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The impact of major disease outbreaks in the third millennium on adolescent and youth sexual and reproductive health and rights in LMICs: a systematic scoping review protocol

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Abstract

Introduction

Adolescent sexual and reproductive health (SRHR) continues to present a high burden and remains underinvested. This is more so in lower and middle-income countries (LMICs), where empirical evidence reveals disruption of SRHR maintenance, need for enhancement of programs, resources, and services during pandemics. Despite the importance of the subject, there is no published review yet combining recent disease outbreaks such as (H1N1/09, Zika, Ebola, and SARS-COV-2) to assess their impact on adolescents and youth SRHR in LMICs.

Method

We will adopt a four-step search to reach the maximum possible number of studies. In the first step, we had a limited/preliminary investigation in databases for reaching relevant keywords (appendix1). Secondly, we will search in four databases: Pubmed, Cochrane Library, Embase, and PsycINFO. The search would begin from the inception of the first major outbreak in 2009 (H1N1/09) up to the date of publication of the protocol in early 2021. We will search databases using related keywords, screen title/abstract, and review full texts of the selected titles to arrive at the list of eligible studies. In the third stage, we will go to the included article's reference list to check their eligibility. In the fourth stage, we will check the citation of included papers in phase 2 to complete our study selection. We will include all types of original studies and without any language restriction in our final synthesis. Our review results would be charted for each pandemic separately and include the details related to authors, year, country, region of the study, study design, participants (disaggregated by age and gender), purpose, and report associated SRHR outcomes. The review will adhere to the PRISMA-ScR guideline.

Ethics and dissemination

Ethical assessment is not required for this study. The results of the study will be presented in peer-reviewed publications and conferences on adolescent SRHR.

Strengths and limitations of our study

Strengths

- ✓ we are targeting an underserved area of research adolescent SRHR and how select disease outbreaks impact the adolescent outcomes
- ✓ our systematic scoping review protocol minimizes the possibility of duplications, and we have sought to engage a stringent peer-review process to arrive at meaningful search outcomes around SRHR impacts.
- ✓ our strategy will include four-step of searching and sifting through studies, which maximize our effort in reaching the all possible eligible studies
- ✓ using ICPD as our guiding framework to elicit key outcomes, we hope to arrive at studies that are tracking adolescent SRHR in a rigorous and insightful manner

Limitations

- There could be other diseases outbreaks to consider; however, we took a broad sweep at significant outbreaks to document here

Introduction

The beginning of sexual activity differs based on sex, country, culture, religion, and context (1). Meanwhile, more people are currently reaching puberty earlier and engaging later in sexual activities and marriage. So, before marriage, they are sexually active longer than their parents (2). The risk of neglecting the adolescent sexual and reproductive health (ASRH) could impose a life-lasting impact on them. For females, adolescent pregnancy and maternity may be mentally and physically challenging (3, 4). It may also impede further academic/educational achievements and economic potential (5). In both sexes, especially for girls, there is a high risk of sexually transmitted infections (STIs), including HIV, reproductive coercion, and violence (6). Approximately one-ninth (11%) of the annual birth rates are related to mothers in the age of 15-19. Rates differ by region, but it is estimated that the percentage of adolescents' pregnancy to all births ranges from 50% in Sub-Saharan Africa to 2% in China (3). In 2019, in LMICs, those between 15-19 gave birth to about 21 million. The number of unintended pregnancies in those between 15-19 was about ten million, and about 55% of these unintended pregnancies resulted in abortion (7, 8). Nearly 70% of the total abortion attempt at the ages of 15-19 leads to unsafe abortions, which can have catastrophic health effects(8). In the GBD 2015 report, the maternal mortality rate (MMR) was highest in 10-14 years old girls, as high as 278 (95% UI 229–339) (9). Additionally, pregnancy and delivery-related complications cause more mortality in 15- 19 years old girls (10).

Value of the proposed review: The already missed adolescents and young SRHR need to develop and become more complicated during the disasters and outbreaks (11). Besides, they have less life experience and theoretically do not have evolved decision making, coping, and judgment capabilities to navigate such complex circumstances. These crises offer a belated opportunity for the governments to fill the gaps in sex education and providing access to contraceptives, safer motherhood, safer abortion, and empowerment programs to impede discrimination and protect adolescents living with disabilities and special conditions. If governments do not take such opportunities, future outbreaks can be a more significant public health issue and exacerbate existing mental health issues, gender inequalities, and social injustice. We know that these social determinants of adolescent health are tied together, and this review will help understand the existing evidence and gaps. We have prioritized studying four significant outbreaks since 2000: swine flu virus(H1N1/09), Ebola virus, Zika virus, and SARS-COV-2 and their impacts on the SRHR of young and adolescents in LMICs.

A) Influenza (H1N1/09) :

On first July 2009, the world health organization acknowledged that the flu outbreak has become universal and called it the Pandemic H1N1/09 virus, becoming popular as "swine flu." Further studies showed that pregnant women are in danger of this virus (12). Pregnant women were considered a high-risk group for H1/N1, as there was a higher rate of spontaneous abortion, preterm birth, low birth weight, fetal disease, and maternal death in those who had the virus (13, 14). In a study at the outset of the pandemic in Australia and New Zealand, around 9% of patients admitted to the Intensive Care Units (ICUs) were pregnant (comparing to 1% in the general population). Moreover, the mortality rate was 11% among those pregnant women (15). In flu pandemic, a global pooled analysis revealed that pregnant women have a higher chance of hospitalization than non-pregnant women of childbearing age, with a relative risk of 3.5-25.3 (16). The virus's vertical transmission during pregnancy has been reported

rarely(14). Due to the high mortality and morbidity rate of the virus for pregnant women, vaccination of pregnant women was prioritized to protect them. However, studies showed that mothers do not show compliance to use the vaccine as they had concerns regarding vaccines' adverse effects (17, 18). Fortunately, multiple studies showed that vaccines are safe and have no significant threat to pregnancy, including spontaneous abortion, still birth and congenital malformations(19-21).

B) Zika Virus :

In March 2015, a group of patients was admitted in Brazil with rash, fatigue, and arthralgia, caused by Zika Virus. In October that year, a few reports showed that the mother-newborn transmission of the virus (22) might lead to fetal loss, dead fetus, preterm delivery, and microcephalic (small head) babies, cumulatively known as congenital Zika syndrome (CZS) (23). Reports showed that the viral load is around 10,000 times more in semen than in the blood (24, 25). The transmission of the virus in human cycles is sexual contact, blood transfusion, and organ transplantation (26-28). Combining the sexual transmission of virus between partners and vertical transmission to the fetus, the WHO recommended safer practice of sexual activities or abstinence during pregnancy. Furthermore, in the case of a pregnancy probability, emergency pills has been recommended (22). To date, a total of 86 countries have reported evidence of Zika infection, considering the outbreak of 2015-2016 as a pandemic (29).

In mid-January 2016, the health ministers of multiple Latin American countries recommended postponing pregnancy for at least 6-24 months in facing the Zika virus. This seemed too idealistic, as more than half of the region's pregnancies are unintended (30). In addition to that, inadequate sex education, difficulty accessing contraception, high rape prevalence, and local cultural constraints resulted in many women not adopting proper advice (31). Also, Latin American countries have a relatively wide range of laws in SRHR. In El-Salvador, a self-induced abortion may lead to a penalty as high as 40 years of incarceration (32).

On the other hand, in response to the Zika virus, the Columbian Ministry of health declared that women have the right to have self-induced miscarriages. Nevertheless, due to the poor education and scarcity of information, women are not well informed concerning the risk and their abortion rights (31). This was reflected by the fact that the rate of contraception use did not change in Columbia during the outbreak in 2015-2016 (33).

C) Ebola virus :

Ebola hemorrhagic fever (EHF) is one of the fatal outbreaks within history. By the end of 2016, a study showed that about 11310 deaths resulted from 28618 definite cases, a staggering 40% (34). Of 10 patients, almost nine of them died in those with critical clinical pictures. The transmission route was via exposure to infected patients with each of the following blood, direct contact (mucus membrane and injured cutaneous tissue), and secretions like semen. It has shown that, even after recovery, the virus may exist in the semen of inflicted cases (35). Studies also showed that Burial ceremonies that require direct contact with the dead body are also contributing to Ebola transmission(36). The latter endangers females as they are usually doing significant roles in the ceremony. Besides, pregnant women can infect their babies as their milk is possibly contaminated with the virus(37-39).

In the past century, multiple outbreaks of the Ebola virus occurred; the first one was in Zaire (currently known as the Democratic Republic of the Congo) and Sudan in 1976. The second outbreak occurred in Susan around 1979. The third epidemic was in Gabon,1996. Coming to this century, Northern Uganda

faced the fourth epidemic in the fall of 2000. The 2014-2016 epidemic of the Ebola virus was the largest outbreak of the Ebola, considered a pandemic (40, 41). The outset was from Guinea and then moved to other countries such as Liberia and Sierra Leone. The current outbreak (2018- now) in the eastern Democratic Republic of Congo (DRC) is the last reported outbreak(42).

WHO Advisory Group on the Ebola Virus Disease Response recommended that the male who survived the EVD should practice hygiene and safer sex until one year from symptom beginning, or after two negative semen specimen for the Ebola virus. Moreover, in some patients after recovery, Ebola Virus can persist in several tissues, such as testicles, the eye, and the central nervous system (43). In women who have contracted the disease during pregnancy, the virus remains in the placenta, amniotic fluid, and fetus. In those women who have been infected during breastfeeding, the virus could persist in breast milk(37, 44-49).

The Ebola has just more uncovered many problems in adolescence SRHR in Africa (50). It is well-established that in humanitarian crises and disasters, like Ebola, women and girls are more vulnerable to gender-based violence (GBV) (51, 52). Multiple studies showed that in Sierra Leone, in the Ebola outbreak, the rate of adolescent pregnancy, rape, the sexual and gender-based violation was increased (50, 53, 54). UNDPA estimates that the teenage pregnancy rate increased by 65% during the outbreak (55). More girls have been forced into prostitution/transactional sex due to family members' loss and financial insecurity(56). This makes the girls twice victim, as pregnant girls are forbidden to attend school in Libera and Sierra Leone (57). In Sierra-Leone, the Ebola increased the fear and affected the newborn and maternal and care by disrupting the health services. This led to an estimated 3600 death of stillbirth, maternal and newborn death (58). The studies showed that even after pandemics, the level of contraceptive care and family planning had returned or exceeded the baseline level after 6 (59) to 24 months (60). After six months of the outbreak in Guinea, the number of family planning sessions and prenatal care visits did not reverse to the prior level, harshly influencing the already insufficient care level (59).

D) SARS COV-2 :

In late 2019, multiple patients were diagnosed with a pneumonia-causing virus. Numerous subsequent studies showed a beta-coronidae family virus named “SARS-COV-2” by WHO to be the causative agent. In March 2020, the WHO declared the pandemic of the SARS-COV-2 and called this condition “coronavirus disease of 2019”, or simply “COVID-19”. Currently, there is no substantial evidence that the virus can transmit during sexual activity or breastfeeding of a newborn. The possibility of vertical transmission is controversial. However, a recently published systematic review and meta-analysis suggest that the minority of pregnant cases can transmit the virus to newborns (61).

As the COVID-19 escalated, many countries adopted a high level of lockdown to mitigate the virus spread. The pandemic disrupted the supply chain of key contraceptive commodities (62). Besides, in practice, most governments categorized SRH services as non-essential and forced them to close. This led to the closure of many clinics and other related health care facilities for adolescents. In late April 2020, UNFPA predicted around 7 million unintended pregnancies during the crisis, with possibly thousands of maternal and newborn maternal mortality and morbidity(63). This is because of the lack of providing SRH services like contraception and safe abortion care, time-sensitive, and potentially lifesaving services (64).

COVID-19 has forced nearly 1.4 billion child and youths out of school/university, including 743 million girls globally (65), raising concerns around long-term impacts on their lives, who, in addition to increasing poverty levels, might also experience increased sexual and gender-based violence, furthering the need not only for remediation and support services but also access to emergency contraception and other reproductive health services (66). COVID-19 has impacted health systems and services severely globally. It has also led to educational institutions' closure, public places for recreation, leisure, and impacted movement (67). The protracted closures across the world have led to increasing concerns around mental well-being and the availability/ accessibility of critical sexual and reproductive health services for adolescents in LMICs (68).

The Guttmacher institute predicted that with a hypothetical one-year 10% decline in the use of short and long-acting contraceptives in LMICs during the COVID-19 pandemic, 49 million women would lose their access to health services. They estimated that around 15 million unintended pregnancies might occur. This number can also lead to an additional 1.7 million delivery, 2.6 million newborns with significant complications, 168000 newborn deaths, and 28000 maternal mortality. The second hypothesis was that with a yearly 10% shift of safe abortion to unsafe abortion, an additional 3.3 unsafe abortions might occur in LMICs, and 1000 other maternal deaths in expected (62). We know that the impact is possibly more than a 10% decline in such services, as frontline partners have predicted a slip could be up to 80% (69). In India, by March 2020, compared to December 2019, a 36% decrease in injectable contraceptives and a 21% reduction in IUD insertion rate were reported. Simultaneously, the distribution of the condoms and oral cycle pills dipped 23% and 15%, respectively. The COVID-19 has interrupted the prevention programs and impacted the household economic status, resulting in 13 million child marriages and two million female genital mutilations in the next decade(53). The health record analysis showed a 68% reduction in HPV vaccination from February to early April 2020(70).

We aim to conduct a scoping review to map the range, extent, and nature of articles related to the effects of H1N1, Ebola virus, Zika virus, and SARS-COV-2 on sexual health and rights (SRHR) adolescents and youth in LMICs. Our goal is to identify current evidence in the literature, identify research gaps, and suggest future applicable types of research. The details pertaining to population, exposure, and outcomes are provided in table 1.

