Original research

International Sexual Health And REproductive health (I-SHARE) survey during COVID-19: study protocol for online national surveys and global comparative analyses

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ABSTRACT

Background COVID-19 may have a profound impact on sexual health, reproductive health and social life across the world. Shelter in place regulations that have extended across the globe may influence condomless sex, exacerbate intimate partner violence and reduce access to essential reproductive health services. Population representative research is challenging during shelter in place, leaving major gaps in our understanding of sexual and reproductive health during COVID-19. This International Sexual Health And ReproductivE health (I-SHARE) study protocol manuscript describes a common plan for online national surveys and global comparative analyses.

Methods The purpose of this cross-sectional study is to better understand sexual and reproductive health in selected countries during the COVID-19 pandemic and facilitate multinational comparisons. Participants will be recruited through an online survey link disseminated through local, regional and national networks. In each country, a lead organisation will be responsible for organising ethical review, translation and survey administration. The consortium network provides support for national studies, coordination and multinational comparison. We will use multilevel modelling to determine the relationship between COVID-19 and condomless sex, intimate partner violence, access to reproductive health services, HIV testing and other key items. This study protocol defines primary outcomes, prespecified subanalyses and analysis plans.

Conclusion The I-SHARE study examines sexual and reproductive health at the national and global level during the COVID-19 pandemic. We will use multilevel modelling to investigate country-level variables associated with outcomes of interest. This will provide a foundation for subsequent online multicountry comparison using more robust sampling methodologies.

INTRODUCTION

The global COVID-19 pandemic has ushered in restrictive social measures that are important for its control. However, shelter in place, self-isolation, quarantine and cordon sanitaire measures could each have a profound influence on sexual and reproductive health. For example, COVID-19 measures may decrease the number of pregnant women delivering in hospitals,[1] delay care-seeking[2] and increase intimate partner violence.[3] Restrictions in movement, social isolation and increased social and economic pressures will likely increase the risk of intimate partner violence in the COVID-19 era.[3] Evidence from other public health emergencies (eg, infectious disease epidemics, wars and humanitarian disasters)[4–6] suggests that many women are unable to obtain family planning services in order to avoid unwanted pregnancies. The Guttmacher Institute has noted that several countries have reduced or stopped provision of sexual and reproductive health services due to COVID-19, interrupting supply chains for condoms and other contraceptives.[7 8] Women who do become pregnant during this period may be at greater risk of adverse outcomes, including stillbirth, spontaneous abortion (miscarriage) and small for gestational age.[9] In addition, the reorientation of health systems towards COVID-19 will have unintended consequences for other health services.[2] For example, the 2014–2015 Ebola epidemic reduced access to healthcare services and may have exacerbated HIV mortality rates in Guinea, Liberia and Sierra Leone.[10]

COVID-19 also creates unique challenges for population-based behavioural research.[11] Many research institutes are closed, and both national and international travels are restricted. While some single-country studies of COVID-19 focused on sexual and reproductive health have been organised, none have been coordinated in a way that allows for multicountry analyses. Multicountry analyses are important for the following reasons: single-country studies are unable to provide insight about regional and higher level trends in sexual and reproductive health; country-level variation in shelter in place policies between countries can be empirically examined; and multicountry data allow an examination of whether cross-national variation in sexual and reproductive health results from differences in the composition of the populations or from differences in the context (eg, COVID-19 measures).

Responding to this gap in the literature, our team designed an online, multicountry sexual and reproductive health research study. This study is part of a project called the *International Sexual Health And REproductive Health in the times of COVID-19 (I-SHARE)*. The purpose of this open science project is to bring together a diverse group of sexual health researchers in order to harmonise sexual and reproductive health survey instruments and faciliate global comparison. The project includes interdisciplinary working groups focused on coordination, data analysis, survey development, digital technology and survey promotion. The I-SHARE project will allow us to examine whether measures implemented by the government will heave an effect on sexual health outcomes above and beyond individual characteristics. This study protocol manuscript describes a common plan for online national surveys and global comparative analyses.

METHODS

Goal and aims

The overall goal of this global study is to better understand sexual and reproductive health among adults during the COVID-19 pandemic using an online convenience sample from selected countries. The primary study aims are :

1. To examine changes in sexual risk behaviours (especially condomless sex) related to the initiation and resolution of COVID-19 measures using a multicountry analysis.
2. To examine changes in intimate partner violence related to the initiation and resolution of COVID-19 measures using a multicountry analysis.
3. To examine changes in access to essential reproductive health commodities and services (eg, contraceptives and abortion services) related to the initiation and resolution of COVID-19 measures using a multicountry analysis.

Secondary study aims include the following:

1. To examine changes in HIV/STI testing related to the initiation and resolution of COVID-19 measures using a multicountry analysis.
2. To examine changes in harmful cultural practices (eg, female genital mutilation and child marriage) related to the initiation and resolution of COVID-19 measures using a multicountry analysis.
3. To examine changes in mental health and other optional secondary outcomes (eg, nutritition) related to the initiation and resolution of COVID-19 measures using a multicountry analysis.

We will use a cross-sectional online survey with convenience sampling in each country. National sample sizes will be calculated based on national priorities and analyses.

Our collaborative research team brings together two groups: the Academic Network for Sexual and Reproductive Health and Rights Policy (ANSER) led by the University of Ghent and partner institutions; and a team within the London School of Hygiene & Tropical Medicine who worked in partnership with the Human Reproduction Programme at the World Health

Organisation to develop a standardised sexual health survey instrument for use in diverse global settings. Investigators in the following countries are piloting online surveys in their respective countries: Armenia, Argentina, Australia, Botswana, Cezch Republic, Canada, China, Colombia, Denmark, Ecuador, Egypt, Ethiopia, France, Germany, Italy, Kenya, Latvia, Lebanon, Luxembourg, Malaysia, Mexico, Moldova, Mozambique, Nigeria, Panama, Portugal, Republic of Moldova, Singapore, South Africa, Spain, Sweden, Uganda, Uruguay and the USA. A full list of research institutes is available online.[12] The in-country lead in each country will have first access to national data and make final decisions about data sharing. Each in-country lead will make preparations for dissemination. The survey link will be available for between 2 and 4 weeks. People from outside of selected countries will be excluded.

