial variation.
 3. A simple simulation shows that, **if we want 80% of the nursing students to take up a rural post the current average salaries would have to be increased with 80% to reach 390,000 RWF.** However, a **substantial number of nursing students (24%) is willing to take up a rural post for a salary below the current starting salary.** Reservation wages are lower for those nursing and medical students who indicate that the first reason to take up a rural post is to 'help the poor'.
 4. **To make rural posts more attractive to those currently opting for an urban post, rural posts should also provide access to further training and specialisation, offer a good working environment, and provide adequate access to schooling for the children of health workers.**
-

We have already reported that 39% of nursing students and 37% of medical students are in favour of spending the first three years of their career in rural areas. Of this group, 38% of nursing students reports that they expect to be still in rural areas five years after the start of their career. This is 31% for medical students. Still of those that want to spend the first 3 years of their career in rural areas, 31% of nursing students and 16% of medical students report that they prefer rural service in the long term. These results suggest three simple messages: (i) the preference to work in a rural area varies considerably across students; (ii) medical students are generally less inclined to work in rural areas compared to nursing students; and (iii) both medical and nursing students are mostly inclined towards rural service early on in their career.

Figure 5.1 Degrees of rural sector preferences



To better understand the choice between urban and rural postings, we asked more detailed questions about the wage for which students would choose to work in a rural area, and what other job characteristics are important.

5.2 Reservation wage to work in a rural area

The analysis in the previous section indicates that wages play an important role in the career choice of future health workers. To get a better insight into the choice between rural and urban posting we therefore asked the students careful contingent valuation questions on the reservation wage to work in a rural area. The nursing students were presented with the following question:

*Imagine that when you finish your studies you are offered two jobs as a health worker in the public sector, one in Kigali and one in a rural area **100km** from Kigali. Both contracts are for at least 3 years and the jobs are otherwise identical. Your monthly salary for the job in Kigali would be 215,000 Rwandese Francs. Which job would you choose if...*

1 Your monthly salary for the rural job would be 165,000 RFR:

- I would choose the job in Kigali I would choose the job in the rural area

2 Your monthly salary for the rural job would be 190,000 RFR:

- I would choose the job in Kigali I would choose the job in the rural area

3 Your monthly salary for the rural job would be 215,000 RFR

- I would choose the job in Kigali I would choose the job in the rural area

4 Your monthly salary for the rural job would be 290,000 RFR:

- I would choose the job in Kigali I would choose the job in the rural area

5 Your monthly salary for the rural job would be 365,000 RFR

- I would choose the job in Kigali I would choose the job in the rural area

6 Your monthly salary for the rural job would be 440,000 RFR

- I would choose the job in Kigali I would choose the job in the rural area

7 Your monthly salary for the rural job would be 515,000 RFR

I would choose the job in Kigali

I would choose the job in the rural area

If you have not accepted a job in the rural area in any of the questions above, what would be the minimum salary against which you choose the rural job? _____ Rwandese Francs

In this question, the reference salary, 215,000 RWF, reflects the average starting salary for a nurse in the public sector. The question was piloted several times and the scale was adapted in order to capture the reservation wage for the majority of students. The same question with a different reference salary (350,000 RWF) and a different scale was presented to the medical students

Figure 5.2 Rural service reservation wages of nursing students

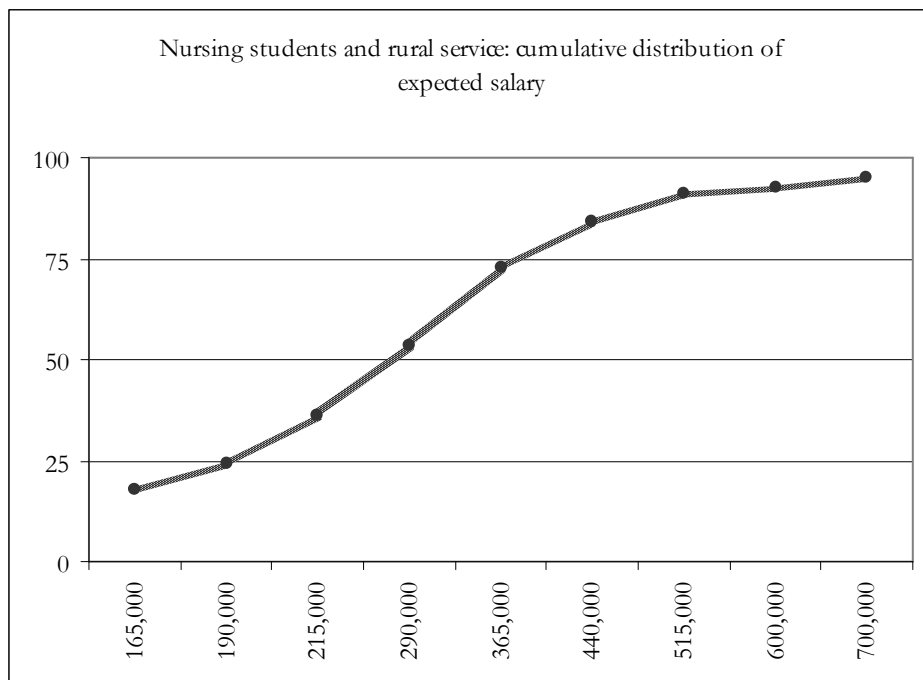
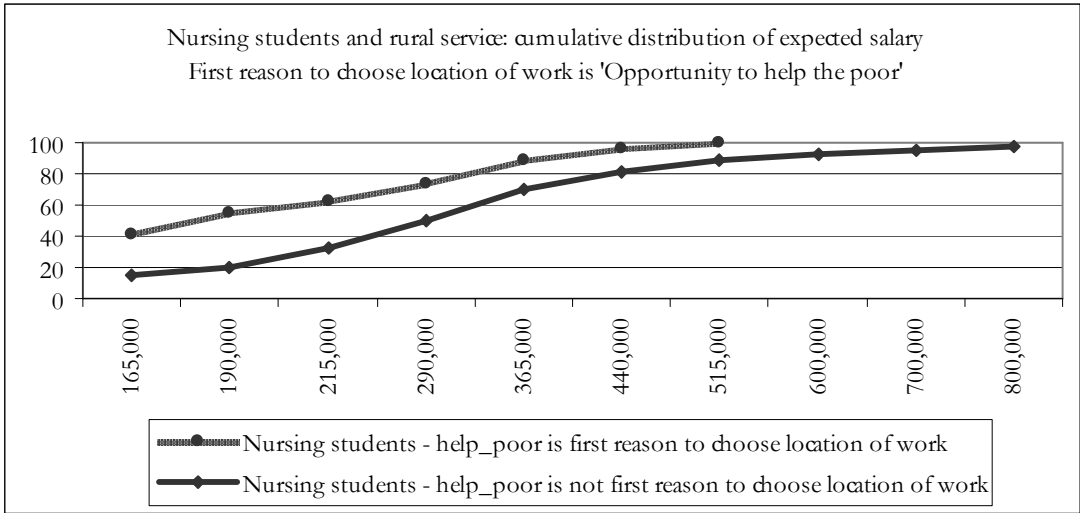


