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Barriers and Facilitators of Sexually Transmitted Infection Control in Maasai Communities: A Qualitative Systematic Review

by

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Plagiarism declaration

I, Catriona Oliver, hereby declare that this dissertation is my own work and that I have not plagiarised work from other sources. I confirm that I have cited all the sources, including books, journals, conference proceedings and websites from which I obtained information for completing this work. The work in this dissertation has not been submitted to any other University for the award of any degree.

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Abstract

Sexually transmitted infections (STIs) continue to have a large impact on global health, with Africa being disproportionately affected. The Maasai people of Kenya and Tanzania are a disadvantaged community in terms of health outcomes, with multiple aspects of their traditional culture putting them at increased risk of STIs. Despite this, comprehensive reviews of the available data are lacking in the literature regarding the extent to which the Maasai are impacted by these infections and the most appropriate methods of STI control.

To address this publication gap, this systematic review analysed qualitative data in order to identify the barriers and facilitators of STI control in Maasai communities. Thematic analysis was utilised to study mixed methods and qualitative studies conducted in various communities across Maasailand. The results were grouped into key themes and further discussed in terms of their applicability to the Maasai as a whole.

Major barriers to STI control included multiple concurrent sexual partners, low STI knowledge and high levels of gender inequality in Maasai society. These factors were found to increase the risk of exposure to STIs, in addition to impacting the uptake of health services such as testing and treatment. Common facilitators included reverence towards elders within the community, formal education services and female empowerment.

These results emphasise the extent to which Maasai social structures differ to that of sedentary society in surrounding areas. Therefore it is imperative that STI control interventions utilise an evidence based approach to ensure their effectiveness. The inclusion of community elders, female empowerment and increased access to education should be core aspects of future STI control programs which target Maasai communities.

Further research should aim to gather widespread quantitative data regarding STI levels in the Maasai in addition to longitudinal study of the impact of culturally congruent intervention implementation. Through increased investment in the inclusion of Maasai in country wide STI control, progress can be made towards decreasing the current health disparities which exist in this disadvantaged population.

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Abbreviations

ABC method	Abstinence, Be Faithful and Condom method
AIDS	Acquired Immune Deficiency Syndrome
CASP	Critical Appraisal Skills Programme
DALY	Disability Adjusted Life Year
FGM	Female Genital Mutilation
HIV	Human Immunodeficiency Virus
NGO	Non-Governmental Organisation
STI	Sexually Transmitted Infection
UNAIDS	United Nations Joint Programme on HIV/AIDS

Key Vocabulary

Maa

Alaigwanani	Age-set leader
Biitia	Acquired Immune Deficiency Syndrome (AIDS) and similar diseases (literally: 'to shrink')
Enkai/Engai	God
Esoto	Home of ilmurran, or the practices which occur there
Olamal	Women's fertility group
Olmurran	Warrior
Ilmurran	Warriors
Osinoni	A sexually undesirable person

Swahili

Upungufu wa kinga mwilini (ukimwi)	Human Immunodeficiency Virus (HIV)

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1 Introduction

Sexually transmitted infections (STIs) have a large global healthcare burden. There were an estimated 273 million cases of infection with a curable STI in 2012 (Newman *et al.*, 2015), disproportionately impacting low and middle income countries (World Health Organization, 2012). The control of such infections requires the synergistic actions of prevention, testing and treatment of individuals and communities (Steen *et al.,* 2009). However, the effectiveness of STI control interventions is reliant on accurate data regarding prevalence and incidence of STIs in the intervention population. This is further enabled by information regarding the prevailing knowledge and attitudes which may impact such programs (Mayaud and Mabey, 2004). Qualitative analysis of barriers and facilitators of STI control allow policy makers to make informed decisions, particularly for the most vulnerable communities (Gough and Elbourne, 2002).

One such high-risk group, the Maasai people of sub-Saharan Africa remain a neglected group in terms of education (Phillips and Bhavnagri, 2002) and access to healthcare (Lawson *et al.*, 2014). This results in a lack of knowledge regarding infectious disease prevention and treatment as well as adverse health outcomes. The lack of both quantitative and qualitative healthcare data regarding the Maasai remains an obstacle to both the surveillance of STIs as well as identifying effective methods of control (Sikar and Hodgson, 2006). As Maasai continue to migrate to areas of greater exposure to STIs (May, 2002), there is an increasing need to identify the barriers to effective STI control in these populations. Furthermore, investigation into pre-existing facilitators of STI control is vital to allow the design of culturally congruent interventions.

This systematic analysis brings together qualitative data from the field in order to inform decision makers of suitable STI control methods for the Maasai communities of Tanzania and Kenya. After a short review of the current literature regarding STIs in East Africa and a background of the culture of the Maasai people, the results section provides thematic analysis of the current published qualitative data regarding STIs in Maasai communities. The discussion section provides further analysis of the impact of these findings, as well as critique of the methods and recommendations for further research.

2 Literature Review

2.1 Sexually Transmitted Infections

The prevalence and incidence of sexually transmitted infections (STIs) continues to be a global problem, with approximately 1 million new cases occurring every day (Newman *et al.*, 2015). These infectious diseases have both a high morbidity and mortality burden with 726 disability adjusted life years (DALYs) and 12 deaths per 100,000 population globally in 2019 (Global Burden of Disease Collaborative Network, 2020). Morbidity can manifest in both acute and chronic sequalae, ranging from discomfort and discharge to infertility and miscarriage (Gewirtzman *et al.,* 2011). An estimated 99.7% of cervical cancer cases are caused by the sexually transmitted human papilloma virus (Walboomers *et al.*, 1999) causing over 300,000 deaths in 2018 (Arbyn *et al.*, 2020). HIV infections also present a particular health challenge globally, accounting for 91% of all STI deaths as well as 85% of all DALYs in 2019 (Global Burden of Disease Collaborative Network, 2020). While HIV is both preventable and treatable, over 10 million people living with HIV were not receiving any form of treatment in 2020 (UNAIDS, 2021b).

Risk factors for STIs include early age of first sexual activity, multiple sexual partners, and drug use. Societal factors also heavily influence the risk of transmission (Mindel *et al.,* 2013). Marginalised populations such as sex workers and men who have sex with men experience disproportionately high prevalence rates (Beyrer *et al.*, 2013). Testing positive for an STI is highly stigmatised in many areas of the world, influencing a person's likelihood of seeking testing or treatment services. Marginalised groups are even less likely to seek healthcare, leading to persistently high prevalence rates in these groups and bridging populations which further perpetuates the cycle of transmission (Huang *et al.,* 2011; Spice, 2007).

One of the targets of the United Nations Sustainable Development Goals is to "ensure universal access to sexual and reproductive health-care services" (United Nations Department of Economic and Social Affairs, 2021). The greatest barrier to this goal exists in low and middle income countries, where sexual health services are severely lacking (Temmerman, Khosla and Say, 2014). STI control programs are imperative to effective sexual health services. These refer to the reduction of prevalence and incidence of STIs through the implementation of programs which look to increase prevention, testing and treatment (Steen *et al.,* 2009). Due to the economic burden of STIs on health systems, many STI prevention interventions are a cost effective solution, especially in low and middle income countries (Chesson, Mayaud and Aral, 2017).

While lower income countries represent a large hurdle to global STI control, Africa remains an area of particular concern. The continent is disproportionately impacted by STIs, suffering from the highest global prevalence of HIV (UNAIDS, 2021a), syphilis and trichomoniasis infection (Newman *et al.*, 2015). There is also an increased level of stigma experienced by STI sufferers, most notably HIV, which impedes access to diagnosis and treatment (Mbonu, van den Borne and De Vries, 2009). The criminalisation of homosexuality and sex work in much of the continent further prevents high-risk individuals from accessing the necessary healthcare services and educational resources (UNAIDS, 2014).

2.2 Indigenous Pastoralist Populations

While there is a wealth of health data available for mainstream sedentary populations, information regarding mobile populations is less widely available (Sheik-Mohamed and Velema, 1999; Weibel *et al.*, 2008; Zinsstag, Ould Taleb and Craig, 2006). STI data from indigenous nomadic communities are scarce and unreliable, due to factors such as geographical isolation and separation from mainstream society and infrastructure (Minichiello, Rahman and Hussain, 2013). These factors contribute to major disparities in health between indigenous populations and non-indigenous populations globally. While specific challenges vary between communities, common issues include poverty, malnutrition and poor access to healthcare (Gracey and King, 2009). Nomadic pastoral communities in particular tend to live rurally or even in isolation, and are often not reached by healthcare services. The logistical barriers to infectious disease control have contributed to a lack of interventions which target pastoralists (Serbessa *et al.*, 2016). These populations are seen as a low priority by local governments and therefore receive little support when faced with adversity (Zinsstag, Ould Taleb and Craig, 2006).

