Understanding vulnerable women's lives in Kinshasa, DR Congo: Female sex workers and agricultural opportunities[1]

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Summary

The present study was carried out to better understand the characteristics and conditions of women in peri-urban areas of Kinshasa, DR Congo, and to describe characteristics of female sex workers (FSW) among them. The aim was to use the information in order to determine an optimal intervention approach to empower these vulnerable women through provision of financial services and alternative skills to generate income, therefore expanding their options to choose alternative types of work. Quantitative and qualitative methods were used and included a baseline study (n=450) to collect socioeconomic characteristics, employment details, and FSW experience and perceptions. In addition, a total of 4 sex-disaggregated focus group discussions (FGDs) with men and women adults and youth were carried out to identify social and structural drivers of women's engagement in sex work and factors that support their transition to alternative jobs. The results show that 65% of the respondents (age range: 15-74 years; median age: 30 years) engaged in sex work and started from the age of 20. Among these women, nearly two-thirds are single and 54 % have at least one child. Overall, their education level was low: > 85 % did not complete secondary school. Remuneration for sexual acts was sometimes reported to be less than $ 1 USD. About 28 % of the women were engaged in agricultural farm activities but the majority (89 %) did not own any land. Most women in the sample reported themselves as the main decision makers when engaging in an income-generating activity or in savings, and when spending. Exercise of leadership outside the household was restricted to a participation in women's (religious or civil) groups, reported by 60% of the respondents. Food insecurity was acute: intake was limited to 1-2 meals a day in 98 % of the households. Access to meat (< 2 %) and to vitamin-A-rich food (< 9.4 %) was very low. Nutritional status was assessed in children (n=100; median age: 38 months) of the women. Stunting (height for age Z score ≤ -2) was found in 31 % of the children. Anemia (Hb < 11 g/dL) was present in about 52 %. The data confirm the high prevalence of prostitution in the studied communities. They indicate that vulnerability in these populations is high, as reflected by low access to protein- and vitamin-rich food and by the high level of anemia in children. Agriculture is already practiced by one quarter of the women and it or related activities (e.g., food processing) may constitute an alternative pathway for income among women who want to quit commercial sex work.

Introduction

General context in the DR Congo

The Democratic Republic of Congo (DRC) is the second largest country in Africa, with a total population of about 80 million. Its capital, Kinshasa, is inhabited by approximately 10 million people. The country is known for its high agricultural and ecological potential as well at as for its high richness in various minerals. Yet the population of the DRC is among the poorest in the world, with an average gross domestic product of 445 USD per capita [1] and with rates of infant mortality and malnutrition among the world highest [2]. Levels of food insecurity and malnutrition are high and growth in the agriculture and rural sectors is undermined, among other reasons, by gender disparity and gender-related constraints in access to productive resources, inputs, knowledge and markets [3], [4]. Poor governance, corruption, decades of conflict and persistent socio-political instability (e.g. rebel armies in the eastern provinces of the Kivu's and Ituri, as well as in Kasai) contribute to poor performance of agriculture, health and other sectors. Poor infrastructures such as roads, schools and medical care institutions are common in rural areas, fueling rural to urban migration. The rural exodus, coupled with a population growth rate of 3.2 % per year, has significant effects on the population growth in major cities. Kinshasa, which had 350000 in 1960 has now a population that is 30 times higher 60 years later. A qualitatively similar increase in urbanization is observed in the provinces and is consistent the observed high rate of urbanization in many developing countries [5].

Rapid urban population growth and insufficient economic growth contribute to high levels of poverty. Unemployment is very high in the DRC, affecting more than 50 % of the urban population [6]. For those who are employed, earnings are low and make it difficult for families to meet their basic needs, e.g. housing, regular meals. Income inequality and welfare differences are often stark. In Kinshasa, a relatively small affluent zone that corresponds to areas occupied by the Belgians during colonial times is side by side to large but continuously growing poor zones which extend beyond the parts occupied by "indigenous" people during colonization and include peri-urban and rural communities. On the outskirts of Kinshasa, communities generally have poor access to water and electricity.

Unemployment is highest in these areas (sometimes reaching 80%). These circumstances create economic vulnerability that is further compounded by violence and malnutrition.

Public subsidies of major sectors play an important role in boosting economic performance. In the DRC, while primary education is free, costs to continue to secondary school and beyond are often substantial and limit the potential of boys and especially girls to continue. Because teacher salaries are low and unreliable, parents are often expected to contribute additional funds to support their salaries. Too, when financial resources are limited, boys are often favored over girls. The health sector is similarly plagued with issues and the country lacks an extensive medical insurance system. Poor women and men face particular challenges in gaining access to healthcare.

