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- A nationwide update

Student thesis

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Preface

The current study on family planning, menstrual concerns and health-seeking behavior among women in reproductive age is part of the Women's Health arm of the Prevalence Study on Surgical Conditions 2019-2020 (PRESSCO) in Sierra Leone.

The data collection of the PRESSCO study was temporarily stopped due to an outbreak of viral hemorrhagic fever, Lassa fever, at Masanga Hospital in November 2019. Approximately two-thirds of the data had been collected at this point. The study restarted in February 2020, where we participated as junior research assistants in the second round of data collection. As research assistants we were responsible for data checking and for uploading and backup of data. We further had a general role in supervising the data collection to promote good quality, and for logistical management in cooperation with the director of the MMRU.

Abstract

Purpose: Sierra Leone is one of the poorest countries in the world, with a health system challenged by a civil war from 1991-2002 and the Ebola viral disease crisis in 2014-2016. The country holds one of the highest maternal and neonatal mortality rates. The purpose of this study is to determine prevalence and describe the use of family planning methods, menstrual concerns and health-seeking behavior among reproductive women in Sierra Leone. We further aim to compare results with the findings from the Women's health section of the Surgeons OverSeas Assessment of Surgical Need, SOSAS, study in 2012 to examine in what way women's health has evolved since 2012 and to explore possible consequences of the Ebola outbreak in 2014-2016.

Methods: This study is a repeat of the SOSAS, a randomized cross-sectional, cluster-based household survey conducted in Sierra Leone in 2012. Data was collected from October to November in 2019 and from February to March in 2020, including 1969 households and a total of 3044 females in reproductive age. Among these, 1145 females were randomly selected for an interview and included in this study.

Results: Use of family planning methods has increased from 20.2% to 28.3% (95% CI 25.5-31.3) since 2012. Injectables (37.5%), implants (37.1%) and oral contraceptives (22.4%) are the most frequently used methods. These are the same most frequently reported methods in 2012, however showing an increased use of implants. Time consume (24.0%) and financial constraints (14.0%) was the main barrier to why family planning was not organized. There has been a significant reduction in severe pain related menstrual bleedings from 45.1% in 2012 to 11.7% in 2020. Need of health care due to menstrual problems has increased from 12,1% in 2012 to 15.3% in 2019/2020. Financial constraints are still mentioned by 50% as the main barrier to seek modern health care. Further, there has been an increase of 5.4 percentage points in reported fear/no trust as reason to not seek health care. Use of traditional medicine has declined from 6.4% in 2012 to 1.0% in 2020.

Conclusion: Use of family planning in Sierra Leone has increased significantly since 2012. Although improvement, a considerable unmet need calls for further development. There has been a significant reduction in women suffering from severe pain in relation to menstrual bleedings. Development is likely related to the more widespread use of family planning. Moreover, are financial constraints still mentioned by fifty percent as the main barrier to seek modern healthcare, indicating that the FHCI is not yet fully covering the reproductive needs. There has been an increase in women reporting no trust/fear as a barrier to seek health care. This could indicate mistrust towards the health care system, possibly due to the Ebola outbreak. Further investigation are however needed to conclude if and how the Ebola outbreak has affected use of family planning, menstrual concerns and health seeking behavior.

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Abbreviations

DHS	Demographic and Health Survey
EA	Enumerator Area
EVD	Ebola Virus Disease
FHCI	Free Healthcare Initiative
HCW	Health Care Worker
IUD	Intrauterine device
MMRU	Masanga Medical Research Unit
MoHS	Ministry of Health and Sanitation
OCP	Oral Contraceptive Pills
PRESSCO	Prevalence Study on Surgical Conditions
REDCap	Research Electronic Data Capture
REK	Regional Committee for Medical and Health Research Ethics Central Norway
SDG	Sustainable Development Goals
SOSAS	Surgeons Over Seas Assessment of Surgical need
STI	Sexually Transmitted Infections
STP	Surgical Training Program students
UN	United Nations
UNFPA	The United Nations Funds for Population Activities
WHO	World Health Organization

Definitions

Cluster	The geographic area where the assigned households are located and where the interviews are hold.
Enumerator	The person conducting the interview.
Head of household	A male or female member of a household recognized as such by the other household members. The head of the household is generally the person who has the economic and social responsibility for the household. All relationships in the household are defined with reference to the head.
Household member	Every person who eats from the same pot as the head of household and slept in the household the night before the visit of the enumerator.
Surgical Training Program Student	Clinical officers (not surgical doctors) in a three year training program through CapaCare to learn how to do the most common surgical and obstetrical emergencies that without treatment would lead to disability or death. The overall aim is to increase the level of surgically skilled health staff at district hospitals.
Supervisor	Research team participant from Statistic Sierra Leone serving as team leaders during data collection. The supervisor is also in charge of the household randomization.
Traditional Medicine	The knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, used in the maintenance of health and in the prevention, diagnosis, improvement or treatment of physical and mental illnesses (1).

