# Health Worker Sources of Income in the Democratic Republic of Congo

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## Executive summary

**Introduction:** Post conflict states present a particularly interesting context within which to examine health worker remuneration. In the Democratic Republic of Congo, the state system to remunerate health workers is poorly functional, if at all, which encourages diversification of income sources as well as increasing susceptibility to corruption. In addition, donors may be responsible for exacerbating the fragmentation in the income received by health workers by providing programme-related performance payments and per diems. Nonetheless, examining the incentive environments of health workers in the DRC is important as the way in which health workers are remunerated influences their motivation and performance in the workplace. Given the central role that health workers play in the delivery of health care, policy-makers need to ensure health workers are remunerated in a way which best incentivises them to provide efficient and good quality services.

**Aim:** This study aims to describe the different sources and quantities of income received by public sector health workers in primary care facilities working in post-conflict Democratic Republic of Congo. The study also investigates which health worker and heath facility characteristics are associated with total income received and different sources of income, but will pay particular attention to government payments and user fees.

**Methods:** Quantitative data on health workers in facilities in ASSP areas and non-ASSP areas was collected through the ASSP baseline health worker and health facility surveys. In addition to health worker and health facility characteristics, data were collected on the type and amount of income received. Descriptive statistics were then used to explore: the demographic characteristics of health workers surveyed, the amount health workers receive for each source of income, the proportion of health workers receiving income/allowances from different sources, and the frequency of government payments to health workers. A series of regression models were also estimated using individual health worker characteristics and facility characteristics as explanatory variables. For each regression model passing diagnostic tests, a general to specific regression specification method was used whereby explanatory variables are excluded from the equation in a stepwise manner, and all models were clustered by health facility.

To complement that quantitative analysis, qualitative data collection was also carried out in November 2014 in the province of Kasai Occidental. Four urban and four rural health zones of the ASSP programme were selected. In all sites, data collection involved in-depth interviews with selected participants on their income. Questions related to the sources and amounts of each income received. Interviews also aimed to identify what factors determined whether a health worker received a particular source of income, and the reasons why.

**Results:** As the majority of health workers interviewed in the baseline surveys were nurses, the analysis was mainly limited to this cadre. Nurses could receive their income from a variety of sources, including: government payments, per diems, user fees, performance payments, informal payments, private practice and non-clinical supplemental activities. Yet,

only a minority of nurses received any remuneration from the government, while the majority reported some income from user fees. Almost half of all nurses engaged in some sort of supplemental non-clinical activity, indicating that the income generated from clinical activities is insufficient. However, private practice was not common. Contextual factors such as the provincial location, presence of other programmes and local user fee policy also influenced the extent to which nurses received many sources of income such as per diems, performance payments and user fees. In addition, local politics within facilities and health zones determined opportunities to receive certain incomes such as the per diems and the occupational risk allowance.

**Conclusions:** Given the importance of financial incentives in relation to motivation, an understanding of the income structure of workers is necessary in order to design more effective financial incentive packages. It can be seen from the results of this study that there is an urgent need to review the current policies around the payment of personnel in primary care health facilities. Greater co-ordination is needed between all partners involved in the remuneration of workers in order to reduce fragmentation of incomes and improve transparency in the payment of workers in the DRC.

**Abbreviations used in the document**

| | |
|---|---|
| ASSP | *Accès Aux Soins de Santé Primaires*/Access to primary health care |
| BCZ | *Bureau Central de la Zone de Santé*/Health Zone Central Office |
| CODESA | Comité de Développement de l'aire de Santé (Development Committee for the Health Area) |
| CS | *Centre de Santé*/health canter |
| DFID | Department for International Development |
| DRC | Democratic Republic of Congo |
| FBO | Faith-based organization |
| FC | *Franc Congolese*/Congolese franc |
| HRIS | Human Resources Information System |
| IT | *Infirmière Titulaire*/Head nurse |
| IA | *Infirmière Assistant*/Nurse supervisor |
| IQR | Interquartile range |
| KSPH | Kinshasa School of Public Health |
| NGO | Non-governmental organization |
| OLS | Ordinary Least Squares |
| OR | Odds ratio |
| PBF | Performance-based financing |
| PPS | Probability proportional to size |
| SE | Standard error |
| USD | United States dollar |

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## Introduction

According to economic theory, different mechanisms of paying health workers can vary in terms of the incentives they provide (Prendergast, 1999; Robinson, 2001; Barnum, Kutzin & Saxenian, 1995). Consequently, the way in which health workers are remunerated may influence their motivation and performance in the workplace (Lagarde, Powell-Jackson, & Blaauw, 2010; Gosden et al., 2000).

Given the central role that health workers play in the delivery of health care, policy-makers need to ensure health workers are remunerated in a way which best incentivises them to provide efficient and good quality services (World Health Organizaation, 2000; Lagarde et al, 2010). If they are successful in this endeavour, countries will be better placed to achieve the goal of universal health coverage whereby all of the population has equitable access to quality health services without suffering financial hardship (World Health Organization, 2005).

Health workers are often paid a salary, which is a guaranteed fixed sum paid irrespective of the amount of services provided. However, they can also be paid in different ways, including: fee-for-service, whereby they are paid for each service administered (Lagarde et al, 2010); capitation where workers are paid a pre-determined amount per member of a defined population during a fixed period of time; and through performance-based financing (PBF) where health workers are paid – at least in part - on the basis of their performance (Meessen, Soucat, & Sekabaraga, 2011). Amongst these standard ways of paying workers, there is no mechanism, or blend of mechanisms, which is deemed to be superior; all have different benefits and disadvantages which can impact on the quality and provision of health care (Barnum et al., 1995). The resulting choice of provider payment approach is therefore usually influenced by the economic, social and institutional context of a particular setting. In addition, health workers can also receive other types of income which may be incremental to these payment mechanisms (Roenen, Ferrinho, Van Dormael, Conceição, & Van Lerberghe, 1997; Smith, 2003; Muula & Maseko, 2006). These include: per diems and allowances, which are payments for specified needs or expenses such as travel (Ridde, 2010); user fees, which are payments made at the point of service use by patients (Lagarde & Palmer, 2008); and informal payments, which are payments by patients to workers that are made outside official payment channels or for purchases meant to be covered by the health care system (Lewis, 2007). To date, there is little conclusive evidence on the effects of these different sources of income on health worker behaviour (Uzochukwu & Onwujekwe, 2005; Ditlopo, Blaauw, Bidwell, & Thomas, 2011; Lindkvist, 2013; Stringhini, Thomas, Bidwell, Mtui, & Mwisongo, 2009). It is also not uncommon for workers to engage in dual-practice, where they may be engaged in health work outside of their main employment. They may even choose to undertake income-generating activities unrelated to healthcare (Ferrinho, Van Lerberghe, Fronteira, Hipólito, & Bascaia, 2004). Such practices can potentially have several negative implications for health care provision, including high worker absenteeism rates as alternative jobs compete for their time (Alcázar & Andrade, 2001; Jaén & Paravisini, 2001).

Post conflict states present a particularly interesting context within which to examine health worker remuneration. Often, the state system to remunerate health workers is poorly functional, if at all, which encourages diversification of income sources as well as increasing susceptibility to corruption (Macrae, Zwi, & Gilson, 1996). Donors may exacerbate the fragmentation in the income received by health workers by providing programme-related performance payments and per diems (Fox, Witter, Wylde, Mafuta, & Lievens, 2013). Examining the incentive environments of health workers in such contexts is also especially important given post conflict states tend to suffer from the worst health indicators globally and thus are in great need of improving the quality of health care provided by the workforce (Ranson, Poletti, Bornemisza, & Sondorp, 2007; Roome, Raven, & Martineau, 2014).

Moreover, there is some recent evidence from post-conflict settings that income received from different sources may vary significantly according to certain individual and health facility characteristics. For instance, in Sierra Leone, female workers received significantly less salary and total income than male workers of the same cadre, although this may have also reflected differences in the lengths of service (Witter et al., 2015). In Zimbabwe, workers in rural areas had less access to user fee revenue and income from non-clinical activities compared to those in urban areas (Chirwa et al., 2014). However, both of these studies were purely descriptive and did not seek to analyse in detail the determinants of each source of income.

This study therefore aims to describe the different sources and quantities of income received by public sector health workers in primary care facilities working in post-conflict Democratic Republic of Congo (DRC). The study also investigates which health worker and heath facility characteristics are associated with total income received and different sources of income, but will pay particular attention to government payments and user fees. It is hoped that such information can be used to inform national discussions on health worker remuneration and health systems policy. Given the ASSP programme is also working at the national level to strengthen governance within the Ministry of Health, an understanding of factors associated with the variation of health worker's incomes, and any existing discrimination in government payments, may also help them to effectively influence the efforts of the government and other agencies co-ordinating on health worker remuneration. Furthermore, IMA is piloting a novel Human Resources intervention in all 28 of the Kasai Occidental ASSP zones which aims to facilitate government payments to health workers. Although IMA has sub-contracted the technical partner IntraHealth to assist with the implementation of this intervention, an understanding of the financial environment in which health workers operate will be key to informing this work.

## Background

### Overview of remuneration of Human Resources for Health in the DRC

The DRC has been left with a dysfunctional health system post-conflict. It currently languishes near the bottom of the Human Development Index which uses a measure of life expectancy in its calculation (United Nations Development Programme, 2011). In particular,

several challenges exist in relation to its human resources for health, one of which is the payment of health workers. Salaries for health workers were nominal following the economic crisis and conflicts during the 1990s, so in order to increase wages, occupational risk allowances or "primes de risque" were introduced (Verheijen & Mulumba, 2008). Occupational risk allowances are allocated to workers delivering clinical services, as they are may be exposed to certain health risks (e.g. infectious diseases such as Ebola). However, there is no national policy that entitles health workers to any other types of allowances. The occupational risk allowances are managed by the Ministry of Health while salaries are controlled by the Ministry of Public Sector Reform. This system of dual payment has led to much confusion amongst health workers around what they should receive from the government, and has important implications for health worker motivation and performance (Agyepong et al., 2004; Ferrinho et al., 2004; McCoy et al., 2008).

In addition, few public-sector health workers currently receive any government payments because of out of date payrolls and the widespread practice of corruption (Fox et al., 2013; World Bank, 2008). The budgetary allocation to health is also very poor; in 2013, public investment in health was only 4.5% of the national budget falling far short of the Abuja commitment of 15% (Ministère de la Sante Publique, Ministère de la Santé Publique, & Programme National des Comptes de la Santé, 2013a). Furthermore, the budget execution rate is low, averaging only 50% between 2001 and 2011 (Ministère de la Santé Publique, & Programme National des Comptes de la Santé, 2013b). As a result of limited government financing to the health sector, services rely heavily on a system of cost recovery through user fees, which are prohibitive to the majority of the population who live in extreme poverty. However, the DRC Ministry of Health recognises that the removal of user fees is not affordable or sustainable, even with substantial contributions from donors (Stasse et al., 2015). Nonetheless, the system of user fee payments remains unregulated, with no accepted national tariff for consultations and facilities have autonomy over setting their own tariffs. In the context of poor remuneration of health workers alongside the absence of a national user fees policy, workers are likely to develop informal payment systems. The health system and its workers have also become dependent on financing from external partners, such as non-governmental organisations (NGOs) and faith-based organisations (FBOs). According to the last published national health accounts, 40% of total health expenditure came from households while 45% came from international donors or NGOs in 2011 (Ministère de la Santé Publique & Programme National des Comptes de la Santé, 2013b). External organisations often provide workers with financial incentives such as performance-based payments and/or per diems to attend training or conduct specific activities such as vaccination campaigns.

**Organisation of the state health system**

The health system has three levels of administration: the national level which corresponds with the Ministry of Health and defines national health policy, an intermediate level

composed of eleven[1] provincial health departments and 48 administrative health districts, and a peripheral level which is the operational unit in providing health activities.

At the peripheral level, the basic unit of the primary care health system is the health zone. A health zone is a defined geographical area with a population of between 100,000 to 150,000 people, with urban areas more likely to have a higher population density that rural areas (Johnson & Stoskopf, 2010). In theory, each health zone should have a reference hospital providing services in the following fields: general medicine, paediatrics, obstetrics and gynaecology, emergency medicine, and surgery. Hospitals also provide other specialist services such as blood transfusion. Health zones are further divided into health areas which typically serve 10,000 to 15,000 people. According to the Ministry of Health standards, each health area should have a health centre providing an essential package of preventative (e.g. immunisation) and curative (e.g. malaria treatment) primary healthcare activities. Some of the health centres are termed reference health centres, the main difference being that reference health centres are equipped to carry out certain minor surgical operations while health centres are not (Ministère de la Santé Publique & Secrétariat Géneral, 2012). Occasionally, if there is no health centre or reference health centre for a designated health area, there is a health post. Health posts are more similar to health centres but offer mainly curative primary healthcare services. They have often been created to serve populations in remote and less accessible areas, and so tend to be manned by fewer staff. The management of health facilities within each zone is overseen by a team of officials in a central health zone office.

Nonetheless, there is known to be great provincial variation in terms of poverty and the availability of staff and health services between the DRC provinces as illustrated in Table 1, with the nursing cadre making up the majority of health workers in state health facilities. The World Health Organisation recommends 23 doctors, nurses and midwives per 10,000 population to achieve sufficient coverage of primary healthcare needs (World Health Organization, 2006). However, only the province of North Kivu meets this criterion out of all of the provinces in the DRC.

[1] At the time of the study, DRC was composed of eleven provinces which have since divided into 26 provinces.

**Table 1: Incidence of poverty, health facility staffing and availability of facilities**

| | Poverty incidence* | State facilities/ 10,000 population† | Nurses/ 10,000 population ‡ | Doctors/ 10,000 population | Pharmacists/ 10,000 population | Laboratory workers/ 10,000 Population |
|---|---|---|---|---|---|---|
| Equateur | 93.6% | 1.78 | 4.21 | 0.17 | 0.01 | 0.04 |
| Kasai Occidental | 55.8% | 4.18 | 11.59 | 0.50 | 0.02 | 0.13 |
| Kasai Oriental | 62.3% | 3.37 | 9.83 | 0.50 | 0.00 | 0.29 |
| Province Orientale | 75.5% | 3.07 | 7.15 | 0.56 | 0.02 | 0.10 |
| Maniema | 58.5% | 3.53 | 11.35 | 0.97 | 0.02 | 0.07 |
| South Kivu | 84.7% | 1.98 | 6.80 | 1.21 | 0.04 | 0.07 |
| North Kivu | 73.0% | 4.22 | 26.76 | 2.54 | 0.31 | 1.54 |
| Katanga | 69.1% | 2.05 | 6.25 | 0.67 | 0.12 | 0.15 |
| Bas-Congo | 69.8% | 5.31 | 19.64 | 1.50 | 0.17 | 0.85 |
| Kinshasa | 41.6% | 2.75 | 3.19 | 7.49 | 0.37 | 1.00 |
| Bandundu | 89.1% | 3.48 | 17.62 | 0.78 | 0.01 | 0.53 |

*Poverty defined as living on less than 1 USD per day

†Information for state health facilities only (primary and secondary)

‡The category of nurses includes midwives

Sources of data: United Nations Development Programme, 2009; Ministère de la Santé Publique & Secrétariat Géneral, 2013.

### Study setting

There is no up to date information on the remuneration of health workers in either primary or secondary healthcare facilities in the DRC. However, this study focuses exclusively on the remuneration of personnel in primary healthcare facilities, as these facilities are the point of entry into the health system. Additionally, most of the burden of morbidity and mortality in the DRC is caused by preventable diseases such as malaria, diarrhoeal illness and malnutrition which can often be managed effectively through primary care (Ministère du Plan et Suivi de la Mise en œuvre de la Révolution de la Modernité, Ministère de la Santé Publique, & ICF International, 2014).

## Methods

### Quantitative Methods

This study has drawn on baseline data collected as part of a broader impact evaluation of a health systems strengthening programme funded by the British Government's Department for International Development (DFID) called ASSP (Accès Aux Soins de Santé Primaires/ Access to Primary Health Care) (Keating, Hotchkiss, Eisele, Kitoto, & Bertrand, 2014). At the health zone level, the ASSP programme consists of a broad range of facility-based health interventions designed to strengthen service delivery by improving the availability of infrastructure, equipment, and supplies, and by supporting financial and managerial practices.

*Sampling and target population*

To shed light on health worker remuneration patterns, data were collected from a cross-sectional survey of sampled health facilities and health workers at these facilities. Sampling was determined by the broader impact evaluation which aimed to conduct surveys in both

"intervention" areas (where the ASSP health programme was working) and "control" areas (where the ASSP health programme was not being implemented). Provinces sampled included: Equateur, Kasai Occidental, Kasai Oriental, Province Orientale and Maniema. Given the geographical distribution of the health programme, more villages were sampled in certain provinces compared to other provinces. Villages within intervention areas were selected using probability proportional to size (PPS) to maximise sampling efficiency. An equal number of control villages were then matched to the selected villages in intervention areas. Finally, one facility per village was selected, and was usually the facility officially designated to serve households in that village's health area. We sampled public health centres and reference health centres in urban and rural areas only because these are the main facilities involved in providing primary health care and the ASSP programme only supports these facilities. In the absence of a health centre or reference health centre, the health post was sampled. Hospitals and private facilities were not included in the sample. In total, 210 facilities were selected, representing 2.3%[2] of all public primary care facilities (excluding reference hospitals) in sampled provinces.

All workers providing clinical services in selected facilities and on duty on the day of the survey were also interviewed using the health worker survey. It was anticipated that there would be on average three to four health workers at any one time working in a facility.

*Surveys*

The facility survey included questions on the total number of staff, the distance of the facility from the village, and the number of primary healthcare services provided. The health worker survey contained various demographic questions. These included questions on the health worker's age, sex, cadre, marital status, educational attainment, number of years worked in their current position, and their number of financial dependents. There were also specific questions on health worker income which had been adapted from the Health Worker Incentive Survey (Ensor & Witter, 2007). Items on the type of income received included: salaries, the occupational risk allowance, performance payments and per diems which would have come from non-governmental partners, private clinical work, user fees from patients which conform with the facility's user fee tariff, informal payments defined as payments made by patients outside of official channels, allowances, and income from non-clinical activities (e.g. agricultural work). Respondents were also asked about the amounts of money generated from each income source and where applicable, whether these payments were received on time. Answers on all incomes were recorded in Congolese Francs (FC), while the recall period depended upon the type of question asked. Recall was for "last month received" for all incomes with the exception of per diems which was asked for the "last year", as per diems are known to be paid less frequently. Both surveys were piloted in two health facilities in Kinshasa and one facility in Bas Congo prior to conducting the surveys on our sample.

*Data collection*

[2] Calculated using population data obtained from the Direction d'Etudes et Planification, Ministère de la Santé Publique in October 2013.

The Kinshasa School of Public Health (KSPH) in collaboration with Tulane University were contracted to manage the fieldwork for this study. These institutions recruited and trained personnel to: pre-test the survey instruments in two facilities in Kinshasa and one facility in Bas Congo, supervise the fieldwork, and oversee data entry. Data collection was carried out between April and May 2014 by data collectors hired from each of the provinces to ensure familiarity with the cultural context.

Participation of health workers in the survey was voluntary. To minimise the potential for social desirability bias, the interviewer explained the purpose, confidentiality and anonymity of the study to each provider before seeking consent to begin the survey.

*Statistical Analyses*

Data collected from the surveys were double entered into the computer database CSPro for verification and checked for any erroneous values. All data were then imported into and analysed in STATA 13.0 and income data were converted into US dollars (USD) using the current exchange rate of 923 FC to 1 USD.[3] Grubb's test was applied to detect any outliers in the income data (Grubbs, 1950). Descriptive statistics were then used to explore: the demographic characteristics of health workers surveyed, the amount health workers receive for each source of income, the proportion of health workers receiving income/allowances from different sources, and the frequency of government payments to health workers.

A series of regression models were then estimated using individual health worker characteristics and facility characteristics as explanatory variables. Individual health worker characteristics expected to affect receipt of income and income level included: age, marital status, sex, health worker cadre, education, years worked in position and the number of financial dependents. Facility level factors expected to affect outcomes of interest included: provincial location of the facility, urban-rural status, facility type, number of staff present on the day of the survey, distance of the facility from the nearest village and the number of primary healthcare services offered. Presence of the ASSP programme was also included in all of the models. Table 2 indicates the hypothesised relationship between the independent variables and income sources.

[3]Exchange rate as of 26th June 2015 using FOREX currency converter.

**Table 2: Hypothesised relationship of independent variables with income sources**

| Variables | Hypothesised relationship with income sources |
|---|---|
| Age | The older the worker, the more likely they are to gain income as elders are respected in DRC (Oppong & Woodruff, 2007). In addition, older workers will have been working for longer and may be paid more based on their experience. |
| Sex | Globally, while women comprise the majority of employees in the formal health system, they are usually less likely than men to hold senior roles, which tend to receive more pay (World Health Organization, 2010). In a study in Sierra Leone, for certain cadres, women received significantly less salary than males (Witter et al., 2015). In addition, according to the latest Gender Equality Index, DRC was ranked near the bottom (United Nations Development Programme, 2014). Therefore, it will be interesting to examine whether gender inequality also exists in the receipt of certain sources of income (e.g. user fees) when health worker position and education is controlled for. A study in Tajikistan has shown that women are equally as likely as men to charge informal payments once other factors have been controlled for but this has not been explored in other contexts (Dabalen & Wane, 2008). The same study also showed that women were less likely to work outside of the health facility than men. |
| Number of dependents | There is some evidence that in DRC, those that earn more have a higher number of dependents and so the number of dependents may increase as overall income increases (Weijs, Hilhorst, & Ferf, 2012). |
| Urban-rural status | Urban areas have a higher population density and so income from user fees may be higher. There are also large discrepancies in access to healthcare between urban and rural areas, with access being higher in urban areas, which may also affect income gained from user fees (World Bank, 2008). Opportunities to receive income from dual practice may be greater in urban areas compared to rural areas, as was observed in Zimbabwe (Chirwa et al., 2014). In addition, a study in Malawi revealed that urban health workers had higher monthly household incomes compared to their rural counterparts (Bowie, Mwase, & Chinkhumba, 2009). |
| Province | There are large differences in poverty between provinces in the DRC which may have implications for both formal and informal fees charged to patients (Moummi, 2010; United Nations Development Programme, 2009). Equateur is comparatively poorer than the other provinces that have been sampled. According to a recent study, there are wide provincial disparities in domestic public spending on health services, which may affect the amount of government payments received by workers (UNICEF, 2015; World Bank, 2008). |
| Total number of staff delivering healthcare present on the day | There is some evidence that facilities with more staff receive more income than understaffed facilities (Murro & Pavignani, 2012). On the other hand, income from user fees may be reduced as they are usually divided amongst workers at the end of the month. Having a high number of personnel may result in lower amounts being received by each staff member (Bertone & Lurton, 2015). |

**Table 2 (continued): Hypothesised relationship of independent variables with income sources**

| Variables | Hypothesised relationship with income sources |
|---|---|
| Number of services offered | Increasing the number of services available to a population is one way of improving access (Gulliford et al., 2002). This improved access may be reflected in increased utilisation rates resulting in higher incomes from user fees. |
| Distance of the facility from the village | Evidence has shown that distance travelled by patients is a key determinant of the utilisation of health services, and so may impact on the amount of user fees collected at facilities (Shannon, Bashshur, & Metzner, 1969). |
| Education | The level of education will vary by position and within positions. Doctors should hold a seven-year university degree, while the education of nurses depends on their grade; it varies between two years of secondary school to a three-year university degree (Yngfors & Andersson, 2010). The difference in grade (and therefore education) is reflected in the payment of salaries. |
| Marital status | Several wage determination studies have found a positive wage effect of marriage even when other variables such as productivity and hours worked have been controlled for (Korenman & Neumark, 1991; Pfeffer & Ross, 1982; Kalachek & Raines, 1976; Hill, 1979). |
| Years in position | The longer a worker has been in their position, the more likely they are to receive a salary as they may have been identified in the last comprehensive health worker census in 2006. This census aimed to ensure workers were correctly registered on the government payroll. |
| Type of facility | Reference facilities are bigger, offer more services and serve a greater population compared to health centres. Therefore, income opportunities may be different within each. |
| Total population of village | User fees and therefore total income are influenced by demand factors such as the total population eligible to access healthcare. |
| Presence of ASSP programme | The programme implemented a subsidised user fee policy which would have influenced the amount of income gained from this source. In addition, the programme does not supply performance payments and was even phasing out performance payments in the province of Maniema provided by a previous health programme at the time of the survey. Finally, the programme has a mandate to strengthen the accountability of health services to the community; it would therefore be expected that informal payments would be less common in ASSP sites. |

Logistic regression models were applied to examine characteristics predicting whether a health worker received a certain type of income. This was performed for salary, the occupational risk allowance, user fees, performance pay, informal pay, per diems, supplementary pay for non-clinical work, and income from private work. The Ramsey RESET test was used to check for functional misspecification and the Hosmer-Lemeshow

goodness of fit test was used to check for goodness of fit in both the full and reduced models. In addition, for salary, occupational risk allowance and user fees received, multivariate regression analysis was also performed to assess any significant determinants of the amount of each income type received. Different models were estimated in each case so that the better ones were chosen for interpreting the parameter estimates. The amounts of income for the total income, salary, occupational risk allowance and user fees were initially log-transformed and Ordinary Least Squares (OLS) models were first applied to analyse the data. Given many health workers did not receive these income sources (i.e. the data was left censored), the Tobit, two-part model and Heckman selection model were also applied where appropriate to allow for zero values and estimate any selection bias effects. Violation of assumptions for full and reduced models were also checked using regression diagnostics and corrected where possible in order to produce unbiased coefficients (see appendix 1 for the list of regression diagnostics).