Objectives

The key research questions are:

- What is the existing evidence regarding the impact of the Zika virus outbreak on adolescents and youth SRHR in LMICs?
- What is the existing evidence regarding the impact of the H1N1/09 virus outbreak on adolescents and youth SRHR in LMICs?
- What is the existing evidence regarding the impact of the Ebola virus outbreak on adolescents and youth SRHR in LMICs?
- What is the existing evidence regarding the impact of the SARS-COV-2 virus outbreak on adolescents and youth SRHR in LMICs?

Table1. PICOS format in this review

PICOS framework for Systematic Reviews	
Population	Adolescents and youths living in LMICs ages 10-24 years
Intervention/exposure	SARS-COV-2, Zika, H1N1, and Ebola-related disruptions
Comparative /Control intervention	n/a
Outcome	SRHR (sexual well-being, sexual health and illness outcomes, reproductive health and illnesses, sexual and reproductive health services outcomes)
Study designs	All types of original articles

Method

We will use *PRISMA*-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) Statement to report the findings of our review (71).

Eligibility Criteria

Study designs:

We will include cross-sectional studies, case-control, cohort studies, clinical trials, and qualitative studies.

Participants/Population:

In the current review for full inclusiveness, we consider those aged 10-24 as adolescents and youth. Studies about youth and adolescents' SRHR) in LMICs are being investigated to study the impact of the outbreak of the Zika virus, Ebola virus, H1N1, and SARS-COV-2 on this target population.

Exposure/Intervention:

This study is designed to exclusively assess the impact of the Ebola virus, Zika virus, H1N1, and SARS-COV-2 on adolescents and youth SRHR in LMICs. The papers published since 2009 will be included.

Control:

There is no control group in this review.

Outcome

We will focus on the SRHR of adolescents and youth in LMICs. SRHR would consist of sexual well-being, sexual health, and illness outcomes, reproductive health, rights and illnesses, sexual and reproductive health services outcomes.

Our proposed outcome indicators inspired by the International Conference on Population and Development (ICPD) Programme of Action and sustainable development goal (SDG) 2030 (72, 73) are summarized in table 2.

Table2. The outcomes in our review

Category of outcome	Sub-category
A) **Contraception**	- The proportion of adolescent and youth have access to contraceptive agent or procedures during the outbreaks
B) **SRH Service Availability**	- The proportion of facilities providing SRHR services for adolescents and youth during the outbreaks - The proportion of health facilities providing post-abortion care and post-partum care for adolescent and youth and also services for those who have contracted HIV in our target group during the outbreaks
C) **Knowledge About SRHR**	- The proportion of adolescent and youth have basic knowledge on SRHR during the pandemics
D) **Adolescent Fertility**	- The adolescents and youth's birth rate during the outbreaks - The proportion of pregnancies related to those 24 years old and below during the outbreaks
E) **Quality of Care, Including Respect for Rights**	- The proportion of females are knowledgeable about side effects of their contraceptive method of choice and how to deal with adverse effects and also are familiar with other methods of contraception during the outbreaks - The universal access to contraceptives and SRHR information during outbreaks in national policy actions during the outbreaks - An indicator reflective of respectful care and human rights in the provision of SRH information and services during the outbreaks
F) **Prevention of Sexually Transmitted Infections**	- The rate of HPV vaccination during the epidemics
G) **Abortions:**	- Number of unsafe abortions during outbreaks - Number of facilities provide safe abortions services; or if it's illegal, the number of facilities providing the services when unsafe abortions become complicated during the outbreaks
H) **Comprehensive Sexuality Education**	- The proportion of school/facilities providing comprehensive sexual education during the outbreaks
I) **Gender Equality in SRHR**	- whether adolescents and youth's sexual autonomy within marriage is respected during the outbreaks

Timing:
The first significant outbreak of the third millennium was the H1N1/09 (swine flu) in 2009; hence, all the papers published since 2009 until 2021 will be included.

Setting:

Our study will focus on LMICs. Low- and middle-income countries (LMICs) were defined according to the 2020-2021 World Bank classification(74).

Language:

Our review compiles articles with no language restriction. We will use Google Translate for the primary translation of abstracts of non-English articles. In case the abstract of the article fits the scope of this review, we will request the experts in SRHR familiar with that specific language, e.g., Mandarin, to fully evaluate the paper based on the inclusion/exclusion criteria and finally extract the data. Alternatively, we will request official language translation centers to make the English version of the article for our evaluation.

Exclusion criteria

- all non-original papers will not be included.
- Those irrelevant to the SRHR
- Studies that do not include adolescents and youth (10-24 years old)
- Studies from countries not categorized as LMICs
- Those not relevant to Zika virus, Ebola Virus, H1N1/09, and SARS-COV-2 outbreaks.
- Full text is not available for evaluation
- If the sample size of a study would be a mixture of other ages besides 10-24, we will include it if data is disaggregated by age group or sub-group analysis on age 10-24. If they have included vivid results about this age group, we will consist of their study.
- Animal studies

Information Sources:

We will look at four databases in our review**:** Pubmed, Cochrane Library, Embase, and PsycINFO.

Search:

Table 3 (appendix 1) shows our proposed search strategy in Pubmed. Table 4-6 (appendix 1))is our search strategy for each of the other target databases (Cochrane Library, Embase, PsycINFO)

Selection of sources of evidence:

A four-step search strategy is being followed in this study. First, the authors have done a preliminary (and limited) search in several databases (Pubmed and Google Scholar) on this topic. We assessed the keywords, abstract, and several full texts to reach our study's final keywords. We discussed our search strategy multiple times until a consensus was reached by all authors reflected in the table of 3-8.

Following the duplication removal, title/abstract, and full-text screening of studies using RAYYAN (75), we will choose our relevant evidence considering the inclusion/exclusion criteria.

In the third step, we will check the articles' reference list to find more relevant studies. Finally, we will look for studies that have cited or included studies and check them for their eligibility. Any discrepancy would be addressed via discussion until consensus is reached in each stage. Two authors worked separately in all searching and extraction stages, and discrepancies would be resolved through discussion.

Data Charting Process:

After choosing the eligible papers, two authors will separately extract the required items based on the extraction excel sheet form designed and approved by researchers for the process.

Data items:

Following the selected papers' primary selection and inclusion and extracting the results, the tabulation phase begins. We will categorize the extracted data based on the items mentioned before. We will extract the following data: authors, year, country and continent (region of the study), study design, participants (differentiated by age and gender), purpose, and main findings. Any disagreements in the process of data extraction will be resolved through discussion until consensus. We will also indicate the country's income level where studies are being done (low, lower-middle, and higher-middle income).

Critical appraisal of individual sources of evidence and synthesis of result

Based on the nature of scoping review, we will neither synthesize the findings/results, nor critically appraise the papers, which is more applicable by performing a systematic review(76). However, publications and the mentioned data would be summarized and categorized.

Ethics and dissemination

As the nature of the work is a scoping review of the currently published papers in peer review journals, ethical approval is not required for this study. The results of the study will be presented in a peer-reviewed publication.

Authors' contribution: HA and MK developed the concept and wrote the early draft. RS,PS,MHT,PC,MRW,SK,IN edited the early draft. All authors approved the final version.

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PRISMA 2009 Flow Diagram for scoping reviews

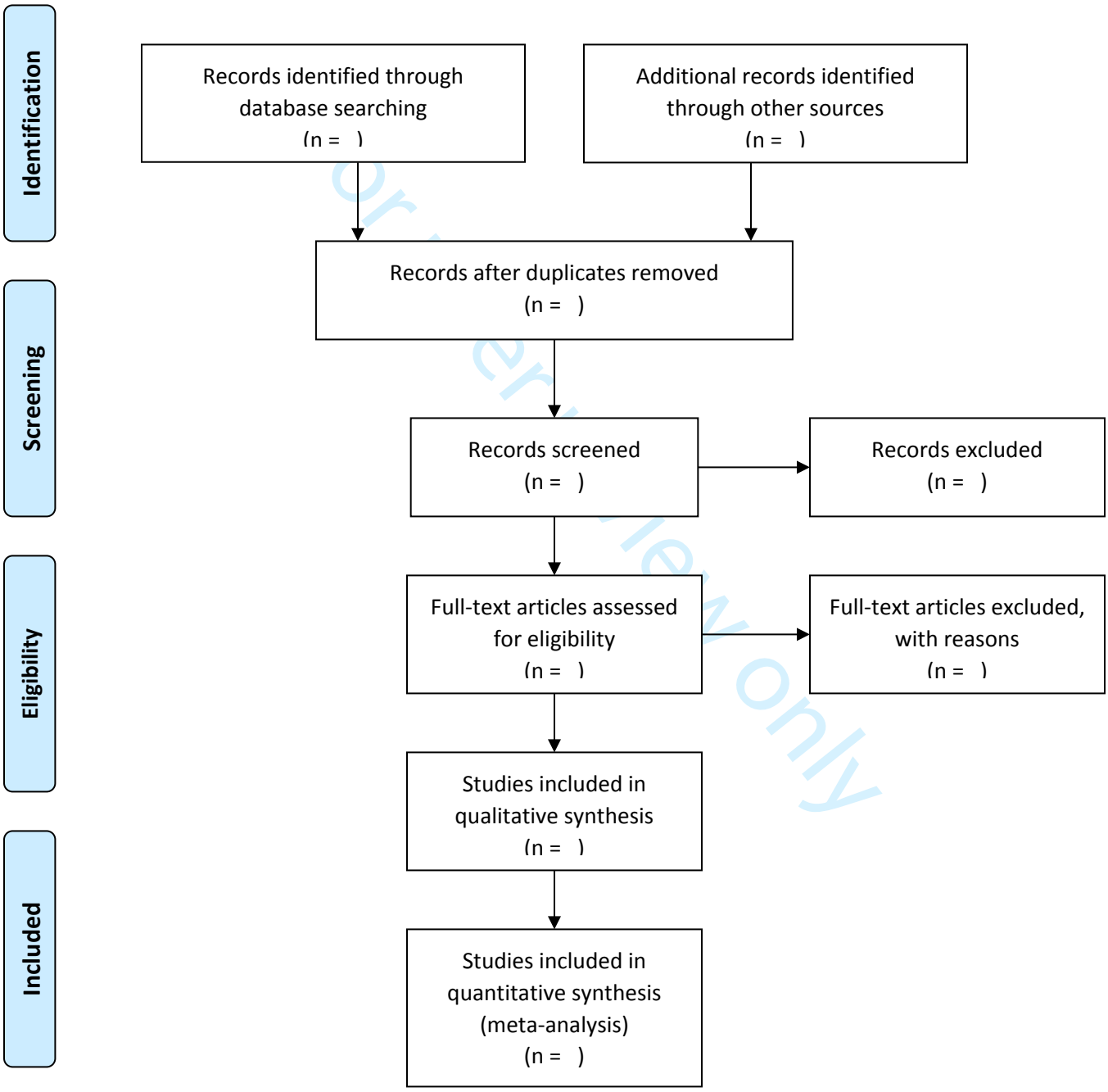

Diagram1. Flow chart of the review phases

Table 2. data charting table

Authors/year	Country and income level	Continent (geographical region)	Sample size and Median Participant age (10-14), (15-19), (20-24), and the gender	Study design	Purpose	Main Findings

Table3. Search in PUBMED/MEDLINE ***(Title/Abstract for all options)***

PUBMED	*Search terms in Pubmed*
Population	*("adolescen*"[Title/Abstract] OR "young"[Title/Abstract] OR "youth"[Title/Abstract] OR "teen"[Title/Abstract] OR "teenager"[Title/Abstract] OR "child"[Title/Abstract] OR "children"[Title/Abstract] OR "paediatr*"[Title/Abstract] OR "pediatr*"[Title/Abstract] OR "juvenil*"[Title/Abstract] OR "boy"[Title/Abstract] OR "boys"[Title/Abstract] OR "girl"[Title/Abstract] OR "girls"[Title/Abstract] OR "pubert*"[Title/Abstract] OR "pubescen*"[Title/Abstract] OR "Young Adult"[Title/Abstract] OR "Young Adults"[Title/Abstract] OR "Adolescent"[MeSH Terms] OR "Young Adult"[MeSH Terms])*
	AND
Exposure	*(((((("swine flu"[Title/Abstract] OR "H1N1"[Title/Abstract] OR "flu pandemic"[Title/Abstract] OR "Zika"[Title/Abstract] OR "Ebola"[Title/Abstract] OR "EVD"[Title/Abstract] OR "EHF"[Title/Abstract] OR "Ebola virus disease"[Title/Abstract] OR "Ebola hemorrhagic fever"[Title/Abstract] OR "COVID-19"[Title/Abstract] OR "SARS-COV-2"[Title/Abstract] OR "Novel Coronavirus"[Title/Abstract] OR "2019-nCov"[Title/Abstract]) OR ("SARS-CoV-2"[MeSH Terms])) OR ("hemorrhagic fever, ebola"[MeSH Terms])) OR (ebolavirus[MeSH Terms])) OR ("influenza a virus, h1n1 subtype"[MeSH Terms])) OR ("Zika virus"[MeSH Terms])*
	AND
Outcome (in SRHR)	*((("ASRH"[Title/Abstract] OR "SRH"[Title/Abstract] OR "SRHR"[Title/Abstract] OR "human right*"[Title/Abstract] OR "pregnan*"[Title/Abstract] OR "abort*"[Title/Abstract] OR "termination"[Title/Abstract] OR "antenatal"[Title/Abstract] OR*