Figure 5.2 plots the cumulative distribution function for nursing and medical students obtained from the data. The graph indicates that at the current monthly salary (215,000 RWF) 36% of the nurses would take up a rural post. If the salary would be higher, this proportion would also increase. A simple simulation shows that, for example, to get 80 % of nurses take up a rural post – about 80% of the population lives in rural areas – a salary of 390,000 RWF is required. The curve is S-shaped indicating that less additional health students can be attracted to work in a rural area as the wage increases. Interestingly, a significant number of nurses (24%) is willing to take up a rural post for a salary below the current starting salary (215,000 RWF).

Figure 5.3 Intrinsic motivation and rural service reservation wages of nursing students



The analysis in the next section indicates that the most important reason to choose a rural post is to want to help the poor, which can be seen as a proxy for altruism or motivation. We find that those who want to work in a rural area because it provides an ‘opportunity to help the poor’ have significantly lower reservation wages on average (254,000 RWF versus 359,000 RWF, p-value 0.01). Plotting the CDF separately for those who want to work in a rural area because it provides an ‘opportunity to help the poor’ versus the others, reveals that they also have a lower reservation wage, as is clear from Figure 5.3.

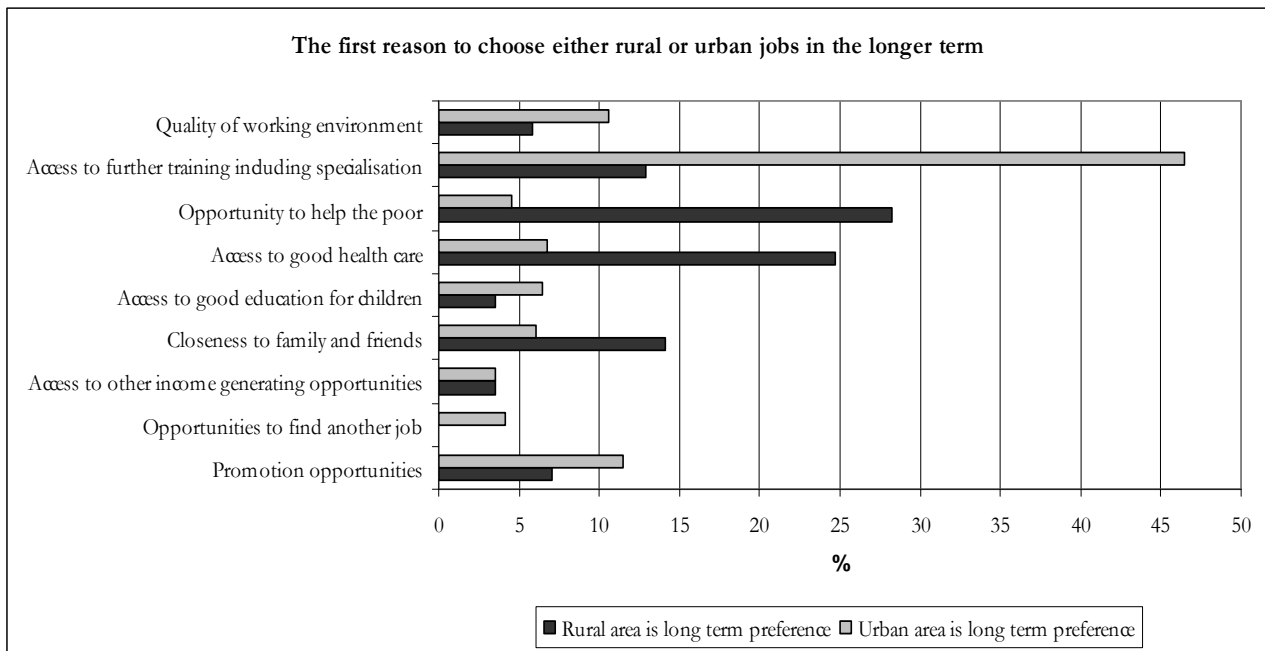
The CDF can be plotted for different sub groups. Plotting a separate CDF for men and women reveals that both groups have similar reservation wages. And when doing a similar exercise for different age groups, we consistently find that younger nursing students tend to have higher reservation wages.

Using a similar analysis for medical students, we find that ten percent of the medical students are prepared to take up a rural position at the current starting salary of 350,000 (RWF). Medical students who rank ‘help the poor’ as most important reason to work in a rural area have a lower reservation wage, but the results are not significant (p=0.13) Like for nursing students there is no significant difference between reservation wages across gender, and younger students tend to require higher salaries.

5.3 Non-wage job attributes

To better understand the role of non wage job characteristics of importance to students when it comes to rural versus urban posting, students were asked to rank the reasons why they prefer to work in a rural or urban post in the long term. The main reason to work in a rural area is the ‘Opportunity to help the poor’ (28%), with ‘access to good health care’ (25%) and ‘closeness to family and friends’ (14%) at the second and third place respectively. Those who prefer an urban post put ‘access to further training and specialisation’ as the most important reason (46%) followed by ‘Promotion opportunities’ (12%) and ‘Quality of working environment’ (11%).

Figure 5.4 Reasons to choose urban versus rural service



An alternative way is to look beyond the first ranking, taking into account that some reasons are not consistently ranked first, but are consistently ranked high overall without necessarily being ranked first. From this perspective, ‘Access to further training’ is ranked in the top three for both those preferring urban and rural posting. Those with a rural long term job preference rank ‘Access to good health care’ and ‘Opportunity to help the poor’ in the top three and ‘Quality of the working environment’ and ‘Access to good education for children’ are ranked among the three most important characteristics by those preferring urban service. ‘Opportunity to help the poor’ is ranked last by those with an urban service preference, making this characteristic highly discriminatory.