Female sex work in Kinshasa and DR Congo

In conditions of poverty women and children are the most vulnerable members of the society. This is also particularly true for the DRC. Many traditional (ethnic) societies in the country were based on a patriarchal system, with women having low or no access to property or land ownership. This is particularly so for patrilineal systems, where rights and properties were passed from fathers to sons. Despite the existence of many matrilineal systems, where the head of the family was the mother, patriarchy was also not absent here since the mother's authority was exerted via her brothers. The colonial system did not correct but aggravated the gender inequality. Compared to girls and women, boys and men were privileged in accessing education and employment. Up till now the local social norms are such that the education of boys is given more importance and priority than that of girls.

Out of a need for a source of income in the absence of employment opportunities, many women, when facing increased costs of living such as food, housing, transport, school fees, medical care costs, etc., will potentially engage in sex work. Sex work in the DRC is said to have started with the appearance of cities and the urbanization of the population during the colonial time. In the country, female commercial sex work is legal and has become a common way to earn money, involving mature women but also very young street girls.

Cities like Kinshasa are famous for a music-bathed leisurely evening life and the presence of many bars and brothels where sex is a common issue of transaction between men on the one hand, and girls and women on the other hand (homosexual transaction has "come out" only recently). Sex workers ("ndumba") have generally been known to come mainly from poor areas of the City or from neighboring provinces.

Although sex work can be viewed as a potential way out of poverty and vulnerability, it often leads in many cases to increased vulnerability. Sex workers are exposed to health issues such as HIV and other sexually transmitted diseases [7], to violence, and to stigmatization by the rest of the society. Hence, after realizing the persisting or increased vulnerability, many sex workers feel the need to abandon the profession and seek alternative sources of income, for example in the Agricultural sector.

Agriculture

Agriculture is a critical sector in the DRC, both as a source of food security at the household level and as a promising subsector of economic growth. The sector has been disorganized by wars and insecurity. Presently, the country is unable to feed its population and was once classified as the hungriest country in the world [8]. High levels of gender inequality have been associated with high levels of food insecurity [9] and plots managed by women produce less than men's plots because women face particular constraints in gaining access to technological inputs such as fertilizers and improved seeds [10]. Many communities in Congo follow patriarchal systems that marginalize women from gaining secure access to land. For instance, patrilineal inheritance customs are common.

Objectives of the study

This project aims to identify the best or more efficient alternative pathways for income to support women's transition out of sex work, and, if they decide to remain in sex work, to help them better negotiate their working conditions (e.g. condom use) to reduce exposure to violence and health risks. Among pathways generally proposed is conversion into a self-

employed income-generating activity. Such a conversion usually involves training to allow the women to acquire new knowledge and skills. Our long-term objective is to improve the conditions and status of vulnerable women who want to abandon sex work and to convert/participate into agriculture or related activities, mainly food processing. The project uses a multi-sector approach, addressing economic, health and gender issues simultaneously, to test whether this approach is more efficient than a uni-sectorial approach addressing only one of these issues.

In order to optimize interventions that assist the women in improving their income, it is necessary to obtain baseline information on their living conditions and on their current knowledge and skills. Therefore, the present study was carried out to obtain information on the demographic and economic characteristics of the women to be targeted by the interventions of the project as well as regarding their level of agricultural and nutritional knowledge and status. Information was needed on their agricultural knowledge, on their sources of income, on their knowledge of nutrition issues, etc. This report provides results and findings from the baseline survey (N=450), that was used to collect socioeconomic characteristics, sources of income, involvement and knowledge in agriculture, knowledge of nutrition issues, etc. It also presents the results of focus group discussions held to understand the driving factors to sex work.

Methods

Study population

Our study was carried out on a total of 450 women, located in urban and peri-urban outskirts of Kinshasa, namely Kimvula (n= 177 women), Mpasa (n= 204) and Yolo (n= 69). The first two areas have a semi-rural character, with some land available for agriculture, whereas Yolo is located in a more urban, poor area. The three locations were selected based on prior reports of high presence of sex workers as well as of women practicing agriculture. In addition, women were expected to be more readily accessible there given their participation in church groups. The centers of Mpasa and Kimvula were known as places where assistance in the form of vocational training is provided to sex workers and vulnerable girls and women. Women were individually selected without prior knowledge of whether they practiced professional sex work or not. All women selected from the 3 areas were surveyed after obtaining informed consent.