Survey development

The survey instrument has the following sections: sociodemographics; compliance with COVID-19 social distancing measures; couple and family relationships; sexual behaviour; access to contraceptives; access to maternal healthcare; abortion; sexual and intimate partner violence; HIV/STI female genital mutilation/cutting and early/forced marriage (optional domain); mental health (optional domain); and nutrition (optional domain).

In each country, the lead organisation will select networks through which to disseminate the link to the survey. The survey link will be distributed through email listservs, local partner organisations affiliated with ANSER, other sexual and reproductive health networks and social media links. Final decisions about incentives will be made by the in-country lead, and the survey will take approximately 15–20 min to complete.

The survey development was a collaborative effort of all partners in the project and was partly based on existing questions and scales and partly on newly developed questions. The full survey instrument is included as online supplemental 1. The network will centrally programme the online survey questionnaire using Open Data Kit software (V.1.16). This will be an online survey self-administered through smartphones, tablets or computers.

In each country, the in-country lead will organise translation, local field testing and ethical review. Translation will ensure that the survey is available in the national language of the country and other relevant languages. Field testing will provide the survey instrument in a print form to at least 10 individuals and have them provide feedback about translations, covering sensitive topics and preambles. Further field testing in digital form among 5–10 potential participants per country will be used to iteratively examine errors in skip logic. We estimate between 1 and 4 rounds of iteration per country survey to finalise content. We anticipate that paper-based field testing will finalise the core survey instrument structure and digital field testing will finalise each country survey instrument. Details of the digital field testing are available as online supplemental material.

Inclusion criteria for the survey include 18 years or older (or younger if country IRBs and ethical regulations permit and the in-country lead can ensure appropriate procedures), currently residing in one of the participating countries, and able to provide online informed consent. We will include standard fraud protection methods, including CAPTCHA and measure to prevent more than one response from a single IP address (in countries where this is available).

Safety considerations

This research study will present no greater than minimal risk to participants. At the same time, this survey will include several questions that are sensitive in many local settings, including questions about sexuality, sexual behaviour, abortion, and intimate partner violence. The participant will be allowed to stop the survey at any point and leave out questions that they do not wish to answer. We will not collect participant names or any other identifiers. Country-level data will only be able to be accessed by in-country leaders who have final decisions about use of data. Data sharing agreements will be signed between

participating country institutions for cross-country analyses. National resources for intimate partner violence, sexual health services and reproductive health services will be provided at the end of the survey.

Data analysis plan

This statistical analysis plan focuses on the multicountry comparison component of the analysis. Only survey data that meet the following criteria will be included in the multicountry comparison: at least 200 participants, Institutional Review Board (IRB) approval from the local authority, description of sampling methodology, local instrument translated and field tested.

Primary analysis

Sociodemographics will be summarised using descriptive statistics. The multicountry analysis will use multilevel modelling to examine individual-level and country-level variables associated with primary outcomes, including sexual behaviours, intimate partner violence and access to reproductive health services. Primary outcomes are further specified in online supplemental material. We will use MlwiN 3.05, a software program used in multilevel modelling (http://www.cmm.bristol.ac.uk/MLwiN/). The general form of the two-level random intercepts model used to predict the proportion of participants with condomless sex (specific aim #1) will be of the form:

$$\text{logit}(\pi i) = \log[\pi i/(1-\pi i)] = \beta 0j + \beta 1 xij\ \beta 0j = \beta 0 + u0j.$$

This is a binomial logistic multilevel model with random intercepts, and the binary response *yij* equals 1 if the individual *i* in country *j* had condomless sex. There is a single explanatory variable in this example, *xij*. The intercept consists of a fixed component $\beta 0$ and a country-specific component, the random effect $u0j$. Similar models will be created to estimate intimate partner violence and access to reproductive health services. Data on country-level indicators will be collected from the WHO and publicly available databases.[13] Several of our country-level data come from the Oxford COVID-19 Government Response Tracker (OxCGRT), an open access database with detailed data on 17 COVID-19 indicators in 180 countries.[14] The OxCGRT has created several indices derived from 17 indicators and report a number between 1 and 100 to reflect the level of government action. We will focus on the following country-level factors: overall government response (OxCGRT), containment and health index (OxCGRT), economic support index (OxCGRT), stringency of lockdown index (OxCGRT), number of COVID-19 per 100 000 population, public insurance and estimated excessive mortality when compared with the year prior.

When level 2 sample size is insufficient (eg, female genital mutilation and early marriage) to perform a multilevel analysis, cross-country differences will be determined through a fixed effects model with country as a covariate.

Given that online sampling has its own inherent biases,[15] we will use propensity score matching in some cases. Propensity score methods can be used to reduce coverage error and make web survey samples more closely approximate population representative samples.[16 17] Propensity score methods have been used to make groups more comparable based on covariarates.[18] Given that we also cannot randomly assign study participants to the stringency of lockdown measures, a key covariate, propensity score methods can help us to make more accurate estimation of the associations between COVID-19 and our primary outcomes. We will also provide more detailed descriptions of the specific country context and COVID-19 response where appropriate.

Subgroup analyses

We will combine data from different countries in order to conduct subanalyses on the following groups of individuals: people living with HIV infection, pregnant women, younger individuals (under 25 years old), individuals under 18 years old (if possible), people living in low-income countries compred with people in middle-income or high-income countries, people living in middle-income countries and people who report an income below the median in their country, rural people versus urban people, single people compared with not single people, sex, and socioeconomic status.

Quality assurance

In-country survey leads will be responsible for quality assurance mechanisms. All data collected will be stored on a password-protected secure server. Encryption keys will be given to the in-country leads so that each country's data will only be available to the in-country lead and people that they designate. Among countries willing to share their data for multicountry comparisons, deidentified and unlinkable data for multicountry comparisons will be stored at the University of Ghent and the University of North Carolina at Chapel Hill.

Dissemination of results

Results will be disseminated in scientific papers and also made available to a public audience. All participating countries will be encouraged to develop a policy brief and communicate research findings to relevant policy makers. The ANSER consortium will take a lead in providing policy briefs for selected countries.

Project management

General coordination of the multi-country study will be organised by researchers at the ANSER consortium represented by Ghent University and the University of North Carolina at Chapel Hill. There are international working groups on: survey development, technical support, survey implementation and statistical analyses. In each participating country, there will be one lead institution responsible for the implementation of the study. The network has agreed on a single data management plan (online supplemental file 4).

