# HIV TESTING UPTAKE AND SOCIO-ECONOMIC STATUS AMONG WOMEN IN BANGUI, CENTRAL AFRICAN REPUBLIC

A cross-sectional study investigating the association between provider-initiated HIV testing uptake and socio-economic status among women aged 15-49 in a family planning clinic.

MARI NYTHUN SØRLIEN

Main supervisor: Cecilie Dahl
Co-supervisor: Tone Kristin Omsland


Department of Community Medicine
Institute of Health and Society
Faculty of Medicine
University of Oslo

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# Foreword

This project took an extra year to complete. I knew, when writing the proposal, that it would not be an easy task to put in place extensive data collection in a war-torn country with volatile security and little functioning government and infrastructure. Many eventualities could have stopped this study altogether at any point. For one, implementing research through an emergency medical organisation means immediate medical needs in the population will take priority over longitudinal activities. Secondly, my own security and that of my colleagues had to be preserved, and a possible upsurge in the conflict could have meant an evacuation of all of us. Not least did the level of violence in the communities strongly affect the patient volume as the roads became unsafe to travel. Sometimes we spent several days in a row in an empty clinic, because nobody dared to come.

The main reason for the delay in this project was however the fact that three different ethical committees had to be convinced that this study should take place. NSD in Norway and the Ethics Review Board in Geneva requested an English version of the protocol, whereas a French version was submitted to the national ethics committee in Bangui, French being the official language in the Central African Republic. They also required a formal presentation by the main researcher in person. After the committee's feedback, a second presentation was required, before approval was finally given 11 months after the first submission of the research protocol. I made two visits to Bangui and spent a total of seven and a half months there. When the first participants were recruited in October 2018, exactly two years after I had first agreed with MSF to conduct this research, "relieved" is in no way a strong enough word to describe how I felt.

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## Abstract

*Background*

Increasing HIV testing coverage is a priority for countries struggling to curb the epidemic of HIV. Previous studies have shown an association between socio-economic status and testing uptake. Provider-initiated testing and counseling (PITC) is strategy that shows promise in increasing testing uptake.

*Objectives*

The main objectives of the study were to determine uptake of PITC among women of reproductive age in a family planning clinic, and to establish whether testing uptake was associated with socio-economic status. In order to achieve this, we also aimed to develop a measure of socio-economic status in the Central African Republic, and find a proxy for socio-economic status for use in future studies.

*Methodology*

A cross-sectional design was used in this study. 1419 participants were recruited among the patients in the family planning clinic. Data was collected through a questionnaire developed for the study. Four different measures of socio-economic status were developed through a point system based on qualitative interviews. Three further measures were developed using Principal Component Analysis. A logistic regression model was built based on a directed acyclical graph to test the exposures and control for confounding factors.

*Results*

The outcome PITC uptake was measured to 87,7%. One measure of SES was associated with the exposure in a crude analysis, but this association disappeared when we controlled for marital status. No further significant association was found with socio-economic status.

*Conclusion*

PITC was successfully implemented in the family planning clinic, with high testing uptake. Testing uptake was not associated with socio-economic status, which may indicate that PITC can be a promising strategy to reduce the barrier of socioeconomic status to testing.

# List of abbreviations

AIDS: acquired immunodeficiency syndrome
ART: antiretroviral treatment
ARV: antiretroviral
AU: African Union
CAR: Central African Republic
CD4: Cluster of Differentiation 4
CTA: Centre de Traitement ARV
DAG: Directed Acyclic Graph
DHS: Demographic Health Survey
ELISA: Enzyme-Linked Immunosorbent Assay
FGD: Focus Group Discussion
HAART: Highly Active Antiretroviral Treatment
HIV: Human Immunodeficiency Virus
ID: Identification
IDI: In-Depth Interview
IDP: Internally Displaced Population
MICS: Multiple Indicator Cluster Survey
MSF: Médecins Sans Frontières (Doctors Without Borders)
NGO: Non-Governmental Organisation
NSD: Norwegian Centre for Research Data
PCA: Principal Component Analysis
PITC: Provider-Initiated Testing and Counselling
PK5: Point Kilométrique 5
PLWH: people living with HIV
REK: Regional Committees for Medical and Health Research Ethics
SDG: Sustainable Development Goals
SEP: Socio-Economic Position
SES: Socio-Economic Status
TSD: Tjenester for Sensitive Data (Services for Sensitive Data)
UN: United Nations
UNAIDS: Joint United Nations Programme on HIV and AIDS
US: United States
VCT: Voluntary Counseling and Testing
WHO: World Health Organisation

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# 1 Background

## 1.1 Context

### 1.1.1 The fight against HIV/AIDS

The human immunodeficiency virus, widely known simply by the acronym HIV, is transmitted from one person to another through blood, sexual contact or transmission of certain other body fluids such as breast milk. It affects the immune system of the infected person by destroying the CD4-cells in the blood, which are responsible for fighting off infection in the body. The infection progresses slowly in this manner. After what could be many years of latent, asymptomatic HIV infection, a gradually weakened immune system makes the infected patient increasingly vulnerable to opportunistic infections. When the CD4 cell count drops below 200 cells/$mm^3$, or when the person is affected by specific opportunistic infections, they are diagnosed with acquired immunodeficiency syndrome (AIDS). Without treatment, a person diagnosed with AIDS is expected to survive for about 3 years (1). There is currently no cure available for people living with HIV/AIDS (PLWH).

After decades of ravaging and some 35 million deaths, HIV/AIDS has become a top global health priority. «Highly active antiretroviral treatment» (HAART) became available for PLWH in 1997 (2). This treatment, when taken correctly, can achieve suppression of virus in the patients, giving them the possibility to live long, healthy lives despite the infection. Successful HAART also prevents transmission of the virus from one person to another. Thanks to improving HIV treatment programmes and advocacy campaigns reducing prices on antiretrovirals (ARVs), access to antiretroviral treatment (ART) has increased drastically, especially in Sub-Saharan Africa (3). As a result, both incidence rates and mortality of this disease has been substantially reduced (4). Access to antiretroviral therapy is arguably one of the most important factors to curb the HIV epidemic, by preventing new infections and decreasing mortality.

Despite this encouraging medical breakthrough, HIV/AIDS is still the 11th cause of death globally. At the end of 2017, there were approximately 36,9 million PLWH, of which 25,7 million live in Sub-Saharan Africa (5). The global fight against HIV/AIDS is currently orientated around the goal formulated by UNAIDS in 2014 - the goal of “90-90-90”. The

objective is that by 2020, firstly, 90% of all PLWH will know their status as a result of having an HIV-test. Secondly, 90% of diagnosed patients will received and initiate ART. Thirdly, 90% of patients on ART will have viral suppression, meaning that the treatment is effective (6). As of end 2017, the achievement globally was 75-79-81(7). 59% of PLWH worldwide were on ART (8).

### 1.1.2 Global progress in HIV testing and treatment

Treatment of HIV is conceived as a continuum of care, or a «treatment cascade» including five steps: diagnosis, linkage to care, retention in care, adherence to antiretroviral therapy (ART), and viral suppression (9).

*Diagnosis*

The first step in the cascade, diagnosis, is done by ever-improving diagnostic tests. Current first line testing is mostly done by a rapid test, which gives a result within 15 minutes. Increased and early testing uptake is essential in order to achieve a high coverage of ARV treatment, and for patients to start treatment before the onset of AIDS and deteriorating health. Global testing coverage is estimated at 75%, still far from the 90% goal but more importantly with large geographical disparities (4). For the most part, people who wanted to be tested have had to seek this service on their own initiative, and several barriers to testing have been described in the literature further down. To increase testing uptake, the WHO issued guidelines for the implementation of "Provider-initiated testing and counseling" (PITC) in 2007. This is not yet the norm, but is now recommended for contexts with generalised HIV epidemics. It is described as follows:

> ""Provider-initiated HIV testing and counselling" refers to HIV testing and counselling which is recommended by health care providers to persons attending health care facilities as a standard component of medical care. The major purpose of such testing and counselling is to enable specific clinical decisions to be made and/or specific medical services to be offered that would not be possible without knowledge of the person's HIV status…. Provider-initiated HIV testing and counselling also aims to identify unrecognized or unsuspected HIV infection in persons attending health facilities. Health care providers may therefore recommend HIV testing and counselling to patients in some settings even if they do not have obvious HIV-related symptoms or signs"(10).

This method allows to seize previously "missed opportunities", where people have already made their way to a health facility. Having people opt out instead of relying on them making the effort and decision to get tested may make HIV testing more accessible for a wider range of the population. PITC has been shown to increase testing uptake considerably, both in low, middle and high income settings (11, 12). More recently, self-testing is being developed as a way to further increase testing uptake (13).

*Linkage and retention in care*

Previously, a positive HIV-test was followed by another test establishing the patient's CD4 cell count, which indicates how far along the disease has progressed. The more the disease progresses, the lower the count will be. A threshold count, which varied according to country policies, would result in the patient receiving treatment. A patient with a CD4 count above the threshold would wait until the disease had progressed to the threshold level before starting treatment. This protocol has now been changed into the "test-and-treat"-scheme, whereby all positive patients are offered to start treatment regardless of their CD4 count. The second step in the cascade, "linkage to care", has thus been somewhat shortened. This strategy has shown promise in decreasing transmission (14).

*Treatment adherence and viral suppression*

HAART, or just ART, is a life-long treatment course, in which medicines have to be taken regularly every day (15). It requires a steady medical follow-up of the patient, who might suffer from secondary effects affecting the third and fourth step in the cascade of care, retention in care and treatment adherence. Failing to take the medicine as prescribed can result in relapse and development of drug resistant HIV, in which case second or third line drugs will be needed in order to achieve viral suppression. An effective treatment course leads to the fifth step of the cascade - viral suppression. At this stage the patient is asymptomatic, and can live a normal life. Viral suppression also drastically reduces the chance to transmit the virus, which means ART is a central preventive measure (14, 16, 17). After decades of advocacy, HIV treatment has become more affordable and available also in the developing world (18). Along with adapted treatments programmes in different communities, this has considerably increased testing and treatment coverage, and reduced mortality and new infections.

### 1.1.3 Health in the Central African Republic

Globally, there are some pockets where the progress in addressing HIV/AIDS has been lagging behind (19). The Central African Republic (CAR) is one such pocket. According to the international medical association Médecins Sans Frontières (MSF), it is a country in «a state of silent crisis», (20). Despite having considerable natural resources, the population remains desperately poor with 75% living under the international poverty line of US$1.90 per day (21). Domestic instability as well as conflict in neighbouring countries leads to large population displacements, and 15% of the population is currently displaced.


*Figure 1: Map of the Central African Republic.*
*Source: The Economist* [https://www.economist.com/middle-east-and-africa/2013/01/05/on-the-brink](https://www.economist.com/middle-east-and-africa/2013/01/05/on-the-brink)

This former French colony achieved independence in 1960. The subsequent history of socio-economic and political instability has severely impeded development of health institutions. The health system in place runs on a meagre 16,64 US$ per capita, and suffers from mismanagement and infrastructural problems (22). Most citizens are left with very limited access to health services and medicines (20, 23). As a result, CAR has some of the world's worst health outcomes, and ranks 188 out of 188 countries on the health-related Sustainable Development Goals (SDG) index for 2015 (24).

For the last few years, security has been an additional challenge to health care. The rebel group Seleka overtook Bangui in 2013 and toppled the president. The abuses propagated by this movement prompted the mobilization of an anti-movement, called Anti-Balaka (25). The city became the scene of a full-blown war, followed by the deployment of international troops. As a result, one quarter of the country's population was internally displaced, and some fled to neighbouring countries. These events had an impact on access to health care overall.

The fate of these 5 million Central Africans, with a life expectancy of only 52,9 years, has received little attention on the world scene (26). Donor funds and NGOs present in the country are insufficient to compensate for the nationwide lack of available health care. MSF has been present in the country since 1997, and is currently working in 10 out of 16 provinces, providing maternity care, paediatric services and medical assistance for victims of sexual violence, basic emergency care, vaccinations and malaria treatment, as well as treatment for HIV/AIDS patients.

## 1.2 Literature review

### 1.2.1 The HIV epidemic in the Central African Republic

The first case of HIV was known in CAR in 1984. Up until 2006 all prevalence data came from sentinel surveys among pregnant women coming for antenatal care, or from HIV testing units. A study on results from these testing units indicated a very high prevalence in the capital Bangui: out of 5,686 individuals tested in 1997-2001, 18,3% were positive (27). In the testing units, HIV tests were offered for free one day per year, on which day attendance increased drastically. Cost thus seemed to be a barrier for testing at the time. A study from 2004 showed a median prevalence of 15% in pregnant women (28). Pregnant women are however not representative of the population as a whole. A more representative sample was used in the Multiple Indicator Cluster Survey (MICS), which is a nationwide household survey carried out every 4 years. In 2006, the MICS in CAR started to include HIV screening (29). The 2010 MICS reports that a prevalence of 4,9% was found among adults aged 15-49. This prevalence makes CAR the site of a generalised HIV epidemic (30).

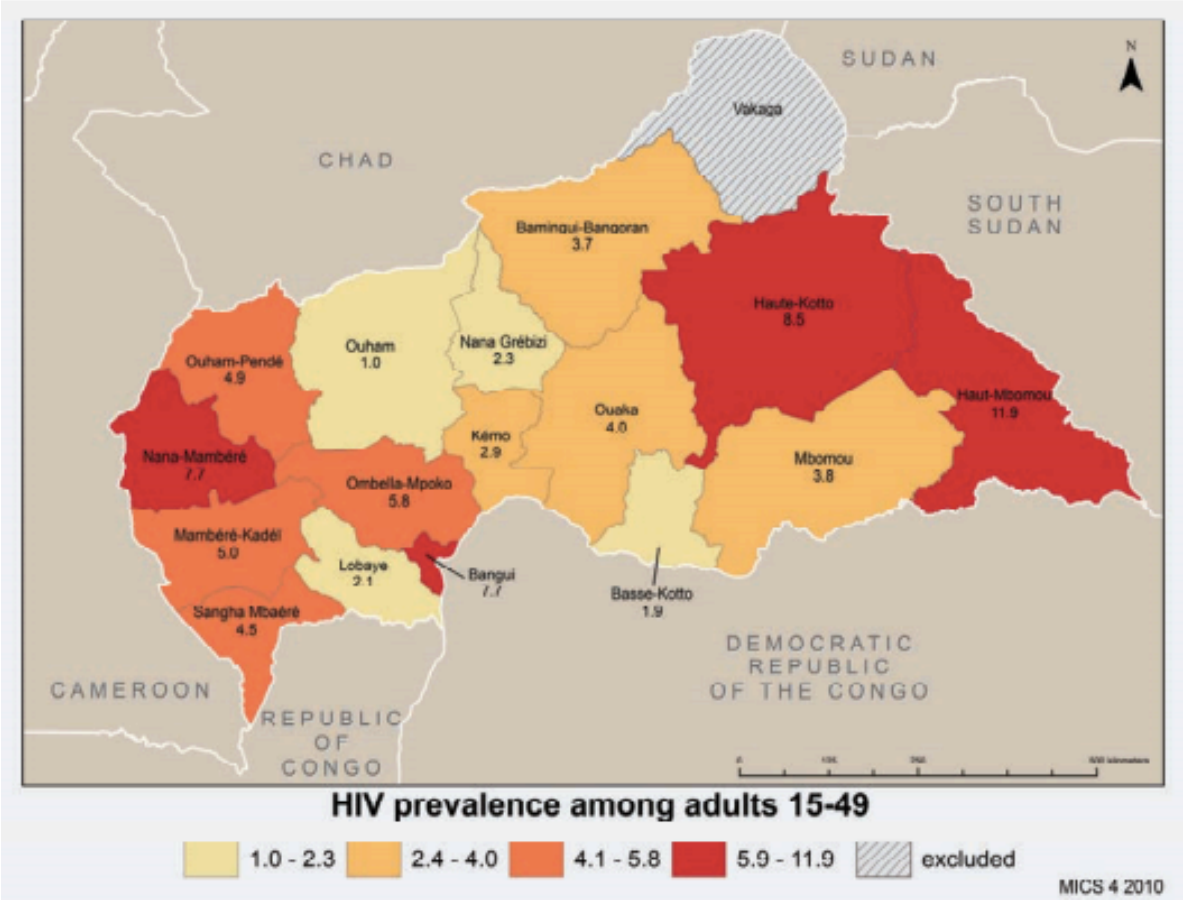


*Figure 2: HIV prevalence in CAR among adults 15-49, MICS 2010*
*Source: https://dhsprogram.com/pubs/pdf/FR263/FR263.pdf*

The 2010 MICS indicated large disparities according to region and gender. In women of reproductive age (15-49) in Bangui the prevalence was 10,6%, more than twice as high as in the general Central African population (30). In 2015, a study on blood donors in Bangui showed an HIV prevalence of 6%. Even «regular donors», i.e. those who had donated blood at least twice, had a prevalence of 3% (31).

According to the Global Burden of Disease project, HIV/AIDS was the biggest killer among people aged 15-49 in CAR in 2017, responsible for 22,21% of total deaths and a staggering 33,71 % of deaths among women in this age bracket (32). PLWH in CAR have the highest death rate in the world, with 91 deaths per 1000 PLWH (33). CAR thus remains, as other West and Central African countries, largely left out of the progress made towards the 90-90-90 goals (19).

### 1.2.2 Testing and treatment uptake in Sub-Saharan Africa, including CAR

Testing uptake among women aged 15-49 varies greatly among Sub-Saharan countries. At the bottom of the list is Niger with 1,9% of women having ever been tested, as opposed to 75,5% in Rwanda (34). CAR remains on the lower end on the scale, with nationwide testing coverage for the sexually active population was reported at 3,8% in 2011. A lack of testing facilities was cited as on one of the challenges (35). According to UNAIDS, an estimated 53% of PLWH in CAR know their status. In 2017, CAR adopted the "test-and-treat" scheme, where all HIV positive patients start ART no matter what their CD4 count is (36).

ARV treatment programmes in CAR are funded by the Global Fund. In 2016, 24% of PLWH were on ART (37), which is far lower than the global 79%. The level of ART coverage is however volatile depending on the level of violence observed at any given time (38). Another reason for the low ART coverage is ARV stock-outs, which happen regularly in CAR. Furthermore, problems with mismanagement of funds and drugs have pervaded the cascade of treatment, making access to testing and treatment unreliable. In 2011, the Global Fund interrupted the funding altogether for a period of time as a result of corruption claims, which lead to a national stock-out of ARV drugs. This unpredictability of access and cost leads to a black market for drugs. Examples of patients having to pay for drugs and services that are officially free of charge are numerous (3, 39).

In the aftermath of the war breaking out in 2013, HIV testing and treatment has been challenged by population movements, looting of medical facilities and drug supply interruption. War also increases additional risk factors for HIV, such as rape and unavailability of contraception. The war thus left the population at high risk of HIV. Non-governmental organisations as well as academics have since sounded the alarm about the HIV epidemic in CAR (19, 40, 41).

### 1.2.3 Risk factors for HIV testing uptake and linkage to care

Demographic Health Survey data in Sub-Saharan countries indicate that age is a significant risk factors for HIV testing among women. Uptake peaks at age 20-34, and is lower for the youngest and the oldest women. Uptake is higher in rural areas than urban. Women with higher education are more likely to have been tested, especially in settings where overall testing uptake is low. Testing uptake also increases monotonically depending on which wealth

quintile the woman's household is in (34). Previous studies in Sub-Saharan African countries have shown that testing uptake is significantly associated with socioeconomic status, education level and age, where lower age, higher education and higher socio-economic status is associated with higher testing uptake (42-44). One study investigates association between contraception use and testing uptake among women in Sub-Saharan Africa, and found that use of modern contraception is associated with higher testing uptake (45). This association was found in total data, but not found in some of the individual countries in the study.

These previous studies are done without specifying necessarily what kind of access the participants have to testing. Mostly, they will have access to VCT, whereby the patient themselves request an HIV-test. An Ethiopian study investigates PITC uptake more specifically, and finds that: lower age; being a government employee; being married; knowledge of HIV; PITC setup; and confidentiality, were positively associated with testing uptake (46). A Dutch study on PITC finds that factors associated with opting out are age ⩾30 years, no previous HIV test, the presence of STI-related complaints and no risky anal/vaginal intercourse (12). Gender has also been shown to be associated with testing uptake, where women have higher testing uptake than men (12). In one study, children had higher PITC uptake if they were accompanied by their mother as opposed to their father (47).

### 1.2.4 Socioeconomic status and HIV testing uptake

As seen in the previous chapter, the issue of socioeconomic status (SES) often appears in studies. Several studies have shown that for women in particular, there is a positive association between testing uptake and high socio-economic status. A study from Zambia investigating testing uptake associated with educational attainment among pregnant women, found that higher education was associated with higher testing uptake. They also found a strong positive association between treatment uptake and high socio-economic status, as well as higher age (42). A study in Nigeria showed that socioeconomic status had a stronger association with testing uptake among women than men, and testing uptake increased incrementally with each increase of wealth index. The authors state that "Wealth may capture the ease of paying for transport to go to the testing centre since HIV testing is free but also unobserved characteristics associated with the poverty level."(48) A study in Ethiopia investigated the uptake of Voluntary Counseling and Testing (VCT) and found a similar association – among women, testing uptake increased incrementally with socioeconomic status (43). Finally, DHS data from 11 different Sub-Saharan countries was analysed in a study establishing a strong positive

association between wealth quintile and testing uptake among women. (44). All of the above-mentioned studies are based on self-reporting, and no test is offered at the moment of inclusion. No studies studying the association between PITC specifically and socio-economic status have been found.

### 1.2.5 Research on HIV in CAR

Very few studies have been done on HIV in CAR at all, and there is a lack of good quality data. A review article from 2014 identified only 7 publications on HIV in CAR since 1991 (49), although another two publications could be found in French. They do however have results that are in line with those covered by the review. The most recent studies have been clinical studies on ARV resistance, which is related to ART adherence (50-53). Older studies have examined co-infections in HIV+ patients. A single small study from 2006 has looked at ART adherence (54). Since 2014, a few more publications have appeared - mainly clinical studies on performances of tests and antiretroviral regimens (55, 56). One recent study looks at risk factors for HIV infection among female sex workers, and another for risk factors for mother-to-child transmission (57, 58). Personal experience from CAR in 2016 is that socioeconomic status is a substantial barrier for access to health care, even when the care is free of charge. This barrier to care has not yet been investigated in the context of CAR, and we do not know whether socioeconomic status also influences HIV testing and treatment. Furthermore, no studies have been conducted on the provision of PITC in CAR. More research is clearly needed on all stages of the treatment cascade in CAR, including uptake of testing.

## 1.3 Study rationale

One of the most important measures to prevent transmission is increasing test coverage in order to be able to link more HIV positive patients to ART. This is also known to contribute to morbidity and mortality reduction. CAR has not had the same improvement in test coverage as seen in other Sub-Saharan countries. Despite the extensive amount of research on HIV/AIDS and antiretroviral treatment, there is a need for further investigation of how to increase coverage of HIV testing. Key demographic groups such as women of childbearing age are particularly important to reach, as this may help curb parent-to-child transmission. PITC, which implies offering HIV testing at medical contact points for such demographics, could be a promising strategy. MSF operates a successful family planning service in Bangui,

which constitutes such a contact point, and is thus an interesting opportunity to offer PITC and referral to treatment.

Therefore, in order to improve linkage to care among women of childbearing age, PITC and referral to treatment was implemented as part of the family planning package in 2017. An ongoing study aims to assess the performance of this integrated offer of family planning services and HIV testing/linkage to care, measured by uptake of testing and uptake of treatment. As access to health care has been shown to be affected by socioeconomic status, we will, as part of this study, investigate whether these outcomes are still associated with the patients' socioeconomic status when the patient is actually offered a free HIV test in the PITC setup. Knowledge about socioeconomic factors that may influence the chance of being tested and successfully referred to treatment may provide indications on how to improve the access to testing and treatment for women of childbearing age in CAR. The results of the study will be used for operational purposes, to adapt the current intervention in Bangui to the needs of the target population.

## 1.4 Research question

This thesis aims to determine the uptake of HIV Provider-Initiated Testing and Counseling (PITC) among women of reproductive age when the test is integrated in a family planning service, and to identify whether socio-economic factors are associated with uptake of testing.

## 1.5 Objectives

For women attending family planning services in Bangui, CAR, the following objectives will be achieved:

- Develop a measuring tool to determine socioeconomic status (SES) in the target population.
- Identify a proxy for measuring SES that can be used in future studies in CAR.
- Quantify the proportion of testing uptake of the free HIV rapid test, when it is offered as PITC in a family planning service.
- Test whether SES is associated with testing uptake.