Based on the project objective to assess whether a multi-sector approach is better than a single sector approach, we sought for ways to define a control group and to ensure that the control group would remain in the study and not be discouraged upon learning that they would not be given the financial assistance that treatment groups were receiving. We selected women from Kimvula as our control group. This control group would receive a single-sector empowerment (economic) intervention, whereas the two test groups would receive interventions in the 3 domains of empowerment: economic (via promotion of agriculture, food processing and savings), health (nutrition), and social/gender sensitization. To test whether multi-sector intervention has a different impact than uni-sector approach, we will compare (post 1-1.5-year intervention) the two groups receiving multi-sector intervention in Mpasa and Yolo to the group receiving uni-sector intervention (only economic empowerment) in Kimvula.

Data collection

Quantitative and qualitative methods of data collection were used.

An extensive quantitative questionnaire was prepared and translated into the local language of the women (Lingala). This research tool and the indicators were reviewed by an external consultant (provided by ICRW) to ensure that the tool aligns with the project proposal and objectives. Enumerators were introduced to the questionnaire and were trained to use electronic tablets for data collection. The training involved a pre-test mock survey.

Four sex disaggregated focus group discussions (FGD) were conducted with adults and youth in the community of Mpasa. The purpose of the FGDs was to better understand the community context, including the prevalence, practices and perceptions of sex work in the community. Groups were selected by local facilitators who used snowball sampling to choose adult men (n=10) and women (n=10), and young women (n=9) and men (n =12) who were not project beneficiaries. Each FDG was facilitated by a trained staff of the same gender.

Assessment of the nutritional status of the children

The above-mentioned survey included questions on food intake. In addition, we chose to carry out a nutritional status assessment. This was done only in children of the 3 study areas, because the nutritional status of young children is a better indicator of the nutrition level of a community.

The nutritional status was assessed by measuring anthropomorphic parameters, including height and weight, in a sub-sample of children below 5 years of age (n=100; mean age (SD): 37.7(13.2) months). Nutritional status was defined according to World Health Organization (WHO) 2006 growth standards [11]. In addition, a venous blood sample was collected from every child, for hematological and biochemical measurements. Blood analysis included the measurement of hematological and some biochemical parameters. Blood cell count was done on a Sysmex XS - 1000i apparatus. Most biochemical analyses (dosage of glucose, urea,

creatinine, albumin, SGOT and SGPT, CRP) were done with Roche reagents on a Cobas C 111 machine. Plasma total proteins and serum iron were determined by spectrophotometry (colorimetric method) using kits from Cypress. Ferritin levels were measured using Biomerieux reagents on mini-Vidas machine. Ferritin concentration was adjusted as suggested by Thurnham et al. according to inflammation (CRP > 5 mg/l) [12]. Anemia was defined as hemoglobin < 11 g/dl [13]. All blood analyses were carried out at the Institut National des Recherches Biomédicales (INRB, Kinshasa)

Data Analysis

Before analysis the data were cleaned. Analysis was done using STATA (StataCorp, College Station, Texas, USA). Measurements of central tendency and dispersion are given as median and interquartile range (IQR) when data were not normally distributed, or as mean and standard deviation when they were normally distributed. Medians were compared sing the Mann-Whitney test. Ratios were compared using the Pearson's χ^2 and Fisher's exact test. $P < 0.05$ was taken as threshold for statistical significance.

Ethical considerations

The study was approved (approval letter UCB/CIE/NC/13/2015) by the Institutional Ethics Committee of the Catholic University of Bukavu. Participation of women was voluntary. Informed consent was read to respondents prior to administering the baseline questionnaire. Collection of anthropomorphic data and of venous blood in children was done only if the parent granted informed consent. All data were managed in a manner to guarantee confidentiality for all participants.

Results

Characteristics of the women

The demographic characteristics of all the women are summarized in Table 1. The median age was 30 years. Their education level was low, with about only 10 % having completed secondary school. The majority of the women were single, but more than half of them had children and the average household size was 6 people. The declared most frequent professional activities were sex work (64.9%).

Table 1 also gives the characteristics of the women, separated among non-sex workers (non-FSW; n=138) and sex workers (FSW; n=312). FSW were significantly younger (median age: 27) than non-FSWs (median age: 51 years; $P < 0.001$). Education level was similarly low among FSW as among non-FSW. Nevertheless, significant and similar numbers of women among FSW (47.2 %) and non-FSW (42.8 %) should have been of good literacy level since they had completed some level of secondary school.

Professional sex work

Conditions of sex work

Table 2 presents a summary of data gathered from FSW using the questionnaire. Most FSW took the initiative to engage in sex work, the age range for starting being 8-44 yeas (median: 17 years). The major push to start were difficult living conditions. FSW mostly worked freely for themselves. The weekly income from sex work was variable, from as low as 1000 CDF (or 0.7 USD) to as high as 335000 CDF (200 USD). The majority (72 %) of FSW felt that they had no other choice, and about half of them declared that they would prefer to practice a different profession.