For each model passing diagnostic tests, a general to specific regression specification method was used whereby explanatory variables are excluded from the equation in a stepwise manner. The stepwise method was felt to be justified given the scarcity of literature on the determinants of health worker income sources in this context. All variables with a hypothesised relationship with the income source were first entered into the model. The first variable to be considered was the one with the smallest correlation with the income source. The variable was then dropped from the model if the probability that the coefficient on that variable was zero was greater than or equal to 0.10 – as indicated by the F-statistic. The variable was re-entered if the probability associated with the F-test was less than 0.10. This procedure was carried out on all variables until none of the remaining variables satisfied entry or exit criteria. All regression analyses were performed initially excluding any missing values (list-wise deletion). All models were also clustered by health facility to take into account the correlation of error terms across observations.

**Qualitative Methods**

*Data collection*

Qualitative research was carried out in November 2014 in four urban and four rural health zones supported by the ASSP programme in the province of Kasai Occidental. Two nurses (one female and one male) were purposively selected from a health centre in each health zone, making a total of 16 nurses. None of these health centres had been selected for the quantitative survey. We have also not included the names of the health zones from which the facilities were sampled in this report as individuals could potentially be identifiable. In all sites, data collection involved in-depth interviews with selected participants on their income. Questions related to the sources and amounts of each income received. Interviews also aimed to identify what factors determined whether a health worker received a particular source of income, and the reasons why. A medical anthropologist with extensive experience in qualitative research performed the qualitative data collection under the supervision of the principal investigator. All interviews were conducted in French and audio recorded. Hand written notes that gave additional insights into the data were also taken.

*Analysis*

Audio recordings were transcribed in French and written up in a Microsoft Word document. The lead author reviewed the transcripts and developed a coding system derived from the initial research themes and questions, as well as key concepts that emerged during data collection. Coding of the interview transcripts was done on NVivo 10, a text-organizing software. Content analysis was used to identify trends of concepts in and across individual codes. Representative, verbatim quotes were selected to illustrate key findings.

## Ethical considerations

The study received human subjects review and approval from the Tulane University Institutional Review Board, the Kinshasa School of Public Health Ethics Committee, and the London School of Hygiene and Tropical Medicine Research Ethics Committee. Informed consent was obtained from all participating healthcare providers.

## Results

Response rates and characteristics of facilities and respondents from the quantitative survey are first reported. Descriptions of each income source are then presented followed by an analysis of the determinants of each source of income. Where appropriate, findings from the qualitative interviews have been presented alongside the quantitative analysis in each section.

**Response rates**

In total, 210 health facility questionnaires were completed. Three facilities were excluded from the analysis because they did not meet the inclusion criteria (i.e. they were not public health centres). These were two hospitals (one in Equateur and one in Province Orientale) and a private health centre in Equateur. This left 207 total facilities for analysis.

Four hundred and seventy-six respondents participated in the health worker survey. Respondents in facilities who did not meet the inclusion criteria (i.e. did not deliver clinical care) or had not responded to any of the questions on income were then eliminated leaving 453 respondents. Those dropped prior to analysis who did not meet the inclusion criteria included receptionists, cashiers and administrative staff. No health workers declined to participate in the survey.

Table 3 illustrates the characteristics of the facilities from where health workers were sampled. Facilities were mainly located in rural areas and were health centres rather than reference health centres or health posts. Most workers were in Kasai Occidental followed by Maniema and Equateur. A smaller proportion of workers were in Province Orientale and only 5.7% were in Kasai Oriental. Facilities were usually located within five kilometres of the nearest village, offered between six and nine services and had two personnel in the facility on the day of the survey.

**Table 3: Characteristics of facilities from where health workers were sampled**

| Facility characteristics of sample for n workers | Proportion of workers |
|---|---|
| | % |
| **Facility location (n=453)** | |
| Rural | 80.6 |
| Urban | 19.4 |
| | |
| **Province (n=453)** | |
| Equateur | 23.0 |
| Kasai Occidental | 29.8 |
| Kasai Oriental | 5.7 |
| Maniema | 27.6 |
| Province Orientale | 13.9 |
| | |
| **Type of facility (n=453)** | |
| Health centre | 81.7 |
| Reference health centre | 17.2 |
| Health post | 1.1 |
| | |
| **Distance of facility from the village (n=443*)** | |
| Less than 1 km | 31.6 |
| Between 1 and 5km | 48.3 |
| Between 5 and 10km | 12.0 |
| Greater than 10km | 8.1 |
| | |
| **Number of services provided by facility (n=435*)** | |
| 3 to 5 services | 12.2 |
| 6 to 9 services | 76.1 |
| Over 10 services | 3.0 |
| | |
| **Total clinical staff present on the day (n=453)** | |
| 1 | 13.3 |
| 2 | 34.0 |
| 3 | 23.8 |
| 4 | 16.8 |
| 5 | 6.6 |
| 6 | 4.0 |
| 7 | 1.6 |
| | |
| **Population catchment for area (n=430*)** | |
| Less than 5000 | 48.9 |
| 5000 to 10,000 | 21.6 |
| 10,001 to 15,000 | 17.4 |
| Greater than 15,000 | 12.1 |

*n less than 453 due to missing values for those variables

**Demographic characteristics of health workers interviewed**

Table 4 illustrates the demographic characteristics of workers who responded to the survey. Most respondents were male and between 30 and 45 years old. Nurses formed the majority of personnel present in health facilities, followed by midwives and traditional birth attendants. The category "other" included auxiliaries, medical and nursing assistants. Only four general physicians were identified. Most workers had attained some level of secondary school education and a third had been to university. For nurses, the more senior grades tend to have a second degree in nursing from a nursing school which is obtained four years post-secondary school. All other junior nurses will usually have achieved a certain level of secondary school education. The majority of workers in the sample were also married and the median length of time worked in their current position was six years.

**Table 4: Characteristics of Health Workers**

| **Characteristics** | **Proportion of all workers interviewed** | **Proportion of nurses only** |
|---|---|---|
| | **%** | **%** |
| **Sex** | **(n=453)** | **(n=407)** |
| Male | 69.3 | 70.3 |
| Female | 30.7 | 29.7 |
| | | |
| **Age** | **(n=453)** | **(n=407)** |
| <30 years | 11.5 | 12.3 |
| 30-44 years | 59.7 | 60.7 |
| 45-60 years | 26.1 | 24.6 |
| >60 years | 3.1 | 2.5 |
| | | |
| **Marital status** | **(n=447*)** | **(n=407)** |
| Married | 90.4 | 91.8 |
| Single | 3.8 | 3.5 |
| Widowed | 3.4 | 2.5 |
| Separated/divorced | 2.2 | 2.0 |
| Other | 0.2 | 0.3 |
| | | |
| **Education** | **(n=453)** | **(n=407)** |
| Primary school | 0.4 | 0.3 |
| Secondary school | 60.3 | 62.9 |
| University/Post-secondary school | 33.1 | 35.1 |
| Not specified | 6.2 | 1.7 |
| | | |
| **Position** | **(n=453)** | **N/A** |
| Doctor | 0.9 | |
| Nurse | 89.8 | |
| Laboratory worker | 1.1 | |
| Pharmacy worker | 1.3 | |
| Traditional birth attendant | 2.9 | |
| Auxiliaries, medical and nursing assistants (other non-qualified personnel) | 4.0 | |
| | | |
| | **N, mean, SE (Median, IQR†)** | **N, mean, SE (Median, IQR)** |
| **Number of financial dependents** | 437*, 9, 4.56. (8, 6-12) | 393*, 9, 4.63. (8, 6-12) |
| **Years worked in current position** | 446*, 9, 8.72. (6, 3-12) | 403*, 9, 8.68. (6, 3-11) |

*n less than 453 for all workers or less than 407 for nurses due to missing values for those variables

† Interquartile range

### Comparison of staffing of sampled facilities with Ministry of Health standards

The number of workers in those cadres specified by the Ministry of Health to be working in health centres was then compared to the numbers required by the national standards (Ministère de la Santé Publique & Secrétariat Géneral, 2012). Table 5 illustrates the results below. It can be seen that both urban and rural facilities sampled by the study did not have enough nurses or laboratory staff according to the Ministry of Health standards when using the mean or median values.

**Table 5: Number of clinical staff in sampled facilities compared with staffing norms for health centres**

| **Position (n = number of facilities)** | **Urban** | **Ministry Standards for urban centres** | **Rural** | **Ministry Standards for rural centres** |
|---|---|---|---|---|
| | Mean, (median, IQR) | Number | Mean, (median, IQR) | Number |
| Nurses (n=163*) | 8, (7, 4-9) | 12 | 3, (2, 2-4) | 6 |
| Lab technician (n=155*) | 1, (1, 0-1) | 2 | 0, (0, 0) | 1-2 |

**N.B. No official norms exist for health posts or reference health centres. No other clinical cadres e.g. doctors are included in the national staffing norms for health centres**

*n less than 207 for these variables due to missing/don't know responses. The reason for the many "don't know" responses to questions on staffing may be because respondents were asked about the number of nurses in relation to nursing grade, which may not be widely known.

Given the very small number of workers identified outside of the nursing cadre as illustrated in Table 4, the rest of the analysis of this paper will focus on nurses only.

### Descriptive analysis of income sources

*Proportion of nurses receiving different sources of income and amounts received*

Table 6 indicates the proportion of nurses receiving different sources of income. It can be seen that user fees are most often received by nurses, followed by the occupational risk allowance from government and per diems for around half of nurses. Just under half of the sample reported receiving income from supplementary non-clinical activities such as agriculture or trade as illustrated later in Figure 5. However, less than ten percent of workers reported receiving income from private clinical practice. The highest median income obtained overall was for non-clinical work outside the facility, followed by the government salary. The lowest median income amounts came from per diems or informal payments from patients. The major differences between the median and mean amounts of income suggest some skewing of the distribution with high values, particularly noticeable for user fees and income from non-clinical activities. Unfortunately, although amounts gained from allowances was recorded by the survey, respondents were not asked about the time period over which this money was gained and so this could not be calculated as a monthly source of income. In terms of total remuneration, the median monthly reported income across all sources was $85 but the mean was almost double at $165 suggesting high variability in the incomes of nurses.

**Table 6: Total proportion of nurses receiving sources of income and median value of income received in the last month of the survey in USD**

| Source of income | Overall proportion of workers actually receiving source of income | Median income per month among those receiving income in USD (IQR) | Mean income per month among those receiving income in USD (Standard Error) |
|---|---|---|---|
| **Payments from government** | | | |
| Salary from government (n=407) | 31.2% | 52.76 (23-75) | 58.06 (60.45) |
| Occupational risk allowance from government (n=407) | 53.8% | 12.46 (11-16) | 36.57 (73.38) |
| **Payments from other sources** | | | |
| Performance pay (n=407) | 24.1% | 16.25 (9-46) | 35.79 (48.81) |
| User fees (n=406) | 74.6% | 19.50 (11-38) | 71.02 (157.95) |
| Gifts/informal payments from patients (n=406) | 16.8% | 4.60 (2-11) | 8.73 (10.43) |
| Per diems (n=406) | 51.7% | 4.06 (2-8) | 8.56 (26.35) |
| Income from private clinical practice (n=407) | 7.1% | 21.67 (11-54)* | 34.02 (34.05)* |
| Income from supplemental (non-clinical) activities (n=400) | 46.8% | 65.01 (33-114)* | 119.27 (154.62)* |
| **Total income (n=300*)** | | 85.05 (36-176)* | 165.26 (227.55)* |

**N.B. For the occupational risk allowance, only one outlier income amount was detected and subsequently dropped from the analysis, but no outliers were detected for any other income amount.**

*Greater than 10% of data missing as respondents had missing values for some of the amounts of income.

The in-depth interviews confirmed that nurses tended to receive a lower amount for the occupational risk allowance compared to the salary. Only six of the 16 nurses received a salary and five nurses received a prime de risqué. The average amount received amongst interviewed nurses for the salary was $74, while the average amount for the prime de risqué was $17.

Nurses receiving a salary would collect it from the bank. However, many expressed dissatisfaction with the payment of the salary, stating that the bank often applied charges which they did not understand and resulted in a decrease in the absolute amount of salary received.

*"Ah, salaire ce n'est pas en entier, il y a un terme au niveau de la banque qui est sorti ici, on dit erreur transactionnelle, admettons vous pouvez avoir 69000(FC), on peut vous donner 60000 (FC), le 9 là on dit erreur transactionnel, je ne sais pas"* [4]

*"Ah, the salary is not complete, there is a bank term they say, they say transactional error, you can have 69000(FC), the bank can give you 60000(FC), the 9 (9000) there, they say is a transactional error, I don't know"*

Male, 42 years

[4] The French transcription is given to preserve meaning

*"Moins de 69000 (FC), on a coupé 5000 (FC) Saphir…avec l'état c'était le problème ? a la banque. Je ne sais pas ce que les gens à Kinshasa fait pour faire le coupage…"*

*"Less than 69000(FC), Saphir (brand of credit card) have cut 5000(FC)...with the government it was the problem ? at the bank. I don't know what the people at Kinshasa do to make this cut…"*

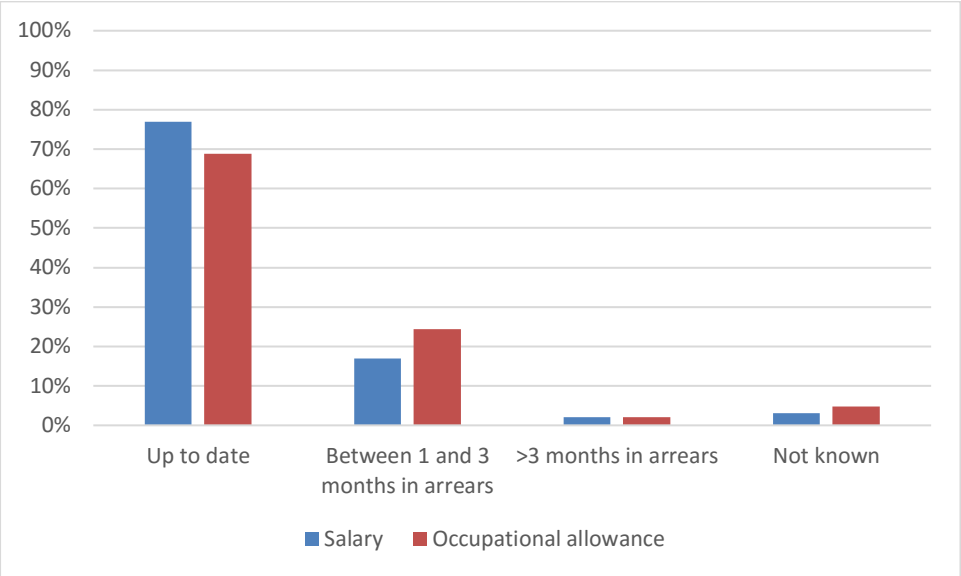
Male, 40 years

Interviewed nurses also reported huge variability in the amounts received from user fees in the past month, with amounts ranging from between approximately $5 and $33. None of the nurses reported engaging in private practice or receiving performance payments from partners. A few nurses reported receiving per diems which were either for training or campaigns (e.g. vaccination campaigns). The amount of per diem received depended on the number of days of the activity, requirement for transport and the organisation funding the activity. Informal payments or gifts from patients were often non-monetary. Patients usually volunteered non-financial gifts, such as soap, fabric or "pagne", or even food such as a sack of manioc to express their gratitude. All nurses were dissatisfied with the total compensation they received, and many claimed they had to regularly request an advance from the facility as they usually ran out of money before the end of the month. Interviews also revealed that it was very common for nurses to borrow from their family or friends in order to meet financial obligations such as rent or children's school fees.

*Government payments*

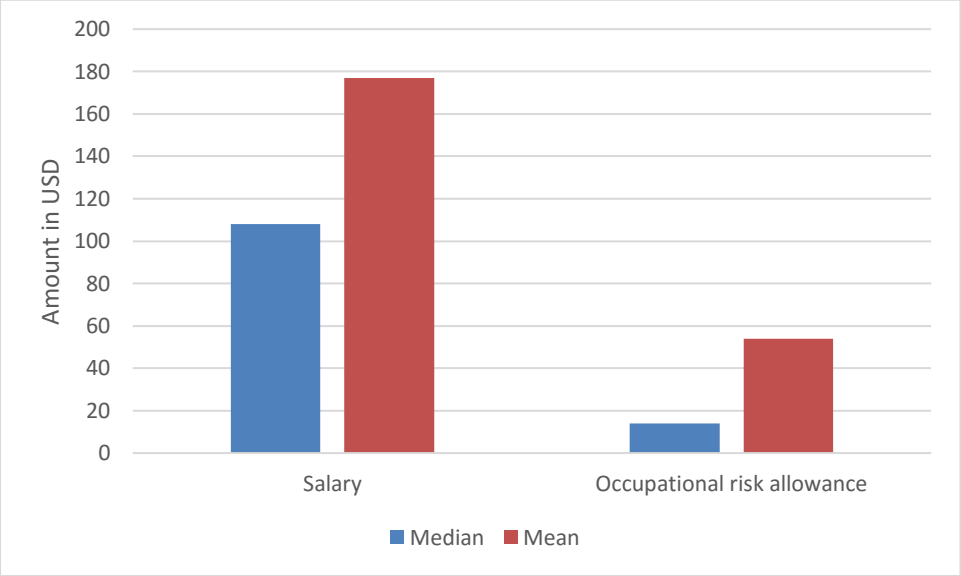
It can be seen from Figure 1 that in general, nurses receiving the salary and the occupational risk allowance payments were usually paid on time. Only 17% of salaries and 24% of occupational risk allowances were between one and three months in arrears, and less than 2% of salaries and occupational risk allowances were over three months in arrears. Unlike salaries which were usually received via the bank, the occupational risk allowance was issued by the health zone office. However, nurses complained more about the frequency of salary payments, stating that it was paid irregularly into their account and that there was no set day of the month when they were due to receive it.

**Figure 1: Frequency of government payments to nurses**



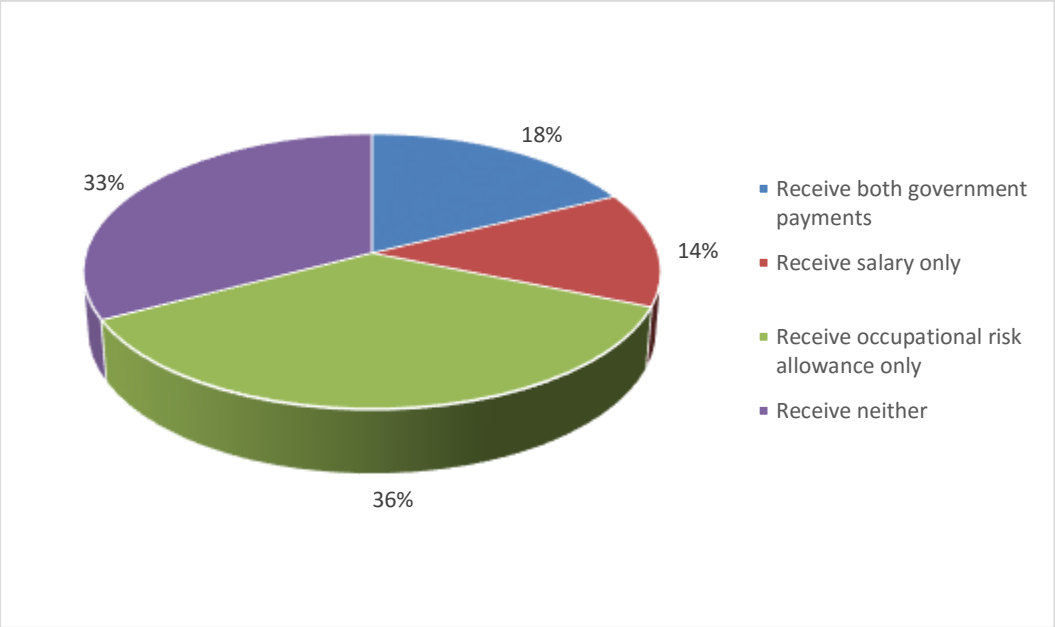

Despite the overall timeliness of payments, the amounts received were typically much less than expected, as indicated by the gap between expected and actual payments in Figure 2. The gap between expected pay and actual pay is much higher for salaries compared to the occupational risk allowance.

**Figure 2: Median and mean monthly income gap between expected and actual government pay for nurses**




The majority of workers received the occupational risk allowance only. However, a third of nurses did not receive any form of government payment at all. Eighteen percent of nurses received both an occupational risk allowance and salary while 14% received only a salary.

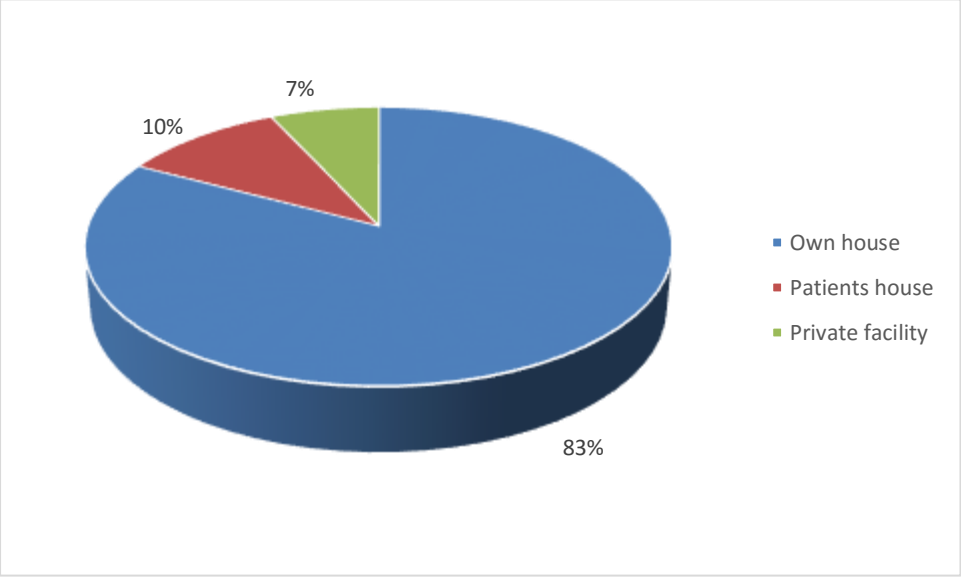
**Figure 3: Proportion of nurses receiving both government payments, salary or occupational risk allowance only, or no government payments**




*Private practice*

Only 29 workers stated they engaged in private practice. Figure 4 below illustrates the location where nurses conducted this work. The majority conducted private practice at home (83%), followed by at the patient's house (10%) or a private clinic (7%).

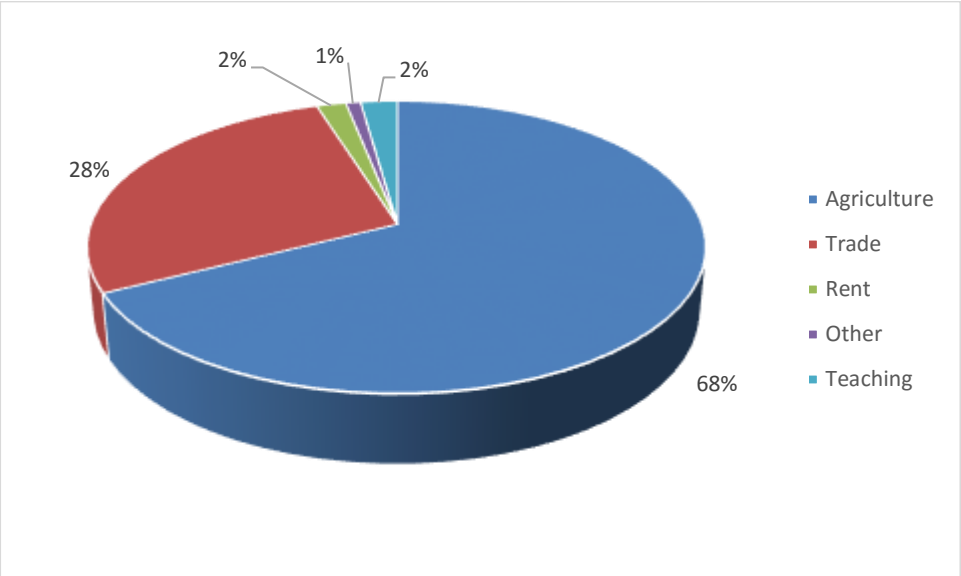
**Figure 4: Location of private practice by nurses**




*Sources of supplemental income*

Almost half of the sample of nurses surveyed (47%) engaged in non-clinical activities to supplement their income. A total of 225 supplemental activities were practiced and are represented in the pie chart below. The majority of nurses practicing non-clinical activities worked in agriculture (68%), followed by trade (28%) as illustrated in Figure 5.