	"postnatal"[Title/Abstract] OR "perinatal"[Title/Abstract] OR "couple"[Title/Abstract] OR "abuse"[Title/Abstract] OR "intercourse"[Title/Abstract] OR "rape"[Title/Abstract] OR "coerci*"[Title/Abstract] OR "violence"[Title/Abstract] OR "violation"[Title/Abstract] OR "incest"[Title/Abstract] OR "emergency pills"[Title/Abstract] OR "Long-acting reversible contraceptive"[Title/Abstract] OR "LARC"[Title/Abstract] OR "Misoprostol"[Title/Abstract] OR "mifepristone"[Title/Abstract] OR "methotrexate"[Title/Abstract] OR "meteneprost"[Title/Abstract] OR "prostaglandin"[Title/Abstract] OR "lilopristone"[Title/Abstract] OR "onapristone"[Title/Abstract] OR "oxytocin" [Title/Abstract] OR "sulprostone"[Title/Abstract] OR "family planning"[Title/Abstract] OR "sex education"[Title/Abstract] OR "STI"[Title/Abstract] OR "sexually transmitted infection"[Title/Abstract] OR "HPV vaccination"[Title/Abstract] OR "intimate partner violence"[Title/Abstract] OR "female genital mutilation"[Title/Abstract] OR "female genital cutting"[Title/Abstract] OR "FGM"[Title/Abstract] OR "maternal death"[Title/Abstract] OR "maternal morbidity"[Title/Abstract] OR "maternal mortality"[Title/Abstract] OR "newborn morbidity"[Title/Abstract] OR "newborn mortality"[Title/Abstract] OR "maternal care"[Title/Abstract] OR "newborn care"[Title/Abstract] OR "infant"[Title/Abstract] OR "infancy"[Title/Abstract] OR "stigma"[Title/Abstract] OR "taboo"[Title/Abstract] OR "Discrimination"[Title/Abstract] OR "GBV"[Title/Abstract] OR "gender"[Title/Abstract] OR "VAWG"[Title/Abstract] OR (sexual and gender disorders[MeSH Terms])) OR (sexual and gender minorities[MeSH Terms])) OR ("Adolescent sexual and reproductive health" OR "sexual and reproductive health" OR "Menstruation-Inducing Agents")*
	AND

Low and middle-income countries (96)	*((("low income countr*"[Title/Abstract] OR "middle income countr*"[Title/Abstract] OR "low middle income countr*"[Title/Abstract] OR "developing countr*"[Title/Abstract] OR "middle income countr*"[Title/Abstract] OR "LMIC"[Title/Abstract] OR "upper middle income countr*"[Title/Abstract] OR "Albania"[Title/Abstract] OR "American Samoa"[Title/Abstract] OR "Argentina"[Title/Abstract] OR "Armenia"[Title/Abstract] OR "Azerbaijan"[Title/Abstract] OR "Belarus"[Title/Abstract] OR "Belize"[Title/Abstract] OR "bosnia"[Title/Abstract] OR "Herzegovina"[Title/Abstract] OR "Botswana"[Title/Abstract] OR "Brazil"[Title/Abstract] OR "Bulgaria"[Title/Abstract] OR "China"[Title/Abstract] OR "Colombia"[Title/Abstract] OR "Costa Rica"[Title/Abstract] OR "Cuba"[Title/Abstract] OR "Dominica"[Title/Abstract] OR "Dominican Republic"[Title/Abstract] OR "Ecuador"[Title/Abstract] OR "Equatorial Guinea"[Title/Abstract] OR "Fiji"[Title/Abstract] OR "Gabon"[Title/Abstract] OR "Georgia"[Title/Abstract] OR "Grenada"[Title/Abstract] OR "Guatemala"[Title/Abstract] OR "Guyana"[Title/Abstract] OR "Indonesia"[Title/Abstract] OR "Iran"[Title/Abstract] OR "Iraq"[Title/Abstract] OR "Jamaica"[Title/Abstract] OR "Jordan"[Title/Abstract] OR "Kazakhstan"[Title/Abstract] OR "Kosovo"[Title/Abstract] OR "Lebanon"[Title/Abstract] OR "Libya"[Title/Abstract] OR "Malaysia"[Title/Abstract] OR "Maldives"[Title/Abstract] OR "Marshall Islands"[Title/Abstract] OR "Mexico"[Title/Abstract] OR "Montenegro"[Title/Abstract] OR "Namibia"[Title/Abstract] OR "North Macedonia"[Title/Abstract] OR "Paraguay"[Title/Abstract] OR "Peru"[Title/Abstract] OR "Russia"[Title/Abstract] OR "Samoa"[Title/Abstract] OR "Serbia"[Title/Abstract] OR "South Africa"[Title/Abstract] OR "Saint Lucia"[Title/Abstract] OR "saint Vincent"[Title/Abstract] OR "grenadines"[Title/Abstract] OR*

	"Suriname"[Title/Abstract] OR "Thailand"[Title/Abstract] OR "Tonga"[Title/Abstract] OR "Turkey"[Title/Abstract] OR "Turkmenistan"[Title/Abstract] OR "Tuvalu"[Title/Abstract] OR "Venezuela"[Title/Abstract] OR "lower middle income countr"[Title/Abstract] OR "Algeria"[Title/Abstract] OR "Angola"[Title/Abstract] OR "Bangladesh"[Title/Abstract] OR "Benin"[Title/Abstract] OR "Bhutan"[Title/Abstract] OR "Bolivia"[Title/Abstract] OR "Cabo Verde"[Title/Abstract] OR "Cambodia"[Title/Abstract] OR "Cameroon"[Title/Abstract] OR "Comoros"[Title/Abstract] OR "Congo"[Title/Abstract] OR "Cote d'Ivoire"[Title/Abstract] OR "Djibouti"[Title/Abstract] OR "Egypt"[Title/Abstract] OR "El Salvador"[Title/Abstract] OR "Eswatini"[Title/Abstract] OR "Ghana"[Title/Abstract] OR "Honduras"[Title/Abstract] OR "India"[Title/Abstract] OR "Kenya"[Title/Abstract] OR "Kiribati"[Title/Abstract] OR "Kyrgyz"[Title/Abstract] OR "Laos"[Title/Abstract] OR "Lesotho"[Title/Abstract] OR "Mauritania"[Title/Abstract] OR "Micronesia"[Title/Abstract] OR "Moldova"[Title/Abstract] OR "Mongolia"[Title/Abstract] OR "Morocco"[Title/Abstract] OR "Myanmar"[Title/Abstract] OR "Nepal"[Title/Abstract] OR "Nicaragua"[Title/Abstract] OR "Nigeria"[Title/Abstract] OR "Pakistan"[Title/Abstract] OR "Papua New Guinea"[Title/Abstract] OR "Philippines"[Title/Abstract] OR "Sao Tome"[Title/Abstract] OR "Principe"[Title/Abstract] OR "Senegal"[Title/Abstract] OR "Solomon Islands"[Title/Abstract] OR "Sri Lanka"[Title/Abstract] OR "Tanzania"[Title/Abstract] OR "Timor-Leste"[Title/Abstract] OR "Tunisia"[Title/Abstract] OR "Ukraine"[Title/Abstract] OR "Uzbekistan"[Title/Abstract] OR "Vanuatu"[Title/Abstract] OR "Vietnam"[Title/Abstract] OR "West*

	Bank"[Title/Abstract] OR "Gaza"[Title/Abstract] OR "Zambia"[Title/Abstract] OR "Zimbabwe"[Title/Abstract] OR "low-income country"[Title/Abstract] OR "Afghanistan"[Title/Abstract] OR "Burkina Faso"[Title/Abstract] OR "Burundi"[Title/Abstract] OR "Central African Republic"[Title/Abstract] OR "Chad"[Title/Abstract] OR "Congo"[Title/Abstract] OR "Eritrea"[Title/Abstract] OR "Ethiopia"[Title/Abstract] OR "Gambia"[Title/Abstract] OR "Guinea"[Title/Abstract] OR "Guinea-Bissau"[Title/Abstract] OR "North Korea"[Title/Abstract] OR "Korea Democratic People's Republic"[Title/Abstract] OR "Haiti"[Title/Abstract] OR "Liberia"[Title/Abstract] OR "Madagascar"[Title/Abstract] OR "Malawi"[Title/Abstract] OR "Mali"[Title/Abstract] OR "Mozambique"[Title/Abstract] OR "Niger"[Title/Abstract] OR "Rwanda"[Title/Abstract] OR "Sierra Leone"[Title/Abstract] OR "Somalia"[Title/Abstract] OR "South Sudan"[Title/Abstract] OR "Sudan"[Title/Abstract] OR "Syrian Arab Republic"[Title/Abstract] OR "Syria"[Title/Abstract] OR "Tajikistan"[Title/Abstract] OR "Togo"[Title/Abstract] OR "Yemen"[Title/Abstract]) OR ("africa"[MeSH Terms])) OR ("central america"[MeSH Terms])) OR ("middle east"[MeSH Terms])

Table 4. terms used in Embase

Abstract, title, and keywords for all option

Search	*Search terms*
Population	'adolescen*':ti,ab,kw OR 'young':ti,ab,kw OR 'youth':ti,ab,kw OR 'teen':ti,ab,kw OR 'teens':ti,ab,kw OR 'teenag*':ti,ab,kw OR 'child*':ti,ab,kw OR 'paediatr*':ti,ab,kw OR 'pediatr*':ti,ab,kw OR 'juvenil*':ti,ab,kw OR 'boy':ti,ab,kw OR 'boys':ti,ab,kw OR 'girl':ti,ab,kw OR 'girls':ti,ab,kw OR 'pubert*':ti,ab,kw OR 'pubescen*':ti,ab,kw
	AND
Exposure	'swine flu':ti,ab,kw OR 'h1n1':ti,ab,kw OR 'flu pandemic':ti,ab,kw OR 'zika':ti,ab,kw OR 'ebola':ti,ab,kw OR 'evd':ti,ab,kw OR 'ehf':ti,ab,kw OR 'ebola virus disease':ti,ab,kw OR 'ebola hemorrhagic fever':ti,ab,kw OR 'covid-19':ti,ab,kw OR 'sars-cov-2':ti,ab,kw OR 'novel coronavirus':ti,ab,kw OR '2019-ncov':ti,ab,kw
	AND
Outcome (in SRHR)	asrh:ti,ab,kw OR 'srh':ti,ab,kw OR 'srhr':ti,ab,kw OR 'human right*':ti,ab,kw OR 'pregnan*':ti,ab,kw OR 'abort*':ti,ab,kw OR 'termination':ti,ab,kw OR 'antenatal':ti,ab,kw OR 'postnatal':ti,ab,kw OR 'perinatal':ti,ab,kw OR 'couple*':ti,ab,kw OR 'abuse':ti,ab,kw OR 'intercourse':ti,ab,kw OR 'rape':ti,ab,kw OR 'coerci*':ti,ab,kw OR 'violence':ti,ab,kw OR 'violation':ti,ab,kw OR 'incest':ti,ab,kw OR 'emergency pills':ti,ab,kw OR 'long-acting reversible contraceptive':ti,ab,kw OR 'larc':ti,ab,kw OR 'misoprostol':ti,ab,kw OR 'mifepristone':ti,ab,kw OR 'methotrexate':ti,ab,kw OR 'meteneprost':ti,ab,kw OR 'prostaglandin':ti,ab,kw OR 'lilopristone':ti,ab,kw OR 'onapristone':ti,ab,kw OR oxytocin:ti,ab,kw OR 'sulprostone':ti,ab,kw OR 'family planning':ti,ab,kw OR 'sex education':ti,ab,kw OR 'sti':ti,ab,kw OR 'sexually transmitted infection':ti,ab,kw OR 'hpv vaccination':ti,ab,kw OR 'intimate partner violence':ti,ab,kw OR 'female genital mutilation':ti,ab,kw OR 'female genital cutting':ti,ab,kw OR 'fgm':ti,ab,kw OR 'maternal death':ti,ab,kw OR 'maternal morbidity':ti,ab,kw OR

	'maternal mortality':ti,ab,kw OR 'newborn morbidity':ti,ab,kw OR 'newborn mortality':ti,ab,kw OR 'maternal care':ti,ab,kw OR 'newborn care':ti,ab,kw OR 'infant':ti,ab,kw OR 'infancy':ti,ab,kw OR 'stigma':ti,ab,kw OR 'taboo':ti,ab,kw OR 'discrimination':ti,ab,kw OR 'gbv':ti,ab,kw OR 'gender':ti,ab,kw
	AND
Low and middle-income countries (96)	'low income countr*':ti,ab,kw OR 'low middle income countr*':ti,ab,kw OR 'developing countr*':ti,ab,kw OR 'middle income countr*':ti,ab,kw OR lmic:ti,ab,kw OR 'upper middle income countr*':ti,ab,kw OR 'albania':ti,ab,kw OR 'american samoa':ti,ab,kw OR 'argentina':ti,ab,kw OR 'armenia':ti,ab,kw OR 'azerbaijan':ti,ab,kw OR 'belarus':ti,ab,kw OR 'belize':ti,ab,kw OR 'bosnia':ti,ab,kw OR 'herzegovina':ti,ab,kw OR 'botswana':ti,ab,kw OR 'brazil':ti,ab,kw OR 'bulgaria':ti,ab,kw OR 'china':ti,ab,kw OR 'colombia':ti,ab,kw OR 'costa rica':ti,ab,kw OR 'cuba':ti,ab,kw OR 'dominica':ti,ab,kw OR 'dominican republic':ti,ab,kw OR 'ecuador':ti,ab,kw OR 'equatorial guinea':ti,ab,kw OR 'fiji':ti,ab,kw OR 'gabon':ti,ab,kw OR 'georgia':ti,ab,kw OR 'grenada':ti,ab,kw OR 'guatemala':ti,ab,kw OR 'guyana':ti,ab,kw OR 'indonesia':ti,ab,kw OR 'iran':ti,ab,kw OR 'iraq':ti,ab,kw OR 'jamaica':ti,ab,kw OR 'jordan':ti,ab,kw OR 'kazakhstan':ti,ab,kw OR 'kosovo':ti,ab,kw OR 'lebanon':ti,ab,kw OR 'libya':ti,ab,kw OR 'malaysia':ti,ab,kw OR 'maldives':ti,ab,kw OR 'marshall islands':ti,ab,kw OR 'mexico':ti,ab,kw OR 'montenegro':ti,ab,kw OR 'namibia':ti,ab,kw OR 'north macedonia':ti,ab,kw OR 'paraguay':ti,ab,kw OR 'peru':ti,ab,kw OR 'russia':ti,ab,kw OR 'samoa':ti,ab,kw OR 'serbia':ti,ab,kw OR 'south africa':ti,ab,kw OR 'saint lucia':ti,ab,kw OR 'saint vincent':ti,ab,kw OR 'grenadines':ti,ab,kw OR 'suriname':ti,ab,kw OR 'thailand':ti,ab,kw OR 'tonga':ti,ab,kw OR 'turkey':ti,ab,kw OR 'turkmenistan':ti,ab,kw OR 'tuvalu':ti,ab,kw OR 'venezuela':ti,ab,kw OR 'lower middle income countr*':ti,ab,kw OR 'algeria':ti,ab,kw