2.3 Maasai

One such population, which will be the focus of this research, is the Maasai people of East Africa. A historically pastoral tribe, the Maasai live in and around the Great Rift Valley on the border of Tanzania and Kenya, in an area known as Maasailand (Figure 1). While some communities have become more sedentary in recent years, much of the Maasai remain nomadic in lifestyle, relocating as necessary according to the seasons and meteorological conditions (McCabe, Leslie and DeLuca, 2010). The Maasai rely heavily on the land for their livelihood due to primarily using cattle livestock supplemented with agriculture for subsistence (Brown, McIlwraith and Tubelle de González, 2020). This dependency on the land for nutrition and income can lead to adverse health outcomes in the circumstance of unfavourable weather, such as the droughts which have

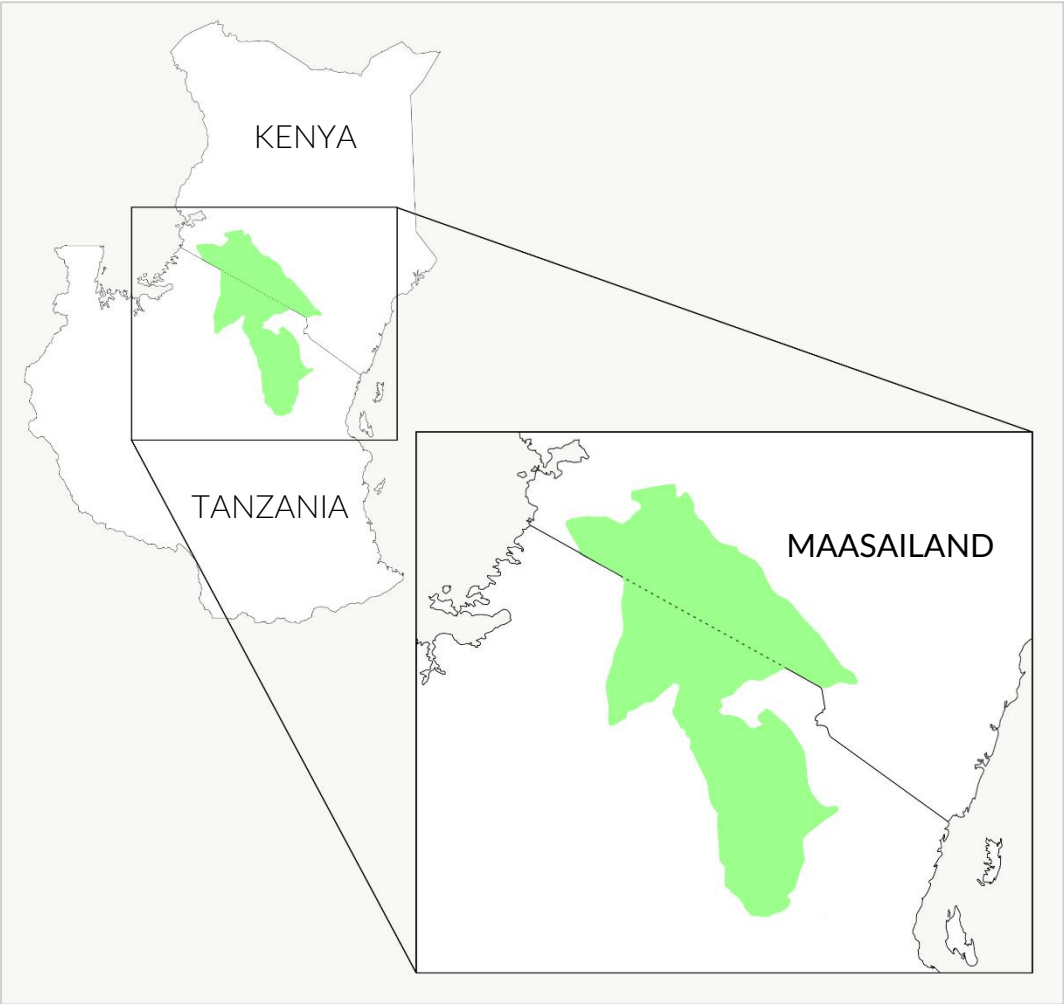

Figure 1: Approximate location of Maasailand, on map of Kenya and Tanzania. Not to scale. Maasailand borders from Spencer (2003).

plagued the area for many years (Heaney and Winter, 2016; Intergovernmental Authority on Development Climate Prediction & Applications Centre, 2021). Maasai populations generally have poor nutrition (Galvin *et al.*, 2015) and are more disadvantaged regarding health outcomes in comparison to neighbouring ethnic groups (Lawson *et al.*, 2014). Low education levels in these remote communities, particularly among women, further contribute to a lack of development (Temba, Warioba and Msabila, 2013).

The societal structure of Maasai communities differs largely from that of non-Maasai in Tanzania and Kenya. The society is patriarchal, with community roles allocated dependent on gender and age within the social structure (McCabe, Leslie and DeLuca, 2010). Males are categorised into age-sets, made up of the participants of a shared circumcision ceremony. Around the age of 17, boys are initiated into their age-set through circumcision to become 'warriors' (singular: *olmurran*, plural: *ilmurran* in Maasai language of Maa). This group are designated as the protectors of the community and live a life separate from the rest of Maasai society (Talle, 1994).

At the end of this life period, which can last as long as 15 years, a ceremony takes place where the men graduate to become junior elders. Males are then permitted to marry and start a family with circumcised females from the associated age bracket, usually at least 15 years their junior. A newly circumcised age-set of males then takes their place as ilmurran for the community (Coast, 2000).

2.4 Maasai Population and Health Data

While the Maasai are over-represented in the literature in terms of anthropological study (Coast, 2002), quantitative data are less available. Population estimates of the Maasai vary widely in the literature due to both a lack of investment in data gathering and resistance from the Maasai to be quantified. While a widely cited estimate approximates the total Maasai population as 1 million (Phillips and Bhavnagri, 2002), more recent census figures reported over 1.1 million people who identify as Maasai in Kenya alone (Kenya National Bureau of Statistics, 2019). Tanzanian censuses do not gather data regarding ethnicity, causing a more accurate estimate to be difficult to obtain (Coast, 2000). Additionally, the mobile aspect of Maasai lifestyle is at odds with traditional census data gathering, especially as this movement often occurs across the border of Kenya and Tanzania (Carr-Hill, 2014). Maasai culture is also known to reject quantification of their people due to cultural beliefs that this is “greedy” and “taboo” (Lekuton and Viola, 2003). This is further hampered by the Maasai’s distrust of government intervention, having suffered many decades of persecution at the hands of British colonisers and subsequent governments (Coast, 2000; Hodgson, 2001).

2.5 Sexually Transmitted Infections in the Maasai

In addition to accurate population data, recent STI prevalence levels in Maasai communities are substantially lacking in the literature, even in comparison to other high-risk indigenous minority groups such as Australian Aboriginals (Australian Government, 2020). The available historical data are small scale, with isolated cohorts. One of the earliest published studies from 1962 screened 406 Maasai in Northern Tanzania for syphilis, with 8.6% confirmed positive for infection (Mann *et al.*, 1966). These data surprised researchers at the time, as it was presumed that the Maasai had higher levels of STIs due to what was perceived by British colonialists as “low moral condition” and “sexual excesses” (Hughes, 2006). A later study in 1990 screened 80 Maasai for HIV in villages surrounding Arusha, Tanzania. Despite many of the cohort having self described history of STI, there were no positive cases of HIV in the population. This was also contrary to popular belief, as HIV was thought to be endemic to the surrounding areas (López

Corral *et al.*, 1992). A study in Kenya in the early 1990s tested 2082 pregnant women in the Kajiado area for HIV and syphilis. Prevalence ranged from 0.95% to 2.23%, much lower than the surrounding areas of non-Maasai communities (Valadez *et al.*, 1999). It was postulated by many of these researchers that the Maasai were not engaging in sex with non-Maasai people due to the belief that non-pastoralist lifestyles were inferior to their own. This was cited as a possible explanation for the lower than average STI levels among the Maasai. However, this conclusion is not supported by any empirical evidence in the literature (Rosenburg, 2009; Valadez *et al.,* 1999).

Many aspects of traditional Maasai culture increase the likelihood of STI transmission, such as polygynous family structures and young age at sexual debut (Talle, 2007). Ilmurran engage in high-risk sexual behaviour with young Maasai girls, with the status and age of the ilmurran creating a power imbalance between sexual partners (Talle, 1994). The Maasai place a great deal of value in large families with many children, as they are seen as a symbol of prosperity and wealth (Coast, 2000). This results in substantial pressure on women to produce children and infertility is stigmatised and feared. Women are known to go to great lengths to induce pregnancy, including risky sexual behaviour (Talle, 2007). This, and a lack of education regarding sexual health and contraception (Stats, Hill and Ndirias, 2020), is thought to contribute to low condom usage. The use of condoms is generally low in much of Central Africa (Kapiga and Lugalla, 2003), including areas surrounding Maasailand (Mnyika *et al.,* 1995). While data regarding condoms in Maasai communities are not well documented, the use of contraceptives and family planning is low in many Maasai communities (Muvandi, 2003; Stats, Hill and Ndirias, 2020).

While Maasai communities have historically had little interaction with non-Maasai, sedentary society, migratory behaviour has begun to change over the past 30 years (May and Ikayo, 2007). Due to factors such as drought and dispute over land, there has been an increase in Maasai migration to urban areas. This has challenged the traditional nomadic lifestyle as young people have sought better employment opportunities to escape poverty (Fratkin, 2001; Heaney and Winter, 2016). Maasai are now present in many towns and cities surrounding the Great Rift Valley as well as further afield in areas such as Dar es Salaam and Zanzibar (May, 2002). This movement has led to an increased likelihood of exposure to infectious diseases (Neiderud, 2015). In addition, the circular migrations that many Maasai undertake to bring their earnings back to their families in Maasailand, further exposes the larger Maasai population to these infections (Jowell *et al.,* 2018). Due to these communities having poorer access to healthcare

facilities, subsequent infection in Maasailand has an increased risk of adverse consequences, and a reduced likelihood of receiving the necessary treatment (Sikar and Hodgson, 2006).

2.6 Study Rationale

Ongoing data collection regarding population and health outcomes is imperative to effective and appropriate healthcare interventions (Clarke *et al.,* 2019; Soucie, 2012). As exposure to STIs increases in Maasai communities, further efforts must be made by governments to include them in STI control programs and HIV/AIDS services. However, with multiple unique cultural factors which increase the likelihood of STI transmission in Maasai societies, there is a need to investigate appropriate STI control programs. As has been observed in attempts to increase general education levels in the Maasai, the unique lifestyle of these communities requires a tailored approach to intervention in order to ensure its success (Phillips and Bhavnagri, 2002). In order to inform these interventions, it is necessary to collect qualitative data regarding the barriers and facilitators of STI control.