**Figure 5: Types of supplemental non-clinical activities practiced by nurses**




In-depth interviews were consistent with findings from the survey; most nurses worked on a field to earn supplementary income while fewer engaged in commercial activities such as selling goods.

*Allowances received by nurses from facilities*

As can be seen from Table 7, 93% of nurses received no allowances. This finding was again consistent with the findings from in-depth interviews, where only two nurses did report receiving an allowance for healthcare; if they or any of their family members fell ill they would receive free treatment at the facility. Only one nurse was living in accommodation supplied by the health facility. Interviews also suggested that these allowances were provided at the discretion of the facility.

**Table 7: Proportion of nurses receiving allowances**

| **Allowance** | **% receiving allowances (n=407)** |
|---|---|
| Transport | 1.7% (7) |
| Healthcare | 4.2% (17) |
| Overtime | 0.7% (3) |
| Uniform | 0.7% (3) |
| Non-practice | 0.5% (2) |
| **No allowances** | **93.4% (380)** |

**N.B. Categories of allowances were not mutually exclusive**

## Analysis of income determinants

Logistic regression results for each income source (with the exception of allowances due to a limited number of observations) are reported in the following section. Models for the determinants of the amount of salary and total remuneration are also presented. For the amount of occupational risk allowance or user fees gained by each nurse, all models failed the diagnostic tests and so are not reported, as coefficients would not be reliable. Appendix 2 illustrates the coding of explanatory variables and proportions of nurses in each category.

*Government payments*

As illustrated in Table 8, the likelihood of receiving a salary increased with every year worked at the facility (OR 1.06, p<0.000) and was greater for staff working in urban facilities (OR 2.48, p=0.021). Nurses were more likely to receive a salary if they were in Equateur than Maniema (0.22, p=0.014). The odds of receiving the occupational allowance were greater if the nurse had more years of experience (OR 1.20, p<0.000) and a higher number of dependents (OR 1.12, p=0.001. The odds of receiving the occupational allowance were highest in Province Orientale (OR 9.58, p=0.001) compared to Equateur, but lower in Kasai Occidental (OR 0.17, p<0.000) or Kasai Oriental (OR 0.05, p<0.000).

**Table 8: Logistic Regressions for salary and occupational risk allowance**

| | **Odds ratio for dependent variables (SE)** | | | |
|---|---|---|---|---|
| **Explanatory variables** | **Salary** | | **Occupational risk allowance** | |
| | **Full model** | **Reduced model** | **Full model** | **Reduced model** |
| Years in position | 1.06 (0.02)*** | 1.06 (0.02)*** | 1.19 (0.04)*** | 1.20 (0.04)*** (p<0.001) |
| Kasai Occidental (vs Equateur) | 1.48 (0.69) | 1.46 (0.64) | 0.17 (0.07)*** | 0.17 (0.07)*** (p<0.001) |
| Kasai Orientale (vs Equateur) | 1.02 (0.89) | 0.71 (0.48) | 0.03 (0.02)*** | 0.05 (0.04)*** (p<0.001) |
| Maniema (vs Equateur) | 0.20 (0.13)** | 0.22 (0.14)*** (p=0.014) | 1.56 (0.76) | 1.30 (0.63) |
| Province Orientale (vs Equateur) | 0.69 (0.43) | 1.05 (0.52) | 11.07 (7.28)*** | 9.58 (6.33)*** (p=0.001) |
| Population served | 1.00 (0.00)** | 1.00 (0.00)** (p=0.043) | 1.00 (0.00) | |
| Total personnel | 1.43 (0.25)** | | 0.94 (0.19) | |
| Urban (vs rural) | 1.90 (0.86) | 2.48 (0.97)** (p=0.021) | 2.42 (1.33) | 2.10 (0.91)* |
| Number of services | 1.08 (0.12) | | 0.84 (0.09) | |
| Distance of facility from village | 1.00 (0.03) | | 1.07 (0.04)* | |
| Reference heath centre (vs heath centre) | 0.74 (0.36) | | 0.49 (0.24) | 0.39 (0.20)* |
| Age | 1.02 (0.02) | | 1.03 (0.02) | |
| Male (vs female) | 0.92 (0.31) | | 0.66 (0.24) | |
| Number of dependents | 0.97 (0.03) | | 1.11 (0.04)** | 1.12 (0.04)*** (p=0.001) |
| Married (vs not married) | 1.10 (0.14) | | 0.67 (0.12)** | 0.75 (0.12)* |
| University (vs school education) | 0.77 (0.27) | | 1.07 (0.41) | |
| ASSP programme | 0.70 (0.28) | | 0.58 (0.23) | |
| Received occupational allowance (salary model only) | 1.03 (0.35) | | - | - |
| Received salary (occupational risk allowance model only) | - | - | 1.06 (0.39) | |
| Constant | 0.04 (0.05)** | 0.09 (0.04)*** | 0.37 (0.41) | 0.21 (0.08)*** |
| | | | | |
| Pseudo $R^2$ | 0.17 | 0.14 | 0.35 | 0.33 |
| Model $\chi^2$ | 50.90*** | 46.98*** | 91.22*** | 77.56*** |
| Number observations (n) | 337 | 383 | 318 | 318 |

*P≤0.1 **p≤0.05 ***p≤0.01

† Standard error

With respect to the amount of salary earned, the log OLS model performed best and is presented here. The amount of salary earned by nurses differed across the provinces; nurses in Kasai Oriental earned more than nurses in Equateur (β=0.72, p=0.005). The more services provided by the facility also significantly increased the amount received (β=0.09, p=0.045). Despite the large number of censored values, the results from the Heckman model indicated there was no significant selection effect. The results for the Heckman model can be found in Appendix 3.

**Table 9: OLS regression for salary**

| **Explanatory variables** | **Coefficient (SE)** | |
|---|---|---|
| | **Full model** | **Reduced model** |
| Years in position | 0.01 (0.01) | 0.01 (0.01) |
| Kasai Occidental (vs Equateur) | -0.22 (0.30) | -0.09 (0.23) |
| Kasai Orientale (vs Equateur) | 0.48 (0.38) | 0.72 (0.24)*** |
| Maniema (vs Equateur) | 0.16 (0.41) | 0.46 (0.35) |
| Province Orientale (vs Equateur) | -0.71 (0.37) | -0.34 (0.31) |
| Population served | 0.00 (0.00) | |
| Total personnel | 0.07 (0.09) | 0.05 (0.08) |
| Urban (vs rural) | 0.02 (0.22) | |
| Number of services | 0.10 (0.07) | 0.09 (0.04)** |
| Distance of facility from village | -0.03 (0.29) | |
| Reference heath centre (vs heath centre) | -0.22 (0.28) | |
| Age | 0.00 (0.01) | |
| Male (vs female) | -0.01 (0.17) | |
| Number of dependents | 0.02 (0.01) | 0.02 (0.01) |
| Married (vs not married) | 0.05 (0.06) | |
| University (vs school education) | 0.01 (0.18) | |
| Supported by ASSP programme | -0.19 (0.20) | |
| | | |
| Constant | 2.61 (0.73)*** | 2.65 (0.41)*** |
| $R^2$ | 0.34*** | 0.26*** |
| Number observations (n) | 104 | 117 |

*P≤0.05 **p≤0.01 ***p≤0.001

The reasons behind the low number of nurses receiving government payments were explored further in the in-depth interviews. Nurses who were not paid stated it was because they had not started working until after the last biometric census of workers in 2006. Therefore, the less time the nurse had been in the profession, the less likely they were to receive a salary, which corroborates well with the findings from the quantitative analysis above. Some nurses also described a census which had taken place between 2010 and 2011, but were frustrated as they still did not have their registration number which would allow them to receive a salary.

*"En 2011 on était par le recensement on nous a dit que au mois de janvier 2014 on doit renouveler d'autres personnes pour donner le numéro matricule. Maintenant c'est 2 ans, on n'a pas eu ça. C'est toujours, quand on doit toujours renouveler pour faire encore d'autre recensement, c'est pour quoi c'est retardé. C'est toujours comme ça."*

*"In 2011, I was included in the census, they told us in January 2014 they must include other people to give them the registration number. Now it is 2 years, we have not had that. It is always like that, when one must always be included to do another census, it is late. It's always like that."*

Male, 32 years

According to our in-depth interviews, nurses seemed to know that the list of workers to receive an occupational risk allowance was managed by the Ministry of Health which received lists of names of those working from the health zone office. Specifically in relation to the occupational risk allowance, some nurses felt that their tribal or ethnic background influenced whether they received an occupational risk allowance.

*"…ça dépend…ça marche des tribus la, oui, c'est ça ce que nous présentons parce que tout nous avons déjà déposé au BCZ (Bureau Central de la Zone de Santé/Health Zone Central Office), nos dossiers, mais on se demande comment ?… même les primes de risques on ne vient pas de toucher, pour quoi ? Mais il y a toujours tel que je vous ai dit la, c'est toujours comme ça."*

*"…it depends…it works for the tribes yes, all of us have already given our documents to the BCZ, but how can one ask?…even the primes de risque, we do not receive it, why? But there are always those which I told you, it's always like that."*

Male, 35 years

*"Ici…c'est toujours le tribalisme qui bat…nous sommes (sert) par le Bakuba, par exemple, le BCZ c'est plein. Il y a que Bakuba. Tels que le cas des primes de risques ici. Quand il y avait l'accident (de train) se déroulait chez ici, nous étions chez le CS (centre de santé) ici, mais cela qu'il n'étaient pas là, ils sont en train de recevoir mais nous, on ne reçoit pas."*

*"Here…it's always tribalism which beats (us)…we are served by the Bakuba, for example, the BCZ is full (of Bakuba). There are only Bakuba. Such as the case with primes de risqué here. When there was the accident where the train was derailed here, we were with the health centre here, but those who were not there, they are about to receive (the prime de risqué", but we do not receive (the prime de risqué)."*

Female, 48 years

*Determinants of other income sources*

According to the quantitative analysis, compared to Equateur, nurses in Maniema were more likely to receive all other sources of income, with the exception of per diems (Table 10). Only those with a higher number of dependents were significantly more likely to receive user fees (OR 1.07 p=0.038).

According to the quantitative analysis, compared to Equateur, nurses in Maniema were more likely to receive all other sources of income, with the exception of per diems (Table 10). Only

those with a higher number of dependents were significantly more likely to receive user fees (OR 1.07 p=0.038).

During in-depth interviews, all nurses reported receiving income from user fees. The process for allocating user fees within the facility was usually overseen by the head of the facility. However, record keeping was often poor meaning the total revenue generated from user fees and allocation process was unclear to some nurses.

*"The way in which we divide (user fees)…I don't know if I receive the same thing. The IT (head nurse) and IA (assistant nurse) and me, I don't know if they give the same thing. They give it to me, I sign, that is all."*

Female, 60 years

As shown in Table 10, nurses were more likely to receive informal payments if they were not based in Equateur. Staff at facilities with a higher number of personnel were less likely to report receiving informal payments (OR 0.67, p=0.07) and facilities supported by ASSP reported a lower likelihood of informal payments (OR 0.48, p=0.039). Older workers were less likely to receive informal payments (OR 0.96, p=0.08).

The qualitative findings revealed that many nurses were reluctant to charge informal fees, as patients were usually so poor that they struggled to pay user fees. Nurses were less likely to charge informal fees where communities were well informed about the facility user fee tariff, for example, in ASSP areas where community health committees (CODESAs) and facilities were involved in setting and publicising tariffs, meaning nurses could by chastised by the public for asking for informal payments.

"*…everyone knows, that if you are going to ask for something someone will tell on you, you will be humiliated all the same, instead of asking, you must leave it."*

Male, 42 years

Receiving income from private practice was more common in urban than rural areas (OR 2.44, p=0.029) and facilities close to the village. Older workers were also less likely to receive income from private practice (OR 0.92, p<0.000) and staff receiving government payments were more likely to receive income from private practice (OR 2.76, p=0.036). Workers in Kasai Occidental and Maniema were more likely to work privately compared to those living in Equateur.

Reasons given by nurses for not engaging in private practice during interviews included: being based far from private clinics, a perceived reduction in job security, and risks of losing the chance of becoming registered with the state and therefore receiving future government pay. However, some admitted that those currently receiving government pay may have been more likely to work privately to supplement their income, which is consistent with the quantitative analysis. Some nurses voiced that the private sector was superior to the public

sector, as it was better resourced, staff were better paid and more motivated. However, many criticised the private sector for poor management and a lack of accountability, with patients not being treated according to best practice, and no focus on preventative care.

*"In the private (facilities) the staff are self-directed but they do not have any sanctions, they behave as they want. But with us here, the hierarchy demands explanations, there is monitoring"*

Female, 38 years

Staff at facilities with a higher number of personnel were less likely to report receiving per diems (OR 0.72, p=0.019). Nurses in reference health centres were less likely to receive per diems (OR 0.45, p=0.032) than those in health centres, while nurses in facilities far from the village were less likely to earn performance payments (OR 0.79, p=0.001) than those near to the village. Facilities supported by ASSP reported a higher chance of receiving per diems (OR 1.80, p=0.031) as well as workers receiving government payments (OR 1.92, p=0.012). Males and workers in facilities offering a higher number of services were also more likely to receive performance payments and per diems.

During interviews, nurses indicated a preference for government payments over performance payments from development partners as they saw these as more stable and less transient sources of income.

"*Because the state, I could stay with the state until death. But the partner, will always be there for a term of 5 years"*

Male, 30 years"

Some of the nurses interviewed felt that per diems were not allocated fairly.

*"Ah, it is not well managed (per diems), if someone tells us there is maternity training, it is one person who can go, from the other side it is the IT (head nurse) and IA (assistant nurse), so we others…nothing!"*

Female, 37 years

Workers reporting income from non-clinical activities were more likely to report income from private practice (OR 2.64, p=0.035), be based in rural areas (OR 0.51, P=0.025) and have a higher number of dependents (OR 1.08, p=0.008). However, workers receiving government payments appeared to be less likely to receive income from non-clinical work (OR 0.51, p=0.02).

Some nurses reported in interviews that those receiving government payments were actually more likely to undertake non-clinical activities, as they knew they would receive their government payments whether they worked in the facility or not but this was inconsistent with the quantitative findings. One worker admitted not coming to work to enable cultivation

of crops to earn more income. Nurses who did not engage in supplementary non-clinical activities indicated this was due to a lack of time or an absence of the necessary resources or start-up capital.

> *"They become negligent…you see, at the end of each month, you go to the bank, you see (them) but you go to the office and there is no-one working. They end up perhaps going to sell things, but at the end of the month, they will go to get their money."*

Female, 30 years

As shown in Table 10, nurses were more likely to receive informal payments if they were not based in Equateur. Staff at facilities with a higher number of personnel were less likely to report receiving informal payments (OR 0.67, p=0.07) and facilities supported by ASSP reported a lower likelihood of informal payments (OR 0.48, p=0.039). Older workers were less likely to receive informal payments (OR 0.96, p=0.08).

**Table 10: Logistic regressions for determinants of non-governmental sources of income**

| | User fees | | Informal payments | | Private payment | | Non-clinical activities | | Performance payments | | Per diems | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Explanatory variables** | **Odds ratio (SE)** | | | | | | | | | | | |
| | **Full** | **Reduced** | **Full** | **Reduced** | **Full** | **Reduced** | **Full** | **Reduced** | **Full** | **Reduced** | **Full** | **Reduced** |
| Years in position | 1.02 (0.02) | | 1.03 (0.03) | | 1.02 (0.05) | | 0.97 (0.02) | | 1.02 (0.04) | | 0.99 (0.02) | |
| Kasai Occidental (vs Equateur) | 0.52 (0.23) | 0.87 (0.32) | 3.13 (2.13)* | 2.34 (1.17)* | 8.72 (10.09)* | 8.42 (8.88)** | 0.69 (0.25) | 0.65 (0.23) | 2.62 (3.02) | 2.69 (3.13) | 1.29 (0.48) | 1.24 (0.41) |
| Kasai Orientale (vs Equateur) | 3.22 (3.86) | 3.81 (2.94)* | 5.84 (4.64)** | 3.77 (2.37)** | 1 | 1 | 0.99 (0.91) | 0.46 (0.37) | 1 | 1 | 3.67 (3.50) | 2.02 (1.35) |
| Maniema (vs Equateur) | 2.65 (1.58) | 3.76 (1.73)*** | 23.82 (18.79)*** | 12.49 (7.39)*** | 21.87 (25.97)*** | 14.53 (16.24)** | 3.59 (1.68)*** | 4.02 (1.81)*** | 158.86 (191.31)*** | 132.02 (147.97)*** | 0.50 (0.26) | 0.56 (0.25) |
| Province Orientale (vs Equateur) | 1.54 (0.89) | 1.08 (0.47) | 9.18 (5.93)*** | 5.76 (3.00)*** | 1 | 1 | 3.99 (2.27)** | 4.42 (2.17)*** | 1 | 1 | 0.41 (0.20)* | 0.37 (0.15)** |
| Population served | 1.00 (0.00) | | 1.00 (0.00) | | 1.00 (0.00) | | 1.00 (0.00) | | 1.00 (0.00)** | 1.00 (0.00)** | 1.00 (0.00) | |
| Total personnel | 1.12 (0.20) | | 0.69 (0.11)** | 0.67 (0.10)** | 0.83 (0.16) | | 0.79 (0.11)* | 0.83 (0.12) | 0.98 (0.21) | | 0.68 (0.11)** | 0.72 (0.10)** |
| Urban (vs rural) | 0.63 (0.32) | | 0.95 (0.48) | | 2.81 (1.85) | 2.44 (0.99)** | 0.51 (0.18)* | 0.51 (0.15)** | 1.17 (0.82) | | 1.37 (0.55) | |
| Number of services | 0.98 (0.14) | | 0.96 (0.14) | | 0.90 (0.10) | | 1.35 (0.12)*** | 1.24 (0.11)** | 1.71 (0.26)*** | 1.51 (0.22)*** | 1.24 (0.11)** | 1.24 (0.09)** |
| Distance of facility from village | 0.98 (0.03) | | 0.97 (0.05) | | 0.78 (0.07)** | 0.88 (0.06)** | 0.99 (0.03) | | 0.78 (0.05)*** | 0.79 (0.06)*** | 0.99 (0.03) | |
| Reference heath centre (vs heath centre) | 0.49 (0.25) | 0.64 (0.26) | 0.54 (0.38) | | 2.53 (1.27)* | | 0.89 (0.36) | | 0.45 (0.28) | | 0.41 (0.16)** | 0.50 (0.16)** |
| Age | 0.97 (0.02)* | 0.97 (0.01)* | 0.94 (0.03)** | 0.96 (0.02)** | 0.89 (0.04)*** | 0.92 (0.02)*** | 1.03 (0.02) | | 0.96 (0.03) | | 1.01 (0.02) | |
| Male (vs female) | 0.82 (0.27) | | 0.80 (0.32) | | 1.32 (0.68) | | 1.03 (0.32) | | 3.37 (1.62)** | 2.36 (1.01)** | 1.57 (0.47) | 1.74 (0.44)** |
| Number of dependents | 1.08 (0.05)* | 1.07 (0.04)** | 0.99 (0.05) | | 1.01 (0.08) | | 1.06 (0.03)* | 1.08 (0.03)*** | 1.09 (0.04)** | | 1.05 (0.03) | 1.04 (0.03) |

*P≤0.1 **p≤0.05 ***p≤0.01

† Government pay = salary and/or occupational risk allowance

¥ The small number of observations meant receipt of government payments could not be included in the model for performance payments.

**Table 10 (continued): Logistic regressions for determinants of non-governmental sources of income**

| | User fees | | Informal payments | | Private payment | | Non-clinical activities | | Performance payments | | Per diems | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Explanatory variables** | **Odds ratio (SE)** | | | | | | | | | | | |
| | **Full** | **Reduced** | **Full** | **Reduced** | **Full** | **Reduced** | **Full** | **Reduced** | **Full** | **Reduced** | **Full** | **Reduced** |
| Married (vs not married) | 0.92 (0.11) | | 0.95 (0.17) | | 0.88 (0.20) | | 1.08 (0.13) | | 1.34 (0.24) | | 0.84 (0.10) | |
| University (vs school education) | 0.83 (0.33) | | 0.84 (0.38) | | 1.32 (0.79) | | 0.93 (0.27) | | 1.02 (0.43) | | 1.28 (0.36) | |
| ASSP programme | 1.55 (0.64) | | 0.41 (0.17)** | 0.48 (0.17)** | 2.47 (1.13)** | | 1.51 (0.44) | | 1.74 (1.05) | | 1.98 (0.64)** | 1.80 (0.49)** |
| Receives any government pay† | 0.20 (0.08)*** | | 0.95 (0.39) | | 4.11 (2.37)** | 2.76 (1.33)** | 0.55 (0.17)* | 0.51 (0.15)** | ¥ | | 1.68 (0.47)* | 1.92 (0.50)** |
| Receives user fees | - | - | 0.89 (0.41) | | - | - | 1.32 (0.41) | | - | - | - | - |
| Receives informal payments | - | - | - | - | - | - | 1.32 (0.48) | | - | - | - | - |
| Receives payment from private practice | - | - | - | - | - | - | 3.00 (1.56)** | 2.64 (1.21)** | - | - | - | - |
| Receives performance payments | - | - | - | - | - | - | 0.67 (0.21) | | - | - | - | - |
| Constant | 14.87 (20.39)** | 4.24 (2.58)** | 2.54 (3.75) | 0.77 (0.65) | 0.27 (0.48) | 0.12 (0.13)* | 0.03 (0.03)*** | 0.18 (0.13)** | 0.00 (0.00)*** | 0.00 (0.00)*** | 0.15 (0.14)** | 0.19 (0.13)** |
| | | | | | | | | | | | | |
| Pseudo $R^2$ | 0.15 | 0.07 | 0.15 | 0.10 | 0.24 | 0.18 | 0.16 | 0.15 | 0.46*** | 0.44*** | 0.13 | 0.11 |
| Model $\chi^2$ | 44.56*** | 21.42*** | 35.55** | 29.59*** | 42.99*** | 29.19*** | 53.16*** | 44.09*** | 77.28 | 47.64 | 47.41*** | 52.87*** |
| Number observations (n) | 333 | 391 | 332 | 405 | 286 | 329 | 326 | 367 | 266 | 266 | 333 | 372 |

*P≤0.1 **p≤0.05 ***p≤0.01

† Government pay = salary and/or occupational risk allowance

¥ The small number of observations meant receipt of government payments could not be included in the model for performance payments.

**Total remuneration**

In Province Orientale (β=-0.47, p=0.032) and Maniema (β =-1.26, p<0.000), nurses had lower levels of total income than nurses in Equateur. Males earned more income overall than females (β=0.21, p=0.05). Receipt of each income source was associated with a higher overall total income, with the exception of informal payments and payments from private clinical work.

**Table 11: OLS model for total remuneration**

| **Explanatory variables** | **Coefficient (SE)** | |
|---|---|---|
| | **Full model** | **Reduced model** |
| Years in position | -0.01 (0.01) | |
| Kasai Occidental (vs Equateur) | -0.37 (0.19)* | -0.27 (0.17) |
| Kasai Orientale (vs Equateur) | -0.11 (0.30) | -0.07 (0.28) |
| Maniema (vs Equateur) | -1.27 (0.26)*** | -1.26 (0.18)*** (p<0.001) |
| Province Orientale (vs Equateur) | -0.74 (0.24)*** | -0.47 (0.22)** (p=0.032) |
| Population served | 0.00 (0.00) | |
| Total personnel | -0.01 (0.08) | |
| Urban (vs rural) | 0.22 (0.26) | |
| Number of services | 0.06 (0.04) | |
| Distance of facility from village | 0.01 (0.02) | |
| Reference heath centre (vs heath centre) | -0.26 (0.21) | |
| Age | 0.01 (0.01) | |
| Male (vs female) | 0.26 (0.13)** | 0.21 (0.12)* |
| Number of dependents | -0.01 (0.02) | |
| Married (vs not married) | -0.03 (0.04) | |
| University (vs school education) | 0.11 (0.12) | |
| Supported by ASSP programme | -0.13 (0.18) | |
| Receives salary | 0.73 (0.14)*** | 0.79 (0.12)*** (p<0.001) |
| Receives occupational risk allowance | 0.81 (0.15)*** | 0.70 (0.12)*** P<0.001 |
| Receives performance payment | 0.59 (0.18)*** | 0.77 (0.15)*** P<0.001 |
| Receives user fees | 0.65 (0.20)*** | 0.75 (0.17)*** P<0.001 |
| Receives informal payments | 0.01 (0.17) | |
| Receives income from private clinical work | -0.01 (0.25) | |
| Receives supplemental income | 1.03 (0.13)*** | 1.00 (0.10)*** P<0.001 |
| Receives per diems | 0.20 (0.13) | 0.20 (0.11)* |
| | | |
| Constant | 2.45 (0.42)*** | 2.91 (0.22)*** |
| $R^2$ | 0.48*** | 0.44*** |
| Number observations (n) | 268 | 328 |

*P≤0.1 **p≤0.05 ***p≤0.01

## Discussion

Firstly, the results of the study illustrate a shortage of key personnel in both urban and rural primary care facilities. This is at odds with the general perception that there is a glut, also often referred to as a "plethore", of health workers in facilities. However, these findings are consistent with a recent World Bank study, which demonstrated that the vast majority of health facilities, mainly in rural areas, are understaffed (Bertone & Lurton, 2015). This study therefore emphasises the urgent need to focus on workforce planning in the DRC, in order to ensure that adequate numbers of staff are trained and deployed effectively to facilities, particularly in rural areas.