Ethics

In each country where the study will be implemented, the local partner will request approval of the appropriate ethical committee or review board. Before starting the survey, each participant will be asked to read an informed consent form (online supplemental material 1) and provide consent through checking a box. The informed consent form will include a link to more detailed information on privacy regulations and management of data. At the end of the survey, the participants will be informed about country-specific organisations where they can seek help.

DISCUSSION

This multicountry behavioural survey will examine sexual risk behaviours, intimate partner violence and access to reproductive health services during the COVID-19 era. Several structural factors increase the importance of understanding sexual and reproductive health during this period of time. The I-SHARE study breaks new ground by focusing on sexual and reproductive health during COVID-19, including a range of low-income, middle-income and high-income countries, and extending out of two complementary global networks (ANSER and the response

to a WHO open call). The prespecified subanalyses and analytical plans outlined here will increase the rigour of this research.

COVID-19 has led to unprecedented uncertainty in our social world, with important implications for sexual and reproductive health. The pandemic presents unique opportunities and challenge. Some have hypothesised that social restriction measures and decreased travel would decrease the frequency of sexual behaviours. In this light, expanded HIV elimination efforts related to HIV self-testing and digital interventions could work towards eliminating HIV transmission in ways that would have been impossible only a few months ago. However, social restriction measures may also decrease access to HIV testing (among those without HIV) and ART medication (among people living with HIV). Conventional sexual health services, especially those focused on intimate partner violence, may be entirely closed or operating at limited capacity.[19 20]

This study has several limitations. First, the cross-sectional study will be a convenience sample that precludes causal inferences and necessitates caution when making inferences. Second, the online nature of the survey will exclude individuals who do not have internet access. Studies have shown that people with lower incomes and education are less likely to have internet access.[21 22] Although there is persistent spatial variation in the digital divide,[23] there is also a growing literature on how to address online sampling bias.[24 25] Third, COVID-19 control measures differ from country to country. However, there are several policy observatory databases that provide detailed open access information about specific COVID-19 control measures in countries.[14 26 27] Fourth, as a cross-national survey, harmonising survey questions and responses is not simple. The I-SHARE team benefited from a previous series of Human Reproduction Programme (HRP) consultations to harmonise a sexual and reproductive health survey instrument,[28] the literature on creating cross-national surveys[29] and local (national level) expertise in sexual and reproductive health from all included countries. Fifth, the extent of field testing was dependent on local personnel and varied from country to country. Finally, studies will gather limited information about adolescents and no information about children.

Our study will generate important research and policy implications. The study outcomes will help guide policy and research related to sexual and reproductive health during emergencies in the selected countries to improve preparedness for future epidemics and disasters. The subgroup analyses will provide insights on need, access and equity issues in sexual and reproductive health during a pandemic. Several additional recommendations for sexual and reproductive health survey research are included as supplementary material (online supplemental 5). Multicountry analyses will provide preliminary data on the association of COVID-19 response with key sexual and reproductive health outcomes, paving the way for future research.

Key messages

- Sexual and reproductive health research in the COVID-19 era is essential, but population-based household sampling methods are constrained because of COVID-19 measures.
- This International Sexual Health And ReproductivE health study protocol describes a cross-sectional online study to better understand sexual and reproductive health in selected countries during the COVID-19 pandemic and facilitate multinational comparisons.
- Global research studies, especially in low-income and middle-income countries, are necessary to understand how COVID-19 measures may influence factors such as condomless sex, access to reproductive health services and intimate partner violence.
- Further multicountry research may be helpful for enhancing sexual and reproductive health research during COVID-19 measures.

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Supplemental Files

1. **I-SHARE survey instrument for Canada.**
2. **Digital field testing description**
3. **Primary outcomes**
4. **Data management**
5. **Considerations for online sexual and reproductive survey research during COVID-19**

Supplement 1. I-SHARE survey instrument for Canada.

ODK Form ID: I_SHARE_CANADA , ODK Form version: 200907 , ODK Excel filename: ISHARE Survey - CANADA

ISHARE

We invite you to participate in this research on sexual and reproductive health and wellbeing in times of the COVID-19 crisis: the I-SHARE study.
This study aims to investigate how the social distancing measures (staying at home, social distancing, only essential trips, ...) taken by your government during the COVID-19 health crisis affect your family situation, your relationships and your access to sexual and reproductive health services (such as contraception and antenatal care services). The survey therefore contains various questions in which you are asked to compare your situation before and after the introduction of the COVID-19 social distancing measures. The study is organized by [**LOCAL INSTITUTION**] in collaboration with academic institutions in thirty other countries (https://ishare.web.unc.edu/).
Participation in this study is important and guarantees that we obtain a complete overview of how the COVID-19 crisis affects people's lives. Participation in this questionnaire takes about 15 minutes.

Your participation in this survey is anonymous and voluntary. You can stop the survey at any time.
More information about this research, how we process the collected data and how we protect your privacy can be found here [LINK TO THE WEBSITE WITH MORE INFORMATION – see below]. You need to be 18 years or older to participate in this survey.

We thank you in advance for your time and participation.

CLICK TO CONTINUE

I herewith declare that, as participant of the study " Sexual and Reproductive Health in times of COVID-19":

1) I have read and understood the information letter for participants. I have been informed about the nature, duration and purpose of the study and about what is expected of me.
2) I was offered the opportunity to obtain additional information.
3) I understand that participation in the study is voluntary. I know I can withdraw my participation at any time without having to justify this.
4) I am aware that this study has been approved by [**NATIONAL IRB]** for national data collection and that this study will be conducted in accordance with the guidelines for good clinical practice (ICH/GCP) and the declaration of Helsinki, designed to protect people participating in studies. This approval was by no means the impetus to decide to participate in this study. I am aware that the I-SHARE partnership will obtain permission from participating in-country leads in order to obtain de-identified data for multi-country comparisons. This process will be formalized in data sharing agreements and IRB approval to cover the secondary data analysis from respective institutions.
5) I authorize the researchers to store my answers in a confidential way according to the data and security management policy of [LOCAL INSTITUTION] so that these data can be reused for future scientific research and education.
6) I authorize the researchers to process and report my results in a confidential way.
7) I am aware that I can contact the Data Protection Officer of [**LOCAL INSTITUTION**] for more information about the protection of my data.
8) Since completing the questionnaire is completely confidential, I do not have the possibility to change, review or delete my data afterwards.