# 2 Methodology

## 2.1 Study design

The current thesis is part of a larger ongoing study (see Figure 3) by the master student in collaboration with MSF. The study uses a mixed methods sequential explanatory research design (59). In the explanatory design, collection of the major element - the quantitative data - is collected first and consists of a cross-sectional and a longitudinal cohort study. The main goal is to quantify testing and treatment uptake associated with socio-economic status, as an indicator of the feasibility of HIV-testing and referral based in a maternity clinic. The second phase is qualitative, and consists of two parts: in-depth interviews with participants in the cohort - after the decision whether to get tested has been made, and after referral to treatment and the end point of treatment initiation. The other part is focus group discussions with women in the community who are not participants in the cohort. The purpose of the qualitative part is to explain and elaborate on the quantitative findings.

The scope of *this* thesis, however, is an assessment of the testing uptake, visualized in the red circle seen in Figure 3. It is a cross-sectional study consisting of two parts:
Part 1 – Pilot study
This part is carried out as a preparation to the cross-sectional study. The aim is to develop a questionnaire that will be used to measure socio-economic status in the target population. In-depth interviewing method will be used to investigate livelihoods and living conditions locally, to ensure pertinence in the questionnaire, which will be tested in a small sample of patients.

Part 2 – Cross sectional study on socioeconomic status and testing uptake
This is a quantitative study based on data collected in the questionnaire developed in part 1, which will be administered to recruited participants. The goal is to quantify testing uptake associated with socio-economic status, as an indicator of the feasibility of HIV-testing in a PITC framework based in a maternity clinic.

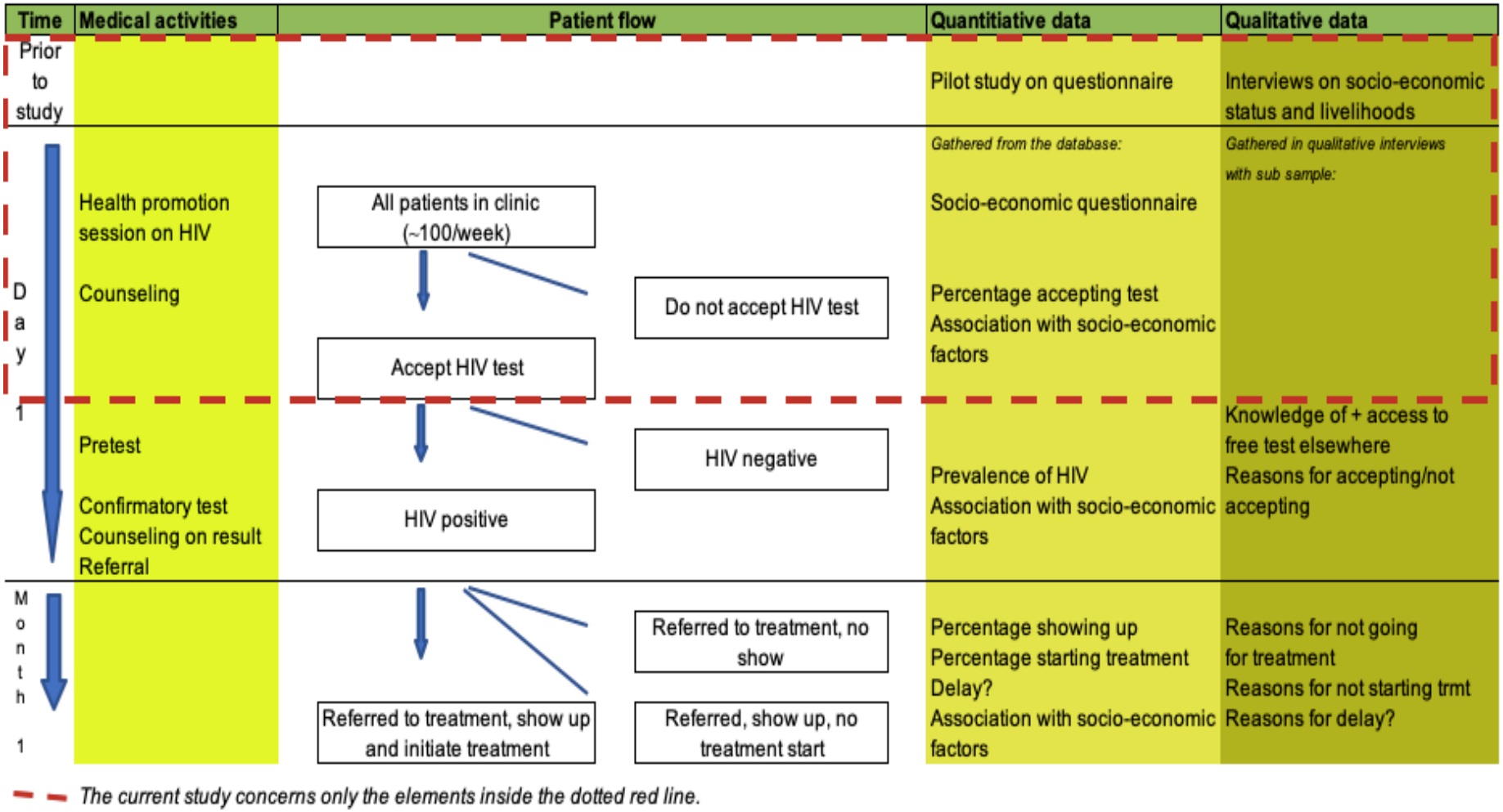


*Figure 3: Patient flow and data collection*

## 2.2 Study setting

### 2.2.1 MSF Gbaya Dombia maternity

The study took place in a small MSF maternity clinic located in the Gbaya Dombia neighbourhood in the area named PK5 in the third "arrondissement" of Bangui, the capital of CAR. PK5 is traditionally known as the most important market place in Bangui (25). During the war that started in 2012, PK5 was hit particularly hard, and subsequently put under military protection. The maternity clinic opened in 2015 to ensure that the largely secluded population had access to maternal health services. The main target population of the clinic is thus women of reproductive age in PK5. Initially providing only a delivery service, the demand for free family planning methods proved so high that a family planning service was opened also to women who had not delivered at the maternity. The clinic is run and financed entirely by MSF and all staff working there are employed by MSF. All services offered there are free of charge.

The maternity currently offers the following free routine care services:

- Safe delivery around the clock including HIV-testing and family planning for the mother
- Antenatal and postnatal consultations on Wednesdays.
- Reception of victims of sexual violence during daytime opening hours, including physical and mental health care.
- Family planning clinic consultations for all women 5 days per week
- HIV-testing for all women who come for the family planning service

HIV-testing is offered as a part of the family planning service, in a PITC framework. The current capacity of the family planning clinic is about 135 patients per week. Patient volume tends to vary a lot depending on security issues in the community making travels unsafe. Although the target population is women in PK5, it attracts women from all parts of the town. The birth control implant and the contraceptive injection are the most popular family planning methods.

### 2.2.2 Security issues

The clinic is vulnerable to security threats, as the area where it is located has a volatile security situation. MSF has a system in place as a part of its operations in Bangui, to analyse the level of security in different parts of town at any given moment. HIV testing is a part of the routine activities, and only continued to the extent that the security of our staff could be maintained, according to the decision of the security manager of the project in Bangui. All staff involved in the study were subject to these decisions. To ensure the security of research staff and participants, any research activity that takes place in the community will only be carried out after the security manager has been consulted on the day of the activity. In case of limitation of medical activities in the clinic itself, the study would not have been prioritised as part of a minimum package of activities and would be interrupted.

## 2.3 Study population

### 2.3.1 Inclusion criteria

The study population for the study as a whole is women of reproductive age (15 to 49 years), living in or around Bangui, who attend the family planning services at the Gbaya Dombia maternity.

Participation in the study required informed consent. Minors, i.e. those aged 15 to 17 included, could only participate with consent of a parent.

### 2.3.2 Exclusion criteria

Participants in this cross-sectional study are the same as the participants in the cohort-study. Pregnant women will be excluded from the cohort, and therefore also from the sample of cross-sectional study. The reasons are that pregnant women are not eligible for family planning, and because the medical protocol for ARV treatment is different in the case of pregnancy – ART is initiated immediately at the clinic before the patient is referred.

## 2.4 Sample size calculation

Based on studies from Zambia (42), Ethiopia (43) and Nigeria (48), we will assume that testing uptake is higher in the high SES group. The study in Nigeria showed that an increase of one standard deviation in the wealth index increased testing uptake by 5,4 percentage points. At the clinic in Bangui, testing uptake is at about 89% on average. In the high SES group, we will estimate that testing uptake is at 90% and at 85% in the lower SES groups. The sample size has been calculated using the "clincalc" online sample size calculator, based on a single population proportion formula (60). The formula used is the following: n (sample size) = $(Z\alpha/2+Z\beta)2 * (p1(1-p1)+p2(1-p2)) / (p1-p2)2$. With an alpha probability of 0.05 and a power of 80%, we need 563 participants in the low SES group and 844 in the mid and high SES group, a total of 1407 participants, to detect the difference of 85% versus 90% depending on the SES group.

Should the difference be smaller or bigger, sample sizes would change according to the following table:

| | | | | |
|---|---|---|---|---|
| Anticipated uptake group 1 | 86 % | 85 % | 82 % | 80 % |
| Anticipated uptake group 2 | 89 % | 90 % | 92 % | 95 % |
| Uptake difference | 3 % | 5 % | 10 % | 15 % |
| Alpha | 0,05 | 0,05 | 0,05 | 0,05 |
| Power | 80 % | 80 % | 80 % | 80 % |
| Enrollment ratio | 1,5 | 1,5 | 1,5 | 1,5 |
| Sample size group 1 | 1576 | 563 | 143 | 60 |
| Sample size group 2 | 2364 | 844 | 214 | 90 |
| Total sample size | 3940 | 1407 | 357 | 150 |

*Table 1: Sample sizes*

Assuming a maximum capacity of the clinic of 135 patients per week, and a study participation of 90%, participant recruitment was foreseen to continue a minimum of 11 weeks to get a sufficient sample for the testing uptake. As the study also included other factors and the patient volume was varying, the actual participant recruitment lasted for 22 weeks.

For the current study, a sample of 1419 participants was analysed.

## 2.5 Data collection tools

### 2.5.1 Pilot study

During the process of developing the questionnaire, a pilot study was carried out. The pilot consisted of two parts: Qualitative in-depth interviews about livelihoods, and 20 test questionnaires.

*Qualitative in-depth interviews*

The aim of the interviews was to determine how women earn and spend money, in order to find distinguishing features between women in different socio-economic groups. We needed to identify what characteristics would be associated with belonging to different socio-economic groups, i.e. what people often buy when they get more money, and what items people who are well off would typically have and poor people would not have. We would then test these items in the pilot to check means, frequencies and standard deviation to see if the variation is large enough.

In-depth interviews were done with a total of 6 women aged between 21 and 60, all mothers, residing in PK5. Five interviews were carried out with an interpreter in the local language Sango. The sixth interview was carried out in French, according to the wish of the participant. Interviews were not recorded, but notes were taken by the interviewer and transcribed by the interviewer and the interpreter after the interview. An interview guideline as seen in Appendix 6 was followed for the interviews. Questions were centered on five main topics: Education, livelihood, spending, saving groups and being broke. Interviews were analysed according to these topics.

*Draft questionnaire test*

The questionnaire test had two objectives:

- Verify that the questions were understandable and culturally pertinent
- Check that variation is large enough to detect three levels of socioeconomic status.

The draft questionnaire first translated into Sango through a process where one person translated the French version into Sango, and then that translation was translated back into French by another person. Any differences in wording were discussed in a group with the translators to achieve an agreement on the best possible translation. This questionnaire was

administered to 20 women by the main researcher, with the help of a translator for those participants that preferred Sango. These women consciously selected to have varying socioeconomic status. The questionnaire responses were expected to show differences.

### 2.5.2 SES questionnaire

A questionnaire with 23 questions was developed to assess socio-economic status, and is seen in appendix 4. Given the time constraint in the clinic with regards to patient volume and patient flow, it was important to keep the questionnaire short and concise.

The following changes were done in the questionnaire itself as a result of the pilot interviews and questionnaire test:

- Two questions about saving groups were added to the questionnaire
- The response options about matrimonial status was changed, as women frequently live in a couple with a man without being able to marry.
- The response options for the level of education were changed to fit better with local terminology
- The response options for sources of income were changed to fit better with local terminology
- A question about the number of meals per day was removed

### 2.5.3 HIV tests used

The tests used in this study are standard in MSF operations and used in most MSF HIV interventions in Sub-Saharan Africa. They are stored and administered according to standard protocol in appendixes 7 and 8. The following tests are used to determine the participant's serological status, i.e. to determine whether or not they have HIV infection:

- Determine VIH ½

This test is performed first, and gives a preliminary result.

- Uni-Gold

This test is only performed only when the result of the Determine is positive, to detect false positives.

Both of these tests have high sensitivity, specificity, and positive predictive value, and are recommended by the WHO (61). An HIV-test involves a prick in the finger and the collection of a drop of blood. In addition, the patient receives pre-and post-test counselling, as specified in appendix 9. The initial consultation and test take about 10 minutes. The patient then waits for the result, which is ready after 15 minutes. At this point the patient receives the post-test counselling. If the Determine is positive and the Unigold is negative, the result is considered undetermined. In those cases, the participant is asked to come back for a second test after one month to rule out the period of seroconversion, which is a period if time just after infection, when the patient is indeed infected but the virus is not yet detectable in the blood. If the result is still undetermined, the participant will not be included in the study. As per the routine practice at the clinic, the patient is referred to the Institut Pasteur in Bangui, where the ELISA test is performed. The patient will herself have to get to the Institut Pasteur, but the cost of the test is covered by MSF.

## 2.6 Data collection

### 2.6.1 Research staff

Data collection was carried out by the following people:

- The main researcher (master student) was present in Bangui to prepare, organise and manage the data collection.
- A trained research assistant administered participant consent forms and questionnaires and followed up participants in the study. The person was recruited based on relevant education, work experience and language skills, and was trained by the main researcher.
- An experienced MSF HIV counselor did the pre- and post-test counseling, and the HIV tests.
- A team of experienced MSF health promoters who work at the Gbaya Dombia maternity supported in ensuring patient flow, translations and other practical tasks related to the study.

### 2.6.2 Information and consent process

At the clinic site, patients typically queue in the waiting area from early morning in order to be first in line. Before any consultations start, a health promoter informs about the family

planning methods offered, and about relevant health issues such as sexually transmitted diseases. The health promoter then introduced the study, explained shortly the purpose and that participation is confidential and voluntary. Patients could ask questions in the plenary session. Then, all patients were seen individually by the research assistant to get a thorough explanation of what participation entailed, and have the opportunity to ask sensitive questions. The research assistant went through the contents of the information sheet and consent form orally, which the patient signed at this point if she wanted to participate. Participants chose whether to get the information sheet in French or in Sango which is the main local language. Bangui is an ethnically diverse city, with migrant populations from Chad and other non-Sango speaking countries. If the patient spoke neither French nor Sango, they could bring in a person of their choosing to translate for them, both Arabic and Poular-speaking staff were available at the clinic and could step in as translators.

*Patients that could not read or write* were given a full reading of the consent form, and signed the form with a fingerprint instead of a signature. They were allowed to bring an independent witness of their own choosing should they wish to do so. If the witness they wanted to use was already present in the clinic, they could complete the consent process immediately. If a witness was present during the consent presentation, this was specified, in writing, in the consent form. The witness also signed the form by name. If the patient wanted to use a witness who was not present, they could return to the clinic with the witness within 30 days which is the duration of participation. In this case, they could go ahead with the HIV-test and family planning consultation, but the patient would not participate in the study at that time. If they came back at a later point with a witness and consented, they would complete the SES questionnaire and information would be gathered from the medical records.

*Minor participants* (15-18 years) could only participate with the consent of a legal guardian, i.e. the guardian had to be present during the presentation and signature of the informed consent form. No sensitive questions, such as about HIV status or sexual behavior, were asked of the participant during this session. The guardian was not present during the HIV testing and further consultations in the clinic unless the patient asked for it.

### 2.6.3 Patient flow

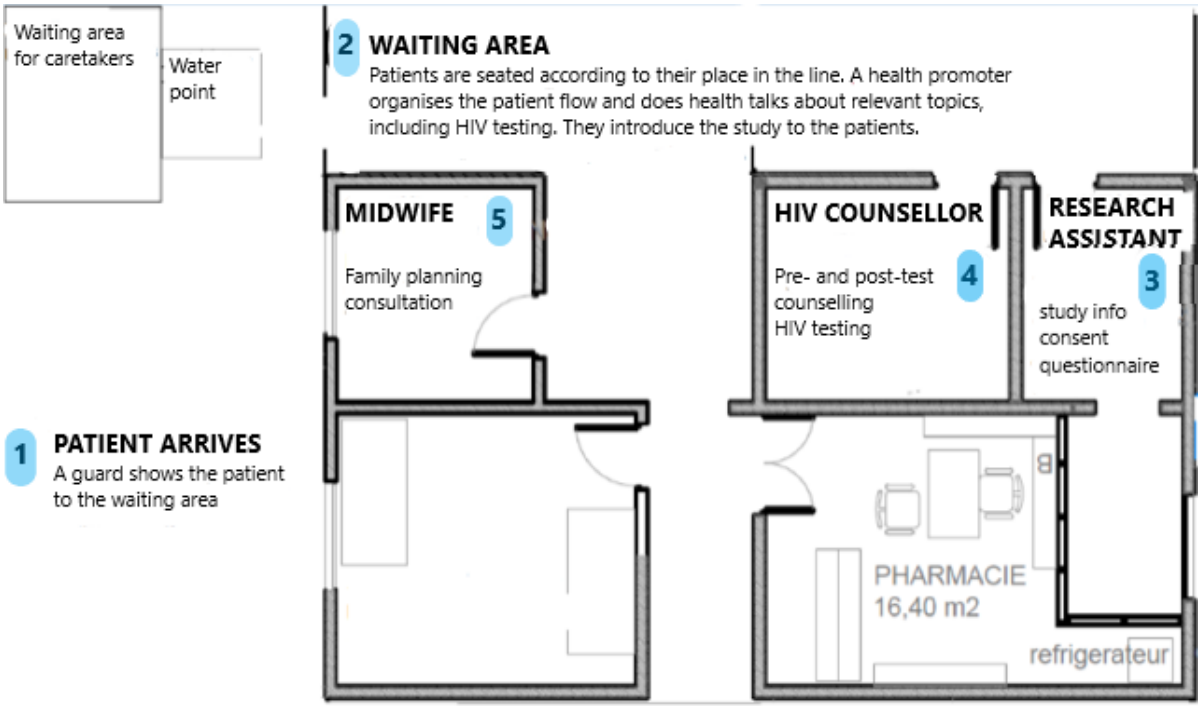


*Figure 4: Family planning clinic layout in the Gbaya Dombia maternity*

Services in the family planning clinic are offered on a first come, first served basis. The patient flow (see figure 4) is organised as follows: The patient arrives at the gate (1) and is shown to the waiting area by the guard. She goes to the waiting area (2) where she will take a seat according to her place in the line. A health promoter will organise the patient flow, and provide information and health talks on relevant topics. HIV testing is one of these topics. The patient then goes to the counselor's office (4), where she gets HIV counselling and the opportunity to have the HIV test done. All patients pass by this office, even if only to refuse the testing. Those who want to get tested have the test done immediately. Lastly, the patient is sent to the consultation room (5) where she has the family planning consultation with the midwife (5). The patient is called back into the counselor's office to get their test result about 15 minutes after their test. All patients follow the same route, even if they do not want HIV testing. This ensures better confidentiality and thus helps to prevent stigma.

HIV positive patients are referred to one of 21 public ARV treatment units (CTA) in Bangui. These treatment units offer free ART under coverage of the Global Fund. Available CTAs are specified in the table below – patients choose freely among those offering ARV treatment, based on their own preference.

| RS | Prefecture | Fosa | Activité | | | |
|---|---|---|---|---|---|---|
| | | | ARV | PTPE | TB | CDV |
| | | AMIS_AFRIQUE_ONG_RS7 | X | X | X | |
| | | AMITIE_HOPITAL_RS7 | X | X | X | |
| | | BEDE_COMBATANT_CSU_RS7 | X | X | X | |
| | | BOY_RABE_CSU_RS7 | X | X | | |
| | | CASTOR_CSU_RS7 | X | X | X | |
| | | CNSS_CSU_RS7 | | X | | |
| | | COMMUNAUT_HOPITAL_RS7 | X | X | X | |
| | | DENTAIRE_CEN_MED_RS7 | | X | | |
| | | FATIMA_NOTRE_DAME_CS_RS7 | | X | | |
| | | GOBONGO_CS_RS7 | | X | | |
| | | IZAMO_CAMP_CS_RS7 | X | X | | |
| | | LAKOUANGA_URBAIN_CS_RS7 | X | X | X | |
| | | MALIMAKA_CS_RS7 | X | X | X | |
| | | MAMADOU_MBAIKI_CS_RS7 | X | X | X | |
| | | MERE_ET_ENFANT_CEN_CS_RS7 | | X | | |
| | | NGARAGBA_CSU_RS7 | | X | | |
| 7 | BANGUI | OBROU_FIDELE_CAMP_RS7 | X | X | X | |
| | | OUANGO_CS_RS7 | X | X | | X |
| | | PETEVO_CSU_RS7 | | X | X | |
| | | ROUX_INF_CAMP_RS7 | X | X | | |
| | | SCOL_ET_UNIV_BANGUI_CS_RS7 | | X | | |
| | | SOS_BANGUI_CS_RS7 | X | X | | |
| | | ST_JONAS_BIEN_CS_RS7 | | X | | |
| | | ST_JOSEPH_CS_RS7 | | X | X | |
| | | VERTUE_LA_CS_RS7 | | X | | |
| | | YAPELE_URBAIN_CS_RS7 | | X | | |
| | | ASSOC_ENVIE_VIVRE_AEV_RS7 | X | | | |
| | | CHOUAIB_CLINIQUE_DR_RS7 | X | | | |
| | | CNHUB_HN_RS7 | X | | X | |
| | | CNRIST_CTA_RS7 | X | | X | X |
| | | COMMUNAUT_HOPITAL_CTA_RS7 | X | | | |
| | | ESPOIR_GROUP_CS_RS7 | X | | | |
| | | PEDIATRIQUE_COMPLEXE_RS7 | X | | X | |
| | | DUNAND_CROIX_R_CS_RS7 | | X | | X |

*Table 2: ARV treatment facilities in Bangui, indicated with a cross in the column entitled "ARV"*

### 2.6.4 On-site data collection

Routine and research activities in the clinic are differentiated as seen in Table 3.

| ROUTINE SERVICES | RESEARCH ACTIVITIES |
|---|---|
| Delivery, including HIV-testing and family planning for the mother | Informed consent |
| Antenatal and postnatal consultations | Socio-economic questionnaire |
| Reception of victims of sexual violence | |
| Family planning methods for all women | Qualitative interview |
| HIV-testing for all women who come for family planning consultation | Follow-up of treatment initiation (not involving the participant) |

*Table 3: Routine services and research activities*

In conjunction with this study, a new point was added in the patient flow: the office of the research assistant (see table 4). Here, each patient was seen individually, and received an explanation about the study. After information and consent procedures have been completed, the research assistant entered the participant´s name, their contact number and assigned participant ID in a list. Then, the SES questionnaire was filled in. To avoid bias in the testing

uptake, patients were recruited to the study only after they had decided whether or not to take the HIV test, but before they had received their test result. The new patient flow is shown in table 4.

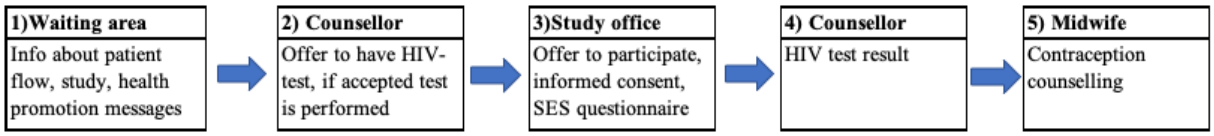


*Table 4: Patient flow with data collection*

## 2.7 Variables

### 2.7.1 Exposure

The main exposure is socioeconomic status, defined by a score composed of different factors. According to their score the participants will be divided into three groups: low, middle and high socioeconomic status.

The exposure is based on the SES questionnaire in Appendix 4. The purpose of the questionnaire is to identify difference in socio-economic status between the participants. There are several ways of measuring socio-economic status (SES) or socio-economic position (SEP), as described by for instance Galobardes et al. (62) and Howe et al. (63). Different measures will be better suited for different contexts such as rural/urban or developed/developing. Therefore, a measure should be developed and adapted according to the characteristics of the particular setting in which one is working. In mid- and high-income countries, a simple measure of SES based on income or tax returns could be used. In low-income countries like CAR, however, people do not necessarily have paychecks, bank accounts and tax returns. Their cash flow may be more unpredictable than monthly salary and rent. In these cases, material measures are often better to use. A very common measure in low-income countries is the asset-based measure (for example (64), (65)), whereby participants are asked about ownership of common household items. Based on what items they have, and sometimes the quality of these items, an index is calculated by which participants are ordered. The method has been shown to be quite robust (66), and standardized measures have been developed for some countries. CAR has no such standardized measure of socioeconomic status. Therefore, we are proposing to develop a measure especially for this study, to be able to establish difference in SES among the participants. The capital Bangui, which is where the study takes

place, is certainly an urban area compared to the rest of the country, but has many similarities with rural areas in that people get water from wells, live in mud and straw houses, lack electricity, and keep livestock. In such contexts, an asset-based measure would be the most applicable to use (67).