Table 1. Demographical & household characteristics of women

Table 1. Demographical & household characteristics of women

Variables	All women			Non-FSW			FSW			*P*
	n	%	Median (P25-P75)	n	%	Median (P25-P75)	n	%	Median (P25-P75)	
Age (years)	450		30 (23-42)	138		51 (30-57)	312		27 (22-34)	<0.001*
Marital status	450			138			312			<0.001
Single		65.6			23.9			84.0		
Married		7.6			23.2			0.6		
Divorced		4.9			5.1			4.8		
Separate		7.1			8.0			6.7		
Widowed		13.5			36.9			3.2		
Free union		1.3			2.9			0.6		
Profession	450									
Agriculture/livestock		21.1								
Job		1.8								
Business		7.3								
Professional sex		64.9								
None		3.1								
Other		0.7								
Not applicable		1.1								
Head of household	450			138			312			0.003
Father		13.8			12.3			14.4		
Mother		18.0			8.7			22.1		
Uncle		3.8			3.6			3.8		
Herself		42.0			54.4			36.5		
Someone else		22.2			21.0			22.8		
Not applicable		0.2			_			0.3		_
Number of people in the household (HH)	450		6 (5-8)	138		7(5-9)	312		6(5-8)	0.007
Children below 5 years in the HH	450			138			312			<0.001
0		45.8			71.0			34.6		
1		28.9			13.0			35.9		
2		20.7			12.4			24.4		
3		4.4			3.6			4.8		
4		0.2			-			0.3		
Level of education	450			138			312			0.229
None		7.3			6.5			7.7		
Primary incomplete		30.0			34.8			27.9		
Primary		9.6			13.0			8.0		
Secondary incomplete		42.4			37.7			44.5		
Secondary		8.2			5.1			9.6		
University incomplete		1.1			1.4			0.9		
University		1			0.7			0.9		
Professional training		0.4			0.7			0.3		
Other										
Saving money	450			138			312			0.175
Yes		36.7			41.3			34.6		
No		63.3			58.7			65.4		
How much money saved (CDF)	165		15000 (7000-30000)	57		15000 (5000-25000)	107		15000 (8000-30000)	0.273*

**Mann-Whitney test, CDF: Congolese (DRC) francs*

Table 2. Characteristics of sex work

Variables	n	%	Median (P25-P75)
Age at which sex work stared	312		17(8-44)
Who introduced to sex work	312		
Self		64.4	
A friend		26.2	
A family member		1.9	
Neighbor		2.8	
Other		4.4	
Why chose sex work	312		
To survive		93.9	
Sexual pleasure		1.6	
Unemployment		1.6	
Other		2.8	
Anyone encouraged	312		
Yes		44.5	
No		55.4	
Work for pimp	312		
Yes		11.5	
No		88.4	
Feel shame about sex work	312		
Strongly disagree		14.4	
Disagree		23.4	
Neutral		1.9	
Agree		34.2	
Strongly agree		25.9	
Sex work helps to become independent	312		
Strongly disagree		10.9	
Disagree		20.1	
Neutral		2.8	
Agree		47.1	
Strongly agree		18.5	
Have no choice than to do sex work	312		
Strongly disagree		8.3	
Disagree		17.6	
Neutral		2.2	
Agree		50.9	
Strongly agree		20.8	
Weekly income	306		12000 (1000-336000)
Monthly income	265		60000 (0-1344000)
Weekly work days	310		6 (1-30)
Cost per act (CDF)	309		2500 (500-140000)
Willingness for different job	312		
Yes		98.7	
No		0.6	
Does not know		0.6	

Perceived prevalence of sex work

All focus group discussion (FGD) participants said that female sex work was very common, estimated to be in 50-80% of households. Negotiation for sex takes place in bars, nightclubs, and places where one can find many people at night. The work takes place in bars, night clubs, in the bush, and in houses under construction. The women often return home late in the evening from work.

Events and factors determining engagement in sex work

From the FDGs it appeared that young girls decide to engage in sex work often when they stop their education (usually after 3-4 years in secondary school) due to a failure to pay school fees or after tragic events such as the loss of parents or husbands. This is in contrast to boys (who stop studying after 4-6 years of secondary school and) who turn to theft or to small business like selling phones. The youth would want to learn a trade, but there are no or only few organizations that teach them apprenticeship trades, e.g. the Salvation Army.

Stigma related to sex work

According to FGD participants, FSW are often not well-respected. They can be identified by their different clothing and language. FSWs' external characteristics include their way of dressing, their makeup, their behavior, their body movements, and especially obvious efforts to lighten the pigment of their skin. FSWs speak freely to others in the community about their work, but 'their words are worthless' (Adult men's FGD). FSWs are not good role models and young people are discouraged from getting close to them (Young men FGD). Common community perceptions of women doing this work are that they are witches and they are disdainful (Adult women). Such women often do not get married (Adult men's FGD).