Table 5.2 Rank order of most important rural and urban job characteristics

	Rural service	Urban service
Access to further training	Top 3	Top 3
Access to good health care	Top 3	Not top 3
Opportunity to help the poor	Top 3	Not top 3
Quality of work environment	Not top 3	Top 3
Access to good education for children	Not top 3	Top 3

These results suggest that to make rural posts more attractive to those currently opting for an urban post, rural posts should also provide access to further training and specialisation, offer a good working environment, and provide adequate access to schooling for the children of health workers.

6 International migration

Summary

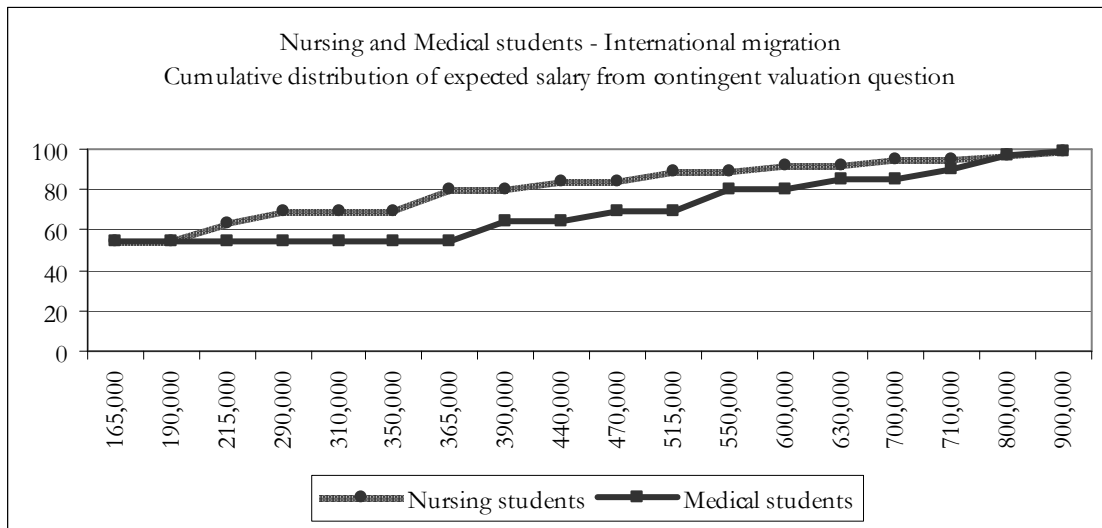
1. **In contrast with other African countries, migration of health workers abroad may not be so important for Rwanda.** The study finds that 80% of nursing and medical students report to have no intention to migrate abroad in the coming five years. And when presented with a hypothetical choice between working domestically and international migration 55% of nursing students and also 55% of medical students report that they would take up a job in Kigali even if this would be paid less than the current entry salary, while 64% of nursing students and still 55% of medical students would stay in Rwanda if offered a job at the current entry salary.
 2. **But there is considerable heterogeneity in the willingness to work abroad** with students who are married or engaged having lower reservation wages to move abroad and therefore more likely to stay in Rwanda. Younger medical students require a higher average salary to stay in Rwanda compared to older students.
-

6.1 Preference for work abroad

Many African countries face the challenge of their health workers migrating to work abroad. There is no existing hard evidence for Rwanda. Qualitative pre-research suggested that not many doctors and nurses considered leaving the country as a career choice. This is to some extent confirmed by our data, as more than 80% of health students do not expect to migrate abroad in the coming 5 years (83% for medical students and 81% for nursing students). Nevertheless, this leaves close to one fifth of the health workers considering migration abroad. To find out the level of financial incentives that would be required to keep health workers in Rwanda, we asked health students for their reservation wage using the stated preference question in Annex B.

The results for nursing students are displayed in the figure below and indicate that the majority (55%) does not want to migrate, even if they would be paid 25% less than the starting salary in a public sector post, and thus earn 60% less than they can currently expect. The figure also indicates that at the current starting salary of 215,000 RWF 64% of nursing students would stay in Rwanda. Further analysis indicates that there are no differences across gender, and those who are not married or engaged tend to have a higher reservation wage to stay in Rwanda, and thus tend to be more likely to migrate abroad, (302,000 RWF versus 263,000 RWF), although the result is not statistically significant ($p=0.19$).

Figure 6.1 Reservation wages for a job in Kigali versus international migration



The analysis for medical students gives similar results, with about 55% of medical students not wanting to leave the country and ready to accept a job in Kigali that is paid 12% below the current starting salary in the public sector. Close to 80% of medical students would prefer to stay in Rwanda if they are paid their own expected monthly salary (RFR 532,000). There are no differences across gender, and medical students who are not married or engaged have higher reservation wages, but again the difference is not significant. In contrast with nursing students, medical students who are younger have higher reservation wages relative to older students, but the results are not statistically significant.

7 HIV and AIDS

Summary

1. **Medical students do better than nurses in medical knowledge about and familiarity with HIV/AIDS.** They score higher on the medical knowledge related to HIV/AIDS, have higher levels of self-reported knowledge on AIDS, and are also more familiar with HIV.
 2. **We observe substantial heterogeneity in health students' attitudes to HIV/AIDS, but medical students have consistently more positive attitudes than nurses,**
 3. Health students are generally averse to take up work in high HIV prevalence areas. Students are willing to accept such a job for salaries ranging from RFR 165,000 to RFR 1,000,000 indicating that different students have quite different preferences regarding employment in areas with high HIV prevalence. We also find that students are more unwilling to work in high HIV prevalence areas than to take up rural service.
 4. **There is considerable heterogeneity in health students' general attitudes towards risk.** Considering the role of a health worker's general attitude towards risk, we find that nursing students are more risk averse than medical students, that younger students are less risk averse than older students and those who have grown up in poorer households are more risk averse than those who have grown up in relatively better off households, but there is no difference between male and female students. **General risk attitudes are related to some attitudes towards HIV/AIDS, but not to others.**
-

7.1 Health workers and HIV/AIDS

HIV/AIDS may have important impacts on health workers' performance and career choice especially in a country with a considerable HIV prevalence such as Rwanda (2.8%; UNAIDS, 2007). Past studies identify a number of factors that play a role. We focus on four issues: the health students' knowledge about HIV/AIDS, attitudes towards HIV/AIDS and risk in general, and their willingness to work in a high HIV/AIDS infected area.