Background and purpose

Context Sierra Leone

Sierra Leone is located in West Africa and is defined as a low-income country by the World Bank (2). It is one of the poorest countries in the world, ranked at the bottom end in terms of health system performance (3). The estimated total population of 7 million currently has an average life expectancy of 54 years (4). The country suffers from extreme shortages of trained healthcare providers (doctors, nurses, and midwives), with only two skilled providers per 10.000 inhabitants (5). With a health system challenged by a civil war from 1991-2002 and the Ebola viral disease crisis in 2014-2016, Sierra Leone is one of the most challenging countries for women to be pregnant and to give birth (5, 6)**.** The country has one of the highest maternal mortality rates, with an estimated maternal mortality of 1360 women per 100 000 live births (7). Approximately one in seventeen women die from pregnancy or childbirth-related causes, with a similar high neonatal mortality rate of 35 per 1000 live births (5, 8).

Family planning in low-income countries

Family planning and use of contraceptives can improve women's and children's health in low-income countries in several ways (9). Among others, it has effect by reducing maternal mortality risk and improving child survival through birth spacing and nutritional status of both mothers and children (9, 10). It further enables a shift in age structure of a population, permitting a favorable ratio between working population and dependent children (11). It also favours gender equality and education (9). Family planning is considered an important component for sustainable global development and for achieving environmental sustainability (12). By beneficial use of family planning, acceleration of fertility declines and economic development due to demographic dividends can be achieved (13, 14). Ensuring universal access to sexual and reproductive health services is a global health concern, underlined in the United Nations Sustainable Development Goals 3 and 5 (15, 16).

Family planning in Sierra Leone

Reproductive health and the effects of family planning has received increased attention in Sierra Leone the last decade, and in 2010 the Government introduced the Free Healthcare Initiative (FHCI) (17). The initiative enables free health care services, including free family planning, to pregnant and lactating mothers and children under five. The FHCI is funded by

the UNFPA, and aims to reduce maternal, infant and child mortality rates. Due to the Ebola crisis, funding dropped from 3.5 million dollars in 2014 to 1.3 million dollars in 2017 as aid money was directed towards handling of the Ebola outbreak (18, 19). Funding was further reduced in 2017 when the U.S., the largest donor for family planning, cut support for the UNFPA (18, 19). The SOSAS study of 2012, two years after the introduction of the FHCI, reported that 20.2% of females used family planning methods. The Demographic and Health Survey 2019 (DHS19), reported that 21.0% of currently married women and 53.0% of sexually active unmarried women utilized a modern method of family planning (21).

Teenage pregnancy in Sierra Leone

Teenage pregnancy is a big challenge in Sierra Leone. It is associated with increased risk of pregnancy complications and maternal and neonatal mortality (22). It also has implications for education, population growth and mental health of women (22). In 2013, 28.0% of girls between 15-19 years were pregnant or had already given birth, making Sierra Leone among ten countries in the world with the highest prevalence of teenage pregnancy (23). In 2019, the DHS reported that 21.0% of girls between 15 and 19 were pregnant or had given birth (21). This is a positive development, but still a high proportion. Dependency on family, socio-cultural beliefs, poor economic status and lack of education/knowledge are all risk factors for teenage pregnancy and represent barriers for family planning (23-25).

Menstrual concerns and health seeking behavior in Sierra Leone

Dysmenorrhea is the most common symptom of all menstrual complaints and pose a greater burden of diseases than any other gynecological complaint (26). It impacts quality of life, reduces work productivity, and increases health-care utilization. As a result, dysmenorrhea has economic impact as it affects activity and productivity, costs of medication and medical care (27). In 2012 the SOSAS study showed that 12.0% of the menstruating females reported a need for medical care due to prolonged, excessive or painful menstruations. Half of the females who reported a need for medical care, mentioned financial constraints as the major barrier to obtain health care (20). Among 990 menstruating women, 45.1% reported pain to such an extent that it interfered with daily activities (20). This is a significant amount compared to a meta-analysis based on data from Asia, North America, South America, Europe and Oceania. In this study 16.0% to 29.0% of women reported pain sufficient to limit activities (28).

The Ebola outbreak in Sierra Leone

The Ebola outbreak from 2014-2016 had great impact on health services in Sierra Leone (6). With 8704 confirmed cases and 3589 deaths in Sierra Leone, the populations trust in the health system declined due to fear of infection, fragility of health systems, reduced numbers of available health personnel and death of healthcare workers (6). This led to a reduction in use of health services, including reproductive health services (29, 30). An article published in September 2019, showed that there had been a negative development in use of family planning methods post Ebola (6).

Purpose

The aim of this thesis is to determine prevalence and describe use of family planning methods, menstrual concerns and health seeking behavior among reproductive women in Sierra Leone. We further aim to compare results with the findings from the Women's health section of the SOSAS study in 2012 to examine in what way women's health has evolved since 2012 after the Ebola outbreak in 2014-2016.

