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Individual, Interpersonal, Community, and Structural Influences that Shape Adolescent Pregnancy and Childbearing

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INDIVIDUAL, INTERPERSONAL, COMMUNITY, AND STRUCTURAL INFLUENCES THAT SHAPE ADOLESCENT PREGNANCY AND CHILDBEARING: DESK REVIEW

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Prepared for USAID
United States Agency for International Development
Matthew Nims, Agreement Officer
ATTN: Kathleen Hartin
Agreement Officer's Representative
khartin@usaid.gov

Prepared by
Prepared by the Mercy Corps led Nawiri Consortium

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Abbreviations

ASAL	Arid and Semi-Arid Land
ARHD	Adolescent Reproductive Health and Development
ARP	Alternative Rites of Passage
ASRH	Adolescent Sexual and Reproductive Health
CSE	Comprehensive Sex Education
DFSA	Development Food Security Activity
FGM	Female Genital Mutilation
LMIC	Low and Middle-Income Country
SDG	Sustainable Development Goal
SRH	Sexual and Reproductive Health
STI	Sexually Transmitted Infection
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
WHO	World Health Organization

Table of Contents

Abbreviations 1
Table of Contents 4
List of Tables 5
Executive Summary 6
1 Introduction 9
1.1 Problem statement 10
1.2 Objectives 12
1.3 Specific research questions 12
2 Methodology 13
3 Findings 14
3.1 Reproductive health needs for adolescents 15
3.2 SRH risks and vulnerabilities 15
3.3 Individual level risks and vulnerabilities 16
3.3.1 Myths and misconceptions 17
3.3.2 Media and digital technology 18
3.3.3 Drugs and substance abuse 20
3.3.4 Interpersonal relationships 20
3.4 Community level risks and vulnerabilities 22
3.4.1 Cultural vulnerabilities 22
3.4.2 Social-cultural and traditional events 23
3.4.3 Female genital mutilation 24
3.4.4 Cultural practice of girl beading 24
3.4.5 Early and forced child marriages 25
3.4.6 Cultural barriers to accessing reproductive health services 25
3.5 Structural level risks and vulnerabilities 26
3.5.1 Limited access to adolescent sexual reproductive health services 27
3.5.2 Limited access to educational opportunities 27
3.6 Adolescent protective assets 28
3.6.1 Educational and knowledge asset 29
3.6.2 Social networks 30
3.6.3 Safe spaces 31
3.7 Level of agency for adolescent girls and boys in relation to their sexual behavior 31
3.7.1 Indicators for agency 31

3.7.2 Developing agency in adolescents 32

3.7.3 Levels, types, and examples of agency in adolescents 32

3.8 Household shocks and stresses influence on sexual behavior in adolescents 34

3.9 Influence of interpersonal relationships/social connections on adolescents' "response" to shocks and stresses, seasonality, and reproductive health outcomes 35

3.10 Institutional frameworks (policy, legal) in place to reduce vulnerabilities for adolescents and youth 36

3.11 Adolescent sexual reproductive health interventions 40

4 Discussion 43

5 Conclusion 45

6 Limitations 45

7 Recommendations 46

8 References 48

9 Appendices 64

Appendix 1: WHO classification of evidence based SRH interventions for young people 64

Appendix 2: Sample interventions for adolescent sexual reproductive health 66

List of Tables

Table1 : Summary of laws, policies and guidelines related to adolescent sexual reproductive health in Kenya 38

Executive Summary

Adolescence is an important stage in human development that is characterized by rapid physical, intellectual, and emotional developments that are the foundation for life and well-being. Adolescent sexual reproductive health is a global public health concern, and the reproductive health outcomes at the adolescent stage impact the broader health, nutrition, and economic development of the individual and the society. In Kenya, adolescent birth rates remain high, with 1 in every 5 girls aged 15–19 either pregnant or already a mother. Turkana and Samburu Counties have some of the highest levels of early childbearing among adolescents, at 20% in Turkana and 26% in Samburu. These counties also have very high rates of malnutrition, with 29% of women being underweight. Growing adolescent girls have higher nutritional needs for their own development. Pregnancy and childbearing during adolescence exacerbate these needs, and adolescent mothers risk having low birth weight babies. The risk of wasting is also high for babies born to adolescent mothers who have limited resources to bring up the children and provide adequate food and health needs.

The Nawiri Program is a U.S. Agency for International Development (USAID) Development Food Security Activity (DFSA) working toward sustainably reducing persistent acute malnutrition in Kenya's arid and semi-arid lands (ASAL) by transforming systems and building capacities to absorb, anticipate, and adapt to shocks and stresses. This desk review aims to understand the drivers and mitigating factors of risks and vulnerabilities that lead to unintended pregnancy and childbirth among adolescent girls.

Methodology

The desk review included peer-reviewed and gray literature from low and middle-income contexts, from sub-Saharan Africa, and specific to Kenya's ASAL region. The literature search was conducted online from academic databases, selected organizations' websites, and mass media outlets. Key search terms were guided by the research questions and their relevance to sub-Saharan Africa, Kenya, and the ASAL context.

Key Findings

Adolescent sexual reproductive health needs, vulnerabilities, and protective assets

The review identifies adolescent sexual and reproductive health (ASRH) needs as those around the need for knowledge on sexual and reproductive health (SRH) and understanding of sexuality and SRH services. Adolescents need information to make decisions around sexual choices and behavior. Specific to the ASAL areas, adolescents in Samburu and Turkana communities need protection against negative cultural practices such as forced early marriages, girl beading, female genital mutilation, intergenerational sex, intergenerational marriages and transactional sex. The adolescents also need access to SRH services, particularly for those married adolescents who need to make decisions about family planning, contraception, and birth spacing. The individual level SRH vulnerabilities include myths and misconceptions, access to media and technology, drugs and substance abuse, and interpersonal relationships. Negative cultural practices and social, cultural, and traditional events are some of the community level risks and vulnerabilities. At the wider society level, limited access to health services and inadequate educational opportunities are risks and vulnerabilities that influence ASRH at the community and individual levels. Protective assets for the adolescents in ASAL areas include education and schooling, economic empowerment, knowledge of SRH, social networks, and safe spaces. These protective assets are a source of agency for adolescents to

make decisions on SRH issues.

Levels of agency for adolescents in relation to SRH

Several indicators have been identified in this review for agency for adolescents in relation to SRH including the ability to make decisions; the capacity to deal with difficult situations; the freedom to interact with peers, relatives, and others in the community; and self-efficacy, self-esteem, and attitudes toward gender-based violence, sexual violence, and gender roles and norms. Examples of relative agency in adolescent girls in Samburu County is expressed when young adolescent girls (aged 10–14) years reject forced marriages and escape to rescue centers in search of formal education. Agency is also expressed by young men who decline herding roles and instead seek educational opportunities. In Turkana County, some girls express agency by rejecting intergenerational marriages and seeking the help of supportive adults to negotiate with their fathers to allow them to continue with their education rather than marry their father's agemates.

Household shocks, stresses, and seasonality's influence on sexual behavior of adolescents

Perennial household shocks, stresses, and seasonality that occur in ASAL such as drought, famine, flooding, and human and animal disease outbreaks destroy people's livelihoods, interrupt the social structure, and cause death in humans and animals. The loss of livelihoods resulting from such shocks and stresses increases the food insecurity experienced in ASAL regions. Food insecure women and girls may turn to transactional sex or commercial sex in exchange of money and food or other gifts for survival. In ASAL regions, girls may be married off to richer, older men in exchange of a dowry to cushion the family through the stress or shock and replenish dead animals through the girl's bride price. On the other hand, young adolescent boys may drop out of school during the shocks and stress to herd livestock further away from home and from their social network. Entire families migrating in search of pasture and water move away from health services and schools, thus distancing themselves from family planning services and risking unwanted pregnancies while the adolescents are out of school.

Interpersonal relationships/social connections influence on adolescents' "response" to shocks and stresses and seasonality and the relationship to reproductive health outcomes

In coping with the household shocks and stresses, families reduce food intake, sell their livestock at poor market prices, migrate away from their social network, and may send their youth away to towns to search for jobs, beg for money, or attend school. These coping mechanisms impact the interpersonal relationships adolescents have with their parents, family, peers, and the community. Disruption to existing interpersonal social connection can influence reproductive health outcomes positively or negatively. Moving away from an abusive environment may afford the adolescent girl an opportunity to break a sexual violence cycle, while moving away in search of pasture and water may expose the adolescent to violent attacks including rape from herding grounds and the territorial protection groups that might operate there.

Institutional frameworks (policy, legal) in place to reduce vulnerabilities for adolescents and youth

The legal and policy framework in Kenya is set to protect the rights of adolescents and reduce vulnerabilities, including commitments to several global, regional, and sub-regional treaties and declarations. For example, Kenya signed on to the United Nations Convention on the Rights of the Child in 1990 and in 2001 ratified the African Charter on the Rights and Welfare

of the Child. In 2013, the Kenyan government signed a Ministerial commitment on comprehensive sexuality education and SRH services for adolescents and young people in Eastern and Southern African. Kenya has also localized several international policies and developed others specific to the protection of the SRH rights of adolescents. The 2010 Constitution of Kenya establishes the basic rights to reproductive health for every person in Kenya and protects children and youth from abuse of all forms. The Kenya Adolescent and Reproductive Health and Development (ARHD) Policy is an interdisciplinary integrated approach to mainstreaming quality reproductive health services for adolescents. Despite the availability of this legal and policy framework in Kenya, little effort has been put into the implementation, monitoring, and evaluation of these policies, especially at the local levels. Domestication of these policies in Samburu and Turkana Counties would secure the local political will power needed to reduce the ASRH vulnerabilities at the community level.

Adolescent sexual reproductive health interventions

Example of ASRH interventions that have shown promising results in Kenya and similar settings include sexuality education offering information and access to contraception, condom use, family planning, mass media behavior change communication, group mentorship, youth-friendly health care, technology-based and social media behavior change and communication, and parental involvement. These initiatives have shown improvements in knowledge around SRH, contraception, and personal values; increased the age of sexual debut; increased utilization of health services by the adolescents; and equipped the youth with agency for decision-making on with whom and when to have sex, as well as increased the capacity of parents to support adolescents to make positive sexual health decisions.

1. Introduction

Adolescents aged 10–19 years make up about 1.2 billion (16%) of the world's population with an estimated 243 million (20%) living in sub-Saharan Africa (1). In Kenya, approximately 24% (11.6 million) of the total population are adolescents aged 10–19 years (2). Adolescence is a period of rapid physical, intellectual, and emotional development. During adolescence, an individual achieves the physical, cognitive, emotional, social, and economic milestones that are the foundation for life and well-being. Investments in adolescent health and well-being bring benefits today, for decades to come, and for the next generation (3). Services targeting adolescents therefore need to be dynamic in response to the rapid development characterizing this phase and the unique challenges that face adolescents in different situations.

Obtaining universal access to SRH services is an important target of the Sustainable Development Goals (SDG) 3.7 (4). The SRH of adolescents sets the stage for health that goes beyond the individual's reproductive years (5,6). Poor adolescent SRH remains a global public health burden.

Early sexual debut increases the risk of sexually transmitted diseases, unintended pregnancies, childbirth, unintended child marriages, gender-based violence, school dropout, sexual exploitation, and mental health challenges (7). An estimated 27% of adolescent girls have had sex by the age of 16 in Africa, while about two-thirds of adolescent girls aged 19 have had sex and 43% are married (8). The adolescent birth rate (births to women 15–19 years of age per 1,000 women in that age group) remains high globally at 39.9, which accounts for 11% of all annual births globally, but 50% of these occur in sub-Saharan Africa (9,10). In fact, sub-Saharan Africa has the highest adolescent birth rate, with 104 births per 1,000 girls aged 15–19 years (11). Globally, it is estimated that 21 million adolescent girls aged 15–19 years become pregnant each year, and about 12 million of these pregnancies result in a birth (8). Approximately 9 million adolescent girls aged 15–19 years become pregnant in Africa and 5.7 million result in a birth (8). Adolescent pregnancy is the leading cause of death for girls in the 15–19 age group (12). Comparatively, adolescent pregnancy is associated with poorer reproductive health outcomes than is pregnancy among adult women, including low birth weight, preterm births, birth trauma, still births, and abortion. Adolescent pregnant mothers are at higher risk of urinary tract infections, pre-eclampsia, eclampsia, risks of emergency cesarean section delivery, anemia, maternal mortality, unsafe abortions, birth trauma, pregnancy, and post-partum depression (13–15).

The risk for these maternal complications is highest in adolescent girls who become pregnant before age 15 (16). Infants of adolescent mothers have a higher risk of being born preterm, have low birth weight, stunting, underweight, wasting, diarrhea, anemia, higher neonatal and infant mortality, and increased risk of respiratory distress and autism during childhood (14–17). In addition, adolescence is marked by rapid physical, cognitive, and emotional development with high nutrient requirements.

In ASAL areas and marginalized communities, adolescent SRH is further compromised by the population's nomadic lifestyle, high levels of illiteracy, remoteness, cultural beliefs, harsh climatic conditions, difficult geographical terrain, sparsely distributed educational institutions, and thinly spaced health facilities. This difficult set-up in the ASALs creates unique risks and vulnerabilities for the adolescents. The challenges of adolescent SRH in Samburu and Turkana Counties include early sexual debut, early pregnancies, forced and child marriages, unsafe abortions, gender-based violence, female genital mutilation (for Samburu County), crime, drug abuse, school dropout, and HIV and sexually transmitted infections (STIs). The risks and vulnerabilities that expose adolescents to these SRH challenges are rooted in social and cultural norms, community, and structural factors.

The USAID Nawiri Program commissioned this desk review to synthesize evidence of the drivers and mitigating factors of the risks and vulnerabilities that lead to unintended pregnancies and childbearing among adolescent girls, with special reference to Turkana and Samburu Counties. Nawiri is a USAID DFSA working toward sustainably reducing persistent acute malnutrition in Kenya's ASALs by transforming systems and building capacities to absorb, anticipate, and adapt to shocks and stresses. In Turkana and Samburu, household shocks and stresses caused by frequent drought, famine, flooding, and insecurity increase food insecurity and the risk of malnutrition. Persistent malnutrition for both women and children remains a public health and developmental concern in Samburu and Turkana. The two counties have the highest proportion of underweight women in Kenya (45% in Turkana and 41% in Samburu) against a national underweight prevalence of 8.9% (18). Compared to the national prevalence for under-5 child stunting (26%), wasting (4%), and underweight (11%) using the 2014 Kenya Demographic and Health Survey data, the prevalence of stunting, underweight, and wasting for children in Turkana County was 24%, 23%, and 34%, respectively, while in Samburu it was 30%, 14%, and 29% (18). The nutrition of adolescents in these counties is also compromised, as shown in a recent study in Samburu central sub-county with 23% of the adolescents there underweight, with suboptimal dietary intake (19).