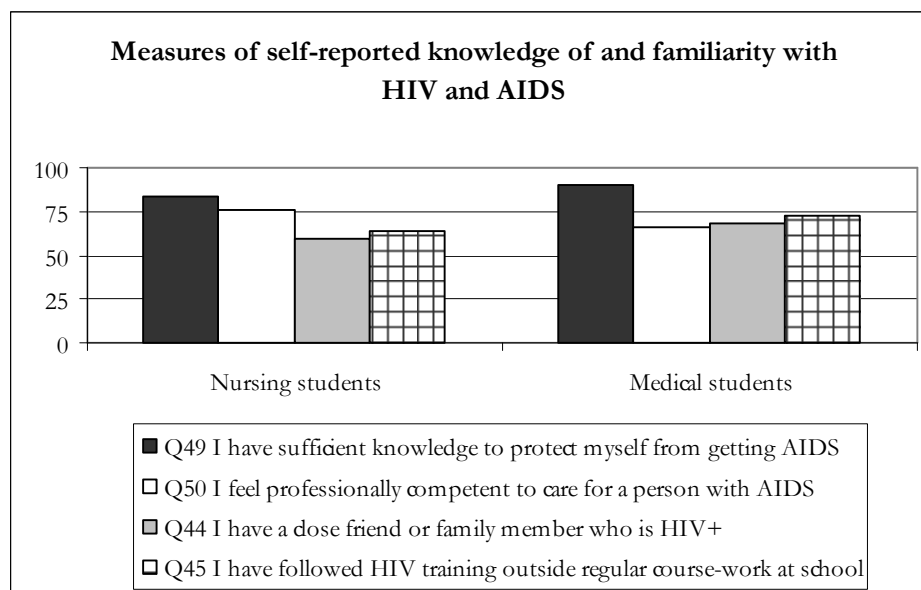
7.2 Knowledge about and familiarity with HIV/AIDS

Using a range of questions to assess health students' knowledge of and familiarity with HIV and AIDS we find that medical students score significantly better than nursing students.

Regarding knowledge more medical students than nursing students have followed a course on HIV and AIDS outside regular courses (74% compared to 64%), but this is not correlated with the score students obtain in the part of the medical knowledge test on HIV/AIDS. Medical students who know an HIV+ person, however score higher on the HIV/AIDS part of the medical knowledge test ($p=0.08$) than those who do not, confirming existing research which indicates that knowing an HIV+ person reinforces knowledge about the disease. This result is, however, not confirmed for nurses, who are also less likely to know a Person Living with HIV/AIDS (PLWHA) (59% versus 68% for medical students).

Self-reported knowledge is positively associated with the test scores on AIDS knowledge, suggesting that students have an accurate view of their own knowledge on HIV and AIDS.

Figure 7.1 Self-reported knowledge of and familiarity with HIV and AIDS



More than 86% of students feel sufficiently competent to protect themselves from being infected by HIV (84% of nursing students; 90% of medical students), and slightly less than three quarter feel professionally competent to take care of an HIV patient (76% of nursing students and 66% of medical students). The latter is positively correlated both with the training received ($p=0.04$) and whether or not the student knows an HIV positive person ($p=0.02$), suggesting that training and familiarity with an HIV-positive person boosts a students' confidence to treat PLWHA.

7.3 Attitudes towards HIV/AIDS

Using a wide range of questions on attitudes we find substantial heterogeneity in health students' attitudes to HIV/AIDS, as reported in table 7.1, with medical students' reporting consistently more positive attitudes to HIV and HIV+ patients.

Table 7.1 HIV and AIDS related questions

	Nursing students	Medical students	p-value for different distribution ¹⁹
Self-reported knowledge on HIV and AIDS			
Have followed an HIV related training course other than at school?	64%	73%	0.07
Have a family member or close friend who is HIV positive	59%	68%	0.08
Have sufficient knowledge to protect myself from getting AIDS	84%	90%	0.01
Feel professionally competent to care for a person with AIDS	76%	66%	0.40
Attitudes towards HIV and AIDS			
How concerned are you about contracting HIV/AIDS in the workplace?			
Very concerned	55%	37%	0.01
Quite concerned	34%	47%	
Not concerned at all	11%	16%	
Would you refuse any medical tasks that you are expected to do out of fear of contracting HIV/AIDS?			
Consistently	8%	4%	0.82
Regularly	8%	6%	
Sometimes	32%	46%	
Never	51%	43%	
Health workers have the right to refuse care to an HIV+ patient (Agree / Strongly agree)	7%	4%	0.01
If I had a choice I would prefer to avoid caring for persons with AIDS (Agree / Strongly agree)	18%	16%	0.21
If I were assigned a patient with AIDS I would worry about putting my family and friends at risk of contracting the disease (Agree / Strongly agree)	35%	25%	0.06
Patients with AIDS should be treated with the same respect as any other patient (Agree / Strongly agree)	87%	92%	0.01
I have little sympathy for people who get AIDS from sexual promiscuity (Agree / Strongly agree)	40%	17%	0.01
If I got AIDS other people would think I'm homosexual or that I've got a promiscuous sexual life (Agree / Strongly agree)	25%	44%	0.01
It is very unlikely that I will get AIDS (Agree / Strongly agree)	49%	39%	0.47

When looking at the relation of these attitudes with knowledge about the virus and disease, we find that the more students say they have enough knowledge to protect themselves from getting AIDS, and the more they

¹⁹ Using a two-sample Wilcoxon rank-sum test.

report that they feel professionally competent to care for a person with AIDS, the more they agree that AIDS patients deserve the same respect as other patients. Higher (self-reported) knowledge about how to protect oneself from getting AIDS is also strongly negatively associated with prejudices about patients (i.e. ‘having little sympathy for people who get AIDS from sexual promiscuity’, and ‘If I got AIDS other people would think I’m homosexual or that I’ve got a promiscuous sexual life’) and with a belief that ‘health workers have the right to refuse care to an HIV+ patient. Students who feel professionally competent to care for a person with AIDS report less that they would avoid caring for a person with AIDS, as are those who have a close friend or family member who is HIV+. The latter also are agree less that ‘health workers have the right to refuse care to an HIV+ patient’.

These associations are suggestive of the impact of self reported knowledge on behaviour and attitude. However, the score on the HIV/AIDS questions in the medical test – a more objective measure of knowledge – is correlated with only two attitudinal questions. Those who score higher are less concerned about contracting HIV/AIDS in the workplace and are also less worried about putting family and friends at risk of contracting the disease.