Methods

(Annex 1)

This study is a part of the Prevalence Study on Surgical Conditions (PRESSCO) in Sierra Leone. The PRESSCO study is a population-based, cross-sectional household survey, based on the methodology from the Surgeons Overseas Surgical Needs Assessment (SOSAS), carried out in Sierra Leone in 2012 (31). The purpose of repeating the original 2012 SOSAS study, was to measure the effect of health system interventions and to examine possible consequences of the Ebola outbreak in 2014-2016. In addition to the original questionnaire, five areas where selected for an extended survey. For these five areas, additional questions were added to develop a better understanding of the need for surgical care. The PRESSCO study consists of following six arms, where arm 2 to 6 make up the extended survey:

      1. SOSAS Repeat

      2. Lower Urinary Tract Symptoms (LUTS) (male participants older than 12 years of age)

      3. Groin Hernias

      4. Wounds

      5. Women's Health (female participants in their reproductive age)

      6. Surgical Volume

This thesis focuses on the fifth arm: Women's Health.

The extended SOSAS Repeat survey consists of two parts. The first part identifies the number of household members and household members that have undergone a surgical procedure the previous year. The second part of the survey randomly selects two household members to undergo a head-to-toe (verbal) examination. Every female among the two randomly selected household members older than 12 and younger than 50 years of age were included in this thesis.

(Annex 1)

The sample size calculation for the PRESSCO study is the same as for the original SOSAS study, based on Kelsey 1996 'Methods in observational Epidemiology' (32). In the original SOSAS study the estimated proportion of the prevalence (p) of a surgical condition was estimated at 7.3%, based on a pilot study (33). The accepted range (L) around the estimated prevalence of the disorder was set at 1%. In the same pilot study 95.0% of the targeted population was eligible with a response rate of 95.0%. Resulting in a eligible rate of (95.0%) (33). The sample size was further corrected for population size and multiplied by a design-effect (DEFF) of 1.3. The estimated population of Sierra Leone was 7.09 million in in 2015 (34).

Calculations

$n = Z^2 p (1-p) / L^2$
n = sample size
Z = Confidence Interval (95% - Z is 1.96)
p = Estimated proportion of the prevalence of the condition looked for
L = Range excepted

n= (1.96)2 x 0.073 x (1 – 0.073) / (0.01)2 = 2599.6

Corrected sample = sample size x effect of population size Sierra Leone x DEFF x (1/response rate) x (1/eligible rate)

n x (1 + (n-1)/ 7,090,000) x DEFF x (1/response rate) x (1/eligible rate)

2599.6 x 1.00 x 1.3 x 1/0.95 x 1/0.95 = 3744.6 = 3745

The PRESSCO study aimed to include 3745 individuals for the extended survey. As two randomly selected household members would be included per household, and 25 households would be randomly selected per cluster, a total of 1873 households and 75 clusters were acquired to achieve this goal. Due to lacking routines of data checking initially in the data collection, uncompleted records and missing data were discovered during the process. Therefor during data inclusion, the PRESSCO group decided to add additional three clusters in order to reach the required sample size. The study therefore randomly selected 78 nationwide representative clusters of 12856 total clusters in Sierra Leone. Sampling was done through a weighted random cluster design, where probability of cluster choice was proportional to population size. Within each cluster, 25 households were randomly selected to

participate in the study. A random number calculator further assigned two household members per household to be surveyed.

Training of field team

In October 2019 the enumerators, Surgical Training Program students (STPs) and supervisors completed a one-week training at Masanga Hospital prior to data collection. The training included a thorough review of the questionnaire, interview techniques, random sampling of household members and use of handheld tablets. Due to an outbreak of viral hemorrhagic fever, Lassa fever, at Masanga Hospital in November 2019, the PRESSCO study was temporarily stopped. Before data collection again was resumed in February 2020, the field team participated in a three-day training to refresh knowledge and share experience from the previous round of data collection.

Data collection

Data was collected from October to November 2019 for the first round of data collection, and from February to March 2020 for the second round. For the initial round of data collection the research team was divided in three field teams, each consisting of one supervisor, one driver, one research assistant, one STP and four enumerators. For the second data collection process there was only one field team, this time consisting of eight enumerators, two STPs, two supervisors and two research assistants (the authors of this student thesis)

Data was collected by individual face-to-face interviews at the house of the respondent. Due to a variety of local languages in Sierra Leone, the interview would normally be held in Krio or in another local language based on the language knowledge of the enumerator and participant. The enumerators administered the interviews through handheld tablets with Research Electronic Data Capture (REDCap) software for data registration.

When entering a new cluster, the supervisors approached the village chief for permission to enter and to initiate data collection. After permission was granted, household randomization was done by visiting every structure in the cluster to register number of households and names of household heads. Based on the total number of households and necessity to include

25 households, the randomization was done by calculation. If a household member was selected but not available at the initial time of interview, the enumerators would make an appointment for a later visit. If the selected household member was still not available by the third appointment, a new household member randomization would find place. No replacement was sought if the randomly selected household member did not consent to participate.

Data quality

Data quality was secured by daily supervision of enumerators and an internal- and external check of data. The internal check of data was the first data check done by the research assistants and the STPs to detect missing records and inconsistencies before uploading data to a server. The external data check was the second check of data done by the logistics team in Masanga to discover faults or inconsistencies in the data sheet. The field team would attempt to stay in the cluster until external check was completed to resolve uncertainties related to the data directly with interviewer or the participant. In cases where this was not feasible due to long working hours and lack of daylight, the team would wait to leave the cluster until the internal check was completed.