While recent STI prevalence and incidence data are currently not available in the literature, there have been small scale qualitative investigations into the various factors influencing the introduction and spread of STIs within Maasai populations. However, the data are limited to individual Maasai settlements, lacking amalgamation across larger areas. There is currently no systematic analysis investigating sexually transmitted infection awareness, treatment and prevention in these communities. As many Maasai communities continue to lead nomadic lifestyles, they cannot be viewed in isolation, but instead as a fluid, mobile population unencumbered by country borders. This research attempts to address the need for a qualitative analysis of barriers and facilitators of sexually transmitted infection control in multiple Maasai communities, both Kenyan and Tanzanian, from the data currently available in the literature.

3 Method

This systematic qualitative review aimed to identify relevant qualitative data for Maasai populations in and around Maasailand of the Great Rift Valley. The eligibility criteria utilised to identify papers for data extraction can be seen in Table 1.

Eligibility criteria:
▪ Full text available in English
▪ Primary qualitative or mixed methods data
▪ Maasai included in investigation population
▪ Study population located in or around Maasailand in Kenya or Tanzania
▪ Data regarding sexually transmitted infection control (such as prevention, testing and treatment), prevalence/incidence or knowledge/attitudes
▪ Grey literature included
▪ Any publication year

Table 1: Eligibility criteria for record inclusion.

As the exact geographical location of Maasailand is contested in the literature (Koissaba, 2016), geographical inclusion was loosely restricted to Maasai communities in Southern Kenya and Northern Tanzania.

The following databases were searched to identify records: African Journals Online, Applied Social Sciences Index and Abstracts, Global Index Medicus, ProQuest Dissertations and Theses, PubMed, Scopus, and Web of Science. Search strings were adapted to each database based on the search settings and Boolean operators used. An example string used to search the Web of Science database is shown below:

> “ALL=(("ma$sai") AND ("sexually transmitted infection$" OR "sexually transmitted disease$" OR "venereal disease$" OR "HIV" OR "HIV/AIDS" OR "human immunodeficiency virus"))”

Items identified through manual searching and citation chains were also included in the initial record identification, identifying 153 records for screening. After removing duplicates, records were excluded if deemed to not fit the eligibility criteria based on the contents of the title and abstract (Appendix 1). Full text reports were then retrieved where possible, with a total of 35 reports assessed for quality using the Critical Appraisal Skills Programme (CASP) Qualitative Studies checklist (CASP, 2018). This excluded one report which did not have a clear research aim

or suitably descriptive information regarding its data gathering methodology. The full text of the remaining 34 reports were then assessed for eligibility. A final 15 reports were included in the systematic analysis, consisting of theses, dissertations, book chapters and journal papers (Figure 2).

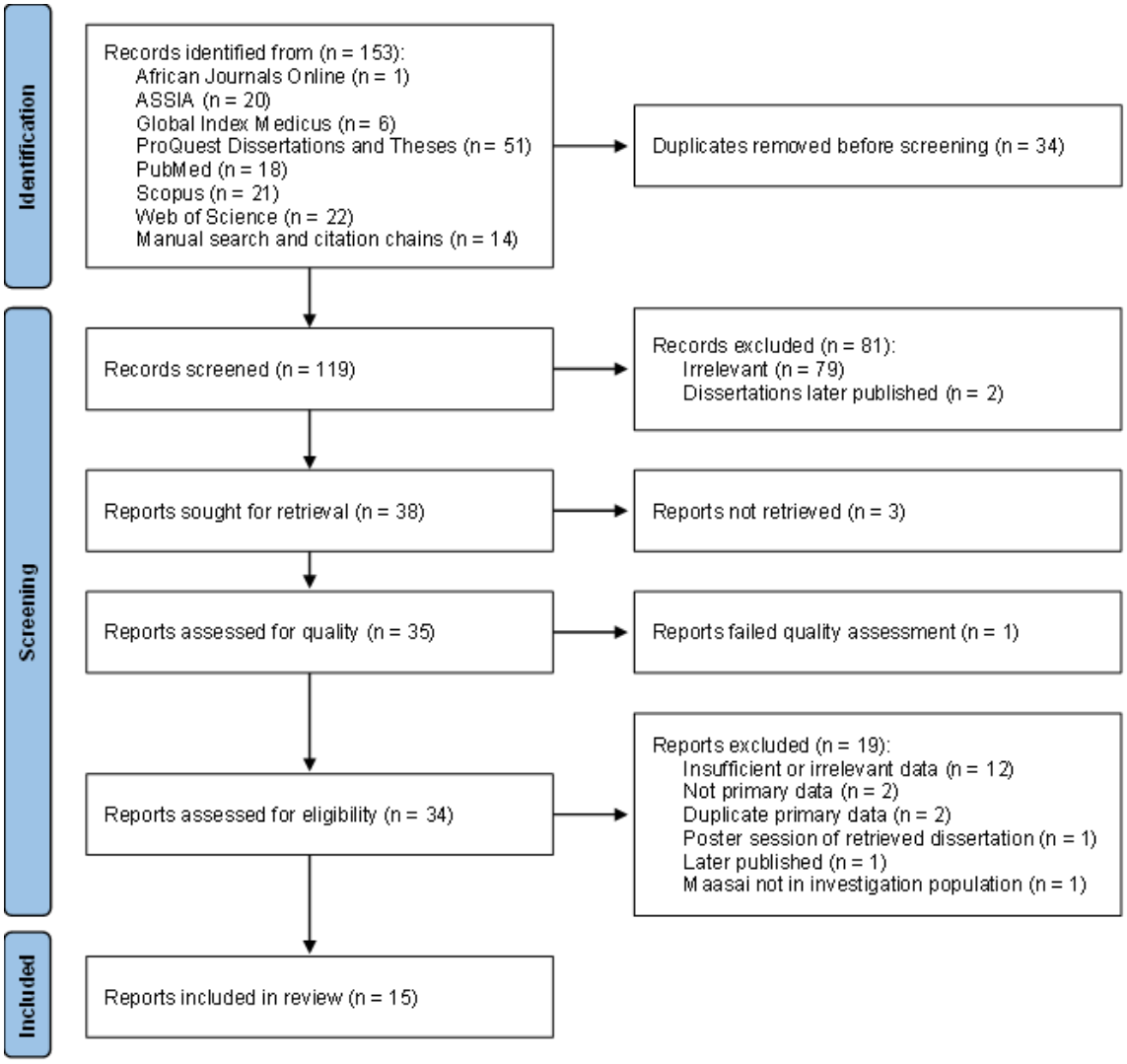

Figure 2: Screening flow diagram. Adapted from Page *et al.* (2021).

A method of thematic analysis described by Thomas and Harden (2008) was used to analyse the collated data. An extraction method initially conceived to analyse raw qualitative data, this analysis method enables the scrutinisation of multiple qualitative studies in the same systematic and reproducible manner. Data extraction initially identified basic study characteristics, followed by line-by-line coding to identify all primary data regarding barriers and facilitators of STI control in the communities investigated. Data was coded from Results and Findings sections, unless otherwise stated in the data extraction table (Table 2). NVivo software R1.6 was utilised to code and group the data into key themes, which are described in the Results section below.

4 Results

4.1 Articles Included

The final fifteen studies selected for inclusion in this review included ten studies conducted in Tanzania, four in Kenya and one in both Kenya and Tanzania (Figure 3). The basic study characteristics can be seen in Table 2. The year of publication ranged from 1995 to 2021 and, while not all of the papers included the date of data collection, the earliest data were most likely collected in the early 1990s. As per the eligibility criteria, Maasai people were included in all the sample populations, however some researchers also included data from non-Maasai people who were deemed to have insight into the phenomena being investigated. While all the papers are included in the analysis below, Wright (2005) collected the majority of interview quotations. The data collected relates to multiple Maasai communities, however this does not indicate that all Maasai are identical in cultural practice or beliefs.

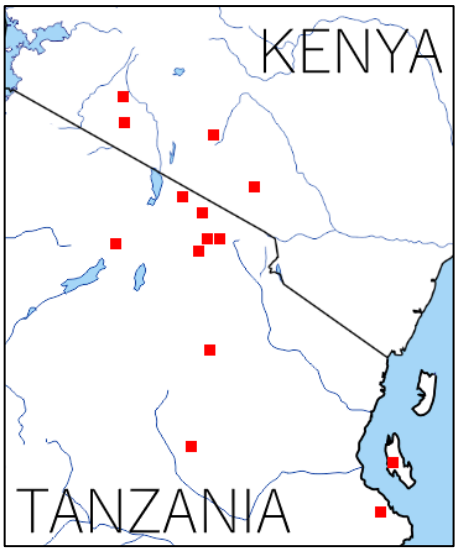

Figure 3: Geographical location of included studies.

Table 2: Data extraction table of basic study characteristics.

Birks (2012) Participatory Knowledge Mobilization: A Gender Analysis Characterizing the Understandings of Mother-to-Child HIV Transmission in Maasai Women and Outreach Healthcare Workers in Rural Tanzania		
Location	***Methods***	***Population***
Country Tanzania **Region** Ngorongoro Conservation Area **Time period** May 2009 - May 2010	**Study Setting** Healthcare and community **Data Collection** Participatory Action Research Methodology and Gender Analysis Methodology - reflexive journaling, document analysis, naturalistic observation, participant observation, interviews and group dialoguing sessions **Language** In situ Maa translation with Maasai, hospital staff interviews in English	**Sample population** Maasai women and men aged 15 to 35, local community traditional birth attendants, outreach healthcare workers associated with the HIV/AIDS education and awareness initiative at Endulen Hospital **Sampling method** Purposive sampling
Comments Duplicate primary data also published in Birks, Roggeveen and Hatfield (2013). Birks (2012) included as was found to contain more in-depth data and description of methods. Some primary data present outside of "Results" section.		