*Asset-based measurement tools*

As Howe et al. state, "The key is to include additional variables that capture inequality between households." (63). Assets used must thus be unequally distributed among the participants. It seems fair to assume that people, when they have money, would buy the things that they need and that they want. These things vary according to context, place and time, so that an assessment should be done before choosing the assets on which to base the index. In order to identify the variables that would in fact "capture inequality between households", one can do a large survey, asking for a large number of items. Descriptive analyses for each variable, establishing means, frequencies and standard deviation would indicate what items to use (68). In the context of this study, a large survey would not be possible for security and budgetary reasons. Instead, we completed a qualitative component, as a part of the pilot study of the questionnaire, as a way to identify items that would indicate a difference.

The following items were collected as part of the exposure, as seen in Appendix 4:

| **Variable**<br>*Type of variable* | Explanation |
|---|---|
| **Level of education**<br>*Ordinal & continuous* | It specifies whether the participants has completed certain schools in the CAR education system, either none, primary ("primaire"), secondary ("college"), upper secondary ("lycee"), or higher education ("université"). An additional continuous variable was collected which specifies the number of years the participant has spent in school. This is because it is common to repeat years, drop out halfway through a year, or complete a year but fail the exams. |
| **Marital status**<br>*Categorical* | Christian and Muslim marriage are the most common forms of union in CAR. However, a steep dowry excludes many from being able to marry their partners. Most people can nevertheless live together and |

| | |
|---|---|
| | form families regardless of their legal marital status, and women could refer to their partners as "husband" ("mari"), even if they would refer to themselves as "single" ("célibataire") in a questionnaire. Typically, being married would indicate a higher socioeconomic status than living as an unmarried couple. As the main interest of the study is socioeconomic, the question includes the options living alone, living as a couple, married, divorced and widowed. |
| **Type of housing**<br>*Categorical* | Many inhabitants of Bangui were displaced during the war in 2014, and some also in 2017, but many of the refugee camps in the city are now closed. People who have lost their homes typically move in with family members. Adult siblings can continue to live in the parental home even after they have formed their own families. Some rent houses if they can afford it, if not some inhabit deserted houses. Most aspire to owning their own house. |
| **Last move**<br>*Ordinal* | Having a stable place to live can indicate a long-term stable household economy. It can be difficult to find a place to live in Bangui, and |
| **Household members under 5 (%)**<br>*Continuous* | Participants were asked to specify specifies the number of household members in each age group, and then the variable was calculated. Children do not always live with their parents, but could go to live with a more well-to-do relative. It is common in CAR for people who are better off to accommodate the children of deceased or ill relatives or relatives are too poor who do not feel able to take care of children. Households can be composed of a variety of adult relatives. |
| **Head of household**<br>*Categorical* | The head of the family is typically male, but women can also be the head of the family, even in families with adult sons and sons in law. Their relationship with the head can indicate the status of the |

| | |
|---|---|
| | participant in the household – your status would be higher if you are his wife than if you are his niece. |
| **Number of children under 15**<br>*Continuous* | Indicates how many people they are responsible for in addition to themselves. |
| **Number of children under 15 to feed**<br>*Continuous* | Some women are for different reasons responsible for children that are not their own, or their own children do not live with them. Also, some women are not breadwinners in the family, and somebody else are responsible for feeding their children. |
| **Source of income**<br>*Categorical* | Work is scarce in Bangui, and it is common to make a living in the informal sector. Many women make money through informal commerce, where they buy ingredients and prepare food for sale, braid hair or buy goods outside of town for resale in local markets. Some have gardens in the city and grow food for sale and for own consumption. Some are supported by family members, while they go to school, are taking care of children or do not have any other income. |
| **2nd source of income**<br>*Categorical* | Many rely on additional means of subsistence. Even if they rely mainly on their husband's income, for example, they may add to the household economy by punctual informal commerce. |
| **N Breadwinners per household member**<br>*Continuous* | A household can be large, but have several members that contribute to the household economy. This variable is calculated based on the total number of household members and the number of breadwinners in the household. |
| **Participation in saving groups**<br>*Continuous* | Bank accounts are rare in Bangui. A "tontine" is a common way for women to save money if they have surplus, and is therefore used as a proxy for savings in this study. |

| | |
|---|---|
| **Mobile phone use**<br>*Continuous* | Mobile phones are quite cheap and thus accessible also to relatively poor people. When in financial trouble, people will cut back on their credit use. |
| **Access to mobile phone in household**<br>*Dichotomous* | Some women are not allowed to or are considered too young to have their own phone, can compensate for the fact that some women are not allowed to have their own phone. |
| **N days last week with enough food**<br>*Ordinal* | Participants were asked to consider last week, and cite the number of days in which they had enough food for themselves and their |
| **Last food shortage**<br>*Ordinal* | Food shortages can be punctual and happen during crises, after which the family recovers. Long term stable food supply can be an indicator of a stable financial situation in the household economy. |

### 2.7.2 Outcome

The outcome is dichotomous: the participant's acceptance to go through with the free HIV test offered (yes/no). The outcome was self-reported, and assessed after the patient had accepted or not accepted to be tested. It was measured using the question "Did you go through with the HIV-test offered today?".

### 2.7.3 Cofactors

The following cofactors will be collected:

| **Variable**<br>*Type of variable* | Explanation |
|---|---|
| **Age**<br>*Continuous* | The participants were asked to state their age. Patients who did not know their exact age were requested to give an estimation. |

**Area of residence**
*Categorical*

Bangui is delimited into eight urban districts, "arrondissements". In addition, the clinic receives patients from the neighbouring district Bimbo, and occasionally patients from other districts. This variable is not included in the SES measure because after the war previously relatively wealthy neighbourhoods were badly ruined and we do not have a strong indication on which areas would be linked to socio-economic status.

**Previous HIV-testing**
*Categorical*

could possibly deter women from being tested, as they may feel they already know their HIV status making the test superfluous to them. Equally, it is recommended to space HIV-testing by about 3 months. Some women may thus opt out of the testing because they have been tested within the last three months. As many do not remember the date of their last test, and this information is not collected in their medical record, the question was asked in an open form: "When was your last HIV-test", and the answer was written down as the calendar year in which they were tested.

**Knowledge of status**
*Dichotomous*

is recorded because there is a chance that people did not receive results from their last HIV-testing, or did not understand the result. Further, HIV-positive patients who know their status would probably not want to be tested again.

**Contraception uptake**
*Dichotomous & categorical*

is recorded because the HIV test in this particular setting is offered in conjunction with a contraception service. It would be important to see whether the two services influence each other. There could also be reasons for the patient not to accept any of the offers. We presume that participants reason to come to the clinic is to get contraception, and hence do not assume that contraception uptake is associated with socio-economic status.

### 2.7.4 Directed acyclic graph of the study

A directed, acyclic graph (DAG) is helpful to map out relationships between variables in a study, as a basis for model construction and statistical analysis. A DAG was created in order to hypothesise how different factors would interact in causal relationships, based on earlier studies showing risk factors for HIV testing uptake. The hypothesized relationships between exposure, outcomes and co-factors are detailed in the DAG below.

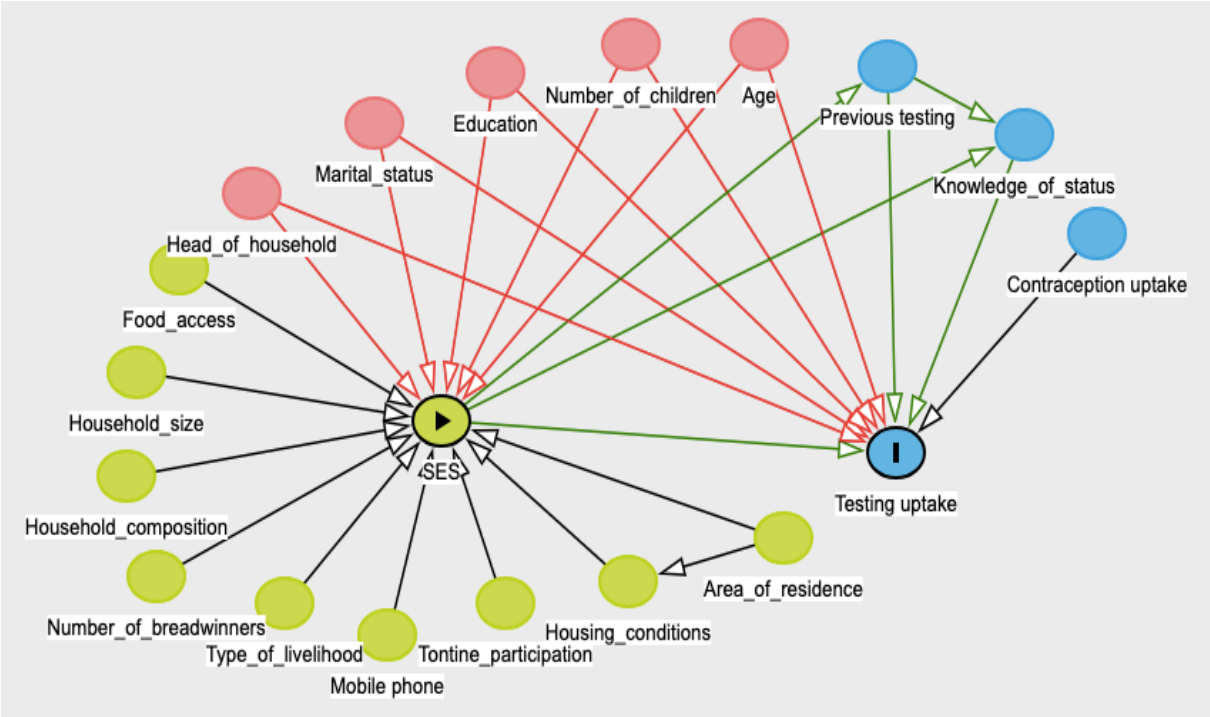


*Figure 5: DAG of the study. Created on [www.dagitty.net](http://www.dagitty.net).*

In this DAG, SES is the exposure, and testing uptake is the outcome. The green line between them represents a causal path indicating that SES influences testing uptake. The line does not specify whether the influence is negative or positive, nor does it indicate the strength of the relationship. Blue circles represent mediators, or ancestors to outcome. In this DAG, previous testing and knowledge of status are mediators, whereas contraception uptake is an ancestor. Red lines symbolise biasing paths, and red circles are possible confounders. In this DAG, head of household, number of children, marital status, age and education are possible confounders. Green circles are ancestors to the exposure. The green circle in this DAG are the variables used to calculate the exposure called SES 2. The circle called “tontine participation” refers to saving groups. A separate analysis was also performed where education level, head of

household, marital status and the number of children were included as measures of SES, called SES 1, in addition to adjusting for them in the regression model.

## 2.8 Ethics

### 2.8.1 Confidentiality

The study population is vulnerable on several levels. Many of them are living in poverty, lacking access to medical treatment, especially maternal health services, except what MSF is offering. HIV positive participants are especially vulnerable given the health implications and social stigma of being carrier of a dangerous communicable disease. Confidentiality has been given the highest priority in this study, as a loss of confidentiality would have had severe consequences for the participants, insofar as being HIV-positive is still associated with stigma in Bangui. Being identified as HIV positive may have negative social consequences for the participants in terms of access to work or relations to friends and family members. Although in this community, some PLWH are open about their status, there are also reports of PLWH being shunned in the community.

Identifiable participant data on paper is kept locked in the research office for the duration of the study. All data was entered into the secure database TSD (see chapter 2.9 for details) and all the statistical analyses were performed in TSD. All research staff, including interpreters and translators were on standard MSF contracts, which means that they are subjects to the confidentiality agreement in the internal regulations for staff in the Central African Republic. In addition, the research assistant was trained in research ethics by the researcher as a part of the preparation for the study.

### 2.8.2 Voluntary participation

Participants that are recruited in the clinic might feel morally obligated to participate in the study because the clinic provides free health care. Information on voluntary participation and the right to withdraw from the study was given before inclusion into the study. The participants were also assured that participation would not influence their medical treatment or follow-up at the clinic. The HIV test had already been offered at the time of inclusion, and the patients were reassured that participation would not influence their referral to treatment. Patients were informed about how to withdraw from the study at any given time, should they wish to do so.

Being tested for HIV and receiving the result may in itself be psychologically demanding to the participants, especially to those who have received a positive test result. All participants received pre- and post-test counseling.

### 2.8.3 Incentives

Patients who chose not to participate in the study received the exact same health care services as participants. There were no incentives offered for participation in the study. Expected long term benefits of the study are detailed in chapter 4.5.

### 2.8.4 Ethical approvals

Ethical approvals have been obtained for this study as a part of the ongoing cohort study. The study was submitted to the Regional Committees for Medical and Health Research Ethics (REK) in Norway. They replied that their approval was not necessary (Appendix 12).

The project was thus submitted to, and approved by, the following institutions (Appendixes 10,11,13):

- NSD – Norwegian Centre for Research Data, who approved the study, provided some changes in the consent form.
- The Comité Scientifique Chargé de la Validation des Protocoles d'Etudes et des Résultats in Bangui, Central African Republic.
- Ethics Review Board commissioned by MSF in Geneva, Switzerland.

## 2.9 Data management and storage

All participant data was first recorded on paper forms by the research assistant. Participant forms as well as name lists are kept in a locked cupboard until publication of the final version of the report, after which they will be destroyed. Only the main researcher and the research assistant has keys to the file cupboard. The research assistant entered participant forms through Nettskjema at the first available internet connection. The data was screened by the main researcher. Missing or erroneous data was verified in the paper forms and corrected.

Data was stored digitally using only “Tjenester for Sensitive Data” (TSD), which is an online computer platform for storing and analysing sensitive data. Digital information stored in TSD will be kept for period of 5 years for quality control measures. After 5 years, all information linking identities to data will be deleted. The main researcher is responsible for this.

Participants were informed during the consent process that they may withdraw from the study and thus withdraw their data up until the point of data analysis. If a participant requests to do so, the paper forms will be destroyed, and the digital data deleted immediately.

## 2.10 Statistics

### 2.10.1 Descriptive analyses

Distributions of continuous variables were examined and number of observations in categorical variables were checked, using kernel density plots and frequency tables. Variables used in bivariate analyses were checked for normality, kurtosis and skewness. Continuous variables were divided into categories in order to have the same type of variables as a basis to calculate the SES scores. The categories were made using the binning function in SPSS. For statistical analyses, categories with too few observations were collapsed with neighboring categories. Mean and standard deviation and percentage in each category according to the outcome were reported, along with results from bivariate analyses. Chi square, or Fisher’s exact tests for variables with few cases in some categories, were used to evaluate differences among categorical variables. Independent samples t-test has been used to evaluate differences in outcome for continuous variables.

### 2.10.2 SES indicator

Due to the lack of studies in this population, there was no standard measure of SES. Therefore, one of the objectives of this study was to find a suitable indicator based on participants' responses in the questionnaire, by combining different factors to measure SES. For example, a person reporting that she is residing in a refugee camp, or has no dwelling, would be classified as having low SES, whereas a person who works in agriculture, but has several family members contributing to the family's income and owns a mobile phone, would be classified as having medium SES.

First of all, a point system was developed based on information gathered in the pilot study. Ordinal categories were developed for each variable, as seen in Table 10, with a score for each category. Continuous variables were scored according to categorical groups obtained by using the binning function in SPSS. Categorical variables with many categories were adjusted and scored by grouping categories together. In the scoring system, some categories have been kept in the point matrix although there were no cases in these categories in this study. This is for future use of this indicator, where there may be cases in those categories. For example, there were no cases living in refugee camps at the time of this study. However, if there is a flare-up in the conflict, people lose homes and camps reappear.

| Variable | 0 points | 1 point | 2 points | 3 points | 4 points | 5 points |
|---|---|---|---|---|---|---|
| N Children to feed | 4 and more | 3 | 2 | 1 | 0 | |
| N people per breadwinner | Over 9 | 5,8-9 | 2,4-5,7 | 1-2,3 | | |
| HH % under 5 | Over 60 | 50,1-60 | 44,5-50 | 33,4-44,4 | 0-33,3 | |
| Saving per week | None | Up to 1000 | 1000-2900 | 3000-5900 | Over 5900 | |
| Phone use | No phone | 0 | 1-499 | 500-999 | 1000-1499 | Over 1500 |
| Income type 1 | Nothing | Agriculture | Family member | Trade/Services | Paid work | |
| Income type 2 | Nothing | Agriculture | Family member | Trade/Services | Paid work | |
| Housing type | Homeless | Camp | Host family | Rented house | Owned house | |
| Last food shortage | Yesterday | This week | Last week | Last month or longer | Never | |
| Enough food (days p/w) | None | 1-3 days | 4-6 days | Every day | | |
| Last move | One month or less | 2-6 months | 7-12 months | 13 months-5 years | 6-10 years | Over 10 years |
| Phone in household | No | yes | | | | |
| N children under 5[a] | 4 and more | 3 | 2 | 1 | 0 | |
| Head of household[a] | Participant | Acquaintance/relativ | Grandparents | Parents | Partner | Husband |
| Marital status[a] | Widowed | Divorced | Single | Cohabitating | Married | |
| Education level[a] | None | Pre-school | Primary | Middle | High | University |

[a] Confounding variable

*Table 5: Categories and points used to calculate SES Index*

First, two different measures of SES, named SES 1 and SES 2, were calculated using this scoring table to add up points for each case. Based on the the participant characteristics, four measures of SES were calculated using the variables described in Table 5, according to the following rationale:

- SES 1: All 16 variables are included in the measure.
- SES 2: Only the 12 non-confounding variables are included in the measure.

Cases with missing values were left out of the calculation by pair-wise exclusion. These measures are thus applicable for 1385 participants.

| | SES 1 | SES 2 |
|---|---|---|
| 1 | Head of house hold | N children to feed |
| 2 | Marital status | % household under 15 |
| 3 | Education | People per |
| 4 | N children under 15 | Housing type |
| 5 | N children to feed | Last move |
| 6 | % household under 15 | Income 1 |
| 7 | People per | Income 2 |
| 8 | Housing type | Phone use |
| 9 | Last move | Phone in household |
| 10 | Income 1 | Saving per week |
| 11 | Income 2 | Last food shortage |
| 12 | Phone use | Weekly food shortage |
| 13 | Phone in household | |
| 14 | Saving per week | |
| 15 | Last food shortage | |
| 16 | Weekly food shortage | |

*Table 6: Variables used to calculate SES 1 and SES 2.*

### 2.10.3 Factor analysis

We also wanted to identify a smaller number of factors which could be used to determine SES, instead of including this large amount of data to determine the participant's SES. In the future, then, one would need to ask fewer, targeted questions on order to establish SES. In a Principal Component Analysis (PCA), which is a type of factor analysis, "the original variables are transformed into a smaller set of linear combinations, with all of the variance in the variables being used" (69). These "linear combinations" are created one by one, where the first explains as much of the variance as possible, then the next explains as much as possible of the remaining variance, and so forth. The "eigenvalue" of each component represents how much variance is explained by that component. The components are ordered from highest to lowest eigenvalue in an eigenplot that is used to determine which components to use.

In this study, PCA was performed in order to determine which variables explained most of the variability in the data. These variables would thus be retained as proxies for socio-economic status. The 16 variables used to calculate SES 1 were included in the PCA. Some of them were however included in the form of continuous variables instead of the ordinal ones created to calculate SES according to the point system. Those were: Number of children under 15, Number of children to feed, Percentage of household under 15, Number of people per breadwinner, Saving per week and Education. The variable Head of household was included with 9 categories instead of 6. Based on the PCA analysis, only the few variables that had a

factor score superior to .3 on each component were included in the SES measures based on the eigenplot. A further three SES measures were calculated in this way, SES 3, SES 4 and SES 5.

### 2.10.4 Statistical tests

In this study, the aim was to predict the likelihood that participants will accept HIV testing, which is a dichotomous dependent variable. Bivariate analyses were conducted. Logistic regression (odds ratio, 95% confidence intervals) has been used to quantify the association between socioeconomic status and HIV test acceptance. Potential confounding variables were included in multivariable regression, after considering their role in the causal graph seen in chapter 2.7.4. Statistical significance level is set at $p<0.05$. IBM SPSS Statistics 22 has been used for all statistical analyses.

### 2.10.5 Regression assumptions

Logistic regression assumes a binary outcome, which in this case is testing uptake (yes/no)(70). Three further assumptions are made when using logistic regression: Independent residuals, no interactions, and linear effects of the exposure on the log-odds scale.

*Independent residuals:* In theory, whether other people get tested would influence participants in their decision to get tested or not, because of the stigma and social pressure connected with HIV in this particular context. We have put measures in place to reduce as much as possible this effect, through the design of the patient flow and the strong focus on confidentiality. We therefore have reason to believe that residuals are independent in this study.

*No interactions:* Interactions between variables in the model would mean that the effect of one independent the dependent variable, would be influenced by the value of a different independent variable. This was checked by including interaction terms in the regression model, and looking for significant interaction. No such interaction was found except for a slight interaction between education and three of the measures of SES. This interaction was not present when education was used as an ordinal variable and not continuous. It was therefore deemed not particularly influencing the results.

*Linear effects of the exposure on the log-odds scale:* As opposed to linear regression, the exposure does not need to have a linear relationship with the outcome, the outcome being dichotomous, but the exposure needs to have a linear relationship with the log-odds. This has been checked for each of the continuous exposure variables in SPSS in the following manner: all the exposure variables were binned into quintiles, and the central points of each quintile were plotted against the estimated beta-coefficients of the quintiles. This is not the best way of testing this assumption but will give a rough idea as to whether the effects are linear. The effect was not found to be linear, as seen in Figure 6 where this procedure has been done for SES 1. The result was the same for the other measures. As a result, the continuous exposures have been transformed into ordinal variables used for the logistic regressions.

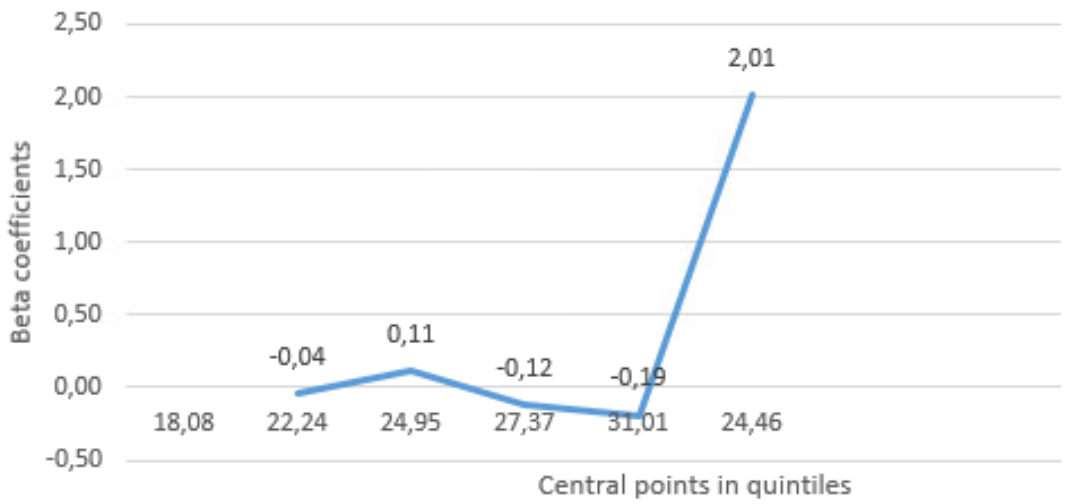


*Figure 6: Beta coefficients and central points for quintiles of SES 1*

### 2.10.6 Correlations

When included in the exposures, the confounding variables were checked for correlation with the exposure using Spearman correlation coefficient (rho). None of the confounders had a higher correlation coefficient than ,356, which is a medium strength of correlation (71). All except one had a correlation coefficient lower than ,3, which is a small strength of correlation.

### 2.10.7 Sensitivity analyses

Given that little previous research is done on SES, the is little comparison for the measures of SES developed here. The exposure SES was adapted in different ways to account for different influencing factors. In one type of sensitivity analysis, the food security variables were weighted in the SES measures more to account for their qualitative importance. In this way, we created SES 6 and SES 7, which are composed of the same variables as SES 1 and SES 2, but the two variables about food security were included twice thus doubling their weight.

Secondly, it is recommended to space HIV tests by three months, and we cannot exclude the possibility that some participants refused testing because they had recently been tested. We found in a separate regression model that previous testing was significantly associated with testing uptake, where those who were not recently tested had higher testing uptake. We therefore deemed necessary to test the association on the selection that was not recently tested. Although we cannot tell exactly how long ago participants were tested because of poor recall and because earlier HIV testing was not recorded in their patient files, the models were also tried on a selection of 429 participants who had never been tested or whose last test took place before 2018.

Finally, instead of calculating SES measures based on the PCA and the score table, the actual components generated through PCA were also tested against the outcome by logistic regression.