Data quality

Data handling, descriptive statistical analysis and correlations was done by using Excel version 16.35, IBM SPSS Statistic software Version 26 and R version 4.0.0 (2020-04-24). The data analyzations in this thesis is based on preliminary data. Changes in data material might therefore occur at a later point due to further data cleansing.

Consent

Prior to interview, informed consent was acquired from all study participants. This was done by a written or thumb printed consent for those who were not able to write. If the participant was not able to read, the consent form would be read to them and explained in a local language. The PRESSCO study operated with different forms of consent based on the age of the study participant. If the participant was 18 years or older, informed consent would be asked of the individual herself. If the participant was under the age of 18 but above 12 years,

informed consent was asked from one of the parents or guardians and the individual herself. The individual's right to refuse consent or withdraw from the study was respected at all times.

Ethical approval

Ethical approval was obtained from REK, Regional Committee for Medical and Health Research Ethics Central Norway (REK number: 31932), the Masanga Medical Research Unit's Scientific Review Committee and the Ethical and Scientific Review Committee of Sierra Leone (Annex 4). The study is registered at the ISRCTN registry, with the ISRCTN number 12353489. The study was further approved by the Ministry of Health and Sanitation Sierra Leone (MoHS) prior to data collection.

Results

Data was collected from 1969 households. Among the 3044 females in reproductive age (12-50 years), 1145 women (37.5%) were randomly selected for a household interview.

Demographics

Table 1 gives a general overview of the included women in regards to age, residency, educational level, literacy, occupation and health. Of the 1145 included participants, almost seventy percent reported living in rural areas while nearly one-third was living in urban areas. Sixteen females reported living in slum area, which later were accounted as urban, hence the areas being defined as urban-slum. Almost half of the respondents had no formal education, and nearly two thirds could not read or write in any language. With regard to employment status, almost one-third were farmers, twenty-six percent reported being self-employed and close to twenty percent was unemployed. Nearly ninety percent described a good general health.

Table 1: Current Social and Economic Status of Survey Participants 2019/2020

	N	%
Age		
12-20	351	30.6
21-30	416	36.3
31-40	240	20.9
41-50	138	12.0
	1145	100.0
Residency		
Urban	332	29.0
Slum	16	1.4
Rural	792	69.2
NA	5	0.4
Total	1145	100.0
Education		
None	532	46.5
Primary school	167	14.6
Secondary school or higher	432	37.7
NA	14	1.2
Total	1145	100.0
Illiteracy		
Not able to read or write	673	58.8
NA	16	1.4
Total	1145	100.0
Occupation		
Unemployed	217	18.9
Self-employed	301	26.3
Farmer	344	30.1
NA	13	1.1
Total	1145	100.0
Generally healthy		
Yes	999	87.2
No	124	10.9
NA	22	1.9
Total	1145	100.0

NA: Not available/missing data

Table 2 compares use of family planning in 2012 and 2019/2020 in regards to prevalence, family planning methods, use among adolescent women and family planning in relation to residency and level of education. Using a Fisher's Exact Test we compared data to determine if changes were clinically significant. Of the included females, almost thirty percent reported to use a family planning method in 2019/2020. This is a significant overall increase of over eight percentage points since 2012 ($p < 0.005$). In 2019/2020, almost thirty-eight percent reported to use injectable contraceptives, followed by implants and oral contraceptives. These are the same three most frequently reported methods in 2012, however showing an increased use of implants by thirty percent ($p < 0.005$). In both studies the less frequent method was intrauterine device and condoms. Among women aged 12-19, almost twenty percent utilized a family planning method in 2019/2020. This is an insignificant increase since 2012 ($p=0.8$). Of women using family planning in 2019/2020, almost seventy percent lived in rural areas and just below one-third lived in urban areas. Regarding family planning in relation to residency, there has been a significant increase ($p < 0.005$) in use of family planning in rural areas, and a significant decrease ($p < 0.005$) of family planning use in urban areas. Almost half of the women had secondary school or higher as highest level of education, while approximately one-third mentioned having no formal education. There is no significant difference in distribution of family planning in regards to educational levels.

Table 2: Family Planning Comparison 2012 vs 2019/2020

	2012	2019/2020	P, OR (CI)
FAMILY PLANNING			
Women answering this question	**N=1205**	**N=960**	
Women using family planning	244 (20.2%, CI 17.9-22.5)	272 (28.3%, CI 25.5-31.3)	< 0.005,1.6 (1.2-1.9)
Implant	20 (8.2 %)	101 (37.1%)	< 0.005, 6.6 (3.9-11.7)
Injectable	118 (48.4%)	102 (37.5%)	0.5, 0.9 (0.7-1.2)
OCP	89 (36.4%)	61 (22.4%)	0.4, 0.9 (0.6-1.2)
IUD	4 (1.6 %)	2 (0.7%)	0.7, 0.6 (0.1-4.4)
Condom	3 (1.2%)	3 (1.1%)	1.0, 0.8 (0.1-6.0)
Breastfeeding	6 (2.5%)	No data	-
Other	3 (1.2%)	1 (0.4%)	0.3, 0.3 (0.005-3.7)
Do not know	No data	1 (0.4%)	-
FP use among adolescent women			
Women answering this question	**N=244**	**N=272**	
12-19 years	43 (17.6%)	51 (18.8%)	0.8, 1.1 (0.6-1.7)
FP use in relation to residency			
Women answering this question	**N=244**	**N=272**	
Rural	88 (36.1%)	185 (68.0%)	<0.005, 3.8 (2.6-5.5)
Urban	147 (60.2%)	86 (31.6%)	<0.005, 0.3 (0.2-0.4)
FP use in relation to education			
Women answering this question	**N=244**	**N=272**	
None	94 (38.5%)	99 (36.4%)	0.6, 0.9 (0.6-1.3)
Primary school	26 (10.7%)	33 (12.1%)	0.7, 1.2 (0.6-2.1)
Secondary school or higher	114 (46.7%)	135 (49.6%)	0.5, 1.2 (0.8-1.6)