Factors determining way out of sex work

Women are advised to leave sex work by church teachings. They can also quit the profession if they get married, but this is rare. There are few community support services for these

women. They end up working more in bars and hotels. Such women are not accepted to perform housework. Sometimes they can be trained to convert to sewing or hairdressing.

Money saving

Less than 40 % of the women were involved in money savings (Table 1) at the time of the survey. The amount of money reported to have been saved was low: about 9 (4.2-18.0) USD. The savings were similar among non-FSW and FSWs (Table 2).

Agriculture and animal farming practice and knowledge

Data in Table 3 show that approximately one-fifth (21.1%) of the women reported to practice small-scale agriculture but only 8 % to be involved in small scale animal farming. More than 90% of the women were able to make decisions on their activities and on the way they spent the money. Access to resources was low. Typically, ownership of land and other agricultural assets was very poor. Access to loans from various creditors was reported to be possible in at least 30 % of cases.

The survey did not include questions on time use by the women, making it impractical to determine a “women empowerment in agriculture index (WEAI)”

Information on agricultural practice and access to market among non-FSW vs FGSW is provided in Table 4. Practically only women not involved in commercial sex work depended on agriculture and livestock for their income.

Food intake

Food intake consisted of 1-2 meals a day, with practically less than 2% household having 3 meals (Table 4). The food was basically made of cassava or maize starch eaten with vegetables. Fish and seafood were the major source of animal protein. Meat consumption was rare: only in 6.5 % of households. In the majority of cases, the quantity of the consumed food was perceived as insufficient.

Table 3. Indicators of the women's empowerment in agriculture

Variables	All women		Non-FSW		FSW		*P*
	n	%	n	%	n	%	
Ask permission to spend money	450		138		312		<0.001
Do not ask permission		93.6		87.0		96.5	
Ask permission		6.2		13.0		3.2	
Refuse to answer		0.2		0.0		0.3	-
Ownership of assets							
Own land	450		138				<0.001
Yes		10.2		25.4		3.5	
No		89.8		74.6		96.5	
Own cell phone	450		138				0.001
Yes		52.7		40.6		58.0	
No		47.3		59.4		42.0	
Practice agriculture	450		138				<0.001
Yes		28.0		79.0		5.5	
No		71.8		20.3		94.5	
Refusal to answer		0.2		0.7		0.0	-
Own agricultural equipment	124	19.0	109	20.2	15	11.8	0.733[#]
Practice small farming	450		138		312		0.002
Yes		8.4		14.5		5.8	
No		91.6		85.5		94.2	
Own farm equipment	38	0.0		-		-	-
Own large consumer equipment (refrigerator, TV, sofa)	450	13.6	138	15.2	312	12.8	0.033
Small consumer equipment (radio, cookware)	450	12.4	138	14.5	312	11.5	0.381
Access to & decisions on credit							
Able to take loan from NGO	450	33.3	138	34.8	312	32.7	0.060
Able to take loan from formal lender	450	32.0	138	28.3	312	33.6	0.054
Able to take loan from informal lender	450	30.8	138	27.5	312	32.4	0.133
Able to take loan from friends & relatives	450	39.3	138	37.7	312	40.1	0.334
Able to take loan from a group-based microfinance	450	23.8	138	18.1	312	26.3	0.026
Able to take loan from Informal credit/savings groups	450	27.1	138	24.6	312	28.2	0.143
Women made decision to take loan from NGO	12	50.0					
Women made decision to take loan from formal lender	17	52.9					
Women made decision to take loan from informal lender	29	55.2					
Women made decision to take loan from friends & relatives	48	70.8					
Women made decision to take loan from a group-based microfinance	10	50.0					
Women made decision to take loan from Informal credit/savings groups	22	63.6					
Membership of a group if any							
Agricultural/livestock/fisheries producer's group (including marketing)	221	15.6	82	36.6	129	2.3	<0.001
Water users' group	159	6.9	56	14.3	103	2.9	0.007
Credit or microfinance group (SACCOs/merry-go-rounds/ VSLAs, etc.)	93	0.0		-		-	-
Mutual help or insurance group (including burial societies)	95	8.4	34	11.7	61	6.6	0.380
Trade and business association group	121	6.6	38	13.2	83	3.6	0.049
Civic groups (improving community) or charitable group (helping others)	94	2.13	33	6.1	61	0	-
Religious group	256	56.2	89	80.9	167	43.1	<0.001
Other group (only if it does not fit into one of the previous categories)	44	4.5	16	6.2	28	3.6	0.998[#]

[#] Fisher exact

Table 4 also illustrates that, except for a few foods (vegetables, nuts and seed) and for children under 5 years as the first to be served, no major difference in food intake was observed between non-FSW and FSW.