Birks *et al.* (2011) Promoting health, preserving culture: adapting RARE in the Maasai context of Northern Tanzania		
Location	***Methods***	***Population***
Country Tanzania **Region** Ngorongoro Conservation Area **Time period** Not stated	**Study Setting** Healthcare and community **Data Collection** Stakeholder workshops Key informant interviews Focus groups Direct observations **Language** Not stated	**Sample population** Hospital staff including indigenous Maasai, traditional birth attendants, traditional healers, traditional community leaders, local politicians, people living with HIV/AIDS, local village committee members, women and youth representatives **Sampling method** Purposive sampling
Coast (2006) Local Understandings of, and Responses to, HIV: Rural-Urban Migrants in Tanzania		
Location	***Methods***	***Population***
Country Tanzania **Region** Arusha; Engare Naibor **Time period** Not stated	**Study Setting** Community **Data Collection** Questionnaires In-depth interviews **Language** Researcher not present at interviews, conducted in Maa and audio later translated	**Sample population** 96 migrant Maasai men and 51 rural Maasai men **Sample method** Purposive sampling at congregation areas
Coast (2007) Wasting semen: Context and condom use among the Maasai		
Location	***Methods***	***Population***
Country Tanzania **Region** Ngorongoro District **Time period** September 2002	**Study Setting** Community **Data Collection** Focus group discussions Questionnaires Key informant interviews **Language** Questionnaires and interviews conducted in Maa. Interview audio later translated	**Sample population** 35 Maasai men and women, local health personnel, health education providers **Sample method** Purposive sampling

Freitas and Nayak (2014)
The Fire Is Coming: An HIV Prevention Intervention Contextualized to the Maasai People of Tanzania

Location	*Methods*	*Population*
Country Tanzania **Region** Simanjiro **Time period** May 2011	**Study Setting** Community **Data Collection** Survey **Language** Survey questions written in English, translated to Maa, and back-translated to English	**Sample population** 200 Maasai aged 13 to 70 **Sample method** Cluster purposive sampling
Comments Sample populations were in intervention and non-intervention groups. Both populations included to identify all barriers and facilitators rather than just impact of a single intervention.		

Hedges (2005)
Ukimwi ni homa (AIDS is a cold) : HIV vulnerability of Maasai women

Location	*Methods*	*Population*
Country Kenya **Region** Narok Town **Time period** June - September 2004	**Study Setting** Community **Data Collection** Focus group discussions Participant observation In-depth interviews **Language** Maa translator present for recruitment Researcher performed interviews in Swahili personally	**Sample population** 32 Maasai women and girls **Sample method** Purposive sampling

Kulzer (2002)
Socio-Cultural Norms and Acceptability of HIV/AIDS Prevention Strategies in the Simanjiro District of Tanzania

Location	*Methods*	*Population*
Country Tanzania **Region** Simanjiro **Time period** July 2001	**Study Setting** Community **Data Collection** Survey Key informant interviews **Language** Not stated	**Sample population** 170 Maasai, 58 non-Maasai, 9 key informants **Sample method** Random, cluster sampling

Matogo (2010)
The Impact of Customs and Sexual Practices on Young Maasai Women's Ability to Negotiate Their Sexual and Reproductive Health in Relation to HIV/AIDS in Loitokitok, Kenya

Location	*Methods*	*Population*
Country Kenya **Region** Loitokitok **Time period** July - August 2009	**Study Setting** Community **Data Collection** Participatory Action Research Methodology - focus group discussions, semi-structured interviews and informal observation methods **Language** Researchers mostly translated in situ, any Maa or Swahili notes translated to English at end of process	**Sample population** 24 Maasai women aged 16 to 25 **Sample method** Purposive sampling of a community youth group

May and McCabe (2004)
City Work in a Time of AIDS: Maasai Labor Migration in Tanzania

Location	*Methods*	*Population*
Country Tanzania **Region** Dar es Salaam; Arusha; Kiteto; Zanzibar **Time period** 1999 - 2000 and 2001	**Study Setting** Community **Data Collection** Questionnaires Interviews **Language** Maa and Swahili translated in situ	**Sample population** Approximately 200 Maasai and 20 non-Maasai and local officials **Sample method** Opportunistic sampling at congregation areas
Comments Some data collected outside of the Great Rift Valley area. Study deemed suitable for inclusion due to returning nature of migrants and usefulness of information collected.		

Mitekaro and Awour (2021)
Factors Influencing Prevalence of Sexually Transmitted Infections in the Maasai Community of Ilkeekonyokie, Kajiado, Kenya

Location	*Methods*	*Population*
Country Kenya **Region** Kajiado **Time period** Not stated	**Study Setting** Community **Data Collection** Survey **Language** Four research assistants who spoke both Maa and English languages assisted in data collection	**Sample population** 100 Maasai aged 20+ **Sample method** Cluster and convenience sampling

Pakdamana and Azadgolia (2014)
Maasai Culture and its Effect on Sexual Health: A Field Study on the Disparities of Knowledge within the Community

Location	*Methods*	*Population*
Country Kenya **Region** Narok County **Time period** Not stated	**Study Setting** Community **Data Collection** Interviews **Language** Not stated	**Sample population** 100 Maasai, 80 Maasai primary school students, 80 Maasai secondary school students, Maasai community leaders, science teachers, pastor, school clinician, nurses, non-profit workers **Sample method** Random and convenience sampling

Siegler, Mbwambo and DiClemente (2013)
Applying the Dynamic Social Systems Model to HIV Prevention in a Rural African Context: The Maasai and the *Esoto* Dance

Location	*Methods*	*Population*
Country Tanzania **Region** Siha; Ngorongoro **Time period** Not stated	**Study Setting** Community **Data Collection** In-depth interviews Survey **Language** Survey translated from English into Maa by two native Maa speakers, then back-translated by two different native Maa speakers. Interviews conducted by native Maa-speakers	**Sample population** 370 Maasai aged 18 to 50 **Sample method** Cross-sectional, purposive sampling

Talle (1995)
Desiring Difference: Risk Behaviour among Young Maasai Men

Location	*Methods*	*Population*
Country Tanzania **Region** Hai, Kilimanjaro **Time period** Not stated	**Study Setting** Community **Data Collection** Unstructured questionnaire survey In-depth interviews **Language** Not stated	**Sample population** 100 Maasai, healthcare practitioners, traditional healer **Sample method** Not stated

Comments
No clear 'Results'/'Findings' section, therefore entire document assessed and coded if deemed to be primary data.

Talle (2010) Living beyond AIDS in Maasailand: Discourses of Contagion and Cultural Identity		
Location	***Methods***	***Population***
Country Kenya and Tanzania **Region** Various **Time period** 1991-2008	**Study Setting** Community **Data Collection** Interviews Survey **Language** Not stated	**Sample population** Maasai **Sample method** Random and opportunistic sampling
Comments No clear 'Results'/'Findings' section, therefore entire document assessed and coded if deemed to be primary data.		

Wright (2005) "*The AIDS is coming and there is nowhere to run…*": Culture, Gender, & the Politics of Kisongo Maasai Women and Girls' Vulnerability to HIV/AIDS		
Location	***Methods***	***Population***
Country Tanzania **Region** Longido Division **Time period** 5 months between 2003 and 2005	**Study Setting** Community **Data Collection** Participatory Action Research Methodology - focus groups, key informant interviews, participant observation **Language** Researcher not present at the interviews, all performed in Maa and translated	**Sample population** 81 Maasai aged 8 to 25, primary school teachers, female political representative, female circumciser, age-set leaders **Sample method** Non-probability, purposive, cross-sectional sampling
Comments Primary data quotes present outside of 'Review of Findings' in 'Discussion and Synthesis' section.		

4.2 Barriers

4.2.1 Behaviour

4.2.1.1 Multiple Sexual Partners

Sexual intercourse is a vital part of Maasai culture and is believed to be important for one's health and holistic wellbeing (Hedges, 2005; Mitekaro and Awour, 2021). While a historical culture of monogamy has aided many countries in the prevention of STIs, such pre-existing practices do not exist in Maasai communities. The Maasai maintain multiple concurrent sexual partners throughout their lives, and this was the most commonly cited barrier to STI control in the papers analysed. The cultural circumstances around multiple sexual partners can be roughly divided into pre-marriage and post-marriage behaviours. For unmarried people, usually young males and pre-circumcision females, the majority of their sexual experience is during the sexual

element of the practice of *esoto* (discussed in more detail below). For married males and females, sexual encounters exist both within marriage and outside of it.

Married Sexual Behaviour

While only men are permitted multiple spouses, both men and women are assumed to have extra-marital sexual partners. This was commonly cited as a sexual need rather than preference, with men particularly described as requiring multiple sexual partners in order to be fulfilled (Talle, 1995). However, a common reason for seeking multiple sexual partners was due to the cultural and societal expectation. Having fewer sexual partners was associated with undesirability and low social status, which led individuals to undertake riskier sexual behaviour in order to be seen to be attractive:

> "There is a name given to those who do not have many partners, and you will feel shame if you are called '*osinoni*'."
>
> – Male Maasai (Wright, 2005)

> "It is very annoying and nobody has peace when they are called [osinoni]... some would even try to find girls, day and night in order not to be called that name."
>
> – Male Maasai age-set leader (*alaigwanani*) (Wright, 2005)

There were also indications of sexual partners having practical and economic reasons beyond sexual gratification. Women cited having extra-marital boyfriends to aid with circumstances of low resources, particularly to provide for their children:

> Group Facilitator: "So, do you mean that this girlfriend will do anything to please her boyfriend?"
> Female Maasai: "Yes, because she finds any way that she can to get money to feed her children."
>
> – Wright (2005)

These boyfriends were often described as being more reliable as sources of money than husbands (Wright, 2005). This further incentivises extra-marital relationships, and, thus, a larger sexual network.