1.1 Problem statement

In Kenya, according to current research, 12% of women and 18% of men aged 15–24 years had sexual intercourse before age 15 while 47% of women aged 18–24 and 55% of men in the same age group had sexual intercourse before age 18 (18). Often, the first sexual encounter for adolescent girls and boys occurred due to coercion or pressure through gifts or money, flattery, threats, pestering, or rape, especially in relationships that involved older sexual partners (20–22). Only 25% of sexually active adolescent girls and 43% of sexually active adolescent boys were using any modern method of contraception in Kenya (22). Samburu County had one of the lowest median ages at first sex for both women (15.7 years) and men (14.9 years) compared to 18 and 17 years median age at first sex for women and men in Kenya, respectively. The median age at first sex in Turkana County is 17.6 years for women and 18.0 years for men (18). The median age at first marriage in Samburu and Turkana Counties for women is 18.4 and 18.9 years, respectively, compared to a median age at first marriage in Kenya of 20.2 for women and 25.3 years for men (18).

More than half of Samburu County's girls aged 15–19 years had ever had sex, while the county had one of the lowest rates (10%) of modern contraceptive use among girls who were sexually active. In Turkana County, 20% of the adolescent girls aged 15–19 years had their first sexual encounter and were sexually active, while only 8.2% of sexually active adolescent girls were using any modern method of contraceptives (22). Among women aged 20–49 years in Turkana, 32% were married before age 18 while 15% of girls aged 15–19 were married and almost 10% were married by age 15. The adolescent birth rate in Turkana for girls aged 15–19 years was 101 per every 1,000 women aged 15–19 years (23).

Box 1. Problem Statement
Adolescent pregnancies exacerbate nutrition needs and increase risk factors for malnutrition for mothers and their children, thus propagating the intergenerational cycle of malnutrition.

Adolescent pregnancies and early childbearing is a risk for maternal and child malnutrition. A poorly nourished adolescent girl who becomes a mother risks having a low birthweight baby, which compromises both the mother's and baby's nutrition and health outcomes. A trend analysis for the determinants of malnutrition in Kenya using four rounds of Demographic Health Survey data (2003 and 2008–2009) found that children of adolescent mothers aged 15–19 years were more likely to be underweight and wasted than were children of adult mothers and that underweight women were more likely to have underweight and stunted children (24). To sustainably reduce malnutrition in Samburu and Turkana Counties, it is important to understand the drivers and mitigating factors of risks and vulnerabilities that lead to unintended pregnancies and childbirth among adolescent girls.

The SRH outcomes of the adolescents in the two counties are underpinned by risks and vulnerabilities at the individual, interpersonal relationship, community, and wider societal level. There exists a strong link between risky sexual behavior, reproductive health outcomes, and nutrition. The nutrition and health of an offspring depends on the mother's nutritional status, which is further determined by the household's food security level. Adolescents in ASAL areas are exposed to challenges such as food insecurity, poor dietary diversity, and low micronutrient intake that increase their vulnerability to malnutrition as mothers and heighten their risk of low birthweight babies (19), stillbirths, preterm deliveries, and maternal and neonatal deaths.

To mitigate this intergenerational cycle of malnutrition, it is important for adolescent SRH interventions and initiatives to understand and respond to the drivers of risky sexual behavior, unwanted pregnancies, and child marriages that are deeply rooted in social-cultural practices and gender inequalities in these counties. For example, in Turkana County, forced child marriages are a critical social issue, deeply rooted in the culture and recognized widely in the community by the authorities, leaders, intellectuals, politicians, teachers, parents, health workers, members of civil society, and the adolescents (25). In Samburu, the female adolescents take up the caregiver role for younger siblings as their mother goes out in search of food and water (26). The adolescent girl can therefore not attend school, and she is left at home without parental supervision and may intentionally engage in sexual intercourse or suffer rape. Adolescents are a difficult group to reach due to multiple identities. Legally, or by law, 10–17-year-olds are below the adult age for consensual sex of 18 years, yet girls in Samburu and Turkana may be married off by the age of 10 years to older men in exchange for livestock

as a bride price.

The adolescent SRH protective legal and policy framework in Kenya includes the Constitution of Kenya, the 2015 ARHD Policy, the 1994 Return to School Policy in Kenya, the 2005 National Guideline for the Provision of Youth Friendly Services, and the 2006 Sexual Offences Act. Though these policies have been ratified and approved by relevant government institutions, the extent to which they are operationalized at national and county levels and their implementation, monitoring, and evaluation remain uncertain. For example, the Sexual Offences Act stipulates that a person who commits an act of sexual penetration with a child commits defilement, and if the child is younger than 11 years old, the offender upon conviction should be sentenced to life imprisonment (27). If the defiled child is aged 12–15 years, a convicted offender is to be imprisoned for a term not less than 20 years, and if the child is between 16–18 years, the convicted offender should be sentenced to 15 years imprisonment (27). Despite this strict law, cases of rape and defilement in Northern Kenya are often unreported or are dealt with locally through family negotiations with the offender for compensation payment and to keep the matter private to avoid public ridicule for the victim (28).

Against this background, this desk review is conducted to establish the extant evidence on the drivers and mitigating factors of risks and vulnerabilities that lead to unintended pregnancy and childbirth among adolescent girls in Kenya.

1.2 Objectives

The objective of this desk review was to understand the drivers and mitigating factors of risks and vulnerabilities that lead to unintended pregnancy and childbirth among adolescent girls.

1.3 Specific research questions

The review seeks to answer the following questions:

1. How do adolescents (10–19 years) define their reproductive health needs, risks, vulnerabilities, and protective assets?
2. What level of agency do adolescent girls and boys have in relation to their sexual behavior?
3. How do household shocks and stresses influence relationships and sexual behavior in adolescents?
4. How do interpersonal relationships/social connections influence how adolescents "respond" to shocks and stresses and seasonality, and how does this relate to reproductive health outcomes?
5. What institutional frameworks (policy, legal) are in place to reduce vulnerabilities for adolescents and youth?
6. What interventions have been implemented before, what worked and what did not work?

2. Methodology

The methodology for the desk review included identification of published and gray literature relevant to the subject matter and the research questions. Literature included peer-reviewed publications, published and unpublished reports, PowerPoint presentations, and draft articles. Global, regional, and Kenyan national and subnational publications were included in the review. A list of key search terms and phrases were generated based on the research questions. Websites of institutions that implement reproductive health work in the arid and semi-arid regions of Kenya and sub-Saharan Africa were searched for documents and reports. The search was also conducted with a focus on livelihood zones in the ASALs including pastoral and agro-pastoral, settled urban, peri-urban, rural, fishing, and farming. The search included names of ASAL counties in Kenya.

A comprehensive Internet search was conducted through electronic databases and academic databases including PubMed, Embase, Access Medicine, Cochrane library, CINAHL complete, EBSCOhost eBook, Google, Google Scholar, ResearchGate, and Comprehensive Journal Index. Gray literature and national reports were searched through selected adolescent reproductive health research and implementing organizations such as the African Population and Health Research Center, Population Council, PSI, and Guttmacher Institute. The search also included Kenyan local and international news websites such as the Nation Media, The Standard, Citizen, BBC, CNN, and the National Geographic documentary website. The key search terms and phrases based on the research questions included *adolescents sexual reproductive health*, *early sexual debut*, *early marriages*, *cultural practices*, female genital mutilation*, *forced marriages* *in-school*, *out-of-school*, *married*, and *unmarried* among others as are summarized in text box 2. The retrieved materials were screened using the titles, abstracts, and executive summaries for relevance to the subject matter. The selected materials were downloaded in full text into a reference manager (Mendeley) folder for further screening to identify those that reported data for the target age group.

Literature was included if published within the last 10 years for intervention studies and reports. For policy documents, global guidance documents such as those by the World Health Organization (WHO) were included based on their relevance for the review, even if older than 10 years. Literature was included if it reported information and data for the 10–19-year-olds. Some studies included a broader age category of 10–24 years, but the findings were reviewed for information relevant to the adolescent years. Quantitative, qualitative, and mixed methods studies and reports with study subjects such as adolescent boys and girls, parents, caregivers, health care workers, teachers, and other key adolescent influencers were also included. Literature was excluded if not available as full text in English.

The primary focus was studies from low- and middle-income countries (LMICs), especially those in the sub-Saharan African context. Literature from other parts of the world were included in some instances to give a broad perspective in topical areas that needed a demonstration of global trends if such studies included data from LMICs. A total of 418 peer-reviewed publications, reports, documents, academic thesis, book chapters, blogs, and PowerPoint presentations were retrieved and stored in a Mendeley citation and referencing folder, and duplicates were removed. Relevant peer-reviewed manuscripts, reports, and documents were mentioned in the Mendeley folder, and those found not to be relevant were deleted. The selected set of materials was reviewed in full, and the relevant information and evidence

synthesis in response to the research questions used a thematic narrative approach.

Box 2

Key literature search terms

Adolescent, teen, teenager, youth; pregnancy, pregnant, unintended pregnancy, childbearing, sex, sexual health, reproductive health, safe, unprotected sex, sexual debut, early sex, initiation, contraception, child marriages, female genital mutilation, abstinence, condom, condom use, abortion, vulnerabilities, socio-ecological model, protective assets, agency, interventions, laws, policies, frameworks, arid and semi-arid, Kenya, Samburu, Turkana, Marsabit, Garissa, Isiolo Mandera, Tana-River, Kajiado, Narok, Kwale, Tharaka Nithi, Wajir, Kilifi, West Pokot, Elgeyo Marakwet, Laikipia, household shocks, stresses, seasonality, safe spaces, culture, cultural practices

Key literature search phrases

Adolescent reproductive health; interpersonal relationships ; drivers of unintended pregnancy and childbirth; risks that lead to unintended pregnancy and childbirth among adolescent girls; vulnerabilities that lead to unintended pregnancy and childbirth among adolescent girls; mitigating factors for unintended pregnancy and childbirth among adolescent girls; adolescents' reproductive health needs; adolescents reproductive health risks; adolescents reproductive health vulnerabilities; access and use of reproductive health services, barriers to reproductive health services, adolescents' interpersonal relationships, reproductive health interventions, laws and policies around adolescent health, laws and policies on female genital mutilation; barriers in enforcing the laws and policies on adolescent reproductive health; adolescents' interpersonal relationships with peers and parents; social and economic opportunities for adolescents; access to and use of quality reproductive health services; climate shocks, stresses and seasonality in Samburu and Turkana counties; household shocks and stresses coping mechanisms; influence of climate shocks, stresses, and seasonality on adolescent sexual behavior in arid and semi-arid regions; comprehensive sex education; cash transfers to adolescents; economic empowerment; parents-child communication

3. Findings

A total of 191 literature sources were included in the review, of which there were 147 peer-reviewed publications, 14 study and project reports, 22 legal and policy documents, 7 news articles, and 1 academic thesis. The literature sources included data and evidence from several sub-Saharan African countries including Kenya, Burkina Faso, Burundi, Egypt, Ghana, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe. Literature sources from Asian and South American continents were also reviewed. This section describes the findings of the desk review per research question with emphasis on the ASAL context and drawing on studies with adolescents as the main respondents. The findings are framed based on the Social Ecological Model that looks at the interaction between individual, relationship, community, and societal levels. The perspectives of the adolescents on their reproductive health needs differ with the perspectives of their caregivers and those who work with adolescents. Adolescent reproductive health is largely viewed as a physical body issue. However, the adolescents define their reproductive health needs as related more to social and mental aspects rather than physical (29). In a study of adolescent girls with perinatally acquired HIV in Malawi, the young women viewed themselves as normal, engaged in sexual intercourse

to feel "normal," and sought relationships to feel loved, accepted, and recognized in the society, while the caregivers and service providers viewed the girls as sick and needing to abstain from sexual relations to protect their health (30).

Perceptions of the risks of sexual relationships are also different between the adolescents and those who work with them. The HIV-positive adolescent girls in Malawi viewed condom use as a threat to sexual relationships rather than a protection against unwanted pregnancies, a risk of acquiring STIs, or transmitting HIV to their sexual partners. The stigma that using a condom could lead to suspicion of HIV status and a loss of the relationship outweighed the benefits of using condoms, and the adolescent girls preferred injectable contraceptives to prevent unwanted pregnancies while maintaining a "normal" health status by not suggesting condom use during sexual intercourse. On the contrary, the adult caregivers and service providers advocated for the girls to abstain or use condoms to prevent HIV transmission to their sexual partners and unwanted pregnancies, which would exacerbate the economic status of the already vulnerable girls (30).

3.1 Reproductive health needs for adolescents

SRH needs identified by adolescents in various LMICs, sub-Saharan Africa, and in Kenya's urban, rural, ASAL region include the need for SRH knowledge; an understanding of sexuality; guidance and counseling on sexuality issues; information on sexuality; sexual reproductive rights and services; provision of basic needs such as sanitary pads, food, clothing, shelter, and education; parental guidance; HIV testing; protection against STIs and HIV; access to condoms; family planning services; education on how contraceptives work; maternal services; child nutrition; protection against sexual exploitation; financial support; and safe spaces to thrive (29–35). In Ethiopia, adolescents living on the city's streets were unable to access health facilities because the health facilities were mostly located in residential areas, while the adolescents spent most of their time on the streets fending for their basic needs (35). Similarly, in Nairobi City, adolescents expressed the need to access information on sexuality, a topic generally considered too taboo to discuss openly in society (36). In Samburu County, the Morans (young men) need mobile health services to reach them with SRH information and services as they move away from such facilities while herding the livestock (31).