It was expected that there would be very few doctors in the sample as they usually work in hospitals, rather than health centres or reference health centres. The low numbers of all other cadres such as pharmacists and laboratory workers are also consistent with results obtained by the national human resources department of the Ministry of Health (Ministère de la Santé Publique & Secrétariat Géneral, 2013). However, nurses constitute the majority of personnel in both primary and secondary care by a long way (see Table 1), and so are an important cadre to focus on.

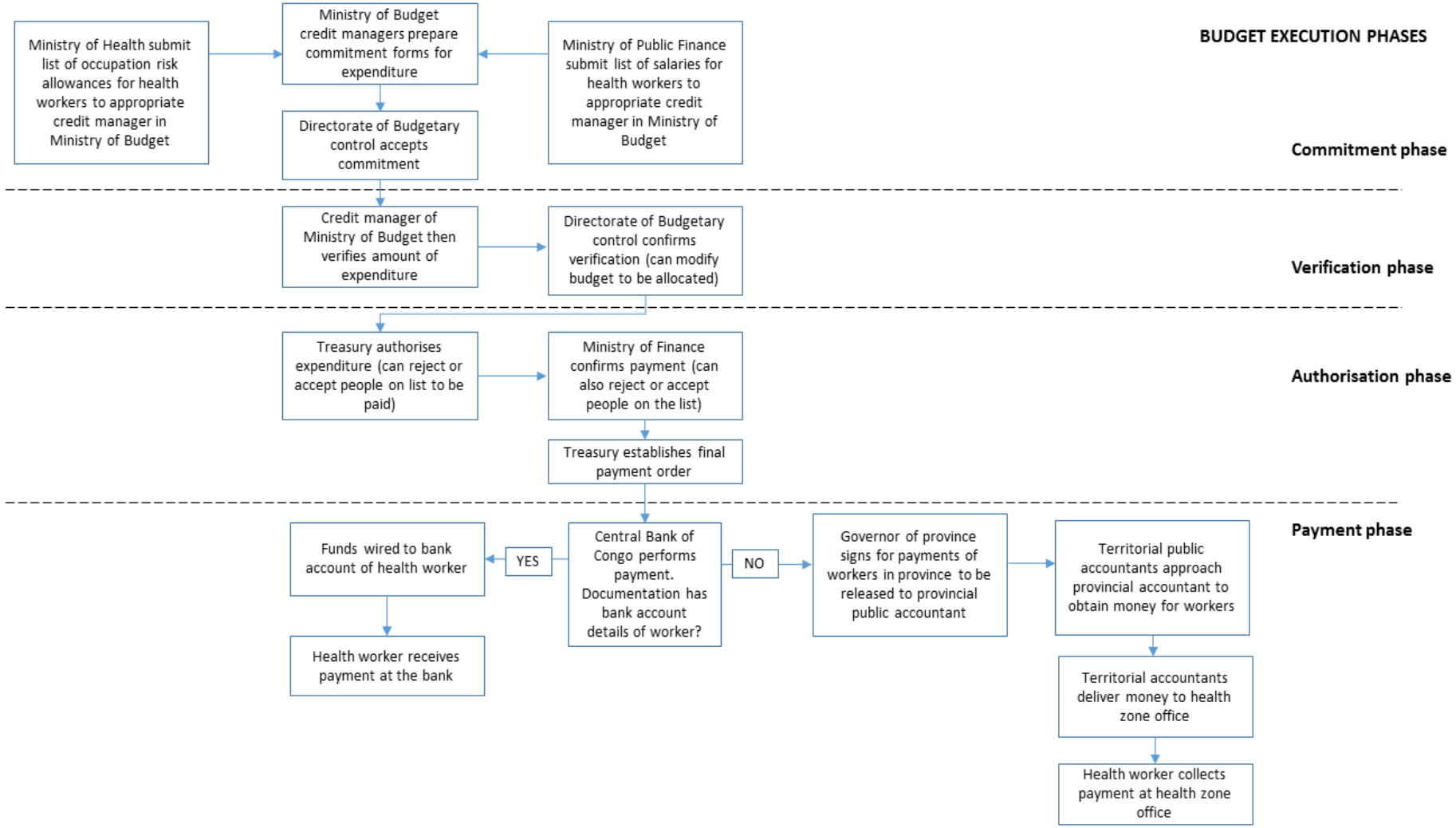
This study also confirms that nurses in the DRC receive their income from a variety of sources. The large differences in the mean and median total remuneration are not surprising given the diversity and fragmentation of income sources. There was also a lot of provincial variation in the extent to which nurses in primary care received certain types of income. Only a minority of nurses receive any remuneration from the government, while the majority reported some income from user fees. Almost half of all nurses engaged in some sort of supplemental non-clinical activity which may be indicating that the income generated from clinical activities is insufficient. However, private practice was not common amongst nurses with many expressing a dedication to working only in public facilities. Reasons given for not working in private facilities included the uncertainty around the length of contracts, a limited understanding of how private facilities function, and the low availability of private clinics. The high variability in the amounts earned from each income source may be due in part to the fact that nurses make up a fairly heterogeneous group of different grades and levels of educational attainment. Particularly for user fees, the variation may be explained by the absence of a national user fees tariff.

*Government payments*

More nurses reported receiving the occupational risk allowance compared to a salary. Although these are both government payments, they are not overseen by the same Ministry; salaries are managed by the Ministry of Public Sector Reform which is responsible for the payroll ("liste de paie") while the occupational risk allowance is issued using the "declarative list" ("liste declarative") controlled by the Ministry of Health. However, these lists are not identical as they are managed independently by each Ministry. The discordance of these lists is also confirmed by our own analysis, where the proportions of workers receiving the occupational risk allowance and salary are different. Figure 6 below illustrates the budget execution process for both government payments to health workers from the central level of

government. According to the Constitution, resources and power to manage the health sector should be transferred to provincial government but the lack of political will to implement this agenda has meant that the central government still remains in control of the execution of payments to workers. It is also important to note that several bottlenecks have been identified in the budget process which can result in a low execution rate of the allocated funds, and the different Ministries involved are able to adjust expenditures (usually downwards) on salaries and occupational risk allowances during the process (Le Gargasson, Mibulumukini, Gessner, & Colombini, 2014).

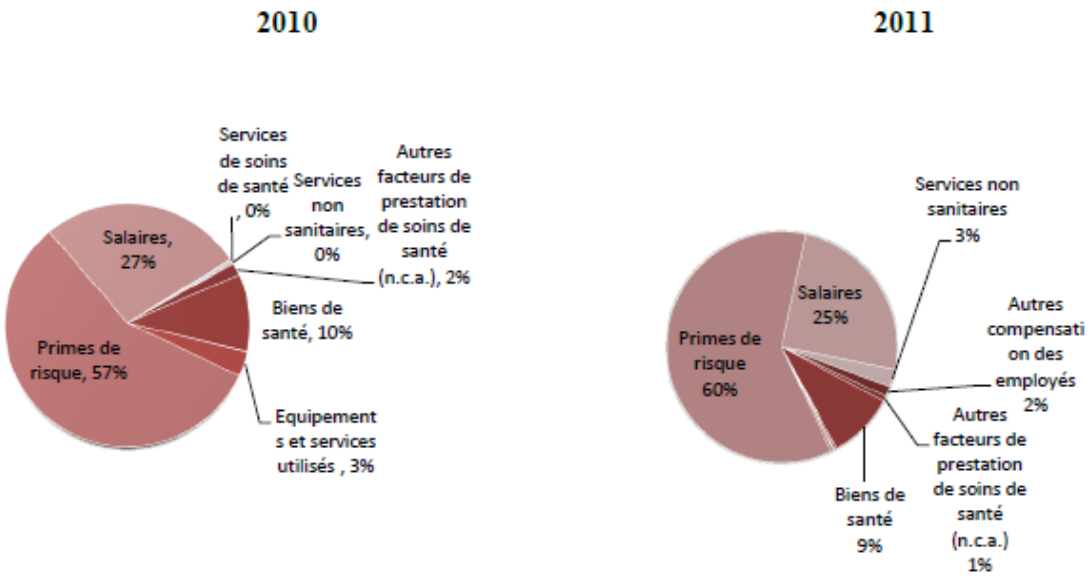
**Figure 6: Diagram of the execution of budget for health worker salaries and occupational risk allowances**



The extent to which either government payment was received varied across the provinces. Although the in-depth interviews could not explore the reasons why certain provinces were significantly associated with either receiving or not receiving government payments, the variation is likely to be due to provincial differences in the government budget available to each province for remuneration. Currently, the budget for remunerations is not prepared in a way where it is transparently broken down by provinces and the majority of the executed funds by province are usually untraceable (H Colquhoun, pers comm). A recent study of Katanga, South Kivu and Kasai Oriental provinces to investigate this very issue found that the allocation and execution of the health budget was inequitable between these provinces and was not made according to any pre-defined criteria (e.g. per capita, health indicators etc.) (UNICEF, 2015).

One reason why more nurses received the occupational risk allowance may be because the "liste declarative" is submitted each quarter using information from the health zone officials, while the salary payroll is only submitted annually and therefore there are fewer opportunities to update it. Yet, there were suggestions from nurses that the process of updating the "liste declarative" is even manipulated at the health zone level by those in control of the list. Other reasons for the higher proportion of nurses receiving this allowance are that it is a lower amount than the salary, potentially allowing more nurses to be paid within the allocated budget, and that a greater proportion of the allocated health budget goes towards the occupational risk allowance than salaries (Ministère de la Santé Publique & Programme National des Comptes de la Santé, 2013b). Figure 7 taken from the national health accounts demonstrates this below.

**Figure 7: Allocated spend of government by health activity, 2010 to 2011**




Source: National health accounts DRC, 2011-2012 (Ministère de la Santé Publique & Programme National des Comptes de la Santé, 2013b)
N.B. Primes de risqué and salaries for all health worker cadres

In terms of improving the number of nurses receiving a salary and/or occupational risk allowance, a repeat census of workers is needed in order to identify nurses who have more recently started working in facilities. The last effective census was in 2006, therefore it is not surprising that our logistic regression results confirmed that nurses who have been working for longer in facilities are more likely to receive a salary or occupational risk allowance. Even if a repeat census is held, it should be ensured that it will translate into changes being made to the "liste de paie" or "liste declarative" and that both lists are subsequently kept up to date; our results indicate that a census conducted in 2010 may not have been effective at capturing those nurses working in facilities. Poor progress on civil service reform in the DRC in the past has been attributed to a variety of reasons, including: fragmented donor involvement and poor co-ordination, overly ambitious time-scales and objectives, and the institution of parallel systems which undermine the existing government system (Moshonas, 2013). Reforming government pay systems is also politically sensitive so partners need to understand and negotiate political agendas which will influence the implementation and outcomes of seemingly straight-forward technical interventions such as a census. Nonetheless, receiving government payments sometimes had the unintended consequence of giving workers the freedom to work elsewhere (either in private healthcare or in non-clinical activities), often displacing them from their duties in public facilities. A census could also potentially identify those nurses who are not working but still receiving government payments; such workers could be deregistered which would discourage others from neglecting their clinical responsibilities in public facilities.

More work is also needed in clarifying the salary and occupational risk allowance policy for nurses. Nurses reported they received less than what they expected to receive, and the gap between expected and actual pay was higher for salaries compared to the occupational risk allowance. There should be a clear policy on when government payments will be paid, how much will be paid, and around any bank charges which may be applied. Any effort to improve the management of salaries and occupational risk allowances would also need to take into account the complex political dynamics affecting which workers are paid the allowance; the government may have vested interests in maintaining the status quo as public sector pay is intricately tied to patronage and corruption (Trefon, 2010). Our interviews revealed that tensions between tribes may also play a part in whether workers receive payment from the government.

During interviews, it was also not clear why nurses receiving both government payments would receive their salary from the bank but the occupational risk allowance in cash from the health zone office. This perhaps further reflects the fact that the "liste declarative" is not reconciled with the "liste de paie". Furthermore, a cash-based system of paying workers has the potential to create more opportunities for the diversion of payments. If possible, a system should be developed to ensure that the details of workers with bank accounts is updated with the relevant Ministry, and that all workers have access to a bank account or are "bancarised". Collaboration between the provincial government and commercial banks to update staff bank details is currently known to be lacking (UNICEF, 2015).

Ideally, as all workers are entitled to a salary and occupational risk allowance, the oversight of these payments should be managed by one Ministry and the payments should be combined

in order to help minimise confusion around which workers should be paid. In addition, the institution of a Human Resources Information System (HRIS) would help to strengthen the transparency of health worker remuneration, and potentially highlight any provincial-level disparities. It is hoped that these findings will help inform the interventions which IMA is planning with respect to improving the payment of government workers from the national payroll.

*User fees*

According to interviews, the allocation of user fees to nurses at the facility level appeared to be managed in line with a standard policy. However, policies may have differed between provinces. All nurses participating in in-depth interviews also received user fee income, while the quantitative analysis suggested that nurses were more likely to receive them if they had more dependents, or resided in Maniema. For many of the interviewed nurses, user fees were the only stable form of income but the amount received could be highly variable as it was linked to the utilisation of facility services. As a short-term measure, it may be better for facilities to increase the amount of user fees allocated to nurses who do not receive government payments, however, this may be difficult to implement given it has been embedded as normal practice that everyone receives a certain portion of the user fees revenue irrespective of whether they receive any government payment or not. More work is also required to improve the documentation of user fee revenue within facilities.

*Informal payments*

It was reassuring to observe that informal payments were relatively infrequent, particularly in the ASSP programme which aims to improve the accountability of health services to communities. The transparency around tariffs may have been lower in non-ASSP supported facilities, increasing the likelihood of these facilities to charge informal payments. Ensuring awareness of the community of the official tariffs therefore appears to have been successful in limiting informal payments. However, due to the sensitivity of questions on informal payments, these results should be interpreted with caution as they are subject to social desirability bias. A study which aimed to elucidate the informal payments received by workers in Uganda by triangulating qualitative reports with information on facility charges found that most workers who had the opportunity to accept informal payments did so, and these payments were often five and ten times the formal charge (McPake et al., 1999).

*Private work*

Very few workers admitted to conducting private clinical work in our survey. This was unexpected as there is no legal impediment to public sector workers practicing in private facilities. In addition, there may have been limited opportunity to gain income from private work in the provinces sampled. Dual practice was significantly more practiced in facilities situated close to villages and in urban areas compared to rural areas, the latter in keeping with evidence from other countries (Chirwa et al., 2014; Bertone & Witter, 2015). According to the quantitative and qualitative analysis, nurses were more likely to engage in dual practice if they received income from the government; once registered with the state, a nurse would expect to receive government payments for the rest of their life. Nurses not receiving government payments thought it would be too risky to work in private facilities as it could

jeopardise any chances of gaining registration. Income from private facilities was also perceived to be more volatile.

*Non-clinical activities*

Almost half of all workers engaged in non-clinical activities to supplement their income, suggesting the revenue derived from facilities was not enough. Agricultural practices were the most common which may be because the survey sampled predominantly in rural areas. Given that the majority of workers are expected to be in the facility six days a week, the time required to undertake supplemental activities could potentially negatively impact on commitments to clinical responsibilities. It was not clear whether most of these non-clinical activities were conducted outside of working hours, however some respondents did confess that either they or their colleagues conducted these activities during times they were supposed to be in the health facility.

*Performance payments and per diems*

The provincial variation in the receipt of performance payments and per diems can be explained by the differential presence of donors and NGOs providing these. It is not surprising that workers in Maniema were significantly more likely to receive performance payments than workers in Equateur; this was due to the fact that workers were still receiving some performance payments from the ASSP programme at the time of the survey, although this was in the process of being phased out. The province of Maniema also appears to be a particularly interesting case, as workers were less likely to receive salaries but more likely to receive user fees and performance pay. Several of Maniema's health zones were known to be receiving regular performance payments from the previous DFID programme Access to Healthcare since 2008. As the government budget is fungible, it is possible that the government prioritises the allocation of spend on salaries on areas where workers are not supported by donor programmes, although we have no evidence to substantiate this claim. Another hypothesis is that health workers are less likely to push for inclusion on the payroll if they are receiving an income which substitutes their salary (Bertone & Lurton, 2015). Performance payments tended to be comparable in their amount to the occupational risk allowance and income from user fees; we hope this study is useful to partners so that they can assess which amounts of performance payments could have the potential to distort health worker incentives in the context of other sources of income.

Per diems were sometimes perceived to be unfairly managed. This may be because this responsibility was often delegated to the head of the facility who seemed to have discretion on how these were allocated. The quantitative analysis also indicates evidence of gender discrimination in the allocation of per diems as well as performance payments, with male nurses being significantly more likely to receive these even after controlling for other individual and facility characteristics. Several studies in other low-income countries have demonstrated how the mismanagement and abuse of per diems and performance payments can contribute to a negative organisational culture, on account of the tensions they create (Vian, Miller, Themba & Bukuluki, 2012; Ridde, 2010; Paul, Sossouhounto, & Eclou, 2014). Partners should therefore be careful to ensure that any supplemental payments are distributed equitably across all facility personnel and that the same staff are not benefitting each time.

*Allowances*

Allowances were not commonly received by nurses; however, this is not surprising as there is currently no government policy to provide allowances other than the occupational risk allowance. Some workers did report receiving certain benefits but these benefits were likely to have been issued at the discretion of the facility. Yet a national policy to provide simple benefits such as free healthcare at the facility for dependents or lodging may be a "quick win" in retaining staff in facilities and potentially easy to implement.

*Total income*

Finally, the total amount of income gained was found to be significantly associated with individual sources of income such as user fees, government payments, non-clinical activities and performance payments. The direction of the association is not clear and may be an avenue of future research; whether an increase in income leads to an increase in the number of dependents or vice-versa, or even both.

## Limitations

There were several limitations to this study. Firstly, the health worker survey only recruited workers present on the day of the survey. It is possible that the sources and amount of revenues of workers who are likely to be present in facilities differs from that of workers who are less frequently working in facilities. However, the extent of this selection bias could not be determined. Secondly, the study was subject to certain biases, including the potential for workers to under-report income or inaccurately recall their income. Ideally, the responses of workers would have been checked against a register of incomes however, formal robust documentation of health worker incomes does not exist in the DRC. A better method may have been to use the technique of "unfolding brackets" in the questionnaire; this approach is often used for sensitive quantitative questions in order to reduce non-response (Heeringa *et al.* 1995). If a respondent does not wish to offer a precise value for a quantitative question, they are asked to answer whether the quantity lies within a pre-specified bracket of values. Ranges presented become increasingly narrower until a final bracket of values within which the quantity of interest lies is selected.

Nonetheless, when the data from qualitative interviews were triangulated with the results from the survey, no substantial differences in the amounts of income reported could be identified. Thirdly, given the opaque policies surrounding government payments, it was not possible to describe whether workers were even receiving the correct amount as no standards for salaries by nursing grade or qualification are available; the policy is only given by administrative grade which this study did not enquire about. The acquisition of up to date information from policy documents in order to contextualise findings was also problematic; for example, figures from national health accounts will always be dated as there is a significant delay in compiling the information and then conducting the necessary analyses. In addition, due to resource constraints, qualitative interviews could only be conducted in one of the five provinces and so were unable to identify reasons for the provincial variation observed. Unfortunately, the timing of the interviews also preceded the analysis of the quantitative data and so the findings of the survey could not be used to ascertain why certain

determinants were significantly associated with each source of income. Another limitation is that although the quantitative survey covered several facilities in different provinces, these facilities only made up a small proportion of the overall number of state primary care facilities and therefore the results are not necessarily representative. Finally, the small numbers of workers identified in cadres outside of the nursing profession meant that the results for these cadres were less reliable. However, this is not surprising as according to national guidelines, nurses should make up the majority of staff in primary health care facilities.

## Conclusion

A recently published paper has discussed the importance of exploring the multiple sources of health worker incomes which make up their total remuneration (Bertone & Witter, 2015). Given the importance of financial incentives in relation to motivation, an understanding of the income structure of workers is necessary in order to design more effective financial incentive packages. Previous studies have tended to focus on specific sources of income, rather than the multiple sources of income available to workers and how these may interact. For instance, in this study, we found that income from dual practice was more likely to complement nurse's incomes if they received government payments than if they did not receive government payments. Similarly, nurses were not significantly more likely to receive other types of income such as user fees if they were not receiving government payments. We also discovered what factors determined whether nurses received certain income sources, and how these factors contributed to their overall remuneration. For example, nurses in urban areas had greater opportunities to engage in dual practice. Contextual factors such as the presence of other programmes and local user fee policy also influenced the extent to which nurses received many sources of income such as per diems, performance payments and user fees. In addition, local politics within facilities and health zones determined opportunities to receive certain incomes such as per diems and the occupational risk allowance. It can be seen from the results of this study that there is an urgent need to review the current policies around the payment of personnel in primary care health facilities. Greater co-ordination is needed between all partners involved in the remuneration of workers in order to reduce fragmentation of incomes and improve transparency in the payment of workers in the DRC.

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# Appendix A: Proposed ASSP Operations Research Concept Note, Health Worker Motivation Study

**2nd May 2014**

## Background

The performance and benefits produced by the health system depend heavily on the knowledge, skills and motivation of its workforce (WHO, 2000). Health workers are also critically important to the functioning of a health system as they manage and coordinate other important elements, including technology and infrastructure (WHO, 2006). In the Democratic Republic of Congo (DRC), several challenges exist in relation to human resources for health. One of the most significant challenges is that the public sector wage system no longer functions effectively, which has important implications for health worker motivation and performance (World Bank, 2008). In general, there is a lack of transparency on what health workers receive and what they should actually be paid by government; a large proportion of health workers do not receive a salary at all (Fox et al., 2013). In addition, the payment of health workers is not limited to salaries; workers may receive complementary remuneration in the form of user fees and/or informal payments from patients, and per diems and/or salary supplements from both government and organisations external to the government such as donors and non-governmental organisations (NGOs). Many health workers may also supplement their income by engaging in private practice or non-health related income-generating activities. The existence of such a complex remuneration structure can have significant repercussions for the motivation and behaviour of health workers within the public sector health system.

## Interventions affecting health workers in Accès Aux Soins de Santé Primaires (ASSP)

In the twenty health zones which were previously receiving financial and technical assistance from DFID, ASSP has eliminated the payment of salary supplements or "primes" (previously financed by DFID) to heath workers over the past year. The reasoning for this was that the payment of primes by donors is not viewed as a sustainable solution to strengthening the health system, and to an extent relinquishes government of its responsibility to pay health worker salaries. According to the results of a health needs assessment conducted by IMA in ASSP zones in early 2013, in areas where projects have not been paying primes, 30% of the workforce is registered on the government payroll system. Yet in areas where donor-financed primes have been operating, only 3% of the workforce is on the government payroll.

As part of ASSP, all health workers will be receiving training and supervision which could affect health worker motivation. However, in addition a package of interventions aimed at strengthening information on human resources for health and improving the management and potentially the payment of health workers will be piloted in the province of Kasai Occidental. This package of interventions will be jointly implemented by IMA and the subcontracted technical partner IntraHealth. The pilot will also be implemented alongside the World Bank, who will be conducting a census of all other civil servants in certain other target sectors including agriculture and environment as part of their Governance Capacity-Building project or "Projet de renforcement des capacités en gouvernance".

During the pilot, which is due to commence in June 2014, the following activities will occur:

- Census of all health workers working in Kasai Occidental health zones (June to July 2014).
- WISN (Workload Indicator of Staffing Needs) methodology applied to selected health zones by Intrahealth, IMA and the Ministry if Health, to calculate the number and types of staff needed in health facilities.
- Development of national norms on staffing of facilities during a national workshop using results obtained from the WISN methodology followed by the elaboration of a plan to rationalise and/or redeploy staff.
- Information on health workers in pilot health zones e.g. qualifications, biometric data etc. will be recorded on iHRIS software (an open source human resources information system), which will be deployed in all Kasai Occidental health zones, at the district provincial levels and at the central level of the Ministry of Health.
- Prior to the setting of the 2015 health budget and provided the Ministry of Public sector is content with the census and data validation process above, the information on Kasai Occidental health workers will be used to "clean" the current staff payroll by eliminating "ghost" workers for these pilot health zones and implementing the rationalisation plan.
- Prior to the setting of the 2015 health budget and provided the Ministry of Health is content with the census and data validation process, the information on Kasai Occidental will also be used to "clean" the list of workers receiving "primes de risques".
- As part of the pilot, there may be some scope to work with partners on "bancarisation" to improve the transparency and transfer of salaries/"primes de risques" to health workers, but this is not confirmed.