Table 4. Information on food intake

	All women		Non-FSW		FSW		*P*
Variables	**n**	**%**	**n**	**%**	**n**	**%**	
Frequency of meal intake /day	450		138		312		0.136
1		49.8		42.0		53.2	
2		48.4		56.5		44.9	
>=3		1.8		1.5		1.9	
Reported enough food at each meal	450	31.3	138	45.6	312	25.0	<0.001
Women interviewed as main provider of income to purchase food	450	70.7	138	68.1	312	71.8	0.429
Who eat first	450		138		312		0.004
Father		4.2		2.9		4.8	
Mother		2.2		0.7		2.9	
Child under 5 years		16.9		10.9		19.5	
Child more than 5 years		24.9		32.6		21.5	
Equitable meal		39.6		44.9		37.2	
Other		12		7.2		14.1	
Refuse to answer		0.2		0.7		-	
Staple food	450		138		312		
Foufou as part of basic food		71.8		78.3		68.9	0.042
Meat as part of basic meal		2.0		0.7		2.6	0.198
Fish as part of basic meal		11.8		9.4		12.8	0.302
Vegetables as part of basic food		68.4		78.3		64.1	0.003
Beans as part of basic food		11.5		13.8		10.6	0.328
Meal eaten yesterday							
Food made from grain (bread, maize bread, rice, pasta)	446	84.1	138	89.1	308	81.8	0.051
White roots and tubers and plantains (white potatoes, white yam, cassava/chikwangue, taro, plantains, etc.)	442	24.9	136	27.9	306	23.5	0.322
Pulses (beans, peas and lentils, soya)	440	7.9	137	7.3	303	8.2	0.733
Nuts and seeds (coconut, peanut, peanut butter, etc.)	441	22	138	28.3	303	19.1	0.032
Milk and milk products (milk, cheese, yogurt, etc.)	415	10.6	136	14.6	279	8.6	0.058
Organ meat (liver, kidney, heart…)	394	1.5	126	0.8	268	1.9	0.669[#]
Meat and poultry	429	6.5	137	6.6	292	6.5	0.981
Fish and seafood	443	43.6	137	48.2	306	41.5	0.191
Eggs	423	2.4	131	3.0	292	2.0	0.536
Dark green leafy vegetable	449	59.5	138	67.4	311	56	0.023
Vitamin A-rich vegetable, roots and tubers	424	2.1	138	3.6	286	1.4	0.136
Vitamin A-rich fruit	437	7.3	137	11.7	300	5.3	0.018
Other vegetable	438	16.4	138	18.8	300	15.3	0.358
Other fruits	438	4.6	137	8.8	301	2.7	0.005

[#] *Fisher exact*

Nutritional status: Results of anthropomorphic measurements

Data in Table 5 indicate the presence of chronic malnutrition among the children: the prevalence of stunting (Z-score for height for age < -2) was about 31%. In contrast, acute malnutrition as indicated by the low percentage of children with weight for height Z-score < -2 and the absence of edema, was uncommon.

Table 5. Demographical and clinical characteristics of children

Variables	n	%	Mean (SD)
Age (months)	100		37.7 (13.2)
6 to <24		21	
24 to 59		79	
Sex	100		
Male		56	
Female		44	
Weight for height Z-score* (wasting)	98		0.01(1.3)
<-3		2.02	
-3 to <-2		2.02	
≥-2		95.96	
Weight for age Z-score* (underweight)	100		-0.6 (1.3)
<-3		2	
-3 to <-2		7	
≥-2		91	
Height for age Z-score* (stunting)	99		-1.1(1.9)
<-3		10.1	
-3 to <-2		21.2	
≥-2		68.7	
Edema	100	0.0	

* References WHO 2006

Nutritional status: Results of blood analyses

The blood analysis included the measurement of concentrations of proteins and of hemoglobin (Hb), the assessment of the iron status and of the inflammation level (using CRP) (Table 6). The Hb (median: 10.9, IQR: 9.58-11.70) was found to be not normally distributed: the frequency distribution curve was skewed to the left (or lower values). The cumulative frequency distribution of the Hb concentration shows that 52 % of the children had anemia (defined as Hb < 11 g/dL).