3.2 SRH risks and vulnerabilities

Several studies have applied a socioecological-ecological model that stipulates that adolescent sexual behavior and choices are influenced by intrapersonal, interpersonal, organizational, community, and societal factors interacting at different levels (33,37). The individual level factors directly influence sexual behavior, but are also informed by the relationships, community, and societal factors. At the individual level, age, early sexual debut, self-efficacy, and the developmental stages of adolescence contribute to sexual behavior. At the interpersonal level, the peer, family, parental, and sexual partner relationships influence sexual behavior directly or through the interaction with the individual level factors. At the community level, the social-cultural norms, gender roles, the media, religious beliefs and practices, societal

expectations, and the school environment influences SRH outcomes. At the broader societal level, the policies and laws, structural aspects of the health care system, education system, and economic factors all determine the SRH outcomes of the adolescents (38). Section 3.3 focuses on findings on individual level risks and vulnerabilities; Section 3.4 focuses on the community level, while Section 3.5 focuses on structural level risks and vulnerabilities.

3.3 Individual level risks and vulnerabilities

At the individual level, physical, biological, psychological, cognitive, and sexual development reaches peak stages during adolescence. Biological and sexual developments that happen at this phase such as onset of menses, development of breasts, increase in body size, change of voice in boys, increased size of the genitals in boys, and hormonal changes can be overwhelming, especially in early adolescence (39).

Box 3. Individual ASRH risks and vulnerabilities

- Pubertal hormonal changes influence adolescents' response to sexuality and may lead to sexual exploration, curiosity, use of pornography, and early sexual debut.
- Adolescent girls in Samburu and Turkana Counties lack the social autonomy and SRH knowledge to make decisions about sex, marriage, and child bearing.

Adolescents are faced with a development shift where they learn to make choices, formulate beliefs, and develop individual ideas (40). The psychosexual developments experienced through adolescence increase the individual's need for intimacy, attraction, and love making (39). Pubertal hormonal changes influence the way adolescents respond to the environment (40), including tendencies for sexual exploration and curiosity which may lead to indulgence in pornography and sexual activities that increase individual vulnerability for early sexual debut (39). Researchers in Ghana found that having sex with a boyfriend or girlfriend was considered an expression of love by both in-school and out-of-school adolescents (33). In Peru, Philippines, and El Salvador, adolescent boys gave the reasons for their first sexual intercourse as "feeling like it," "having fun," "wanting to know what sex felt like," wanting to be more popular with the peers, and getting carried away by sexual arousal, while the girls mostly had first sex because they "felt in love" (41).

In addition to sexual exploration, adolescent boys and girls were exposed to multiple sexual partners in many contexts (33,42–45). Among a population of adolescents in post-conflict community in Karamoja, Northern Uganda, 27% and 10% of sexually active young men and women aged 15–19 years had engaged in sex with multiple partners (46).

Sexually active adolescents not using contraceptives or any method of protection increase their risk of STIs and unintended pregnancies. In Southeast Nigeria, the perceived individual level risks that limited adolescents' access to contraceptives were limited knowledge of contraceptives, fear of side effects, low-self-esteem, and inadequate resources to travel to the

health facilities and pay for services (47). Shame and stigma against sexual violence increase the vulnerability of girls as they are not able to report when sexually violated (42).

In Samburu and Turkana Counties, there are differences in profiles of the adolescent boys and girls that define the SRH vulnerabilities based on their residence in rural areas or urban centers. Afya Timiza described the profile of the adolescent girls in rural areas in the two counties as more vulnerable to SRH risks than were urban counterparts. Urban girls had access to education, SRH information, and services and had higher agency for decision-making, while their rural counterparts were illiterate, exposed to sexual debut at 10 years old, and married early to older men in polygamous arrangements (31). In Samburu and Turkana, adolescents lacked the social autonomy and prerequisite knowledge needed to make decisions about sex, marriage, and child bearing (43).

3.3.1 Myths and misconceptions

Box 4. Myths and misconceptions about SRH upheld by adolescent boys and girls:

- Laxatives, hard drugs, choline, and alcohol can be used as contraceptives
- Menstruation is a curse
- Family planning implants can get lost in the body
- Condoms can cause infections

Risky sexual behavior in adolescents is influenced by myths and misconceptions on reproductive health, sex, sexuality, and contraception harbored by the adolescents, their parents, and other influential adults. Misconceptions regarding sexual reproductive health at the individual level include those around menstruation and the functioning of the reproductive system. Adolescents from Southeast Nigeria with inadequate information believe that hard drugs, laxatives, chlorine, and alcohol can be used as emergency contraceptives (48). In Kenya's Homabay County, adolescent boys believed that menstruation in girls helped clear STIs and make it safe to have sex (49). Misconceptions regarding menstruation may cause difficulties for adolescent girls in accessing menstrual hygiene products such as sanitary pads, which in turn affect their school attendance (50,51). In Kajiado County, about half of adolescent girls in primary schools did not have adequate knowledge about menstruation; some claimed it was a curse, viewed a discussion around menstruation as a shameful taboo, and had difficulties accessing adequate sanitary pads to maintain menstrual hygiene practices (51).

In regard to contraception, the most common misconception among adolescents in Kenya is that hormonal methods cause infertility, especially for women who have never given birth (43,52,53). These myths and misconceptions may arise from inadequate knowledge or from information acquired from peers, parents, family members, male sexual partners, and the community. Kenyan adolescent girls and boys living in rural, peri-urban, and urban settings in Homabay, Kisumu, Kwale, Laikipia, Mombasa, Narok, Samburu, Thika, and Turkana Counties believed that long-term hormonal contraception such as injectables and implants result in infertility, fetal malformations, birth defects, injury to the uterus, irregular menstrual cycles,

retention of dirty blood, vaginal injuries, cancer, and high blood pressure—and implants may get lost in the body, (31,43,49,52–55). These misconceptions are upheld by a wide range of boys and girls including those in-school, out-of-school, married, or unmarried. In Turkana County for example, in addition to misconceptions, adolescents fear that they will suffer from real side effects of contraceptives such as weight gain, reduced sexual desire, and excessive bleeding (52).

There are conflicting views of acceptability and use of condoms by adolescents and young adults, parents, and health care workers. In Samburu County specifically, out of school, unmarried 15 to 19 year old and 20 to 24 year old Morans believed that implants could get lost in the body after some time (31). Compared to hormonal contraceptive methods, condoms were more acceptable for preventing unintended pregnancies and protection against HIV and STIs, as reported by adolescents in Kirinyaga, Meru, Nairobi, Narok, and Samburu Counties (53,56). On the other hand, adolescents from various settings in Kenya and the African region misunderstood that condoms are contaminated with HIV and are uncomfortable to use; that the lubricants in condoms may cause infections; and that condoms are potential risks for spreading diseases, increase mistrust among sexual partners, encourage promiscuity and prostitution, can burst during intercourse or have holes that cause sperm leakages, or are not suitable for married couples (43,51,54,56). These perceptions were echoed by girls in Malawi with perinatally acquired HIV. Although they considered condoms important protection against spreading HIV, they would not negotiate for their use in fear of losing their sexual relationship and the material gains associated with the relationship (30). Married and out-of-school adolescent girls in Turkana reported that they feared using condoms because they did not know how to use them correctly (31).

3.3.2 Media and digital technology

At the individual level, media and technology simultaneously present as a vulnerability, a protective asset, and a new possibility for interventions (3). Access to digital technology for adolescents in LMIC settings has increased the availability of social media and networking platforms. The social media space has changed the notion of a peer group and provided a fast way of influencing adolescents who are at a stage of rapidly learning behaviors through imitation. For instance, sexting, which can include the use of sexual language or the exchange of nude or nearly nude photos, can be learned. Sexting using mobile phones and digital media technologies is associated with risky sexual behaviors in adolescents in both high-income and low- and middle-income settings (36,57–62). In Zimbabwe, adolescent boys and girls in secondary schools who sexted were more likely to engage in sexual intercourse, have multiple sexual partners, and engage in intergenerational and transactional sex compared to those who did not sexted (57). In addition, the same study reported that adolescent girls who sexted were more likely to use a condom with every sexual partner than boys who sexted (57). This is a potential indication of access to safe sex information through the Internet.

In Northern Ethiopia, among secondary school adolescent boys and girls aged 14–17, sexters were involved in high-risk sexual behavior with the occurrence of first sexual intercourse, last sexual episode without a condom, and multiple sexual partners (58). In a study conducted in Nairobi, Kenya, on adolescent high school students aged 14–19 years where all randomly selected participants had access to mobile phones, 65% sent or received sexts every day (36). Those who sexted daily or weekly in the same study were more likely to masturbate, have multiple sexual partners, watch pornography, and engage in frequent sexual intercourse than those who sexted rarely or never sexted (36). Although no specific study was found focusing on sexting or the influence of digital technologies on ASRH in Kenya's ASAL regions, there is increased mobile phone penetration in these settings, and adolescents are likely to be accessing the technology products as well.

Having access to phones and connection tools allowed adolescent girls to decide whom to connect with and when to have sexual activity with their choice of sexual partners. Among the Maasai girls in Kajiado County for example, mobile phones were used to communicate with boyfriends on where and when to meet for sexual activity, especially on market days at home when parents were away or in lodgings around the nearby towns (42). In Samburu County, participatory observational studies demonstrated that a 13 year old adolescent boy, who had never been to school, spent his time heading livestock in forests, yet aspired to save up enough money to purchase a mobile phone (63). In this participatory study, the young boy indicated his need for a phone was primarily to contact several adolescent girls whom he regularly met at the forest for sexual encounters. He initiated sex at 10 years with adolescent girls who were also headers. This same report narrates that the adolescent boy who lived six kilometers away from Malaral town in Samburu, regularly visited the town on market days to sell his chickens, and he would use some of the money to buy a stock of condoms for protection against HIV and to avoid making the girls pregnant since he was aware the girls were sexual partners of older Morans and he would be attacked by the older men if he was caught having sex with the girls or if he was known to make any girl pregnant (63). This indicates the risks of early sex debut, multiple sexual partners, the consciousness to self-protect against STIs, and how technology is viewed by the adolescent in this context as a tool for making choices around sexual partners.

Recent media reports indicate the extent to which access to technology can be a vulnerability for adolescents especially in urban settings. In Nairobi, adolescents have used social media apps such as Instagram and Snapchat to organize large house parties that are characterized by sexual orgies with alcohol and drug abuse (64,65). These high-risk sexual behaviors were organized by school adolescents mostly during regular school holidays and forced school closure as a containment measure for the spread of coronavirus disease 2019 (COVID-19) pandemic (64,65). This underscores the role of schools as a protective asset for the adolescents. Most of the high schools in Kenya are boarding schools, thus the large house parties are unlikely to occur during a school term as the students are in school.

Open communication about sexuality between adolescent sexual partners increases self-awareness and agency for contraceptive use (34). Digital media solutions are increasingly being applied for engaging parents, teachers, and adolescents on ASRH. For example, in the United Kingdom, parents were invited to view animated content about the importance of communicating with adolescent boys and girls aged 14–15 years to reduce unintended pregnancies, delay initiation of sexual activity, and ensure use of contraceptives (7). Access to mobile phones and social media are tools for decision-making for adolescents. This intervention reported an increased communication to normalize SRH conversations between parents and adolescents (7). Digital media solutions are increasingly being applied for engaging parents, teachers, and adolescents on ASRH in LMIC settings. In Migori County, Kenya, adolescents preferred to receive SRH information from social media platforms, such as Facebook, Google, and YouTube, than from a health facility, citing confidentiality (66). These adolescents perceived the use of sexting on phones or other digital gadgets as offering private space to talk about sex without any interference from adults.

3.3.3 Drugs and substance abuse

Drugs and substance abuse contribute to individual risky sexual behavior and increase the SRH vulnerabilities among adolescents (43,46). Drugs and substance abuse are associated with gender-based violence, insufficient parental care, abuse, or neglect (42). The risky sexual behavior associated with drug and substance abuse exposes adolescents to early pregnancy through casual sexual contact (67). Adolescents in a pastoralist post-conflict community in Karamoja North, Eastern Uganda, who engaged in drugs and/or substance abuse were more likely to have multiple sex partners and not to know their HIV status compared to their counterparts who did not abuse drugs or substances (46). In Ghana, homeless youths on the streets who used marijuana were more likely to be sexually active, have multiple sexual partners, inconsistently use condoms, and engage in survival sex than homeless youths not using drugs or alcohol (68). In Kilifi County, Kenya, adolescents who engaged in drug, substance, and alcohol abuse believed that taking drugs and substances would enhance their sexual prowess (46). School teachers interviewed in the Kakuma refugee camp located in Turkana County reported that in-school adolescent boys and girls aged 10–18 years abusing drugs or substances were likely to be involved in sexual activity (69). Alcohol was seen as a trigger for rape by out-of-school adolescent boys aged 15–19 years in rural Samburu County (31).

3.3.4 Interpersonal relationships

Adolescence occurs within complex interactions between family, peers, school, the community, media, and cultural contexts (70). Interpersonal relationships during adolescent years involve peers, friends, siblings, parents, and teachers. The quality of these social connections is an important source of support for adolescents navigating the challenges of this age group. Although parents remain a constant relationship point of reference, adolescents start to establish independence from parents as they build their personal identity, independence, respond to their developmental characteristics and their desire to fit in with peers. Adolescents

expand their social network of close friendships, clustering in peer groups with the emergence of romantic intimate relationships (71). During puberty, there is a shift toward a greater involvement with peers, youth cultures, and the media (71). This wider social involvement allows the adolescent to test the values they have gained during childhood (72).

Maintaining a supportive relationship and connection with peers, teachers, and parents is a factor associated with successful academic transitions in a school context (31). The interpersonal relationships that adolescents establish with peers, parents, other family members and community have strong influences on how they respond to the demands of puberty and sexual behavior (39). Secure attachments in the family give adolescents more stable emotional stamina to navigate the teenage years and influence their ability to interact and make decisions around sexual behaviors. Adolescent–parental relationships that include open communication, trust, and shared goals result in positive interactions and parents are able to offer guidance on SRH. On the other hand, poor parent-adolescent communication on SRH issues and negative attitudes of parents toward sexuality education for adolescents are interpersonal risks that influence adolescents' sexual behavior (47).

Adolescent relationships with peers, parents, sexual partners, and teachers may support and reinforce positive health behaviors or increase risks and vulnerabilities. For example, in Southeast Nigeria, the discussion of SRH between parents and adolescents was viewed as inappropriate and morally wrong (47). Adolescents who received supportive, positive services by health care workers and caregivers in Nairobi gained motivation to test for HIV in an HIV prevention project and were willing to discuss sexual behaviors when they felt not judged by the health care worker (73). Adolescents are highly influenced by their peers, which can impact their behaviors either positively or negatively. In Ghana in an urban setting, adolescents perceived their peers' disapproval of sexual intercourse as a loss of respect within the peer group (74). In the same study, using a perceived peer norms favoring sex scale, Bingeheimer demonstrated that the adolescents with affiliations to peer groups that favored sex were at high risk of early sexual debut while having more friends increased the risk of multiple sexual partners in both males and females (74).