	OR 'angola':ti,ab,kw OR 'bangladesh':ti,ab,kw OR 'benin':ti,ab,kw OR 'bhutan':ti,ab,kw OR 'bolivia':ti,ab,kw OR 'cabo verde':ti,ab,kw OR cambodia:ti,ab,kw OR 'cameroon':ti,ab,kw OR 'comoros':ti,ab,kw OR 'cote divoire':ti,ab,kw OR 'Ivory Coast ':ti,ab,kw OR 'djibouti':ti,ab,kw OR 'egypt':ti,ab,kw OR 'el salvador':ti,ab,kw OR 'eswatini':ti,ab,kw OR 'ghana':ti,ab,kw OR 'honduras':ti,ab,kw OR 'india':ti,ab,kw OR 'kenya':ti,ab,kw OR 'kiribati':ti,ab,kw OR 'kyrgyz':ti,ab,kw OR 'laos':ti,ab,kw OR 'lesotho':ti,ab,kw OR 'mauritania':ti,ab,kw OR 'micronesia':ti,ab,kw OR 'moldova':ti,ab,kw OR 'mongolia':ti,ab,kw OR 'morocco':ti,ab,kw OR 'myanmar':ti,ab,kw OR 'nepal':ti,ab,kw OR 'nicaragua':ti,ab,kw OR 'nigeria':ti,ab,kw OR 'pakistan':ti,ab,kw OR 'papua new guinea':ti,ab,kw OR 'philippines':ti,ab,kw OR 'sao tome':ti,ab,kw OR 'principe':ti,ab,kw OR 'senegal':ti,ab,kw OR 'solomon islands':ti,ab,kw OR 'sri lanka':ti,ab,kw OR 'tanzania':ti,ab,kw OR 'timor-leste':ti,ab,kw OR 'tunisia':ti,ab,kw OR 'ukraine':ti,ab,kw OR 'uzbekistan':ti,ab,kw OR 'vanuatu':ti,ab,kw OR 'vietnam':ti,ab,kw OR 'west bank':ti,ab,kw OR 'gaza':ti,ab,kw OR 'zambia':ti,ab,kw OR 'zimbabwe':ti,ab,kw OR 'low-income country':ti,ab,kw OR 'afghanistan':ti,ab,kw OR 'burkina faso':ti,ab,kw OR 'burundi':ti,ab,kw OR 'central african republic':ti,ab,kw OR 'chad':ti,ab,kw OR 'congo':ti,ab,kw OR 'eritrea':ti,ab,kw OR 'ethiopia':ti,ab,kw OR 'gambia':ti,ab,kw OR 'guinea':ti,ab,kw OR 'guinea-bissau':ti,ab,kw OR 'north korea':ti,ab,kw OR 'korea democratic people republic':ti,ab,kw OR 'haiti':ti,ab,kw OR 'liberia':ti,ab,kw OR 'madagascar':ti,ab,kw OR 'malawi':ti,ab,kw OR 'mali':ti,ab,kw OR 'mozambique':ti,ab,kw OR 'niger':ti,ab,kw OR 'rwanda':ti,ab,kw OR 'sierra leone':ti,ab,kw OR 'somalia':ti,ab,kw OR 'south sudan':ti,ab,kw OR 'sudan':ti,ab,kw OR 'syrian arab republic':ti,ab,kw OR 'syria':ti,ab,kw OR 'tajikistan':ti,ab,kw OR 'togo':ti,ab,kw OR 'yemen':ti,ab,kw

Table 5. terms used in PsycINFO

abstract for all options

Search	*Search terms*
Population	ab(("Adolescen*" OR "young" OR "youth" OR "teen" OR "teenag*" OR "child" OR "children" OR "paediatr*" OR "pediatr*" OR "juvenil*" OR "boy*" OR "girl*" OR "pubert*" OR "pubescen*"))
	AND
Exposure	ab(("swine flu" OR "H1N1" OR "flu pandemic" OR "Zika" OR "Ebola" OR "EVD" OR "EHF" OR "Ebola virus disease" OR "Ebola hemorrhagic fever" OR "COVID-19" OR "SARS-COV-2" OR "Novel Coronavirus" OR "2019-nCov"))
	AND
Outcome (in SRHR)	ab((“ASRH” or “SRH” or “SRHR” or “human right*” or “pregnan*” or “abort*” or “termination” or “antenatal” or “postnatal” or “perinatal” or “couple*” or “abuse” or “intercourse” or “rape” or “coerci*” or “violence” or “violation” or “incest” or “emergency pills” or “Long-acting reversible contraceptive” or “LARC” or “Misoprostol” or “mifepristone” or “methotrexate” or “meteneprost” or “prostaglandin” or “lilopristone” or “onapristone” or “oxytocin” or “sulprostone” or “family planning” or “sex education” or “STI” or “sexually transmitted infection” or “HPV vaccination” or “intimate partner violence” or “female genital mutilation” or “female genital cutting” or “FGM” or “maternal death” or “maternal morbidity” or “maternal mortality” or “newborn morbidity” or “newborn mortality” or “maternal care” or “newborn care” or “infant” or “infancy” or “stigma” or “taboo” or “Discrimination” or “GBV” or “gender”
	AND

Low and middle-income countries (96)	ab(("low income countr*" OR "middle income countr*" OR "low middle income countr*" OR "developing countr*" OR "middle income countr*" OR "LMIC" OR "upper middle income countr*" OR "Albania" OR "American Samoa" OR "Argentina" OR "Armenia" OR "Azerbaijan" OR "Belarus" OR "Belize" OR "bosnia" OR "Herzegovina" OR "Botswana" OR "Brazil" OR "Bulgaria" OR "China" OR "Colombia" OR "Costa Rica" OR "Cuba" OR "Dominica" OR "Dominican Republic" OR "Ecuador" OR "Equatorial Guinea" OR "Fiji" OR "Gabon" OR "Georgia" OR "Grenada" OR "Guatemala" OR "Guyana" OR "Indonesia" OR "Iran" OR "Iraq" OR "Jamaica" OR "Jordan" OR "Kazakhstan" OR "Kosovo" OR "Lebanon" OR "Libya" OR "Malaysia" OR "Maldives" OR "Marshall Islands" OR "Mexico" OR "Montenegro" OR "Namibia" OR "North Macedonia" OR "Paraguay" OR "Peru" OR "Russia" OR "Samoa" OR "Serbia" OR "South Africa" OR "Saint Lucia" OR "saint Vincent" OR "grenadines" OR "Suriname" OR "Thailand" OR "Tonga" OR "Turkey" OR "Turkmenistan" OR "Tuvalu" OR "Venezuela" OR "lower middle income countr*" OR "Algeria" OR "Angola" OR "Bangladesh" OR "Benin" OR "Bhutan" OR "Bolivia" OR "Cabo Verde" OR "Cambodia" OR "Cameroon" OR "Comoros" OR "Congo" OR "Cote d'Ivoire" OR "Ivory Coast" OR "Djibouti" OR "Egypt" OR "El Salvador" OR "Eswatini" OR "Ghana" OR "Honduras" OR "India" OR "Kenya" OR "Kiribati" OR "Kyrgyz" OR "Laos" OR "Lesotho" OR "Mauritania" OR "Micronesia" OR "Moldova" OR "Mongolia" OR "Morocco" OR "Myanmar" OR "Nepal" OR "Nicaragua" OR "Nigeria" OR "Pakistan" OR "Papua New Guinea" OR "Philippines" OR "Sao Tome" OR "Principe" OR "Senegal" OR "Solomon Islands" OR "Sri Lanka" OR "Tanzania" OR "Timor-Leste" OR "Tunisia" OR "Ukraine" OR "Uzbekistan" OR "Vanuatu" OR "Vietnam" OR "West Bank" OR "Gaza" OR "Zambia" OR "Zimbabwe" OR "low-income country" OR "Afghanistan" OR "Burkina Faso" OR "Burundi" OR "Central African Republic" OR "Chad" OR "Congo" OR "Eritrea" OR "Ethiopia" OR "Gambia" OR "Guinea" OR "Guinea-Bissau" OR "North Korea" OR "Korea Democratic People's Republic" OR "Haiti" OR "Liberia" OR "Madagascar"

	OR "Malawi" OR "Mali" OR "Mozambique" OR "Niger" OR "Rwanda" OR "Sierra Leone" OR "Somalia" OR "South Sudan" OR "Sudan" OR "Syrian Arab Republic" OR "Syria" OR "Tajikistan" OR "Togo" OR "Yemen"))

Table 6. terms used in Cochrane library search abstract, title and keywords for all options

Search	*Search terms*
Population	((“Adolescen*” OR “young” OR “youth” OR “teen” OR “teenag*” OR “child” OR “children” OR “paediatr*” OR “pediatr*” OR “juvenil*” OR “boy*” OR “girl*” OR “pubert*” OR “pubescen*”)):ti,ab,kw
	AND
Exposure	(“swine flu” or “H1N1” or “flu pandemic” or “Zika” or “Ebola” or “EVD” or “EHF” or “Ebola virus disease” or “Ebola hemorrhagic fever” or “COVID19” or “SARSCOV2” or “Novel Coronavirus” or “2019nCov”):ti,ab,kw
	AND
Outcome (in SRHR)	(“ASRH” or “SRH” or “SRHR” or “human right*” or “pregnan*” or “abort*” or “termination” or “antenatal” or “postnatal” or “perinatal” or “couple*” or “abuse” or “intercourse” or “rape” or “coerci*” or “violence” or “violation” or “incest” or “emergency pills” or “Long acting reversible contraceptive” or “LARC” or “Misoprostol” or “mifepristone” or “methotrexate” or “meteneprost” or “prostaglandin” or “lilopristone” or “onapristone” or “oxytocin” or “sulprostone” or “family planning” or “sex education” or “STI” or “sexually transmitted infection” or “HPV vaccination” or “intimate partner violence” or “female genital mutilation” or “female genital cutting” or “FGM” or “maternal death” or “maternal morbidity” or “maternal mortality” or “newborn morbidity” or “newborn mortality” or “maternal care” or “newborn care” or “infant” or “infancy” or “Discrimination” or “GBV” or “gender”) :ti,ab,kw
	AND
Low and middle-income countries (96)	(“low income countr*” or “middle income countr*” or “low middle income countr*” or “developing countr*”

	or “middle income countr*” or “LMIC” or “upper middle income countr*” or “Albania” or “American Samoa” or “Argentina” or “Armenia” or “Azerbaijan” or “Belarus” or “Belize” or “bosnia” or “Herzegovina” or “Botswana” or “Brazil” or “Bulgaria” or “China” or “Colombia” or “Costa Rica” or “Cuba” or “Dominica” or “Dominican Republic” or “Ecuador” or “Equatorial Guinea” or “Fiji” or “Gabon” or “Georgia” or “Grenada” or “Guatemala” or “Guyana” or “Indonesia” or “Iran” or “Iraq” or “Jamaica” or “Jordan” or “Kazakhstan” or “Kosovo” or “Lebanon” or “Libya” or “Malaysia” or “Maldives” or “Marshall Islands” or “Mexico” or “Montenegro” or “Namibia” or “North Macedonia” or “Paraguay” or “Peru” or “Russia” or “Samoa” or “Serbia” or “South Africa” or “Saint Lucia” or “saint Vincent” or “grenadines” or “Suriname” or “Thailand” or “Tonga” or “Turkey” or “Turkmenistan” or “Tuvalu” or “Venezuela” or “lower middle income countr*” or “Algeria” or “Angola” or “Bangladesh” or “Benin” or “Bhutan” or “Bolivia” or “Cabo Verde” or “Cambodia“ or “Cameroon” or “Comoros” or “Congo” or “Cote d’Ivoire” or “Ivory Coast” or “Djibouti” or “Egypt” or “El Salvador” or “Eswatini” or “Ghana” or “Honduras” or “India” or “Kenya” or “Kiribati” or “Kyrgyz” or “Laos” or “Lesotho” or “Mauritania” or “Micronesia” or “Moldova” or “Mongolia” or “Morocco” or “Myanmar” or “Nepal” or “Nicaragua” or “Nigeria” or “Pakistan” or “Papua New Guinea” or “Philippines” or “Sao Tome” or “Principe” or “Senegal” or “Solomon Islands” or “Sri Lanka” or “Tanzania” or “Timor Leste” or “Tunisia” or “Ukraine” or “Uzbekistan” or “Vanuatu” or “Vietnam” or “West Bank” or “Gaza” or “Zambia” or “Zimbabwe” or “low income country” or “Afghanistan” or “Burkina Faso” or “Burundi” or “Central African Republic” or “Chad” or “Congo” or “Eritrea” or “Ethiopia” or “Gambia” or “Guinea” or “Guinea Bissau” or “North Korea” or “Korea Democratic People’s Republic” or “Haiti” or “Liberia” or “Madagascar” or “Malawi” or “Mali” or “Mozambique” or “Niger” or “Rwanda” or “Sierra Leone” or “Somalia” or “South Sudan” or “Sudan” or “Syrian Arab Republic” or “Syria” or “Tajikistan” or “Togo” or “Yemen”):ti,ab,kw

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The impact of major disease outbreaks in the third millennium on adolescent and youth sexual and reproductive health and rights in Low and/or Middle Income Countries: a systematic scoping review protocol

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The impact of major disease outbreaks in the third millennium on adolescent and youth sexual and reproductive health and rights in Low and/or Middle Income Countries: a systematic scoping review protocol

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Abstract

Introduction

Sexual and Reproductive Health and Rights (SRHR) of young people continue to present a high burden and remain underinvested. This is more so in lower and middle-income countries (LMICs), where empirical evidence reveals disruption of SRHR maintenance, need for enhancement of programs, resources, and services during pandemics. Despite the importance of the subject, there is no published review yet combining recent disease outbreaks such as (H1N1/09, Zika, Ebola, and SARS-COV-2) to assess their impact on adolescents and youth SRHR in LMICs.