**Literature review and research gaps**

Despite the existence of a significant body of qualitative literature on the complex remuneration structures of health workers in post-conflict states (Roenen et al., 1997; Smith, 2003; Muula and Maseko, 2006; Vian and Bukuluki, 2011), little quantitative data on health worker financial remuneration and its effects on health worker practices and performance exists (McCoy et al., 2008; Witter, Kusi and Aikins, 2007). Such information would be important in informing national discussions on health worker salary policy and coordinating the efforts of the government and other partners involved in health worker remuneration. This information will also contribute to ASSP in understanding the baseline situation of financial payments to health workers prior to implementing a package of human resources (HR) interventions. In addition, the factors that influence health worker motivation (including both financial and non-financial incentives) have never been examined in the DRC. A deeper understanding of these influences may allow ASSP and the government to refine interventions aimed at strengthening the motivation and performance of health workers.

Previous attempts to withdraw the payment of salary supplements by external partners have proven to be difficult in other fragile states; for instance, in 2006 the NGO Merlin had to reinstate the payment of salary supplements to health workers in Liberia as staff were selling drug supplies to private clinics to supplement their income when salary supplements were initially withdrawn (DFID, 2011). Therefore, the effects of a strategy to eliminate salary

supplements within ASSP may have important programmatic implications on account of the pivotal role played by health workers in health service delivery.

In contrast to the recent proliferation of studies evaluating "pay for performance" strategies in low-income countries (Borghi et al., 2013; Ssengooba, McPake and Palmer, 2012; Witter et al., 2012), there is little robust evidence in the academic and grey literature on how strengthening human resource information systems (HRIS) can improve the state's management and payment of its workforce. Although HRIS make it possible to plan for health worker requirements and are a step towards improving the processing of payments (Perry, 2005; Ferrinho and Omar, 2006; Gilson and Erasmus, 2005), a recent systematic review identified a lack of rigorous research on HRIS implementation in developing countries (Riley et al., 2012). It also concluded that a disappointingly small number of countries actually used the data generated by the system in decision-making over human resources. There is also little evidence on how to overcome the challenges impeding the effective management and payment of human resources for health in fragile states; these challenges include inaccurate payroll information, inadequate national budget allocations for salaries, logistical challenges, corruption, poor leadership, and weak governance (Goldsmith, 2010). Hence, the generation of more evidence in this area will aid understanding on how best to transition towards a more sustainable model of financing health systems in fragile states. This research will also be of relevance to similar interventions in other public sectors such as education.

**Overall aim**

The overarching aim of this research is to describe the environment in which health workers currently operate, and the importance of both financial and non-financial incentives in influencing motivation. The effects of a package of interventions to improve the management and payment of the health workforce will also be investigated.

**Research questions**

*Phase 1:*

1. What are the different sources and levels of income currently received by health workers in the DRC?

2. Which characteristics of health workers are significantly associated with receiving a low level of income?

3. To what extent do health workers receive a government salary and does the amount received concur with the current salary policy?

*Phase 2:*

4. What are the determinants of health worker motivation and behaviour? (e.g. pride, perceived self-efficacy, perceived conscientiousness, financial reward etc.)

5. Does health worker motivation and behaviour in ASSP zones where salary supplements have been gradually removed differ from that in ASSP zones where salary supplements were never operational? If so, how?

*Phase 3:*

6. Using a theory of change approach, what are the facilitators and bottlenecks at different levels of the health system in the implementation of a package of interventions to improve the management and payment of health workers?

7. Is the package of HR interventions being implemented as planned and are the expected changes occurring?

8. What are the intended and unintended consequences observed when implementing a package of HR interventions?

9. Have the HR interventions improved government payments to health workers?

10. Have the HR interventions improved motivation and behaviour of health workers?

*N.B. For phase 3 of the study, research questions 7 and 8 will be further clarified following the articulation of a theory of change for the package of HR interventions as described in the following sections.*

**Methodology**

This study will be based on 1) quantitative data from the ASSP baseline surveys (mainly health facility, health worker and household surveys), 2) qualitative data from in-depth interviews with a variety of key stakeholders, 3) document review and direct observation of meetings and workshops within ASSP, and 4) routine monitoring data collected by the ASSP programme.

*Phase 1:*

**Data:** Data for this descriptive phase will be obtained directly from the health facility and health worker questionnaires in the baseline survey. The health facility survey will provide detailed information on the characteristics of official health centres while the health worker survey will contain questions on demographic characteristics and levels and sources of income. Data collection will take place from March to May 2014.

**Sample Size:** The total sample size for the health facility survey will be 210 facilities, while the total sample size for the health worker survey will be all health workers working on the day of the survey in these facilities.

*Phase 2:*

This phase will employ a mixed methods approach to explore the determinants of health worker motivation and behaviour, and also differences between zones where health workers received primes in the past compared to zones where primes were never operational.

**Data:** Data on health worker motivation will be collected from the health worker survey. Likert scales of 1 to 5 have been used (strongly agree to strongly disagree) in the health worker survey to inquire about levels of motivation. The questions selected are based upon previous tools and themes identified in the literature, and anecdotal reports from

implementing partners and health workers. Items with negative statements will be reverse coded when calculating scores. Data on behaviour will be obtained from both the health worker survey and household survey (which will be linked to the health worker survey). Behaviour measures include: the number of hours worked, reported absenteeism, time spent on provision of services, and satisfaction reported by patients on the quality of care received. Data collection will take place from March to May 2014.

In-depth interviews inquiring about levels of motivation and behaviour will also be conducted with a purposive sample of nurses and doctors in zones where primes were operational and zones where primes were not operational. Data collection will take place from August 2014.

**Sample Size:** The total number of household surveys will be 4200. The sample size for the health worker survey is given in Phase 1 above. Four nurses and four doctors at facilities previously receiving primes will be interviewed and four nurses and four doctors at facilities which have never received primes will be interviewed.

*Phase 3:*

This phase will include a theory-based process evaluation and controlled before and after study.

**Data:** Process data concerning implementation of the intervention will be both quantitative and qualitative. A plausible theory of change narrative will first be developed with stakeholders in order to determine the links between the intervention activities and intended outcomes. This theory of change will also inform the choice of indicators to be measured during the evaluation process. Qualitative data will be collected from participants in the form of in-depth interviews during at least two intervals during the pilot intervention activities, in order to understand the fidelity of the implementation process, as well as potential facilitators and bottlenecks. Information will be collected on the intended and any unintended consequences. Study participants from each of the stakeholder groups specified in table 1 below will be purposively selected on the basis of their involvement in the intervention.

**Table 1: Stakeholder Groups involved in the intervention**

| Stakeholder Group | Role |
|---|---|
| DFID | Donor of funds to ASSP programme. |
| Ministry of Health and its department for human resources at the central level | Central Ministry of Health and department on human resources sets overarching policy on human resources for health. |
| Ministry of Health: provincial/district and zone levels | Provincial levels supervise zonal level, and zonal levels are expected to implement the national policy. |
| Ministry of Public Sector Reform | Leads on civil service reform and is in charge of the civil service payroll. |
| IntraHealth | Technical partner responsible for implementing HRIS software. |
| Ministry of Finance | Proposes economic and financial policy, leads on public financial management and manages tax collection. |
| Ministry of Budget | Controls government expenditure. |
| IMA WorldHealth | Lead partner in implementing the ASSP programme, |
| NGO implementing partners of ASSP programme – World Vision, Caritas, SANRU | Work closely to support health workers to deliver the ASSP programme. |
| Other donors/NGOs | Donors such as the World Bank are also engaged HR strengthening programmes in the DRC |
| Health workers | Directly affected by any changes in human resources policy. |

Relevant documents will be reviewed (e.g., progress reports), and the researcher will attend relevant meetings and workshops in order to observe both the discussion and implementation of HR activities.

For the controlled before and after study, ASSP health zones in Kasai Occidental will be considered to be the "intervention zones" and ASSP health zones in Equateur where the pilot will not be implemented, will be considered to be "control zones". Prior to the pilot, surveys as part of the baseline for the ASSP impact evaluation will have been undertaken in Kasai Occidental and Equateur. Midline surveys of the same health facilities (again as part of the midline impact evaluation of ASSP) in both Equateur and Kasai Occidental will be conducted in October 2015, following implementation of the HR activities in Kasai Occidental.

Quantitative data on variables to be collected and their sources are given in the table below:

| **Variables** | **Source** |
|---|---|
| Motivation scores of health workers | Health worker survey (baseline and midline) |
| Health worker productivity, number of hours worked | Utilisation rates from routine health information data<br>Health worker survey (baseline and midline) |
| Number of workers receiving government payment – salaries and/or "primes de risques" | Health worker survey (baseline and midline)<br>Payroll/Intrahealth data |

**Sample size:** For the process evaluation, a minimum of 22 interviews will be conducted with key stakeholders. The sample size for the before and after controlled study will be determined by the number of health workers and facilities sampled in the baseline and midline survey.

*Phase 1:*

Descriptive statistics will be used to explore the following: demographic characteristics of health workers answering the survey, the amount health workers receive for each different source of income and/or in allowances, the proportion of health workers receiving income/allowances from different sources, the average number of income sources received by health workers, and the frequency of different payments to health workers.

In addition, multivariate regression analysis of the data using levels for each source of income as the dependent variables will be performed. Independent variables from the health worker survey will include: age, marital status, gender, health worker position/cadre, qualifications, years worked at facility, number of financial dependents, number of hours worked per week, number of income sources, and presence of the ASSP programme. Independent variables from the health facility survey will include: location and type of facility, total number of staff, facility volume or number of patients seen, and services offered. Discrepancies between the official amount to be paid and actual pay from the government will also be quantified and described.

*Phase 2:*

Exploratory factor analysis techniques will be employed to identify the number of latent constructs and the underlying factor structure of the health worker motivation survey questions. Items with loadings less than 0.32 will be dropped. Internal consistency of each component of the instrument will be assessed using Cronbach's alpha. A coefficient value of > 0.70 will be required for a component to be considered as being consistent.

Scores for each latent construct will be standardised to 100 to allow for comparison between other constructs. Overall scores will be calculated as the sum of all sub-scores of latent factors described. Univariate analyses and a multiple regression model will be used to identify relationships between independent variables and motivation. Independent variables will include: age, marital status, gender, health worker position/cadre, qualifications, years worked at facility, number of financial dependents, number of hours worked per week,

number of income sources, and presence of the ASSP programme. Independent variables from the health facility survey will include: location and type of facility, total number of staff, facility volume or number of patients seen, and services offered.

Data on overall motivation in the baseline health worker survey will then be calculated by the sum of all sub-scores of latent constructs identified for groups receiving salary supplements and groups not receiving salary supplements. Data on the sub-scores of latent constructs for both groups will also be calculated. Multivariate regression will be used to compare motivation scores for individual constructs and overall motivation scores in both groups. The model will contain a dummy variable indicating whether health workers used to receive salary supplements or did not. The following independent variables will also be included: age, marital status, gender, health worker position/cadre, qualifications, years worked at facility, number of financial dependents, number of hours worked per week, and number of income sources, location and type of facility, total number of staff, facility volume or number of patients seen, and services offered.

For the qualitative data analysis, once the health worker in-depth interviews are transcribed and entered into Microsoft Word, transcripts will be reviewed and a coding system will be developed. Coding categories will be derived from the initial research themes and questions, as well as key concepts that emerge during data collection. Coding of the interview transcripts will be done on ATLAS.ti, a text-organizing software. Content analysis will be used to identify trends of concepts in and across individual codes. Data triangulation will be used to ensure that the findings are validated across different respondents. Efforts will also be made to identify direct quotations that illuminate key data findings.

*Phase 3:*

For the process evaluation, participant observations during the implementation activities, review of relevant documents, and in-depth interviews will be used to understand the design, decision processes and rationale for participants' responses. Thematic analysis of responses during qualitative interviews will be undertaken using an inductive technique to construct plausible explanations of participant's responses to the package of interventions. Repeat interviews will permit validation of explanations of the mechanism by which the package of interventions works. The analysis will also depend on the other indicators which will be developed following the construction of a theory of change, and test whether the package of interventions works according to the theory of change articulated from the outset.

For the controlled before and after study, a comparison of all variables between intervention and control arms will be made at baseline. Tests of differences in means of motivation scores, number of hours worked, number of workers receiving government payment, and health worker productivity between intervention and control groups for both the baseline and midline surveys will be conducted, and t-tests undertaken to assess whether the differences are statistically significant. A difference-in-difference regression analysis will also be conducted to assess the independent effect of the intervention on each of the outcome variables, controlling for factors which may influence the given outcome.

A limitation of this approach is that the before-and-after study will not be conducted within the same province and there may be other contextual factors explaining the differences between the two areas. However, this was not avoidable as the pilot needed to cover all of Kasai Occidental in order to effectively coordinate with the World Bank's project.

**Research staff**

The study will be co-led by Drs. Rishma Maini and David Hotchkiss. Dr. Maini is a public health registrar who has been working in the DRC for the past 1.5 years and is a PhD student with the London School of Hygiene and Tropical Medicine. She will also be receiving supervisory support from Drs. Natasha Palmer and Josephine Borghi, both health economists with extensive research experience in countries in sub-Saharan Africa. Dr. Hotchkiss is a health economist with research expertise in health care financing issues in low- and middle-income countries. He is also a faculty member of Tulane University's School of Public Health and Tropical Medicine and the Technical Lead on the Operation Research and Impact Assessment component of the ASSP Project.

Research assistance for the qualitative component of the study will be provided by Anicet Yemweni and Cele Manianga, lecturers at the University of Kinshasa who have training in medical anthropology and extensive experience in qualitative data collection.

**Ethics**

This is minimal risk study. The researchers will obtain informed consent from all study participants. Ethical approval of the study and data collection procedures will be obtained from the Institutional Review Boards of Tulane and the Kinshasa School of Public Health before data collection commences.

**Deliverables**

Two technical reports to be disseminated to all stakeholders. The first technical report will be based on phases 1 and 2 of the OR study and the second technical report will be based on phase 3 of the study.

**Timeline**

See table below.

**Estimated costs**

The total estimated cost for this research is approximately $70,000 (excludes costs of baseline and midline surveys).

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**Timeline**

Operational Research Steps and Milestones

| | |
|---|---|
| Programme: | ASSP - OR |
| Study Topic: | Health worker motivation |
| DFID Adviser(s): | Sarah Goldsmith, Lizz Frost Yocum |
| Implementer: | Tulane |

| | **Steps and Milestones (marked in *)** | **Expected** | **Completed** | **Notes** |
|---|---|---|---|---|
| 1 | **Identifying Research Topics** | | | |
| | Study topics proposed to DFID | Dec 2013 | Dec 2013 | |
| * | DFID APPROVAL : Study topic agreed by DFID (with input from IMA) | Jan 2014 | Jan 2014 | |
| 2 | **Drafting Concept Note** | | | |
| | Discussions with DFID, gov and other stakeholders on research questions for the study completed | Feb 2014 | | |
| | Development of study concept note | Feb, 2014 | | |
| | Submission of Concept Note to DFID | 2 May, 2014 | | |
| * | DFID APPROVAL: Concept Note approved by DFID (OR STUDIES ONLY) | June, 2014 | | |
| * | DFID APPROVAL: CV of lead researcher agreed by DFID | June, 2014 | | |
| 3 | **Developing Study Protocol** | | | |
| | Protocol and instruments completed | July, 2014 | | |
| | Submission of Study Protocol to DFID | July 14, 2014 | | |
| | DFID review and QA | July 14 - 28, 2014 | | |
| * | DFID APPROVAL: When protocol has passed QA | July 28, 2014 | | |
| | Authorisation in writing from DFID to start research implementation | August 18, 2014 | | |
| | Tulane IRB approval given | August 11, 2014 | | |
| | Local IRB approval given | August 11, 2014 | | |
| 4 | **Implementing Study** | | | |
| | Field workers trained | August 30, 2014 | | |
| | Field work/ secondary data collection completed. | June 2015 | | Phase 1 collection completed by August 2014 (baseline survey)<br>Phase 2 collection completed by October 2014<br>Phase 3 collection completed by April 2015 |

| | | | | |
|---|---|---|---|---|
| | Analysis of data completed | Sept 30, 2015 | | Phase 1 analysis completed by October 2014<br>Phase 2 analysis completed by January 2015<br>Phase 3 analysis completed by December 2015. |
| 5 | **Reporting,** | | | |
| | Preliminary findings presented in routine meetings with IMA and DFID | Ongoing | | Fieldwork briefs will be submitted upon completion of data collection in each province. This will include a discussion of the preliminary findings. |
| | Drafting preliminary report | December 2015 | | |
| | Preliminary report submitted | January 2016 | | |
| | Dissemination and uptake plan, based on dissemination strategy in study protocol approved earlier by DFID (following QA), submitted | January 2016 | | |
| * | DFID APPROVAL: Preliminary report | February 15 2016 | | |
| * | DFID APPROVAL: Dissemination and uptake plan | February 15 2016 | | |
| | Final report revisions | February - March 14, 2016 | | |
| | Final report submitted to DFID for approval | March 14, 2016 | | |
| | DFID review and final report | March 14-28, 2016 | | |
| * | DFID APPROVAL: Final report | March 28, 2016 | | |
| 6 | **Dissemination, Uptake** | | | |
| | Publication paper(s) reviewed by DFID | TBD | | |
| | Dissemination activities conducted | March 2016 | | |
| | Study submitted for publication | In 2016/2017 | | |

# Appendix B: Research Protocol, Health Worker Motivation in the DRC

**Date:** 7th August 2014


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**Executive Summary**

**Study objectives and research questions:** The overarching objectives of this operational research study are to describe the environment in which health workers currently operate, and the importance of both financial and non-financial incentives in influencing health worker motivation. The effects of a package of interventions to improve the organisation, management and payment of the health workforce will also be evaluated.

The following are the principal research questions that will be investigated:

*Phase One*

11. What are the different sources and levels of income currently received by health workers in the DRC?

12. Which characteristics of health workers are significantly associated with receiving a low level of income (e.g. gender)?

13. What proportion of health workers receive a government salary and, for those that do, does the amount received concur with the current salary policy?

*Phase Two*

14. What are the determinants of health worker motivation and behaviour? (e.g. pride, perceived self-efficacy, perceived conscientiousness, financial reward etc.)

15. Does health worker motivation and behaviour in ASSP zones where salary supplements have been gradually removed differ from that in ASSP zones where salary supplements were never operational? If so, how?

*Phase Three*

16. Using a theory of change approach, what are the facilitators and bottlenecks at different levels of the health system in the implementation of a complex HR intervention to improve the organisation, management and payment of health workers?

17. Is the package of HR interventions being implemented as planned and are the expected changes occurring?

18. What are the intended and unintended consequences observed when implementing a package of HR interventions?
19. Have the HR interventions improved government payments to health workers, relative to areas where the HR interventions were not carried out?

20. Have the HR interventions improved motivation and behaviour of health workers, relative to the areas where HR interventions were not carried out?

**Study design/methodology:** The study will have three main phases.

*Phase one:* This will involve a cross-sectional descriptive analysis of data relating to income sources and levels collected from health workers during the baseline surveys of ASSP. This phase will address research questions 1-3.

*Phase two:* As in phase one, data on determinants of motivation from a cross-section of health workers in ASSP and non-ASSP supported zones will be obtained from the baseline survey. In addition, a purposive sample of at least 16 nurses who used to receive salary supplements or never received salary supplements within the ASSP programme will be interviewed. This phase will address research questions 4 and 5.

*Phase three:* This phase will involve a theory-based process evaluation of the HR interventions and incorporate a controlled before-and-after study. A plausible theory of change narrative will first be developed with key stakeholders in order to determine the links between the HR intervention activities and intended outcomes. Process data relating to the implementation of HR interventions will be collected from a range of sources, including documents, qualitative in-depth interviews, programme data, meetings and workshops. For the controlled before and after study, data collected from the midline and baseline surveys will be used to compare outcomes relating to motivation and payment of workers in HR intervention areas in ASSP with areas in ASSP which are not receiving the HR interventions. This phase will address research questions 6-10.

**Target population:** The target population consists of health workers participating in both ASSP and non-ASSP zones in Maniema, Province Orientale, Kasai Occidental and Equateur.

**Sampling method and sample size:** For the surveys within the ASSP baseline evaluation, the full methodology is given in the protocol for the ASSP baseline evaluation. For the qualitative study component in phase two, purposive sampling will be used to identify nurses. In phase three, two interviews will be conducted with a member of each key stakeholder group affected by the HR interventions.

**Statistical and analytic plan:**
*Phase 1:* Descriptive analysis will be used to explore key indicators captured in the health worker survey on income. Multivariate regression analysis of the data using levels for each source of income as the dependent variables will also be performed.

*Phase 2:* Exploratory factor analysis techniques will be employed to identify the number of latent constructs and the underlying factor structure of the health worker motivation survey questions. Overall scores will be calculated as the sum of all sub-scores of latent factors described. Univariate analyses and a multiple regression model will be used to identify relationships between independent variables and motivation. Multivariate regression will also be used to compare motivation scores for individual constructs and overall motivation scores between health workers who used to receive salary supplements and health workers who never received salary supplements. For the qualitative component, content analysis will be used to identify trends of concepts in and across individual codes identified through the qualitative study.

*Phase 3:* For the process evaluation, thematic analysis of responses during qualitative interviews will be undertaken using an inductive technique to construct plausible explanations of participant's responses to the package of interventions. The analysis will also depend on the other indicators which will be developed following the construction of a theory of change, and test whether the package of interventions works according to the theory of change articulated from the outset. For the controlled before and after study, tests of differences in outcomes between intervention and control groups for both the baseline and midline surveys will be conducted, and t-tests undertaken to assess whether the differences are statistically significant. A difference-in-difference regression analysis will also be conducted to assess the independent

effect of the intervention on each of the outcome variables, controlling for factors which may influence the given outcome.

**Limitations:** Much of the data on income and motivation will rely on self-report by health workers which may be vulnerable to response bias. In phase three, the intervention and control areas of the before-and-after controlled study will be in different provinces, meaning other contextual factors could potentially explain any differences in outcomes observed.

**Ethics:** Ethical approval of the study and data collection procedures will be obtained from the Institutional Review Boards of Tulane and the Kinshasa School of Public Health before data collection commences. Oral and written informed consent will first be obtained from all participants in the qualitative study.

**Contents**

# Background and ASSP Project Description

## Health workers in the DRC

The performance and benefits produced by the health system depend heavily on the knowledge, skills and motivation of its workforce (1). Health workers are also critically important to the functioning of a health system as they manage and coordinate other important elements, including technology and infrastructure (2). In the Democratic Republic of Congo (DRC), several challenges exist in relation to human resources for health. One of the most significant challenges is that the public sector wage system no longer functions effectively, which has important implications for health worker motivation and performance. In general, there is a lack of transparency on what health workers receive and what they should actually be paid by the government; a large proportion of health workers do not receive a salary at all from government (3). This is in part due to new workers not being registered onto a payroll which is plagued by "ghost workers", which are individuals listed on the payroll to receive a salary but not currently practicing in health facilities (4). The reasons behind this are multiple: the government has failed to maintain the payroll so many workers registered on it have left the country, died, or changed occupation; corruption has allowed the proliferation of many unofficial appointments; and many registered workers are now of retirement age but in the absence of a pension system, continue to receive a salary instead.

In addition, the payment of health workers is not limited to salaries; workers may receive complementary remuneration in the form of user fees and/or informal payments from patients, and per diems and/or salary supplements from organisations external to the government such as donors and non-governmental organisations (NGOs). Many health workers may also supplement their income by engaging in private practice or non-health related income-generating activities. The existence of such a complex remuneration structure can have significant repercussions for the motivation and behaviour of health workers within the public sector health system.

## Overview of the Accès aux Soins de Santé Primaire (ASSP) project

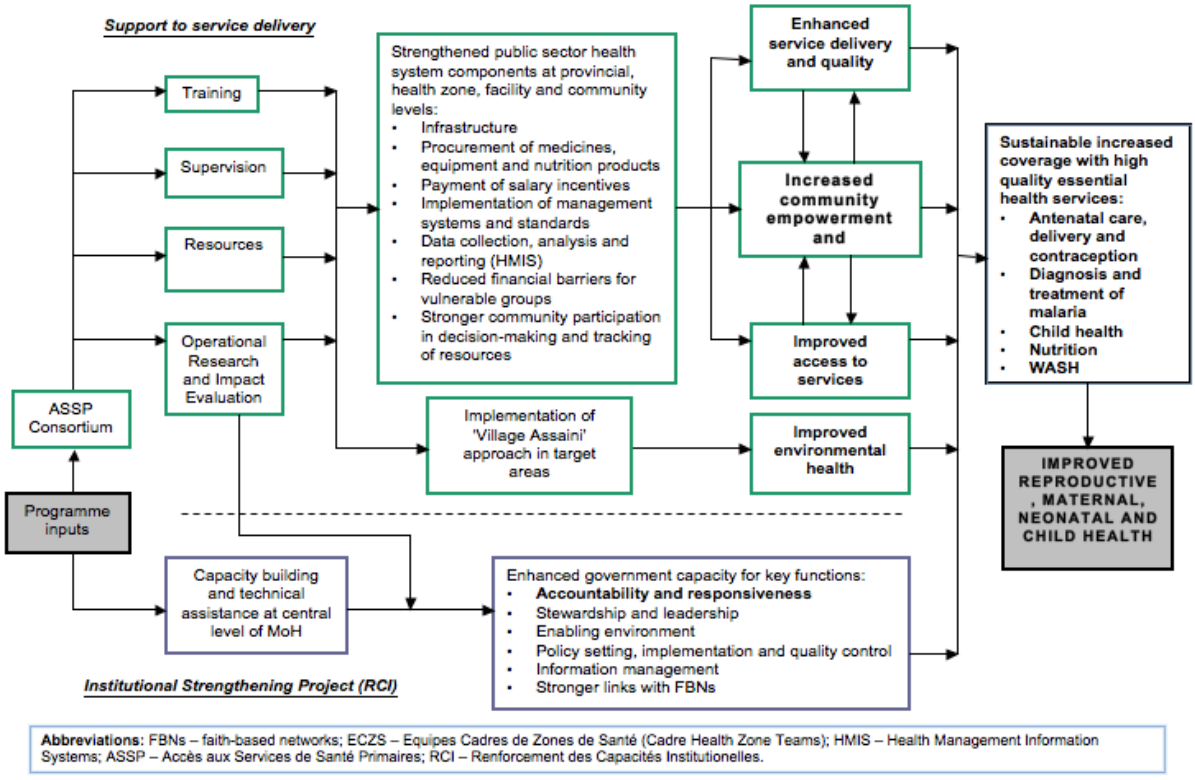
In an effort to strengthen the health care delivery system and increase service utilisation, the DRC's Ministry of Health has developed a five-year health development plan, which is being implemented with support from a number of international health partners, including the United Kingdom's Department for International Development (DFID) (5). The DRC government's National Health Development Plan for the period 2011-2015 defines eight priority pillars: governance, human resources for health, medicines and specific inputs, health financing, health information management system, infrastructure and equipment, health service delivery and collaboration with related sectors (5).