Accessing reproductive health services can be inhibited by interpersonal relationships where the adolescents are afraid of visiting health facilities for condoms, contraception, or testing of STIs in fear that the health care provider will communicate to their parents that the adolescent is having sex and needing reproductive health services (74). Youth who maintain consistent friendships with sexual partners in Nairobi expressed that repeat sexual encounters with the same partner reduced the chances of using condoms on repeat sexual intercourse because trust is built over time (56). While adolescents of the same age can successfully negotiate the use of condoms, the power dynamics in intergenerational sexual relationships and gender disparities in sexual partner negotiations create a risk for adolescent girls who are unable to negotiate condom use with older male partners (34,56). Having multiple concurrent partners among

adolescents may be motivated by peer pressure to fit into a social group and as proof of fertility (33,42,43).

3.4 Community level risks and vulnerabilities

At the community level, social-cultural norms and expectations may support the adolescents to develop safe sexual behaviors or increase their risks and vulnerabilities. The community spaces outside the family environment include schools, religious institutions, neighborhoods, and workspaces. At the community level, an unstable family set-up, domestic violence, single parent families, extended family set-up, being orphaned, and parental migration increase the adolescent's vulnerability to risky sexual behaviors (3). In addition to family-related risks and vulnerabilities, negative cultural practices and long distances to schools increase reproductive health risks for adolescents (42,43,75). Long distances to education facilities increase the vulnerability of girls to men who may offer them transport or protection in exchange for sexual favors. Boda-boda (commercial motor-bike) riders are a risk for the young girls, as drivers offer girls transport to schools in settings where schools are long distances away (42). Gendered cultural norms and expectations of girls as the agents of population growth and views of premarital sex as a taboo deny the adolescents access to SRH information and services, thus increasing their vulnerability to unprotected sexual intercourse (47) that contributes to early sexual activity, unintended pregnancies, school dropout, and intergenerational and transactional sex in adolescents. Household poverty drives adolescent girls to transactional sex in exchange for gifts, food items, basic needs such as sanitary pads, money, and favors. Adolescents who lack adequate food, have poor housing, are out-of-school, or who are engaged in income generating activities while out of school are vulnerable to transactional sex, early marriage, forced marriages, sexual exploitation, unintended pregnancies, and STIs.

Gender disparities in sexual partner negotiations is a risk for the adolescent girls who are unable to negotiate condom use with older male partners. Shame and stigma against sexual violence increases the vulnerability of girls as they are not able to report if they are sexually violated. Kenyan society is generally conservative about discussing sex with school children and adolescents, and parents often pass on the role of sex education to teachers, who are also ill prepared to train the adolescents (47,76). There is a strong religious belief that sex outside of marriage and use of contraceptives for unmarried sexual partners is not condoned (30,77,78).

3.4.1 Cultural vulnerabilities

Harmful traditional practices in the community are a violation of human rights. These cultural practices arise from gender inequalities and discriminatory values that disenfranchise adolescent girls of any decision-making power in the community (79). These harmful cultural practices include social-cultural events, female genital mutilation (FGM), girl beading, forced marriages, male dominance, sexual exploitation, and violence. In the Samburu and Turkana cultural context, age disparities play a role in propagating adolescent sexual and reproductive vulnerabilities. The adolescents have perceptions that having multiple sexual partners is a sign of popularity and a source of pride. Having multiple sexual partners is also motivated by the

peer pressure to fit into a social group and prove that one's reproductive system and sexual organs are in good health.

The gendered roles and responsibilities within households and divisions of labor determine the activities carried out on a daily basis by both male and female adolescents that may increase or decrease their exposure to risky sexual behaviors. For example in Turkana County, the role of herding small livestock such as goats and sheep belongs to women and children, while herding cattle and large livestock is a man's job. Looking after younger siblings, fetching water, collecting firewood, watering animals, milking animals, cooking, making sheds and fences for animals, making hides and skins, searching for missing animals, searching for food, making traditional dresses and bead work, and making shelter for the family are all responsibilities for adolescent girls which often conflicts with attending school (80). Roles and responsibilities that take the girls away from home such as fetching water and looking for firewood increase their risks of attack by wild animals while out in the bushes or rape and physical attacks. On the other hand, adolescent boys are expected to look after livestock, search for wild fruits, hunt wild animals for food, milk the animals, look out for security threats, collect previous stones, and make bows and arrows (81). Their role is the community protectors, and they are often targeted for attacks by bandits, expected to participate in cattle raids, or attacked by wild animals as they migrate with livestock in pastoralist communities.

3.4.2 Social-cultural and traditional events

Various social-cultural and traditional events in Kenya that increase the risks and vulnerabilities of adolescents to risky sexual behavior include circumcision ceremonies, warrior and age group graduation ceremonies, funerals, and weddings. These events present opportunities when adolescents might engage in risky sexual behaviors or be exposed to sexual exploitation, cross-generational sex, and use of drugs and alcohol. In Kilifi County, sex orgies are known to occur during funeral ceremonies (82). In Western Kenya, the concept of disco *matanga* that involves overnight vigils during funerals presents opportunities for sexual encounters for the youth marked with alcohol and drug abuse, sexual seduction, and physical and sexual violence (49). In Samburu culture, the graduation ceremonies when the young men are promoted from junior Morans to seniors and eventually to elders are marked with elaborate cultural festivals (83). The ceremonies are marked with elaborate cultural displays, song, and dance that can last weeks or months, with mingling and exposing the adolescents boys and girls to sexual activity (42). Morans in Samburu County often engage in night time unsupervised singing events joined by young ladies, which presents a platform for risky sexual behavior (63). School teachers in Samburu indicated that such traditional parties and discos held on Saturdays in market places encourage school dropouts, and adolescent boys and girls are enticed to engage in sexual activities during these events (84).

3.4.3 Female genital mutilation

Despite the Kenyan parliament passing the anti-FGM law in 2011 and the establishment of the anti-FGM board in 2014, the practice of FGM continues in various communities including the Samburu culture. FGM causes a myriad of reproductive health challenges such as infibulation (narrowing of the vaginal orifice), keloid (scars) formations, pelvic infections, dysmenorrhea (painful menstruation), hematocolpos (menstrual blood accumulation in the vagina due to anatomical obstruction), painful intercourse, infertility, and child birth complications (85,86). This practice is common in Samburu County where a majority (86%) of women aged 15–49 years have undergone FGM (18). FGM is also rampant in the Maasai community, which has cultural practices similar to those of the Samburu people, and is initiated at the age of 10–14 years—the onset of puberty. FGM promotes early sexual debut and increases the girls' vulnerability to sexual abuse, exploitation, and gender-based violence. Circumcision in the Samburu and Maasai culture gives the girls social status, and the girls are considered mature, with reduced parental monitoring while they are encouraged to practice adult behaviors, including getting married and having children (42,43). In the Maasai culture, girls who start developing physical sexual characteristics at 10 years of age are culturally expected not to share the family manyatta with the father and instead to move out of the homestead and find alternative shelter with other girls of similar age (42). Young girls living in such shelters with less parental monitoring are exposed to consensual or non-consensual sexual activities and rape from Morans (warriors) who visit the girl's only manyattas at night (42).

3.4.4 Cultural practice of girl beading

In Samburu County, the cultural practice known as girl beading involves Morans giving specialized beads to young girls aged 9–15 years to signify the start of an unrestricted sexual relationship with the young girl (79). This harmful practice happens within clans and does not lead to marriage and forbids pregnancy because the beading Moran could be from the same clan with the girl. When pregnancy occurs, the girl may be forced into a traditional abortion, further endangering her life (79). This practice is a risk for STIs including HIV, maternal deaths, psychosocial stress, infertility resulting from the abortions, social stigma if the young girl is pregnant or becomes infertile, and early and forced marriages to elderly men since younger Morans often shun the beaded girls (79). This practice of beading in the Samburu culture is underpinned by the fact that young Morans are not expected to marry until 11 to 13 years after their circumcision, which occurs when the young men are around 14 years old and they become junior warriors. For 11 to 13 years after their circumcision, the Morans are tasked with providing security and labor for the community (83,87). Thus the girl beading practice gives the Morans long-term unrestricted sexual relationships with the beaded girls, whom the Morans will not marry (83,87). The Morans may also practice sexual partner sharing within the cohort of Morans and beaded girls, thus promoting multiple sexual partners (87). Although sexually active and exposed to unintended pregnancies, abortions, and STIs, the rate of contraceptive use among sexually active adolescent girls (aged 15–19 years) in Samburu County is among the lowest in the country at 10% (22). Since the beaded girls remain unmarried to the Morans, they face social stigma and end up married to older men, increasing

the girls' vulnerability and chance of ending up in abusive marital relationships. In addition, beaded girls often drop out of school due to unwanted pregnancies and the stigma associated with beading.

3.4.5 Early and forced child marriages

In both Samburu and Turkana Counties early and forced marriages of adolescent girls are practiced as an economic venture for their parents and families. These marriages are mostly to whoever the parents or other relatives determine as suitors, and the girls have limited or no autonomy in determining who their sexual partner is (43). Bridal wealth is considered of more value than the education of the adolescent girls, especially in hard economic times. In marginalized communities, girls are withdrawn from school and married off for economic opportunities for the family (42). Parents in the pastoralist communities encourage early pregnancies and marriages for their adolescent girls; the value and emphasis on having children increases the desire among adolescent girls to fulfill this proud ambition for their parents and themselves. In Turkana County, if a girl refuses to get married to the parents' choice of husband, the parents may arrange for the suitor's friends to gang rape the girl, after which she is declared married (43). In Samburu County, girls and women are encouraged to have children with different men to produce a variety of brave Morans who can defend the community in case of adversity (43). Among the Maasai living in Kajiado County with similar cultural practices with the Samburu, early marriages are seen as a way of helping adolescent girls mature quickly (42). Girls in such communities are taught not to refuse sexual advances from men (31,42,43). Numerous media reports and blogs demonstrate that the practice of forced marriages is rampant in the ASAL counties of Kajiado, Narok, Samburu, and Turkana.

In Turkana, marriages have high economic and social-cultural value, and the bride price can be exorbitant—from a few goats or sheep to hundreds of them in addition to larger animals such as cows, donkeys, and camels. Much regard is held for the bride price, which is shared among male relatives of the girl's father and clan members. Besides the wealth generated, traditional marriages are a source of prestige as it earns the woman, her children, and family social value, respect, and status among peers and the community (23). This marital prestige in Turkana applies in all contexts, including among the educated, non-educated, wealthy, poor, urban, or rural. Any ASRH interventions around traditional early marriages should consider how to harness this respectability of marital status by assuring parents that keeping adolescent girls in school and avoiding early marriage will not reduce the bride price.

3.4.6 Cultural barriers to accessing reproductive health services

In the Turkana and Samburu communities, adolescent girls are culturally discouraged from talking to older people, which is seen as rude, thus they are unable to visit the health facilities to seek reproductive health services (23). Adolescent girls interviewed in Samburu County reported being unable to seek contraceptives from the health facility because the health care workers might inform their parents that the girls are sexually active, and that would be considered prostitution (23). Adolescent girls aged 15–19 years, out-of-school and unmarried

in Samburu County, expressed concerns that using contraceptives would make a girl infertile and a prostitute because they no longer worry about becoming pregnant (43). Such misconceptions reduce access to and utilization of contraceptives, thus increasing the vulnerability to risky sexual behaviors among the adolescents. In Kwale County, an ASAL zone, young men and women (18–24 years) believe that contraceptives cause excessive bleeding, infertility, and cause discomfort during sexual intercourse (for intrauterine devices) (54). These misconceptions results from hearsay and misinformation passed around through peer to peer interactions as the youth discuss their experiences with sex and contraceptives (31).

Among the Maasai community in Narok, adults opined that the use of contraceptives by adolescents would promote promiscuity. In Samburu County, although young Morans have rights to bead young girls and have sex with them, they are culturally barred from associating with older or mature women, yet the majority of health workers are women, creating a major barrier in access to health services (31,43). The cultural expectation not to associate with women is informed by the practice that Morans, upon circumcision, can no longer eat food cooked by a woman but rather must stay together in the forest in solidarity with other Morans, where they also prepare their own meals (88). Furthermore, when the young men contract STIs, their access to health facilities for treatment is limited due to the cultural belief that Morans are invincible to disease. There is higher reliance on traditional herbs, resorting to modern medicine only when treatment fails using the traditional methods among the Samburu Morans (31). Married young men (aged 18–24 years) in Kwale County argue that contraceptives reduce women's sexual desires, interfere with sexual freedom through the use of condoms, believe it is counter-cultural to restrict the number of children, and can contribute to infidelity among married couples when the women's sexual desire is decreased and the man has to look for other sexual partners for satisfaction (54).

3.5 Structural level risks and vulnerabilities

Societal level factors that cause or mitigate SRH risks and vulnerabilities for the adolescents include policies and laws that promote and protect adolescents' SRH, social economic factors, and broader societal norms (37). Household poverty is widely recognized as a reproductive health vulnerability that contributes to early sexual activity, unintended pregnancies, school dropout, and intergenerational and transactional sex in adolescents (89–93). Household poverty drives girls to transactional sex in exchange for gifts, food items, basic needs such as pads, money, and favors (40,42,43). Adolescents who lack adequate food, have poor housing, are out-of-school, or are engaged in income generating activities while out of school are vulnerable to transactional sex, early marriage, forced marriages, sexual exploitation, and unintended pregnancies and are at risk of contracting STIs (94).

In ASAL areas, there is poor documentation of proper birth registration, which limits the ability to know a girl's correct age. In the absence of formal records, the right age of marriage is based on physical maturity (breast size, hips, and body size) rather than birth year (95). This raises

questions regarding the right age for sexual consent in this community, yet girls are known to start sexual activity as early as 10 years of age (30,75).