1. Selection Criteria	

Question	**Response options**
Do you live in the Canada?	Select one: Yes, No

Question	Response options
How old are you?	Integer value
As you are not from Canada you can not complete this survey. To see if your country is taking part go to	Text
"INDIANA UNIVERSITY STUDY INFORMED CONSENT FOR RESEARCH International Sexual Health and Reproductive Health Survey IRB# 2005838659"	
Do you give your consent to participate in this research study?	Select one: Yes
2. Socio-demographics	
What sex were you assigned at birth, on your original birth certificate?	Select one: NA
How do you describe yourself?	Select one: NA
What best describes the area where you live?	Select one: NA
In which province/state do you live?	Select one: ALBERTA, BRITISH COLUMBIA, MANITOBA, NEW BRUNSWICK, NEWFOUNDLAND and LABRADOR, NORTHWEST TERRITORIES, NOVA SCOTIA, NUNAVUT, ONTARIO, PRINCE EDWARD ISLAND, QUEBEC, SASKATCHEWAN, YUKON
What best describes your relationship status?	Select one: NA
How many children do you have, if any?	Integer value
What is your highest degree of scholing?	Select one: NA
What is your religion?	Select one: NA

Question	Response options
What is your ethnicity, origin group or caste?	Select one: White, Black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, Other, Two or more races
3. COVID-19 social distancing measures	
How much would you say that you're following COVID-19 social distancing measures?	Select one: Not at all, A little bit, A lot, Very strictly
Were you ever in (self-)isolation because of symptoms or because you were in close contact with someone with COVID-19 or because you returned from a country that had a large number of cases?	Select one: Yes, No
Were you ever tested for COVID-19?	Select one: No, Yes, I tested positive at least one, Yes, I have always tested negative
Number of adults > 18 years	Integer value
Number of children 0-9 years	Integer value
Number of teenagers 10-18 years	Integer value
Was/is your family structure different during the COVID-19 social distancing measures?	Select one: No, the composition of my family was/is the same, Yes, the composition of my family was/is different
Number of adults > 18 years	Integer value
Number of children 0-9 years	Integer value

Question	Response options
Number of teenagers 10-18 years	Integer value
What was your employment status the month before the COVID-19 social distancing measures?	Select one: Employed and received a salary, Self-employed / Business owner, Unemployed, Informal / Piecemeal work, Retired / Pensioned, Student, Other
Since the COVID-19 social distancing measures, has your employment status changed?	Select one: No change: I continue doing the same work and going to the usual job site, I keep doing the same work, but from home, I keep doing the same work, but partly from home, I am employed and paid but unable to attend or do work, I work on reduced time, I lost my job/work/business, I am temporarily unemployed, I changed work/jobs, Other
Below is an income scale on which 1 indicates the lowest income group and 10 the highest income group in your country. We would like to know in what group your household was in the year before the COVID-19 crisis?	Select one: 1 Lowest group, 2, 3, 4, 5, 6, 7, 8, 9, 10 Highest group
What best describes your housing?	Select one: I own my home, I rent my home, I rent an apartment or condominium, I do not have stable housing
Since the COVID-pandemic, the economic situation of many households has changed. Has this been the case for you?	Select one: Yes, the economic situation of my household became worse, No, the economic situation of my household stayed the same, Yes, the economic situation of my household improved

Question	Response options
Have you personally experienced a loss of income?	Select one: Yes, a total of income, Yes, a partial loss of income, No loss of income, I had no personal income before COVID-20
How often did you drink alcohol before the COVID-19 social distancing measures?	Select one: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week
During the COVID-19 distancing measures, did this increase or decrease?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot
How many standard drinks containing alcohol do you have on a typical day when you drink before the COVID-19 social distancing measures?	Select one: 0, 1-3, 3-5, 5-7, 7-10, 10+
During the COVID-19 distancing measures, did this increase or decrease?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot
How often did you have six or more drinks on one occasion before the COVID-19 social distancing measures?	Select one: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week
During the COVID-19 distancing measures, did this increase or decrease?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot
How often did you use cannabis (marijuana, hash, grass) before the COVID-19 social distancing measures?	Select one: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week
During the COVID-19 distancing measures, did this increase or decrease?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot

Question	Response options
4. Couple and family relationships	
Did you have a steady partner in the three months before the COVID-19 social isolation measures?	Select one: Yes, No
Are you currently still in this relationship?	Select one: Yes, No
Did your relationship end before, during or after COVID-19 social distancing measures?	Select one: Before, During, After
Would you say the end of your relationship was precipitated by COVID-19 social distancing measures?	Select one: Yes, No, Not sure
Have you had a new steady partner since COVID-19 social distancing measures?	Select one: Yes, No
What is your sexual orientation?	Select one: NA
During the COVID-19 social distancing measures, is/was your steady partner living with you in the same place?	Select one: No, s/he stay elsewhere, Yes, the whole time, Yes, part of the time
In the three months before the COVID-19 social distancing measures, how often did you experience tension in your relationship with your partner/spouse?	Select one: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week
How has this changed since the COVID-19 social distancing measures?	Select one: Much less tension than before, A bit less tension than before, About the same amount of tension, A bit more tension than before, A lot more tension than before
In the three months before the COVID-19 social distancing measures, how often did you experience tension in your relationship with your children?	Select one: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week

Question	Response options
How has this changed during the COVID-19 social distancing measures?	Select one: Much less tension than before, A bit less tension than before, About the same amount of tension, A bit more tension than before, A lot more tension than before
In the three months before the COVID-19 social distancing measures, how much would you say your partner provided you with emotional support?	Select one: A lot, Some support, Little support, No support
How has this changed during the COVID-19 social distancing measures?	Select one: Much less support than before, A bit less support than before, About the same smount of support than before, A bit more support than before, A lot more support than before
Who is doing most of the household work in your household? Before the COVID-19 social distancing measures	Select one: I was doing most of the household work, My partner did most of the household work, My partner and I equally contributed to the household work, Most members of the household contributed equally, Someone else did most of the household work
During the COVID-19 social distancing measures.	Select one: I am doing most of the household work, My partner is doing most of the household work, My partner and I equally contribute to the household work, Most members of the household contribute equally, Someone else is doing most of the household work