7.4 Willingness to work in an area with high HIV prevalence

Although much of the literature suggests that wherever possible workers avoid taking up work in high HIV prevalence areas, this is poorly documented from an empirical perspective. Our data support the finding that HIV affects health workers’ job choice as students are weary taking up jobs in high HIV-prevalence areas. Using the following contingent valuation question we asked students to indicate at what salary they would choose to work in a high infected area.

35. Imagine that when you finish your studies you are offered two jobs as a health worker in the public sector, one in a place with a high HIV infection rate and one in a place with a low HIV infection rate. Both contracts are for at least 3 years and the jobs are otherwise identical. Your monthly salary for the job in the place with low infection rate would be 350,000 Rwandese Francs. Which job would you choose if...

35. Imagine that when you finish your studies you are offered two jobs as a health worker in the public sector, one in a place with a high HIV infection rate and one in a place with a low HIV infection rate. Both contracts are for at least 3 years and the jobs are otherwise identical. Your monthly salary for the job in the place with low infection rate would be 350,000 Rwandese Francs. Which job would you choose if...

35.1 Your monthly salary for the job in the high infected area would be 310,000 Rwandese Francs

I would choose the job in the place with low infection rate *I would choose the job in the place with high infection rate*

35.2 Your monthly salary for the job in the high infected area would be 350,000 Rwandese Francs:

I would choose the job in the place with low infection rate *I would choose the job in the place with high infection rate*

35.3 Your monthly salary for the job in the high infected area would be 390,000 Rwandese Francs:

I would choose the job in the place with low infection rate *I would choose the job in the place with high infection rate*

35.4 Your monthly salary for the job in the high infected area would be 470,000 Rwandese Francs:

- I would choose the job in the place with low infection rate I would choose the job in the place with high infection rate

35.5 Your monthly salary for the job in the high infected area would be 550,000 Rwandese Francs:

- I would choose the job in the place with low infection rate I would choose the job in the place with high infection rate

35.6 Your monthly salary for the job in the high infected area would be 630,000 Rwandese Francs:

- I would choose the job in the place with low infection rate I would choose the job in the place with high infection rate

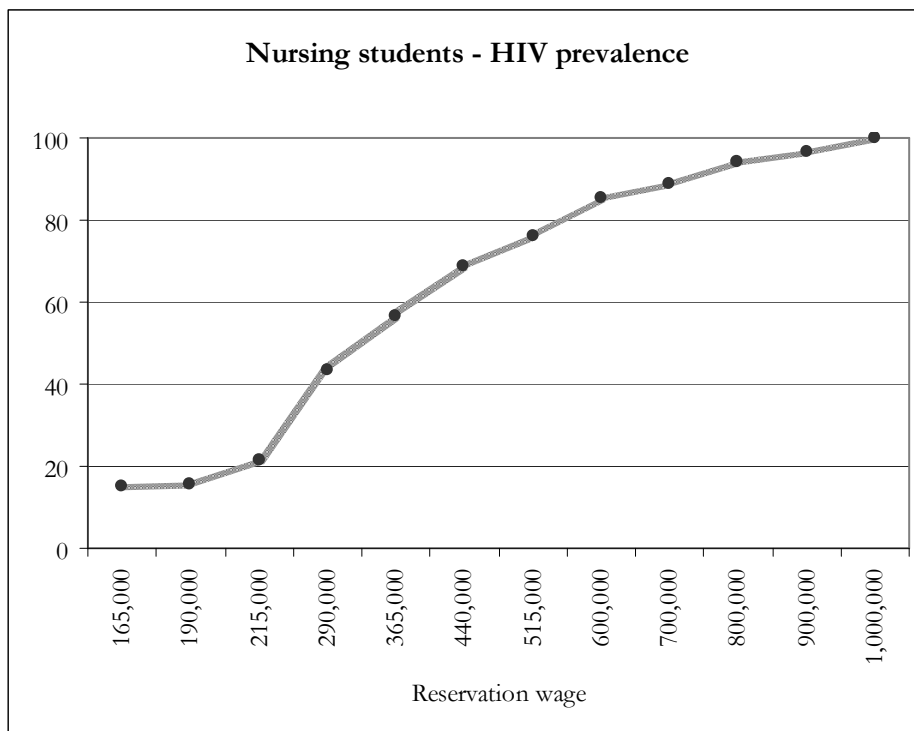
35.7 Your monthly salary for the job in the high infected area would be 710,000 Rwandese Francs:

- I would choose the job in the place with low infection rate I would choose the job in the place with high infection rate

35.8 If you have not accepted a job in the high prevalence area in any of the questions above, what would be the minimum salary for which you choose the job in the high prevalence area? _____ Rwandese Francs

35.8 If you have not accepted a job in the high prevalence area in any of the questions above, what would be the minimum salary for which you choose the job in the high prevalence area? _____ Rwandese Francs

Figure 7.2 Reservation wages relating to job postings with a high HIV prevalence

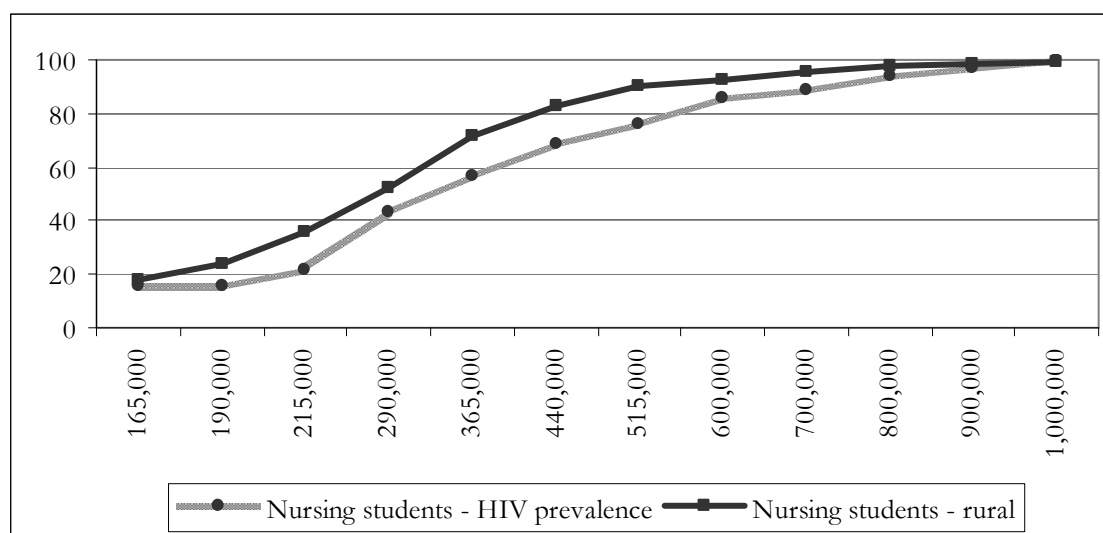


The figure below plots the cumulative distribution function of the requested salary to make people choose a job in a high HIV prevalence area. The S-shaped function spans a salary range from RFR 165,000 to RFR 1,000,000 indicating that different students have quite different preferences regarding employment in areas with high HIV

prevalence. About one-fifth of the students is willing to accept such a post for a salary lower than the starting wage in the public sector.