Table 3 shows the unmet need of family planning and barriers to family planning arrangement in 2019/2020. Of 960 women answering, over seventy percent reported to not use a contraceptive method. Among these, nearly fifteen percent reported a wish to use contraceptives, while almost thirty percent did not want to get pregnant at the moment of the interview. Making a total unmet need of family planning of forty percent. Among women not wanting to use family planning, one third was currently pregnant, wanted to become pregnant or could not become pregnant due to a previous operation. Main barriers for family planning was time limitations (24.0%) followed by financial constraints (14.0%) and lack of trust/fear (11.3%). Barriers to family planning was not examined in 2012.

Table 3: Family planning and unmet need in 2019/2020

	N	%
Women answering this question	960	100.0
Do not use family planning	688	71.7
Unmet need		
Want to use	139	14.5
Don't want to get pregnant	262	27.3
Total	400	41.7
Do not need family planning, because		
Currently pregnant	74	7.7
Wants to get pregnant	205	21.4
Operated	8	0.8
Total	288	30.0
Possibility to arrange FP		
Yes, but no wish for FP	192	27.9
No money	96	14.0
No time	165	24.0
Fear/no trust	78	11.3
No transport	10	1.5
Not available	17	2.5
Other	14	2.0
Unknown	32	4.7
Na	84	12.2
Total	688	100.0

Health seeking behavior

Table 4 describes and compare health seeking behavior in 2012 and 2019/2020 in regards to reported need, sought help, use of traditional healer and barriers for seeking health care. In 2019/2020, over fifteen percent indicated a need of health care. This is a slight increase (p= 0.02) since 2012. Among 148 women indicating a need in 2019/2020, almost half of the women sought help. Amount of women who sought help was not examined in 2012. There has been a significant reduction in use of traditional healer (p < 0.005) from over six percent in 2012, to only one percent in 2019/2020. Main barriers for seeking healthcare in both studies was financial constraints, availability and time limitation. Half of the included women reported financial constraints as the main reason to why they did not access modern healthcare in both studies. Further, we found that almost seven percent did not seek health care due to fear/no trust in 2019/2020. This is an increase since 2012, where no one reported fear/no trust as a barrier to seek health care.

Table 4: Health Seeking Behavior Comparison 2012 vs 2019/2020

	2012	2019/2020	P, OR (CI)
HEALTH SEEKING BEHAVIOR			
Women answering this question	**N=990**	**N=960**	
Women indicating need of health care	116 (12.1%, CI 9.7-13.7)	148 (15.3%, CI 13.2-17.9)	0.02, 1.4 (1.0-1.8)
Traditional healer			
Women answering this question	**N=1205**	**N=1145**	
Went to a traditional healer	77 (6.4%)	11 (1.0%)	< 0.005, 0.1 (0.1-0.3)
Sought health care			
Women answering this question	**No data**	**N=148**	
Yes	No data	48.6% (72/148)	-
No	No data	51.6% (75/148)	-
Barriers for seeking health care			
Women answering this question	**N=116**	**N=75**	
Financial constraints	58 (50.0%)	37 (49.3%)	1.0, 0.9 (0.5-1.8)
No time	3 (2.6%)	17 (22.7%)	< 0.005, 10.9 (3.0-60.4)
Transport	1 (0.9%)	0	-
Not available	5 (4.3%)	5 (6.7%)	0.5, 1.6 (0.4-7.1)
No trust/fear	0	5 (6.7%)	-
Do not know	No data	1	-

Menstrual concerns

Table 5 compares menstrual complaints in 2012 and 2019/2020. Menstrual complaints are categorized in four groups; spotting, irregular bleedings, painful bleedings and painful bleedings to such an extent that it is not possible to work. In 2012, 960 (83.3%) females indicated having at least one menstrual bleeding the previous year. Among these, 95 (9.9%) reported irregular bleedings, 139 (13.5%) spotting, 507(52.8%) indicated painful bleedings and 112 (11.7%) reported painful bleedings to such an extent they could not work. In 2012 990 (82.2%) women were currently menstruating, whereas 127 (12.8%) reported having an irregular bleeding, 99 (10.0%) spotting and 446 (45.1%) reported painful bleedings affecting ability to work. There are no significant difference in reported irregular bleeding and spotting since 2012 (p > 0.05). Severe pain to such an extent that it is not possible to work, has decreased significantly with approximately one-third (p < 0.005). Painful bleedings with ability to work was not examined in 2012.