Question	Response options
Before COVID-19 social distancing measures, who was most in control over household spending?	Select one: I had most control, My partner had most control, My partner and I had equal control, Someone else than my partner and I had most control
Has your control over household spending changed since the COVID-19 measures?	Select one: Yes, I now have more control, Yes, I now have less control, No, I have the same control
5. Sexual behaviour	
Have you ever had sexual experience?	Select one: Yes, No
How satisfied were you with your sex life in the three months before the COVID-19 social distancing measures?	Select one: Very satisfied, Somewhat satisfied, Not very satisfied, Not at all satisfied
How satisfied were you with your sex life during the COVID-19 social distancing measures?	Select one: Very satisfied, Somewhat satisfied, Not very satisfied, Not at all satisfied
How often have you or your partner experienced sexual problems (problems getting an erection, or loss of sexual interest, arousal, orgasm, sexual satisfaction) in the threee months before the COVID-19 social distancing measures?	Select one: Never, Once, Sometimes, Often, Not applicable
How often have you or your partner experienced sexual problems (problems getting an erection, or loss of sexual interest, arousal, orgasm, sexual satisfaction) during the COVID-19 social distancing measures?	Select one: Never, Once, Sometimes, Often, Not applicable
Hugged, kissed, held hands with or cuddled with your steady partner?	Select one: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week

Question	Response options
Engaged in sexual activities with your steady partner?	Select one: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week
Used a condom when you had sex with your steady partner?	Select one: Never, Rarely, Sometimes, Most of the time, Always
Masturbated by yourself?	Select one: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week
Had sex with someone who you are not in a long-term relationship with (a casual partner)?	Select one: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week
Used a condom when you had sex with a casual partner?	Select one: Never, Rarely, Sometimes, Most of the time, Always
Sent or received naked/semi-naked pictures, audio or videos to a partner?	Select one: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week
Had sex in exchange for money, material goods, favors, drugs, or shelter?	Select one: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week
Watched sexually explicit videos (pornography)?	Select one: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week
Performed/watched sexual acts before a webcam?	Select one: Never, Monthly or less, 2-4 times a month, 2-3 times a week, 4 or more times a week

Question	Response options
Hugged, kissed, held hands with or cuddled with your steady partner?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot
Engaged in sexual activities with your steady partner?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot
Used a condom when you had sex with your steady partner?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot
Masturbated by yourself?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot
Had sex with someone who you are not in a long-term relationship with (a casual partner)?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot
Used a condom when you had sex with a casual partner?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot
Sent or received naked/semi-naked pictures, audio or videos to a partner?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot
Had sex in exchange for money, material goods, favors, drugs, or shelter?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot
Watched sexually explicit videos (pornography)?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot

Question	Response options
Performed/watched sexual acts before a webcam?	Select one: Decreased a lot, Decreased a little bit, Stayed the same, Increased a little bit, Increased a lot
If some of your sexual behaviours have changed due to COVID-19 social distancing measures why do you think this happened?	Text
Did the COVID-19 social distancing measure make it more difficult to access condoms?	Select one: No, Yes, Not applicable - I don't normally use condoms
If yes, what made it difficult to access condoms?	Select all that apply from: No transport available, I am afraid I might acquire COVID-19 and therefore do not want to go to the doctor/health centre/shop, Shops are closed, Condoms were not in stock in my store, I am not able/allowed to leave the house, Pharmacy/dispensary closed, Health centre/clinic had long queues or are not accessible at this time, I can no longer afford it, I can no longer access free condoms, Other
6. Access to contraceptives	
Have you ever been pregnant?	Select one: Yes, No
How many times have you been pregnant in your life?	Integer value

Question	Response options
What best describes your current situation?	Select one: Currently pregnant or probably pregnant, Currently trying to become pregnant, Recently had a baby (during the COVID-19 social distancing measures), Not currently pregnant and don't wish to be in the near future, Cannot have children (fertility issue / medical issue / menopause)
Have you recently changed your mind about having a child soon because of COVID-19?	Select one: Yes, I have decided to postpone my decision to have a child in the near future, Yes, I have decided I want a child sooner, No, I have not changed my plans
Are you or your partner currently doing something to avoid or delay a pregnancy, including condoms, contraceptive methods, traditional methods etc?	Select one: No, Yes, all the time, Yes, most of the time, Yes, sometimes
What is the main reason you are not using contraception?	Select one: I am not regularly sexually active and don't need contraceptives, I don't know what is the best method to use, I am scared of the side-effects, My partner objects, Other
What contraceptive method are you currently using?	Select all that apply from: Male or condom, Diaphragm, Pills, Patch or ring, Copper IUD, Hormonal IUD, Implant, Injectables, Self or partner sterilization, Withdrawal, Natural methods (rhythm method), Birth control apps, Other
Have the COVID-19 social distancing measures stopped or hindered you from seeking or obtaining contraception?	Select one: Yes, No

Question	Response options
What stopped or hindered you from seeking or obtaining contraception?	Select all that apply from: No transport available, I am too afraid I will get COVID-19 if I would to the doctor/health centre to get contraceptives, I am not able allowed to leave the house, Method not in stock, Doctor/health professional not available, Pharmacy/dispensary closed, I can no longer afford it, Health centre/clinic has long queues or is not accessible at the time, Other
What services were you using to seek or obtain contraceptive services before the COVID-19 social distancing measures?	Select all that apply from: Family physician/General practitioner, Hospital doctor or nurse, Community health centre, Online services, Telephone services, Over the counter services (pharmacy), Other
What services did you use to seek or obtain contraceptive services during the period when the COVID-19 social distancing measures were in place?	Select all that apply from: Family physician/General practitioner, Hospital doctor or nurse, Community health centre, Online services, Telephone services, Over the counter services (pharmacy), Other, I did not need to seek or obtain contraceptive services during the COVID-19 social distancing
7. Access to Reproductive Health services, antenatal care, pregnancy and maternal and child health	
How many months have you been pregnant?	Integer value
When you found out you were pregnant, what was your reaction?	Select one: Very unhappy, Somewhat unhappy, A little happy, Very happy