Extra-marital sexual partners had by women were more likely to be clandestine than those had by men, or at least an open secret within the community (Kulzer, 2002). Thus, an individual in a polygynous marriage is unlikely to know the extent of their own sexual network.

Many reported that one member of a marriage cannot dictate whether their spouse(s) have other sexual partners. While mostly commonly reported by females, both sexes cited having no

control over whether their spouse or other sexual partner had sex with others. This sometimes led to fatalistic and resigned views regard their own exposure to STIs:

> "I know only that I, myself can [abstain from sex outside of marriage]. But, for my husband there is no way to tell him he can't go somewhere. You won't know what time it will come. Today if he sleeps outside, and then he comes, how will I know if he got it there?"
>
> – Female Maasai (Hedges, 2005)

> "If [my husband] goes out and finds many partners, then he brings disease to me. So, you see, as a wife, I will now have to suffer. If my husband hadn't gone out, then I would not have suffered."
>
> – Female Maasai (Wright, 2005)

While a sex-positive culture, females in Maasai communities are commonly victims of non-consensual sex. Multiple aspects of Maasai culture expose women to situations of reduced sexual autonomy, varying from coercion to violence and rape. Many Maasai women reported not being able to refuse sex with their husband for fear of violence, due to the widely held belief that a man has the right to sex with his wife:

> "A married woman can't say no."
>
> – Male Maasai (Wright, 2005)

With wives being unable ask their husbands to reduce their sexual partners and unable to refuse sex with their husband, women have little to no control over their exposure to STIs. This cultural obligation to engage in sex is often not just limited to one's husband, but also to men of the same age-set. This practice of wife-sharing allows a man's age-mate to have sex with his wife or wives while visiting his household. A woman's refusal to do so was linked to fear of curses and witchcraft:

> "You might have a guest, you've prepared water for a bath, prepared a bed, and food, but still, during the night, you will be much disturbed, he will wake you with the purpose of wanting sex with you, and when you ignore him, you will be cursed."
>
> – Female Maasai (Wright, 2005)

> "For women, they are also at risk, because when an age-mate comes, sometimes when they are afraid of curses, as a result, they permit sex and so they get AIDS due to their fear of curses."
>
> – Male Maasai (Wright, 2005)

The extent to which wife-sharing is still observed and enforced varied in the papers analysed, with some participants arguing it is no longer practiced in Maasai society (Wright, 2005).

While such unique aspects of Maasai culture are responsible for the majority of occurrences of multiple sexual partners, many studies also reported an increase in the number of Maasai women engaging in commercial sex work. A known risk factor for STIs, this also leads to more Maasai women having sex with non-Maasai people outside of their community. The primary reason provided by women who had engaged in commercial sex work was to cope with poverty and low income:

> "Another big thing is that are (sic) women who are selling their body to get money for their children because they are really poor."
>
> – Female Maasai (Birks, 2012)

Unmarried Sexual Behaviour

While the Maasai age-set system, in theory, prevents males and females of different age-sets from engaging in sexual activity, the breaking of these societal rules is an open secret. While ilmurran are forbidden from having sex with married women, it was frequently reported in the studies. The ilmurran age-set commonly has the largest number of sexual partners, both as a result of their illicit sexual encounters with married women and their sanctioned unmarried partners (Talle, 1995).

Prior to marriage, uncircumcised females engage in sex with males from the active ilmurran age-set. The majority of these sexual encounters occur at the esoto: the communal home of the ilmurran. The social activities which occur there are also commonly referred to as 'esoto' in the literature, so in order to avoid confusion these gatherings will be referred to as the 'practice of esoto' from this point onwards. These events generally consist of eating, dancing and socialising, attended by uncircumcised females (aged around 8 to 15) and ilmurran (aged around 14 to 30). Believed by many to be an important aspect of Maasai culture, the young males and females frequently engage in sex with multiple partners (Birks *et al.*, 2011). Ilmurran are perceived as being in the most virile period of their lives and, thus, are awarded substantial levels of power within society. This power is not only exerted over young females, but also other women in the community:

> "[An olmurran] can freely walk into any home he knows he'll find unmarried girls to socialize and even sleep with them... some will walk into a home even when the girls' mother is around… because the mother equally recognizes the powers given to [ilmurran], she will walk out of the house leave her daughters with the [olmurran] in privacy."
>
> – Female Maasai (Matogo, 2010)

The power imbalance inherent in ilmurran's relationships with girls is exacerbated by the difference in social and physical maturity. As a result, pressuring and forcing females into sex during the practice of esoto is openly condoned:

> "If an olmurran wants to have sex then there is no option."
>
> – Female Maasai (Wright, 2005)

Participants repeatedly reported being unable to decline sex from ilmurran for fear of violence:

> Group Facilitator: "What if a girl refuses to have sex with an olmurran?"
> Female Maasai: "You will be beaten."
>
> – Wright (2005)

Girls who attempt to avoid these high-risk situations also experience adverse effects. Lack of attendance at the practice of esoto can lead to social alienation by ilmurran as well as violence from various members of the Maasai community. Thus, many studies found females were more likely to participate in the practice of esoto than males, due to little alternative (Siegler, Mbwambo and DiClemente, 2013).

4.2.1.2 Early Sexual Debut

The early sexual debut of girls in Maasai communities is often linked to the practice of esoto. Girls as young as 6 years old have been reported to attend and it was the most common factor involved in female sexual debut. Virginity is not valued in Maasai culture, rather it is believed to be unwise to allow a female to have abstained from sex before marriage. Semen is thought to aid female physical development and is thus necessary to obtain fertility. A new wife who has not previously had sex is seen as an embarrassment, with repercussions such her family being fined or the girl being rejected by the new husband's household:

> "If you have your virginity, you will be sent back until you lose it."
>
> – Female Maasai (Wright, 2005)

With marriage occurring early in a girl's life in comparison to many Western societies, sexual debut is also therefore earlier. This exposes girls to STIs earlier in their lives, with the belief in the health-aiding properties of semen leading to an unwillingness to use barrier methods of contraception (Coast, 2007).

4.2.1.3 Female Genital Mutilation

Before marriage, Maasai girls commonly undergo female genital mutilation (FGM). While a known risk factor for the transmission of blood-borne diseases such as HIV, the ritual was

commonly described as being very important to the tradition and culture of the Maasai (Wright, 2005). These procedures often use unsterilised blades and non-sterile materials to clean the area after cutting (Birks *et al.*, 2011). While many participants were aware of the dangers associated with FGM, its practice has widely continued. However, this does not indicate that all those undergoing FGM did so willingly and without coercion. Girls cited pressure from their families to undergo the procedure, with little opportunity to decline. Uncircumcised women were often described as undesirable or even repulsive:

> "Who will marry you? Nobody will see you, even though you are beautiful, no one will see you."
>
> – Female Maasai (Wright, 2005)

There appears to be some movement towards changing attitudes towards circumcision with some individuals having decided not to circumcise their children (Matogo, 2010). However, the overall community pressure is very strong and deters people from speaking out due to possible alienation (Birks, 2012).

While traditional circumcision of males is also commonplace in Maasai communities, there is insufficient evidence in the literature to indicate an associated increased risk of blood-borne diseases (Dowsett and Couch, 2007; Greely *et al.*, 2013). Therefore, its continued practice has not been considered a barrier to STI control in this analysis.

4.2.1.4 Low Use of Health Services

Of the communities with access to Western medical services, use of these services was low. Reasons for this varied between studies, including barriers such as cost or distance from residence (discussed further below). Some participants indicated a mistrust of non-Maasai medicine and were more familiar with traditional Maasai remedies (Kulzer, 2002). There was also stigma associated with attendance at testing and treatment clinics as many perceived this as an STI diagnosis. This was likely exacerbated by the fact that Kenyan healthcare practitioners are required by law to inform a person's partner of their STI status, deterring individuals from seeking testing (Pakdamana and Azadgolia, 2014).

In multiple studies, women reported being unable to access health services for themselves or their children without first consulting their husband (Birks, 2012; Wright, 2005). This included acquiring the necessary money needed to pay for such services (Birks, 2012). For many, these barriers had the dual impact of low use of prevention, testing and treatment resources as well as reduced access to education materials or professional advice.

4.2.1.5 Migration to Urban Areas

Some of the studies included in this analysis focussed on the semi-recent transition of the Maasai from rural to urban living. This change was linked to factors such as climate change and poverty, which have led Maasai to seek employment opportunities in urban areas such as Arusha and Dar es Salaam (May and McCabe, 2004). Maasai migrants were found to have greater knowledge of STIs, particularly HIV, than Maasai in more rural areas. However, misconceptions and misinformation were common issues, paired with increased likelihood of exposure to infection in urban areas (Mitekaro and Awour, 2021). Many continued to engage in high-risk sexual behaviour, as well as residing in areas of high HIV prevalence. With urban Maasai regularly returning to their home communities, there is the additional associated risk of introduction to these rural areas (Talle, 2010).

4.2.2 Attitudes

4.2.2.1 Cultural Attitudes Towards Barrier Contraceptives

Condom use was consistently reported as low across the studies analysed, with both cultural and societal factors cited as barriers to use. Women are expected to have children in Maasai society, with wealth and social standing highly influenced by the size of one's family. Therefore, the fact that condoms also prevent fertility was highlighted as problematic:

> "The husband would make a quarrel with his wife and fight with her and say ''why do you not want a child from me?""
>
> – Male Maasai (Coast, 2007)

> "Once the husband is told that he should not have other partners, he will say "no, because I want my [household] to be big.""
>
> – Female Maasai (Wright, 2005)

Infertility is a frightening idea to many Maasai women as the inability to conceive can lead to alienation by society. Maasai women generally do not have a right to the household's assets and are therefore left with no livelihood upon their husband's death (Birks, 2012). This desperation to conceive can lead to acceptance of risky sexual behaviour, such as polygynous marriage. In circumstances where conception is difficult, more wives are likely to be added to the household, thus increasing the number of sexual partners:

> "I would not like my husband to find another wife. If he thinks of taking up another wife, I would try to find out what I am not doing right and do it well. I would talk it through with him... If it's children that I am not able to have, then it is okay if he takes up another wife."
>
> – Female Maasai (Matogo, 2010)

The idea of having sex with one's husband without the chance of procreation was undesirable for many female participants. Women who are particularly desperate to conceive may also participate in *olamal*. This is a travelling women's group which visits various Maasai communities to address women's issues and to conduct a fertility ritual. During this practice, women are known to engage in extra-marital sex with multiple partners in the hopes of increasing their likelihood of conceiving a child. The mobile nature of olamal increases the likelihood of transmitting STIs between isolated communities. However, condoms would not be appropriate for use at these gatherings due to the women's desire to conceive (Birks, 2012).