# 3 Results

## 3.1 Pilot study interview results

Six in-depth interviews were carried out prior to the data collection to gather qualitative information for developing the questionnaire, as detailed in chapter 2.5.1. The interviews were carried out with six women aged 21-60, who were living in the district where the study took place, but who were not participating in the study. Interviews followed an interview guide, allowing for other topics to be discussed if the participant brought them up. The interview data was analysed according and is summed up in the following chapter. All citations are from interviewees.

### 3.1.1 Education

The six interviewees ranged from having no formal education at all to having started university. Regardless of their level of education, all wished they had been able to have more schooling. They perceived education as a means to higher income, better standard of living and independence. Reasons for not going to school were school fees, pregnancy and in one instance a refusal from the husband. Some said that some people don't send their children to school, because they needed the income they could make as vendors, for food. Public schools are free in CAR, but costs such as inscription fees, writing equipment, printouts and uniforms are an economic deterrent from schooling. Private schools are considered to be of better quality than public schools. Those, in return, have school fees. Universities have intake fees and fees for intake tests. In this way, education reinforces socio-economic disparity, in that it allows those that can pay for it to access the socio-economic benefits associated with education.

All interviewees want their children to have more schooling than they had themselves, and believe this will give their children a chance at a better future. One interviewee said: "My husband doesn't want the children to go to school. It really hurts me. He only wants them to go to the Quranic school. I insist that they go, and I pay with my own salary."

### 3.1.2 Livelihood

Five of the women earned their own money. Two of them were the sole breadwinners of their family. All five reported being able to dispose of their own income as they saw fit. Three of the women made a living doing petty commerce, which was cited by all as the most common source of income for women. Typically, women buy ingredients and make food items or soap that they sell in the market, or buy manioc which they grind and sell as manioc flour. Some travel out of town or abroad to buy goods for sale locally. One interviewee did housework, and another was employed by an NGO. Formal jobs are very scarce in Bangui. The last participant, better off than the others, stayed home thanks to her husbands' successful business. In certain milieu in PK5, men prefer to have a stay-at-home wife if they can afford it.

### 3.1.3 Spending and saving

Participants were asked to rank their spending according to importance. Food was cited as the most important expenditure. Some reported not always having enough money to buy the food that they wanted. They would cut out expensive foods such as meat and oil and give priority to manioc flour and leafy greens. Thus food expenses varied according to what kind of food people felt they could afford.
Medication was the second most important expenditure, but for some the most worrying one because of the unpredictability of these expenses. Some participants paid medical expenses for less wealthy members of the extended family.
Other expenditures were clothes, shoes, firewood, school expenses for the children and house repairs. Only two out of the six paid rent, the others lived in owned houses or had well doers who provided free housing. All the participants had a mobile phone, and reported spending between 100 and 2000 Central African Francs (FCFA) per week on credits. 1000 FCFA equates roughly to US$ 1,7.

When broke, the women say they ask family and friends for loans, or more frequently, knowing that they are not able to repay a loan, handouts. Some talked about selling household items: “Previously, if I was broke, I could sell some of the valuable clothes. But during the events, all my things were stolen so I have nothing anymore”. The concept of “tontine” was often brought up. This is a savings group, often consisting of 10 to 20 women, where each participant contributes a regular sum of cash to the pot. Members take turns in being the recipient of the lump sum, which is mostly used for commercial investments, restocking of food or big expenses. Four interviewees said they participated in tontine, contributing between 250 and 5000 francs a day. One did not because she could not afford it, and the other because her husband wouldn’t allow it.

### 3.1.4 Poverty and wealth

When asked what characterised poverty, the participants invariably mentioned access to food. “A poor person is one who doesn’t have anything to eat”. “I consider myself poor. I only eat one meal day, and otherwise we always have to try and find something to eat and to give to the children.” Poverty was also seen as having poor social support: “Poverty is when you don’t have anyone to help you out, you don’t have anyone to ask when you are in trouble. You are alone. You live with the hassle to find something to eat, you are hungry. You have nothing to eat but you suffer through it.”

Being rich is first and foremost associated with being well fed and having well fed children. Further, wealthy people send their children to private schools, have means of transportation and own their house with a floor indoors. Their children have time to read and succeed at school. Poverty and wealth were seen as something you are born into and inherit from your parents.

Five of the interviewees mentioned that they lost property and had a lower standard of living as a result of looting during the war. When asked about expensive things they had bought, one answered “Before the events, I bought a TV. It was stolen during the events, everything was looted.” Another said “Before the events, I had a freezer, so I could do business making yoghurt. Now, I have nothing anymore. I haven’t bought anything expensive since the events.” (“Events” refers to war related fighting that erupt in Bangui, either the events of 2013-14 or those in 2015-16)

#### 3.1.5 Conclusions from the interviews

Looting and loss of property was mentioned by most of the interviewees. Given the widespread looting happening at regular intervals, household items would come and go in households, and investments made may be lost by the next riot. Likewise, everybody mentioned a stable access to food and strong social support as characteristics of the wealthy. These would also be more stable factors than items. People with a social network, like family to support them, business contacts etc, would most likely recover from the losses quicker than those who were on their own. The questionnaire was therefore conceived to rely more on social support and food supply than on material acquisitions.

## 3.2 Sample characteristics

The following chapters described the sample used in the study, and all the data reported in the text and in tables is gathered from the questionnaires.

### 3.2.1 Respondent characteristics

- A total number of 1419 respondents were included in the analysis. The population was young, ages ranged from 16 to 49 with a mean of 24,3 years (SD 5,04). 59,5 % of the respondents were aged 18 to 24.
- Most of the patients were living with a partner as 19,3 % of the respondents were married, and another 55,2 % were cohabitating with a partner. 23,9% were single, and 1,6% were divorced or widowed.
- Many had young children; 94,7 % of the respondents had between 1 and 9 children aged under 15, with a median of 2 children. Three quarters of the respondents (74,4 %) had between one and three children.
- 6,8 % of respondents were entirely self-reliant to feed children under 15 that they were responsible for.
- The number of years of education ranged between 0 and 18, with a mean of 7,8 (median 8, SD 3,78). 10,5 % of the respondents had never gone to school. 13,5 % of respondents have some high school education or higher education.

Table 7 shows the respondents characteristics according to the outcome. A significantly larger proportion of married participants refused testing. Testing uptake did not vary significantly according to the other individual characteristics.

| | | HIV testing uptake | | | | |
|---|---|---|---|---|---|---|
| | | No | | Yes | | Total |
| | | Count | % | Count | % | Count |
| **Age** | 16-20 | 36 | 9,1 | 361 | 90,9 | 397 |
| | 21-25 | 67 | 12,1 | 485 | 87,9 | 552 |
| | 26-30 | 48 | 15,1 | 270 | 84,9 | 318 |
| | 31-35 | 15 | 14,7 | 87 | 85,3 | 102 |
| | 36 or above | 8 | 16,0 | 42 | 84,0 | 50 |
| **Education level** | None | 19 | 12,8 | 129 | 87,2 | 148 |
| | Primary school | 57 | 12,8 | 389 | 87,2 | 446 |
| | Middle school | 73 | 11,5 | 560 | 88,5 | 633 |
| | High school | 24 | 14,0 | 148 | 86,0 | 172 |
| | Higher education | 1 | 5,0 | 19 | 95,0 | 20 |
| **Relationship status** | Single | 25 | 7,4 | 314 | 92,6 | 339 |
| | Cohabitating | 86 | 11,0 | 697 | 89,0 | 783 |
| | Married | 61 | 22,3 | 213 | 77,7 | 274 |
| | Widowed/divorced | 2 | 8,7 | 21 | 91,3 | 23 |
| **Children under 15** | 0 | 4 | 5,3 | 71 | 94,7 | 75 |
| | 1 | 40 | 10,1 | 355 | 89,9 | 395 |
| | 1 | 47 | 12,4 | 331 | 87,6 | 378 |
| | 3 | 39 | 13,9 | 242 | 86,1 | 281 |
| | 4 | 27 | 14,8 | 155 | 85,2 | 182 |
| | 5 | 9 | 12,7 | 62 | 87,3 | 71 |
| | 6 or more | 8 | 21,6 | 29 | 78,4 | 37 |
| **Children to feed** | 0 | 161 | 12,2 | 1162 | 87,8 | 1323 |
| | 1 | 3 | 14,3 | 18 | 85,7 | 21 |
| | 2 | 5 | 20,0 | 20 | 80,0 | 25 |
| | 3 | 4 | 13,8 | 25 | 86,2 | 29 |
| | 4 or more | 1 | 4,8 | 20 | 95,2 | 21 |

*Table 7: Individual characteristics*

### 3.2.2 Livelihood, saving and spending

Almost half of the participants, 49,6 %, had petty trade or services as their main source of income. Another large portion, 47,3 %, relied mainly on family members to support them. Only 1,6 % had a paid job. Saving groups or “tontines”, used as a proxy for personal saving as personal bank accounts are rare, were accessed by 29 % of respondents. Those who saved, saved a mean of 3311 FCFA per week (median SD 2409,7) 45,7 % of respondents had a mobile phone, proxy for spending. Those who had a phone, had a mean weekly credit spending of 743 FCFA (median 500, SD 733).

| | | HIV testing uptake | | | | |
|---|---|---|---|---|---|---|
| | | No | | Yes | | Total |
| | | Count | % | Count | % | Count |
| **Source of income** | Nothing | 0 | 0,0 | 2 | 100,0 | 2 |
| | Agriculture | 3 | 17,6 | 14 | 82,4 | 17 |
| | Family member | 78 | 11,6 | 593 | 88,4 | 671 |
| | Petty trade or services | 92 | 13,1 | 612 | 86,9 | 704 |
| | Paid work | 1 | 4,5 | 21 | 95,5 | 22 |
| | Other | 0 | 0,0 | 3 | 100,0 | 3 |
| **Second source** | Nothing | 85 | 11,2 | 675 | 88,8 | 760 |
| | Agriculture | 0 | 0,0 | 2 | 100,0 | 2 |
| | Family member | 87 | 13,3 | 565 | 86,7 | 652 |
| | Petty trade or services | 1 | 25,0 | 3 | 75,0 | 4 |
| | Other | 1 | 100,0 | 0 | 0,0 | 1 |
| **Saving per week** | None | 119 | 11,8 | 889 | 88,2 | 1008 |
| | Up to 1000 FCFA | 5 | 13,9 | 31 | 86,1 | 36 |
| | 1000-2900 FCFA | 34 | 17,3 | 162 | 82,7 | 196 |
| | 3000-5900 FCFA | 10 | 9,6 | 94 | 90,4 | 104 |
| | Over 5900 FCFA | 6 | 8,0 | 69 | 92,0 | 75 |
| **Phone use** | No phone | 91 | 11,8 | 679 | 88,2 | 770 |
| | 0 FCFA | 3 | 9,7 | 28 | 90,3 | 31 |
| | 1-499 FCFA | 16 | 10,7 | 134 | 89,3 | 150 |
| | 500-999 FCFA | 42 | 14,6 | 245 | 85,4 | 287 |
| | 1000-1499 FCFA | 10 | 10,9 | 82 | 89,1 | 92 |
| | 1500-1999 FCFA | 10 | 20,4 | 39 | 79,6 | 49 |
| | >=2000 FCFA | 2 | 5,0 | 38 | 95,0 | 40 |

*Table 8: Income, saving and spending*

### 3.2.3 Household characteristics

The majority of participants, 64,6 %, lived in households headed by the participant's partner or spouse. Only 6,1 %, were heads of their own household. 22,1 % lived in a household headed by one of their parents. The median number of household members was 6 (mean 7,8, SD 4,67), ranging from 1 to 47.

Over a third of participants, 36,9 %, lived in households that had more members under 15 than over 15. 63,8% of households were reliant on a single breadwinner. Breadwinners had a mean of 5,7 (SD 3,35) people to support, ranging from 1 to 28.

Almost half of the participants, 46,7 %, lived in a house owned by their family. 52,1 % lived in a rented house. 1,1 % were sheltered by a host family. 26,6 % had moved within the last year. 27,3 % had resided in the same house for over 5 years.

| | | HIV testing uptake | | | | |
|---|---|---|---|---|---|---|
| | | No | | Yes | | Total |
| | | Count | % | Count | % | Count |
| **Head of household** | Participant | 11 | 12,9 | 74 | 87,1 | 85 |
| | Other | 6 | 8,6 | 64 | 91,4 | 70 |
| | Grandparents | 3 | 8,8 | 31 | 91,2 | 34 |
| | Parents | 27 | 8,6 | 286 | 91,4 | 313 |
| | Partner | 70 | 10,7 | 582 | 89,3 | 652 |
| | Husband | 57 | 21,5 | 208 | 78,5 | 265 |
| **% Household members under 15** | 0-33,3% | 16 | 9,2 | 157 | 90,8 | 173 |
| | 33,4%-44,4% | 38 | 9,9 | 346 | 90,1 | 384 |
| | 44,5%-50% | 48 | 14,2 | 290 | 85,8 | 338 |
| | 50,1%-60% | 37 | 13,4 | 240 | 86,6 | 277 |
| | OVer 60% | 35 | 14,2 | 212 | 85,8 | 247 |
| **Household size** | 1-3 | 19 | 11,8 | 142 | 88,2 | 161 |
| | 4-7 | 91 | 13,2 | 597 | 86,8 | 688 |
| | 8-12 | 41 | 11,4 | 319 | 88,6 | 360 |
| | More than 12 | 23 | 11,0 | 187 | 89,0 | 210 |
| **Members per breadwinner** | 1-2,3 | 7 | 9,2 | 69 | 90,8 | 76 |
| | 2,4-5,7 | 99 | 12,5 | 694 | 87,5 | 793 |
| | 5,8-9 | 54 | 13,5 | 346 | 86,5 | 400 |
| | Over 9 | 14 | 9,3 | 136 | 90,7 | 150 |
| **Housing type** | Owned house | 61 | 9,2 | 602 | 90,8 | 663 |
| | Rented house | 111 | 15,0 | 628 | 85,0 | 739 |
| | Host family | 1 | 6,3 | 15 | 93,8 | 16 |
| **Last move** | Don't know | 1 | 16,7 | 5 | 83,3 | 6 |
| | One month or less | 2 | 5,1 | 37 | 94,9 | 39 |
| | 2-6 months | 16 | 10,5 | 137 | 89,5 | 153 |
| | 7-12 months | 23 | 13,2 | 151 | 86,8 | 174 |
| | 13 months-5 years | 89 | 13,8 | 556 | 86,2 | 645 |
| | 6-10 years | 18 | 12,7 | 124 | 87,3 | 142 |
| | Over 10 years | 25 | 10,5 | 214 | 89,5 | 239 |

*Table 9: Household characteristics*

The clinic itself is located in the 3rd arrondissement - 38 % of participants resided in that same district. One third of the participants, 33%, came from other districts in the city of Bangui. The remaining 29 % came from the neighbouring region of Bimbo, which is adjacent to Bangui and geographically close to the clinic site. The geographic provenance of participants is seen in table 9. A map of Bangui with the location of the clinic and the proportion of patients coming from different districts can be seen in Appendix 14.

| | HIV testing uptake | | | | |
|---|---|---|---|---|---|
| | No | | Yes | | Total |
| | Count | % | Count | % | Count |
| Other | 12 | 14,0% | 74 | 86,0% | 86 |
| 3e arrondissement | 81 | 15,0% | 458 | 85,0% | 539 |
| 5e arrondissement | 25 | 10,7% | 209 | 89,3% | 234 |
| 6e arrondissement | 16 | 10,9% | 131 | 89,1% | 147 |
| 8e arrondissement | 0 | 0,0% | 0 | 0,0% | 0 |
| Bimbo | 40 | 9,7% | 373 | 90,3% | 413 |

*Table 10: Geographic distribution of participants.*

### 3.2.4 Food security

Well over a third of the participants, 39,5 %, reported being short on food at least once per week. 39,7 % reported not having had enough to eat in the last week before they came to the clinic.

| | | HIV testing uptake | | | | |
|---|---|---|---|---|---|---|
| | | No | | Yes | | Total |
| | | Count | % | Count | % | Count |
| **Days with enough food** | Never | 0 | 0,0 | 0 | 0,0 | 0 |
| | 1-3 days per week | 58 | 12,4 | 409 | 87,6 | 467 |
| | 4-6 days per week | 12 | 12,8 | 82 | 87,2 | 94 |
| | Every day | 104 | 12,1 | 754 | 87,9 | 858 |
| **Last food shortage** | Yesterday | 12 | 14,3 | 72 | 85,7 | 84 |
| | This week | 35 | 11,7 | 265 | 88,3 | 300 |
| | Last week | 22 | 12,4 | 156 | 87,6 | 178 |
| | Last month or longer ago | 104 | 12,2 | 751 | 87,8 | 855 |

*Table 11: Food security*

### 3.2.5 HIV testing data

HIV testing uptake in the full sample was 87,7 %. Of those tested, 86,5 % had already been HIV-tested at an earlier date. Those who had not been tested recently, i.e. in 2018-2019, were significantly more likely to get tested. Contraception uptake was at 95,5 % among participants and did not vary significantly depending on testing uptake.

| | | HIV testing uptake | | | | |
|---|---|---|---|---|---|---|
| | | No | | Yes | | Total |
| | | Count | % | Count | % | Count |
| **Previous HIV test** | Not tested | 7 | 4,0 | 168 | 96,0 | 175 |
| | 1997-2013 | 0 | 0,0 | 23 | 100,0 | 23 |
| | 2014-2015 | 2 | 5,4 | 35 | 94,6 | 37 |
| | 2016-2017 | 13 | 6,9 | 175 | 93,1 | 188 |
| | 2018-2019 | 152 | 15,4 | 836 | 84,6 | 988 |
| **HIV status known** | status unknown | 6 | 3,5 | 166 | 96,5 | 172 |
| | status known | 168 | 13,5 | 1079 | 86,5 | 1247 |
| **Contraception taken** | No | 4 | 6,3 | 60 | 93,8 | 64 |
| | Yes | 170 | 12,5 | 1185 | 87,5 | 1355 |

*Table 12: Previous HIV testing and contraception*

| | | HIV testing uptake | | | | |
|---|---|---|---|---|---|---|
| | | No | | Yes | | Total |
| | | Count | % | Count | % | Count |
| **Contraception type** | None | 4 | 6,3% | 60 | 93,8% | 64 |
| | Condom | 1 | 25,0% | 3 | 75,0% | 4 |
| | Contraceptive pill | 39 | 16,5% | 197 | 83,5% | 236 |
| | Injection | 114 | 13,2% | 752 | 86,8% | 866 |
| | Implant | 16 | 6,4% | 233 | 93,6% | 249 |

*Table 13: Type of contraception and testing uptake*

## 3.3 SES index calculation

### 3.3.1 SES 1 and SES 2

A histogram of distribution of cases according to SES 1, including all 16 variables, can be seen in Figure 6. We can observe in the histogram that the participants who refused testing are

distributed across most of the SES scale. We also observe that the cases are normally distributed, which means the continuous variable can be tested in bivariate tests.

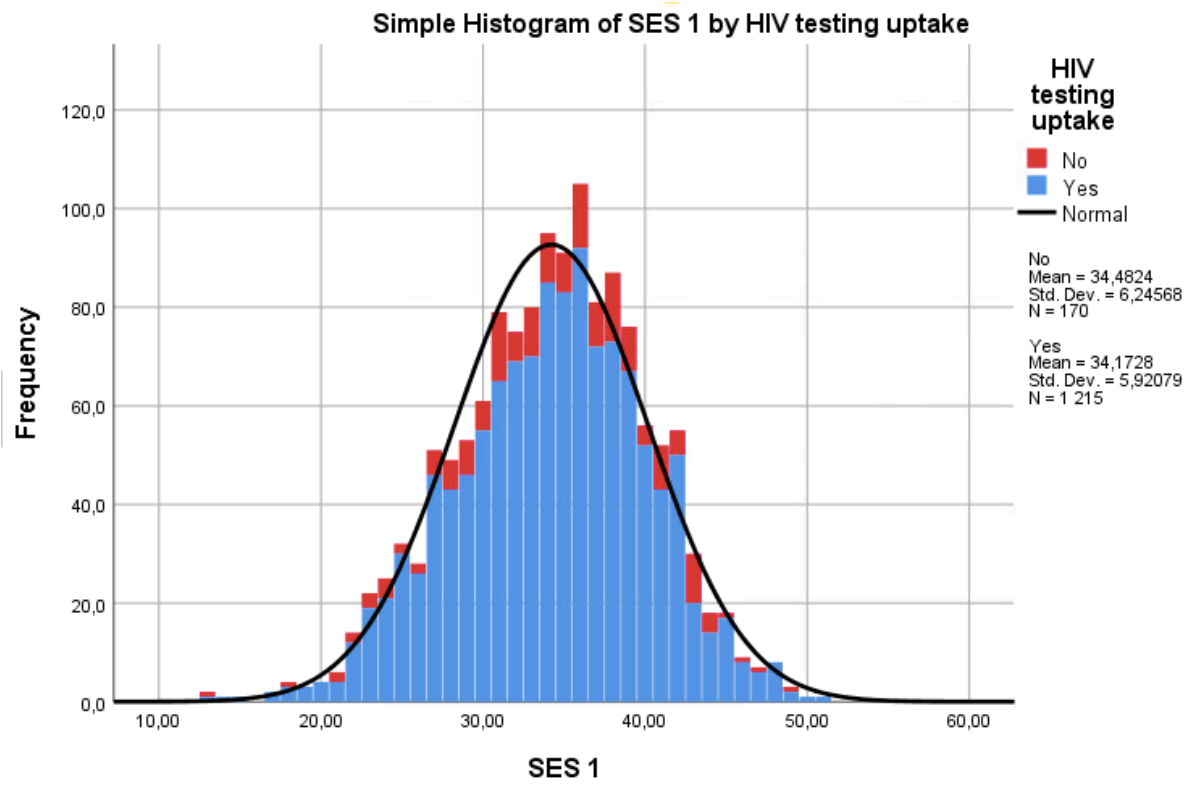


*Figure 7: Histogram of distribution of cases based on SES 1 score*

Based on this continuous variable, three fairly equally sized groups of socioeconomic status could be obtained by using the binning function in SPSS. These three groups had a significant difference in mean SES score, which shows that the variation in SES among the participants was large enough to distinguish groups with low, medium and high SES.

**SES 1**

| | N | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Low SES | 512 | 27,9902 | 3,52873 | 13,00 | 32,00 |
| Mid SES | 452 | 35,0265 | 1,36773 | 33,00 | 37,00 |
| High SES | 421 | 40,9002 | 2,67520 | 38,00 | 51,00 |
| Total | 1385 | 34,2108 | 5,96015 | 13,00 | 51,00 |

*Table 14: Frequencies and means of low, mid and high SES 1*

For SES 2, calculated without the confounding factors, the same tendency can be observed.

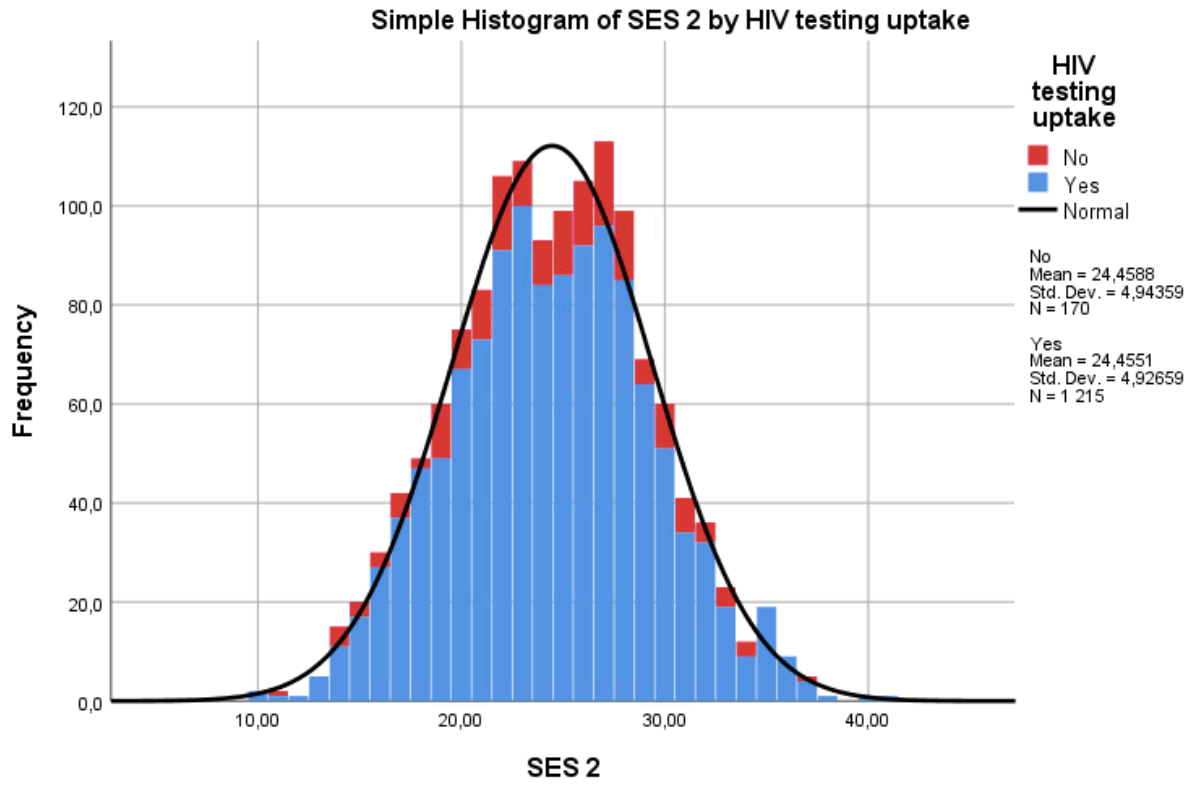


*Figure 8: Histogram of distribution of cases based on SES 2 score.*

SES 2 was also divided into three categories using the binning function in SPSS, as seen in Table 15 below:

**SES 2**

| | N | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Low SES | 512 | 19,6309 | 2,89315 | 10,00 | 29,00 |
| Mid SES | 452 | 24,9668 | 2,01794 | 20,00 | 32,00 |
| High SES | 421 | 29,7743 | 2,90138 | 22,00 | 41,00 |
| Total | 1385 | 24,4556 | 4,92689 | 10,00 | 41,00 |

*Table 15: Frequencies and means of low, mid and high SES 2*

### 3.3.2 Principal components analysis as basis for SES

After including the 16 SES variables in the PCA, there were not many coefficients in the correlation matrix with values superior to .3, which indicates that the dataset is not ideally suited for PCA (72). The Kaiser-Meyer-Olkin value is however superior to .6, and Bartlett's Test of Sphericity shows significance at .000 (69). We therefore chose to go ahead with the analysis.