To get a sense of the extent of the impact of HIV on career choice we plotted the cumulative distribution function of expected wage for rural service in the same graph. When comparing the results from this question with the reservation wage to work in a rural area, we find that at all salary levels of the former stochastically dominates the latter, indicating that students are more willing to work in a rural area than in a High HIV prevalence areas at any salary level. At the current public job entry salary, only 21% of students would accept an employment in high HIV prevalence areas; this compares to 36% for rural service. This is a factor 1.7 factor difference in favour of rural service. Marital status, gender and age do not impact in a significant way on the salary requirements of nursing students for high HIV-prevalence postings.

Figure 7.3 Nursing students - jobs in areas with high HIV prevalence versus rural service: cumulative distribution of expected salary



7.5 Attitudes towards risk

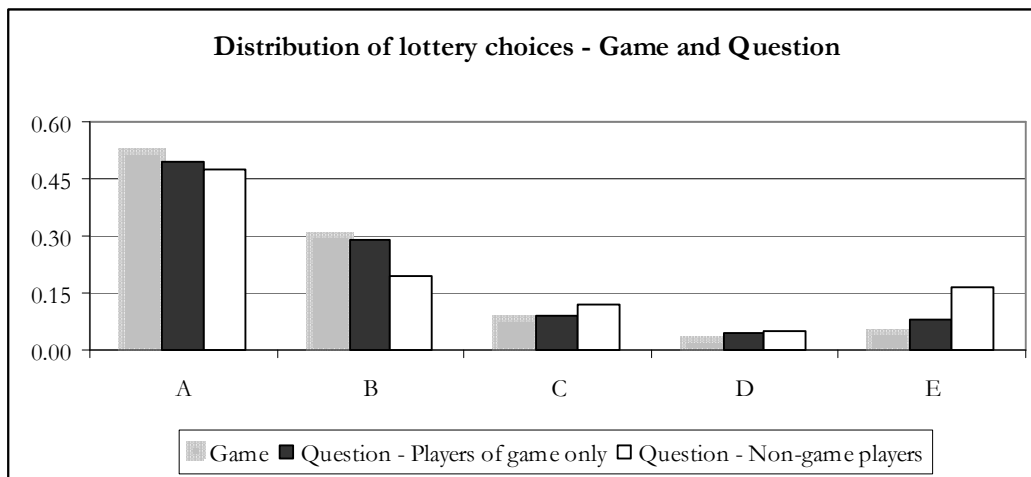
To see whether attitudes towards HIV/AIDS are related to attitudes towards risk in general we measure the students' attitudes towards risk carefully using two methods that are now standard in behavioural sciences: a lottery question and a lottery game with similar stakes. In the lottery question, students were asked to choose from 5 different lotteries the one that they would prefer to play, with each of the lotteries having two outcomes, a high and a low outcome, and each outcome having a 50% chance of occurring. The lotteries had different expected values reflecting different degrees of risk. While everyone was asked the lottery question in the questionnaire, only a sub set were also asked to choose a lottery from similar lotteries in a game. Figure 7.4 plots three histograms for the 5 lotteries: the outcome for the game, the outcome for the survey question for those

who also played the game, and the outcome of the survey question for those who did not play the game. In all cases Lottery A is more risk averse than lottery B, which is more risk averse than lottery C, etc. The results from the questionnaire are very similar to those played in the game.

Table 7.2 Comparison of lottery game and lottery question outcomes

Lottery	Proportion of students who choose this lottery in the game	Proportion of students who choose this lottery in the question (and also played the game)	Proportion of students who choose this lottery in the question (and did not play the game)
A	53%	49%	47%
B	31%	29%	20%
C	8%	9%	12%
D	3%	5%	5%
E	5%	8%	16%
Total respondents	192	192	220

Figure 7.4 Comparison of different measures of risk-attitudes



Visual inspection of the graph shows first of all that the three distributions are very similar. Second, we see that those that actually play the game are more risk-averse than those that only answer the lottery question. Respondents are more risk-averse in real life than on paper. Those that play the game and answer the question have played the game first. Interestingly, it seems that these respondents bring their answers to the lottery question in line with their choices during the game, since they are somewhat more risk-averse than those that only answer the lottery question in the questionnaire.

When considering the attitudes towards risk between different groups of students, we find that nursing students are more risk averse than medical students ($p=0.09$), that younger are less risk averse than older students ($p=0.03$) and those who have grown up in poorer households are more risk averse than those who have grown up in relatively better off households ($p=0.08$), but there is no difference between male and female students.²⁰

Further analysis will look into the relationship between risk aversion and attitudes towards HIV. First results indicate that the general risk attitudes is not necessarily highly correlated with all types of attitudes towards HIV/AIDS, but it is in some cases. Students who are more risk-averse agree for example more often that they should have the right to refuse care to HIV+ patients.

²⁰ Given the ordinal nature of the risk preference data we use a Wilcoxon rank-sum test to diagnose the difference across different groups of health workers.