A recurrent theme in the literature was that the use of condoms within marriage was not culturally congruent due to preventing conception. However, many Maasai were open to using condoms with extra-marital partners, as these unions were rarely undertaken in order to conceive (Wright, 2005). Despite this, the existence of multiple spouses continues to increase the likelihood of an STI being introduced into the household. Any of the sexual partners could be engaging in high-risk sexual activity outside of the marriage, leading to individuals being unable to control their own personal exposure.

Other barriers to condom use included cost and lack of availability. Some believed the condoms available were of dubious quality, with mistrust of both local and imported condoms described in the literature. All studies reported a general lack of knowledge regarding their use and purpose. While many were aware of the existence of condoms, there was a wide misunderstanding of how to use them and how the quality of the sex would be impacted:

> "I don't believe that they work — they're too thin and easy to break. Besides, what happens if they break inside the woman and cause her problems?"
>
> – Female Maasai (Coast, 2007)

> "What about the enjoyment for the women? They need what we can give them. We cannot waste it."
>
> – Male Maasai (Coast, 2007)

Condom use was highly stigmatised across the literature, with negative perceptions also preventing their use:

> "It is like eating a sweet with its wrapper on."
>
> – Female Maasai (Matogo, 2010)

> "It is shameful to see my boyfriend wearing something between me and him."
>
> – Female Maasai (Coast, 2007)

With the existence of this stigma, factors such as disposal become all the more important. Participants highlighted that discreet disposal would be difficult in Maasai communities, presenting a further deterrent to their use (Coast, 2007).

4.2.2.2 Gender Inequality

As discussed above, Maasai societies are patriarchal and based heavily on the male as the leader and decision maker of the household. Violence towards women who are seen as wayward and disobedient is generally accepted across Maasai society (Siegler, Mbwambo and DiClemente, 2013). This translates to women being unable to dictate boundaries in relationships, such as use of barrier contraception, occurrence of sex in and out of the relationship and financial decisions. The existence of a bride price also leads to a belief of ownership of a wife. The fear associated with intimate partner violence leads to a lack of autonomy and increased submission:

> "You are always beaten because he owns you."
>
> – Female Maasai (Wright, 2005)

> "In the sense that he gave away a lot of cattle to marry her, he owns even your bones. So, if he breaks them, it doesn't matter because it is his property."
>
> – Female Maasai (Wright, 2005)

A bride price can also influence a man's decision to allow his daughters to leave the community to attend school or explore other external opportunities. This was often cited as selfishness on the man's part to profit from the marriage of his daughters:

> "Although mothers wish for their daughters to progress, it is often the father who discourages their education and promotes early marriage."
>
> – Non-governmental community based organisation worker (Pakdamana and Azadgolia, 2014)

Such practices contribute to the early sexual debut of girls as well as limiting their opportunity to receive education, including STI knowledge.

The continuation of the mistreatment of women is enabled by children witnessing their mothers being harmed at the hands of their husband:

> "There's no way to complain because we grew up seeing our mother treated the same way. The day you are given in marriage to the husband, the night before, your father will come to give a few blessings for a farewell, but the main thing he

says is that if you don't treat your husband well you will be beaten. When a husband takes you, you will always have this in mind."

– Female Maasai (Wright, 2005)

Intimate partner violence or the threat of such violence causes women to be accepting of behaviour and attitudes that puts them at risk of STIs. This violence is linked to sexual intercourse early in a Maasai woman's life through the inherent violence and coercion involved in the practice of esoto. As a result, women are aware from a young age the consequences of declining sex (Wright, 2005).

4.2.2.3 Faith and Morality as a Method of Protection

A lack of initiative to take measures to prevent contracting an STI was often linked to faith in God. Many Maasai believed that God (*Engai* or *Enkai*) would decide whether or not they would die of HIV/AIDS and therefore they as individuals were powerless to stop it. This was perpetuated by both Christian and non-Christian religious Maasai:

"Even if a young girl gets this disease, she will still have a baby, so it is Enkai telling you to have children, but just die sooner."

– Female Maasai (Coast, 2007)

''I can't tell you whether I'm at risk or not, because Engai is the one who arranges people's deaths. I might be at risk or I might not be. Engai knows.''

– Male Maasai (Coast, 2006)

Some cited prayer as a satisfactory precautionary measure to prevent STI transmission:

"I will just pray to God. It is just God."

– Female Maasai (Hedges, 2005)

Multiple studies discussed the belief that contraction of HIV was associated with immorality and Swahili, i.e. non-Maasai, lifestyles (Talle, 2010). The stark difference between Maasai and Swahili culture is well reported in the literature, with prejudice on both sides regarding the cultural practices of the other. While some Swahili informants were disdainful of the promiscuity of the Maasai, some Maasai, on the other hand, showed disapproval of the 'incorrect' circumcision practices of the Swahili and their lack of respect for elders. One healer believed that the lack of circumcision by Swahili alone was an explanation for the high rates of HIV:

"[Swahili people] die [from AIDS] because they are not circumcised."

– Female Maasai healer (Talle, 2010)

More generally, many Maasai believed HIV to be a 'Swahili disease', whether due to amoral Swahili practices or simply geographically. This manifested in the belief that by simply avoiding sex with the Swahili one will be protected from HIV:

> ''I've never had sex with a prostitutes, or with anyone who might be a victim of [HIV] for that matter, so I can never be at risk of that disease.''
>
> – Male Maasai (Coast, 2006)

4.2.3 Knowledge

4.2.3.1 Lack of Knowledge

Another commonly described barrier to STI control was a lack of knowledge regarding these infections. This included all aspects of sexual health including transmission, prevention, testing and treatment. In studies where participants could name STIs, many could not list routes of transmission or methods of prevention (Matogo, 2010; May and McCabe, 2004). A recurring theme across many of the papers analysed was the lack of understanding of the impact that HIV infection can have on an individual and their sexual network. Many did not have a full understanding of the true danger of HIV infection and did not cite it as a pressing issue for their community (Hedges, 2005). Other aspects of life were deemed more important than preventing HIV, such as issues with food security and fertility (Birks, 2012), or simply good quality sex (May and McCabe, 2004).

One particular barrier to knowledge and understanding of HIV/AIDS was the Maa word used to describe the disease. The Swahili term for HIV can be directly translated to the English equivalent (*upungufu wa kinga mwilini*, abbreviated to *ukimwi*). In Maa, however, the word used to describe AIDS is *biitia* - meaning to shrink. While referring to the physical changes that untreated AIDS sufferers undergo, this term is also used to describe other diseases with similar weight loss symptoms. Therefore, in studies where awareness of HIV/AIDS was assessed, it is unclear whether Maasai were referring to AIDS or other diseases also described as biitia (Coast, 2007). Not all of the studies acknowledged this as a limitation, calling into question the validity of some of the results regarding HIV awareness.

4.2.3.2 Lack of Education

General language barriers were often described in the literature as a barrier to STI knowledge. With lower than average education levels among Maasai compared to mainstream Tanzanian and Kenyan populations, many Maasai are illiterate. For these individuals, literature-based

resources, such as pamphlets or billboards, are ineffective. While literature regarding STIs was reportedly low in these rural communities, the available resources were usually written in Swahili or English (Coast, 2006). Of those who could read and write in Maa, even fewer were literate in a second language (Coast, 2007). This barrier continues to impact women to larger extent than men due to lower levels of education.

Access to formal education was low across all included studies, contributing to a lack of sex education and general health knowledge. Reasons for low school attendance were complex, with interacting factors such as rural living, low income and pressure to become married and start families (Birks, 2012). As discussed in the Gender Inequality section, Maasai girls and women are less valued in Maasai culture compared to males. This also impacts school attendance rates, with fathers less likely to choose to send their daughters to school where financial constraints exist. As many continue to view girls as having no further potential outside of being a mother and carer of the home, the perceived outcome on investment in education is low (Hedges, 2005). In circumstances where girls are enrolled in school, dropout rates are high due to pregnancy or pressure to marry (Pakdamana and Azadgolia, 2014).

4.2.3.3 Incorrect Knowledge

In tandem with lack of general knowledge regarding STIs, a recurring theme in the literature was incorrect knowledge disseminated within communities. These inaccuracies often led to increased STI risk due to misconceptions regarding methods of prevention. Examples included the belief that one could visibly identify an HIV-infected person or that it could be cured by traditional Maasai medicine (May and McCabe, 2004). This also led to avoidance of true prevention methods, such as condoms, due to the belief that they were ineffective on Maasai penises or that they were contaminated with HIV (Coast, 2007).

Sources of information were often not reputable, such as hearsay and rumours. This was especially true of Maasai women and girls, who were often not afforded the time to attend local seminars and awareness campaigns addressing STIs. Therefore, any information they may gain from their husbands and fathers risked becoming inaccurate through poor communication (May and McCabe, 2004).