As part of its programme to assist the government in strengthening the country's health system, DFID awarded the five-year ASSP (Accès aux Soins de Santé Primaire) project to IMA World Health and its implementing partners and subcontractors in late 2012. ASSP is a health systems strengthening project tasked with working in 56 health zones in Equateur, Orientale, Kasai-

Occidental and Maniema provinces of the DRC. As shown in the Theory of Change (Figure 1), ASSP consists of a broad range of facility- and community-based health interventions designed to:

1. Strengthen the public health sector at the provincial, health zone, facility and community level though improved availability of infrastructure, equipment, supplies, improved supervision, training and management of health workers, and improved financial and managerial practices.
2. Improve environmental health in targeted areas via the introduction of "Village Assaini," a water, sanitation, and hygiene (WASH) approach
3. Broaden key governance functions, including accountability, governance, stewardship and leadership.

**Figure 1: Theory of Change for ASSP project**




**Human Resources (HR) intervention**

As part of the ASSP programme, there will be interventions which also directly affect human resources for health.

Across all ASSP areas, health workers will receive extensive training as well as equipment and resources in order to enable them to carry out their job effectively.

However, for the twenty health zones which were previously receiving financial and technical assistance from DFID's previous Access to Health-care programme (ATH) between 2008 and

2013, the ASSP programme has already eliminated the payment of salary supplements or "primes" that had been paid by ATH to heath workers. The reasoning for this was that the payment of primes by donors does not represent a sustainable solution to strengthening the health system, and to an extent relinquishes government of its responsibility to pay health worker salaries. According to the results of a health needs assessment conducted by IMA in ASSP zones in early 2013, in areas where projects have not been paying primes, 30% of the workforce is registered on the government payroll system.[5] Yet in areas where donor-financed primes have been operating, only 3% of the workforce is on the government payroll. In order to develop a more sustainable approach to manage and pay health workers, IMA will pilot a novel Human Resources (HR) intervention in all 28 of the Kasai Occidental ASSP zones which aims to facilitate government payments to health workers. IMA has sub-contracted the technical partner IntraHealth to assist with the implementation of this intervention, which will involve a package of activities described below. The Ministry of Health and Ministry of Public Sector will be involved in the pilot, as well as the World Bank who will be implementing similar activities in other sectors, including agriculture and environment, as part of their Governance Capacity-Building Project (6).

In July/August 2014, IMA plans to conduct a headcount of health workers in ASSP zones of Kasai Occidental and will record the details for each health worker currently working in health facilities, including their qualifications and biometric data in the form of photographs. This list will then be cross-checked against the list of workers on the staff payroll and the list of workers receiving a government risk allowance or "prime de risque." Provided the Ministry of Health and Ministry of Public Sector are satisfied by the process, this information will be used to "clean" the payroll and "prime de risque" list. The payment of any salaries or "prime de risque" to any identified "ghost" workers will then be terminated. Instead, salaries and a "prime de risque" will be paid to those workers who should legitimately be receiving them. It is expected that these activities will occur before the agreement of the next national health budget, so that health workers will expect to see an improvement in their payments (in terms of being paid on time as well as being paid the correct amount) from the government by the beginning of 2015.

The data obtained on health workers during July and August will also eventually be recorded on a Human Resource Information System (HRIS). Managerial staff will be trained in the use of iHRIS software (an open source HRIS), which is to be deployed in all Kasai Occidental health zones, as well as the provincial and central levels of the Ministry of Health. This will enable managerial staff to have accurate information on the workforce as well as ensure it remains up to date.

In addition, IMA and Intrahealth will assess the staffing needs of health facilities using the WISN (Workload Indicator of Staffing Needs) methodology (planned for August 2014), in order to update guidelines on the normal numbers of staff required per facility. A plan will then be developed on how to retire or redeploy excess staff, in order to improve the planning and management of the health workforce. It is anticipated that the updated guidelines on staffing norms and the retirement/redeployment plan will be agreed and adopted by the Ministry of Health nationally.

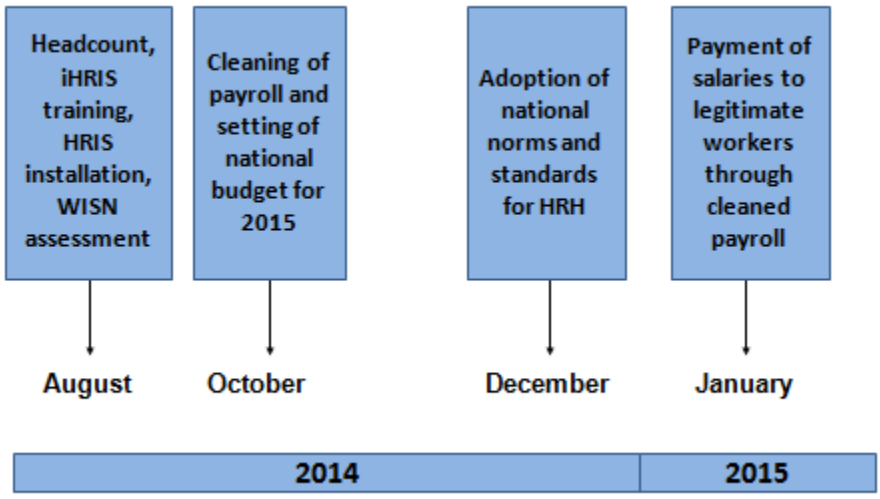
[5] Taken from IMA paper submitted to DFID on policy for primes and user fees in ASSP.

Finally, there may be scope as part of the pilot to work on mobile banking to improve the transfer of salaries and/or "primes de risques" to health workers, but this is not yet confirmed.

As this pilot is relatively innovative, it is anticipated that the intervention itself will be dynamic and may evolve and change over time. Nonetheless, research is needed to track the implementation process, identify implementation successes and failures, determine what the effects are, and document any unintended consequences.

A summary of the steps and timeline of the intervention is provided in Figure 2 below:

**Figure 2: Summary of HR intervention steps**




**Previous Research on Health Worker Payment and Motivation**

Despite the existence of a significant body of qualitative literature on the complex remuneration structures of health workers in post-conflict states (7-10), there is comparatively little quantitative data on health worker financial remuneration and its effects on health worker practices and performance (11, 12). Such information would be important in informing national discussions on health worker salary policy and coordinating the efforts of the government and other partners involved in health worker remuneration. This information would also contribute to ASSP in understanding the baseline situation of financial payments to health workers prior to implementing a complex HR intervention. In addition, the factors that influence health worker motivation (including both financial and non-financial incentives) and therefore performance have never been examined in the DRC. A deeper understanding of these influences may allow ASSP and the government to refine interventions aimed at strengthening the motivation and performance of health workers.

Previous attempts to withdraw the payment of salary supplements by external partners have proven to be difficult in other fragile states; for instance, in 2006 the NGO Merlin had to reinstate the payment of salary supplements to health workers in Liberia as staff were selling drug supplies to private clinics to supplement their income when salary supplements were

initially withdrawn (13). Therefore, the effects of a strategy to eliminate salary supplements within ASSP may have important programmatic implications on account of the pivotal role played by health workers in health service delivery.

In contrast to the recent proliferation of studies evaluating "pay for performance" strategies in low-income countries (14-16), there is little robust evidence in the academic and grey literature on how the activities which are included in this complex HR intervention can contribute to an improvement in the state's ability to manage and pay its workforce. For example, although HRIS make it possible to plan for health worker requirements and are a step towards improving the processing of payments (17-19), a recent systematic review identified a lack of rigorous research on HRIS implementation in developing countries (20). It also concluded that a disappointingly small number of countries actually used the data generated by the system in decision-making over human resources. There is also little evidence on how to overcome the challenges impeding the effective management and payment of human resources for health in fragile states; these challenges include inaccurate payroll information, inadequate national budget allocations for salaries, logistical challenges, corruption, poor leadership, and weak governance (21). Hence, the generation of more evidence in this area will aid understanding on how best to transition towards a more sustainable model of financing health systems in fragile states.

## Study Objectives and Research Questions

Under the ASSP project, Tulane University's School of Public Health and Tropical Medicine (Tulane) is responsible for developing and carrying out the study which will be divided into three phases. The objectives and research questions for each phase are given below.

**Objectives:**

*Phase One*

1. To describe and quantify the different sources and levels of income for health workers in a sample of public facilities, and explore the discrepancy between what health workers expect to be paid and what they are actually paid by the government.

*Phase Two*

2. To understand the main determinants of health worker motivation in the DRC, and quantify the differences in motivation of health workers where salary supplements paid by the donor have been recently removed compared to motivation of health workers in zones where salary supplements were never operational.

*Phase Three*

3. To undertake a theory-based process evaluation with a controlled before and after study, to understand the facilitators and bottlenecks at different levels of the health system of an intervention to facilitate the management and organization of health workers, and overall impact of the intervention on health worker motivation, behaviour and payment.

**Research Questions:**

*Phase One*

1. What are the different sources and levels of income currently received by health workers in the DRC?

2. Which characteristics of health workers are significantly associated with receiving a low level of income (e.g. gender)?

3. What proportion of health workers receive a government salary and, for those that do, does the amount received concur with the current salary policy?

*Phase Two*

4. What are the determinants of health worker motivation and behaviour? (e.g. pride, perceived self-efficacy, perceived conscientiousness, financial reward etc.)

5. Does health worker motivation and behaviour in ASSP zones where salary supplements have been gradually removed differ from that in ASSP zones where salary supplements were never operational? If so, how?

*Phase Three*

6. Using a theory of change approach, what are the facilitators and bottlenecks at different levels of the health system in the implementation of a complex HR intervention to improve the organisation, management and payment of health workers?

7. Is the package of HR interventions being implemented as planned and are the expected changes occurring?

8. What are the intended and unintended consequences observed when implementing a package of HR interventions?

9. Have the HR interventions improved government payments to health workers, relative to areas where the HR interventions were not carried out?

10. Have the HR interventions improved motivation and behaviour of health workers, relative to the areas where HR interventions were not carried out?

The analysis will address gender disparities in several ways. The quantitative analysis will determine whether there are any notable differences in income levels, behavior, motivation levels and motivational determinants between men and women. The qualitative methods will examine the perceptions of health workers, and how the perceptions of women differ from those of men.

In designing the study, Tulane is committed to adhering to the OECD DAC criteria for evaluating programmes and projects (relevance, effectiveness, efficiency, impact, and sustainability).

## Study Methodology

### Sampling, recruitment and data collection

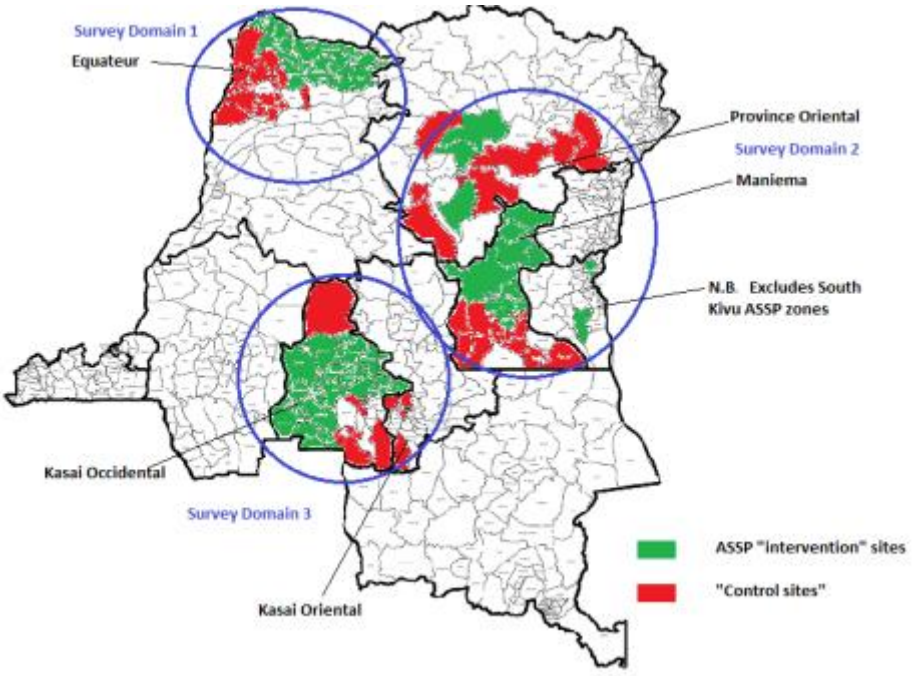
This operational research study, which is nested within the larger baseline and midline evaluation study of the ASSP programme, will employ a mixed-methods approach.

### Quantitative data

Quantitative data for phases 1, 2 and 3 will be collected from the ASSP baseline and/or midline evaluation surveys. The sampling frame for the ASSP baseline evaluation is all facilities in provinces covered by ASSP with the exception of South Kivu (Figure 3). Province Oriental and Maniema will be combined to make one survey domain, Kasai Occidental and Kasai Oriental will be another, and Equateur will constitute its own survey domain. For each survey domain, data will be collected from ASSP "intervention" sites and "control" sites which do not receive ASSP support. Therefore, data will be collected from six distinct strata. Further information on the sampling and methodology for the baseline survey is given in the ASSP baseline impact evaluation protocol.

The Kinshasa School of Public Health is taking a lead role in overseeing the fieldwork and data entry for the baseline survey for the impact evaluation. They have been responsible for recruiting and training interviewers; pre-testing the instruments; supervising the fieldwork; overseeing the data entry, cleaning and processing; and producing preliminary tables. Data collectors will be hired from each of the provinces to ensure appropriate language skills and familiarity with the cultural context.

**Figure 3: Survey domains for ASSP impact evaluation**




**Data:** During April to May 2014, baseline health worker and health facility surveys were conducted within each survey domain described above. Data were collected from 35 ASSP-supported facilities (intervention sites) and 35 facilities where ASSP was not operating (control sites). In total, 210 health facility surveys were conducted, and all doctors, midwifes or nurses working in a selected health facility on the day of the surveys were interviewed using the health worker survey. For the midline evaluation in October 2015, data for the health worker and health facility surveys will be collected in ASSP-supported facilities only (i.e. control sites will not be sampled).

**Qualitative data**

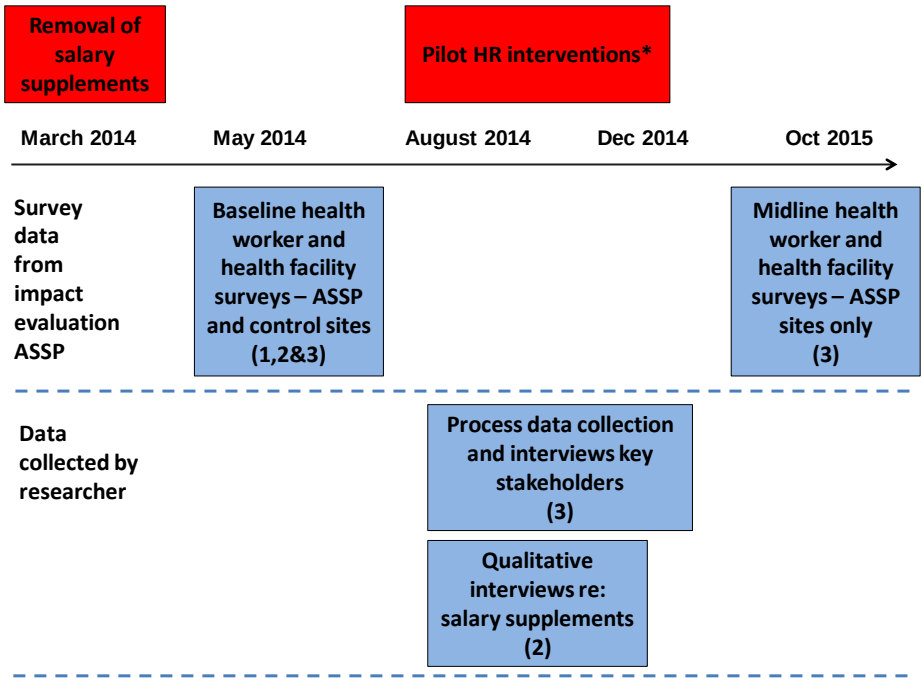
Qualitative data will be collected for phases 2 and 3 in the form of tape-recorded in-depth qualitative interviews with purposively selected individuals.

The Principal Investigator has developed the tools which will then be translated into French and then independently back-translated into English to check for consistency with the original tools (see Appendix 2). The Principal Investigator will participate in all interviews; two Congolese medical anthropologists will conduct interviews with French-speakers with the Principal Investigator as an observer, while interviews in English will be conducted by the Principal Investigator. Interviews undertaken by the anthropologists will be first transcribed into French and the Principal Investigator will review and translate all transcripts into English before commencing coding.

Prior to data collection, a 3-day training will be held which will include sessions on the qualitative data collection techniques employed during the study, with a focus on open-ended questioning, approaches used when interacting with respondents, and research ethics and ethical procedures. The training will be conducted by the Principal Investigator.

Figure 4 summarises the different time points of data collection for the study. Interventions affecting health workers are in red boxes. The blue boxes show the relationship between data sources and the different phases which are in brackets.

**Figure 4: Time-frames for data collection**




*Pilot HR intervention described in Background section. See figure 2 for summary of components.
N.B. Numbers in brackets refer relevant phases

## Phase One

Objective: To describe and quantify the different sources and levels of income for health workers in a sample of public facilities, and explore the discrepancy between what health workers expect to be paid and what they are actually paid by the government.

**Design:** A cross-sectional descriptive study of secondary data collected from the baseline surveys.

**Target population:** Health workers in both ASSP and matched non-ASSP facilities.

**Research Questions:** 1-3

**Source of data:** Data from the health worker survey conducted during the baseline evaluation has been collected on health worker income sources and levels. Demographic and work history variables are also included at the start of the questionnaire, as well as a unique facility identifier which can enable linking of the health worker survey to a separate health facility survey which contains variables relating to facility characteristics.

## Phase Two

**Objective:** To understand the main determinants of health worker motivation in the DRC, and quantify the differences in motivation of health workers where salary supplements paid

by the donor have been recently removed compared to motivation of health workers in zones where salary supplements were never operational.

**Design:** A mixed-methods cross-sectional descriptive study.

**Target population:**
*Quantitative analysis* - Health workers in both ASSP and matched non-ASSP facilities.
*Qualitative analysis* – Nurses in rural ASSP zones only.

**Research Questions:** 4-5

**Method:** For the quantitative analysis, data will be collected from the baseline health worker surveys will be used. The content of the questions in the survey around motivation is based upon: previous tools and themes identified in the literature, anecdotal reports and contextual information from implementing partners, and discussions with experts who have previously developed similar tools. More detail on the sources drawn upon for the motivation questions is given in Appendix 1. The survey includes measures of determinants of motivation (intrinsic and extrinsic), job satisfaction, cognitive outcomes and behavioural outcomes, such as number of hours worked and staff attendance. Likert scales of 1 to 5 have been used (strongly agree to strongly disagree) to inquire about levels of motivation and satisfaction. Items with negative statements will be reverse coded when calculating scores.

For the qualitative component, a purposive sample of 16 nurses in eight rural facilities will be selected for in-depth interviews, as nurses are typically the main type of staff working in health centres, and ASSP is focused in rural areas. Eight nurses (two nurses from four facilities) who previously received salary supplements from the ATH programme will be interviewed as well as another eight nurses (two nurses from four facilities) who have never received salary supplements from the programme between September and October 2014. It is likely that the nurses will come from the province of Kasai Occidental as this province has facilities which were previously supported by ATH as well as facilities which were not previously supported by ATH and are now supported by ASSP. Core questions for the interview study guide are given in the Appendix 2.

## Phase Three

**Objective:** To undertake a theory-based process evaluation with a controlled before and after study, to understand the facilitators and bottlenecks at different levels of the health system of an intervention to facilitate the management and organisation of health workers, and overall impact of the intervention on health worker motivation, behaviour and payment.

**Design:** Theory-based process evaluation and controlled before and after study.

**Target population:**

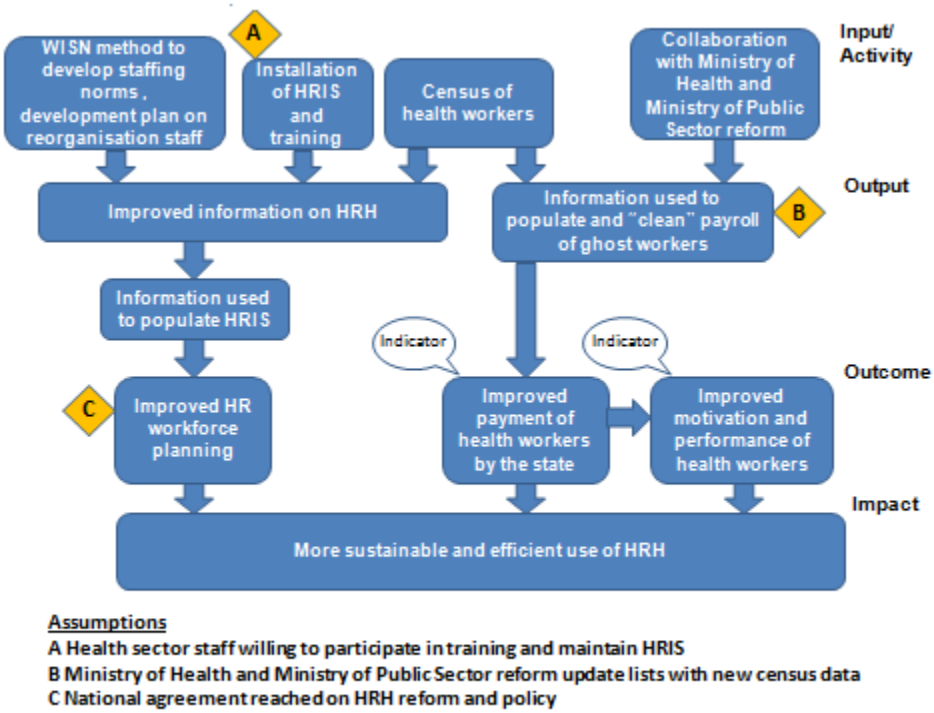
*Process evaluation* – Key stakeholders involved or affected by the pilot HR intervention.
*Before and after controlled study* – Health workers in ASSP-supported facilities in Kasai Occidental and Equateur.

**Method:** For the controlled before and after study, survey data from the baseline and midline evaluation health worker and health facility surveys in ASSP sites only will be used (Figure 4). However, the sampling frame will be restricted to two survey domains, namely: ASSP-supported facilities in the survey domain of Kasai Occidental (green areas in survey domain 3

in Figure 3) which will be considered to be "intervention" sites as the pilot will be implemented in this province only, and ASSP-supported facilities in the survey domain of Equateur province (green areas in survey domain 1 in Figure 3) where the HR pilot will not be implemented, which will be considered to be "control" sites. Main outcome variables which will be compared include: motivation scores of health workers obtained from the health worker surveys, provision of health services (obtained from the health facility survey) which will serve as a proxy measure of health worker productivity, and the number of health workers receiving a form of payment from the government.

Data to assess the process of implementing the intervention will be quantitative and qualitative. In September 2014, a detailed theory of change (building on and revising as needed the high-level theory of change in Figure 5) and narrative will be developed with stakeholders during a half-day workshop in French facilitated by the research team in order to determine the links between the intervention activities and intended outcomes. Key assumptions and risks in relation to the context will also be made explicit. The theory of change should also inform the choice of indicators to be measured during the evaluation process.

**Figure 5: High-level theory of change for HR intervention**




Following this workshop, at least two rounds of qualitative interviews will be conducted (and tape-recorded subject to consent) with representatives from each stakeholder group shown in Table 1. It is estimated that in total, 18 stakeholders will be interviewed. The interviews will start in September 2014 and follow the process until the midline survey, and seek to understand the fidelity of the implementation process, facilitators and bottlenecks, intended and unintended consequences, and reasons underlying the outcomes observed. Key assumptions highlighted during the development of the theory of change will also inform topic guides for the semi-structured interviews (see Appendix 3). The analysis of the results early on as data is being collected will help to refine the theory of change during the research.