3.5.1 Limited access to adolescent sexual reproductive health services

Barriers to ASRH services such as the negative attitude of health care providers and lack of parental and teacher support for the use of contraceptives continue to expose adolescent girls to the risks of unintended pregnancies and contracting STIs and HIV infections (33,34). A study among Class 7 girls aged 10 to 21 years old in Kilifi County of coastal Kenya reported 13% prevalence of genital sores and ulcers and only 20% of those with infections ever sought medical treatments (89). Access to contraception by adolescents is seen by parents, teachers, and health care providers as a way of promoting promiscuity in some contexts. Further, SRH services are inaccessible by adolescents due to inadequate knowledge among them about where to access services, costs, and stigma (94). Stigma and negative attitudes by health care workers and the community against unmarried pregnant girls in Samburu County induced fear and discouraged the adolescents from seeking health services (19). In Kilifi County, sexually active adolescents complained of poor SRH services at the health facility level and would rather take condoms at night unnoticed from public distribution points than at the health facility for fear of stigma (19). A recent study in Samburu central sub-county by the Center for Behaviour Change and Communication pointed out the health care capacity gaps in the delivery of SRH services to adolescents (19). The health care workers had limited or no training to provide responsive quality adolescent services. Only 28% of pregnant adolescents in Samburu County attended at least four antenatal care visits, which is the recommended minimum number of visits (19). Pregnant adolescents unable to access crucial antenatal care benefits such as folic acid supplementation remain exposed to poor maternal and infant nutrition and health outcomes. When the pregnant, unmarried adolescent girls hide in the community and do not access health services, they are at risk of unsafe deliveries and are unlikely to access postnatal care that introduces them to family planning services. They also may not return to school post-delivery if they were in school and are at risk of subsequent unintended pregnancies.

3.5.2 Limited access to educational opportunities

Education is an important investment for individual and societal development and one of the investments with strong political and financial support in Kenya through its free primary and secondary education policies. Although the country has put strong investment into the education sector, children and adolescents in ASAL areas are still unable to optimize educational opportunities due to various ecological, social, cultural, and environmental barriers. Limited access to educational opportunities is a societal level vulnerability for risky sexual behavior. Access to educational opportunities for adolescent boys and girls living in ASAL regions is limited by the pastoralist way of life, sparse distribution of schools, long distances from educational facilities, cultural practices, hunger and malnutrition, poverty, parents' perceptions of education, child labor, conflicts, and insecurity (96). In Samburu and Turkana Counties, adolescent boys are expected to herd the family livestock, often migrating in search of pasture and water away from the family dwelling and schools. Girls' education in

these settings is hindered by cultural practices, early and forced marriages as a source of income for the parents through dowry payment, pregnancy, the belief that men are superior to women, the prestigious status accorded to married girls and women in these societies, household chores, and poverty (43,84). In addition, teenage pregnancies lead to school dropout, and the girls may not be allowed to return to school upon delivery due to stigma or lack of support from the teachers and parents (43). Among the Maasai community in Kajiado County, girls reported that teachers declined to let them back in school upon delivery of their babies (95). This is despite the existence of the Return to School Law of 1994 allowing girls to remain in school while pregnant and continue schooling post-delivery. In remote areas of Marsabit County, some parents viewed taking children to school as giving them up to the government at the expense of herding their goats and sheep (97).

In Turkana County, educational opportunities are inadequate to protect girls from sexual abuse and early pregnancies, especially in remote rural areas where schools are few and located at far distances (25). Adolescent boys and girls seeking education in these settings walk long distances to get to schools or have to migrate to the towns where the schools are available away from parental supervision. Parents in rural Turkana complained that girls moving to towns may end up working in bars and become prostitutes instead of attending school. Considering the high regard for marriages in this community, girls who end up pregnant before marriage become a reproach to their families, and the family would rather keep them away from school to protect them from becoming pregnant outside of marriage (25). Access to education in this context is further complicated by the belief that girls who move from their rural homes to attend school in towns are separated from the culture and do not experience the closeness with family that they would have enjoyed if they had stayed at home (25). This cultural separation is costly for the girls as they end up too old for marriage in the cultural context and thus miss out from the social status accorded to girls who marry early and whose dowry has been paid. This duo-dynamic effect of education as a protective asset yet culturally alienating to adolescents needs to be carefully considered when developing interventions to explore ways of assuring the girls and their parents that the benefits of education outweigh the perceived downsides.

In Samburu ASAL settings, where girls are married at an early age and a dowry is paid, parents are hesitant to spend money on educational expenditures on a girl who is claimed for marriage, arguing that the girl will end up married in another home and educating her would be a poor investment choice (98).

3.6 Adolescent protective assets

Protective assets are the skills, resources, and social and economic capital that are needed for adolescent girls and young women to achieve their full potential (99). Protective assets are also viewed as “personal stores of value that empower girls and young women to reduce their risks and expand their opportunities” (100). Protective assets can help build resilience against reproductive health risks and vulnerabilities and circumvent poor reproductive health outcomes. Protective assets help the adolescents to improve reproductive health knowledge, behaviors, and actions. Protective assets for reproductive health for adolescents include

education, group-based mentoring programs, clubs, financial and economic empowerment, social networks, self-efficacy, family connections, technology, sports, and safe spaces (99,101–103).

3.6.1 Educational and knowledge asset

Education is recognized as a protective asset for SRH because educational engagement, skills development, and attachment to institutions of learning are associated with reduced sexual behavior (104). School is a protective asset for SRH for both adolescent boys and girls. In early adolescence, school equips students with reading, writing, and language skills; numeracy; critical thinking; and problem-solving skills. In mid and late adolescence, educational attainment opens opportunities for further education and bridges to career goals for adulthood. These skills gained through education increase the self-efficacy of adolescents, which has an impact on their SRH outcomes. School promotes sexual health through the theory of human functioning and school organization where adolescents take pride in positive institutional culture and values (105). Evidence from both high-income settings and LMICs indicate that school involvement reduces occurrence of early sexual debut, unprotected sex, and pregnancies among adolescents (104).

Schools provide a structured environment for implementing age-appropriate SRH interventions. On this premise, comprehensive sex education policies and curriculums have been developed in various LMICS such as Kenya, Ghana, Peru, and Guatemala. However, the implementation of comprehensive sex education (CSE) is limited in most countries (106). The implementation of CSE in these settings is hindered by coordination challenges, lack of capacity of teachers to deliver the CSE, opposition from religious institutions that view the CSE program as an introduction to promiscuity for children, inadequate political will, and limited funding (106). In Kenya's Kisumu County, secondary school teachers were unaware of key topics within the CSE curriculum such as condom use, benefits of abstinence, and contraception (107).

In addition to schools, adolescents also gain SRH knowledge through mass media, digital media, social media, discussion with peers, youth information centers, and targeted counseling sessions (33,108,109). Digital technologies offer social networking opportunities that can be utilized to connect, mobilize, and galvanize adolescents for SRH interventions (60). Adolescent girls who were exposed to media and youth information centers in rural India were less likely to marry early (110). Reproductive health experiences and information sharing was considered an important asset among adolescents in Northern Ghana (33). Analysis using DHS 2014 data for Kenya and Zambia showed that adolescent girls aged 15–19 years exposed to three or more media (radio, TV, or newspapers), were less likely to start childbearing compared to those with no exposure to media (76). In Samburu and Turkana Counties, sexual reproductive health counseling organized by religious organizations also improves adolescent knowledge and decision-making (111). Knowledge gained through churches organizing counseling services to

youth increases adolescents' capacity to act independently in sexual behavior (111). However, such counseling services need to use CSE rather than emphasize abstinence.

3.6.2 Social networks

Strong social networks, positive parental relationships, and communication between parents and adolescents improve reproductive health outcomes for adolescents. Girls with a strong social network of friends, older female mentors, teachers, or relatives have higher self-esteem and self-efficacy (102), which is considered a protective asset as it allows adolescents to seek help from their parents and older adults to make reproductive health decisions. Family set-ups characterized by open, honest, and non-judgmental communication with the youth, where there are expressions of love, support, and predictable structures, are known to protect adolescents against negative behaviors such as drugs and substance abuse, unprotected sex, violence, and poor school performance (112). Parental guidance and responsive behavioral control, especially in younger adolescents, promotes prevention of earlier sexual debut and STIs, including HIV (40,92,113). Communication with parents and other family members about sex influenced the timing of first sex intercourse among adolescents in the United States (114).

Evidence from African settings, especially the ASAL areas, on the influence of parental involvement on adolescents' sexual behavior is limited. In Nairobi's urban slums, a study by Okgbo and others (115) found an influence on cross-gender communication between parents and adolescents on sexual behavior. Mother-son communication was associated with delayed sexual debut among the boys while father-daughter communication, monitoring, and discipline was associated with delayed sexual debut among the girls (115). Although this study in Nairobi slums and others in African countries did not demonstrate parental monitoring as a predictor for sexual debut for both girls and boys, studies from high-income countries found high levels of parental monitoring as a deterrent to early sexual debut. A contextual understanding of parental influence is necessary for the design of adolescent SRH interventions that involve parents.

It is worth noting that although parents play a crucial role in the adolescents' SRH outcomes, parents are sometimes ill-equipped to support the adolescents. For example, in Mombasa, Kenya, parents indicated they had limited SRH information to discuss with their adolescents and would prefer this obligation be handled by school teachers (116). Barriers that inhibit parents from engaging on SRH with the adolescents include embarrassment, religious and cultural beliefs opposed to CSE, low self-efficacy, and underestimating adolescents' sexual behavior (117).

Mentorship programs build around social groupings and clubs with adolescents and young adults as the mentors create a social network that is a protective asset for SRH (89,99,103). A systematic review that included studies from the United States, Burkina Faso, Egypt, and South Africa synthesizing findings on adolescent girls' mentorships programs concluded that group-based and one-on-one mentorships improved the girls' self-efficacy and social networks;

improved their reproductive health knowledge and behavior, academic performance, and financial behavior; and decreased violent experiences (102). In a study among adolescents in Nairobi, Samburu, and Meru Counties, the adolescents preferred interventions at the community level to include clubs, groups, and mentorship to deliver nutrition, health, and SRH interventions (98).

3.6.3 Safe spaces

Girls who accessed an intervention that included safe-spaces mentorship and financial empowerment improved their reproductive health knowledge. Safe spaces for vulnerable girls who are in-school, out-of-school, married or unmarried support the girls to build their decision-making capacities. The power to negotiate sexual relationships and generate career and long-term goals is especially important for highly vulnerable girls (118). For example, the Population Council in Kenya and Uganda invested in providing physical spaces where girls could meet regularly in groups with peers and mentors to discuss SRH issues and personal development or engage in financial asset building activities (102). Girls with access to these safe spaces expanded their social networks, built self-esteem and confidence, and had access to emergency financial help through group savings plans (102).

3.7 Level of agency for adolescent girls and boys in relation to their sexual behavior

Adolescence is a life stage that is exciting and full of opportunities, but also brings the stresses and anxieties of growing responsibilities and independence (119). Thinking and acting independently in making our own choices and decisions is a function of the transition from childhood to adulthood driven by purpose and agency. Adolescents' agency can be defined as the ability to make an objective decision and to set and achieve goals (120).

3.7.1 Indicators for agency

Individual agency has various indicators applied in literature guided by the context and purpose for which it is used (121). The indicators for agency relevant to adolescents' SRH includes the economically inclined indicators such as financial independence, access to resources, self-expression, ownership of household assets, and contribution of household resources. Financial independence for adolescents is considered as having some money savings, saving goals, bank account, group savings, and access to loans (121,122). Other indicators relate to the ability to make decisions, self-efficacy, and the ability to deal with difficult situations (123). Indicators related to freedom of movement include visiting neighborhood friends and relatives, ability to visit a health facility for health care services, and attending community meetings, markets, and places of worship (121,123). Gender norms and attitudes toward gender norms, violence, intimate partner violence, belief in women's right to refuse sex, support for traditional gender roles, and beliefs in women's health rights are also indicators for agency (121). Indicators around collective action include the ability to discus and use family planning by married couples, social cohesion, community support in times of crisis, collective efficacy, and participation in collective action (121,123). Scholars either consider these indicators as

individual variables or combine them to make a composite variable for reporting levels of agency.

3.7.2 Developing agency in adolescents

Agency and purpose are competencies adolescents need to thrive as they transition into adulthood (124). Agency is built through repeatedly experiencing a sense of control over outcomes of one's choices and is an important aspect in controlling one's behavior (125). Building the capacity for agency in adolescents can be achieved through skills development programs, experiences in formal education, active civic engagement, interactions with adult advisors, leadership opportunities, and community service (119,120). The agency skills built through leadership, involvement, formal education, and other challenging activities have an influence on decision-making and sexual behavior. Adolescents also learn agency from engaging in challenging and demanding tasks, receiving feedback on successes and failures, and support from adults working with the adolescents in these challenging tasks (120). Engaging in challenging and demanding environments develops the adolescent's strategies for self-motivation, critical thinking, creativity, and problem solving (125). Young people with a sense of purpose in life and participating in meaningful societal activities develop agency (119). Adolescents involved in formal work and tasks, such as community mobilization, event organizing, and leading other adolescents in group activities, were able to gain skills in personal organization, thinking ahead, anticipation of scenarios, and taking responsibility for themselves and others (120).

3.7.3 Levels, types, and examples of agency in adolescents

Financial and economic empowerment of adolescents create agency for SRH. For example, married adolescent girls in Northern Ethiopia with access to a village savings and loan program improved their practice of personal saving, use of savings, and decision-making power for complex negotiations with spouses on household resources (126). Adolescent girls who saved regularly in a financial savings intervention in Uganda were less likely to receive gifts or cash in exchange for sexual favors than those who did not save regularly (102). There was an association between participation in a self-help group and individual agency in adolescents and young women in India. The girls and young women exposed to a self-help group scored high on financial independence, collective action, decision-making, and mobility indicators (121). In a CARE 2017 Ethiopia study, married adolescent girls who received support from their husband, mother-in-law, or any family member were more likely to use contraceptives (126). In the same study in Ethiopia by CARE, the married adolescent girls with freedom of mobility to go to the market, attend church, or visit friends had high agency for sexual behavior (126).

In Kenya's ASAL societies, women and girls have less power, status, and privileges and are considered owned by men upon payment of dowry for marriage (28). Men are given the upper hand in ownership of livestock and property, and decision-making power even over issues of sexuality. The suppression of girls and women limits their agency on SRH and makes them vulnerable to sexual abuse and exploitation. For example, in Samburu the belief that men are superior to women was reported as a barrier to girls' education, which is one of the ways

adolescent girls gain agency for making decisions. In the same county, girls lack agency to decline unwanted sexual advances as they are taught not to refuse sexual moves from men (31). Due to this cultural expectation of not rejecting unwanted sexual advances and not screaming for help, adolescent girls in Samburu who face gender-based violence and sexual violence lack the agency to self-express if in fear or to report the violence to parents or authorities. Factors that guide girls in decision-making about their sexual relationships include the nature of the relationship, age of the partner, economic status of the partner, and the exchange of gift items, favors, or finances. Girls in Kajiado County felt that they had more decision-making power when the sexual partner was another adolescent than when the relationship involved older, wealthier men, in which case, decision-making power rested with the male partner (42).