Table 5: Menstrual Concerns Comparison 2012 vs 2019/2020

	2012	2019/2020	P, OR (CI)
MENSTRUAL CONCERNS			
Women answering this question	**N=1205**	**N=1145**	
Women currently menstruating	990 (82.2%, CI 80.0-84.4)	960 (83.3%, CI 81.6-85.9)	0.3, 0.9 (0.7-1.1)
Irregular	127 (12.8%)	95 (9.9%)	0.7, 0.9 (0.7-1.2)
Spotting	99 (10.0%)	139 (13.5%)	0.02, 1.4 (1.1-1.9)
Pain – and not able to work	466 (45.1)]	112 (11.7%)	< 0.005, 0.2 (0.2-0.3)
Pain- but able to work	No data	507 (52.8%)	-

Discussion

Family planning

According to our findings, there has been a significant overall increase of 8.1 percentage points in use of family planning since 2012. Injectable contraceptives, implants and oral contraceptives are the most frequently reported methods in both studies. Only 1.1% reported to use condom as a family planning method. This is noticeably low hence condoms being the only contraceptive preventing Sexually Transmitted Infections (STI). Even though a National Condoms Programming Committee has been set up and The National HIV/AIDS Control program distribute free condoms in all districts (37), little knowledge and lack of access are mentioned as main reasons for why condoms are rarely utilized (38).

Among 688 women, 14.0 % reported financial constraints and 20.0% reported time as the main barrier to why family planning was not arranged in 2019/2020. This is surprising findings hence the Free Health Care initiative launched in 2010, including family planning in free healthcare services. However, the fall in international economic support to the UNFPA might have affected implementation of the initiative and thus availability of contraceptives (19, 20). Also, transportation costs, time lost earning money and providers of family planning taking charge, might pose a central problem (25).

We further found that 18.8% of women between 12-19 years utilized a family planning method. This is a slight increase since 2012, yet remarkable low. According to a study from 2020 based on data from 90 low- and middle-income countries, 31.6% of adolescent women utilize a modern contraceptive method (39). This indicates a low coverage of family planning use among adolescents in Sierra Leone compared to other countries, and explains the high prevalence of teenage pregnancy in the country.

The overall increased use of family planning in Sierra Leone might indicate a strengthened reproductive health care system since 2012 and since the Ebola outbreak. On the other side, the country aimed to increase the contraceptive prevalence rate to 30.0% and to decrease the unmet need of family planning to 10.0% by 2020 through the Family Planning 2020 initiative (25). The fact that use of family planning has only increased with 8.1% in 8 years despite this ambition, might raise questions towards a possible slowing effect due to the Ebola outbreak.

Menstrual concerns

There are no clinically significant changes in reported irregular bleedings and intermittent bleedings since 2012. Although need of medical care due to menstrual complaints has increased slightly, the complaint of severe pain to such an extent that it is not possible to work, has decreased significantly. The increased use of family planning might partially explain the reduction in severe menstrual pain. Our findings are however not studied in depth, and only gives a general idea without further description of gynecological conditions. It is not possible to conclude if the Ebola outbreak have had an impact on menstrual concerns based on our disperse findings.

Health seeking behavior

Half of the included women reported financial constraints as the main reason to why they did not access modern healthcare in both 2012 and 2019/2020. As previously remarked, we find financial constraints as a barrier to health care surprising hence the Free Health Care initiative. The FHCI do however only include pregnant and lactating mothers and children under five. Also, transportation costs and transportation time might explain our findings (25). Further we found that 6.5% did not seek health care due to fear/no trust. This is an increase since 2012 where no one reported fear/no trust as a health seeking barrier. If increased mistrust is due to the Ebola outbreak, is not possible to conclude (29, 30, 40). On the other side, there has been a reduction in use of traditional medicine from 6.4% in 2012 to 1.0% in 2020. This could imply more women seeking help at healthcare facilities in the country, indicating trust towards the national health care system.

Comparison with DHS

We found that 68.0% of females using family planning methods lived in rural areas, while 31.6% lived in urban areas. This is a surprising finding compared to the DHS19 that found that women in urban areas are more likely to use a contraceptive method than women in rural areas (21). This is also surprising compared to data from 2012. Our findings must however be interpreted with caution due to being based on preliminary data. The PRESSCO study further selected proportionally more rural households (74.0%) than the DHS19 (63.0%) and the SOSAS12 (61.2%) which complicates comparison (21). In addition the definition of rural and urban differs between the PRESSCO and DHS study.

The DHS19 further concluded that use of contraception increases with educational attainment (21). Our findings are partially in line with the DHS. However, we found that females without any formal education had a higher prevalence of contraceptive use than females with completed primary school. These findings might again be due to the fact that the PRESSCO study is based on a larger proportion rural household where education levels in general are lower.

Our results shown an approximately 10% higher unmet need of contraception than the DHS study. Findings are however not comparable due to different definitions of unmet need. The DHS defined an unmet need of family planning in cases where women who wanted to postpone their next birth with 2 or more years, or who wanted to stop childbearing, were not using a contraceptive method. Also, pregnant and amenorrhoeic women were considered to have an unmet need if their pregnancy or last birth was mistimed or unwanted (21). This more restrictive definition of unmet need was not used in the following study, possibly explaining deviant numbers.