**Table 1: Stakeholder Interviews**

| Stakeholder | Number of representatives | Number of interviews | Language of interviews |
|---|---|---|---|
| DFID | 1 | 2 | English |
| Ministry of Health and department for human resources at the central level | 2 | 4 | French |
| Ministry of Health: provincial and zonal levels | 3 or more | 6 or more | French |
| Ministry of Public Sector Reform | 1 | 2 | French |
| IntraHealth | 1 | 2 | English |
| Ministry of Finance | 1 | 2 | French |
| Ministry of Budget | 1 | 2 | French |
| IMA | 1 | 2 | English |
| NGO partners of ASSP – World Vision, Caritas, SANRU | 3 | 6 | English |
| Other donors/NGOs | 2 | 4 | English |
| Health workers in the facility | 2 | 4 | French |
| **Total** | **18 or more** | **36 or more** | |

Observations of meetings during the research will be documented in field notes, and information from relevant project documents (e.g. progress reports) will be reviewed and recorded in order to accurately profile the context within which the intervention is occurring. It is hoped that the interviews and observations will also contribute to a better understanding of the political context within which the intervention is occurring, as this will clearly influence the success of the intervention.

## Data Analysis

## Phase One

Descriptive statistics will be used to explore the following: demographic characteristics of health workers surveyed, the amount health workers receive for each different source of income and/or in allowances, the proportion of health workers receiving income/allowances from different sources, the average number of income sources received by health workers, and the frequency of different payments to health workers.

In addition, multivariate regression analysis of the data using levels for each source of income as the dependent variables will be performed. Independent variables from the health worker survey will include: age, marital status, gender, health worker position/cadre, qualifications, years worked at facility, number of financial dependents, number of hours worked per week, training, number of income sources, and presence of the ASSP programme. Independent variables from the health facility survey will include: location and type of facility, total number of staff, facility volume or number of patients seen, and services offered. Discrepancies between the official amount to be paid and actual pay from the government will also be quantified and described.

## Phase Two

Exploratory factor analysis will be employed to identify the number of latent constructs and the underlying factor structure of the health worker motivation survey questions. Items with loadings less than 0.32 will be dropped (23). Internal consistency of each component of the instrument will be assessed using Cronbach's alpha. A coefficient value of $> 0.70$ is generally accepted in the literature for a component to be considered as being consistent (24).

Scores for each latent construct will be standardised to 100 to allow for comparison between other constructs. Overall scores will be calculated as the sum of all sub-scores of latent factors described. Univariate analyses and a multiple regression model will be used to identify relationships between independent variables and motivation. Independent variables will include: age, marital status, gender, health worker position/cadre, qualifications, years worked at facility, number of financial dependents, number of hours worked per week, training, number of income sources, presence of ASSP, and previous support by ATH. Independent variables from the health facility survey will include: location and type of facility, total number of staff, facility volume or number of patients seen, resources and equipment available, resources and equipment available, and services offered. Differences in motivation for health workers who previously received salary supplements from ATH will be compared with health workers in ASSP zones where salary supplements were never operational.

For the qualitative data analysis, once the in-depth interviews with nurses are transcribed and entered into Microsoft Word, transcripts will be reviewed and a coding system will be developed. Coding categories will be derived from the initial research themes and questions, as well as key concepts that emerge during data collection. Coding of the interview transcripts will be done on ATLAS.ti. Content analysis will be used to identify trends of concepts in and across individual codes. Data triangulation will be used to ensure that the findings are validated across different respondents. Efforts will also be made to identify direct quotations that illuminate key data findings.

## Phase Three

**Controlled before-and-after study**: Facility characteristics and health worker survey responses will be compared both at baseline and midline for "intervention" and "control" areas. Tests of differences in means of variables between intervention and control groups for both the responses to baseline and midline health worker surveys will then be conducted, and t-tests undertaken to assess whether the differences in motivation, provision of services (as a proxy of health worker productivity), and the number of government payments to health workers are statistically significant. Difference-in-differences using ordinary least squares with standard errors clustered at the facility level will also be used to assess the independent

effect of the intervention on each of the outcome variables, after controlling other factors, including other aspects of the ASSP project that might potentially influence outcomes. In all models, facility and year fixed effects models will be estimated, while controlling for health worker characteristics. Where possible, trends prior to the introduction of the interventions will be assessed for both "intervention" and "control" areas for measures such as service utilisation and assisted birth rates (which can be obtained from routine data) where more than two data points are available. This will test the plausibility of the assumption that trends in outcomes will not differ between the intervention and control groups in the absence of the intervention.

**Process Evaluation:** Observations of meetings, review of relevant documents, and in-depth interviews will be used to understand the design, context, decision processes and rationale for the way the intervention evolves. The data collected will also be used to assess the plausibility of any changes in outcomes being linked to the intervention, and unpack how the intervention works.

The theory of change will provide the deductive framework to analyse responses from the qualitative interviews. Where possible, findings will be triangulated with supporting documentary evidence. Data analysis will also be guided by the development of any other pertinent indicators identified following the construction of a theory of change, helping to monitor the achievement of intended outcomes.

## Data Processing and Management

For the quantitative component, data from the baseline and midline evaluation surveys will be double-entered into SYSPRO using customized entry screens. The Kinshasa School of Public Health is responsible for overseeing the data entry, cleaning and processing; and producing preliminary tables.

For the qualitative data components in phases two and three, data collectors will audio record the key informant and in-depth interviews and group discussions; hand written field notes of information that will give additional insights into the data will also be taken. The audio recordings will be translated and transcribed from the local language into French after the interview is completed. Transcriptions will be written up in a Microsoft Word document. All completed transcripts will first be reviewed by the data collectors and subsequently sent to the Principal Investigator for her review. She will send comments on the transcripts if gaps are identified or improvements in interviewing techniques are needed. Electronic copies of the transcripts will be stored on a password protected computer and only accessible to the research assistants and the Principal and Co-Principal Investigators.

All data forms and records collected during this research will be held in a secure location at KSPH and/or Tulane University for the duration of the proposed research. Confidentiality of all respondents will be ensured through the replacement of any personal information with unrelated unique identifiers. Where relevant, names and location information will be separated from the electronic data processed for analysis. The only identifiers used during the analysis will be a unique identification number. All data will be kept under lock and key or password protected computer, with only key personnel having access.

## Study strengths and limitations

The strength of the approach for phase one is that the results will be drawn from a large sample, thereby increasing the generalisability and representativeness of the results.

Drawbacks of this approach are that reporting on income and levels can be a sensitive issue and respondents may not wish to disclose this information and/or provide biased answers. In order to mitigate this risk, the issue of confidentiality will be emphasised and respondents will be informed that data will be anonymised and stored securely.

For phase two, given this is a cross-sectional analysis of quantitative data, it will not be possible to attribute causality between salary supplement withdrawal and motivation. However, qualitative interviews will be used to investigate whether there are differences observed between health workers who used to receive salary supplements and those who did not. Another limitation between the cross-sectional comparison between areas that were supported by ATH and those of the new ASSP zones in terms of motivational outcomes is that ATH areas do not only differ in terms of the removal of salary payments, but also due to a history of support that the new ASSP zones did not have. Phase two also relies on subjective or self-reported measures of income and motivation, which can be problematic as such methods are subject to several errors, including response bias. Again, in order to mitigate this risk, the issue of confidentiality will be emphasised.

A strength of the approach of phase three is that it will permit the collection of a lot of detailed information from a variety of stakeholders. A weakness of the controlled before and after study, is that control and intervention zones will not be located within the same province and so there may be other contextual factors explaining the differences between the two areas. However, it was not possible to have control sites in Kasai Occidental due to programming priorities; IMA are collaborating with a larger World Bank project which hopes to conduct a headcount of civil servants in key sectors for the whole province. The World Bank have agreed to conduct a headcount of health workers outside of ASSP zones if IMA cover all ASSP zones. In the analysis, we will be testing for differences between the two provinces using the baseline data (health worker, health facility and community data from the surveys). However, if there are substantial differences noted between zones in Kasai Occidental and Equateur, it may be necessary to resort to a before and after study without a control.

## Results Dissemination

The study team will submit to DFID and IMA World Health two technical reports; one detailing the results of phases 1 and 2, and the other detailing the results of phase 3. Reports will be written in English and in French, summarising the study results. IMA World Health and DFID will use the study findings to inform decisions about whether the interventions affecting health workers need to be refined or changed.

## Ethical Considerations for Human Subjects Research

### Risks to subjects

There is the risk of breach of confidentiality or privacy during the data collection or storage process; processes to mitigate these risks are detailed below. In addition, all data will be stored under lock and key or password protected computers. Only key personnel and data managers will have access to collected data. The use of unique identifiers will further ensure that no data are linked to individuals. The data will be retained by the researchers without identifiers for possible use in future data analysis related to this project, which will be consistent with the original research purpose.

The consent procedures for the baseline survey have already been documented in the ASSP baseline impact evaluation research protocol. For the qualitative interviews, we will administer an informed consent form both verbally and in writing to all participants in French (see Appendices 4 and 5). The consent forms and procedures will follow exactly those that are approved by the Ministry of Health, and institutional review board of the Kinshasa School of Public Health. These forms will be read or will be given to participants to read themselves and will include a full description of voluntary participation (no penalty for non-participation), the right to withdraw from the study at any time and the right to not answer any question. Verbal and written consent will be obtained before each interview and respondents have the right to withdraw from the study at any point over the five year time period. The forms will also address the risks, benefits and purpose of the study and what we hope to learn. All interviewers will be trained extensively on the consent procedures, and each form will be co-signed (or verified by their mark) by the interviewer to ensure all participants have consented **(see section on training below)**. Checks in the field by the Principal Investigator will further ensure the consenting process is followed in all cases. The confidentiality procedures are designed to meet all contingencies so that the privacy of the participants is preserved.

**Potential benefits of the proposed research to the subjects and others**
The selected health zones for the pilot intervention may potentially benefit from improved compensation from the government. The national health policy makers will potentially benefit from the availability of evidence to support the effectiveness of the project in improving the motivation, management and payment of health workers.

**Remuneration**
Respondents will not be paid to participate in the study.

**Costs**
Apart from the respondents' time, there will be no costs to individuals participating in this research study.

## Importance of knowledge to be gained

Describing and quantifying how health workers are remunerated in the DRC will be of critical importance in informing national discussions around the coordination of contributing actors (such as donors, government, faith based organisations etc.). It will also shed light on the degree of consistency in government payments to workers.

In addition, in the DRC health worker performance and motivation are serious concerns given the low and uncontrolled remuneration which exists. This research will be the first to identify both financial and non-financial influences on health worker motivation in the DRC, which will be a necessary precursor to planning future policy interventions aimed at improving health worker performance. It will also be the first research to describe the effects on motivation of withdrawing financial incentives from health workers in a fragile state.

Finally, uncovering the strengths and weaknesses of an intervention to support the payment of health workers by government in fragile states will have important implications for future continued work on health worker pay reform, as well as in other public sectors such as education, where similar problems with the organisation and payment of teachers exist. In comparison with pay-for-performance schemes, this intervention offers an opportunity for the government to resume its responsibility to health workers and services, thereby signalling an increased willingness to act on behalf of its citizens in an accountable and responsive way.

Hence, the intervention may also contribute to the rebuilding of the social contract between government and Congolese society. A key benefit of conducting a process evaluation is that it will be able to distinguish any issues early on with the intervention and therefore allow ASSP to adapt the intervention as necessary, thus potentially limiting a waste of resources and increasing the chance of its success (22).

## Inclusion of vulnerable populations (women, minorities, children)

Both the quantitative and qualitative analyses will include men and women, as gender-differences in the motivation, behaviour and compensation of health workers is an important aspect of the study. No racial or ethnic group will be excluded.

## Training of data collectors

Training for the baseline surveys has already been described for the baseline impact evaluation study protocol. The same level of training will be repeated for the midline survey. Prior to qualitative collection, a three-day training will be held which will include sessions on the qualitative data collection techniques employed during the study, with a focus on open-ended questioning, approaches used when interacting with respondents, and research ethics and ethical procedures. During the training, the researchers will be introduced to the study objectives, the methodology, and the instruments. Sessions will also be devoted to obtaining informed consent.

## Planning, Study Management and Governance

Dr. Rishma Maini, the Principal Investigator, and Dr. David Hotchkiss, the Co-Principal Investigator, are responsible for overseeing the planning and implementation of the study. Tasks completed to this point include developing a concept note, and convening meetings with IMA World Health and DFID staff to discuss the objectives and approach for the study. Two data collectors need to be identified and recruited to assist with data collection. In carrying out the study, the research team will adhere to Tulane's Terms of Reference for the ASSP project. This includes ensuring that the study is carried out independently, routinely reporting on the progress of the study to DFID and IMA World Health staff, and adhering to the OECD DAC criteria for evaluating programmes and projects (relevance, effectiveness, efficiency, impact, and sustainability).

## Study timeline

Operational Research Steps and Milestones

| | |
|---|---|
| Programme: | ASSP - OR |
| Study Topic: | Health worker motivation |
| DFID Adviser(s): | Sarah Goldsmith, Lizz Frost Yocum |
| Implementer: | Tulane |

| | Steps and Milestones (marked in *) | Expected | Completed | Notes |
|---|---|---|---|---|
| 1 | Identifying Research Topics | | | |
| | Study topics proposed to DFID | Dec 2013 | Dec 2013 | |
| * | DFID APPROVAL : Study topic agreed by DFID (with input from IMA) | Jan 2014 | Jan 2014 | |
| 2 | Drafting Concept Note | | | |
| | Discussions with DFID, gov and other stakeholders on research questions for the study completed | Feb 2014 | | |
| | Development of study concept note | Feb, 2014 | | |
| | Submission of Concept Note to DFID | 2 May, 2014 | | |
| * | DFID APPROVAL: Concept Note approved by DFID (OR STUDIES ONLY) | June, 2014 | | |
| * | DFID APPROVAL: CV of lead researcher agreed by DFID | June, 2014 | | |
| 3 | Developing Study Protocol | | | |
| | Protocol and instruments completed | July, 2014 | | |
| | Submission of Study Protocol to DFID | July 14, 2014 | | |
| | DFID review and QA | July 14 - 28, 2014 | | |
| * | DFID APPROVAL: When protocol has passed QA | July 28, 2014 | | |
| | Authorisation in writing from DFID to start research implementation | August 18, 2014 | | |
| | Tulane IRB approval given | August 11, 2014 | | |
| | Local IRB approval given | August 11, 2014 | | |
| 4 | Implementing Study | | | |
| | Field workers trained | August 30, 2014 | | |
| | Field work/ secondary data collection completed. | August 2016 | | Phase 1 collection completed by August 2014 (baseline survey) Phase 2 collection completed by October 2014 Phase 3 collection |

| | | | | |
|---|---|---|---|---|
| | | | | completed by August 2016 |
| | Analysis of data completed | December 2016 | | Phase 1 analysis completed by October 2014<br>Phase 2 analysis completed by August 2015.<br>Phase 3 analysis completed by December 2016 |
| 5 | Reporting, | | | |
| | Preliminary findings presented in routine meetings with IMA and DFID | Ongoing | | Fieldwork briefs will be submitted upon completion of data collection in each province. This will include a discussion of the preliminary findings. |
| | Drafting preliminary report | December 2016 | | |
| | Preliminary report submitted | January 2017 | | |
| | Dissemination and uptake plan, based on dissemination strategy in study protocol approved earlier by DFID (following QA), submitted | February 2017 | | |
| * | DFID APPROVAL: Preliminary report | March 2017 | | |
| * | DFID APPROVAL: Dissemination and uptake plan | March 15th 2017 | | |
| | Final report revisions | March-April 2017 | | |
| | Final report submitted to DFID for approval | April 14 2017 | | |
| | DFID review and final report | April 14-28 2017 | | |
| * | DFID APPROVAL: Final report | April 28th 2017 | | |
| 6 | Dissemination, Uptake | | | |
| | Publication paper(s) reviewed by DFID | TBD | | |
| | Dissemination activities conducted | April 2017 | | |
| | Study submitted for publication | In 2017/2018 | | |

## Appendix 1: Modifications made to original health worker survey

The sources of the original questions in the baseline health worker survey developed by Tulane were taken from survey instruments used in the following studies:

1. Khan et al., 2013 - Use of a balanced scorecard in strengthening health systems in developing countries: an analysis based on nationally representative Bangladesh Health Facility Survey.

2. Banteyerga et al., 2010 - The system-wide effects of the scale-up of HIV/AIDS, Tuberculosis, and Malaria services in Ethiopia

3. Hansen et al., 2008 – Measuring and managing progress in the establishment of basic health services: the Afghanistan Health Sector Balanced Scorecard

Subsequently, the Principal Investigator reviewed the literature and proposed several additions based on: instruments previously used in other low income countries; themes identified from the literature; input from the Principal Investigator's PhD supervisors; and contextual information from partners working in the field. Where Likert scales were used for questions, a five-point scale replaced the original three-point scale as this was more consistent with the recent literature.

Detail on the sources of additional/modified questions is given in the following table.

| Reference/Source for questions | Questions added/modified in final survey tool |
|---|---|
| Willis-Shattuck et al., 2008 – Motivation and retention of health workers in developing countries: a systematic review (indicated themes as opposed to questions) | 109. |
| Bennett et al., 2001 – The development of tools to measure the determinants and consequences of health worker motivation in developing countries. | 305, 312, 322, 323, 329 |
| Blauuw et al. 2013 – Comparing the job satisfaction and intention to leave of different categories of health workers in Tanzania, Malawi, and South Africa | 314 |
| Chandler et al., 2009 – Motivation, money and respect: A mixed-methods study of Tanzanian non-physician clinicians | 323, 415, 416, 417 |
| Penn-Kekana et al., 2005 – Nursing staff dynamics and implications for maternal health provision in public health facilities in the context of HIV/AIDS. | 415, 416, 417 |
| Peters et al., 2010 – Job satisfaction and motivation of health workers in public and private sectors: cross-sectional analysis from two Indian states | 302, 307, 316, 322, 323, |
| Faye et al., 2013 – Developing a tool to measure satisfaction among health professionals in sub-Saharan Africa | 102, 109, 302, 304, 305, 307, 309, 310, 314, 315, 316, 320, 322, 323, 325, 326 – 331, 335, 509, 510 |
| Prytherch et al., 2012 – The challenges of developing an instrument to assess health provider motivation at primary care level in rural Burkina Faso, Ghana and Tanzania | 102, 108, 109, 110, 306, 337, 411, 416, 417, 421, 424, 425, 426, |
| Mutale et al., 2013 – Measuring health workers' motivation in rural health facilities: baseline results from three study districts in Zambia | 301, 302, 320, 338, 403, 418, 423, 426 |
| Fox et al., 2013 – Paying health workers for performance in a fragmented, fragile state: reflections from Katanga province, Democratic Republic of Congo (gave more contextual information than questions) | 501, 502 |
| Mbindyo et al., 2009 – Developing a tool to measure health worker motivation in district hospitals in Kenya | 309, 403, 415, 420 |
| Yami et al., 2011 – Job satisfaction and its determinants among health workers in Jimma University Specialised Hospital, Southwest Ethiopia | 307 |
| Malik et al., 2010 – Motivational determinants among physicians in Lahore, Pakistan | Questions covered in original survey (appendix 5) |
| Agyepong et al., 2004 – Health worker (internal customer) satisfaction and motivation in the public sector in Ghana | 337 |
| Alhassan et al., 2013 – Association between health worker motivation and healthcare quality efforts in Ghana | Questions covered in original survey (appendix 5) |
| Health Worker Incentive Survey, Impact Toolkit developed by University of Aberdeen. | 521 – 532 |
| Tanzania P4P study. (Preliminary results from December 2013) | 312 |
| Dieleman et al., 2006 – The match between motivation and performance management of health sector workers in Mali | 109, 315 |
| **Other sources** | |
| Suggestions from Principal Investigator's supervisors | 221, 222, 227, 501, 513, |
| Suggestions by researcher based on contextual information from IMA Worldhealth | 222, 227, 418, 421, 423, |

N.B. Many of the tools in the literature had questions which overlapped with those in the original survey developed by Tulane and with each other.

**Appendix 2: Interview Guide for Phase Two**

**In depth interviews with nurses**

**Note to interviewer on logistics:**
Conduct interview in a private place. Interviews should be tape-recorded subject to consent.

**Selecting interviews:**
Choose at least 8 nurses in facilities previously receiving salary supplements and at least 8 nurses in facilities where salary supplements were never operational.
**Respondents:**
Gather basic information about the respondents before the interview and assign a code to him/her. Only use the assigned code for the interviewee in the notes/transcript, together with notes about gender, age, etc.

**Introducing the interview (see consent form in Appendix 4)**

**Topic Guide**

| Key area of investigation | Rationale | Themes | Example questions | Explanatory notes |
|---|---|---|---|---|
| Health facility environment | Introductory questions to encourage nurses to discuss the health facility within which they work in and what their everyday job is like. This will give an idea of context. Also explore reasons for doing their job, which may be linked to intrinsic motivation.<br><br>Also start to explore nurse's perceptions of the facility and challenges associated with their work. | • History of working for the facility<br><br>• Health facility environment<br><br>• Perceptions of quality of health facility services<br><br>• Barriers or facilitators in performing job in facility<br><br>• Relationship with other staff | 1. What made you want to become a nurse?<br><br>2. Can you tell me for how long you have worked in this facility?<br><br>3. What services do you directly provide at the facility?<br><br>4. Do you think that the clinic provides good services to the community? Can you give examples?<br><br>5. What features of the services do you think are good and what bad? Can you give examples?<br><br>6. How does this service compare with the services offered at other facilities?<br><br>7. Do you think the facility has a good reputation with the community? (Please give reasons for your answer)<br><br>8. What prevents you from doing your job effectively at this facility? Can you give examples? | Deliberately don't start with challenges of doing the job. Want to understand the everyday context within which the nurse operates, and encourage them to talk in a more informal way.<br><br>Also may discuss features of the environment (extrinsic factors) which may affect the "can do" component of motivation.<br><br>When asking about challenges or reputation of the facility, may be worthwhile emphasising the confidentiality of the interview. |

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| | | | 9. What would allow you to do your job more effectively? Can you give examples?<br><br>10. How would you describe your relationship with other staff in the hospital? | |
| Organisational commitment | To explore the commitment of the nurse to the organisation, and this should lead into discussion of whether the nurse's goals are aligned with that of the organisation and perceptions of management of the facility. | • Commitment to organisation<br><br>• Factors which affect commitment to the organisation<br><br>• Perception of management of the facility | 11. Do you feel that there is a strong commitment to delivering good health care at this facility?<br><br>12. Do you think the commitment of health workers is different in different sectors (private, for-profit, not-for-profit)? Why?<br><br>13. How likely is it that you will be working at this facility three years from now? Why or why not? If not, where do you think you will be working and why? What would encourage you to stay?<br><br>14. What are your thoughts on the way the facility you work in being managed?<br><br>15. If you could change anything about how the facility is managed, what would you change? | Want to understand whether the nurse's goals are aligned with what they perceive to be the organisational goals (the "will do" component of motivation)<br><br>Also want to understand the organisational environment within which the nurse is working (extrinsic factors). |
| Incentives and income | To understand the non-financial and financial | • Non-financial incentives | 16. How valued do you feel by your employer? Why or why not? | Important to get a picture of the different incentives nurses |

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| | incentives affecting nurses.<br><br>To also explore the perception of the job itself and the role of government | • Financial incentives | 17. What are some of the ways your employer shows that they value you as a professional? Can you give any examples?<br><br>18. Does your facility or employer do/give you anything if you perform well at work? If yes, can you please explain? Does this influence how you work? If so, in what way?<br><br>19. What are your sources of income?<br><br>20. How often are you paid from each source?<br><br>21. Do you receive any allowances or other benefits e.g. accommodation etc. Can you please elaborate?<br><br>22. Do you have to work elsewhere to supplement your income? If so, can you please give details?<br><br>23. Do you feel you are well compensated for the work you do? Please give reasons for your answer.<br><br>24. How do you feel currently about the way you are compensated *by the government* for the work you do? | are exposed to. Also, whether these incentives are perceived to change how the nurse works, and which ones are deemed to be important.<br><br>These questions are likely to be more sensitive hence they are being raised later on in the interview, once rapport has been established. |

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| | | | 25. Do you think the government currently fulfils its responsibility to health workers? Please give reasons for your answer.<br><br>26. What changes, if any, would you like to see in the future in terms of how the health system operates in the DRC? | |
| Motivational outcomes – job satisfaction and behaviour | To give some contextual understanding around how nurses behave in the workplace, and factors influencing job satisfaction. | • Behaviour and coping strategies of nurses<br><br>• Job satisfaction | 27. In many countries, communities complain about the quality of health services. For example, there are often complaints that health workers are not very motivated, that they do not spend as much time as they should doing their job, that they are competent at their job, and even sometimes that they are involved in illegal activities such as stealing drugs and material and charging too much for services. How do you feel that the situation is in the DRC?<br><br>28. Do you think most health workers are satisfied with their job? Why do you think some health workers are unsatisfied in their job?<br><br>29. What aspects of how the staff behave and do their work are good and what are bad? Can you give | Where the nurse may be struggling to talk about anything that they feel may incriminate them (e.g. charging informal payments), then you should use hypothetical situations – what would happen if etc.?<br><br>Again, it may be worthwhile emphasising the confidentiality of the interview. |

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| | | | examples for each?<br><br>30. What drives you to do your job? Can you give any concrete examples? | |
| *For facilities where primes were removed only*<br><br>Effect of removing primes | To explore nurses perceptions of (1) the payment of primes, (2) how primes were removed, and (3) a description of any changes in behaviour following the removal of primes | • Perceptions of donor-funded primes<br><br>• Perceptions on why primes were removed and process of communicating the removal of primes to nurses<br><br>• Behaviour following removal of primes | 31. What did you think about the payment of "primes" in the old Access to healthcare programme? Did you agree with it or disagree with it? Can you give reasons for your answer?<br><br>32. Did you understand the reasons why the primes were removed? What do you think these reasons were?<br><br>33. Was it adequately explained to you that primes would be removed? Who explained that this would occur?<br><br>34. How did you feel when the salary supplements were removed? Did you change your behaviour in any way? Did you see any change in behaviour in your colleagues?<br><br>35. How have you coped with the removal of primes? Have you done anything to supplement your | Need to understand the strengths and weaknesses around the process of removing primes so lessons can be learned and applied to other programmes. Also to gain an understanding of any negative or positive consequences as a result of removing primes. |

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| | | | income since they have been removed? | |
| Finish by asking for advice from nurses (if not already covered) on what strategies nurses think would be likely to lead to improvements in nurse behaviour and satisfaction. | | | | |

**Conclusion**

Thank you very much for your time, it's been really interesting to hear about your experiences and views.