Table 6. Results of blood analyses in children

Variables	n	%	Mean (SD)	Median (P25-P75)
Hemoglobin Unadjusted (g/dl)	100			10.9 (9.6-11.7)
<70		5		
70-109		47		
>=110		48		
Anemia (Hemoglobin <11 g/dl)	100			
Yes		52		
No		48		
Albumin (g/dl)	100			44 (41.5-47)
<3.5		5		
>=3.5		95		
C-Reactive-protein (CRP mg/L)	100			7.9 (2.3-27.2)
<5		38		
>=5 (inflammation)		62		
Ferritin (µg/L)	100			39.1 (16.1-69.2)
<=12		16		
>12 and <=30		29		
>30		55		
Ferritin (µg/L) adjusted for CRP	100			30.1 (12.4-53.3)
<=12		24		
ID* = Ferritin Adjusted for CRP				
Yes		24		
No		76		

*ID: Iron deficiency

(Note: 5 children with Hb less than 7 g/dL were recalled for reassessment of the Hb level, malaria test and Hb electrophoresis. Hb had recovered to values > 10 g/dL in 4 out of the 5 children. None of them had malaria as assessed by thick blood smear. One was identified to be homozygous for HbS, i.e. to be suffering from sickle cell anemia. Ferritin, 159-724 ug/L, was increased in all of them, with a corresponding abnormal CRP in only 2. This calls for a more thorough assessment of the cause of anemia in this population).

The hematocrit distribution (median: 33.9, IQR: 31.30-35.18) was also similarly skewed to the left. In contrast the distribution of the erythrocyte count (median: 10.9, IQR: 9.58-11.70) was skewed to the right (not illustrated).

High ferritin levels were obtained in many children, probably reflecting a high frequency of inflammation. Indeed, high CRP levels were also seen in many patients (levels above 50

µg/L, i.e. above 10 times the standard threshold for inflammation, were obtained in 18 children). (Need to correct ferritin levels for CRP)

Levels of total proteins and albumin, liver function (as assessed using transaminases levels) and kidney function (as assessed using urea and creatinine levels) were normal. No child was seropositive for HIV (using ElisaDialab or Determine assays).