Methods and Analysis

We will adopt a four-step search to reach the maximum possible number of studies. In the first step, we had a limited/preliminary investigation in databases for getting relevant keywords (appendix1). Secondly, we will search in four databases: Pubmed, Cochrane Library, Embase, and PsycINFO. The search would begin from the inception of the first major outbreak in 2009 (H1N1/09) up to the date of publication of the protocol in early 2022. We will search databases using related keywords, screen title/abstract, and review full texts of the selected titles to arrive at the list of eligible studies. In the third stage, we will check their eligibility to the included article's reference list. In the fourth stage, we will check the citations of included papers in phase 2 to complete our study selection. We will include all types of original studies and without any language restriction in our final synthesis. Our review results will be charted for each pandemic separately and include the details related to authors, year, country, region of the study, study design, participants (disaggregated by age and gender), purpose, and report associated SRHR outcomes. The review will adhere to the PRISMA-ScR guideline.

Patient and public involvement

Patients or public were not involved in this study.

Ethics and dissemination

Ethical assessment is not required for this study. The results of the study will be presented in peer-reviewed publications and conferences on adolescent SRHR.

Strengths and limitations of our study

Strengths

- ✓ Our systematic scoping review protocol minimizes the possibility of duplications, and engages a stringent peer-review process to arrive at meaningful search outcomes around SRHR impacts.
- ✓ Our strategy will include four steps of searching and sifting through studies, maximizing our effort to reach all eligible studies.
- ✓ Using International Conference on Population and Development (ICPD) as our guiding framework to elicit key outcomes, we will to study adolescent SRHR rigorously and insightfully.

Limitations

- There could be other localized and globally impacting diseases outbreaks to consider other than what we focused on that merit further scrutiny.

Introduction

The beginning of sexual maturation differs based on sex, country, culture and religious context (1). We know that adolescents are accessing services earlier, but the use of these services tends to be inconsistent (2). The risk of neglecting the adolescent sexual and reproductive health (ASRH) could impose a life-lasting impact on them. For females, adolescent pregnancy and motherhood may be mentally and physically challenging (3, 4). It may also impede further academic and educational achievements and economic potential (5). There is a high risk of sexually transmitted infections (STIs), including HIV, reproductive coercion, and violence in both sexes, with severe impacts seen especially for girls.(6). In 2016, it was found that 15-19 years old adolescents in developing countries had over 21 million pregnancies, and approximately than half of them (12 million) resulted in child delivery (7). The number of unintended pregnancies in girls between 15-19 years were around ten million, and about 55% of these unintended pregnancies resulted in abortion (8, 9). Nearly 70% of the total abortion attempts at the ages of 15-19 leads to unsafe abortions that can trigger catastrophic health effects (9). In the Global Burden of Disease (GBD) 2015 report, the maternal mortality rate (MMR) was highest in 10-14 years old girls. The ratio was as high as 278/100,000 (95% UI 229–339) (10). Additionally, pregnancy and delivery-related complications cause more mortality in 15-19 years old girls than other age groups (11).

Research question:

What is the existing evidence regarding the impact of the Zika virus, H1N1/09, Ebola and SARS- COV-2outbreaks on adolescents and youth SRHR in LMICs?

Value of the proposed review: Adolescents and young people have SRHR needs that become neglected and more complex during the disasters and outbreaks (12). Besides this, we have to underscore that their life experience is limited, and their decision-making abilities are still evolving. Consequently, their coping mechanisms and judgment capabilities to navigate complex circumstances triggered by these extraordinary disease outbreaks are also limited. Despite this developmental challenge, these crises offer a belated opportunity for Governments to fill the gaps in sex education and provide access to contraceptives, safer motherhood, safer abortion, and empowerment programs to address inequities in SRHR and protect vulnerable adolescents in time. If governments do not take such opportunities, future outbreaks can further compound the public health burden, including exacerbation of mental health issues, gender inequalities, and social injustices in society. We know that these social determinants of adolescent health are tied together, and this review will help understand the existing evidence and gaps. We have prioritized studying four significant outbreaks since 2000: swine flu virus (H1N1/09), Ebola virus, Zika virus, and SARS-COV-2 and their impacts on the SRHR of young and adolescents in LMICs.

Influenza (H1N1/09) :

On the first July 2009, the World Health Organization acknowledged that the influenza outbreak had become pandemic and called it the Pandemic H1N1/09 virus, popularly known as "swine flu". Pregnant women were considered a high-risk group for H1/N1, as there was a higher rate of spontaneous abortion, preterm birth, low birth weight, fetal disease, as well as increased hospitalization and maternal death (13,14, 15). In a study at the outset of the pandemic in Australia and New Zealand, 9% of patients admitted to the Intensive Care Units (ICUs) were pregnant, a high proportion, given that 1% of the Australasian population were pregnant (16). A global pooled analysis revealed that pregnant women had a 3.5-25.3 fold higher risk of hospitalization compared to non-pregnant women of childbearing age(17). Due to the high mortality and morbidity rate in for pregnant women, vaccination of pregnant women was prioritized. However, studies show that poor vaccine uptake in pregnant women possibly a result of concerns regarding adverse effects (18, 19). Despite multiple studies showing that influenza vaccines are safe and have no significant threat to pregnancy, including spontaneous abortion, still birth and congenital malformations (20-22).

Zika Virus:

In March 2015, a group of patients were admitted in Brazil with rash, fatigue, and arthralgia, caused by the Zika Virus. In October that year, a few reports showed that the mother-newborn transmission of the virus (23) might lead to fetal loss, preterm delivery, and microcephalic (small head) babies, cumulatively known as congenital Zika syndrome (CZS) (24). Case reports showed high semen viral load, 10,000 times higher in semen than in blood in one case (25, 26). The transmission of the virus in humans is via sexual contact, blood transfusion, and organ transplantation (27-29). Combining the sexual transmission of the virus between partners and vertical transmission to the fetus, the WHO recommendations were adoption of safer sex practices, abstinence during pregnancy and emergency contraception (23). To date, a total of 86 countries have reported evidence of Zika infection (30).

In mid-January 2016, the health ministers of multiple Latin American countries recommended postponing pregnancy for at least 6-24 months. This seemed too idealistic and unrealistic, as more than half of the region's pregnancies have been unintended (31). In addition, inadequate sex education, difficulty accessing contraception, high rape prevalence, and local cultural constraints resulted in many women not adopting proper advice (32). Latin American countries have a relatively wide range of restrictive laws in SRHR. In El-Salvador, a self-induced abortion may lead to a penalty as high as 40 years of incarceration (33). On the other hand, in response to the Zika virus, the Columbian Ministry of Health declared that women have the right to have self-induced miscarriages. Nevertheless, due to poor education and scarcity of information, women are not well informed about the risk and their abortion rights(32). This was reflected by the fact that the rate of contraception usage did not change in Columbia during the outbreak in 2015-2016 (34).

Ebola virus:

Ebola hemorrhagic fever (EHF) is one of the fatal outbreaks within history. By the end of 2016, an estimated 11310 deaths resulted from 28618 definite cases, a staggering 40% mortality (35). The transmission route is through contact with infected patient's blood or secretions and direct contact (mucus membrane and injured cutaneous tissue). Even after recovery, the virus may exist in the semen of cases for up to 7 weeks later (36). Burial ceremonies that require direct contact with the dead bodies contribute to Ebola transmission (37). The latter endangers females as they have significant roles in the ceremony. Pregnant women can also transmit the virus to their babies either in-utero or through breastmilk (38-40).

In the past century, multiple outbreaks of the Ebola virus occurred; the first one was in Zaire (currently known as the Democratic Republic of the Congo) and Sudan in 1976. The second outbreak occurred in Sudan around 1979. The third epidemic was in Gabon,1996. In this century, Northern Uganda faced the fourth epidemic in the fall of 2000. The 2014-2016 Ebola virus epidemic was the largest outbreak of the Ebola, considered a pandemic (41, 42). The outset was from Guinea and then moved to other countries such as Liberia and Sierra Leone. The current outbreak (2018- now) in the eastern Democratic Republic of Congo (DRC) is the last reported outbreak(43).

WHO Advisory Group on the Ebola Virus Disease Response recommended that the male who survived the Ebola virus disease (EVD) practice hygiene and safer sex until one year from symptom beginning or after two negative semen specimens for the Ebola virus. In some patients after recovery, Ebola Virus can persist in several tissues, such as testicles, the eye, and the central nervous system (44). In women who have contracted the disease during pregnancy, the virus remains in the placenta, amniotic fluid, and fetus. In those women who have been infected during breastfeeding, the virus could persist in breast milk (38, 45-50).

Ebola revealed many problems in adolescence SRHR in Africa (51). It is well-established that in humanitarian crises and disasters, women and girls are more vulnerable to gender-based violence (GBV) (52, 53). Multiple studies showed that in Sierra Leone, during the Ebola outbreak, the rate of adolescent pregnancy, rape, sexual and gender-based violation increased (51, 54, 55). United Nations Department of Political Affairs (UNDPA) estimates that the teenage pregnancy rate increased by 65% during the outbreak (56). More girls were forced into prostitution/transactional sex due to family members' loss and financial insecurity(57). This makes the girls twice victims, as pregnant girls are forbidden to attend school in Libera and Sierra Leone (58). In Sierra-Leone, Ebola increased the fear of clinic attendance and impacted newborn and maternal care by disrupting the health services. This led to 549 maternal deaths, 2161 neonatal deaths and 883 still births in the year 2014-15 (59). The studies showed that even after pandemics in Liberia and Sierra-Leone, the level of contraceptive care and family planning had returned or exceeded the baseline level after 6 months (60) to 24 months (61). After six months of the outbreak in Guinea, the number of family planning sessions and prenatal care visits did not reverse to the prior level, harshly influencing the already insufficient care level (60).

SARS COV-2 :

In late 2019, multiple patients were diagnosed with a pneumonia-causing virus. Numerous subsequent studies showed a beta-coronidae family virus named "SARS-COV-2" by WHO to be the causative agent. In March 2020, the WHO declared SARS-COV-2 a pandemic and called the disease "coronavirus disease of 2019", or simply "COVID-19". Currently, there is no substantial evidence that the virus is transmitted sexually or through breastfeeding. The possibility of vertical transmission is controversial. However, a recently published systematic review and meta-analysis suggest that a minority of pregnant women can transmit the virus to newborns (62).

As the COVID-19 escalated, many countries adopted lockdown measures to mitigate the virus spread. The pandemic disrupted the supply chain of key contraceptive commodities (63). In practice, most Governments categorized sexual and reproductive health (SRH) services as non-essential and forced them to close. In late April 2020, United Nations Population Fund (UNFPA) predicted an estimated 7 million unintended pregnancies would occur (64), as a result of lack of access to SRH services like contraception and safe abortion care and time-sensitive potentially lifesaving services (65).

COVID-19 has forced nearly 1.4 billion children and youths out of school/university, including 743 million girls globally (66). This has raised concerns around long-term impact on their lives. As in addition to increasing poverty levels they might also experience increased sexual and gender-based violence, furthering the need not only for remediation and support services but also access to emergency contraception and other reproductive health services (67). COVID-19 has impacted health systems and services severely globally. It has also led to closure of educational institutions', public places for recreation and leisure, and has impacted movement (68). The protracted closures across the world have increased concerns around mental well-being and the availability/ accessibility of critical sexual and reproductive health services for adolescents in LMICs (69).

The Guttmacher institute predicted that with a hypothetical one-year 10% decline in the use of short and long-acting contraceptives in LMICs during the COVID-19 pandemic, 49 million women would lose their access to contraception of their choice. They estimated that around 15 million unintended pregnancies might occur, leading to an additional 1.7 million deliveries, 2.6 million newborns with significant complications, 168000 newborn deaths, and 28000 maternal deaths. The second hypothesis was that with a yearly 10% shift of safe abortion to unsafe abortion, an additional 3.3 unsafe abortions might occur in LMICs, and 1000 maternal deaths are expected (63). We know that the impact is possibly more than a 10% decline in such services, as frontline partners have predicted a slip could be up to 80% (70). In India, by March 2020, compared to December 2019, a 36% decrease in injectable contraceptives use and a 21% reduction in IUD insertion were reported. Simultaneously, the distribution of the condoms and oral contraceptive pills dipped 23% and 15%, respectively. The COVID-19 has interrupted the prevention programs and impacted the household economic status, and is expected to result to 13 million child marriages and two million female genital mutilations in the next decade(54). The health record analysis showed a 68% reduction in HPV vaccination from February to early April 2020(71).

We aim to conduct a scoping review to map the range, extent, and nature of effects of H1N1, Ebola virus, Zika virus, and SARS-COV-2 on SRHR among adolescents and youth in LMICs. Our goal is to identify current evidence in the literature, identify research gaps, and suggest future research. The details pertaining to population, exposure, and outcomes are provided in Table 1. Our data charting table is also available in appendix1 (Table A-1).

Objective

What is the existing evidence regarding the impact of theH1N1/09, Ebola, Zika virus and SARS-COV-2 outbreaks on adolescents and youth SRHR in LMICs?