Question	Response options
Had you planned to become pregnant?	Select one: No, Yes, Yes, but it was sooner than we planned, Yes, but it was later than we planned
Did you getting pregnant, in your opinion, have anything to do with the COVID-19 situation?	Select one: NA
Have you decided to keep the pregnancy?	Select one: Yes, No, I decided to terminate my pregnancy, I don't know
Have you missed or delayed pregnancy health care appointments during the COVID-19 social distancing measures?	Select one: No, Yes, because I am afraid I may acquire COVID-19 in the hospital/health care centre, Yes, because the doctor/nurse cancelled or rescheduled the appointment because of COVID-20, Yes, other reason
How satisfied are/were you with your pregnancy health care during the COVID-19 social distancing measures?	Select one: Not at all satisfied, Not satisfied, Neutral, A bit satisfied, Very satisfied
Because of COVID-19, did you feel anxious or depressed during your pregnancy?	Select one: No, Yes, a bit, Yes, a lot
Did you receive information on acquiring COVID-19 during pregnancy?	Select all that apply from: No, Yes, from my doctor/midwife, Yes, from the media, Yes, from other sources
Do you have any concerns regarding your delivery in the following weeks/months?	Select one: No, Yes, I am afraid i may acquire COVID-19 in the hospital/health care centre, Yes, I am afraid i may not know how to get to the hospital, Yes, other reason

Question	Response options
Where do you plan to deliver the baby?	Select one: In the health care centre or hospital, At home with a health care worker, At home with a traditional birth attendant, At home alone, Other
Why do you plan to give birth at home?	Select one: I am concerned about the risk of COVID-19 in health facilities, The facility is closed or cannot provide, I have no access to a facility, I prefer to deliver at home
Where did you give birth?	Select one: In the health care centre or hospital, At home with a health care worker, At home with a traditional birth attendant, At home alone, Other
Why did you give birth at home?	Select one: I was concerned about the risk of COVID-19 in health facilities, The facility was closed or cannot provide, I had no access to a facility, I planned to deliver at home
Have you missed or delayed post-natal care appointments as a result of the COVID-measures?	Select one: No, Yes, because I am afraid I may acquire COVID-19 in the hospital/health care centre, Yes, because the doctor/nurse cancelled or rescheduled the appointment because of COVID-20, Yes, other reason
8. Abortion	
During the COVID-19 social distancing measures have you been in need of a termination of pregnancy (abortion)?	Select one: Yes, No

Question	Response options
Did you have an abortion during the COVID-19 social distancing measures?	Select one: No, Yes, a medical abortion (taking pills e.g. misoprostol), Yes, a surgical abortion, Yes, with other methods
Has the COVID-19 situation stopped or hindered you from seeking or obtaining an abortion?	Select one: Yes, No
How did the COVID-19 social distancing measures stop or hinder you from seeking or obtaining an abortion?	Select one: No transport available, I am too afraid I will get COVID-19 if I would to the doctor/health centre to get contraceptives, I am not able allowed to leave the house, Method not in stock (abortion service not available), Doctor/health professional not available, Pharmacy/dispensary closed, I can no longer afford an abortion, Health centre/clinic has long queues or is not accessible at the time, Other
What services would you use to obtain an abortion before the COVID-19 social distancing measures?	Select all that apply from: I never had an abortion before the COVID-19 social distancing measures, Family physician / general practitioner, Hospital or health centre doctor/nurse, Online services, Telephone services, Over the counter services (pharmacy), Traditional healer, Self-medication, Abortion Clinic, Through a civil society organization for abortion, Other

Question	Response options
What services did you use to obtain an abortion during the COVID-19 social distancing measures?	Select all that apply from: Family physician / general practitioner, Hospital or health centre doctor/nurse, Online services, Telephone services, Over the counter services (pharmacy), Traditional healer, Self-medication, Abortion Clinic, Through a civil society organization for abortion, Other
Did you experience any delays in obtaining abortion care?	Select one: No, Yes, a few days, Yes, 1-2 weeks, Yes, 3-4 weeks, Yes, more than 4 weeks
9. Sexual and Gender-Based Violence	
In your everyday life, in the three months before the COVID-19 situation, how vulnerable did you feel for sexual harassment or sexual, physical, or emotional assault by someone who does not live in your house?	Select one: Not vulnerable at all, Little vulnerable, Neutral, Quite vulnerable, Very vulnerable
In your everyday life, during the COVID-19 situation, how vulnerable did you feel for sexual harassment or sexual, physical, or emotional assault by someone who does not live in your house?	Select one: Not vulnerable at all, Little vulnerable, Neutral, Quite vulnerable, Very vulnerable
Has a partner tried to restrict (online or phone) contact with your family?	Select one: No, Yes, once, Yes, multiple times, Not applicable
Has a partner insulted you or made you feel bad about yourself?	Select one: No, Yes, once, Yes, multiple times, Not applicable
Has a partner ever not provided money to run the house or look after the children, but has money for other things?	Select one: No, Yes, once, Yes, multiple times, Not applicable
Has a partner slapped, pushed, hit, kicked or choked you or thrown something at you that could hurt you?	Select one: No, Yes, once, Yes, multiple times, Not applicable

Question	Response options
Has a partner physically forced you to have sexual intercourse when you did not want to?	Select one: No, Yes, once, Yes, multiple times, Not applicable
Has a partner made you have sexual intercourse when you did not want to because you were afraid of what your partner might do?	Select one: No, Yes, once, Yes, multiple times, Not applicable
Has a partner tried to restrict (online or phone) contact with your family?	Select one: No, Yes, once, Yes, multiple times, Not applicable
Has a partner insulted you or made you feel bad about yourself?	Select one: No, Yes, once, Yes, multiple times, Not applicable
Has a partner ever not provided money to run the house or look after the children, but has money for other things?	Select one: No, Yes, once, Yes, multiple times, Not applicable
Has a partner slapped, pushed, hit, kicked or choked you or thrown something at you that could hurt you?	Select one: No, Yes, once, Yes, multiple times, Not applicable
Has a partner physically forced you to have sexual intercourse when you did not want to?	Select one: No, Yes, once, Yes, multiple times, Not applicable
Has a partner made you have sexual intercourse when you did not want to because you were afraid of what your partner might do?	Select one: No, Yes, once, Yes, multiple times, Not applicable
Did you ever talk to someone about the violence experiences you had before the COVID-19 social distancing measures?	Select all that apply from: No, Yes, to a relative, Yes, to a friend, Yes, to a phone or online helpline, Yes, to social services, Yes, to the police, Yes, to an association, Yes, other
Did you ever officially report (i.e. file a complaint) any violence experiences you had before the COVID-19 social distancing measures?	Select one: Yes, No