In the analysis, 6 components had eigenvalues above 1 as per the Kaiser criterion, although none had very high eigenvalues. The highest, 2,582, was the eigenvalue of component 1, explaining 16,1% of the variance. The next two components had values above 2, and explained another 13,8 and 13,4% of the variance. The screeplot showed a drop after the third component which by Cattell's scree test (73) is reason to retain the components above the drop. A Monte Carlo PCA for Parallel Analysis was done – showing that the three first components had a higher than random eigenvalue and thus could be retained.

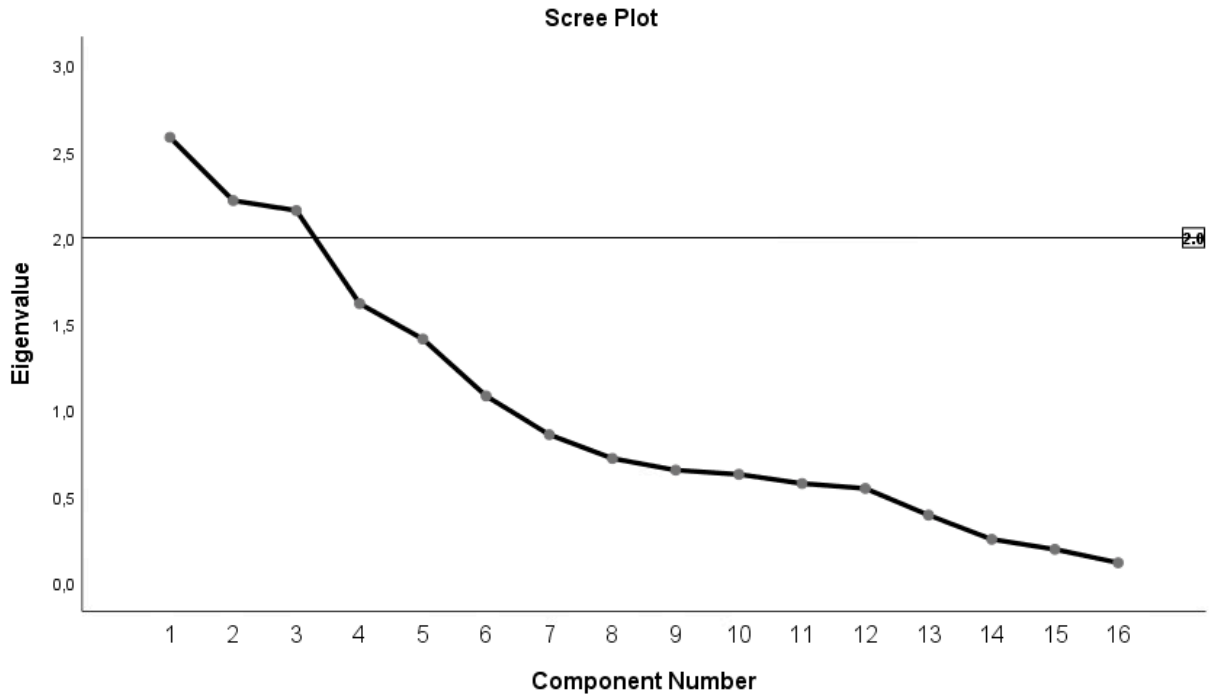


*Figure 9: Scree plot. Components above the line are retained.*

The three components explained a total of 43,4% of the variance. Oblimin Rotation was performed to find out how much each variable loaded on each component. The result is shown in Table 12, with values above .3 in bold.

| Factors | Pattern Matrix[a] | | | Structure Matrix | | | Communalities |
|---|---|---|---|---|---|---|---|
| | Component | | | Component | | | |
| | 1 | 2 | 3 | 1 | 2 | 3 | Extraction |
| Head of household | **0,766** | -0,081 | **-0,303** | **0,763** | -0,112 | -0,299 | 0,684 |
| N Children to feed | **-0,666** | 0,139 | 0,006 | **-0,667** | 0,144 | 0,008 | 0,464 |
| Days with enough food | **0,657** | 0,234 | 0,260 | **0,660** | 0,251 | 0,289 | 0,567 |
| Last food shortage | **0,631** | 0,218 | 0,244 | **0,633** | 0,233 | 0,272 | 0,517 |
| Marital status | **0,582** | -0,001 | **-0,528** | **0,574** | -0,050 | **-0,520** | 0,608 |
| Phone in household | **0,512** | -0,048 | 0,060 | **0,514** | -0,047 | 0,064 | 0,269 |
| Income | -0,182 | **0,856** | -0,016 | -0,189 | **0,856** | 0,053 | 0,766 |
| Second income | 0,041 | **0,836** | -0,087 | 0,033 | **0,829** | -0,016 | 0,696 |
| Saving per week | -0,068 | **0,670** | 0,032 | -0,073 | **0,673** | 0,087 | 0,459 |
| Members per contributor | -0,135 | **-0,368** | 0,028 | -0,132 | **-0,364** | -0,005 | 0,152 |
| Children under 15 | -0,117 | 0,220 | **-0,710** | -0,129 | 0,161 | **-0,694** | 0,543 |
| % household members under 15 | -0,151 | 0,150 | **-0,643** | -0,161 | 0,097 | **-0,633** | 0,446 |
| Education (years) | -0,022 | -0,108 | **0,633** | -0,012 | -0,055 | **0,623** | 0,400 |
| Phone use | 0,039 | 0,080 | **0,368** | 0,044 | 0,110 | **0,375** | 0,149 |
| Housing type | -0,014 | 0,041 | **0,352** | -0,009 | 0,071 | **0,355** | 0,128 |
| Last move | -0,078 | 0,108 | 0,290 | -0,074 | 0,133 | 0,298 | 0,107 |
| Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization. | | | | Extraction Method: Principal Component Analysis. | | | |
| a. Rotation converged in 5 iterations. | | | | Rotation Method: Oblimin with Kaiser Normalization. | | | |

*Table 16: Pattern and structure matrix for PCA with Oblimin Rotation of three factors.*

Based on these three components, three measures of socio-economic status were calculated, using the same point system as shown in Table 10, but only the variables that loaded above .3 for each component. We this get the three following measures, called SES 3, 4 and 5, based on the variables seen in Table 17.

| SES 3 | SES 4 | SES 5 |
|---|---|---|
| Head of household | Income 1 | Head of household |
| Marital status | Income 2 | Marital status |
| Weekly food shortage | Saving per week | N children under 15 |
| Last food shortage | People per breadwinner | % household under 15 |
| N children to feed | | Education |
| Phone in household | | Phone use |
| | | Housing type |

*Table 17: Variables included in SES score based on PCA.*

The measures were tested for normality, only SES 5 had a normal distribution.

## 3.4 The relationship between SES and testing uptake

### 3.4.1 Odds ratios

| EXPOSURE | | CRUDE | ADJUSTED | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Age | Education | Marital status | Head of household | Nb of children | Age + education | Age + marital status | Marital status + nb of children | Education + marital status | age + education + marital status + children |
| | Low | | | | | | | | | | | |
| SES 1[a] | Mid | 1,09 (,73-1,62) | 1,00 (,67-1,450 | 1,07 (,72-1,60) | 1,19 (,80-1,78) | 1,20 (,80-1,79) | ,97 (,65-1,46) | ,99 (,66-1,49) | 1,11 (,74-1,67) | 1,11 (,73-1,67) | 1,25 (,83-1,88) | 1,15 (,76-1,74) |
| | High | ,83 (,57-1,22) | ,74 (,50-1,10) | ,80 (,53-1,20) | ,94 (,64-1,39) | ,93 (,63-1,38) | ,69 (,46-1,03) | ,73 (,48-1,10) | ,85 (,57-1,27) | ,83 (,54-1,27) | 1,04 (,68-1,59) | ,92 (,59-1,45) |
| | Low | | | | | | | | | | | |
| SES 2[b] | Mid | 1,09 (,75-1,59) | 1,03 (,70-1,50) | 1,08 (,74-1,58) | 1,15 (,79-1,68) | 1,16 (,79-1,70) | 1,01 (,69-1,48) | 1,03 (,70-1,51) | 1,09 (,74-1,61) | 1,10 (,74-1,67) | 1,19 (,81-1,75) | 1,13 (,76-1,66) |
| | High | 1,01 (,68-1,52) | ,96 (,64-1,44 | 1,01 (,67-1,52) | 1,00 (,66-1,50) | 1,04 (,70-1,57) | ,92 (,61-1,39) | ,97 (,64-1,46) | ,95 (,63-1,44) | ,94 (,62-1,42) | 1,05 (,69-1,59) | 1,00 (,65-1,53) |
| | | | | | | | | | | | | |
| | Low | | | | | | | | | | | |
| SES 3[c] | Mid | ,96 (,66-1,38) | ,88 (,61-1,28) | ,97 (,67-1,40) | 1,19 (,80-1,75) | 1,02 (,69-1,52) | ,91 (,63-1,32) | ,89 (,61-1,30) | 1,09 (,73-1,63) | 1,13 (,76-1,67) | 1,22 (,83-1,81) | 1,11 (,75-1,66 ) |
| | High | **,44 (,29-,68)**** | **,42 (,27-,65)**** | **,42 (,27-,66)**** | 1,08 (,57-2,05) | **,51 (,29-,90)*** | **,45 (,29-,69)**** | **,40 (,25-,62)**** | ,94 (,49-1,81) | 1,01 (,53-1,92) | 1,08 (,57-2,04) | ,91 (,47-1,74) |
| | Low | | | | | | | | | | | |
| SES 4[d] | Mid | ,96 (,65-1,43) | 1,06 (,71-1,58) | ,96 (,65-1,43) | ,82 (,55-1,23) | ,87 (,58-1,30) | 1,02 (,68-1,52) | 1,06 (,71,58) | ,90 (,59-1,36) | ,86 (,57-1,29) | ,81 (,54-1,21) | ,88 (,59-1,34) |
| | High | ,83 (,57-1,21) | ,89 (,61-1,31) | ,84 (,57-1,22) | ,76 (,52-1,11) | ,80 (,55-1,17) | ,87 (,60-1,28) | ,89 (,61-1,31) | ,80 (,55-1,18) | ,78 (,53-1,15) | ,75 (,51-1,10) | ,80 (,55-1,18) |
| | Low | | | | | | | | | | | |
| SES 5[e] | Mid | 1,28 (,86-1,90) | 1,11 (,74-1,67) | 1,21 (,80-1,83) | 1,29 (,86-1,93) | 1,38 (,92-2,06) | ,97 (,63-1,50) | 1,06 (,69-1,62) | 1,16 (,77-1,76) | 1,10 (,71-1,70) | 1,38 (,91-2,11) | 1,17 (,74-1,85) |
| | High | ,84 (,58-1,22) | ,70 (,47-1,03) | ,76 (,49-1,17) | ,94 (,64-1,37) | ,95 (,65-1,39) | **,55 (,35-,86)**** | **,64 (,41-,99)*** | ,80 (,54-1,20) | ,71 (,44-1,15) | 1,08 (,69-1,71) | ,82 (,48-1,42) |

* p<0,05

** p<0,01

[a] composed by all 16 variables

[b] composed by 12 variables, confounders are left out

[c] composed by the 6 variables loading on Component 1

[d] composed by the 4 variables loading on Component 2

[e] composed by the 7 variables loading on Component 3

*Table 18: Logistic regressions for SES 1-5 with the outcome testing uptake*

When checked in bivariate analysis, SES 1 and SES 2 were not significantly associated with the outcome, HIV testing uptake. Results from logistic regression analyses are shown in Table 15 – there was no significant association between these exposures and the outcome. When it comes to the PCA-based measures, SES 3,4 and 5, the highest category of SES 3 had a significant negative association with the outcome. This association disappeared when we controlled for marital status, no matter which other confounders were controlled for.

### 3.4.2 Other findings

The confounders were also checked separately by logistic regression. Marital status and head of household were significantly associated with the outcome, where married women and women living in households headed by their husband were less likely to accept HIV testing. Younger women were significantly more likely to get tested. Education and number of children were not significantly associated with the outcome.

### 3.4.3 Principal component as proxy for SES

There was no component that clearly explained a larger amount of variation, as seen in the Scree plot. The one with the highest eigenvalue was Component 1, with an eigenvalue of 2.5. Component 1 had the variables marital status, head of household, weekly food shortage, last food shortage, N children to feed and phone in household, with a factor score above 0.3. In addition to constituting SES measures based on PCA by using the point system seen in Table 5, we also ran another test where the principal components themselves were included in a regression analysis along with confounding factors. No significant association was found between either of the components and HIV testing uptake.

### 3.4.4 Results from sensitivity analysis

Two types of sensitivity analyses were done. The first one was related to food security. Based on the qualitative interviews, food security seemed to be particularly strongly perceived as a distinguishing characteristic between rich and poor. We therefore created two SES measures where the two variables about food security were weighted double in the point system in Table 5. We tested these through the same regression models as the other measures, but found no significant difference.

The second sensitivity analysis sought to investigate the role of previous testing. We ran the regression analyses on a selection of the sample which had not recently been tested. The results of regression analyses on the selection that had not been recently tested can be seen in Table 16. We can see the same negative association between testing uptake and the high category of SES 3, which again disappears when controlled for marital status.

| EXPOSURE SELECTED FOR PREVIOUS TESTING | | CRUDE | ADJUSTED | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Age | Education | Marital status | Head of household | Nb of children | Age + education | Age + marital status | Marital status + nb of children | Education + marital status | age + education + marital status + children |
| SES 1[a] | Low | | | | | | | | | | | |
| | Mid | 1,13 (,35-3,65) | 1,10 (,34-3,57) | 1,02 (,31-3,35) | 1,23 (,38-4,02) | 1,27 (,39-4,13) | ,79 (,23-2,66) | 1,01 (,31-3,32) | 1,22 (,37-3,99) | ,89 (,26-3,06) | 1,24 (,37-4,16) | ,92 (,26-3,24) |
| | High | ,72 (,25-2,12) | ,68 (,23-2,04) | ,56 (,17-1,81) | ,78 (,26-2,33) | ,80 (,27-2,37) | ,40 (,12-1,32) | ,55 (,17-1,78) | ,76 (,25-2,32) | ,45 (,13-1,58) | ,79 (,23-2,74) | ,50 (,14-1,86) |
| SES 2[b] | Low | | | | | | | | | | | |
| | Mid | ,9 (,28-2,85) | ,89 (,28-2,82) | ,85 (,27-2,73) | ,99 (,31-3,19) | 1 (,31-3,18) | ,73 (,23-2,4) | ,85 (,27-2,72) | ,98 (,30-3,17) | ,80 (,24-2,66) | ,99 (,31-3,22) | ,82 (,25-2,74) |
| | High | ,68 (,22-2,07) | ,67 (,22-2,04) | ,60 (,19-1,89) | ,60 (,19-1,87) | ,67 (,22-2,05) | ,48 (,15-1,54) | ,60 (,19-1,89) | ,6 (,19-1,86) | ,43 (,13-1,42) | ,60 (,19-1,97) | ,45 (,13-1,52) |
| | | | | | | | | | | | | |
| SES 3[c] | Low | | | | | | | | | | | |
| | Mid | ,45 (,14-1,47) | ,44 (,13-1,43) | ,44 (,14-1,44) | ,60 (,18-2,04) | ,45 (,15-1,72) | ,37 (,11-1,24) | ,43 (,13-1,42) | ,59 (,17-2,02) | ,49 (,14-1,71) | ,60 (,18-2,04) | ,51 (,15-1,75) |
| | High | **,18 (,05-,65)**** | **,18 (,05-,65)**** | **,2 (,05-,78)*** | ,8 (,12-5,3) | ,23 (,04-1,29) | **,17 (,05-,64)**** | **,2 (,05-,77)*** | ,77 (,12-5,23) | ,57 (,08-4,08) | ,79 (,12-5,28) | ,57 (,08-4,30) |
| SES 4[d] | Low | | | | | | | | | | | |
| | Mid | ,86 (,27-2,76) | ,89 (,27-2,92) | ,88 (,27-2,85) | ,61 (,18-2,05) | ,74 (,23-2,41) | 1,01 (,31-3,31) | ,9 (,28-2,93) | ,61 (,18-2,08) | ,68 (,2-2,33) | ,61 (,18-2,05) | ,64 (,18-2,21) |
| | High | ,51 (,18-1,45) | ,53 (,18-1,50) | ,53 (,19-1,52) | ,43 (,15-1,26) | ,49 (,17-1,39) | ,6 (,21-1,72) | ,54 (,19-1,54) | ,43 (,15-1,26) | ,47 (,16-1,41) | ,43 (,15-1,26) | ,47 (,16-1,39) |
| SES 5[e] | Low | | | | | | | | | | | |
| | Mid | 1,48 (,5-4,44) | 1,42 (,46-4,36) | 1,2 (,38-3,8) | 1,43 (,47-4,34) | 1,64 (,55-4,94) | ,85 (,25-2,81) | 1,16 (,36-3,75) | 1,44 (,46-4,50) | ,91 (,27-3,09) | 1,6 (,49-5,26) | 1,04 (,28-3,83) |
| | High | 1,21 (,4-3,63) | 1,13 (,36-3,59) | ,81 (,22-2,97) | 1,41 (,46-4,32) | 1,40 (,46-4,25) | ,51 (,14-1,93) | ,78 (,21-2,94) | 1,43 (,44-4,69) | ,71 (,18-2,76) | 1,78 (,43-7,40) | ,93 (,18-4,69) |

* p<0,05

** p<0,01

[a] composed by all 16 variables

[b] composed by 12 variables, confounders are left out

[c] composed by the 6 variables loading on Component 1

[d] composed by the 4 variables loading on Component 2

[e] composed by the 7 variables loading on Component 3

*Table 19: Logistic regression for SES 1-5 and testing uptake. Selected for recent testing.*

# 4 Discussion

## 4.1 Findings

### 4.1.1 The SES measure

The first objective of this study was to develop a measuring tool to determine SES in the target population. The starting point for this measuring tool was the asset-based method, which is the most appropriate for the context of CAR given that it is a low-income country where few have formal jobs. An asset-based measure needs to be adapted for each locality, as not every community would need, want, or have access to the same assets. Further, a possible problem with using a pure asset-based method in Bangui is conflict-related looting. Having affected the rich and the poor somewhat indiscriminately, it could translate into clumping of the data; i.e. if very few people have the item in question, or people have all the same items, there would be no variation in the data to distinguish different level of SES among participants. It is however not uncommon to include factors such as livelihood, education and consumption to calculate SES, also when using an asset-based measure. This was taken into account when conducting the qualitative interviews - and topics such as livelihoods, education and family ties were broached in relation to poverty and wealth. We wanted to assess whether they, too, may be indicative of socio-economic status from the community's own point of view, and interpret how they may influence people's responses in the questionnaire.

As a result of these qualitative interviews, the questionnaires were focused more on social support, stable access to food, as well as spending and saving. These are less concrete and more difficult to measure than asset ownership, which probably has made the measures proposed less sensitive. We nevertheless believed that such factors are better indicators of actual socio-economic status, not least because they allow people to recover from looting more quickly. Continuous variables were preferred over binary and categorical ones.

In a setting where there would be more time for the questionnaire, it should probably include more questions so that a more sensitive measure could be developed. Aspects that came up in the interviews could be included in a future version of the questionnaire is that of transportation, i.e. whether the household has a bicycle, motorbike or car. They are a source of income for men making a living as "taxi-moto" drivers but are also very frequently stolen.

Another possible measurable asset is the type of flooring of the house. Having children in school and separating between public or private could also be an interesting variable to take into account.

### 4.1.2 Proxy for SES

The second objective of the study was to identify a proxy for measuring SES that could be used in future studies in CAR. We approached this by running a factor analysis (PCA) to find components that would indicate which variables should be included in an SES measure. The three components with the highest eigenvalues explained 43,4% of the variance. This is slightly lower than the recommended amount of variance that should ideally be explained by the chosen components (74). The first component in the PCA, which we called SES 3, was the closest we got to a proxy for SES, where six variables (marital status, head of household, weekly food shortage, last food shortage, N children to feed, phone in household) were used to explain 16,1% of the variance in the 16 variables used in the analysis. Ideally, there would be a larger amount of variance explained if one were to rely on this measure of SES.

We found that marital status was the variable that in itself explained most of the variance in SES 3. This would be in line with the idea that married women often have a more secure socio-economic than single/divorced/widowed women in Bangui. A possible explanation for this is that relatively wealthy men are more likely to get married in the first place, because of the dowry, and that married women thus become part of a wealthier family. Marital status was also shown to be a confounding variable, as the association with the outcome disappeared when we controlled for marital status.

### 4.1.3 PITC uptake

The third objective of the study was to quantify the proportion of testing uptake of the free HIV rapid test, when it is offered as PITC in a family planning service. The uptake of PITC measured to 87,7% was generally higher than that described in certain other studies on PITC uptake (46, 47, 75, 76). This may be in part due to the fact that the sample is exclusively female, but uptake is also higher than in a study with only female participants (76). Other reasons for the high testing uptake could be the fact that the service was entirely free of cost. Given that informal payments for medications are so common in Bangui, measures had been

taken in the clinic at an earlier point in time, to make sure that no patient would be charged anything at any point in their consultations - everything was free. Further, they received health information on HIV before the consultation, which may encourage testing uptake. Finally, the measures taken to ensure confidentiality could improve testing uptake, as all patients went through the same patient flow whether or not they were tested. This should however be common practice in a PITC setup, and should not distinguish this study from other studies on PITC.

In this study, contraception uptake was also high, at 95,5%. This may be expected, as provision of contraception was the primary function of the clinic and the reason for people to come. We did not find a significant association between testing uptake and contraception uptake. If anything, testing uptake was slightly higher among those who did not use contraception. This study shows that PITC for HIV was successfully introduced in a family planning service, without influencing the uptake of contraception which is the primary function of the clinic, and with a high testing uptake.

### 4.1.4 PITC uptake and SES

The fourth objective was to test whether SES was associated with PITC uptake. Previous studies on the association between testing uptake and SES, have found that SES is a risk factor for uptake, where low SES is associated with lower testing uptake (42-44). In this study, we could not establish such an association. Possible explanations for this are:

Firstly, previous studies have been based on DHS data or have asked the participants about previous tests at certain times in their life. The studies do not distinguish between a participant who never had access to a test and a participant who has turned down an available test. The current study differs from those previous studies in that a test is made available for the participant at the point of inclusion in the study, which demands no extra time or cost for the participant. This difference has been accounted for by also including a question about previous testing in the questionnaire, as well as the year of testing. The outcome in our study is thus whether or not the participant chooses to have the test, knowing that they do not have to spend any extra time or money to get tested, and not whether they can access a test.

Secondly, we must consider the possibility that the poorest segment of the population does not access the service offered, that they do not come to the clinic at all, so that the sample does

not reflect the true SES of the population. Patients who were offered to participate in the study, had already overcome a possible opportunity cost, or, say, a transportation cost, by coming to the clinic and may thus not include the poorest. There was however a large variability in the SES of participants. Another particularity with this sample is that it was female only. Women have been shown previously to have a somewhat higher testing uptake, which may explain the high testing uptake seen in this study.

This study shows that when a test of offered in the form of PITC, low socio-economic status as an obstacle for HIV testing is removed. This is a strong argument for the PITC methods of providing HIV testing to vulnerable populations. One could presume that some participants do not want to be tested - however participants who had not recently been tested had higher testing uptake, which indicates that remaining untested was not a choice. Only a total of four participants had never been tested and refused testing.