Table1. PICOS format in this review

PICOS framework for Systematic Reviews	
Population	Adolescents and youths living in LMICs ages 10-24 years
Intervention/exposure	SARS-COV-2, Zika, H1N1, and Ebola-related disruptions
Comparative /Control intervention	n/a
Outcome	SRHR (sexual well-being, sexual health and illness outcomes, reproductive health and illnesses, sexual and reproductive health services outcomes)
Study designs	All types of original articles

Method

We will use *PRISMA*-ScR (Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews) Statement ,showed in appendix figure 1, to report the findings of our review (72).

Patient and public involvement

Patients or public were not involved in this study.

Eligibility Criteria Study designs:

We will include cross-sectional studies, case-control, cohort studies, clinical trials, and qualitative studies.

Participants/Population:

As per WHO definition of young people we are considering ages 10-24 to denote adolescents and youth.

Exposure/Intervention:

This study is designed to assess the impact of the H1N1/0, Ebola virus and Zika virus, and SARS-COV-2 on adolescents and youth SRHR in LMICs. The review will include work published after 2009

Category of outcome	Sub-category
A) **Contraception**	- The proportion of adolescent and youth have access to contraceptive agent or procedures during the outbreaks
B) **SRH Service Availability and Access**	- The proportion of facilities providing SRHR services for adolescents and youth during the outbreaks - The proportion of health facilities providing post-abortion care and post-partum care for adolescent and youth and also services for those who have contracted HIV in our target group during the outbreaks
C) **Knowledge About SRHR**	- The proportion of adolescent and youth have basic knowledge on SRHR during the pandemics
D) **Adolescent Fertility**	- The adolescents and youth's birth rate during the outbreaks - The proportion of pregnancies related to those 24 years old and below during the

Control:

There is no control group in this review.

Outcome

We will focus on the SRHR of adolescents and youth in LMICs. SRHR would consist of sexual and reproductive health access and services outcomes, sexual health and well-being, and illness outcomes, reproductive health, reproductive health, rights and illnesses, sexual and reproductive health access and services outcomes.

Our proposed outcome indicators inspired by the International Conference on Population and Development (ICPD) Programme of Action and sustainable development goal (SDG) 2030 (73, 74) are summarized in table 2.

Table 2. The outcomes in our review

	outbreaks
E) **Quality of Care, Including Respect for Rights**	- The proportion of females are knowledgeable about side effects of their contraceptive method of choice and how to deal with adverse effects and also are familiar with other methods of contraception during the outbreaks - The universal access to contraceptives and SRHR information during outbreaks in national policy actions during the outbreaks - An indicator reflective of respectful care and human rights in the provision of SRH information and services during the outbreaks
F) **Prevention of Sexually Transmitted Infections**	- The rate of HPV vaccination during the epidemics
G) **Abortions:**	- Number of unsafe abortions during outbreaks - Number of facilities provide safe abortions services; or if it's illegal, the number of facilities providing the services when unsafe abortions become complicated during the outbreaks
H) **Comprehensive Sexuality Education**	- The proportion of school/facilities providing comprehensive sexual education during the outbreaks
I) **Gender Equality in SRHR**	- whether adolescents and youth's sexual autonomy within marriage is respected during the outbreaks

Timing:

The first significant outbreak of the third millennium was the H1N1/09 (swine flu) in 2009; hence, all the papers published from 2009 until 2021 will be included.

Setting:

Our study will focus on LMICs. Low- and middle-income countries (LMICs) were defined according to the 2020-2021 World Bank classification(75).

Language:

Our review compiles articles with no language restriction. We will use Google Translate for the primary translation of abstracts of non-English articles. In case the abstract of the article fits the scope of this review, we will request the experts in SRHR familiar with that specific language, to evaluate the paper based on the inclusion/exclusion criteria and extract the data. Alternatively, we will request official language translation centers to make the English version of the article for our evaluation.

Exclusion criteria

- all non-original papers
- Those irrelevant to the SRHR
- Studies that do not include adolescents and youth (10-24 years old)
- Studies from countries not categorized as LMICs
- Those not relevant to Zika virus, Ebola Virus, H1N1/09, and SARS-COV-2 outbreaks.
- Full text is not available for evaluation
- If the population comprises of other ages besides 10-24, we will include it if data is disaggregated by age group or sub-group analysis on age 10-24. If they have included vivid results about this age group, we will consist of their study.
- Animal studies

Information Sources:

We will look at four databases in our review**:** Pubmed, Cochrane Library, Embase, and PsycINFO.

Search:

Table A-2 (appendix 1) shows our proposed search strategy in Pubmed. Tables A-3 to A-5 (appendix 1) is our search strategy for each of the other target databases (Cochrane Library, Embase, PsycINFO)

Selection of sources of evidence:

A four-step search strategy is being followed in this study. First, the authors have done a preliminary (and limited) search in several databases (Pubmed and Google Scholar) on this topic. We assessed the keywords, abstract, and several full texts to reach our study's final keywords. We discussed our search strategy multiple times until all authors reached a consensus reflected in Tables 3-8. Following the duplication removal, title/abstract, and full-text screening of studies using RAYYAN (76), we will choose our relevant evidence considering the inclusion/exclusion criteria.

In the third step, we will check the articles' reference lists to find more relevant studies. Finally, we will look for studies that have cited or included studies and check them for their eligibility. Any discrepancy would be addressed via discussion until consensus is reached in each stage.

Two authors worked separately in all searching and extraction stages, and discrepancies would be resolved through discussion.

Data Charting Process:

After choosing the eligible papers, two authors will separately extract the required items based on the extraction excel sheet form designed and approved by researchers for the process.

Data items:

Following the selected papers' primary selection and inclusion and extracting the results, the tabulation phase begins. We will categorize the extracted data based on the items mentioned before. We will extract the following data: authors, year, country and continent (region of the study), study design, participants (differentiated by age and gender), purpose, and main findings. Any disagreements in the process of data extraction will be resolved through discussion until consensus. We will also indicate the country's income level where studies are being done (low, lower-middle, and higher-middle income).

Critical appraisal of individual sources of evidence and synthesis of result

Based on the nature of scoping review, we will neither synthesize the findings/results, nor critically appraise the papers, which is more applicable by performing a systematic review(77). However, publications and the mentioned data would be summarized and categorized.

Ethics and dissemination

As the nature of the work is a scoping review of the currently published papers in peer review journals, ethical approval is not required for this study. The results of the study will be presented in a peer-reviewed publication.

Authors' contribution: HA and MK developed the concept and wrote the early draft. RS, PS ,MHT, PC, MRW, SK, IN and MB edited the early draft. All authors approved the final version.

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Competing interest: none

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Figure 1 PRISMA flow chart

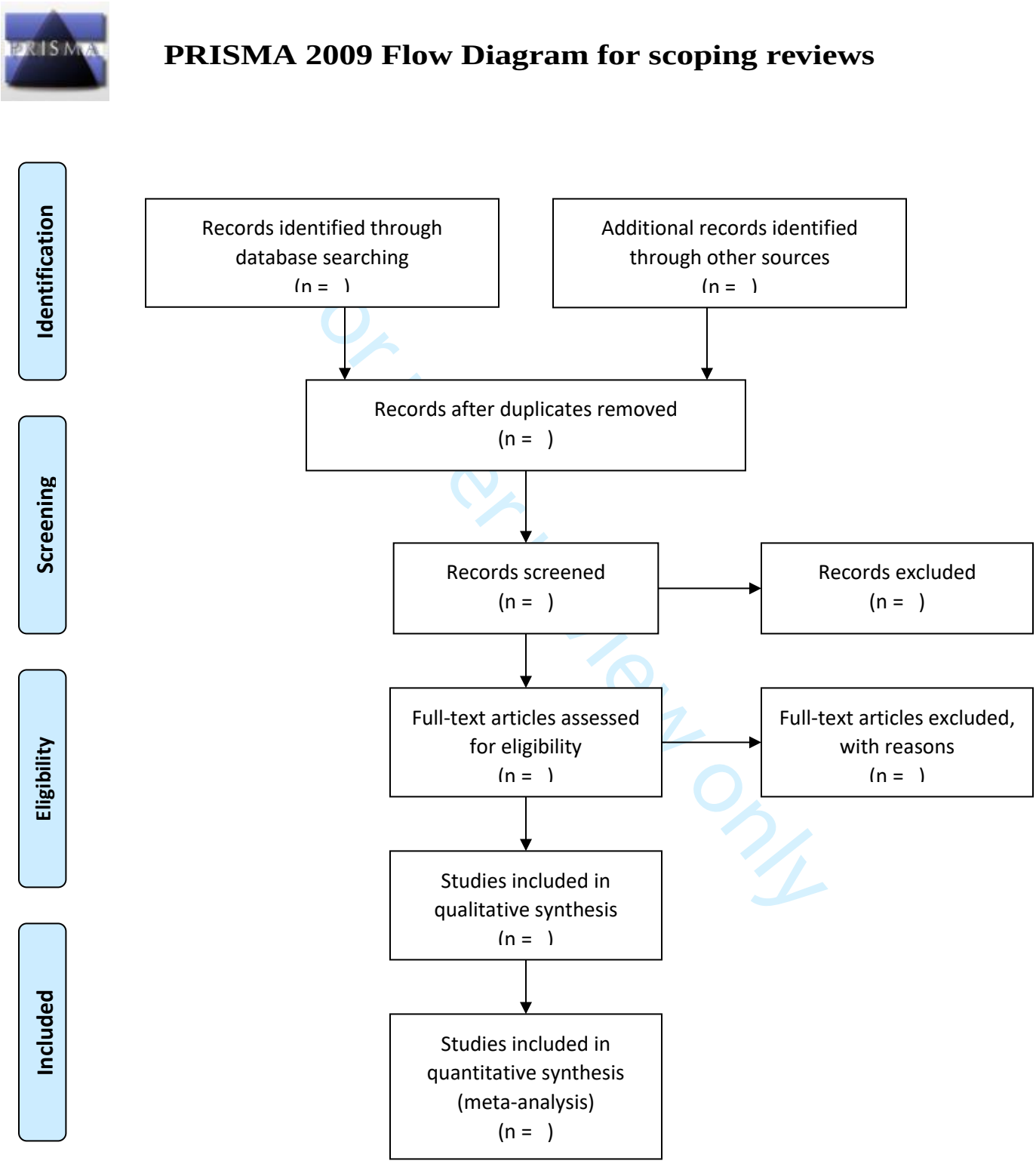

Diagram1. Flow chart of the review phases (98)

Table A-1. data charting table

Authors/year	Country and income level	Continent (geographical region)	Sample size and Median Participant age (10-14), (15-19), (20-24), and the gender	Study design	Purpose	Main Findings

TableA-2. Search in PUBMED/MEDLINE ***(Title/Abstract for all options)***

PUBMED	*Search terms in Pubmed*
Population	*("adolescen*"[Title/Abstract] OR "young"[Title/Abstract] OR "youth"[Title/Abstract] OR "teen"[Title/Abstract] OR "teenager"[Title/Abstract] OR "child"[Title/Abstract] OR "children"[Title/Abstract] OR "paediatr*"[Title/Abstract] OR "pediatr*"[Title/Abstract] OR "juvenil*"[Title/Abstract] OR "boy"[Title/Abstract] OR "boys"[Title/Abstract] OR "girl"[Title/Abstract] OR "girls"[Title/Abstract] OR "pubert*"[Title/Abstract] OR "pubescen*"[Title/Abstract] OR "Young Adult"[Title/Abstract] OR "Young Adults"[Title/Abstract] OR "Adolescent"[MeSH Terms] OR "Young Adult"[MeSH Terms])*
	AND
Exposure	*(((((("swine flu"[Title/Abstract] OR "H1N1"[Title/Abstract] OR "flu pandemic"[Title/Abstract] OR "Zika"[Title/Abstract] OR "Ebola"[Title/Abstract] OR "EVD"[Title/Abstract] OR "EHF"[Title/Abstract] OR "Ebola virus disease"[Title/Abstract] OR "Ebola hemorrhagic fever"[Title/Abstract] OR "COVID-19"[Title/Abstract] OR "SARS-COV-2"[Title/Abstract] OR "Novel Coronavirus"[Title/Abstract] OR "2019-nCov"[Title/Abstract]) OR ("SARS-CoV-2"[MeSH Terms])) OR ("hemorrhagic fever, ebola"[MeSH Terms])) OR (ebolavirus[MeSH Terms])) OR ("influenza a virus, h1n1 subtype"[MeSH Terms])) OR ("Zika virus"[MeSH Terms])*
	AND
Outcome (in SRHR)	*((("ASRH"[Title/Abstract] OR "SRH"[Title/Abstract] OR "SRHR"[Title/Abstract] OR "human right*"[Title/Abstract] OR "pregnan*"[Title/Abstract] OR "abort*"[Title/Abstract] OR "termination"[Title/Abstract] OR "antenatal"[Title/Abstract] OR*