I have asked so many questions, do you have any further questions?

Again thank you. And let me just remind you that, as I said at the start, this interview will be confidential no one will know what you personally have said.

## Appendix 3: Interview Guides for Phase Three

### Stakeholders: DFID / Government Ministries / IntraHealth / IMA / World Bank

**Note to interviewer on logistics:**
Conduct interview in a private place. Interviews should be tape-recorded subject to consent.
**Respondents:**
Gather basic information about the respondents before the interview and assign a code to him/her. Only use the assigned code for the interviewee in the notes/transcript.

**Introducing the interview (see consent form in Appendix 5)**

**Topic Guide**

| Key area of investigation | Rationale | Themes | Example questions | Explanatory notes |
|---|---|---|---|---|
| Knowledge of the HR intervention | Introductory questions to encourage stakeholders to reveal their interpretation and understanding of the HR intervention.<br><br>Also start to explore the role of the stakeholder in the intervention and how their actions may moderate the intervention itself. | • Understanding of what the intervention will do<br><br>• Changes made to the intervention<br><br>• Perceptions of stakeholder's role in the implementation of the intervention | 1. Can you start off by telling me what you know about the HR intervention planned in ASSP?<br><br>2. What problems do you think this is trying to address?<br><br>3. What is/are the overall goal/goals of the intervention?<br><br>4. What activities are planned in order to achieve these goals?<br><br>5. How did the choice of these activities come about?<br><br>6. How will these activities achieve the intended goal/vision, and through which mechanisms?<br><br>7. Do you know of any changes which have been made to the intervention during the pilot? If so, what are they?<br><br>8. What has been your role in the intervention to date? | This will allow the interviewer to gauge the respondent's knowledge and understanding as well as involvement in the intervention. |
| Theory of Change | To explore the stakeholder's understanding of theory | • Understanding of principles of theory of | 9. Are you familiar with Theories of Change? (Explain using a brief description if necessary). | The interviewer will use a visual theory of change map when discussing this element with |

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| | of change, and how it applies to the intervention. Also to identify areas of risk/contention/gaps with respect to the intervention. | change<br><br>• Understanding of how theory of change applies to the intervention<br><br>• Gaps in the intervention<br><br>• Participation of stakeholders in implementation<br><br>• Risks associated with the intervention<br><br>• Threats to the intervention<br><br>• Stakeholder's perceptions of the intervention and activities | 10. Below is a theory of change which has been devised together with relevant stakeholders. Starting with inputs, followed by outputs through to outcomes and impact, are there any gaps that you can identify based on your knowledge of the planned interventions? Is there anything in there which you do not agree with? Are there any activities missing which we would should be doing?<br><br>11. Who will be involved in implementing these activities and in taking action to achieve the goal?<br><br>12. How will each actor be involved?<br><br>13. What are their roles?<br><br>14. Why are they crucial for this intervention (probe: what resource they bring in, etc))<br><br>15. Which parts of the theory of change seem to carry the highest risk? In other words, what threats are there to the intervention not being executed as planned?<br><br>16. Overall, do you agree with the approach being adopted? Please give | stakeholders.<br><br>The interviewer should think about how best to extract individual opinion as opposed to the "party-line" response. They should also be cognisant and reflect on their position in relation to the interviewee (e.g. is the interviewee perceived as being a member of DFID etc.) and emphasise that they will not be individually identified by their responses. |

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| | | | reasons for your answer. | |
| Implementation of the intervention | To better understand the current state of implementation of the intervention and contextual factors affecting the intervention. | • Intended consequences<br>• Unintended consequences<br>• Enabling factors<br>• Bottlenecks | 17. Are the activities being implemented as you had envisaged? If not, please elaborate.<br>18. What has happened so far that you didn't expect?<br>19. Were the necessary inputs supplied by the project (technical input, equipment, managerial and training support)?<br>20. Were there any particular opportunities the HR interventions could capitalise on?<br>21. What have been the important elements so far in enabling the HR interventions to happen?<br>22. What factors have impeded the HR interventions?<br>23. How do you expect the health workers to react to these activities? Why do you expect that? | The interviewer should seek to probe for strengths and weaknesses of the intervention, as well as understand the roles played by stakeholders and how they may influence implementation of the intervention.<br><br>The information will be used to refine the intervention if necessary. |
| Next steps | To explore where the intervention can be changed in order to enhance the chance of success | • Changes needed to the intervention | 24. What do you think will be needed to insure that the HR activities succeed and have a sustained impact on health workers?<br>25. Do you have any suggestions | Information will be used to inform ongoing implementation so that the intervention can be refined if necessary. |

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| | | | regarding ways to improve the HR intervention design and/or activities? | |

**Conclusion**

Thank you very much for your time, it’s been really interesting to hear about your experiences and views.

I have asked so many questions, do you have any further questions?

The next step is that I'm going to go away and put together a combined Theory of Change for the HR interventions, based on this interview and the other interviews I'm conducting with key stakeholders. I'd like to forward the final version to you to let you feedback on it, if that would be OK?

Again thank you. And let me just remind you that, as I said at the start, this interview will be confidential no one will know what you personally have said.

**Interview Guide for Process Evaluation**

**Stakeholders: Health Workers/NGO implementing partners**
**Note to interviewer on logistics:**
Conduct interview in a private place.
**Respondents:**
Gather basic information about the respondents before the interview and assign a code to him/her. Only use the assigned code for the interviewee in the notes/transcript.

**Introducing the interview (see consent form in Appendix 5)**

**Topic Guide**

| Key area of investigation | Rationale | Themes | Example questions | Explanatory notes |
|---|---|---|---|---|
| Knowledge of the HR intervention | Introductory questions to encourage respondents to reveal their awareness and involvement in the intervention. | • Understanding of what the intervention is<br>• Understanding of what the intervention will achieve<br>• Involvement in the intervention | 1. Can you start off by telling me what you know about the HR interventions planned in ASSP?<br>2. What do you think the HR interventions are intending to achieve?<br>3. What do you think is/are the overall goal/goals of the intervention?<br>4. Do you know about the activities planned in order to achieve these goals? If so, what are they?<br>5. To what extent have your views been solicited on the HR interventions planned within the programme? | This will allow the interviewer to gauge the respondent's knowledge and understanding of the intervention. |
| Theory of Change | To explore the respondent's understanding of theory of change, and how it applies to the intervention. Also to identify areas of risk/contention/gaps. | • Understanding of principles of theory of change<br>• Understanding of how theory of change applies to the intervention<br>• Gaps in the | 6. Are you familiar with Theories of Change? (Explain using description if necessary).<br>7. Below is a theory of change that has already been devised together with relevant stakeholders.<br>Starting with inputs, followed by outputs through to outcomes and | The interviewer will use a visual theory of change map when discussing this element.<br>For NGO implementing partners, the interviewer should think about how best to extract individual opinion as opposed to the "party-line" response. They should also be |

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| | | intervention<br>• Risks associated with the intervention<br>• Threats to the intervention<br>• Respondent's perceptions of the intervention and activities | impact, are there any gaps that you can identify based on your knowledge of the planned interventions? Is there anything in there which you do not agree with? Are there any activities missing which we would should be doing?<br>8. Which parts of the intervention seem to carry the highest risk? In other words, what threats are there to the intervention not being executed as planned?<br>9. Overall, do you agree with the approach being adopted? Please give reasons for your answer. | cognisant and reflect on their position in relation to the interviewee (e.g. is the interviewee perceived as being a member of DFID etc.) and emphasise that they will not be individually identified by their responses.<br><br>For health workers, the interviewer may need to explain the theory of change in a lot of detail, as it will be unlikely they will have ever come across this before. The interviewer may also have to explain the intervention activities as it is possible that the health workers are not aware of it. |
| Implementation of the intervention | To better understand the current state of implementation and contextual factors affecting the intervention. | • Intended consequences<br>• Unintended consequences<br>• Participation in implementation<br>• Enabling factors<br>• Bottlenecks | 10. Do you think the HR interventions are being implemented as planned?<br>11. What positive things have you seen happen as a result of the intervention?<br>12. What negative things have you seen as a result of the intervention?<br>13. Do you feel sufficiently involved and consulted in the process? | As above, the health worker may not be aware of the status of implementation. However, the interviewer should try and probe for their opinion on risks associated with the intervention and whether there are any gaps in activities. |

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| | | | 14. Do you know of anything which has helped the activities to occur?<br><br>15. Do you know of anything that has prevented certain activities from taking place? | |
| Next steps | To explore where the intervention can be changed in order to enhance the chance of success | • Changes needed to the intervention | 16. What do you think will be needed to insure that the HR activities succeed and have a prolonged impact on health workers?<br><br>17. Do you have any suggestions regarding ways to improve the HR intervention design and/or activities? | Information will be used to inform ongoing implementation so that the intervention can be refined if necessary. |

**Conclusion**

Thank you very much for your time, it’s been really interesting to hear about your experiences and views.

I have asked so many questions, do you have any further questions?

The next step is that I'm going to go away and put together a combined Theory of Change for the HR interventions, based on this interview and the other interviews I'm conducting with key stakeholders. I'd like to forward the final version to you to let you feedback on it, if that would be OK?

Again thank you. And let me just remind you that, as I said at the start, this interview will be confidential no one will know what you personally have said.

**Appendix 4: Consent form for Phase Two In-Depth Interviews**

**Principal Investigator:** Rishma Maini, MBChB
**Co-Investigator:** David Hotchkiss, PhD
**Study Title:** Health worker motivation in the DRC.
**Sponsor:** Interchurch Medical Assistance

The following informed consent is required by Tulane University for any research study conducted by investigators at the University. This study has been approved by the University's Institutional Review Board for Human Subjects.

## Introduction

You are invited to participate in a research study to understand more about your experience of working in this health facility. You are being asked to participate because you are currently working in this facility. No research activity is to be conducted until you have had an opportunity to review this consent form, ask any questions you may have, and sign this document if applicable.

The main objective of this study is to understand health workers experiences of working in facilities, and what help health workers to be effective in their job, and what needs to be improved or changed. The information collected will guide decisions regarding changes which should be made in health facilities in order to improve the effectiveness of health workers and hence service delivery.

We would like to ask you about more about your role in the facility, the facility environment, what helps you to do your job effectively and what things hinder you in performing your job. We will also be asking some questions related to your income.

You have the right to refuse to participate in the study now or at any time during the interview. There are no penalties of any kind if you decide that you do not want to participate. You can also refuse to respond to specific questions if you choose. If you decide to participate, you will be asked to sign this form and it will be a record of your agreement to participate. You will be given a copy of this form.

The study will be carried out in eight health facilities of ASSP and the study will be conducted in Kasai Occidental province. In each facility we plan to carry out two interviews with nurses working there.

## Why is this study being done?

The purpose of this research study is to understand the working environment of health workers in the DRC, and the experiences of health workers in delivering services. We also hope to understand what changes could be made to improve the ability of health workers to perform their job as effectively as possible.

## What are the study procedures? What will I be asked to do?

If you agree to take part in this study, you will then be asked to participate in one interview which should last about an hour. Questions will be asked about the place where you work, and how you feel about working there. There will also be some questions relating to the income you receive in the facility. If you agree, the interview will be audio recorded for the study. We will conduct the interview in a private area of the facility today. After this interview, I may need to follow up to understand some of the points made during our talk and to ask some additional questions. We are hoping to interview a total of 16 people for this study.

If you agree to have our talk audio recorded, neither your name nor any other information that can identify who you are and will be linked to the audio recordings or any written documents created from the recordings. Only the people involved in the study will be permitted to listen to the recordings. Immediately following your interview you will be given the opportunity to have the recordings erased. The recordings will be written up by members of the research team and erased once the written document is checked for accuracy. The written document may be used in whole or in part for oral presentations or written documents that result from this study. Neither your name nor any other information that can identify who you are will be used in presentations or in written documents that result from this study.

**What are the risks or inconveniences of the study?**

We believe there are no known risks associated with this research study; however, a possible inconvenience may be the time it takes to complete the study. You can refuse to answer any questions during the discussion. The initial discussion will take about an hour of your time. Any discussions carried out later will probably be shorter.

We understand the possibility of problems in keeping the information we collect confidential, or private, and are taking measures to prevent that your name is linked to the information collected. All the information obtained from you will be kept in a secure location and will be strictly used for the purpose of this study. If you have any concerns regarding our study, please use the contact information below to express your concerns.

**What are the benefits of the study?**

You will not receive any direct benefit from taking part in the study. By talking to you, we will be able to understand changes that are needed to improve working conditions for health workers in order for them to be more effective.

**Will I receive payment for participation?**

You will not be paid to be in this study. Your participation in the study is for voluntary. You will not be provided with any reward or payment to participate in the study.

**Are there costs to participate?**

There are no costs to you to participate in this study.

**How will my personal information be protected?**

The following procedures will be used to protect the confidentiality of your data. The researchers will keep all study records locked in a secure location. Research files and documents will be marked with a special code. A list that includes the names of people who participated in the study and special codes for each name will be kept in a separate and secure location. All computer files that include information that can be used to identify your name will be protected by a password. Any computer containing these files will also have a special password to prevent use by people not participating in the study. Only the members of the research staff will have access to the passwords and any other information you provide. At the end of this study, the researchers may share the findings. Information will be presented in a summary format and you will not be identified in any printed documents or presentations. Any list of codes, audio recording, and other information described in this paragraph will be kept as explained in this paragraph until they are destroyed by the researchers five years after the study. Audio recordings will be written up by a member of the staff.

You should also know that the ethics committees of Tulane University and the University of Kinshasa School of Public Health may inspect study records, but these reviews will only focus on the researchers and not on your responses or involvement. The IRB or ethics committee is a group of people who review research studies to protect the rights and well-being of research participants.

**Can I stop being in the study and what are my rights?**

You do not have to be in this study if you do not want to. If you agree to be in the study, but later change your mind, you may drop out at any time. There are no penalties or consequences of any kind if you decide that you do not want to participate. You also do not have to answer any question that you do not want to answer.

**Who do I contact if I have questions about the study?**

Take as much time as you like before you make a decision to participate in this study. Feel free to ask me any questions you have about the study. If you have questions about this study that I cannot answer, or if you feel that you have been treated unfairly or have been hurt by joining the study, you may contact Rishma Maini who is in charge of the study, at Tel: 0817106670 or David Hotchkiss who is the co-investigator of the study, at +504 988-3289.

If you have any questions, concerns, or complaints about your rights as a research subject or want to speak to someone who is not included in in the research, you can contact the Kinshasa School of Public Health Ethics Committee, Félicien Munday Mulop, Tel: 0998419816 or Tulane University Human Research Protection Office (HRPO) Tel: +504 988-2665; email at irbmain@tulane.edu.

**Consent to Audio:**

This study involves **audio recording of your participation.** Neither your name nor any other identifying information will be associated with the **audio recordings or any transcripts created from them.** Only the researchers will be permitted to **listen to** the recordings.

Immediately following the interview, you will be given the opportunity to have the recordings erased.

**Please initial one of each pair of options.**

___ I consent to have my participation recorded.

___ I do not consent to have my participation recorded

___ I consent to have my recorded participation transcribed into written form.

___ I do not consent to have my recorded participation transcribed.

The recordings will be transcribed by the researcher and erased once the transcriptions are checked for accuracy. Transcripts of your participation may be reproduced in whole or in part for use in presentations or written products that result from this study. Neither your name nor any other identifying information such as your voice will be used in presentations or in written products resulting from the study.

___ I consent to the use of the written transcription in presentations and written products resulting from the study provided that neither my name nor other identifying information will be associated with the transcript.

___ I do not consent to the use of my written transcription in presentations or written products resulting from the study.

The above permissions are in effect until August 2015. On or before that date, the tapes will be destroyed.

_____ _____

Subject Date

_____ _____

Legally Authorized Representative (if applicable) Date

_____ _____

Person Obtaining Consent Date

**Documentation of Consent:**

I have read this form and decided that I will participate in the research project described above. Its general purposes, the particulars of involvement and possible risks and inconveniences have been explained to my satisfaction. I understand that I can withdraw at any time. My signature also indicates that I have received a copy of this consent form.

_____ _____

Subject Date

_____ _____

Legally Authorized Representative (if applicable) Date

_____ _____

Person Obtaining Consent Date

I am unable to read but this consent document has been read and explained to me by

_____ . I volunteer to participate in this research.

_____ _____

Subject Date

_____ _____

Witness Date

_____ _____

Person Obtaining Consent Date

_____ _____

Principal Investigator Signature

**Appendix 5: Consent for Phase Three In-Depth Interviews**

**Principal Investigator:** Rishma Maini, MBChB
**Co-Investigator:** David Hotchkiss, PhD
**Study Title:** Health Worker Motivation in the DRC
**Sponsor:** Interchurch Medical Assistance

The following informed consent is required by Tulane University for any research study conducted by investigators at the University. This study has been approved by the University's Institutional Review Board for Human Subjects.

## Introduction

You are invited to participate in a research study to understand more about the pilot intervention affecting human resources for health within the ASSP programme. No research activity is to be conducted until you have had an opportunity to review this consent form, ask any questions you may have, and sign this document if applicable. The main objective of this study is to understand whether the activities of the intervention are being implemented as planned, any strengths and weaknesses, as well as any ways to improve the intervention. The information collected will guide decisions regarding changes in intervention activities.

We are asking you to participate in the study because we know that you are either involved or will be affected by the intervention. We would like to learn more about your views on the intervention preparations and activities, including any benefits and problems that have occurred thus far. We would like to ask you about how you are involved in the project, and how the project activities could be improved.

You have the right to refuse to participate in the study now or at any time during the interview. There are no penalties of any kind if you decide that you do not want to participate. You can also refuse to respond to specific questions if you choose. If you decide to participate, you will be asked to sign this form and it will be a record of your agreement to participate. You will be given a copy of this form.

The study will be carried out mainly in Kinshasa with a total of 18 people who are known to be involved or affected by the intervention.

## Why is this study being done?

We are working with a university in the United States called Tulane University. The research will be carried out to understand how the intervention itself, and to learn about ongoing intervention activities. We also hope to understand successes and failures associated with the intervention, as well as any outcomes that were not planned. One component of the study is to talk to people who have directly influenced or been involved in the planning and/or implementation of the intervention. We will also talk to those who are directly affected by the activities of the intervention.

**What are the study procedures? What will I be asked to do?**

If you agree to take part in the study, I will ask you to participate in one interview which should last about an hour. If you agree, the interview will be audio recorded for the study. After the first interview, I may need to follow up to understand some of the points made during our talk and to ask some additional questions. We are hoping to interview a total of 18 people for this study.

If you agree to have our talk audio recorded, neither your name nor any other information that can identify who you are and will be linked to the audio recordings or any written documents created from the recordings. Only the people involved in the study will be permitted to listen to the recordings. Immediately following your interview you will be given the opportunity to have the recordings erased. The recordings will be written up by members of the research team and erased once the written document is checked for accuracy. The written document may be used in whole or in part for oral presentations or written documents that result from this study. Neither your name nor any other information that can identify who you are will be used in presentations or in written documents that result from this study.

**What are the risks or inconveniences of the study?**

There are no known risks in taking part in the study. You can refuse to answer any questions during the discussion. A possible problem may be the time it takes to complete the discussion. The initial discussion will take about an hour of your time. Any discussions carried out later will probably be shorter.

We understand the possibility of problems in keeping the information we collect confidential, or private, and are taking measures to prevent that your name is linked to the information collected. All the information obtained from you will be kept in a secure location and will be strictly used for the purpose of this study. If you have any concerns regarding our study, please use the contact information below to express your concerns.

**What are the benefits of the study?**

You will not receive any direct benefit from taking part in the study. By talking to you, we will be able to understand changes that are needed to improve working conditions for health workers in order for them to be more effective.

**Will I receive payment for participation?**

You will not be paid to be in this study. Your participation in the study is for voluntary. You will not be provided with any reward or payment to participate in the study.

**Are there costs to participate?**

There are no costs to you to participate in this study.

**How will my personal information be protected?**

The researchers will keep all study records locked in a secure location. Research files and documents will be marked with a special code. A list that includes the names of people who participated in the study and special codes for each name will be kept in a separate and secure location. All computer files that include information that can be used to identify your name will be protected by a password. Any computer containing these files will also have a special password to prevent use by people not participating in the study. Only the members of the research staff will have access to the passwords and any other information you provide. At the end of this study, the researchers may share the findings. Information will be presented in a summary format and you will not be identified in any printed documents or presentations. Any list of codes, audio recording, and other information described in this paragraph will be kept as explained in this paragraph until they are destroyed by the researchers five years after the study. Audio recordings will be written up by a member of the staff.

You should also know that the ethics committees of Tulane University and the University of Kinshasa School of Public Health may inspect study records, but these reviews will only focus on the researchers and not on your responses or involvement. The IRB or ethics committee is a group of people who review research studies to protect the rights and well-being of research participants.

**Can I stop being in the study and what are my rights?**

You do not have to be in this study if you do not want to. If you agree to be in the study, but later change your mind, you may drop out at any time. There are no penalties or consequences of any kind if you decide that you do not want to participate.

**Who do I contact if I have questions about the study?**

Take as much time as you like before you make a decision to participate in this study. Feel free to ask me any questions you have about the study. If you have questions about this study that I cannot answer, or if you feel that you have been treated unfairly or have been hurt by joining the study, you may contact Rishma Maini who is in charge of the study, at 0817106670 or David Hotchkiss who is the co-investigator of the study, at +504 988-3289.

If you have any questions, concerns, or complaints about your rights as a research subject or want to speak to someone who is not included in in the research, you can contact the Kinshasa School of Public Health Ethics Committee, Félicien Munday Mulop, Tel: 998419816 or Tulane University Human Research Protection Office (HRPO) Tel: +504 988-2665; email at irbmain@tulane.edu.

**Consent to Audio:**

This study involves **audio recording of your participation.** Neither your name nor any other identifying information will be associated with the **audio recordings or any transcripts created from them.** Only the researchers will be permitted to **listen to** the recordings. Immediately following the interview, you will be given the opportunity to have the recordings erased.

**Please initial one of each pair of options.**

___ I consent to have my participation recorded.

___ I do not consent to have my participation recorded

___ I consent to have my recorded participation transcribed into written form.

___ I do not consent to have my recorded participation transcribed.

The recordings will be transcribed by the researcher and erased once the transcriptions are checked for accuracy. Transcripts of your participation may be reproduced in whole or in part for use in presentations or written products that result from this study. Neither your name nor any other identifying information such as your voice will be used in presentations or in written products resulting from the study.

___ I consent to the use of the written transcription in presentations and written products resulting from the study provided that neither my name nor other identifying information will be associated with the transcript.

___ I do not consent to the use of my written transcription in presentations or written products resulting from the study.

The above permissions are in effect until August 2015. On or before that date, the tapes will be destroyed.

_____ _____

Subject Date

_____ _____

Legally Authorized Representative (if applicable) Date

_____ _____

Person Obtaining Consent Date

**Documentation of Consent:**

I have read this form and decided that I will participate in the research project described above. Its general purposes, the particulars of involvement and possible risks and inconveniences have been explained to my satisfaction. I understand that I can withdraw at any time. My signature also indicates that I have received a copy of this consent form.

_____ _____

Subject Date

_____ _____

Legally Authorized Representative (if applicable) Date

_____ _____

Person Obtaining Consent Date

I am unable to read but this consent document has been read and explained to me by

_____ . I volunteer to participate in this research.

_____ _____

Subject Date

_____ _____

Witness Date

_____ _____

Person Obtaining Consent Date

_____ _____

Principal Investigator Signature Date

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