It should also be noted that the study took place in an already functioning clinic, with the aim of providing services to as many patients as possible. High testing uptake was a specific target. Patients in the waiting area received health talks on relevant topics, including HIV testing. This was however the same session for all participants, so should not introduce any internal bias, but could increase the overall testing uptake. This would however be much the same in other similar studies.

### 4.1.5 Risk factors for PITC uptake

We found a significant negative association between high SES 3 (the measure calculated by including the variables that had the highest loading in Component 1) and testing uptake both with and without selecting for previous testing. For SES 5 there was the same negative association with testing uptake for the full sample. In all cases, the association disappeared when we adjusted for marital status. SES 3 and SES 5 have in common that they are composed by only five and six different variables, one of which is marital status (see table 14). Marital status did in fact have a significantly strong association with testing uptake, which means that the significance observed for SES 3 and SES 5 is probably due to marital status.

Based on these findings, marital status is an important variable to include in future studies on HIV testing uptake. Within the scope of this study, it is hard to offer possible explanations for the association between marital status and testing uptake. A future study should carefully

check for confounding factors, as the institution of marriage is closely linked to age, socio-economic status, religion, ethnicity and probably a number of other factors which are context specific.

## 4.2 Strengths and weaknesses

The strength of this study lies in the quality of the data set. All data was collected specifically for the study, and by the same person, who was trained to administer this questionnaire and enter the data, as well as supervised for 5 weeks of the study. These measures can improve data quality, and are further detailed further down in chapter 4.3.4 on information bias. As a result, there was little missing data in the set, and a large enough sample to detect a 5% difference in the outcome.

The measures of SES should be treated with caution. Because no other similar studies have been done in that context for comparison, it is hard to judge its quality. A major constraint in creating this measure was time, given that the data collection had to be integrated in the patient flow of a medical service. Ideally, asset-based measures would include a large number of questions, allowing to calculate a more sensitive index. The time-constraint in the patient flow meant that the questionnaire could not exceed around 10 minutes. Within the limited number of variables that could be included, continuous variables and questions about social support were given priority over binary response questions about assets. Including a larger number of variables ("assets") would have allowed us to select the ones that explained a larger amount of variation. The development of this measure, both in terms of preliminary study and statistical analysis, would probably have benefited from more time and resources, as well as fewer security constraints which made data collection outside the clinic site more challenging. This measure is however a good starting point for further work in the field in CAR.

With regards to the SES measure, it should also be taken into account, as mentioned further up, that the sample is not representative of the general female population of Bangui. The poorest segment of the population, which may not have access to the clinic because of e.g. transportation or opportunity cost, might not be represented in this sample. This could mean that SES in this sample is somewhat higher than in the general population.

## 4.3 Internal validity

### 4.3.1 Study design

This study had a cross-sectional design, which implies that all data was collected at one point in time for each participant thus constituting a snapshot of the sample (77). As the outcome variable was testing uptake at this particular point in time (when the test was offered), this design was well suited. As a consequence, the data cannot say anything about causality, given that one cannot know which events occurred at what point in time in relation to each other. We can however say with a fair amount of certainty that testing uptake does not cause low (or high) SES in any particular way, so that a longitudinal study would not be necessary to distinguish the direction of causality and a cross-sectional study is suitable.

### 4.3.2 Statistical tests

When statistical models included controlling for confounding factors, logistic regressions showed no associations between testing uptake and SES, no matter which measure of SES was used. A feature of this test is that if the outcome event is common, and associated with the exposure, odds ratios can be exaggerated. The outcome event PITC uptake was indeed common at 87,7%, which would lead to an overestimation of the association when calculating odds ratios. In such cases, a Generalised Linear Model (GLM) should be used instead. In the present case, however, no association was found, hence the GLM was not deemed necessary to verify the findings.

### 4.3.3 Selection bias

Selection bias occurs when there are systematic differences between the sample used in the study and the population one wants to describe (78). Several measures were put in place to reduce selection bias in this study. All patients who came for a family planning visit were offered to participate, in full confidentiality, and taking no extra time as participation would be completed during their wait in line for a consultation. Some potential participants had to be excluded from the study. Fifty-nine patients under the age of 18 were excluded from participation, because they did not have an adult there to give consent for them. Had they been included, the age distribution would have changed in the sample, which could affect the

outcome in a minor way as age was shown to be a significant factor. It would however not affect the main exposure SES. 3 participants were excluded from the sample because of pregnancy, as well as 12 patients because they were not from Bangui or Bimbo, which were exclusion criteria for the cohort study of which this cross-sectional study is a part. Patients refusing to participate may differ from those who There was very high participation acceptance – only 29 patients (2%) refused to participate in the study. It is thus fair to claim that the study sample is representative of the general patient group in the clinic, with a slightly elevated mean age.

There is a stronger selection bias in the fact that participants in this study were all recruited on the clinic site and were thus already patients. One can assume that they have already "paid" the costs such as travel and opportunity cost of coming to a health centre, that would exclude the poorest segment of the population. The fact that all the services provided in the clinic were free of cost could reduce some of the bias. The sample used in this study is not representative for women in Bangui aged 15-49, but is probably quite representative for the patients MSF treat in Gbaya Dombia. This point should be considered with regards to external validity (see chapter 4.4).

### 4.3.4 Information bias

Information bias could be introduced in the study through the questionnaire, in that it may not reflect the true situation of the participants that it is meant to describe. This can result in a misclassification of the participant with regards to the exposure (77).

Misunderstanding of questions could lead to information bias. Misunderstandings can occur if the participants do not understand the questions well, but also if the data collector does understand the questions, or if they do not understand the answers given. Several measures can alleviate this bias. First of all, the participants were interviewed in their own language, by the research assistant who was herself a native Sango-speaker but also fluent in French. Before starting the data collection, the questionnaire was tested to see how the phrasing of questions was understood by interviewees. The questionnaire was then adapted accordingly. Several steps were taken to translate the questionnaire into Sango: The original French questionnaire was translated into Sango by one person, and subsequently translated back into French by another who did not know the original questionnaire. Any discord in the versions would then be discussed in a group with the two translators, two other Sango-native fluent French

speakers, and the main researcher, to reach a common understanding of the meaning of the questions and the best Sango translation.

Bias in the final questionnaire was reduced by having the same person, the research assistant, administer the questionnaire to all participants. The first 500 questionnaires were checked on the day of inclusion by the main researcher before entering the data in the database, to ensure correct filling of information. Clarifications were made on the same day. In this way, the research assistant acquired good routine for interviewing and filling in questionnaires. Some of the questionnaire questions deliberately had open fields for response entry instead of alternatives, for example in the question about head of household or the last move. This allowed the participant to answer in their own words and avoided on the spot mental calculation by the research assistant to make the response fit a pre-defined format. This could reduce both response error and observation error in the data. The responses were transformed into a common format (e.g. number of months) at the time of data cleaning.

In this study, some questions in the questionnaire can be perceived as embarrassing because they will try to discern poverty and low social status, which might for some people feel shameful. Taking this into account, answers may be skewed towards a higher SES. One could presume that the real socio-economic status may be lower than the one measured. There is also a theoretical possibility that certain participants, for different reasons, may not answer truthfully to whether they had been tested or not. Some of the staff believed that a fear of testing could lead some patients to say that they had recently been tested, as an excuse to avoid testing. To reduce this type of bias, data collection was done in a private room to ensure confidentiality. The purpose of the questionnaire was carefully explained to each participant.

Poor recall can be an issue in some parts of the questionnaire, such as mobile phone use, last move or last food shortage. One could perhaps argue that somebody whose financial situation is precarious, may have a more detailed memory of their spending. This would however not influence the outcome of testing uptake If the participant did not remember, the data was entered as missing, and the case was not used in models that included that variable. This could lead to recall bias if the group that accepted the test remembered differently than the group that did not accept the test – which there is no reason to believe is the case in this study.

### 4.3.5 Unmeasured confounders

PITC testing uptake may be related to factors that have not been measured. In this study, possible cultural, ethnic or religious factors were not measured. The current social and political context in CAR is such that these issues are very sensitive. It would not be responsible to ask people questions about it in the context of offering a health service in a location where ethnic-religious divisions have played a role in violent conflict which may have affected and still affects the participants. Under different circumstances it would be interesting to collect such variables, as they influence women's livelihoods and access to the work market, and may thus be associated with SES. The strong association between marital status and testing uptake may also have an explanation in these cultural, ethnic or religious factors, as the phenomenon and institution of marriage is usually influenced thereby.

## 4.4 External validity

The approach to estimate the level of socio-economic status in the current study is a first attempt in a country where there are few, if any, previous studies on socio-economic status and livelihoods, especially in the post-war situation. More research should be done to refine it. Socio/economic status is very much location specific and developed to take into account the current situation of political instability and looting. In order to reproduce the methodology and conduct a similar study in another context, a locally developed measure of SES should be used.

This study concerns a quite specific service setup, where PITC was introduced in a family planning clinic, and patients coming for a family planning consultation are obliged to opt out of HIV testing. This is for the time being not a common setup. Therefore, these findings should not be generalized to health services that differ from this one. We also need to emphasise that the target population in this study was women coming to the clinic. When comparing the findings in this study to other cross-sectional studies that have a random community-based sample, it must be kept in mind that the sample in this study is not representative of the general female population of Bangui. In this regard, it is more comparable to other studies recruiting their sample in the clinic site.

## 4.5 Implications and further research

This study was originally designed to evaluate the possibility of introducing PITC in a family planning service, as a means to reduce missed opportunities for HIV testing. The results show that HIV PITC can in fact be successfully introduced in a family planning service, with a high testing uptake and without interrupting the family planning uptake. With this setup of the service, low SES is no longer a barrier to HIV testing. Uptake of contraception was also higher among the participants who accepted HIV-testing. The results of the study will be used for operational purposes, to adapt the current intervention in Bangui to the needs of the target population.

It is a good first step, but good testing uptake is not enough to break transmission and curb the HIV epidemic. Increasing treatment initiation and adherence has been an important goal in Sub-Saharan Africa. Most of the literature on treatment outcomes has however focused on adherence to ART, and not on loss to follow up before treatment initiation, known as pre-ART loss to follow up. Four recent reviews on pre-ART loss to follow-up (9, 79-81) show that possible risk factors associated with pre-ART loss to follow-up are: low age, male gender, pregnancy, less advanced stage of disease, low income, cost of service and distance to service (for example (82, 83)). All four of these reviews underline the need for more research on this step of the cascade. One review includes a meta-analysis showing that among 58 746 patients that tested positive for HIV in Sub—Saharan Africa, 72% presented for the next step of the treatment cascade, which is the CD4 test determining whether they are eligible for ART. Only 25% actually started ART (79). As previously mentioned, most countries including CAR, have adopted a "test-and-treat" policy, where all patients tested positive for HIV can start treatment regardless of their CD4 status.

In the Gbaya Dombia clinic, for the time being patients are referred to external ARV treatment in other health care facilities, which is known to reduce treatment uptake (REF). Further investigations will be done to determine the referral success of those patients who tested positive for HIV. Should socioeconomic status be shown to be a barrier to access, this will be a part of the terms on which the intervention will be designed – the needs of the poorest specifically will be taken into account. In more general terms, understanding HIV positive patients' access to care and their perception thereof in this particular context may contribute to an improvement in the HIV response in the Central African Republic and other similar contexts.

The data in this study being of good quality, it can be used to examine other relationships between the factors. The most significant predictor for testing uptake was marital status, which can be further investigated in the context of Bangui in order to increase testing uptake.

# 5 Conclusions

Achieving the 90-90-90 goals hinges on reaching vulnerable populations, and populations in certain countries with low testing and treatment coverage. There is a need to diversify the strategies used to increase testing coverage in the populations that have so far been left behind. This study was initially conceived to assess the introduction of PITC in a family planning clinic, and evaluate this type of setup as a means to increase HIV testing coverage in Bangui. In addition to that, we wanted to find out whether the association between HIV testing uptake and SES seen in other studies persisted when HIV testing was offered using the PITC framework. Coincidentally, we wanted to find a measuring tool for socio-economic status, and a proxy for this measure, that could be used in future studies.

Different measures of SES were developed based on the data collected. PCA was used to reduce the variables into a component that may be used as a proxy for SES. The components found did not explain particularly much of the variation in the data, so more work should be done on developing a practical measure for SES in CAR.

In the logistic regression model, no association was found between PITC uptake and SES. This differs from previous studies on the association between HIV testing and SES. Considering that sample used in this study, this could mean that the sample is not representative of the true SES of the population. But more likely, it could mean that the PITC setup reduces the influence of SES on testing uptake seen in other studies. In this case, the PITC setup does not only increase testing uptake in a population as a whole, but it could decrease the difference in uptake between rich and poor.

Finally, the study shows that PITC can indeed be introduced in a family planning clinic, and form part of the regular activities and patient flow without affecting the contraception uptake. With careful planning to ensure confidentiality and reduce stigma, this strategy can increase

access to HIV testing for women of childbearing age who, in the context of Bangui, may otherwise only be tested during pregnancy.

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# Appendix 1: Information sheet, French version

PROPOSITION DE PARTICIPATION DANS CE PROJET DE RECHERCHE

## FACTEURS SOCIO-ECONOMIQUES ASSOCIÉS AVEC LE TEST DE HIV ET LA CONTINUITÉ DU SOIN, DANS UN SERVICE DE PLANNING FAMILIAL POUR LES FEMMES ÂGÉES DE 15 À 49 ANS À BANGUI, RÉPUBLIQUE CENTRAFRICAINE

Ceci est une proposition de participer dans une étude de recherche qui a pour but d'évaluer l'accès des femmes au dépistage de VIH et au traitement ici à Bangui, pour mieux comprendre comment nous pouvons améliorer notre réponse à l'épidémie de sida.

Dans ce service nous offrons, pour tout venant, la consultation et les méthodes de planning familial, ainsi que le dépistage VIH. Ces services sont gratuits et disponibles pour toutes. Pour celles qui ont un résultat positif au test VIH, nous allons vous orienter dans un centre de traitement de votre choix. Nous pouvons aussi vous aider à trouver le centre qui est placé le plus près de chez vous. On doit vous orienter ailleurs car Médecins Sans Frontières n'a pas de service de traitement du VIH. Nous vous orientons d'office dans un CTA gratuit. Arrivées là-bas, vous allez pouvoir commencer le traitement antiretroviral contre le VIH.

En même temps que nous offrons ces services, nous souhaitons évaluer si ça marche, c'est-à-dire si la maternité constitue un bon endroit pour effectuer le dépistage VIH. Dans l'étude nous cherchons aussi à savoir si le statut socio-économique des patients influence leur accès aux soins. L'étude a lieu ici dans cette clinique, et votre contribution à l'étude pourra être complété aujourd'hui même, ici même. Nous vous proposons de participer car vous êtes dans la tranche d'âge qui nous intéresse. Il faut savoir que si vous êtes enceinte, vous ne pouvez pas participer dans l'étude car le protocole de traitement des patients VIH enceintes est différent. Si vous ne savez pas si vous êtes enceinte, vous allez pouvoir faire un test de grossesse lors de votre consultation avec la sage-femme. Si vous ne participez pas dans l'étude, quelle que soit la raison, vous pouvez toutefois vous faire dépister.

Médecins Sans Frontières (MSF) est responsable du service et les soins offerts. L'évaluation de ce service, sous la forme d'une étude, se fait en collaboration avec l'Université d'Oslo en Norvège. Le Ministère de Santé de la Centrafrique est consulté au fur et à mesure que l'étude avance.

### EN QUOI CETTE ETUDE CONSISTE-T-ELLE?

Si vous choisissez de participer dans l'étude, cela veut simplement dire que nous allons remplir un questionnaire ensemble sur votre situation socio-économique. Après le remplissage du questionnaire, vous ne devez plus rien faire concernant l'étude, et vous continuez avec vos consultations. Vous n'êtes pas obligés de vous faire dépister pour participer dans l'étude.

Nous allons consulter les registres ici pour savoir si vous êtes dépistés ou non, et si vous êtes dépistés, le résultat de votre test. Si votre test est positif, nous allons, au bout d'un mois, contacter le centre de traitement où vous avez été référé, pour savoir s'ils ont pu démarrer le traitement. Il faut donc que vous soyez conscients et d'accord que le centre de traitement partage cette information avec nous.

## AVANTAGES ET DÉSAVANTAGES POUR VOUS

Si vous choisissez de participer dans l'étude, vous contribuez développement de la connaissance de VIH. Il n'y a pas de compensation financière ou autre.
Se faire dépister du VIH peut constituer une épreuve psychologique, surtout si le résultat est positif. Nos conseillers sont là pour répondre à vos besoins de soutien psychologique.

## PARTICIPATION VOLONTAIRE ET TERMINAISON DE LA PARTICIPATION

Il faut bien noter que la participation dans l'étude est volontaire. Si vous ne voulez pas participer, vous pouvez quand même vous faire dépister pour le VIH, et vous faire référer au traitement dans le cas où votre test est positif. La conseillère qui va vous dépister et la sage-femme qui vous fait la consultation au planning familial, ne savent pas si vous participez ou non dans l'étude. Votre soin sera assuré de la même façon que vous participiez ou non.

Si vous voulez participer, vous devez signer le consentement sur la dernière page. Si vous ne savez pas écrire, vous pouvez poser votre empreinte digitale à la place.

Vous pouvez terminer votre participation dans l'étude à tout moment et sans donner de raison. Ceci n'aura aucune conséquence pour le suivi de votre soin. Si vous terminez votre participation on supprime toute information sur vous, à moins que les résultats de l'étude aient déjà été publiés dans une revue scientifique. Si vous souhaitez terminer votre participation, vous pouvez contacter l'assistant de recherche ou le responsable médical dans la clinique où vous vous êtes fait dépister..

## QUE DEVIENT VOTRE INFORMATION?

Les informations que nous enregistrerons sur vous ne seront utilisées que pour les propos écrits dans l'étude. Vous avez le droit de savoir quelles informations sont enregistrées sur vous, et de les faire corriger dans le cas où elles sont incorrectes. Vous avez le droit d'une copie de toutes les informations enregistrées sur vous.
Toutes les informations sur vous seront traités dans la confidentialité, et ne serons pas liés à votre nom ou votre date de naissance. Vous allez recevoir un numéro qui sera votre identifiant dans l'étude. Une liste confidentielle contient votre nom et identifiant. Aucun personne extérieure à l'étude n'aura accès à votre nom ou identifiant.
Le directeur du projet est responsable du bon déroulement quotidien du projet et de la confidentialité totale de vos informations. Au bout de 5 ans, toute information qui pourrait vous lier aux données de l'étude sera supprimée. Cela veut dire que la liste qui contient votre nom et votre identifiant sera détruite et plus personne ne pourra jamais trouver votre identité, même les chercheurs dans l'étude. Si vous souhaitez vous plaindre sur la façon dont vos informations ont été traitées, vous pouvez envoyer une plainte à la Protection des Données personnelles en Norvège, par courriel, à postkasse@datatilsynet.no, ou à l'Université d'Oslo à personvernombud@uio.no.

## FINANCEMENT DU PROJET

Ce projet est entièrement financé par Médecins Sans Frontières (MSF). MSF est une organisation indépendante, qui est financé par des donateurs privés dans le monde entier. MSF n'est pas financièrement dépendante de fonds publics ou de donations venant du gouvernement ici ou ailleurs.

## APPROBATIONS ETHIQUES

Le projet a été revu par le Comité Régional pour l'Éthique de Recherche Médicale et de Santé en Norvège, par le Centre Norvégien de Données de Recherche (NSD), par le comité d'éthique interne de Médecins Sans Frontières et par le Comité Scientifique Chargé de la Validation des Protocoles d'Etudes et des Résultats à Bangui.

# Appendix 2: Information sheet, Sango version

## BANGO NDO NA DUTÎNGO NA YATÎ PIALO TÎ GUINGO NDA TÎ YE

**AYESÔ A FA DUTÎNGO TÎ ZO NGA NA LE GUETÎ KONOMI A BUNGBI NA BANGO YA TÎ MENE TENE TÎ MAKONGO TÎ SÔNGUEWOZO NGA NA NGBANGO NAYA TÎ MOUNGO YORO NAYA TÎ NDOKOA TÎ BGOTONGO POPO TÎ DOUNGO TENE TÎ A WALI SÔ NGU TÎ ALA ALONDO NA 15 A SI NA 49, NA BANGUI, BÊ-AFRICA.**

Sô ayeke bangondo tî mu légué na ya tî gbungo li na guingo nda tî yé nda li tî gui tî inga mu legi na awali tî bango ya tî menè nda li tî makongo tî sônguèwosô na mungo yoro gue na Bangui tî inga nzon tongana nye é lîngbi bian kiringo ténè na ndo tî sônguèwosô.

Na ya tî ndokoa sô è yeke mou na azo sô kwe aga, bango seni tî a la na a kodé tî gbotongo popo tî doungo nga na bango ya tî mènè tenè tî makongo tî sônguèwozo, ndokoua so a yéké sengué-sengué ngbanga ti azo kouè. Ti ala so ayéké wara makotigo na téré ti ala, eyeke tokoa é yeke tokoa a la na ya tî mbênî ndokoa tî moungo yoro (tî bé tî ala) sô ala nvêni a yé ni. E lîngbi nga tî mouna ala mamboko (légué) tî wara ndokoa sô a yeke ndourou na ala. Ayeke tokoa ala ngbanga tî sô a wanganga sô a yeke na maka pépé (MSF) a yeke na ndokoa tî moungo yoro tî makongo tî sônguèwozo pèpè. E yekè tokoa gui ala na ya tî mbênî ndokoa tî moungo yoro sô a yeke gui senguè senguè. Na singo ni ka, a la lîngbi tî tonda tî moungo yoro ndali tî makongo tî sônguèwozo.

Gui na yatî tango sô e yeke sala kusâla, é ye tî ba tongana nyè si ye ni ayeke maï, sô tî tene, ndokoa tî doungo sô a yeke mbênî nzonî ndo tî bangoya ya tî mènè ngbanga tî makongo tî sônguèwozo. Na ya tî gbungo li sô, è yéké gui nga tî inga wala légué tî doutîngo na popo tî azo nga na conomie tî azo (a yeke na mokongo) sô a yeke mbênî kpale (kanga legue) tene tî moungo tonga. Gboungo li ni a yeke doutî gui gué na ya tî ndokoa sô, nga bango ndo tî ala, wala (tene tî bê tî ala) na ndo tî gbungo li sô, a lîngbi tî ziani da (lasô lasô) gui gué lasô. Bango ndo tî é a yeke tî tene na nzonî bè tî ala, é na ala é pika patara, tene tî sô a ala yeke na popo (na ya tî maka) tî ngu tî azo sô éyé tî sala kusâla na ni. Tongana si ala inga si ala yéké na ngö, ala lingbi ti dauti nay a ti gbungo li so apé ngbanga ti so téné ti bango séni ti ala ayéké ndé. Tongana si ala inga wala ala yeke na ngö pépé fade sage-femme ayeke gui ti inga wala ala yeké nan go, wala ala yeké nan go apé na ngoï ti bango seni ti ala, tongana ala ye tî pika patara na é na ya tî gbungo li sô pèpè, ala lîngbi nga tî ba gui ya tî mènè tî ala.
A wanganga sô a yeke na maka pèpè (MSF) la a yeke ban do tene tî ndokoa sô. Bango péko tî kusâla tî ndokoa sô, sô a yeke tongana gbungo li, a yeke sala ni mamboko na mamboko na sendaguigui tî Oslo na sésé tî Norvège. A yeke ba kota ndokoa tî seni tî Bé-Africa lakwe, lakwe na tango sô gbungo li ni a yeke maï.

## NGBOUNGO LI SU A YEKE NDALI TÎ GNE

Tongana mo yeda tî doutî na ya tî ngbongo li sô. I yeke nga na a mbênî a hounda na ndo tî doutîngo tî mo na légué tî conomie. Na peko tî a hounda sô. Mo lîngbi tî sara mbênî ye ako pepe nga mo lîngbi tî ba tanga tî seni tî mo.

A yeke hounda nga mo na ngangou tî baya tî méné tî mo si mo doutî na ya tî ngboungo li sô pepe. I yeke ba na ya tî mbêtî sô wala mo ba yatî mènè tî mo wala mo ba pepe. Tongana mo ba ya tî mene tî mo awè. Mo fa mbêtî ni tongana mo yeke na makongo ni, fa de. I yeke ba na ya tî nze oko. I ke gui tî hînga na ya tî ndokoa sôsi a takoua ala da tî moungo yoro sô. Tî hînga wala ala tonda tî mou yoro a we a lîngbi mo hînga nga mo yeda sô ndokoa sa yeke mou na I sängö.

## AVANTAGES ET DÉSAVANTAGES POUR VOUS

Tongana mo yeda tî doutî na ya tî ngboungo li sô, fade mo yeke moulegue na maï ngo tî hînga ngo ye na ndo tî VIH. I ye ke mou nguinza wa la mbênî ye pepe. Bango ya tî méné ayeke mou legue tî nzonî doutî. Tongana a wara makongo sô.
A wa mougo wango tî é, a yeke gué tî mou maboko na a la.