Question	Response options
Did you ever talk to someone about the violence experiences you had during the COVID-19 social distancing measures?	Select all that apply from: No, Yes, to a relative, Yes, to a friend, Yes, to a phone or online helpline, Yes, to social services, Yes, to the police, Yes, to an association, Yes, other
Did you ever officially report (i.e. file a complaint) any violence experiences you had during the COVID-19 social distancing measures?	Select one: Yes, No
10. HIV and other STI	
During the COVID-19 social distancing measures have you wanted a test for HIV or another sexually transmitted infection (STI)?	Select one: Yes, No
Has the COVID-19 situation stopped or hindered you from accessing a test for HIV or another sexually transmitted infection?	Select one: Yes, No
How did the COVID-19 social distancing measures stop or hinder you from accessing a test for HIV or another a sexually transmitted infection?	Select all that apply from: No transport available, Postal services not functioning, Pharmacy closed, I can no longer afford it, Health centre/clinic had long queues or is not accessible at this time, Not able/allowed to leave the house, Health workers not offering providing HIV STI testing services anymore, Other
What services would/did you use to obtain a test for HIV or another sexually transmitted infection?	Select all that apply from: Never needed a test before COVID-20, Family physician / general practitioner, General hospital/clinic, HIV/STI clinic, Online services, Telephone services, Over the counter services (pharmacy), Traditional healer, Self-medication, None, Other

Question	Response options
What services would/did you use to obtain a test for HIV or another sexually transmitted infection?	Select all that apply from: Family physician / general practitioner, General hospital/clinic, HIV/STI clinic, Online services, Telephone services, Over the counter services (pharmacy), Traditional healer, Self-medication, None, Other
In your life, have you ever tested positive for HIV?	Select one: No, Yes, Prefer not to answer
During the COVID-19 social distancing measures, were any appointment at your clinic/health centre for HIV treatment or care cancelled?	Select one: Yes, No
During the COVID-19 social distancing measures, have you missed or delayed an appointment at your clinic/health centre for HIV treatment or care?	Select one: Yes, No
What was the main reason for missing or delaying an appointment at your clinic/health centre for HIV treatment or care?	Select one: No transport available, I was too afraid I would acquire COVID-19 if I would go to the doctor/health centre to get HIV treatment or care, I am not able/allowed to leave the house, Doctor/health professional not available, Pharmacy/dispensary closed, I can no longer afford it, Health centre/clinic has long queues or is not accessible at this time, Other
How did the COVID-19 social distancing measures affect your adherence to medication for HIV (on a scale from 1 to 5)?	Select one: 1 made adherence to ART impossible, 2 made adherence more difficult, 3 didnt affect my adherence to ART, 4 made adherence somewhat easier, 5 made adherence to ART much easier

Question	Response options
During the COVID-19 social distancing measures, have you been worried that you will run out of ART tablets/your HIV medication because of the lockdown?	Select one: Very worried, A bit worried, Not worried
Has the COVID-19 social distancing measures prompted you to disclose your HIV status?	Select one: No, I continued to keep my status private, No, I had already disclosed my status, Yes, it forced me to disclose my status, Yes, although I was planning on disclosing anyway
11. Mental Health	
I get angry frequently with slight provocation.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
Does this happen more or less since the start of the COVID-19 social distancing measures?	Select one: A lot more, More, About the same, Less, A lot less
I have felt frustrated with things in general.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
Does this happen more or less since the start of the COVID-19 social distancing measures?	Select one: A lot more, More, About the same, Less, A lot less
I have felt bored.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
Does this happen more or less since the start of the COVID-19 social distancing measures?	Select one: A lot more, More, About the same, Less, A lot less
I have worried about my financial situation.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
Does this happen more or less since the start of the COVID-19 social distancing measures?	Select one: A lot more, More, About the same, Less, A lot less

Question	Response options
I feel frustrated because of the COVID-19 restrictions	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
I am confused about what I can or cannot do due to COVID-19.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
I am afraid to acquire COVID-19.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
I experience obsessive or compulsive behaviors with regards to hand washing.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
I am afraid of touching items outside my house.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
I cannot stop thinking about the COVID-19 epidemic.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
I have nightmares about the current situation.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
I feel that there is enough protective gear (gloves, mouth masks, sterilizing alcohol) available for me.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
I feel the Government fails to provide enough, adequate and true information concerning the COVID-19 outbreak.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
If I have to sneeze or cough in my household, I try to hide this from the people around me.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
If I would be outside and I would have to sneeze or cough, I would try to hide this from the people around me.	Select one: Totally agree, Agree, Agree nor disagree, Disagree, Totally disagree
How would you rate your overall mental health	Select one: Poor, Fair, Good, Very good, Excellent
12. Nutrition	

Question	**Response options**
During the COVID-measures, did you worry that your household would not have enough food?	Select one: No, Yes, but less than before, Yes, but no more than before, Yes, more than before
During the COVID-measures, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources?	Select one: No, Yes, but less than before, Yes, but no more than before, Yes, more than before
During the COVID-measures, did you or any household member eat less in either the morning or evening meal than you felt you needed because there was not enough food?	Select one: No, Yes, but less than before, Yes, but no more than before, Yes, more than before
During the COVID-measures, were your household food stores ever completely empty and there was no way of getting more?	Select one: No, Yes, but less than before, Yes, but no more than before, Yes, more than before
During the COVID measures, did you increase your consumption of foods of low nutritional value (e.g. fast food)?	Select one: No, Yes, a bit, Yes, a lot
During the COVID measures, did you increase your food consumption in general?	Select one: No, Yes, a bit, Yes, a lot
Final Section	
You can find more information at	Text

Supplement 2. Digital Field Testing Description

Digital field testing is an essential component of creating an online survey. We will use an ODK platform to program the core survey instrument into country-specific instruments. Each country will be responsible for translating the core survey into relevant languages for their country. Briefly, the in-country lead will send an Excel document with each translation to the I-SHARE digital working group. Translations will be programmed into an XLS Form and a temporary link to field test will be sent to the in-country lead. Detailed English comments in a single Word document will be sent from the in-country lead back to the digital working group. If there are no further changes, the in-country lead provides the green light for survey launch. The digital working group would then share the final survey link and provide an encryption key to access the data. We anticipate one to three rounds of field testing and do not anticipate that digital field testing will influence the core survey instrument structure.