4.2.3.4 Misinformation

Many of the information, education and communication programs regarding STIs in Maasailand were provided by Christian organisations. Christianity is a widely followed religion in both Kenya and Tanzania and the majority of health services and schools available to rural Maasai

communities were Christian affiliated. As a result, the influence of Christian beliefs on the content of STI educational materials was a common theme in the literature. Some charitable groups disseminated beliefs that condoms were ineffective against HIV, and that abstinence and faithfulness were the sole methods of prevention (Coast, 2007). Notable Christian figures in East Africa have also spoken out against the use of condoms, even attempting to prevent awareness campaigns which advocated their use (May and McCabe, 2004). Individuals with low education and little pre-existing STI knowledge are less likely to question these assertions, perpetuating incorrect knowledge in these high-risk communities.

Where education was unbiased and factual regarding STIs, it rarely took into account Maasai culture. Multiple studies found that the education and advice provided, such as the 'ABC' method – Abstinence, Be Faithful and Condoms, were not applicable or easily incorporated into Maasai life. As discussed above, abstinence is very abnormal in Maasai communities as sex is associated with good health. In addition, the concept of 'faithfulness' is an imposed ideology from a foreign culture which associates multiple sexual partners as being amoral and shameful. With the addition of large families and ideals around conception impacting the use of barrier contraceptives, the entire prevention methodology becomes difficult to translate culturally (Wright, 2005). The use of ABC prevention programs was found to lead to fatalism in women in particular, as the prevention options available to them were hopeless and outwith their control. With no ability to abstain, use condoms or compel their husband to be faithful, some viewed infection as inevitable (Hedges, 2005).

4.2.4 Extraneous Factors

4.2.4.1 Rural and Transient Lifestyle

As many Maasai communities live in areas which are separated from infrastructure, this leads to difficulties accessing STI testing, prevention and treatment resources. The distance necessary to travel to healthcare services was frequently highlighted as a barrier to their utilisation (Birks *et al.*, 2011). Studies reported healthcare services as far as 30 kilometres from the communities studied. For many the only transport option is by foot, making this a full day's journey (Matogo, 2010). Thus, more readily available traditional remedies were often consulted in the first instance before turning to Western medicine. In such circumstances, symptoms of STI were allowed to become more severe before effective treatment or testing were utilised. Even low-

tech, non-medical interventions can be difficult to access by the Maasai, with low condom availability a frequently cited reason for lack of awareness and use (Coast, 2007).

4.2.4.2 Low Income and Poverty

Low income was found to impact many behaviours which influence STI exposure and prevention. The cost of testing, treatment and prevention methods in these communities continues to be a factor in their utilisation. For many women who are struggling to afford the basic necessities for their children, condoms are expensive luxury items (Wright, 2005). With subsistence living being very time-consuming, there is often no available time to travel to pharmacies and healthcare providers. Poverty also had an impact on access to education, with most schools charging fees or, due to distance, required boarding to attend. The ability to pay school fees continues to impact attendance and thus the cycle of low education and low income continues (Pakdamana and Azadgolia, 2014).

4.2.4.3 Inadequate Health Services

In addition to both low income and distance providing barriers to healthcare, the quality of some rural healthcare services were called into question. Staff were often low in number or poorly trained and the facilities inadequate to cope with the size of the catchment population (Birks *et al.*, 2011). The improvement and investment into rural health centres were not believed to be of high priority to governmental bodies, with superior facilities and resources provided at health centres which catered to nearby sedentary populations (Pakdamana and Azadgolia, 2014).

4.3 Facilitators

4.3.1 Behaviour

4.3.1.1 Monogamy and Fewer Sexual Partners

While polygynous marriages were described as being the norm in Maasai communities, some evidence also suggested that monogamous unions are on the rise. Siegler, Mbwambo and DiClemente's (2013) survey of a Kenyan community found 179 of the 291 married participants (56%) had only one wife, while a smaller sample of 50 married women in Tanzania reported 38% to be the only wife in the marriage (Pakdamana and Azadgolia, 2014). Reasons for monogamy

included external urban influence and an increase in Christianity in Maasai communities (Matogo, 2010). While the colonialisation and religious conversion of Maasai communities is not a cause to be celebrated, it has challenged some mindsets regarding the traditional marriage structure (Talle, 1995).

While monogamous marriages may still have extramarital sexual partners, some study participants reported a decrease in these partners also. Participants cited the risk of contracting an STI, or more specifically HIV, as a reason for decreasing the number of extramarital sexual encounters (Hedges, 2005). Both of these factors lead to a decrease in number of households with multiple concurrent sexual partners and thus a decrease the risk of STI exposure.

4.3.1.2 Safer Female Genital Mutilation Practices

The practice of FGM was frequently highlighted as an important aspect of Maasai society and would be incredibly difficult to halt. However, traditional circumcisers have shown awareness of the importance of individual equipment for each participant in order to decrease the risk of transmitting blood-borne diseases in this practice (Wright, 2005). This illustrates the understanding that this is a key route of transmission of HIV and that communities are willing to adjust pre-existing practices in order to minimise such risk (Freitas and Nayak, 2014).

4.3.1.3 Safer Esoto Practices

Another deeply routed cultural tradition is the practice of esoto. However, this practice does not need to include sexual permissiveness. In fact, some participants stated the history of the practice was not sexual, indicating that it need not continue to be so in order for tradition to be respected:

> "[The practice of esoto was] meant to be something that was meant to gather us together, and it was not traditionally meant to have sex."
>
> – Male Maasai age-set leader (Wright, 2005)

> "[The practice of esoto] was not meant for sexual relations… sex is not the essence of esoto."
>
> – Male Maasai age-set leader (Wright, 2005)

The households that are responsible for hosting the practice of esoto are also influential in the activities of the attendees. One such host was observed refusing attendance to individuals they deemed too young to participate (Siegler, Mbwambo and DiClemente, 2013). These influential members of the social hierarchy have the power to influence behaviours associated with increased STI risk, especially among those most vulnerable to infection.

4.3.1.4 Migration to Urban Areas

While the urbanisation of Maasai communities has increased the likelihood that Maasai will contract STIs, it has also been found to increase individual knowledge and awareness of such infections. Exposure to HIV sufferers in particular was found to lead to increased knowledge of the infection, as well as reducing stigma surrounding it (Coast, 2006).

In contrast, increased interaction with Swahili did not lead to increased sexual contact in all the studies analysed. There remains many Maasai who do not have sex with Swahili, due to being deemed unrespectable and below their social class:

> "No, we don't sex with [Swahili], this is a shame to a Maasai woman."
> – Female Maasai (Talle, 2010)

Reported interaction with commercial sex workers by Maasai men is also low. Due to the cultural belief that sex and semen are beneficial to women's health, it is thought as counter-intuitive or even embarrassing to pay a woman for sex (May and McCabe, 2004). While unlikely to continue as these communities become more integrated into mainstream society, these behaviours decrease the likelihood of STIs being brought into Maasai communities from external sources. However, given the association with shame and embarrassment, the true extent of sexual contact between ethnic groups may be higher than reported.

4.3.2 Attitudes

4.3.2.1 Female Empowerment

Strong female networks exist in Maasai communities. Older women are heavily involved in the cultural initiation practices involving the youngest girls in the age-set system which often includes counselling them during their early sexual relationships. While women are often not included in political discourse, they have been known to form their own groups and meetings to discuss women's issues and how to best approach them (Wright, 2005). These collaborative networks have also been used to exchange knowledge and important information, and to enable women to support each other in times of poverty or desperate need (Birks, 2012).

This can be extended to the existence of traditional birth attendants, which are highly respected and trusted within Maasai communities. These networks and respected individuals are ideal

candidates to become community champions to educate and aid others in STI control and prevention (Birks, 2012).

Women are also being empowered to refuse sex from men through coaching each other in tactful and culturally sensitive methods of doing so. Key informants showed optimism that with culturally appropriate advice, women could better navigate situations of unsafe sex:

> "It is possible because no one wants to die, there just hasn't been any efforts to teaching them how and when."
>
> – Key informant (Kulzer, 2002)

The promotion of females in positions of decision making was highlighted as a key factor to improving STI outcomes. Situations where women were able to make their own choices regarding seeking healthcare was also linked to increased uptake of healthcare services (Wright, 2005).

4.3.2.2 Community Respect Towards Elders

As a culture which reveres the elders of the community, such individuals were cited as being capable of influencing high-risk STI behaviour:

> "An old man can, for example, tell me to stop [the practice of esoto]."
>
> – Female Maasai (Wright, 2005)

This is especially so of key political figures in the communities, such as age-set leaders and spiritual healers:

> "First of all is to use these leaders of the society, the alaigwanani… if you will use them you can succeed, because the Maasai they listen very much to these leaders."
>
> – Non-Maasai Primary School Teacher (Wright, 2005)

However, this was dependent on such individuals themselves being educated regarding STIs. For example, one spiritual healer believed that HIV was a curable infection via his traditional healing methods (Kulzer, 2002). Thus, the influence elders have on the community can also be detrimental to STI control.

4.3.3 Knowledge

4.3.3.1 Awareness

There was awareness of STIs in all of the included studies. In particular, despite its relatively recent emergence in the disease landscape, awareness of the existence of HIV was widespread in the participating communities. There was also a desire to understand HIV and how to avoid it and treat it:

> "If I just could I *see* an AIDS diseased person, I would know how to treat him."
>
> – Male Maasai healer (Talle, 2010)

Many Maasai people learnt more about STIs through being involved in these studies. Through these interactions, most showed a willingness to change their behaviour in response to the increasing threat of STIs. Despite their low reported use, many showed interest in the use of condoms:

> "There would be no problem provided that we are told how to use it, it does not harm anyone, meaning that if it is put on it doesn't bring any effect to either person, and again, if it is something for prevention, who should avoid using it?"
>
> – Female Maasai (Wright, 2005)

Many cited a lack of knowledge as the main reason for not utilising condoms, hence education regarding their use could facilitate their uptake:

> "I've heard many people talking about this thing called condom. And we hate that thing very much. We hate it because we don't know how to use it."
>
> – Male Maasai (Wright, 2005)

4.3.3.2 Education

Communities and individuals with higher education levels generally had higher levels of correct knowledge regarding STIs. Promotion of education was found to lead to behaviour changes in communities such as increased condom use and refusal of high-risk sexual intercourse (Pakdamana and Azadgolia, 2014). Individuals with higher levels of STI knowledge were more likely to have had attended school for longer (Kulzer, 2002). Enrolment in school also had the dual purpose of less participation in the practice of esoto and lower levels of sexual intercourse. The existence of STI counselling at schools also increased awareness (Pakdamana and Azadgolia, 2014).