## PARTICIPATION VOLONTAIRE ET TERMINAISON DE LA PARTICIPATION

A lîngbi é hînga doutîngo na ya ngboungo li sô a ye ke tî bê tîmo. Mo lîngbi tî kein nga. Wala mo lîngbi tî bay a tî méné tî mo. E ke tokwa mo na ndo tî moungo yoro tongana mo yeke na kobêla sô. Wa moungo wango sô lo ba yatî méné tî mo na sage-femme sô a yeke ba na planning familiale, ala ke hînga nga pepe wala mo doutî na ya tî ngboungo li sô pepe.
Moungo maboko na mo ayeke legue oko tongana mo doutî na ya tî ngboungo li sô wa la pepe.
Tongana mo yeda tî doutî na yatî guingo nda tî ye sô a lîngbi mo sôu maboko tî mo na ngbê tî mbêtî sô tongana mo hînga mbêtî pepe mo lîngbi tî pko li tî moboko tî mo na gbêni.
Na ya tî gui ngo nda tî ye sô mo lîngbi tî ngba na legue, tene a yeke pepe. Ayeke kanga nga légué na warango a yoro tîmo pepe.
Mo lîngbi nga tî hînga nye a sôu na letî mbêtî sô mo lîngbi tî lekere guéré ni tongana ayeke na legué ni pepe. Mo lîngbi nga tî hounda tî tene a zi a hounda sô kouè na ndo tî mo. Tongana a fan da tî guingo ye sô polélé nay a tî a ngboungoli.
Tongana mo yeda tî konda tî moungo maboko tî mo. Mo lîngbi tî iri wa guingo nda tî yé, auala lo sô lo bando na ndo tî ndokoa sô si a ba yatî mènè tî mo da.

## QUE DEVIENT VOTRE INFORMATION?

A hounda sô a mou na ndo tî mo sô, a lîngbi tî sara na koua gui tongana tîsô a mou na mbêtî sô.
Mo lîngbi nga tî hînga la yein si a mou na mbêtî na ndo tî mo.
Nga tî lekere ni tongana a yeke na legue ni pepe, a yé sô koué a mou na ndo tî mo, a lîngbi tî sara na koua gui na batongo nênê tî mo, èrè tî mo ouala langa tî doungo mo ake doutî na yani pepe. A yeke mou na mo mbênî nzoroko sô a lîngbi tî fa mo. Ake sôu iri tî mo gui na ya tî mbênî boukou sô a yeke bata nênê tî zo nga na ye sô afa zo.
Waïnda tî ndo kwa sô la ayeke bando na ndo tî koussala ni lakoue lakoue na ndo tî batango nda tî a sängö sô a la yeke mou na é. Na ya tî ngou okou a sängö sôkoué aye tî mou peko tî mo na ndo tî guingo nda tî ye sô I yeke kanga légué na ni.
Sô tî tene a mbêtî sô koue iri tî mo a yeke na ndo ni. I yeke gbini si mbênî zo ayeke hînga nda tî mo pepe. Tongana ala ba téré ti ala nzoni na yati ye so I yéké sala pé, nga tongana si i mou a téné ti ala si i sala ni nzoni apé, ala pé ti tokana mbeti ti fa voundou ti bé ti ala na nolo gbande téré na email postkasse@datatilsynet.no , nga na sendagui ti Oslo a yéké na séssé ti Norvège, na email personvernombud@uio.no.

## FINANCEMENT DU PROJET

Ndokoa sa a wara moungo maboko tî MSF.
MSF ayeke ndokoua  sô lô nveni lo bando na ndo ni. Sô lo auara. Moungo moboko tî a zo ndédé na ndo tî bêndo guigui. MSF a yeke ouara moungo maboko tî gouvernement pepe.

## APPROBATIONS ETHIQUES

Ndokoa sô a kiri a ba gui gui ndali tî ndokoa tî comité d'éthique de recherche médicale nga na tî seni na sesse tî Norvège. Nga na ndo tî a norvégien tî guingo nda tî yé (NSD). Nga na ndokoa sô a yeke na yatî Médecins Sans Frontîères nga na Comité Scientîfique sô a bando na ndo tî yengo da na peko tî guingo nda tî a ye sô koue a wara na Bangui.

# Appendix 3: Consent form

**CONSENTEMENT À LA PARTICIPATION DANS L'ÉTUDE «FACTEURS SOCIO-ÉCONOMIQUES ASSOCIÉS AU DÉPISTAGE VIH ET À L'INITIATION AU TRAITEMENT, DANS UN SERVICE DE PLANIFICATION FAMILIALE POUR LES FEMMES EN ÂGE DE REPRODUCTION À BANGUI, RÉPUBLIQUE CENTRAFRICAINE »**

JE VEUX PARTICIPER DANS LA PARTIE QUANTITATIVE DE L'ÉTUDE: DONNÉES MÉDICALES ET QUESTIONNAIRE SOCIO-ÉCONOMIQUE

Lieu et date — Signature ou empreinte du pouce du participant

Nom du participant en lettres majuscules

J'accepte qu'on me recontacte plus tard pour un entretien : ☐OUI ☐NON

Présence de témoin :

Signature du témoin

Nom du témoin en lettres majuscules

Si le participant est âgé de moins de 18 ans, la signature d'un parent ou un tuteur légal adulte est requise.

En tant que parent/tuteur de _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ (Nom complet) je consente à sa participation dans l'étude.

Lieu et date — Signature du parent/tuteur

Le nom du parent/tuteur en lettres majuscules

J'ACCEPTE QU'ON ME CONTACTE DANS 30 JOURS POUR UN ENTRETIEN DE SUIVI

Lieu et date — Signature du participant

À signer par l'assistant de recherche:
Je confirme avoir donné toute les informations sur le projet et la participation.

Lieu et date — Signature

Appendix 4: Participant form including SES questionnaire

**FICHE PARTICIPANT**

Numéro de participant:

Date de consultation:

Enquêteur:

**JOUR 0**

**QUESTIONNAIRE SOCIO-ECONOMIQUE**

| | | |
|---|---|---|
| 1 | AGE | |

EDUCATION

Niveau d'éducation:

| | | | | | |
|---|---|---|---|---|---|
| 2 | Maternelle | | Secondaire | | |
| | Primaire | | Université | | |
| | Collège | | Aucune formation formelle | | |

| | | |
|---|---|---|
| 3 | Combien d'années de scolarisation avez-vous fait en tout? | |

SITUATION MATRIMONIALE

| | | | | | |
|---|---|---|---|---|---|
| 4 | Vit seule | | Divorcée | | |
| | Vit en couple | | Veuve | | |
| | Mariée | | Autre | | |

LIEU DE DOMICILE



| | | | | | |
|---|---|---|---|---|---|
| 5 | 1er arrondissement | | 6e arrondissement | | |
| | 2e arrondissement | | 7e arrondissement | | |
| | 3e arrondissement | | 8e arrondissement | | |
| | 4e arrondissement | | Bimbo | | |
| | 5e arrondissement | | Autre | | |

Type de domicile

| | | | | | |
|---|---|---|---|---|---|
| 6 | Cité/camp de déplacés | | Chez une famille hôte | | |
| | Ma maison | | Sans abris | | |
| | Maison louée | | Autres | | |

| | | |
|---|---|---|
| 7 | Depuis quand vivez-vous dans votre logement actuel? | |

SITUATION FAMILIALE

| | | | | | |
|---|---|---|---|---|---|
| 8 | Etes-vous chef de la famille? | Oui | | Non | |

| | | |
|---|---|---|
| 9 | Si non, quelle est votre relation avec le chef de la famille? | |

| | | | |
|---|---|---|---|
| 10 | Combien êtes vous dans la famille? (par tranche d'âge) | Moins de 15 ans | |
| | | Entre 15 et 65 ans | |
| | | Plus de 65 ans | |

| | | |
|---|---|---|
| 11 | Combien d'enfants avez-vous de moins de 15 ans? | |

| | | |
|---|---|---|
| 12 | Combien d'enfants de moins de 15 ans dépendent de vous pour être nourris? | |

CONDITIONS DE VIE

| | | | | | |
|---|---|---|---|---|---|
| 13 | Quelle est votre activité/source principale pour gagner votre vie? | Agriculture | | Travail | |
| | | Parent | | Commerce | |
| | | Rien | | Autre chose | |
| 14 | Avez-vous une seconde activité/source pour gagner votre vie? Quelle est-elle? | Agriculture | | Travail | |
| | | Parent | | Commerce | |
| | | Rien | | Autre chose | |
| 15 | Combien de personnes de votre ménage participent à gagner la vie de la famille? | | | | |

DEPENSES

| | | | | | |
|---|---|---|---|---|---|
| 16 | Est-ce que vous participez dans une tontine? | | | Oui | |
| | | | | Non | |
| 17 | Si oui, combien contribuez-vous à la tontine? | | | tous les | |
| 16 | Avez-vous un téléphone portable? | | Oui | | |
| | | | Non | | |
| 17 | Est-ce que quelqu'un d'autre dans votre ménage a un téléphone portable? | | Oui | | |
| | | | Non | | |
| 18 | Combien avez-vous dépensé en crédits téléphoniques les 7 derniers jours? | | | | |
| 19 | Combien de jours par semaine pouvez-vous manger autant que vous voulez? | tous les jours | | | |
| | | 1 à 3 jours | | | |
| | | 4 à 6 jours | | | |
| | | jamais | | | |
| 20 | Quelle est la dernière fois que vous n'avez pas eu assez à manger pour vous ou pour vos enfants? | | | | |



DEPISTAGE VIH PRECEDENT

| | | | | | |
|---|---|---|---|---|---|
| 21 | Avez-vous déjà fait un dépistage VIH? | Oui | | Non | |
| 22 | Si oui, en quelle année? | | | | |
| 23 | Vous connaissez déjà votre sérologie? | Oui | | Non | |

| DEPISTAGE VIH | | | | |
|---|---|---|---|---|
| Dépistage complété: | Oui | | Non | |
| Résultat dépistage: | Positif | | Négatif | |
| Si positif, structure d'orientation: | | | | |

| PLANIFICATION FAMILIALE | | | | |
|---|---|---|---|---|
| Méthode prise: | Oui | | Non | |
| Type choisi: | | | | |



**JOUR 30**

| SUIVI TRAITEMENT ARV | | | | |
|---|---|---|---|---|
| Contact pris avec structure d'orientation: | Oui | | Non | |
| Patiente venue en consultation: | Oui | | Non | |
| Traitement ARV initié: | Oui | | Non | |
| Date d'initiation du traitement: | | | | |

Appendix 5: SES questionnaire, Sango version

| HOUNDA NGO NDO | | | | | | | |
|---|---|---|---|---|---|---|---|
| Wa hounda ngo nda ti yé..... | | | | | | | |
| Lango ni..... | | | | | | | |
| Molongo ti zo ni..... | | | | | | | |
| Hounda | | | | | | | |
| 1 | NGOU | | | | | | |
| 2 | HINGA NGO Yé | | | | | | |
| | Maka ti a hinga ngo yé: | | | | | | |
| | Da mapa | | Kota da mbeti (makanda) | | | | |
| | Kété da mbeti | | Senda guigui | | | | |
| | Da mbeti ti collège (maka | | La oko pépé | | | | |
| 3 | Ala sala ngou okè na ya ti mandango mbeti? | | | | | | |
| 4 | DOUTINGO TI YA TI SEWA | | | | | | |
| | Koumbamba | | Ka ngbi | | | | |
| | Doutingo na ndeko | | Wa mwoua | | | | |
| | Zo ti fango seleka | | Mbeni | | | | |
| 5 | NDO TI LANGO | | | | | | |
| | Gba-vaka oko | | Gba-vaka omènè | | | | |
| | Gba-vaka oussé | | Gba-vaka mbra-mbra | | | | |
| | Gba-vaka ota | | Gba-vaka miambé | | | | |
| | Gba vaka ossio | | Bimbo | | | | |
| | Gba-vaka okou | | Mbeni | | | | |
| 6 | Mara ti da ti lango-ngoni | | | | | | |
| | Kando | | Ndo ti a sewa nde | | | | |
| | Da ti mbi na sewa timbi | | Da ti lango a yéké pépé | | | | |
| | Da ti fouta-ngoni | | Mbeni | | | | |
| 7 | Ala yéké na ndo so ala sala la ngo okè? | | | | | | |
| 8 | YA TI SEWA | | | | | | |
| | Ala yéké makounzi ti sewa ti ala? | Hein | | Hein-hein | | | |
| 9 | Tongana hein-hein, nye la a boumbi mo na makounzi ti sewa ni? | | | | | | |
| 10 | A zo okè la a yeke na ya ti sewa ti mo? | Na gbi ti ngou balako na okou (15A) | | | | | |
| | | Na popo ti ngou balako na okou (15) ti si na ngou balé omènè na okou (65A) | | | | | |
| | | Na ndo ti gou balé omènè na okou | | | | | |
| 11 | Mo yeke na a molengué oké na gbé ti mo so adé a ouara ngou balako na okou pépé? | | | | | | |
| 12 | Mo yéké mou kobe na a molengue oké so adé a ouara ngou balako na okou pépé? | | | | | | |

| | KODE NGOBO TI DUTI NGO NI | | | | |
|---|---|---|---|---|---|
| 13 | Ngnè la a mou légué na ala kozoni ti ouara nguinza? | Yaka | | Koussala | |
| | | Mbeni sewa | | Ka-ngo yé | |
| | | Yé oko pépé | | Mbeni ndé | |
| 14 | Ngnè la ti oussé ni so a moulégue na ala ti ouara nguinza. Mbeni oko a yéké da? | Yaka | | Koussala | |
| | | Mbeni sewa | | Ka-ngo yé | |
| | | Yé oko pépé | | Mbeni ndé | |
| 15 | Na ya ti da ti ala azo okè la aké mo mamboko na ala na ngiza? | | | | |
| 16 | Ala yéké na singa mè ti ala mveni? | | Hein | | |
| | | | Hein-hein | | |
| 17 | Ala yéké na passa ti ouara singa-mé na ya ti da ti ala? | | Hein | | |
| | | | Hein-hein | | |
| 18 | Ala yéké vo crédit ti okè na ya ti Dimanche oko? | | | | |
| 19 | Ala yéké té kobé fani okè na ya ti Dimanche oko tongana ti so be ti ala a yé? | lakwé | | | |
| | | langa oko ti si na langa ota | | | |
| | | langa oussio ti si na langa oméné | | | |
| | | la oko pépé | | | |
| 20 | Na ya ti a langa so a ohon so, langa wa la ala té yéda nzoni apé? | | | | |

| | KIZAME TI MAKONGO TI SIO-NGUE A HO ZO | | | | |
|---|---|---|---|---|---|
| 21 | Ala ba ya ti méné ti ala la oko awé? | Hein | | Hein-hein | |
| 22 | Tongana hein, na ngou wa? | | | | |
| 23 | Ala inga téné na ndo ti méné ti ala awé? | Hein | | Hein-hein | |

Appendix 6: SES questionnaire, English translation

**SOCIO-ECONOMIC QUESTIONNAIRE**

| | |
|---|---|
| Interviewer: | |
| Date: | |
| Participant number: | |

| Question | | | | | |
|---|---|---|---|---|---|
| 1 | **AGE** | | | | |
| 2 | **EDUCATION**<br>Level of completed education: | | | | |
| | Pre-school | | High school | | |
| | Primary school | | Higher education | | |
| | Middle school | | No formal education | | |
| 3 | How many years of formal education do you have in total? | | | | |
| 4 | **MARITAL STATUS** | | | | |
| | Living single | | Divorced | | |
| | Living with partner | | Widowed | | |
| | Married | | Other: | | |
| | **YOUR PLACE OF RESIDENCE** | | | | |
| 5 | 1er arrondissement | | 6e arrondissement | | |
| | 2e arrondissement | | 7e arrondissement | | |
| | 3e arrondissement | | 8e arrondissement | | |
| | 4e arrondissement | | Bimbo | | |
| | 5e arrondissement | | Other: | | |
| | **TYPE OF RESIDENCE** | | | | |
| 6 | Refugee camp | | With a host family | | |
| | Family owned house | | No residence | | |
| | Rented house | | Other: | | |
| 7 | How long have you lived in your current residence? | | | | |
| | **HOUSEHOLD COMPOSITION** | | | | |
| 8 | Are you the head of you household? | | Yes | | |
| | | | No | | |
| 9 | If not, what is your relation to the head of household? | | | | |
| 10 | In your household, how many persons are in the age groups: | | Under 15: | | |
| | | | Between 15 and 65 | | |
| | | | 66 years or above: | | |
| 11 | How many children under the age of 15 do you have? | | | | |
| 12 | How many children under the age of 15 depend on you for food? | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | **LIVING CONDITIONS** | | | | |
| 13 | What is you main source of income? | Agriculture | | Employed | |
| | | A family member | | Informal trade | |
| | | None | | Other: | |
| 14 | Do you have a second source of income? Which | Agriculture | | Employed | |
| | | A family member | | Informal trade | |
| | | None | | Other: | |
| 15 | In your household, how many people contribute to the family's total income? | | | | |
| | **SPENDING** | | | | |
| 16 | Are you currently participating in a saving group (tontine)? | | | Yes | |
| | | | | No | |
| 17 | If yes, how much do you save? | | | FCFA every | |
| 16 | Do you have your own mobile phone? | | | Yes | |
| | | | | No | |
| 17 | Do you have access to a phone in your household? | | | Yes | |
| | | | | No | |
| 18 | How much phone credit did you spend in the last 7 days? | | | | |
| 19 | How many days per week do you usually eat as much as you feel like? | | Every day | | |
| | | | 4-6 days | | |
| | | | 1-3 days/week | | |
| | | | Never | | |
| 20 | When was the last time that you didn't have enough food to feed yourself and the children? | | | | |
| | **HIV TEST** | | | | |
| 21 | Have you ever been tested for HIV? | | Yes | | |
| | | | No | | |
| 22 | If yes, which year? | | | | |
| 23 | Do you know your HIV status? | | Yes | | |
| | | | No | | |

Appendix 7: Interview guide, pilot study

## 1. Introduction

Bienvenue et merci beaucoup de vouloir partager de votre temps pour participer dans cet entretien. Je commence par me présenter, je m'appelle (nom, pays, profession, famille) et ceci est (traducteur se présente). Nous travaillons pour MSF Belgique, une organisation internationale médicale, dont le but est simplement venir à l'aide des malades dans le monde entier. Ici, nous avons démarré le dépistage de VIH pour les femmes dans la maternité de Gbaya Dombia, et nous faisons une étude pour trouver la meilleure façon possible d'organiser ces services liés au VIH et au SIDA. Cet entretien fait partie des préparations pour l'étude, et son but est pour nous de comprendre la situation économique des femmes à Bangui, c'est-à-dire comment elles gagnent leurs vies, comment elles dépensent leur argent, et comment elles perçoivent la pauvreté et la richesse. Ce que vous allez dire va nous servir à développer un questionnaire pour les participantes dans cette étude.

## 2. Règles de base

Pendant cette discussion, vous êtes libres de partager vos pensées et avis honnêtes, et vous êtes encouragés de dire tout ce qui vous vient à l'esprit. Il n'y a pas de réponses fausses, au contraire, tous ce que vous avez à dire est indispensable pour que nous puissions bien comprendre ce que nous avons à faire pour rendre notre programme efficace. La session durera moins d'une heure, selon votre disponibilité. Vous êtes libres de vous servir de boissons et biscuits.

## 3. Confidentialité

Tout ce qui sera dit pendant cet entretien sera strictement confidentiel, c'est-à-dire que les informations que vous nous donnez seront utilisées uniquement pour le développement du questionnaire, et ne sera pas partagé avec autrui. Le fait que vous avez participé dans un tel entretien reste entre nous. Nous allons prendre des notes pendant la discussion afin de pouvoir nous rappeler de ce que vous avez dit. Ces notes ne seront pas partagées avec autrui.
. L'entretien est anonyme, c'est-à-dire que nous n'allons pas noter votre nom ou votre contact.

Je tiens à souligner que la participation est volontaire. Vous êtes libres de quitter à tout moment si vous ne vous sentez plus de participer.

Le travail :

- Parlez-moi de votre gagne-pain, c'est-à-dire comment vous gagnez votre vie.
- Comment est-ce que les membres de votre ménage gagnent leurs vies?

L'école :

- Parlez-moi de votre éducation (années de scolarisation, qualité perçue, diplômes etc)
- En quoi pensez-vous que l'éducation vous a servi dans votre vie adulte ?
- Souhaiteriez-vous faire plus d'études si vous en aviez la possibilité? Pourquoi/pourquoi pas ?
- Si vous pensez à votre entourage, pensez-vous que plus on est allé à l'école, plus on a d'argent ?
- Comment pensez-vous que la scolarisation est liée à la vie professionnelle ?

Pauvreté vs richesse:

- Qu'entendez-vous par "pauvreté"?
- Comment définissez-vous qu'une personne est pauvre?
- Connaissez-vous quelqu'un que vous décririez comme pauvre ?
- Qu'est-ce qui fait que cette personne est pauvre ?
- De la même manière, qu'entendez-vous par « richesse » ?
- Que faudrait-il avoir pour être considéré comme riche ?
- Est-ce qu'il y a des gens dans votre communauté que vous considérez comme riche ?

L'argent :

- Est-ce que vous disposez vous-même d'argent ? Est-ce que c'est vous qui dépensez l'argent que vous gagnez ?
- Dans votre ménage, qui décide comment la famille dépense l'argent ?
- Pouvez-vous lister les différents moyens, dans votre communauté, de gagner de l'argent ?
- Si vous êtes en panne d'argent, que faites-vous pour vous dépanner ? (si question pas comprise, donner exemples tels que emprunter de l'argent, vendre des affaires, travailler avec la famille, etc).
- Selon-vous, est-il possible de vivre dans votre quartier sans gagner de l'argent ? Par exemple si on a des animaux ou des champs ?
- Si non, combien d'argent faudrait-il avoir par jour pour vivre correctement ?

Les matériels :

- Pouvez-vous lister les cinq choses les plus importantes à se procurer dans la vie ? (si question pas comprise, donner exemples tels que nourriture, loyer, essence, frais de scolarité, électricité, moyen de communication, médicaments etc).
- Est-ce que vous pouvez mettre ces choses dans l'ordre du plus important au moins important ?
- Est-ce que vous pouvez lister des objets que vous considérez moins importants, mais que vous vous permettez d'acheter si vous avez de l'argent en plus ?
- Pouvez-vous me parler de la dernière fois que vous avez investi dans quelque chose ?
- Quel est le dernier achat important que vous avez fait ?
- Est-ce que vous disposez d'un téléphone portable ? Si oui, pouvez-vous expliquer qui a payé le téléphone et qui paye les crédits pour appeler ?

Merci beaucoup pour votre contribution !

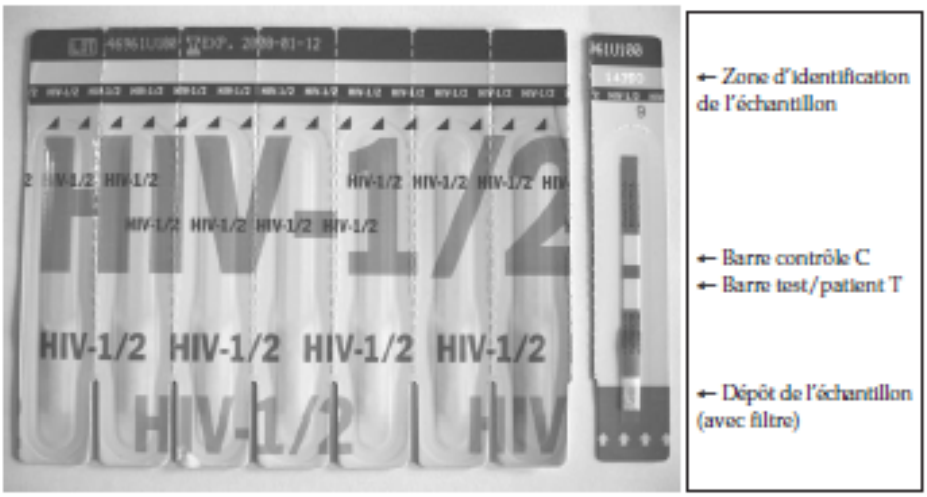
Appendix 8: Protocol for HIV-testing, Determine

# 18 - Test HIV 1/2 Determine®

Le test HIV 1/2 Determine® est un test rapide à flux latéral pour la détection des anticorps anti-VIH-1 et anti-VIH-2.

***Description***

- Membrane recouverte d'antigènes recombinants et de peptides synthétiques du VIH 1 et du VIH 2.
- Bandelettes scellées individuellement, par cartes de 10 bandelettes (10 cartes), emballées dans un sachet en aluminium. Le sachet est muni d'un système de fermeture hermétique et contient un dessicant.