Despite the odds, girls express their agency in various ways in this context. In Samburu County, in-school girls who set career objectives were more likely to stay in school and to make decisions against risky sexual behavior that would expose them to early pregnancy and school dropout (84). In Turkana and Samburu Counties, parents increasingly embraced education and taking their children to school, especially in urban centers. This in return equipped the youth with agency as they developed long-term life and career goals and gained knowledge of the dangers of unprotected sex, early marriages, multiple sexual behaviors, protection against HIV/AIDS, and the importance of seeking health services (43).

Youth in nomadic pastoralist cultures are adapting to changing livelihoods in response to the emerging challenges to pastoralism. They are willing to diversify their incomes by pursuing wage labor from conservancies set up to protect and manage wildlife and livestock grazing, moving to the towns in search of formal employment and emphasizing education (2). These adaptations are seen to improve the community's chance of survival, alleviate poverty, and increase economic growth. Young men in urban environments in Samburu are opening up to access reproductive health services from health facilities as they gain understanding of the importance of health care for the prevention and treatment of STIs and other ailments (43). On the other hand, urbanization and modernization are also societal level vulnerabilities for risky sexual behavior for youth as they get access to negative information, such as pornography, through digital transformations that negatively impact SRH outcomes. Thus, the agency created by education, urbanization, and modernization should be harnessed to guard against negative influences and steer youth interventions toward positive SRH outcomes.

Adolescent girls in Samburu County who have access to education and are aware of their rights, disagreed with their fathers about intergenerational marriages (127). Adolescent girls with self-efficacy to seek education may escape forced marriages and find refuge in schools or rescue centers. News media reports highlight situations where young girls (aged 10–14 years) have escaped from their homes to avoid FGM and forceful marriages in Kenya's ASAL areas (128–132). Such escapes are motivated by the desire to receive an education that the adolescents view as a means to a prosperous future. Girls had awareness of the eminent cultural expectation that they would be married off as a source of income, and the girls used their own agency to

seek an education. Adolescent girls demonstrate relative agency by seeking protection from local authorities such as the village elders or chief, peers, and sympathetic relatives or strangers to either aid them in their escape or to persuade their fathers against forced marriages.

For example, a media story from Kajiado and Samburu Counties highlighted the brave escapes of adolescent girls from forced marriages into rescue centers in search of education (129,133). The rescue centers offer education, safety, food, career training, and counseling. These offerings increase the girls' self-value allowing them to create long-term career goals, thus keeping them away from early marriage that would have led to poor SRH outcomes. However, limited capacity at the girls' rescue centers and schools curtail the expectations of some of the young girls who have been turned away for lack of space at the institutions (128). Though the girls who escape to rescue centers receive an education, they also contend with the pain of separation from family members as they are unable to return home during school holidays for the fear that they would still be married off.

3.8 Household shocks and stresses influence on sexual behavior in adolescents

Repeated household shocks and stresses that occur in ASAL areas expose individuals and families to risks and vulnerabilities that threaten their health, nutrition, security, education, and overall livelihoods. ASAL areas are prone to climate, health, market and conflict shocks and stresses (134). Climate shocks include flooding, drought, climate change, changed rain patterns, environmental degradation, and pest infestations such as locusts. Climate shocks threaten livestock by reducing water and forage availabilities (135). Market shocks are caused by increased food prices due to prolonged climate shocks such as droughts where the prices of essential food and other commodities increase. These shocks result in increased market sales of livestock in pastoralist communities as a coping mechanism during droughts, thus depleting the family income and impoverishing the families. Conflict shocks result from insecurity and armed conflicts that could be due to resource and livestock disputes in grazing pasture lands (136) or politically instigated conflicts. Privatization of communal grazing fields in the Northern Kenya region leads to land right shocks and conflicts from claims on a given piece of land, competition for grazing fields, and dispossession of customary pastoral lands (136).

Human and health shocks resulting from disease outbreaks, pandemics and epidemics affect populations in the ASAL regions. For example, in Turkana County, the 2005–2006 drought led to more than 50% livestock losses through starvation followed by an outbreak of contagious caprine pleuropneumonia, a highly contagious respiratory disease in goats (137). Famine and droughts also lead to human losses and increased mortality caused by malnutrition, starvation, or famine-related disease outbreaks, such as cholera (137). Mass media news and humanitarian organizations news reports point to the devastating effects of the perennial droughts, famine, locust infestations, disease outbreaks, and flooding in Turkana and Samburu Counties and the severity of the human and animal losses in these settings (138–141). Using data from 29 sub-Saharan African countries, Herskowitz found that droughts caused a 1%–2% reduction in conception among rural agriculture-dependent households and a likelihood of increased modern contraception use (142), possibly in an effort to control the number of births so that there is not an extra mouth to feed during drought.

The effects of household shocks and stresses for the adolescents include dropping out of school for in-school adolescents, inadequate food at the household level, moving with the families in search of food and water for the livestock, displacement, and disruption of their social network with family and peers (97,137,143–145). Malnutrition, starvation, and deaths that occur with these repeated household shocks and seasonality in Turkana and Samburu Counties leave the adolescents orphaned, destitute, and displaced. In Turkana, adolescents from rural areas may also move into towns in search of jobs to support their families during shocks and stresses. Youths may drop out of school during a drought or famine due to reduced family resources to pay for education expenses (144), or when the young men herd the animals for long distances away from their schools and family residences. During the crises that result from shocks and stresses, women and girls are left behind. While men and boys migrate seeking for pasture for the livestock, the women and girls take on extra roles to provide for the family.

Adolescent girls in particular have to cover long distances to fetch water, take care of other siblings, search for wild food, and weave items such as baskets for sale to make an income and provide for the family (81). To cope with conflict shocks, herders create territorial protection groups comprised of young men and Morans in the community who would otherwise possibly be in school. Once the adolescents drop out of the protective school environment, they are exposed to early marriages, risky sexual behaviors, and violence in livestock raids. In this situation, household shocks and stresses become a structural vulnerability that contribute to community level vulnerability and that influence individual sexual reproductive health choices for the young people as they cope with shocks. There is evidence in several African contexts that demonstrate the influence of household shocks and stresses on sexual behavior.

A study in Ghana and South Africa found that adolescent girls and adult women in food insecure circumstances due to famine, drought, and seasonal household economic shocks turned to transactional sex to earn food or money (146). In Uganda, a national study revealed that women and their sexual partners increased their contraceptive use to limit child bearing during economic shocks (147). Although evidence from Northern Kenya on the influence of household shocks and stresses on adolescents' sexual behavior is lacking, the livelihoods disruption caused by shocks and stresses creates vulnerabilities for adolescents as households apply coping mechanisms. For example, families that lose their livestock due to drought, flooding, animal diseases outbreak, raids, or poor market prices may marry off their young daughters to older men who pay a bride price to replace their livestock, as highlighted in a study by the United Nations Children's Fund (UNICEF) that interviewed elders in Turkana (25). The young girl in this case becomes the family safety net to restock the livestock in response to the household shocks and stresses. The vulnerability of young girls during shocks and stresses in ASAL settings also results from loss of parents and responsible adults to drought, flood, disease, and conflicts as communities fight for scarce pasture lands and water. Girls who are orphaned or isolated as a result may find refuge within the community where they are exposed to rape and sexual exploitation for economic gain.

3.9 Influence of interpersonal relationships/social connections on adolescents' "response" to shocks and stresses, seasonality, and reproductive health outcomes

Interpersonal relationships during adolescent years are important support systems for adolescents to navigate the challenges of this age. Again, although parents remain a constant relationship point of reference, adolescents start to establish independence from parents as they

build their personal identity and respond to the developmental stage and the desire to fit in with peers. Maintaining a supportive relationship and connection with peers, teachers, and parents is a factor associated with successful academic transitions in a school context (148). In a study among adolescents attending secondary schools in Tharaka Nithi County in Kenya, those who received love and affirmation from parents and other authority figures and got corrected for mistakes made were less likely to engage in sexual activity (149).

There is insufficient evidence to explain the influence of interpersonal relationships and social connections on the adolescent's response to shocks and stresses and the relationship of those responses to reproductive health outcomes in ASAL areas. The responses of households to shocks and stresses through coping mechanisms points to the potential impact on the adolescents' interpersonal relationships and sexual behaviors. Other households' coping mechanisms for these shocks and stresses that influence adolescents' responses include reduction of food intake by humans and livestock, sharing food, buying food on credit, borrowing, selling the livestock, migration, and mobility in search of water and pastures (97,135). These household coping strategies indirectly influence interpersonal relationships for adolescents and their reproductive health behavior. For example, migration in search of pasture and water results in school dropout and a disruption of the social networks adolescents have with family, peers, and teachers for those in schools. The practice of sending adolescents off to school or to live with relatives or to the urban centers in search of a better environment during droughts may disrupt their social connection with parents, peers, immediate family, and the community. For example, in Ethiopia, adolescent girls and boys aged 10–19 who migrated to the city of Addis Ababa from rural areas in search of education and job opportunities and to escape forced marriages felt that they had lost contact with their parents back in the rural areas (150). However some families may still send them away for educational purposes in recognition of the educational benefits and appreciation of the role of schools as protective environments against early marriage for adolescent girls. Families adjusting to adaptive livelihood approaches to cope with shocks and stresses embrace the education of their children with the hope of alternative employment as adults thus influencing their long-term health and economic outcomes (150).

3.10 Institutional frameworks (policy, legal) in place to reduce vulnerabilities for adolescents and youth

The government of Kenya has signed on to international and regional treaties and declarations on adolescents' sexual reproductive health, such as the Convention on the Rights of the Child, 1990 (151); Program Action of the International Conference on Population and Development, 1994 (152); the 2002 United Nations General Assembly Special Session on Children (153); Committee of the Convention on the Rights of the Child: Comment no. 4 of 2003 (154); and the Sustainable Development Goals (155). At a continental level, the country has adopted the Maputo Protocol (156), the Common Africa Position, the African Charter on the Rights and Welfare of the Child (157) and the Post-2015 Development Agenda (156). At the subregional level, Kenya has signed on to the Ministerial commitment on CSE and SRH services for adolescents and young people in Eastern and Southern African 2013 (158).

The country has also demonstrated its commitment to the SRH agenda for adolescent SRH through a number of policies, guidelines, and legislative frameworks (Table 1). For example, the Kenyan Constitution of 2010 (159), the Sexual Offences Act, 2006 (27), the Children's Act in 2001 (160), the Counter Trafficking of Persons Act in 2010, the National Reproductive Health Strategy 2009–2012, Kenya's first ARHD Policy in 2003 (161), Guidelines for Provision of Youth Friendly Services (2005), and the Return to School Policy in Kenya (1994) allowing girls to remain in school while pregnant and continue schooling post-delivery. These policies and legal commitments are all summarized in Table 1. The 2015 Kenya National Adolescent Sexual and Reproductive Health Policy (162) is the most recent policy guidance for the adolescent age group. As a follow-up to this policy, the National Adolescents and Sexual Reproductive Health Policy Implementation Framework 2017–2021 was developed to provide guidance to the national and county governments, development partners, and civil society organizations to appropriately respond to ASRH needs (163). In addition, the Kenya Adolescent Health Strategy 2021–2026 (draft) aims to consolidate adolescent health strategy to guide and coordinate multi-sectoral adolescent health programming in the country.

These policy and legal guidelines are anchored on respect for human rights and freedoms, responsiveness to SRH needs for adolescents, provisions of holistic integrated ASRH information and services, and utilization of evidence-based interventions and programs (162). The 2015 Adolescent Sexual and Reproductive Health Policy identifies priority intervention areas such as health systems strengthening, ASRH and rights, ASRH information and sexuality education, STIs, human papilloma virus and HIV, early and unintended pregnancy, harmful traditional practices, drugs and substance abuse, sexual and gender-based violence and response, and marginalized and vulnerable adolescents (163).

Box 5. Status of ASRH legal and policy framework in Kenya

- Poor advancement of the proposed milestones reflected in the policy and legal frameworks
- Slow dissemination, implementation, and inadequate monitoring of polices hindering progress in achieving desirable adolescent sexual and reproductive outcomes in Kenya
- County governments of Turkana and Samburu have not yet domesticated any national adolescent sexual reproductive health policies

The ASRH policies and guidelines are in their third and fourth iterations in the country. The extent to which the national policies are disseminated and implemented in Kenya remains suboptimal and of low political priority, which has limited the change in sexual reproductive health outcomes of adolescents. Implementation of ASRH in Kenya is limited by lack of awareness about the ASRH policies and guidelines among the multi-sectoral stakeholders and the general public, insufficient coordination among the actors, low political will power to invest in ASRH, insufficient involvement of adolescents, limited resources, lack of reliable mechanisms to earmark and commit funds for ASRH, limited quality of adolescent-specific reproductive health services, and limited age disaggregated data (163–165). Insufficient distribution of the policy documents through supply of hard/soft copies to the key stakeholders; lack of monitoring, evaluation, and accountability mechanisms; and mis-alignment with other multi-sectoral legal and policy frameworks are barriers to implementation of these policies in Kenya (166). There is limited evidence of adolescent involvement in Kenya and the ASAL region in developing, disseminating, monitoring, or evaluating these laws and policies in Kenya.

Although WHO defines adolescence as the age between 10–19 years, the 10–13-year-olds in Kenya are largely in primary school and still viewed as children and the 14–17-year-olds are mostly in high school, while the 18–20-year-olds are usually completing high school education, starting out college education, and viewed as adults having achieved the age for issuance of a national identity card at 18 years. This heterogeneity of adolescent age groups complicates the definition of their needs as they differ by age, schooling levels, and marital and social status (164). Policy level ASRH interventions aligned to educational milestones such as CSE need to be delivered through the various educational levels and should articulate the reproductive health needs at each age level, yet remain relevant to the framing of the social constructs and political commitment to these age groups. Limited birth registration in ASAL regions in the country further obscures the chronological age of the adolescents. Poor birth registration results from low utilization of health facilities for births by pregnant mothers as births that occur at home are unreported and unregistered. The age dilemma in Samburu County is further defined by the social-cultural milestones where adolescent girls circumcised at 10 years are viewed as adult women who are ready for marriage and child bearing. Indeed some 10-year-old girls are already married and pregnant in Samburu County (127).