8 Exploring the role of altruism as intrinsic motivation

Summary

1. Intrinsic motivation can be described as the inclination to provide medical care for its own sake, independently of extrinsic incentives. **Intrinsic motivation affects performance in the sense that more motivated health workers tend to perform better. The biggest challenge is to measure intrinsic motivation empirically.** Given our interest in service provision to the poor and based on previous research we focus on exploring the role of altruism as a form of intrinsic motivation.
 2. **We measure intrinsic motivation through survey questions and an experimental economic game that focus on altruism, and investigate three possible measures:** we asked students (i) whether they have chosen a career in health to help people; (ii) whether they prefer to work in a rural area in order to help the poor; and we also observed their behaviour in a behavioural game measuring altruism (the dictator game). The different measures are positively associated as expected, but the relationship between them is not always significant, **highlighting the complex nature of intrinsic motivation and calling for a deeper analysis.**
 3. Whatever measure for intrinsic motivation we consider, **we observe substantial heterogeneity in intrinsic motivation across health workers.**
 4. We find that **religion, gender and profession (medical or nursing student) tend to be highly correlated with intrinsic motivation.** Those who knew at the age of 12 that they would become a health worker also tend to have higher intrinsic motivation.
 5. Intrinsic motivation is also correlated with a number of career preferences. Comparatively **more altruistic students, have a higher propensity to work in a rural area, have lower income expectations, are less interested in a job outside the health sector if pay were better, are less likely to engage in dual practice or do non-health work on the side to earn extra money. They have a higher preference for the public sector in the long term, require (on average) a lower salary to accept a job in Kigali as opposed to a job abroad, and require (on average) a lo**
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8.1 Considering intrinsic motivation

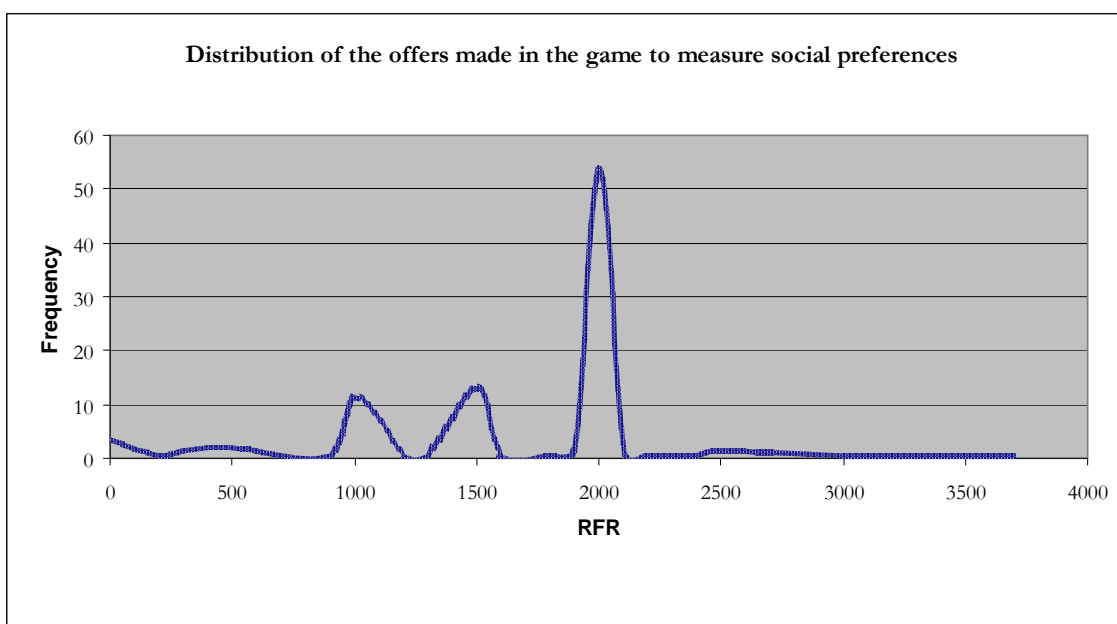
The literature pays much attention to the importance of intrinsic motivation for health worker behaviour. It affects performance in the sense that more motivated health workers tend to perform better. Intrinsic motivation is defined as the inclination to provide medical care for its own sake, independently of extrinsic

incentives. Theory argues that while intrinsic motivation comes about as the internalization of norms over time (see for example Deci 1975), since this is a slow process, it should be considered exogenous in the short term. It can also be seen as a self-enforcing contract that leads to a higher performance outcome (see for example Benabou and Tirole 2003). However, most work on intrinsic motivation is of a theoretical nature and empirical measurement remains scarce. The biggest challenge is how to measure intrinsic motivation empirically. Given our interest in service provision to the poor and based on previous work, we explore three potential measures of intrinsic motivation, focusing on altruism and consider how they differ across groups of health students, and how they are correlated with health workers' choices.

8.2 Exploring measures of intrinsic motivation

We investigate three possible measures of intrinsic motivation that focus on altruism: (i) whether students have chosen a career in health to help people (help_people); (ii) whether they prefer to work in a rural area in order to help the poor (help_poor); and (iii) whether they act altruistically in a behavioural game that measures their social preference. For the latter we played the dictator game (DG game) where students receive a money amount x , and are asked to 'give away' any amount $y \leq x$ to another player, unknown to them, and based in another room. They keep the money that they decide not to pass on to the other player. The amount of money that is given away (y) is a standard measure of altruism. The graph shows the distribution of this experimental measure of altruism.

Figure 8.1 Distribution of a dictator game outcomes



We find that the three measures are positively correlated, although significant levels can be low especially for the measure obtained from the game – possibly due to its large standard error caused among others by the small

sample size. More work is needed to explore the relationship between these measures and their respective correlates.

8.3 Correlations of altruism with demographic characteristics

Female students are significantly more likely to have entered the health profession primarily 'to help people' ($p < 0.01$), as are those who find religion important and those who have work experience in a rural area. Medical students, on the other hand, enter the health profession comparatively more for reasons other than 'to help people' compared to nursing students. A logistic regression with the primary motivation 'to help people' as dependent variable confirms the explanatory power of religion, gender and being a medical or nursing student for altruistic behaviour.

The significance of religion is consistent with results from the qualitative pre-research where health workers underscored the importance of a calling in choosing for the health sector, and some argued that intrinsic motivation is related to religious beliefs, making use of religious vocabulary such as vocation, devotion and apostolate when describing their calling to become a health worker.²¹

87% of the nursing students, and 68% of the medical students who reported that 'to help people' was their first reasons to have entered the health sector also report that they knew they wanted to become a health worker at age twelve. Those who did not list 'to help people' as their first reason report more often that they wanted to become something different than a health worker at age twelve.

Because intrinsic motivation is believed to be not only a product of nature, but also of nurture we probe into the impact of the students' social environment on the decision to become a health worker and asked whether parents, teachers, or a health worker known to the student had any influence on their decision to become a health worker. The majority of students reports that their parents, teachers or a health worker they knew had no major influence on their decision to become a health worker. We do, however, find that those stating that they entered the health sector to help people are significantly more influenced by parents, teachers and a health worker they knew.