*Bandelettes scellées et descellées*

*Attention :*

- Le tampon (chase buffer) à utiliser pour tester du sang total n'est pas fourni dans le kit et doit être commandé séparément.
- Les bandelettes HIV 1/2 Determine® ressemblent beaucoup aux bandelettes HBsAg Determine®.

***Echantillon***

- Plasma ou sang total (tube EDTA) ou sérum (tube sec)
- Sang capillaire

***Procédure***

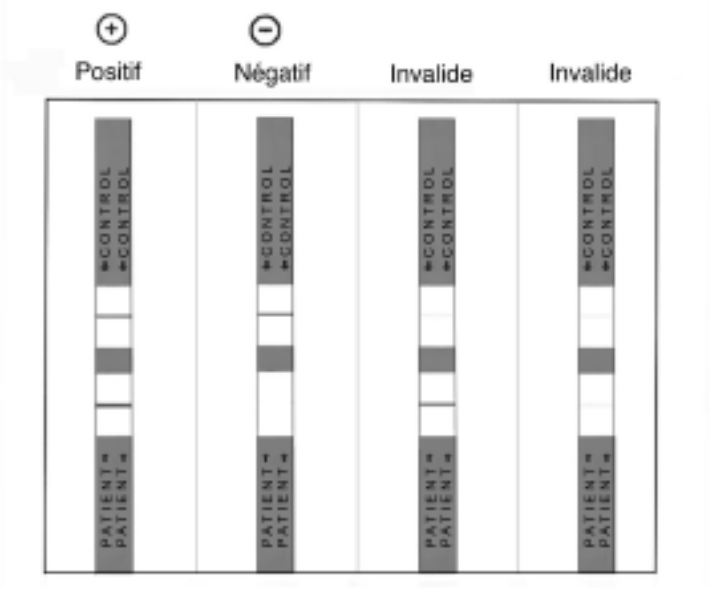
1. Séparer la (ou les) bandelette(s), en partant du côté droit de la carte, après avoir plié plusieurs fois le long des perforations. Remettre les bandelettes restantes dans le sachet d'aluminium et refermer soigneusement.

2. Identifier la bandelette en inscrivant le numéro de l'échantillon à tester entre les 2 bandes pleines vert-gris en haut de la bandelette, avec un marqueur permanent fin.
3. Tirer doucement sur la feuille de protection de la bandelette au niveau du triangle.
4. *Pour un test sur sang total :*
   - Déposer 50 microlitres sur la zone de dépôt de l'échantillon.
   - Une minute après, ajouter 1 goutte de tampon sur la zone de dépôt de l'échantillon.

   *Pour un test sur plasma ou sérum :*
   - Déposer 50 microlitres sur la zone de dépôt de l'échantillon. NE PAS ajouter de tampon.

### *Interprétation*

– Lire le résultat au bout de 15 minutes minimum (60 minutes maximum).
– Le test est validé seulement si la barre contrôle interne est visible. Sinon, le test est invalide.




*Interprétation du test HIV1/2 Determine®*

### *Conservation*

Le kit doit être conservé à une température comprise entre 2°C et 30°C et ne doit pas être congelé.

Appendix 9: Protocol for HIV-testing, Unigold

# 19 - Test HIV Uni-Gold®

Le test HIV Uni-Gold® est un test rapide à flux latéral pour la détection des anticorps anti-VIH-1 et anti-VIH-2.

### *Description*

– Membrane recouverte d'antigènes recombinants immunodominants de l'enveloppe du VIH-1 (gp 41 et gp 120) et du VIH-2 (gp 36).

### *Contenu du kit*

– 20 cassettes, emballées individuellement dans une pochette d'aluminium
– 20 capillaires en plastique
– 1 flacon compte-gouttes de tampon de lavage (2 ml)

### *Echantillon*

– Plasma ou sang total (tube EDTA) ou sérum (tube sec)
– Sang capillaire

### *Procédure*

1. Ouvrir l'emballage juste avant de réaliser le test.
2. Identifier la cassette avec le numéro de l'échantillon à tester, à l'aide d'un marqueur permanent fin.
3. Appliquer 2 gouttes (environ 60 microlitres) de sang total, sérum ou plasma dans le cercle SAMPLE.
4. Appliquer 2 gouttes (environ 60 microlitres) de tampon dans le cercle SAMPLE.

### *Interprétation*

– Lire le test entre 10 et 20 minutes après le dépôt du tampon.
– Le test est validé seulement si la bande contrôle interne est visible. Sinon, le test est invalide.

**Négatif :** une bande rose est visible en face du C.

**Positif :** 2 bandes roses sont visibles, une en face du C et une en face du T.

C = bande contrôle interne
T = bande test

**Invalide :** il n'y a pas de bande visible en face du C. Recommencer le test avec une nouvelle cassette.

*Interprétation du test HIV Uni-Gold®*

### *Conservation*

Le kit doit être conservé à une température comprise entre 2°C et 27°C et ne doit pas être congelé.

Appendix 10: Protocol for pre- and post-test counselling

**Séances : Pré et Post-test counseling VIH. Conseil et dépistage du VIH.**

<table>
<tr><th colspan="4">Séance de Pré-Test</th></tr>
<tr><td>Groupe cible</td><td colspan="3">Femmes victimes de VS ou autres femmes référées.<br>Femmes se présentant au planning familial<br><br>(à l'exception de femmes enceintes qui arrivent au moment de l'accouchement ou des femmes avortées/ décès d'un bébé)</td></tr>
<tr><td>Objectifs</td><td colspan="3">- Donner des informations nécessaires sur le test VIH (procédures, avantages etc.) et préparer la femme pour le dépistage</td></tr>
<tr><td>Moment</td><td>Avant le dépistage</td><td>Mode</td><td>Individuel/ Groupe</td></tr>
<tr><td>Durée</td><td>Environ 15 minutes</td><td>Outils</td><td>Boîte à outils PTME (1,2,3)</td></tr>
<tr><td colspan="4">

**1. INTRODUCTION :**

- Présentation du conseiller
- Expliquez les objectifs de la séance (Les 5 étapes suivantes) puis test et post-test
- Mettez l'accent sur la confidentialité (ANNEXE 1)

**2. VERIFICATION DES CONNAISSANCES SUR LE VIH :**

Demandez à votre cliente ce qu'elle connait du VIH/SIDA et combler les lacunes le cas échéant.

- *« Qu'est-ce que le VIH ? », « Quelles sont les voies de transmission? » etc.*

**3. EXPLIQUER LE VIH (boîte à image) :**

**Qu'est-ce que c'est le VIH : CARTE 1**

Un corps en bonne santé a un système immunitaire qui le défend contre toutes les maladies qui nous attaquent, comme la TBC, la grippe, la malaria. Notre système immunitaire se comporte comme des soldats de notre corps, nous les appelons CD4.

</td></tr>
</table>

Le VIH est un virus qui attaque ce système immunitaire (les cellules CD4, les soldats) Une fois dans notre corps, il attaque les cellules CD4 et le virus se multiplie. Petit à petit le corps va s'affaiblir. Même si vous vous sentez forte, le virus cause des dégâts dans votre corps. Alors n'importe quelle maladie pourra entrer: fièvre, diarrhée, TBC, muguet.

Sans traitement, le virus va continuer à détruire le système immunitaire et éventuellement la personne infectée par le VIH va mourir.

**Comment traite-t-on le VIH ? CARTE 2**

Le VIH ne se guérit pas encore mais il y a un traitement qui peut maitriser le VIH : le traitement aux Anti Rétroviraux (ARV). Les ARV vont combattre le virus VIH et permettre à notre corps de garder assez de cellules CD4 pour qu'il soit fort. Il fera en sorte que la quantité de virus VIH présents dans le sang reste basse et cela va augmenter la chance que votre bébé naisse en bonne santé et vous resterez en bonne santé.

Le traitement aux ARVs aide notre corps en supprimant les virus, mais chaque jour le corps a besoin d'un nouveau comprimé pour l'aider à combattre. Le traitement aux ARVs doit être suivi pendant le reste de votre vie, mais si vous le prenez correctement vous pouvez mener une bonne et longue vie avec le VIH.

**Modes de transmission : CARTE 3**

Le VIH se transmet :

- par des rapports/contacts sexuels sans préservatif avec une personne séropositive (par voie vaginale, buccale, anale) ;
- par contact du sang avec le sang d'une personne séropositive (transfusion sanguine, usage des mêmes objets tranchants souillés du sang infecté du VIH) ;
- de la mère à l'enfant (pendant la grossesse, l'accouchement, l'allaitement du lait maternel).

Le VIH ne se transmet pas par la salutation à la main, les baisers ou les embrassements, le repas ou les ustensiles partagés, ni par la piqure des moustiques.

**Traitement ARV (TARV) :**

A ce jour il n'existe pas de traitement curatif mais il y a un traitement qui peut maitriser le VIH : le traitement aux Anti Rétroviraux (TAR).

Les antirétroviraux (ARV) sont des médicaments qui arrêtent la multiplication du VIH dans le corps. Plus tôt vous commencerez le traitement aux ARV, pendant que vous vous sentez encore en bonne santé, moins vous courrez le risque de tomber malade et de détruire votre système immunitaire de façon permanente. Le traitement aux ARVs est à vie et ne doit pas être interrompu pour reprendre plus tard.

**Expliquer les informations suivantes :**

- Les avantages du dépistage du point de vue clinique et préventif.
- Les services disponibles en cas de résultat positif.
- Le **droit de refuser** le test. Expliquer le fait que si elle refuse le test, ça ne va pas influencer l'accès aux soins dans la clinique.

  - *« le dépistage est volontaire et vous êtes libre de décider de ne pas le faire »*

- La confidentialité par rapport au résultat.

  - *« Si vous décidez de faire le dépistage soyez rassurée que le résultat est confidentiel et que nous sommes ici pour vous assister»*

**4. EXPLICATION DE LA PROCEDURE DU TEST :**

- Test = Piqure au niveau du doigt. (pour récolter une petite goutte de sang)
- Procédure du test et délai d'obtention des résultats :

  - *« Si vous acceptez de faire le test de dépistage nous allons prélever du sang au niveau de votre doigt. Le sang sera placé sur le test rapide.*
  - *Après environ 15 minutes le résultat va apparaître sur le test rapide. Si le test est positif nous allons refaire un autre test pour confirmer le résultat. ».*

**5. CONSENTEMENT ECRIT :**

Le consentement doit toujours être obtenu de manière individuelle et en prive. Demandez le consentement :

*« Est-ce qu'il y a des informations qui ne sont pas claires pour vous? »*
*« Avez-vous besoin de temps pour prendre une décision ? »*
*« Vous êtes libre de décider de faire le dépistage. Acceptez-vous de faire le test de dépistage maintenant? »*

Faire signer la fiche de consentement. (Copie pour le patient) (ANNEXE 3)

**6. CLOTURE DE LA SEANCE :**

Referez la femme aux sages-femmes (LABO) pour le prélèvement de sang

OU

Préparation du matériel et expliquer les différents éléments du test.

**Séance de Post-Test**

| | | | |
|---|---|---|---|
| **Groupe cible** | Femmes victimes de VS qui ont été dépistées.<br>Femme du planning familial dépisté. | | |
| **Objectifs** | - Annoncer et expliquer les résultats du test VIH<br>- Soutien émotionnel en cas d'un résultat positif<br>- Référencement au CTA (si+) | | |
| **Moment** | Après le dépistage | **Mode** | Individuel |
| **Durée** | Environ 20 minutes | | |

## 1. INTRODUCTION

- Expliquez les objectifs de la séance (Les différentes étapes)
- Insister sur la confidentialité

## 2. DONNEZ LE RESULTAT DU TEST

## EN CAS DE RESULTAT POSITIF :

- Demandez si la patiente est prête à entendre le résultat et si elle a encore des questions.
- Informez le résultat d'une façon neutre et claire :

*« Le test VIH est positif, cela signifie que vous avez le VIH ».*

Reconnaitre le choc du diagnostic et donnez à la patiente le temps pour exprimer ses émotions.

- Vérifiez si elle comprend le résultat et **apportez un soutien émotionnel :**
  - Demandez les premières préoccupations que la femme a, maintenant qu'elle a découvert qu'elle est séropositive. Donnez-lui le temps d'exprimer ses émotions.

*«Comment vous vous sentez », …*

- Vérifier si la patiente « accepte » le résultat et si elle a des questions.

**A :Evaluation du système de support**

- *« Vous serez assistée et aidée ici à l'hôpital MSF et vous recevrez des soins médicaux gratuits. »*
- « *Après vous serez référée dans un centre de santé pour le suivi de votre traitement.* »
- Le test de dépistage que vous avez fait ici est **confidentiel**, personne ne va découvrir ces résultats. Vous déciderez vous-même à qui et quand vous pouvez le dire lors que vous serez disposée.

*''Avez-vous quelqu'un proche avec qui vous pouvez partager ces résultats, un ami ou un membre de famille qui peut vous assister?''*

**B : Explication de modes de prévention de transmission**

- « Etant donné que le VIH se transmet aussi par contact sexuel, il est important de connaître aussi le statut de votre partenaire.
- Vous pouvez dire à votre partenaire que vous voulez parler du dépistage du VIH afin que vous puissiez vous rapprocher tous deux, prendre des décisions ensemble, et garder votre famille en bonne santé.
- Demandez à votre partenaire d'aller dans un centre de dépistage volontaire (CDV) pour avoir davantage des informations sur le dépistage du VIH et le counseling ».
-
- Soulignez l'importance de prévenir la transmission du VIH en ayant des rapports sexuels protégés (utilisation des préservatifs).
- Fournir des préservatifs et des instructions pour les utiliser correctement.

**C : Clôture de la séance**

- Vérifiez si votre cliente a d'autres questions immédiates et faites la référence/accompagnement au CTA.

**EN CAS DE RESULTAT NEGATIF**

Demandez si la personne à des questions et donnez le résultat de façon neutre :

- *'' Le test est négatif. Cela signifie que nous n'avons pas trouvé de trace de VIH dans votre sang.*
- *''Comment ressentez-vous cela?''*

**B. Explication de modes de prévention**

- Soulignez l'importance de rester séronégatif en ayant des rapports sexuels protégés (utilisation des préservatifs).
- Fournir des préservatifs et des instructions pour les utiliser correctement.

**3 : CLOTURE DE LA SEANCE**

- Vérifiez si la patiente a des questions ou d'autres préoccupations.

Appendix 11: Approval from Comité Scientifique chargé de la Validation des Protocoles d'Études et des Résultats

UNIVERSITE DE BANGUI

REPUBLIQUE CENTRAFRICAINE
Unité – Dignité - Travail
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FACULTE DES SCIENCES DE LA SANTE
**********

COMITE SCIENTIFIQUE CHARGE
DE LA VALIDATION DES PROTOCOLES
D'ETUDES ET DES RESULTATS
**********

N° 4 /UB/FACSS/CSCVPER/18

Madame Mari Nythun SORLIEN
MSF Belgique
Bangui
République Centrafricaine

**Objet :** Facteurs socio-économiques associés au taux de dépistage VIH et à la référence au traitement, dans un service de planning familial pour les femmes en âge reproductif à Bangui. République Centrafricaine

## AVIS DU COMITE SCIENTIFIQUE DE LA FACSS

DEPOSE LE **10/01/2018** N° ENREGISTREMENT : 4

**Madame,**

Le Comité Scientifique et éthique de la Faculté des Sciences de la Santé de l'Université de Bangui a examiné votre projet en sa session du **16 avril 2018** et a émis un avis de principe:

**Favorable** (suite aux remarques générales du Comité et des commentaires des Rapporteurs).

**Remarques générales du Comité :**

- ✓ Prendre en compte toutes les remarques des deux rapporteurs ;
- ✓ Les notifications des deux Comités éthiques (Université de Oslo, Norvège et MSF Belgique) ;
- ✓ Traduction en sango de la fiche de consentement éclairé.

Vous souhaitant bonne réception de la présente note, veuillez accepter Madame, mes salutations distinguées.

Bangui, le 25 avril 2018

**Le Président du Comité**

Comité Scientifique de Validation des Protocoles et Résultats de Recherche
Le Président
Faculté des Sciences de la Santé
Université de Bangui

**Pr Gérard GRESENGUET**

## RAPPORT DU 1er RAPPORTEUR DE L'ETUDE

Analyse de la forme : Pour cette fois, les auteurs de la présentation du protocole de recherche médicale ont adopté une présentation proposée par le comité scientifique et ont tenu compte des remarques et contributions apportées.

Analyse de fond :
Néanmoins certaines erreurs infimes doivent être corrigées :

- **Femmes en âge de procréer (reproductif) à Bangui, République Centrafricaine (mai 2017)**
- **Antibalaka ne veut anti-machette mais plutôt Anti Balle (bal) AK (anti-balle Kalachnikov : AK47) page 8**
- **Formule de proportion à inclure à la page 14**
- **Participantes ou patientes aux pages 27 et 28**
- **Et enfin les fautes d'orthographe et grammaire**

# Appendix 12: Approval from Ethics Review Board instituted by MSF

Ethics Review Board
Instituted by *Médecins Sans Frontières*

Dr Petros Isaakidis
Operational Research Coordinator
Médecins Sans Frontières – Operational Centre Brussels

Cc: Annick Antierens

15 June 2018

**Re: Ethics approval of "Socio-economic factors associated with uptake of HIV testing and linkage to care integrated in a family planning service for women of reproductive age in Bangui, Central African Republic", Version 3 dated April 2018 (ID 1754)**

Dear Petros,

Thank you for your reply to our review of the above-mentioned protocol. We are happy with the answers provided by the investigators and thus approve the protocol. Please ensure that all people associated with the research receive a copy of the final, approved protocol.

Please note that:

- *if the study is not started within the next twelve months*, this approval will not be valid anymore, and you should submit a *Request for Amendment* (with the new schedule and the rationale for the delay);
- *after the study has started*, any planned substantial revisions/changes to the protocol must be submitted to the Ethics Review Board through a *Request for Amendment*, for further review and approval;
- any occurrences *during the research* that may affect its ethical acceptability, such as serious adverse events or other unforeseen events, must be reported to the Ethics Review Board;
- *once the study is completed or if it is stopped prematurely*, the Ethics Review Board should be notified with an *End of Study Notification*. Please also send us copies of the final research report and any related publications.

Please send us in due time the approval by the *Comité Scientifique Chargé de la Validation des Protocoles d'Etudes et des Résultats* in CAR if this has not been done, and notify us once this study is initiated.

We wish you much success with the research.

Yours sincerely,

Raffaella Ravinetto
Chairperson, Ethics Review Board

# Appendix 13: Response letter from REK

REK
REGIONALE KOMITEER FOR MEDISINSK OG HELSEFAGLIG FORSKNINGSETIKK

| Region: | Saksbehandler: | Telefon: | Vår dato: | Vår referanse: |
|---|---|---|---|---|
| REK sør-øst | Elin Evju Sagbakken | 22845502 | 19.05.2017 | 2017/744/REK sør-øst A |
| | | | Deres dato: | Deres referanse: |
| | | | 28.03.2017 | |

Vår referanse må oppgis ved alle henvendelser

Cecilie Dahl
Avdeling for samfunnsmedisin

**2017/744 Sosioøkonomiske faktorer assosiert med HIV testing og oppfølging i Den sentralafrikanske republikk**

Vi viser til søknad om forhåndsgodkjenning av ovennevnte forskningsprosjekt. Søknaden ble behandlet av Regional komité for medisinsk og helsefaglig forskningsetikk (REK sør-øst) i møtet 04.05.2017. Vurderingen er gjort med hjemmel i helseforskningsloven § 10, jf. forskningsetikkloven § 4.

**Forskningsansvarlig:** Universitetet i Oslo
**Prosjektleder:** Cecilie Dahl

**Prosjektomtale (revidert av REK):**

*Studien har til hensikt å undersøke forholdet mellom sosioøkonomisk status og oppmøteratio for personer som har testet positivt for HIV. Prosjektet vil prøve ut en ny strategi ved å tilby gratis HIV-test til pasienter ved en kvinneklinikk drevet av Leger uten Grenser i Den sentralafrikanske republikk Bangui. Store fremskritt er gjort innen forskning på HIV, men det mangler fortsatt kunnskap om hva som påvirker om man blir testet og behandlet. Det er også store regionale forskjeller innen forskning på HIV, og Den sentralafrikanske republikk er lite kartlagt. Prosjektet vil også gi kunnskap om hvorvidt en kvinneklinikk er egnet for HIV-testing, og resultatene vil bli brukt operasjonelt av Leger uten Grenser for å utvikle kvinneklinikken. Dette er et masteroppgaveprosjekt med oppstart juli 2017 og sluttføring i juni 2019. Prosjektgruppen antar at flere med høyere sosioøkonomisk status vil møte opp sammenlignet med de som har lavere sosioøkonomisk status. Til sammen vil 240 personer ta del i studien, herav 80 personer med lav sosioøkonomisk status og 160 personer med høy sosioøkonomisk status. Forskningsdeltakerne rekrutteres fra Leger uten grensers kvinneklinikk som oppsøker klinikken for å få prevensjon. I søknaden heter det at det ikke finnes «nok forskning på hva som skjer med HIV-positive pasienter i de første fasene av test- og behandlingsprosessen, spesielt ikke i den sentralafrikanske regionen. Det er behov for å finne nye måter å nå ut med testen på, samt å finne gode oppfølgingsopplegg for positive pasienter for å sikre behandling for dem».*

**Vurdering**

Slik komiteen forstår prosjektet, er formålet med prosjektet å undersøke forholdet mellom sosioøkonomisk status og oppmøteratio for personer som har testet positivt for HIV.

Etter komiteens vurdering vil ikke prosjektet, slik dets formål er beskrevet i søknad eller protokoll, kunne bringe ny kunnskap om helse eller sykdom.

Hva som er medisinsk og helsefaglig forskning fremgår av helseforskningsloven § 4 bokstav a hvor medisinsk og helsefaglig forskning er definert slik: «virksomhet som utføres med vitenskapelig metodikk

**Besøksadresse:** Gullhaugveien 1-3, 0484 Oslo
**Telefon:** 22845511
**E-post:** post@helseforskning.etikkom.no
**Web:** http://helseforskning.etikkom.no/

for å skaffe til veie ny kunnskap om helse og sykdom».

Det er institusjonens ansvar å sørge for at prosjektet gjennomføres på en forsvarlig måte med hensyn til for eksempel regler for taushetsplikt og personvern.

**Vedtak**

Prosjektet faller utenfor helseforskningslovens virkeområde, jf. § 2, og kan derfor gjennomføres uten godkjenning av REK.

*Klagead gang*

Komiteens vedtak kan påklages til Den nasjonale forskningsetiske komité for medisin og helsefag, jf. helseforskningsloven § 10, 3 ledd og forvaltningsloven § 28. En eventuell klage sendes til REK Sørøst A. Klagefristen er tre uker fra mottak av dette brevet, jf. forvaltningsloven § 29.

Med vennlig hilsen

Knut Engedal
Professor dr. med.
Leder

Elin Evju Sagbakken
Senior rådgiver

**Kopi til:** n.k.vollestad@medisin.uio.no, postmottak@medisin.uio.no

# Appendix 14: Approval from NSD

Cecilie Dahl
Postboks 1130 Blindern
0318 OSLO

Vår dato: 04.08.2017 Vår ref: 54568 / 3 / MSS Deres dato: Deres ref:

## Tilbakemelding på melding om behandling av personopplysninger

Vi viser til melding om behandling av personopplysninger, mottatt 29.05.2017.
Meldingen gjelder prosjektet:

| | |
|---|---|
| *54568* | *Sosioøkonomiske faktorer assosiert med HIV testing og oppfølging i Den sentralafrikanske republikk* |
| *Behandlingsansvarlig* | *Universitetet i Oslo, ved institusjonens øverste leder* |
| *Daglig ansvarlig* | *Cecilie Dahl* |
| *Student* | *Mari Sørlien* |

Personvernombudet har vurdert prosjektet, og finner at behandlingen av personopplysninger vil være regulert av § 7-27 i personopplysningsforskriften. Personvernombudet tilrår at prosjektet gjennomføres.

Personvernombudets tilråding forutsetter at prosjektet gjennomføres i tråd med opplysningene gitt i meldeskjemaet, korrespondanse med ombudet, ombudets kommentarer samt personopplysningsloven og helseregisterloven med forskrifter. Behandlingen av personopplysninger kan settes i gang.

Det gjøres oppmerksom på at det skal gis ny melding dersom behandlingen endres i forhold til de opplysninger som ligger til grunn for personvernombudets vurdering. Endringsmeldinger gis via et eget skjema. Det skal også gis melding etter tre år dersom prosjektet fortsatt pågår. Meldinger skal skje skriftlig til ombudet.

Personvernombudet har lagt ut opplysninger om prosjektet i en offentlig database.

Personvernombudet vil ved prosjektets avslutning, 30.06.2019, rette en henvendelse angående status for behandlingen av personopplysninger.

Dersom noe er uklart ta gjerne kontakt over telefon.

Vennlig hilsen

Katrine Utaaker Segadal *Dokumentet er elektronisk produsert og godkjent ved NSDs rutiner for elektronisk godkjenning.*

Appendix 15: Map over Bangui with patient provenance