In Turkana, in the absence of birth registration, families determine when girls are fit for marriage based on physical and emotional maturity, further risking early marriages and teen pregnancies (25). Similar to inadequate civil registration of births, registration of marriages is also limited in the ASAL areas where marriages are traditional and under-reported due to limited access to reporting authorities or unwillingness to report when the child marriages are illegal by law. In Kajiado County for example, a study among young women and men aged 15–24 years found only 28% of first marriages were registered (167).

ASRH is considered a cross-cutting issue incorporated in various line ministries including education, labor, agriculture, and health. However, some ministries lack the capacity to understand and enforce guidelines to address ASRH challenges (164). At a subnational level, within the context of a devolved health system, county governments have a role to domesticate national policy and guidance for implementation. Although marginalized adolescents living in arid and semi-arid counties of Samburu and Turkana face severe structural, socio-cultural, and economic vulnerabilities in sexual reproductive health, these two county governments have yet to domesticate the national adolescent sexual and reproductive health policies or to develop county-specific costed action plans for ASRH.

Table1: Summary of laws, policies and guidelines related to adolescent sexual reproductive health in Kenya

Year	Policy	Type of document	Summary of content in relation to ASRH
1994	Return to School Policy in Kenya	Law	Makes a provision for pregnant adolescent girls to remain in school and return to school after delivery.

2001	Children's Act (160)	Law	Safeguards the rights and welfare of the child; Offers children protection against sexual exploitation.
2003	Adolescent and Reproductive Health and Development (ARHD) Policy 2005–2015 (161)	Policy	Multi-sector interdisciplinary integrated approach for mainstreaming quality of reproductive health services for the adolescent.
2005 and 2016	National Guideline for the Provision of Youth Friendly Services (168)	Plan	Recommendations on minimum package of youth-friendly SRH services in all clinic-based youth centers and school-based programs.
2005	ARHD Policy Plan of Action 2005–2015(169)	Strategy	Establishes the link between national development and the health of young people and underscores the role of young people in promoting their own health.
2006	Sexual Offences Act (27)	Law	Defines the child defilement, legal implications of child defilement, indecent acts against children, and protection against child trafficking, child prostitution, and child pornography.
2010	The Constitution of Kenya, 2010 (159)	Law	Establishes the child's best interest, the right to reproductive health to every person, and protects children and youth from abuse, all forms of violence, inhumane treatment, punishment, harmful cultural practices, and exploitation.
2015	The 2015 Kenya National Adolescent Sexual and Reproductive Health Policy (162)	Policy	Provides guidance to government ministries and development partners on how to respond to adolescents' SRH needs, outlines the principles, objectives, priorities, and priority actions for ASRH in Kenya.
2017	National Adolescents and Sexual	Guidelines	Provides guidance to the national and county governments, development partners, and civil

	Reproductive Health Policy Implementation Framework 2017–2021 (163)		society organizations to appropriately respond to ASRH needs.
2021	Kenya Adolescent Health Strategy 2021–2026 (draft)	Strategy	Provides seven strategic directions for ensuing adolescent health: ● Ensure an enabling environment for adolescent health ● Empower adolescents as critical partners in their own health ● Strengthen capacity of parents, teachers, and other duty bearers for shared responsibility with regard to adolescent health ● Ensure access to equitable, quality, and adolescent-responsive health services ● Sustain community advocacy and engagement for collective support and protection of adolescents ● Strengthen data, monitoring and evaluation, research, and surveillance systems ● Strengthen partnerships and coordination for adolescent health

3.11 Adolescent sexual reproductive health interventions

In 2006, WHO and other institutions provided an evidence-based classification of HIV/AIDS prevention in developing countries based on evidence of the effectiveness for such interventions (170). The principles behind the prevention of HIV/AIDS interventions are similar to those of broader SRH services. WHO grouped the interventions as either 'Do not go," "Ready," "Steady," or "Go." Interventions were further grouped based on settings as summarized in Appendix 1. The Steady interventions were those that were not ready for rollout and needed more research to generate evidence; the Ready category were those interventions that had been widely implemented but needed more evaluation for effectiveness; Go interventions were those that were ready for implementation and had shown effectiveness (170). Appendix 1 shows a summary of the WHO classification of recommendations for implementing SRH interventions in various settings. School- based interventions anchored on effective characteristics of curriculum development, training of teachers on teaching methods and content, and implemented through school structures were classified Go (170). Such

programs have shown evidence of delayed sexual debut in adolescents, reduced frequency of sex, decreased the number of sexual partners, and increased condom and contraceptive use in six interventions reviewed (170). Appendix 2 summarizes the examples of interventions in settings similar to those in the WHO classifications, giving the description of the intervention and the key findings.

Most of the examples of interventions reviewed apply multiple components to address ASRH challenges by seeking to improve individual self-efficacy, cohesive action, and community and society level risks and vulnerabilities (89,99,110,167,171–175). The multiple components of these interventions involve community and youth group level activities, financial empowerment, in-school education, knowledge and behavior change communication, parental involvement, and the establishment of safe spaces and adolescent-friendly SRH services.

Establishing safe spaces for marginalized and vulnerable adolescents is one of the priority intervention activities identified in the Kenya National Adolescents Sexual Reproductive Health Policy Implementation framework (2017–2021) (163). Safe spaces for vulnerable adolescents have been tested with promising results in various contexts including India (110,121), Ethiopia (103), Kenya, and Uganda (102). Safe spaces provide adolescents with opportunities for networking with friends and strengthening peer support. Interventions that provided safe spaces for adolescent girls to make life choices have been effective, especially for vulnerable girls (102,167). In Kenya and Uganda, a safe spaces model was implemented for vulnerable adolescent girls that included physical safe space for girls to meet regularly in their community, a same-sex groups of friends, and young women mentors to meet regularly with the adolescent girls (102). This intervention increased the young girls' self-esteem, agency for decision-making about finances, ability to stay in school, increased hope and purpose in life, and self-confidence (102). The safe spaces approach has been used to deliver multiple interventions for adolescents that include financial savings products and behavior change communication (110). In Ethiopia, adolescent girls aged 10–19 years in and out of school, married and unmarried, were exposed to group formation from adult female mentors. The girls also participated in a financial savings scheme, informal numeracy and literacy classes for out-of-school girls, and livelihoods training. This intervention increased SRH knowledge, financial decision-making, communication skills, access to family planning and delayed childbirth, and protection of the girls from early marriage (103).

Various models of the Alternative Rites of Passage (ARP) have been promoted by Non-Governmental Organizations, donors and religious groups in an effort to reduce the practice of FGM in various communities in Kenya(176). ARP interventions are interwoven with education, health, and protection programming and they aim to mimic the cultural practices of the target communities (176). ARP interventions aim to encourage positive culture and discourage negative culture. Circumcision is considered a maturation ritual for the females in the Maasai culture that marks the transition to adulthood and higher ranks in social status (177). Similarly in the Samburu culture, circumcision of young girls marks the transition to adulthood, and they are allowed to participate in sexual activity and marriages (43). The practice of FGM involves the physical cutting of some female genitalia such as the labia minora, labia majora,

and the clitoris; seclusion of the circumcised girls; and instruction about culture and traditions (176). Programs that offer an alternative to FGM as a rite of passage must therefore involve the broader social context for buy-in and support of the alternative. The programs should also be designed with sensitivity to the cultural value that is attached to the circumcision act. The ARP programs seek to accommodate the positive aspects of the transition to adulthood and discourage the harmful genital mutilation (176). Examples of ARP activities that have been tried include community sensitization about the consequences of FGM; female empowerment; and seclusion for adolescent girls and teaching traditional beliefs, aspirations, and values that end in graduation ceremonies as would an actual FGM (65,178). Although ARPs have demonstrated some results in protecting girls from FGM, the girls who do not become circumcised run the risk of being socially stigmatized in their communities (179). Thus, to ensure contextual application and success, ARP interventions must therefore incorporate social support at the family, school, religious, community, law enforcement, and political levels.

CSE implemented in a girls school in Nanyuki, Kenya, that included didactic sessions, educational games, and open discussions increased reproductive health knowledge about family planning, contraceptives, and STIs improved attitude and self-efficacy (55). In this CSE intervention, students met for 3–4 weeks in age-specific small groups for CSE didactics, discussions, peer presentations, and creative arts activities. A nationwide comprehensive reproductive health curriculum focusing on HIV/AIDS prevention implemented in 18,500 primary schools in Kenya achieved a significant increase in reproductive health knowledge and attitudes about sexuality, condom use, and prevention of HIV infection (180). Although these examples showed promising results, the implementation of the CSE curriculum in the Kenyan context is insufficient in coverage and is challenged by inadequate human and institutional capacity to reach all the adolescents in the country. Similarly, Chandra-Mouli, et al., identified five thematic challenges that inhibit positive results in ASRH interventions: inadequate reach to the intended adolescents especially the most vulnerable, ineffective interventions, ineffective delivery, piecemeal delivery of interventions thus limiting effect, and inadequate intervention dosage (181).

A program using village health teams to provide free family planning was implemented in Uganda, but was not highly used by adolescents and youth (182) because they were concerned that the village health teams would breach confidentiality and inform their parents, that they would be judged for accessing contraceptives, or that they would suffer side effects of the contraceptives (182).

The use of digital technologies for SRH interventions among adolescents is increasingly becoming popular. Studies on the use of web-based technologies such as the Internet, text messaging, social networking sites, and gaming sites show modest results in engaging adolescents in promoting sexual health and reducing risky sexual behaviors (183). Using a quasi-experimental school-based pre-post test study design among adolescents in Nairobi, Kenya, and Rio de Janeiro, Brazil, Halpern and colleagues tested a web-based training for adolescents on reproductive health (184). They reported a 372% improvement in knowledge about the length of time for emergency contraceptive effectiveness after sex among adolescents who participated in the web-based training (184). There is a knowledge gap on the effectiveness

of technology-based SRH interventions in ASAL regions, where mobile technology is becoming increasingly available.

4. Discussion

This review provides insight into adolescent sexual reproductive health needs, risks, and vulnerabilities at individual, interpersonal, community, and societal levels. The review also considers the adolescents' protective assets for SRH, agency, household shocks and stresses, and their influence on adolescents' interpersonal skills and risky sexual behaviors and the legal and policy framework that supports and protects ASRH in Kenya and the ASAL areas.

Adolescent sexual reproductive health needs from across various LMIC settings were identified as the persistent need to access SRH information and services and the need for protection against sexually transmitted diseases, including HIV. In addition, adolescent girls in marginalized ASAL communities need protection from sexual exploitation, harmful cultural practices such as FGM, and early and forced marriages for girls, and they also need access to SRH services including contraception. These needs are underpinned by vulnerabilities at individual, community, and broader society levels. At the individual level, adolescents who initiate sexual intercourse at an early age, are involved in unprotected sex, or have multiple sexual partners are at risk of STIs, unintended pregnancies, abortions, school dropout, and poor reproductive health outcomes. Early sexual debut is associated with a long-term reproductive lifespan, increasing the risks of multiple births with minimal birth spacing. Multiple births are associated with both poor reproductive health outcomes and poor nutritional status of the mother and the child, especially in adolescent mothers with competing nutritional needs for the mother and the fetus during pregnancy and through the breastfeeding period (185).

Further, the biological changes during adolescence and puberty require corresponding informational and knowledge maturity and psychosocial support for the adolescent to understand and cope with the growth process. The adolescents in ASAL areas with limited educational opportunities lack the knowledge and agency to make reproductive health decisions. Their understanding of reproductive health issues is obscured by myths and misconceptions individually held as informed by cultural beliefs and practices at that cause community level risks and vulnerabilities. These cultural practices such as girl beading, FGM, transactional sex with favors, intergenerational sex, and forced and early marriages undermine achievement of desirable sexual reproductive health in adolescents. A study in Kajiado County among the Maasai reported that circumcision of both boys and girls was an indication of readiness for sexual activity and that FGM preceded sexual debut, which then preceded teenage pregnancies, school dropout, and early marriages (167). Similarly, in Samburu, mothers encourage their young daughters to have children with more than one sexual partner to increase their chances of having strong Moran genes (79).

Sexual exploitation of adolescent girls by families and the community has been documented in Kenya (167,186,187), South Africa (171,188), Malawi (189), Ethiopia (187), Uganda (190), and Tanzania (191). Sexual violence and exploitation of young adolescent girls sets them on a trajectory of violence and risky sexual behaviors (192). In addition to sexual exploitation, harmful cultural practices deny adolescent girls the self-development opportunities and protective assets that are gained by staying in school and obtaining an education. In Kenya's

ASAL region, adolescent girls' pregnancies are treated as a normal occurrence within families due to the value attached to having children, and the girls are considered mature once they have undergone FGM or developed secondary sexual characteristics(42,43). The risks for multiple sexual partners include sexual abuse and sexually transmitted diseases, including HIV infection.

There exists a cultural tension where the girls who stay in school and receive an education are viewed as having missed out on the cultural experience of beading, as they are infrequently sought after for beading (87). In Turkana County, educated women question their cultural self-worth and worry that they are late for marriage and the community perceives them as having denied their families the social pride that a bride price brings (23). This is an interesting dynamic for ASRH intervention programmers to consider in finding a balance between the benefits of education and the disconnect with culture that may result from pursuing education, which is a well-recognized protective asset against risky sexual behavior. Indeed, education is gaining traction in ASAL areas as more families in Samburu County are considering taking their children to school as a long-term investment for development (193). On the other hand, some parents in Turkana County expressed disappointment with the fact that they have to release their adolescents to attend schools in urban centers due to scarcity of schools in the remote areas. The search for education ends up becoming a source of risk for young adolescents who instead of going to the school their parents intended, are lured to work in the towns in small trades such as selling charcoal and becoming bar attendants. Parents have expressed the loss they experience by sending their adolescents, especially girls, to schools away from home (25).

At the structural level, poverty is a vulnerability that creates risks for adolescents, as girls may get married in exchange for a bride price to cushion the family during shocks and stresses. The other society level ASRH risks and vulnerabilities include policies that are non-responsive to the ASRH limited access to sexual reproductive health and education opportunities. These society level risks and vulnerabilities include the ASRH outcomes at community or individual levels.