These preliminary results suggest that altruism and intrinsic motivation can differ considerably between health workers. A deeper analysis is needed to unravel this further.

²¹ A doctor in a rural district mentioned for example "(...) *some say it's an apostolate*", while a doctor in Kigali stated that "*If one wants it or not, once you study medicine you've got a vocation. If you haven't got a vocation, you fail. A doctor needs to be permanently devoted; a doctor without devotion is no doctor.*" An auxiliary nurse argued that "*The fact of having a vocation makes it impossible to do something else.*" (see Serneels and Lievens, 2008)

8.4 Correlations of measures of intrinsic motivation with health worker choices

When exploring whether the different measures of altruism are correlated with labour market outcomes we find that students who are more altruistic have a higher propensity to work in a rural service area: , their long and medium term career preferences and expectations are more oriented towards rural areas, and their average reservation wage to accept a rural post is lower.

Students who are more altruistic generally also have lower income expectations, are less likely to .state that they may choose a job outside the health sector if pay were better; and are less likely to engage in dual practice,or to do non-health work on the side to earn extra money.

More altruistic students also have (on average) a higher preference for the public sector in the long term, require (on average) a lower salary to accept a job in Kigali as opposed to a job abroad, and require (on average) a lower salary to accept a job in a high HIV prevalence area.

These statistically significant correlations are firm illustrations of the importance of altruism and intrinsic motivation for labour market outcomes. However, further detailed (and multivariate) analysis is needed to understand these results.

Table 8.1 Indications of the effect of intrinsic motivation on health worker labour market behaviour

	help_people		help_poor		DG_offer	
	<i>p-value</i>	<i>sign</i>	<i>p-value</i>	<i>sign</i>	<i>p-value</i>	<i>sign</i>
Prefer public sector in the long term	<0.01	+	0.55	+	0.22	-
Prefer rural area in the long term	0.10	+	<0.01	+	0.12	+
Expect to be in a rural area in 5 years time	0.25	+	<0.01	+	0.32	+
Salary expectations	<0.01	-	0.97	-	0.99	+
May accept job outside health if pay is better (agree / strongly agree)	<0.01	-	0.25	-	0.07	-
Will do health work on the side to earn extra money (agree / strongly agree)	<0.01	-	0.03	-	0.69	-
Will do non-health work on the side to earn extra money (agree / strongly agree)	0.03	-	0.14	-	0.69	-
Requested salary for rural service, nursing students – contingent valuation	0.05	-	0.06	-	0.54	-
Requested salary for rural service, medical students – contingent valuation	0.04	+	0.13	-	0.56	+
Requested salary for job in Kigali (as opposed to international migration), nursing students – contingent valuation	0.05	-	<0.01	-	0.61	-
Requested salary for job in Kigali (as opposed to international migration), medical students – contingent valuation	0.14	-	<0.01	-	0.98	-
Requested salary for job in high HIV prevalence area, nursing students – contingent valuation	0.15	-	0.01	-	0.98	-
Requested salary for job in high HIV prevalence area, medical students – contingent valuation	0.26	+	0.20	-	0.67	+

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Annex A Nursing and medical Students currently enrolled in Rwanda

NURSING STUDENTS	1st year	2nd year	3rd year	Total
Kibungo Nursing School				
Nursing	43	33		76
Midwifery	0	0		0
Mental health	0	0		0
<i>Total</i>	43	33		76
Byumba Nursing School				
Nursing	24	16		40
Midwifery	13	11		24
Mental health	0	0		0
<i>Total</i>	37	27		64
Kabgayi Nursing School				
Nursing	20	18		38
Midwifery	20	18		38
Mental health	0	0		0
<i>Total</i>	40	36		76
Rwamagana Nursing School				
Nursing	31	19		50
Midwifery	0	18		18
Mental health	0	0		0
<i>Total</i>	31	37		68
Nyagatare Nursing School				
Nursing	46	32		78
Midwifery	0	0		0
Mental health	0	0		0
<i>Total</i>	46	32		78
Kigali Health Institute (KHI)				
Nursing		54	34	88
Midwifery		10	13	23
Mental health		42	30	72
<i>Total</i>		106	77	183
Total Nursing students	197	271	77	545
MEDICAL STUDENTS				
		3rd year	4th year	Total
National University of Rwanda (Butare)		57	103	160
Total Medical students		57	103	160
TOTAL health students				705

Annex B Contingent Valuation question for international migration

36. Imagine that you are offered a job as a health worker in the public sector in Kigali for life. Imagine that you also have the possibility to migrate to a high-income country of your choice (for example US, Canada, France, UK, Belgium). However, you do not know whether you will be able to find a job in the high-income country, what type of job, and how much you will earn. What would you choose if...

36.1 Your monthly salary for the job in the public sector in Kigali would be 310,000 Rwandese Francs:

I would choose to migrate to the high-income country I would choose the job in Kigali

36.2 Your monthly salary for the job in the public sector in Kigali would be 350,000 Rwandese Francs:

I would choose to migrate to the high-income country I would choose the job in Kigali

36.3 Your monthly salary for the job in the public sector in Kigali would be 390,000 Rwandese Francs:

I would choose to migrate to the high-income country I would choose the job in Kigali

36.4 Your monthly salary for the job in the public sector in Kigali would be 470,000 Rwandese Francs:

I would choose to migrate to the high-income country I would choose the job in Kigali

36.5 Your monthly salary for the job in the public sector in Kigali would be 550,000 Rwandese Francs:

I would choose to migrate to the high-income country I would choose the job in Kigali

36.6 Your monthly salary for the job in the public sector in Kigali would be 630,000 Rwandese Francs.

I would choose to migrate to the high-income country I would choose the job in Kigali

36.7 Your monthly salary for the job in the public sector in Kigali would be 710,000 Rwandese Francs.

I would choose to migrate to the high-income country I would choose the job in Kigali

36.8 If you have not accepted a job in Kigali in any of the questions above, what would be the minimum salary against which you are willing to accept a job in Kigali? _____ Rwandese Francs.

This study is intended to map the motivations of health workers in Rwanda and their responsiveness to various forms of incentives. The research collects data through self administered questionnaires, for a quantitative contingent valuation. The contingent aims to make progress on a very specific domain and tries to give an idea of the wage-related costs of a more balanced distribution of health workers over the country. It also aims to contribute to explaining the willingness of health workers to work in rural areas.

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Health Systems for Outcomes Publication



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