	"postnatal"[Title/Abstract] OR "perinatal"[Title/Abstract] OR "couple"[Title/Abstract] OR "abuse"[Title/Abstract] OR "intercourse"[Title/Abstract] OR "rape"[Title/Abstract] OR "coerci*"[Title/Abstract] OR "violence"[Title/Abstract] OR "violation"[Title/Abstract] OR "incest"[Title/Abstract] OR "emergency pills"[Title/Abstract] OR "Long-acting reversible contraceptive"[Title/Abstract] OR "LARC"[Title/Abstract] OR "Misoprostol"[Title/Abstract] OR "mifepristone"[Title/Abstract] OR "methotrexate"[Title/Abstract] OR "meteneprost"[Title/Abstract] OR "prostaglandin"[Title/Abstract] OR "lilopristone"[Title/Abstract] OR "onapristone"[Title/Abstract] OR "oxytocin" [Title/Abstract] OR "sulprostone"[Title/Abstract] OR "family planning"[Title/Abstract] OR "sex education"[Title/Abstract] OR "STI"[Title/Abstract] OR "sexually transmitted infection"[Title/Abstract] OR "HPV vaccination"[Title/Abstract] OR "intimate partner violence"[Title/Abstract] OR "female genital mutilation"[Title/Abstract] OR "female genital cutting"[Title/Abstract] OR "FGM"[Title/Abstract] OR "maternal death"[Title/Abstract] OR "maternal morbidity"[Title/Abstract] OR "maternal mortality"[Title/Abstract] OR "newborn morbidity"[Title/Abstract] OR "newborn mortality"[Title/Abstract] OR "maternal care"[Title/Abstract] OR "newborn care"[Title/Abstract] OR "infant"[Title/Abstract] OR "infancy"[Title/Abstract] OR "stigma"[Title/Abstract] OR "taboo"[Title/Abstract] OR "Discrimination"[Title/Abstract] OR "GBV"[Title/Abstract] OR "gender"[Title/Abstract] OR "VAWG"[Title/Abstract] OR (sexual and gender disorders[MeSH Terms])) OR (sexual and gender minorities[MeSH Terms])) OR ("Adolescent sexual and reproductive health" OR "sexual and reproductive health" OR "Menstruation-Inducing Agents")*
AND	

Low and middle-income countries (96)	*((("low income countr*"[Title/Abstract] OR "middle income countr*"[Title/Abstract] OR "low middle income countr*"[Title/Abstract] OR "developing countr*"[Title/Abstract] OR "middle income countr*"[Title/Abstract] OR "LMIC"[Title/Abstract] OR "upper middle income countr*"[Title/Abstract] OR "Albania"[Title/Abstract] OR "American Samoa"[Title/Abstract] OR "Argentina"[Title/Abstract] OR "Armenia"[Title/Abstract] OR "Azerbaijan"[Title/Abstract] OR "Belarus"[Title/Abstract] OR "Belize"[Title/Abstract] OR "bosnia"[Title/Abstract] OR "Herzegovina"[Title/Abstract] OR "Botswana"[Title/Abstract] OR "Brazil"[Title/Abstract] OR "Bulgaria"[Title/Abstract] OR "China"[Title/Abstract] OR "Colombia"[Title/Abstract] OR "Costa Rica"[Title/Abstract] OR "Cuba"[Title/Abstract] OR "Dominica"[Title/Abstract] OR "Dominican Republic"[Title/Abstract] OR "Ecuador"[Title/Abstract] OR "Equatorial Guinea"[Title/Abstract] OR "Fiji"[Title/Abstract] OR "Gabon"[Title/Abstract] OR "Georgia"[Title/Abstract] OR "Grenada"[Title/Abstract] OR "Guatemala"[Title/Abstract] OR "Guyana"[Title/Abstract] OR "Indonesia"[Title/Abstract] OR "Iran"[Title/Abstract] OR "Iraq"[Title/Abstract] OR "Jamaica"[Title/Abstract] OR "Jordan"[Title/Abstract] OR "Kazakhstan"[Title/Abstract] OR "Kosovo"[Title/Abstract] OR "Lebanon"[Title/Abstract] OR "Libya"[Title/Abstract] OR "Malaysia"[Title/Abstract] OR "Maldives"[Title/Abstract] OR "Marshall Islands"[Title/Abstract] OR "Mexico"[Title/Abstract] OR "Montenegro"[Title/Abstract] OR "Namibia"[Title/Abstract] OR "North Macedonia"[Title/Abstract] OR "Paraguay"[Title/Abstract] OR "Peru"[Title/Abstract] OR "Russia"[Title/Abstract] OR "Samoa"[Title/Abstract] OR "Serbia"[Title/Abstract] OR "South Africa"[Title/Abstract] OR "Saint Lucia"[Title/Abstract] OR "saint Vincent"[Title/Abstract] OR "grenadines"[Title/Abstract] OR*

	"Suriname"[Title/Abstract] OR "Thailand"[Title/Abstract] OR "Tonga"[Title/Abstract] OR "Turkey"[Title/Abstract] OR "Turkmenistan"[Title/Abstract] OR "Tuvalu"[Title/Abstract] OR "Venezuela"[Title/Abstract] OR "lower middle income countr"[Title/Abstract] OR "Algeria"[Title/Abstract] OR "Angola"[Title/Abstract] OR "Bangladesh"[Title/Abstract] OR "Benin"[Title/Abstract] OR "Bhutan"[Title/Abstract] OR "Bolivia"[Title/Abstract] OR "Cabo Verde"[Title/Abstract] OR "Cambodia"[Title/Abstract] OR "Cameroon"[Title/Abstract] OR "Comoros"[Title/Abstract] OR "Congo"[Title/Abstract] OR "Cote d'Ivoire"[Title/Abstract] OR "Djibouti"[Title/Abstract] OR "Egypt"[Title/Abstract] OR "El Salvador"[Title/Abstract] OR "Eswatini"[Title/Abstract] OR "Ghana"[Title/Abstract] OR "Honduras"[Title/Abstract] OR "India"[Title/Abstract] OR "Kenya"[Title/Abstract] OR "Kiribati"[Title/Abstract] OR "Kyrgyz"[Title/Abstract] OR "Laos"[Title/Abstract] OR "Lesotho"[Title/Abstract] OR "Mauritania"[Title/Abstract] OR "Micronesia"[Title/Abstract] OR "Moldova"[Title/Abstract] OR "Mongolia"[Title/Abstract] OR "Morocco"[Title/Abstract] OR "Myanmar"[Title/Abstract] OR "Nepal"[Title/Abstract] OR "Nicaragua"[Title/Abstract] OR "Nigeria"[Title/Abstract] OR "Pakistan"[Title/Abstract] OR "Papua New Guinea"[Title/Abstract] OR "Philippines"[Title/Abstract] OR "Sao Tome"[Title/Abstract] OR "Principe"[Title/Abstract] OR "Senegal"[Title/Abstract] OR "Solomon Islands"[Title/Abstract] OR "Sri Lanka"[Title/Abstract] OR "Tanzania"[Title/Abstract] OR "Timor-Leste"[Title/Abstract] OR "Tunisia"[Title/Abstract] OR "Ukraine"[Title/Abstract] OR "Uzbekistan"[Title/Abstract] OR "Vanuatu"[Title/Abstract] OR "Vietnam"[Title/Abstract] OR "West*

	Bank"[Title/Abstract] OR "Gaza"[Title/Abstract] OR "Zambia"[Title/Abstract] OR "Zimbabwe"[Title/Abstract] OR "low-income country"[Title/Abstract] OR "Afghanistan"[Title/Abstract] OR "Burkina Faso"[Title/Abstract] OR "Burundi"[Title/Abstract] OR "Central African Republic"[Title/Abstract] OR "Chad"[Title/Abstract] OR "Congo"[Title/Abstract] OR "Eritrea"[Title/Abstract] OR "Ethiopia"[Title/Abstract] OR "Gambia"[Title/Abstract] OR "Guinea"[Title/Abstract] OR "Guinea-Bissau"[Title/Abstract] OR "North Korea"[Title/Abstract] OR "Korea Democratic People's Republic"[Title/Abstract] OR "Haiti"[Title/Abstract] OR "Liberia"[Title/Abstract] OR "Madagascar"[Title/Abstract] OR "Malawi"[Title/Abstract] OR "Mali"[Title/Abstract] OR "Mozambique"[Title/Abstract] OR "Niger"[Title/Abstract] OR "Rwanda"[Title/Abstract] OR "Sierra Leone"[Title/Abstract] OR "Somalia"[Title/Abstract] OR "South Sudan"[Title/Abstract] OR "Sudan"[Title/Abstract] OR "Syrian Arab Republic"[Title/Abstract] OR "Syria"[Title/Abstract] OR "Tajikistan"[Title/Abstract] OR "Togo"[Title/Abstract] OR "Yemen"[Title/Abstract]) OR ("africa"[MeSH Terms])) OR ("central america"[MeSH Terms])) OR ("middle east"[MeSH Terms])

Table A-3. terms used in Embase

Abstract, title, and keywords for all option

Search	*Search terms*
Population	'adolescen*':ti,ab,kw OR 'young':ti,ab,kw OR 'youth':ti,ab,kw OR 'teen':ti,ab,kw OR 'teens':ti,ab,kw OR 'teenag*':ti,ab,kw OR 'child*':ti,ab,kw OR 'paediatr*':ti,ab,kw OR 'pediatr*':ti,ab,kw OR 'juvenil*':ti,ab,kw OR 'boy':ti,ab,kw OR 'boys':ti,ab,kw OR 'girl':ti,ab,kw OR 'girls':ti,ab,kw OR 'pubert*':ti,ab,kw OR 'pubescen*':ti,ab,kw
	AND
Exposure	'swine flu':ti,ab,kw OR 'h1n1':ti,ab,kw OR 'flu pandemic':ti,ab,kw OR 'zika':ti,ab,kw OR 'ebola':ti,ab,kw OR 'evd':ti,ab,kw OR 'ehf':ti,ab,kw OR 'ebola virus disease':ti,ab,kw OR 'ebola hemorrhagic fever':ti,ab,kw OR 'covid-19':ti,ab,kw OR 'sars-cov-2':ti,ab,kw OR 'novel coronavirus':ti,ab,kw OR '2019-ncov':ti,ab,kw
	AND
Outcome (in SRHR)	asrh:ti,ab,kw OR 'srh':ti,ab,kw OR 'srhr':ti,ab,kw OR 'human right*':ti,ab,kw OR 'pregnan*':ti,ab,kw OR 'abort*':ti,ab,kw OR 'termination':ti,ab,kw OR 'antenatal':ti,ab,kw OR 'postnatal':ti,ab,kw OR 'perinatal':ti,ab,kw OR 'couple*':ti,ab,kw OR 'abuse':ti,ab,kw OR 'intercourse':ti,ab,kw OR 'rape':ti,ab,kw OR 'coerci*':ti,ab,kw OR 'violence':ti,ab,kw OR 'violation':ti,ab,kw OR 'incest':ti,ab,kw OR 'emergency pills':ti,ab,kw OR 'long-acting reversible contraceptive':ti,ab,kw OR 'larc':ti,ab,kw OR 'misoprostol':ti,ab,kw OR 'mifepristone':ti,ab,kw OR 'methotrexate':ti,ab,kw OR 'meteneprost':ti,ab,kw OR 'prostaglandin':ti,ab,kw OR 'lilopristone':ti,ab,kw OR 'onapristone':ti,ab,kw OR oxytocin:ti,ab,kw OR 'sulprostone':ti,ab,kw OR 'family planning':ti,ab,kw OR 'sex education':ti,ab,kw OR 'sti':ti,ab,kw OR 'sexually transmitted infection':ti,ab,kw OR 'hpv vaccination':ti,ab,kw OR 'intimate partner violence':ti,ab,kw OR 'female genital mutilation':ti,ab,kw OR 'female genital cutting':ti,ab,kw OR 'fgm':ti,ab,kw OR 'maternal death':ti,ab,kw OR 'maternal morbidity':ti,ab,kw OR

	'maternal mortality':ti,ab,kw OR 'newborn morbidity':ti,ab,kw OR 'newborn mortality':ti,ab,kw OR 'maternal care':ti,ab,kw OR 'newborn care':ti,ab,kw OR 'infant':ti,ab,kw OR 'infancy':ti,ab,kw OR 'stigma':ti,ab,kw OR 'taboo':ti,ab,kw OR 'discrimination':ti,ab,kw OR 'gbv':ti,ab,kw OR 'gender':ti,ab,kw
	AND
Low and middle-income countries (96)	'low income countr*':ti,ab,kw OR 'low middle income countr*':ti,ab,kw OR 'developing countr*':ti,ab,kw OR 'middle income countr*':ti,ab,kw OR lmic:ti,ab,kw OR 'upper middle income countr*':ti,ab,kw OR 'albania':ti,ab,kw OR 'american samoa':ti,ab,kw OR 'argentina':ti,ab,kw OR 'armenia':ti,ab,kw OR 'azerbaijan':ti,ab,kw OR 'belarus':ti,ab,kw OR 'belize':ti,ab,kw OR 'bosnia':ti,ab,kw OR 'herzegovina':ti,ab,kw OR 'botswana':ti,ab,kw OR 'brazil':ti,ab,kw OR 'bulgaria':ti,ab,kw OR 'china':ti,ab,kw OR 'colombia':ti,ab,kw OR 'costa rica':ti,ab,kw OR 'cuba':ti,ab,kw OR 'dominica':ti,ab,kw OR 'dominican republic':ti,ab,kw OR 'ecuador':ti,ab,kw OR 'equatorial guinea':ti,ab,kw OR 'fiji':ti,ab,kw OR 'gabon':ti,ab,kw OR 'georgia':ti,ab,kw OR 'grenada':ti,ab,kw OR 'guatemala':ti,ab,kw OR 'guyana':ti,ab,kw OR 'indonesia':ti,ab,kw OR 'iran':ti,ab,kw OR 'iraq':ti,ab,kw OR 'jamaica':ti,ab,kw OR 'jordan':ti,ab,kw OR 'kazakhstan':ti,ab,kw OR 'kosovo':ti,ab,kw OR 'lebanon':ti,ab,kw OR 'libya':ti,ab,kw OR 'malaysia':ti,ab,kw OR 'maldives':ti,ab,kw OR 'marshall islands':ti,ab,kw OR 'mexico':ti,ab,kw OR 'montenegro':ti,ab,kw OR 'namibia':ti,ab,kw OR 'north macedonia':ti,ab,kw OR 'paraguay':ti,ab,kw OR 'peru':ti,ab,kw OR 'russia':ti,ab,kw OR 'samoa':ti,ab,kw OR 'serbia':ti,ab,kw OR 'south africa':ti,ab,kw OR 'saint lucia':ti,ab,kw OR 'saint vincent':ti,ab,kw OR 'grenadines':ti,ab,kw OR 'suriname':ti,ab,kw OR 'thailand':ti,ab,kw OR 'tonga':ti,ab,kw OR 'turkey':ti,ab,kw OR 'turkmenistan':ti,ab,kw OR 'tuvalu':ti,ab,kw OR 'venezuela':ti,ab,kw OR 'lower middle income countr*':ti,ab,kw OR 'algeria':ti,ab,kw