Supplement 3. Primary outcomes

Our primary outcomes are sexual behaviours, partner violence, and access to essential reproductive services. Sexual behavior analysis will focus on condomless sex with any partner (casual or steady partner), sexual dysfunction, and sexual activity comparing the three months before COVID-19 measures and during the COVID-19 measures. Intimate partner violence will be defined by six items (restrict contact, insult, withheld money, slapped, physically or non-physically forced to have sex), as well as speaking about and reporting partner violence, comparing the three months before COVID-19 measures and during the COVID-19 measures. Access to reproductive health services will be divided into access to condoms (all participants), access to antenatal care (women only), access to contraceptives (women only) and access to abortion (women only). These will also compare the period three months before COVID-19 measures and the period during COVID-19 measures.

Supplement 4. Data management plan.

1.1 Format and scale of the data

Quantitative will be initially stored in Stata data files. This format is recommended by the UK Data Archive as preferred long-term storage formats for quantitative and qualitative data. Stata .dta files can be easily exports and converted to other software, facilitating sharing of data within the study team. Online data capture among study participants will use OpenDataKit open-source tools.

2. Data collection/generation

2.1 Methodologies for data collection/generation

Data will be collected by study participants (self-completed survey instruments on their mobile phone or a tablet, photographs of test kit results via instant messaging).

2.2 Data quality and standards

Electronic data collection tools will follow guidelines set by ODK@LSHTM (http://opendatakit.lshtm.ac.uk/), and will be pre-programmed and tested before use in the field. To minimize errors, range checks and skip patterns within data entry screens will be used. The computing system is password protected, encrypted and only accessible to authorised study team members. Any access to the system is automatically recorded.

3. Data management, documentation, and curation

3.1 Managing, storing, and curating data

Data will be managed according to International Conference on Harmonisation guidelines for Good Clinical Practices. Participants will receive a unique study identification (ID) number recorded on all forms. All data will be kept confidential and accessible only to trained study staff. All consent forms and survey information will be digital only. ODK data will be uploaded directly to the server. Each in-country lead will be the sole individual with access to

the data.

4.2 Metadata standards and data documentation

We will prepare documentation describing all data produced from the study, in accordance with Data Documentation Initiative (DDI) principles. This will describe the relationship between the different databases and the variables for each database. Important documentations for the study which are to be included in the metadata are: study title and short description; study protocol; SOPs; questionnaires; topic guides; and all other data collection instruments. The documents will be stored in .rtf format. Quantitative datasets stored in Stata have extensive metadata attached in .dta files (including descriptions of variable coding).

4.3 Data preservation strategy and standards

Data will be stored electronically in the file formats specified above on servers and backed-up in accordance with normal procedures for a minimum of 5 years, in accordance with UNCST policy. Metadata will be created in conformance with Preservation Metadata International Standards (PREMIS).

4. Data security and confidentiality of potentially disclosive information

Strict measures will be employed in order to ensure data confidentiality. Immediately after data finalisation, data collected on electronic forms will be encrypted using a random single use symmetric encryption key, which is in turn then asymmetrically encrypted using a 2048-bit public Rivest–Shamir–Adleman (RSA) key that is inherited from the eCRF. This means that once finalized, no human readable data for the form could be accessed again on the device. Encrypted data files will then be transferred via end-to-end encrypted https protocols to a firewalled institutional server. No human readable form of the raw data will be available on any web-accessible server and no user will have permission or ability to alter any raw file on the server. Electronic data will be backed up in the encrypted form and these

backups will represent an unmodifiable copy of the study's raw data. Decryption permissions will be limited to a small number of individuals, namely the in-country leads, who possess copies of the secret decryption key files (anonymous/de-identified data and summaries may be shared according to data sharing policy). Decryption will only be possible once a copy of the encrypted data has been downloaded to a local workstation. Handling of the decrypted human readable data will preferably take place on encrypted disk volumes. Any database systems used in downstream work will implement a tiered password controlled system of access. Read and write access to these 'working copies' of the data will depend on the designation of the in-country lead. Password protection on computers, servers and networks will be used and data transfer over wireless or mobile networks will use Virtual Private Networks or router protected dedicated IP addresses.

5.1 Formal information/data security standards Most of our data will contain unique identifies which cannot easily be linked to a study participant. For the data containing identifying information, this will be stored and transferred in encrypted files which use AES 128-bit advanced encryption and conform to the ISO/IEC 18033-3 standard.

5.2 Data sharing and access

All of the data generated by a single country will only be accessible to that specific in-country lead investigator. Any sharing of data for multi-country comparisons will be governed by data sharing agreements.

5.3 Governance of access Decisions about access to individual country data will be made entirely by the in-country lead.

5.4 Relevant institutional, departmental, or study policies on data sharing and data security

Policy	**URL or Reference**
Data Management	MRC policy on data management and sharing;

Policy & Procedures	http://www.lshtm.ac.uk/research/researchdataman/rdm_policy_summary.html
Data Security Policy	MRC information security policy; http://www.lshtm.ac.uk/its/informationsecurity/policy/
Data Sharing Policy	MRC policy on research data-sharing

Supplement 5. Considerations for online sexual and reproductive survey research during COVID-19

The following represent some themes are relevant to organizing online sexual and reproductive health survey research during COVID-19:

a) Survivor resources. Given the potential for increased intimate partner violence during COVID-19, survey organizers should identify resources to support survivors and include them in informational materials. Surveys introduce the potential for increased violence if survivors are found completing the survey by a partner. In addition, completing the survey could be distressing.

b) Online sampling considerations. Recruiting participants through online methods introduces the potential for substantial bias, in addition to unique opportunities for reaching vulnerable groups and asking about sensitive behaviours. Prior to survey launch, the survey organizers should consider how specific aspects of survey promotion (e.g., targeting groups that may be difficult to access), survey implementation (e.g., CAPTCHA and methods for avoiding duplicate participation), data analysis (e.g., propensity score methods) could be used to improve the validity of data.

c) Field testing with participants. Several rounds of field testing can improve the quality of the data generated through identifying errors in skip patterns, revising preambles, and improving translations.

d) Anonymity. Many online survey software may default to capturing IP addresses, but we recommend against collecting this information. We would recommend carefully considering all identifying information and discussing with ethical review committees as appropriate.