Strengths and weaknesses

A strength of this study is that it has a population-based design and is based on a large sample size. Further is the study based on thorough randomization techniques, consisting of three separate randomizations. This gives representative data and description of family planning use, menstrual concerns and health seeking behaviour.

Moreover, is the study a result of a broad collaboration between national and international institutions, giving a diverse group of experts, both locally and internationally. Cooperation with Statistics Sierra Leone, CapaCare and the Masanga Medical Research Unit has been valuable as local support during the data collection. Use of local enumerators and supervisors has also been a strength through promoting an efficient data collection process due to their local knowledge and in ensuring cultural sensitivity. It has further strengthened the data quality by keeping the interviews in a local language, making answers more reliable than if translation would be necessary. However, a local translator was necessary at times due to the many different local languages in Sierra Leone and language barriers between enumerators and participants. This is a limitation, not only because essential parts of questions and answers might be missed during translation, but also because a third present part might affect answers

concerning sensitive parts of the survey. We further suspect some under reporting due to the questions sensitive character. Reproductive morbidities are often inadequately measured and underreported because of stigma (41) and might therefore be a limitation of our study. Also interviews conducted by male enumerators and lack of privacy during interviews might have affected the respondent´s answer.

The fact that this study is based on preliminary data is a limitation. Further data management may lead to some modifications of the result. In addition, is the survey time consuming, possibly affecting participants answers in regards of tiredness and wish to complete. Another limitation is that the study describes prevalence of family planning use, but do not assess if family planning is used correctly or describe the respondents knowledge of family planning use. A systematic review on adolescents knowledge two contraceptive use and abortion in low- and middle income countries showed that adolescents had poor, limited, incomplete and even wrong knowledge/information about contraception and abortion (42). The study further provides limited description of why women want to or do not want to use family planning. In a low income country where limited education in reproductive health is offered, cultural beliefs are important and women's rights and dependence on husbands might be an issue and affect women's view on family planning use.

Recommendations

Based on the following study, Sierra Leone has undergone a positive develop in use of family planning methods. There is however improvements to be done for Sierra Leone to achieve the UN Sustainable Development Goal 3 and 5 (14, 15). The relatively high percentage of reported financial constraints and time consume as barrier to family planning, despite family planning being free, suggest that transport costs and time pose a challenge. Family planning could be made more available by investing further in outreach projects.

Also investment in reproductive health education through outreach projects could have a possible positive effect. Increased knowledge of family planning use, sexual transmitted infections, birth spacing and effects on maternal- and neonatal mortality could promote education, economic, gender equality and independence among women in a country where educational levels in general are low. It could further contribute in reducing teenage pregnancy, maternal mortality and neonatal mortality.

Conclusion

In conclusion, this study indicates that use of family planning in Sierra Leone has increased since 2012. Although there has been an improvement, a considerable unmet need of family planning calls for further development. Women suffering from severe pain in relation to menstrual bleedings has reduced significantly since 2012. Development is likely related to the more widespread use of family planning. Moreover, are financial constraints still mentioned by fifty percent as the main barrier to seek modern healthcare. This indicates that the FHCI is not yet fully covering the reproductive needs. Further investigations are necessary to examine what lies in these financial barriers. There has been an increase in women reporting no trust/fear as a barrier to seek health care in 2019/2020. This could indicate mistrust towards the health care system, possibly due to the Ebola outbreak. Further investigation are however needed to conclude if and how the Ebola outbreak has affected use of family planning, menstrual concerns and health seeking behavior.

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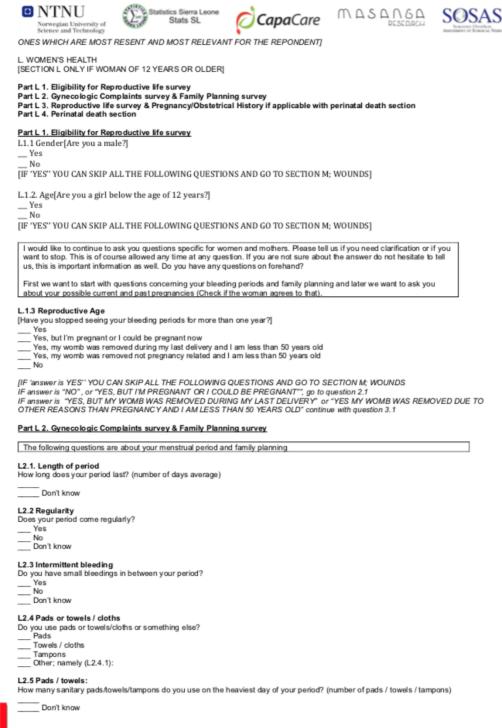
Annexes

Annex 1: PRESSCO protocol

Annex 2: Questionnaire part L2: Family planning, menstrual concerns and health seeking behavior

NTNU Norwegian University of Science and Technology   **Statistics Sierra Leone Stats SL**   **CapaCare**   **MASANGA RESEARCH**   **SOSAS** Sierra Leone Overseas Assessment of Surgical Needs