	OR 'angola':ti,ab,kw OR 'bangladesh':ti,ab,kw OR 'benin':ti,ab,kw OR 'bhutan':ti,ab,kw OR 'bolivia':ti,ab,kw OR 'cabo verde':ti,ab,kw OR cambodia:ti,ab,kw OR 'cameroon':ti,ab,kw OR 'comoros':ti,ab,kw OR 'cote divoire':ti,ab,kw OR 'Ivory Coast ':ti,ab,kw OR 'djibouti':ti,ab,kw OR 'egypt':ti,ab,kw OR 'el salvador':ti,ab,kw OR 'eswatini':ti,ab,kw OR 'ghana':ti,ab,kw OR 'honduras':ti,ab,kw OR 'india':ti,ab,kw OR 'kenya':ti,ab,kw OR 'kiribati':ti,ab,kw OR 'kyrgyz':ti,ab,kw OR 'laos':ti,ab,kw OR 'lesotho':ti,ab,kw OR 'mauritania':ti,ab,kw OR 'micronesia':ti,ab,kw OR 'moldova':ti,ab,kw OR 'mongolia':ti,ab,kw OR 'morocco':ti,ab,kw OR 'myanmar':ti,ab,kw OR 'nepal':ti,ab,kw OR 'nicaragua':ti,ab,kw OR 'nigeria':ti,ab,kw OR 'pakistan':ti,ab,kw OR 'papua new guinea':ti,ab,kw OR 'philippines':ti,ab,kw OR 'sao tome':ti,ab,kw OR 'principe':ti,ab,kw OR 'senegal':ti,ab,kw OR 'solomon islands':ti,ab,kw OR 'sri lanka':ti,ab,kw OR 'tanzania':ti,ab,kw OR 'timor-leste':ti,ab,kw OR 'tunisia':ti,ab,kw OR 'ukraine':ti,ab,kw OR 'uzbekistan':ti,ab,kw OR 'vanuatu':ti,ab,kw OR 'vietnam':ti,ab,kw OR 'west bank':ti,ab,kw OR 'gaza':ti,ab,kw OR 'zambia':ti,ab,kw OR 'zimbabwe':ti,ab,kw OR 'low-income country':ti,ab,kw OR 'afghanistan':ti,ab,kw OR 'burkina faso':ti,ab,kw OR 'burundi':ti,ab,kw OR 'central african republic':ti,ab,kw OR 'chad':ti,ab,kw OR 'congo':ti,ab,kw OR 'eritrea':ti,ab,kw OR 'ethiopia':ti,ab,kw OR 'gambia':ti,ab,kw OR 'guinea':ti,ab,kw OR 'guinea-bissau':ti,ab,kw OR 'north korea':ti,ab,kw OR 'korea democratic people republic':ti,ab,kw OR 'haiti':ti,ab,kw OR 'liberia':ti,ab,kw OR 'madagascar':ti,ab,kw OR 'malawi':ti,ab,kw OR 'mali':ti,ab,kw OR 'mozambique':ti,ab,kw OR 'niger':ti,ab,kw OR 'rwanda':ti,ab,kw OR 'sierra leone':ti,ab,kw OR 'somalia':ti,ab,kw OR 'south sudan':ti,ab,kw OR 'sudan':ti,ab,kw OR 'syrian arab republic':ti,ab,kw OR 'syria':ti,ab,kw OR 'tajikistan':ti,ab,kw OR 'togo':ti,ab,kw OR 'yemen':ti,ab,kw

Table A-4. terms used in PsycINFO abstract for all options

Search	*Search terms*
Population	ab(("Adolescen*" OR "young" OR "youth" OR "teen" OR "teenag*" OR "child" OR "children" OR "paediatr*" OR "pediatr*" OR "juvenil*" OR "boy*" OR "girl*" OR "pubert*" OR "pubescen*"))
	AND
Exposure	ab(("swine flu" OR "H1N1" OR "flu pandemic" OR "Zika" OR "Ebola" OR "EVD" OR "EHF" OR "Ebola virus disease" OR "Ebola hemorrhagic fever" OR "COVID-19" OR "SARS-COV-2" OR "Novel Coronavirus" OR "2019-nCov"))
	AND
Outcome (in SRHR)	ab((“ASRH” or “SRH” or “SRHR” or “human right*” or “pregnan*” or “abort*” or “termination” or “antenatal” or “postnatal” or “perinatal” or “couple*” or “abuse” or “intercourse” or “rape” or “coerci*” or “violence” or “violation” or “incest” or “emergency pills” or “Long-acting reversible contraceptive” or “LARC” or “Misoprostol” or “mifepristone” or “methotrexate” or “meteneprost” or “prostaglandin” or “lilopristone” or “onapristone” or “oxytocin” or “sulprostone” or “family planning” or “sex education” or “STI” or “sexually transmitted infection” or “HPV vaccination” or “intimate partner violence” or “female genital mutilation” or “female genital cutting” or “FGM” or “maternal death” or “maternal morbidity” or “maternal mortality” or “newborn morbidity” or “newborn mortality” or “maternal care” or “newborn care” or “infant” or “infancy” or “stigma” or “taboo” or “Discrimination” or “GBV” or “gender”
	AND

Low and middle-income countries (96)	ab(("low income countr*" OR "middle income countr*" OR "low middle income countr*" OR "developing countr*" OR "middle income countr*" OR "LMIC" OR "upper middle income countr*" OR "Albania" OR "American Samoa" OR "Argentina" OR "Armenia" OR "Azerbaijan" OR "Belarus" OR "Belize" OR "bosnia" OR "Herzegovina" OR "Botswana" OR "Brazil" OR "Bulgaria" OR "China" OR "Colombia" OR "Costa Rica" OR "Cuba" OR "Dominica" OR "Dominican Republic" OR "Ecuador" OR "Equatorial Guinea" OR "Fiji" OR "Gabon" OR "Georgia" OR "Grenada" OR "Guatemala" OR "Guyana" OR "Indonesia" OR "Iran" OR "Iraq" OR "Jamaica" OR "Jordan" OR "Kazakhstan" OR "Kosovo" OR "Lebanon" OR "Libya" OR "Malaysia" OR "Maldives" OR "Marshall Islands" OR "Mexico" OR "Montenegro" OR "Namibia" OR "North Macedonia" OR "Paraguay" OR "Peru" OR "Russia" OR "Samoa" OR "Serbia" OR "South Africa" OR "Saint Lucia" OR "saint Vincent" OR "grenadines" OR "Suriname" OR "Thailand" OR "Tonga" OR "Turkey" OR "Turkmenistan" OR "Tuvalu" OR "Venezuela" OR "lower middle income countr*" OR "Algeria" OR "Angola" OR "Bangladesh" OR "Benin" OR "Bhutan" OR "Bolivia" OR "Cabo Verde" OR "Cambodia" OR "Cameroon" OR "Comoros" OR "Congo" OR "Cote d'Ivoire" OR "Ivory Coast" OR "Djibouti" OR "Egypt" OR "El Salvador" OR "Eswatini" OR "Ghana" OR "Honduras" OR "India" OR "Kenya" OR "Kiribati" OR "Kyrgyz" OR "Laos" OR "Lesotho" OR "Mauritania" OR "Micronesia" OR "Moldova" OR "Mongolia" OR "Morocco" OR "Myanmar" OR "Nepal" OR "Nicaragua" OR "Nigeria" OR "Pakistan" OR "Papua New Guinea" OR "Philippines" OR "Sao Tome" OR "Principe" OR "Senegal" OR "Solomon Islands" OR "Sri Lanka" OR "Tanzania" OR "Timor-Leste" OR "Tunisia" OR "Ukraine" OR "Uzbekistan" OR "Vanuatu" OR "Vietnam" OR "West Bank" OR "Gaza" OR "Zambia" OR "Zimbabwe" OR "low-income country" OR "Afghanistan" OR "Burkina Faso" OR "Burundi" OR "Central African Republic" OR "Chad" OR "Congo" OR "Eritrea" OR "Ethiopia" OR "Gambia" OR "Guinea" OR "Guinea-Bissau" OR "North Korea" OR "Korea Democratic People's Republic" OR "Haiti" OR "Liberia" OR "Madagascar"

	OR "Malawi" OR "Mali" OR "Mozambique" OR "Niger" OR "Rwanda" OR "Sierra Leone" OR "Somalia" OR "South Sudan" OR "Sudan" OR "Syrian Arab Republic" OR "Syria" OR "Tajikistan" OR "Togo" OR "Yemen"))

Table A-5. terms used in Cochrane library search abstract, title and keywords for all options

Search	*Search terms*
Population	((“Adolescen*” OR “young” OR “youth” OR “teen” OR “teenag*” OR “child” OR “children” OR “paediatr*” OR “pediatr*” OR “juvenil*” OR “boy*” OR “girl*” OR “pubert*” OR “pubescen*”)):ti,ab,kw
	AND
Exposure	(“swine flu” or “H1N1” or “flu pandemic” or “Zika” or “Ebola” or “EVD” or “EHF” or “Ebola virus disease” or “Ebola hemorrhagic fever” or “COVID19” or “SARSCOV2” or “Novel Coronavirus” or “2019nCov”):ti,ab,kw
	AND
Outcome (in SRHR)	(“ASRH” or “SRH” or “SRHR” or “human right*” or “pregnan*” or “abort*” or “termination” or “antenatal” or “postnatal” or “perinatal” or “couple*” or “abuse” or “intercourse” or “rape” or “coerci*” or “violence” or “violation” or “incest” or “emergency pills” or “Long acting reversible contraceptive” or “LARC” or “Misoprostol” or “mifepristone” or “methotrexate” or “meteneprost” or “prostaglandin” or “lilopristone” or “onapristone” or “oxytocin” or “sulprostone” or “family planning” or “sex education” or “STI” or “sexually transmitted infection” or “HPV vaccination” or “intimate partner violence” or “female genital mutilation” or “female genital cutting” or “FGM” or “maternal death” or “maternal morbidity” or “maternal mortality” or “newborn morbidity” or “newborn mortality” or “maternal care” or “newborn care” or “infant” or “infancy” or “Discrimination” or “GBV” or “gender”) :ti,ab,kw
	AND
Low and middle-income countries (96)	(“low income countr*” or “middle income countr*” or “low middle income countr*” or “developing countr*”

	or “middle income countr*” or “LMIC” or “upper middle income countr*” or “Albania” or “American Samoa” or “Argentina” or “Armenia” or “Azerbaijan” or “Belarus” or “Belize” or “bosnia” or “Herzegovina” or “Botswana” or “Brazil” or “Bulgaria” or “China” or “Colombia” or “Costa Rica” or “Cuba” or “Dominica” or “Dominican Republic” or “Ecuador” or “Equatorial Guinea” or “Fiji” or “Gabon” or “Georgia” or “Grenada” or “Guatemala” or “Guyana” or “Indonesia” or “Iran” or “Iraq” or “Jamaica” or “Jordan” or “Kazakhstan” or “Kosovo” or “Lebanon” or “Libya” or “Malaysia” or “Maldives” or “Marshall Islands” or “Mexico” or “Montenegro” or “Namibia” or “North Macedonia” or “Paraguay” or “Peru” or “Russia” or “Samoa” or “Serbia” or “South Africa” or “Saint Lucia” or “saint Vincent” or “grenadines” or “Suriname” or “Thailand” or “Tonga” or “Turkey” or “Turkmenistan” or “Tuvalu” or “Venezuela” or “lower middle income countr*” or “Algeria” or “Angola” or “Bangladesh” or “Benin” or “Bhutan” or “Bolivia” or “Cabo Verde” or “Cambodia“ or “Cameroon” or “Comoros” or “Congo” or “Cote d’Ivoire” or “Ivory Coast” or “Djibouti” or “Egypt” or “El Salvador” or “Eswatini” or “Ghana” or “Honduras” or “India” or “Kenya” or “Kiribati” or “Kyrgyz” or “Laos” or “Lesotho” or “Mauritania” or “Micronesia” or “Moldova” or “Mongolia” or “Morocco” or “Myanmar” or “Nepal” or “Nicaragua” or “Nigeria” or “Pakistan” or “Papua New Guinea” or “Philippines” or “Sao Tome” or “Principe” or “Senegal” or “Solomon Islands” or “Sri Lanka” or “Tanzania” or “Timor Leste” or “Tunisia” or “Ukraine” or “Uzbekistan” or “Vanuatu” or “Vietnam” or “West Bank” or “Gaza” or “Zambia” or “Zimbabwe” or “low income country” or “Afghanistan” or “Burkina Faso” or “Burundi” or “Central African Republic” or “Chad” or “Congo” or “Eritrea” or “Ethiopia” or “Gambia” or “Guinea” or “Guinea Bissau” or “North Korea” or “Korea Democratic People’s Republic” or “Haiti” or “Liberia” or “Madagascar” or “Malawi” or “Mali” or “Mozambique” or “Niger” or “Rwanda” or “Sierra Leone” or “Somalia” or “South Sudan” or “Sudan” or “Syrian Arab Republic” or “Syria” or “Tajikistan” or “Togo” or “Yemen”):ti,ab,kw

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	Page 1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	Page 2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	Page 4
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	Page 8
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	Page 14
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	Page 9 and 13
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	Page 13
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	Page 13
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	Page 13
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	Page 13
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	Page 14
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	Page 14

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	Page 14
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	Page 13
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	Page 13
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	Page 14
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	Page 10 and 11
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	Page 14
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	Page 11
Limitations	20	Discuss the limitations of the scoping review process.	Page 3
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	Click here to enter text.
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	Page 14

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.