At the intervention level, this review identifies a gap in implementation and monitoring of appropriate polices that would promote ASRH outcomes. The review also highlights some examples of multiple approaches that involve mentorship, ARP, behavior change communication, CSE, economic empowerment, safe spaces, and enhancing social connections that include the individual adolescents, parents, teachers, or other significant community members yielded promising results. These approaches improved knowledge gains around SRH and enhanced positive sexual behaviors, thereby improving self-efficacy and enhancing agency for SRH decision-making. In achieving the overall goal of USAID Nawiri to reduce persistent acute malnutrition in Samburu and Turkana, a careful consideration of these findings on the drivers of ASRH outcomes is important. Intensive community engagement while addressing ARP will be key in working with communities to mitigate the effects of the identified harmful cultural practices.

5. Conclusion

The findings of this review highlight the needs, risks, and vulnerabilities for adolescents in sexual reproductive health as influenced by individual, community, and structural components. At the individual level of the personal development journey, knowledge and interpersonal relationships influence the sexual behavior of adolescents. At the community and structural levels, cultural practices, inadequate access to education and health services, and household poverty are key contributors to child marriages, pregnancy, and child bearing among adolescent girls. Where parents cannot provide for adolescent girls, the girls are forced to accept gifts and cash in transactional and repeated sexual encounters that expose them to STIs, HIV, sexual exploitation, gender-based-violence, abuse, and child bearing. At the same time, access to health facilities is limited by the sparse distribution of facilities and the insufficient focus on adolescent needs.

Harmful cultural practices such as FGM, forced child marriages, and sexual exploitation of young adolescent girls contribute to risky sexual behavior and demean efforts to protect sexual reproductive rights for the adolescents.

Interventions that have shown promising results for improving ASRH and offering protection against adolescent pregnancies and child bearing include safe spaces; mentorship; financial empowerment models; ARP; education; information and behavior change communication; parent, teacher, and other stakeholder involvement; and application of technology tools for behavior change communication.

The extent to which policies and laws have been embraced and enforced in context-specific environments is not well documented. For example, in Kenya within the devolved governance structure, it is expected that the county governments adapt and domesticate the national policies for implementation at local levels. The extent to which this has been actualized in Samburu and Turkana Counties was unknown at the time of this review.

6. Limitations

The evidence that informs the results of this review refer mostly to the adolescent aged between 10–19 years as a whole rather than disaggregated by age categories of 10–14 and 15–19 years. Most studies focused on the 15–19 age group with less emphasis on the younger adolescents at 10–14 years. Some studies that used qualitative methods did not indicate the age of the selected respondent's quotes, but rather generalized the adolescents' responses. The findings of this study are skewed toward female adolescents due to the availability of studies that focused on females and less of males.

This review aimed at gaining an understanding of how household shocks and stresses influence sexual behavior in adolescents and how interpersonal relationships and social connections influence the adolescent's response to shocks and stresses, and seasonality, and the relationship to reproductive health outcomes. Literature is limited on the extent to which adolescents are

impacted by household stresses and shocks and how that influences their sexual behavior. However, the impact of shocks and stresses on adolescents may be similar to that on other household members, particularly the women and children with whom circumstances are similar. More studies are needed to distill the adolescent-specific influence of shocks and stresses and the relationship to the sexual behaviors and reproductive health outcomes.

7. Recommendations

Policy Level

- There is a need to domesticate the national adolescent reproductive health policies and guidelines in Samburu and Turkana counties by developing action plans at the county level and committing resources to the implementation of the policies that will ensure an advancement of the ASRH agenda in these counties.

- USAID Nawiri and partners can support the domestication of relevant policies and advocate for commitment of resources and budget line toward implementation, monitoring, and evaluation of policies.

Programming Level

- A combination of social, health, and economic interventions to build strong resilience against vulnerabilities and increase the levels of agency for the adolescents to protect them against sexual exploitation due to poverty and household shocks and stresses.
- Interventions should seek to equip adolescents with knowledge about sex, sexual health, importance of timing of sexual debut, safe sex, contraception, and family planning. Use technology solutions to innovate around implementation of the CSE in a way that is age appropriate, acceptable, yet comprehensive enough to achieve the intended results.
- To harness the shifting perceptions and behavior around the value of education for the girls and boys in Samburu and Turkana Counties, it is important to develop life-skills approaches for the adolescents to navigate this changing landscape to optimize SRH outcomes.
- Co-create with the adolescents an enabling environment for them to form positive interpersonal relationships through safe spaces and mentorship by young adults whom the adolescents can look up to as role models. Co-creation should also test models of how the adolescent can be involved in the curriculum delivery around sex education.
- To build the resilience of adolescents against recurrent shocks and stresses, programming should focus on economic empowerment solutions that equip the adolescents with some level of independence and self-efficacy. Economic empowerment activities that have promising results include access to savings and credit facilities and livestock keeping incentives in line with the nomadic life.
- Engage with influential networks with parents, community leaders, change agents, and cultural gatekeepers to co-create and implement long-term interventions

targeting deep-rooted social-cultural practices. These should be culturally and contextually sensitive to mitigate the cultural alienation and sense of loss or self-worth and prestige that emerges as a potential barrier to the effectiveness of the interventions.
- Integrate youth-friendly health services by building the capacity of health providers to communicate non-judgmentally and improve attitudes on SRH for the youth.

Further Research

- There is limited evidence on how adolescents define their SRH needs, particularly in Kenya's ASAL region. More contextual, qualitative research could be beneficial to programming.
- There is a gap of evidence around the relationship between household shocks, stresses, and seasonality with adolescents' sexual behavior. In this review, we did not find studies that directly addressed the nexus between sexual behavior and the shocks or stresses that regularly occur in the ASALs in Kenya or similar settings. A study in this domain is recommended to generate evidence of the influences of shocks and stresses on adolescent SRH and how their responses influence interpersonal relationships and reproductive health outcomes.
- Further research is needed on trends in attitudes and changing beliefs on transitional issues such as economic opportunities through education, adapting to climate change, changes in cultural norms, and visions of the future.
  Further research to prove a contextual understanding of the parental influence is necessary for the design of adolescent SRH interventions that involve parents, especially in the ASAL regions.

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9. Appendices

Appendix 1: WHO classification of evidence based SRH interventions for young people

Sexual and reproductive health (SRH) intervention settings	Intervention types	Evidence-based classification	Interventions outcome measures
Schools	Curriculum-based interventions with effective characteristics of curriculum development, content, teaching methods and implementation, led by adults	Go	Knowledge, skills on personal values, perceptions of peer norms, communication about sex, sexual behavior (sexual initiation, condom use, number of partners, use of contraceptives)
Health services	Interventions that include training for service providers, improves the facilities, Includes community support to generate demands	Go	Increased utilization of health services by the adolescents
	Interventions with service providers in health facilities and in the community that involves other sectors such as schools or religious institutions	Ready	
Mass media	Interventions that deliver messages through radio and/or television, print media	Go	Knowledge, skills (self- efficacy in terms of abstinence or condom use), sexual behavior (condom use, numbers of partners, abstinence), communication (parents, others), social norms, awareness and use of health
	Radio only program	Steady	

Geographically defined communities	interventions that target young people using existing youth-service organizations/centers and structures	Ready	Knowledge, skills (communication with peers, parents, partners, condom use), sexual behavior (ever having sex, number of partners), social norms Findings
	Interventions targeting youth but not affiliated with existing organizations or centers. Interventions targeting all community members and delivered through traditional community structures Interventions targeting communities as a whole and delivered through community-wide events	Steady	
Young people most at risk (injecting drug users, young people in slums, or out-of-school adolescents	Outreach and facility-based information and services	Ready	Increased access to information and services (harm reduction interventions, condoms and sexually transmitted infection treatment
	Facility-based information and services with information only through outreach and no services in the outreach	Steady	

Appendix 2: Sample interventions for adolescent sexual reproductive health

Author, year	Title	Study design/intervention type /country/ target population/ duration	Intervention description	Main findings	What worked well	What didn't work well/limitations
Gifty Apiung Aninanya, 2014(194)	Effects of an Adolescent Sexual and Reproductive Health Intervention on Health Service Usage by Young People in Northern Ghana: A Community-Randomized Trial	Community-Randomized Trial in upper East Region of Ghana Adolescents aged 15–17 years involving sample size of 2,664 adolescents 3 years	Multiple interventions a)Community mobilization for supportive environment b) Youth-friendly health services approaches to make health facilities more attractive to adolescents c) School-based sexual health education for knowledge gain and behavior change d) Peer outreach through training	There was an increase in adolescents using health services. School-based and outreach activities had higher impact than community mobilization and training health providers in youth-friendly services provision alone.	Increased access and usage of health facility by adolescents.	There was loss to follow-up due to migration and not being present for interviews.

Author, year	Title	Study design/intervention type /country/ target population/ duration	Intervention description	Main findings	What worked well	What didn't work well/limitations
			young people to reach out-of-school adolescents with knowledge and behavior change messages and health facility referrals Methods included one-on-one counseling, drama, film, sports.			
Aoife M. Doyle, 2010 (173)	Long-Term Biological and Behavioural Impact of an Adolescent Sexual Health Intervention in Tanzania: Follow-up Survey of the	Cross-sectional survey for young people aged 15–30 years in rural Tanzania with a sample size of 13,814 12-month survey of a population that had experienced an ASRH	In-school and health service intervention with teacher-led, peer-assisted sessions offered to Year 5 and 6 students. Educational topics included; HIV, sexually transmitted infections (STIs),	The intervention resulted in higher SRH knowledge and desirable SRH attitudes and increased condom use at last sex with a non-regular partner among women	Large number of participants involved and long term intervention may have influenced the community norms beyond	No impact on attitudes to sexual risk, pregnancies, or other risky sexual behaviors beyond what might have happened due to chance.

Author, year	Title	Study design/intervention type /country/ target population/ duration	Intervention description	Main findings	What worked well	What didn't work well/limitations
	Community-Based MEMA kwa Vijana Trial; (Target group was young people aged 15–30 years)	intervention for 3 years (1999–2002)	functioning of reproductive health, pregnancy, saying no to sex, respecting others, and decision making among others.		the participating individuals	Potential for recall bias since the survey was conducted more than 5 years post intervention.
Margaret Gaughran, 2014(173)	On-Site Comprehensive Curriculum to Teach Reproductive Health to Female Adolescents in Kenya	An evaluation using mixed methods of quantitative and qualitative approaches for (10–16-year-old school girls in Nanyuki, Kenya, among a predominantly Maasai community	In-school, culturally contextual comprehensive sex education curriculum. Female teenagers in junior year and high school attended 1-hour didactic sessions and 2-hour discussion groups 3 times a week for 4 weeks and twice a week for the last 2 weeks. Students also participated in	Significant gain in knowledge of STIs, HIV, teenage pregnancies, pelvic inflammatory disease, chlamydia, risk of miscarriage, increased risk of infant death in teen pregnancy. Increases self-efficacy confidence in discussing ideas and asking questions	Adolescent girls found a safe space to discuss adolescent sexual and reproductive health vulnerabilities such as early marriages and other sexuality topics such as masturbation, female genital mutilation,	There existed cultural barriers between the implementors of the intervention and the local context.

Author, year	Title	Study design/intervention type /country/ target population/ duration	Intervention description	Main findings	What worked well	What didn't work well/limitations
		Main measurement was knowledge, attitudes, and self-efficacy and efficacy of the curriculum Sample size of 42 students who had attended comprehensive sex education sessions for 6 weeks	creative activities, journaling, writing, photography, presentations, and personal counseling sessions.		condom use, and stigma around HIV. The curriculum remained a living document and was improved based on feedback from students	
Karen Austrian, (102)	Safe and Smart Savings Products for Vulnerable Adolescent Girls in Kenya and Uganda: Evaluation Report	This intervention was for girls aged 10–14 and 15–19 living in slums in Nairobi and Kampala. Data were collected for 1 year at baseline and end line.	Community-based a) Safe spaces for girls to meet regularly b) Groups of friends of same age living in same community	The program was successful in building vulnerable girl's social assets, providing reproductive health information and financial empowerment. Girls made friends, had access to emergency financial resources,	Girls were protected from sexual harassment, equipped with agency to make decisions. Girls used their savings to reduce vulnerabilities	There was a short time of 1 year for the evaluation, which limited the ability to observe significant behavior change and long-term impact of this financial safe

Author, year	Title	Study design/intervention type /country/ target population/ duration	Intervention description	Main findings	What worked well	What didn't work well/limitations
		Interventions lasted 18 months.	c) Young woman mentor Girls saved money, received training on financial education and health, and received incentives for making deposits.	increased decision-making power to reject money from men for sexual favors.	during emergencies. The program was extended to reach over 12,000 girls in Kenya and Uganda.	spaces intervention program on social, health, and economic outcomes.
Annabel S. Erulkar, 2009 (195)	Evaluation of Berhane Hewan: A Program to Delay Child Marriage in Rural Ethiopia	Quasi-experimental design with baseline and end line in rural Ethiopia Adolescent girls aged 10–14 and 15–19 in-school and out-of-school; married or unmarried;	Group formation by adult female mentors, support for girls to remain in school with economic incentives, participation in nonformal education such as basic literacy and numeracy, livelihood training for out-of-school girls	Improved friendship and networks, school attendance, knowledge of reproductive health, age at marriage improved, contraceptive use and ability to communicate on sexual and reproductive health topics. Improved use of contraceptives delayed child birth. Notable increase in school	Adolescent girls remained in school and gained extra years to expand their social networks and develop as individuals. There was cooperation with the community in co-creating	Multiple interventions in this study did not allow for an effect for ascertaining the project component that had the most influential effect on preventing child marriages.

Author, year	**Title**	**Study design/intervention type /country/ target population/ duration**	**Intervention description**	**Main findings**	**What worked well**	**What didn't work well/limitations**
		Samples size at baseline was 460 girls, and 462 at end line. Duration was 2 years (2004–2006),	and community conversations. Incentives to parents to keep girls in school	enrolment among girls aged 10–14 years and protection from early arranged marriages.	solutions through the community conversations.	

CONTACT

DARIUS RADCLIFFE

Chief of Party (CoP), USAID Nawiri
MERCY CORPS
tel +254 701 442 396 | skype mdariusradcliffe
The Almont Park
Church Rd. | Westlands – Nairobi, Kenya

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