ONES WHICH ARE MOST RESENT AND MOST RELEVANT FOR THE REPONDENT]

L. WOMEN'S HEALTH
[SECTION L ONLY IF WOMAN OF 12 YEARS OR OLDER]

Part L 1. Eligibility for Reproductive life survey
Part L 2. Gynecologic Complaints survey & Family Planning survey
Part L 3. Reproductive life survey & Pregnancy/Obstetrical History if applicable with perinatal death section
Part L 4. Perinatal death section

Part L 1. Eligibility for Reproductive life survey
L1.1 Gender[Are you a male?]
__ Yes
__ No
[IF 'YES' YOU CAN SKIP ALL THE FOLLOWING QUESTIONS AND GO TO SECTION M; WOUNDS]

L.1.2. Age[Are you a girl below the age of 12 years?]
__ Yes
__ No
[IF 'YES' YOU CAN SKIP ALL THE FOLLOWING QUESTIONS AND GO TO SECTION M; WOUNDS]

| I would like to continue to ask you questions specific for women and mothers. Please tell us if you need clarification or if you want to stop. This is of course allowed any time at any question. If you are not sure about the answer do not hesitate to tell us, this is important information as well. Do you have any questions on forehand? |
| First we want to start with questions concerning your bleeding periods and family planning and later we want to ask you about your possible current and past pregnancies (Check if the woman agrees to that). |

L.1.3 Reproductive Age
[Have you stopped seeing your bleeding periods for more than one year?]
___ Yes
___ Yes, but I'm pregnant or I could be pregnant now
___ Yes, my womb was removed during my last delivery and I am less than 50 years old
___ Yes, my womb was removed not pregnancy related and I am less than 50 years old
___ No

[IF 'answer is YES'' YOU CAN SKIP ALL THE FOLLOWING QUESTIONS AND GO TO SECTION M; WOUNDS
IF answer is "NO", or "YES, BUT I'M PREGNANT OR I COULD BE PREGNANT"', go to question 2.1
IF answer is "YES, BUT MY WOMB WAS REMOVED DURING MY LAST DELIVERY" or "YES MY WOMB WAS REMOVED DUE TO OTHER REASONS THAN PREGNANCY AND I AM LESS THAN 50 YEARS OLD" continue with question 3.1

Part L 2. Gynecologic Complaints survey & Family Planning survey

| The following questions are about your menstrual period and family planning |

L2.1. Length of period
How long does your period last? (number of days average)
_____
_____ Don't know

L2.2 Regularity
Does your period come regularly?
___ Yes
___ No
___ Don't know

L2.3 Intermittent bleeding
Do you have small bleedings in between your period?
___ Yes
___ No
___ Don't know

L2.4 Pads or towels / cloths
Do you use pads or towels/cloths or something else?
___ Pads
___ Towels / cloths
___ Tampons
___ Other; namely (L2.4.1):

L2.5 Pads / towels:
How many sanitary pads/towels/tampons do you use on the heaviest day of your period? (number of pads / towels / tampons)
_____
_____ Don't know

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L2.6 Pain:
Do you have pain during your period so that you cannot work?
___ Yes
___ No

L2.7.1 Health care needed
Do you need help for menstrual problems?
___ Yes
___ No

L2.7.2 Health care needed [if L2.7.1 is yes]
Did you search for help for menstrual problems?
___ Yes
___ No

L2.7.3 Health care seeking behaviour [only if L 2.7.2 is answered "Yes"]
Where did you go with your menstrual problems?
___ Female family member
___ Traditional birth attendant
___ Traditional healer
___ Primary health care center (PHU)
___ Hospital
___ Other, please specify (L2.7.3.1):

L2.7.4 Possibilities for health care [only if L 2.7.2 is answered "No"]
Why did you not seek help for menstrual problems?
___ No need
___ No money for health care
___ No (money for) transportation
___ No time
___ Fear / no trust
___ Not available (facility/personnel/equipment)
___ Don't know

L2.8 Family Planning
Do you use a family planning method at the moment? [Not including traditional methods]
___ Yes [go to question L2.10]
___ No but I am currently pregnant [go to question L3.1]
___ No because I want to become pregnant now [go to question L2.9]
___ No but I would like to use family planning [go to question L2.9]
___ No and I don't want to get pregnant now [go to question L2.9]
___ No because I have been operated so I cannot become pregnant anymore

L2.9 Possibilities for family planning [only if L2.8 is answered No]
Do you have the possibility to arrange family planning for yourself?
___ Yes, but no wish for family planning
___ No, no money for this
___ No, no transportation
___ No, no time
___ No, because of fear / no trust
___ No, not available (facility/personnel/equipment)
___ Other (L2.9.1)
___ Don't know

L2.10 Type of family planning [only if L2.8 is answered with 'Yes']
What method do you use currently?
___ Contraceptive pills
___ Implant
___ Injectable
___ Intra uterine device / coil
___ Condom
___ Other, namely
___ Don't know

L2.11 Duration of Family planning [only if L2.8 is answered with 'Yes']
Since how many years do you use this method? (number of years)
___ < 1 year
___ years