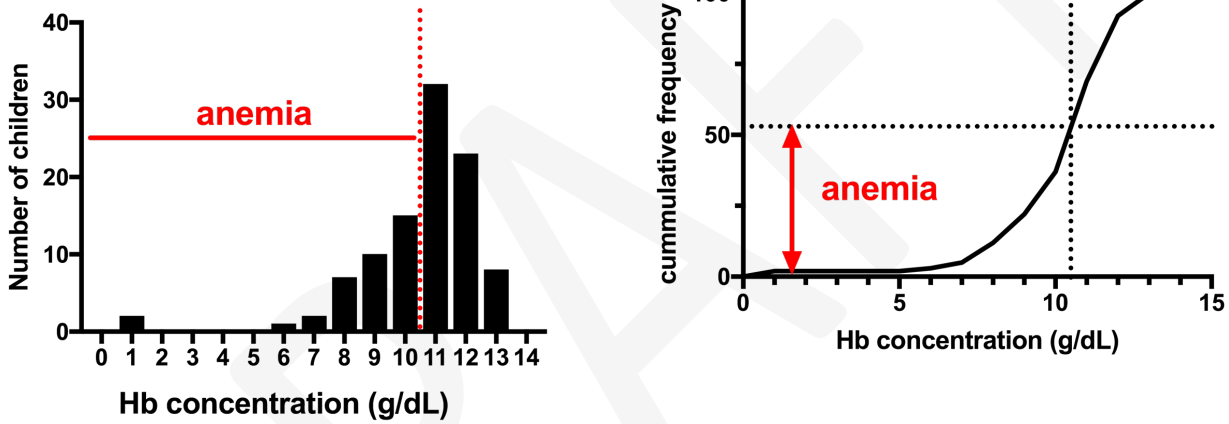

Figure 1

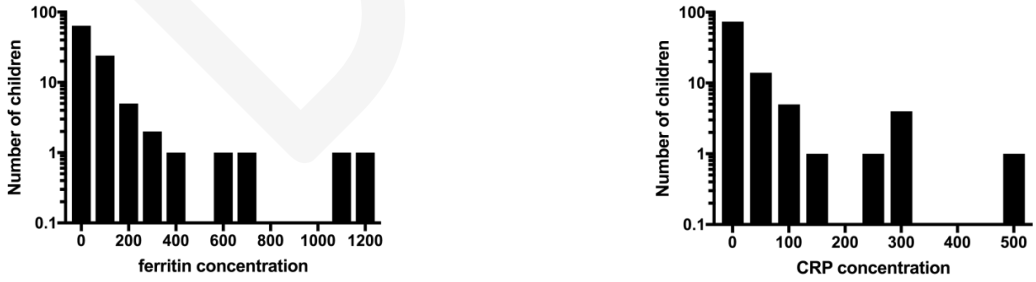

Figure 2

Discussion

The present report presents the characteristics of women living in 3 different but poor areas of Kinshasa: Kimvula, Mpasa and Yolo. Data of our survey using an extensive questionnaire submitted to 450 respondents show that poverty was frequent and severe in the group of women sampled. Nearly two-thirds of the women reported to have engaged in commercial sex work, the next profession being small-scale agriculture. Although the level of education was very low among these women, a majority of them has completed elementary school. This low level of education may work in conjunction with the poor economic performance of the DRC, the high level of unemployment and the fact that access to the few job opportunities is still more favorable to males, to account for the lack of access to other sources of income. The reported rate of engagement in commercial sex work may actually be an underestimated, as some women may refrain to declare having been involved for scare of stigmatization. In addition, even when not engaging in professional sex, many women may have had infrequent casual sex in return for monetary or material advantages [14]. The focus group discussions confirmed that data of the survey since most participants estimated sex work to be highly prevalent, involving at least one member of the majority (80 %) of the households. The survey and the FDG indicated that the definitive push into commercial sex work was usually special hardship following the death of a parent or of a husband.

Agriculture was the second most frequent professional activity. This is likely due to the location of most women in Kimvula and Mpasa, in the outskirts of Kinshasa, where cultivable land is still available. This is in contrast to the situation in Yolo, which is more central and overpopulated, with no availability of arable land. The fact that a significant number of women were already involved suggests that Agriculture may constitute a potential alternative professional activity for women engaged in sex work who want to convert to a different source of income. However, the survey indicated a low possession of assets such as land and agricultural tools by the women. Although the women reported to be able to lend money in more than 30 % of cases, access to finances was probably very limited as suggested by the low level of savings in these communities.

Poverty and vulnerability of these women is also indirectly apparent from the low nutritional status in the communities. Food consumption was limited to 1-2 meals a day, and most respondents felt they did not eat enough. In the communities, priority to food was given to the children in most cases. We carried out an assessment of the nutritional status only on a sub-sample of children under 5 years of age from the communities because the nutritional status in this subgroup is supposed to reflect the status in the community [15]. Anthropomorphic measurements indicated that stunting was frequent in these children, pointing to a chronic state of undernourishment. This is consistent with the low number of meals (1-2) per day and the lack of access to nutrient- or vitamin-rich food reported in the survey. Although data from the two Demographic and Health Surveys (DHS) done in 2007 (23.4%) & in 2013 (17.3%) reported low prevalence of stunting in Kinshasa compared to the national average (45.5% in 2007 and 42.7 in 2013), and even decreased prevalence of stunting in Kinshasa over time, our results highlight the fact that there still a high difference within the capital city and that a “gross” estimate may hide a low or even an absence of improvement of health conditions in vulnerable population [16, 17]. We agree that our sample might not be representative of all vulnerable households of Kinshasa but it gives a picture of the condition in places where our study took place. Blood analyses showed that anemia (hemoglobin concentration less than 11 grams per liter) was highly prevalent, affecting nearly half of the children. The causes of anemia in this sample remain unknown. Anemia is frequent in children from low and middle-income countries including those of sub-Saharan Africa [18] [19] [20]. Traditionally, it was attributed to nutritional factors such iron deficiency. However, more recent results have shown a less important role of such deficiency and point to other potential causes, including infections and inflammation. Similar results have been obtained in South-Kivu [21] and Kongo Central [22], and it may be interesting to pursue this issue. Except for a few cases of very severe anemia, we did not search for malaria or hemoglobinopathies as possible causes. Inflammation is another possible cause and was present in many cases.

There is a need to design interventions that economically empower the women to generate more income [23] [24]. The project was designed to help the women develop skills in Agriculture so that they can improve their productivity. Interventions for economic

empowerment should include promoting more frequent and substantial savings by the women. This may help FSW abandon commercial sex work or eventually decrease the health risks associated with the profession [25]. For example, additional income may help the FSW to refuse extra-money for risky sex without condom use [26]. The project also wants to couple this economic intervention with empowerment interventions in other sectors, including in nutrition and in gender status.

Conclusions

- Commercial sex work is common among women living in the three areas of Kinshasa surveyed. Engagement into sex work often follows situations of hardship and is usually the decision of the women themselves.
- Women in these communities who do not practice sex work are usually involved in small scale agriculture. However, their access to resources (e.g., ownership of land agricultural tools) is low.
- Income and savings of the women in these communities are very low and not different between female sex workers (FSW) and non-FSW practicing agriculture.
- Food consumption in households of these communities is at most twice a day and hardly includes vitamin-rich products, and chronic infant malnutrition and anemia are highly prevalent.
- Interventions to improve the women's conditions in these communities should empower then to increase their income through alternative activities in agriculture. In addition, such interventions should also simultaneously address issues of nutrition and food preparation, and of women's access to or control of resources.

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