The age of marriage, and thus for many the age of sexual debut, was found to increase in those who had been to school. Many women reported delaying having children until their schooling

was completed, again leading to delayed entrance into the Maasai sexual network (Hedges, 2005).

Seminars conducted by non-governmental organisations (NGOs) and the Ministry of Health outside of formal education also increased awareness of STIs in these communities (Freitas and Nayak, 2014). They also allowed the Maasai to have their questions answered regarding these infections and address any misconceptions. Some studies reported the existence of community led health groups which had increased awareness of STIs, as well as providing a safe setting for discussion and collaboration (Birks, 2012).

4.3.4 Extraneous Factors

4.3.4.1 Health Services

The existence and accessibility of Western health services was highlighted as being important to facilitate STI testing and treatment. Such services also delivered support groups for individuals living with HIV/AIDS, while others hosted awareness workshops regarding the dangers of FGM. These facilities often provided STI awareness seminars which included information regarding symptoms and treatment (Pakdamana and Azadgolia, 2014). Such programs led to increased uptake of barrier contraceptives in their catchment communities. Dispensaries also exist in many communities, which female participants were able to attend without their husband's permission (Birks, 2012).

4.3.4.2 Legislation

At the time of data collection, legislation existed in Kenya which outlawed child marriage and the practice of FGM was illegal in both Kenya and Tanzania (Birks, 2012; Matogo, 2010). As a result of Maasai separation from infrastructure and a long history of self-sufficient communities, many laws are not adhered to. However, external low tolerance of these practices can deter individuals from participating due to a fear of legal consequences.

5 Discussion

5.1 Analysis of Findings

This qualitative systematic review used thematic analysis to identify the common barriers and facilitators of sexually transmitted infection control in Maasai communities in Tanzania and Kenya. Common themes emerged from the studies that aspects of Maasai culture such as multiple concurrent sexual partners, gender inequality and lack of knowledge regarding STIs prevent their control in these communities. These results are consistent with other findings in the literature, such as Booker (2009) and Talle (2007) who cited the Maasai sexual culture as a substantial barrier to the success of STI control measures. In addition, Ngadaya *et al.* (2021) found the oppression of Maasai women to be a contributor to low HIV awareness within this group. Other recurring themes in the results of this analysis included poverty and increased exposure to STIs through migration. In contrast, facilitators of STI control included formal education, strong female networks and influential community leaders. Previous study into infectious disease interventions in the Maasai has also highlighted the importance of utilising respected individuals to ensure a program's success (Nkedianye *et al.,* 2008).

The most highly reported barrier was the existence of multiple concurrent sexual partners through the practice of esoto, polygynous marriage and extra-marital relationships. As these practices are very specific to Maasai culture, their existence may prevent more traditional STI prevention methods from being applied. In cultures where monogamy is mainstream and there is societal pressure to practise it, behaviours such as abstinence and faithfulness are more likely to be considered (Conley *et al.*, 2015). However, as Maasai culture places no value in virginity, and infidelity is not a cultural concept, these programs are often futile. Further to this, the high value placed on large families and fertility translates to polygynous marriages being unsuitable to introduce barrier contraceptives. Therefore, the practice of esoto and extra-marital sexual encounters should be considered as more appropriate avenues to introduce condoms in order to minimise the risk of STI introduction and transmission. Women were highlighted as having low sexual autonomy in both marriage and sexual encounters at an esoto. Thus, the proposal of condoms by women becomes difficult due to the threat of violence and social exclusion. Conversely, women were described as having increased autonomy in their extra-marital relationships with boyfriends. Therefore, this could be an initial target of female empowerment regarding barrier contraceptives.

While the onus should not be on the female participants of the practice of esoto to reduce the risk of STIs, others in the community may be used to influence the environment. While efforts to halt the practice could be seen as culturally insensitive, and therefore unlikely to be successful, the focus instead should be on risk reduction. As elders are highly revered in Maasai society, their influence may be harnessed to both restrict who can attend the practice of esoto and what the event entails. As highlighted by Wright (2005), the practice of esoto need not include a sexual element in order to be continued. Thus educating influential people in the dangers linked to the practice could enable these gatherings to be made safer, both in terms of sexual violence and exposure to STIs.

This method of risk reduction has been documented in other high-risk cultural practices, such as wife inheritance among the Luo people of Kenya. The practice traditionally consists of a woman marrying a member of her husband's family upon his death in order to protect her and her children from economic hardship (Maleche and Day, 2011). While historically having no sexual element, in modern settings the practice is linked with another tradition which involves the sexual cleansing of the woman by her new husband (Agot *et al.,* 2010). This ritual requires semen and vaginal fluids to mix in order to cleanse the widow and her family of the impurity from her husband's death (Perry *et al.*, 2014). Therefore STI prevention methods are rarely used and associated STI risk is high (Agot, 2001; Agot *et al.*, 2010). However, alternatives to this element of wife inheritance have been promoted - such as returning to the traditional, symbolic customs of wearing the new husband's coat or repairing the roof of their shared home (Kenya Legal & Ethical Issues Network on HIV and AIDS, 2010; 2012). While organisations continue to work to improve the rights of widows in these communities (POLICY Project and Kenya National Commission on Human Rights, 2005), the involvement of the elders in adapting pre-existing practices facilitates community health improvement while the practice continues.

Gender inequality and gender-based violence continue to impede STI control and were frequently highlighted in the Maasai communities examined. Situations where women and girls are unable to refuse sex or dictate the terms of sexual encounters substantially impacts their ability to control their exposure to STIs. Factors shown to increase the likelihood of STI in women include experience of intimate partner violence (Wu *et al.*, 2003), sexual violence and sexual coercion (Williams, Clear and Coker, 2013). Condom usage is also lower in individuals who have experienced sexual coercion (Fair and Vanyur, 2011), often due to the fear that suggestion of their use would result in physical violence (Kalichman *et al.*, 1998). As a result, even women with knowledge regarding STI prevention methods remain at risk as they are unable to change their

behaviour due to fear of retribution. Hence, the empowerment of females in Maasai communities is crucial to decrease the risk of STIs across society.

Lack of knowledge and education regarding STIs was another substantial barrier to STI control and, thus, the implementation of awareness programs and increased education highly cited facilitators. World Health Organization (2016) have highlighted the importance of counselling and education regarding reproductive health, which have been shown to decrease the incidence of both STIs and unintended pregnancies. Such education becomes all the more important in light of the misinformation disseminated in Maasai communities by Christian organisations. The promotion of misinformation by religious bodies can have serious consequences for health initiatives, as was the case for the Global Polio Eradication Initiative in 2003. Nigerian Muslim leaders claimed the vaccine contained HIV and caused infertility, leading to a 16 month boycott by the northern Muslim states (Jegede, 2007). It is therefore critical that resources and structures are in place to allow communities to receive consistent and accurate messaging regarding infectious diseases in order to minimise the impact of erroneous religious influence. While awareness campaigns and outreach programs for whole communities can be effective, the integration of STI education into school curriculums can be more cost-effective than implementing community based interventions (Horton *et al.,* 2018). School attendance is also paramount to challenge pre-existing mindsets, while simultaneously providing other skills for life. Due to the wealth of research indicating that educating women benefits an entire society (UNICEF, 2022), the promotion of girls' education in particular is an area which requires additional attention and investment. This focus would likely lead to increased empowerment of girls and women to make their own choices regarding high-risk sexual behaviour, and other practices such as female genital mutilation.

This empowerment could also have the added benefit of improving healthcare seeking behaviour by women. As many Maasai women are not currently able to access healthcare without permission from their husbands, if a male sees no value in seeking healthcare this impacts the health outcomes of the entire household. Not only would the empowerment of women encourage them to take control of their own health, but this would also increase the likelihood of them seeking healthcare for their dependents.

Evidence has shown that research must be conducted in a culturally sensitive manner in order to be successful (Amerson and Strang, 2015) and has been highlighted as particularly important for the Maasai in previous health studies (Strang and Mixer, 2016). The large majority of the studies analysed were conducted by individuals from Western backgrounds, who were outsiders

to both Maasai and Swahili culture. Ethnicity-matching, or the race-of-interviewer effect, is known to be an important factor in interview design (Sin, 2007). Therefore, the extent to which the participants felt they could divulge personal information to ethnically contrasting interviewers cannot be known, especially regarding sex and sexually transmitted infections. The stigma around these topics continues to exist in many cultures (Garcia *et al.,* 2021; Global Network of People Living with HIV, 2021) and the Maasai are no exception (Schelling, Weibel and Bonfoh, 2008). Multiple studies acknowledged that some of the questions posed to participants covered topics which many would find difficult to discuss or would not be motivated to answer honestly. For example, in a culture which values a high number of sexual partners, participants may over-estimate the number of sexual partners they have either consciously or unconsciously. Additionally, the impact of the race-of-interviewer effect is most pronounced when the topic is associated with social desirability or prestige (Schaeffer, 1980). This self-reporting or response bias is apparent in many studies which include sensitive, self-reported data (Krumpal, 2013) and is not easily overcome through design of a study's method or its conduct (Althubaiti, 2016). However, it can be accounted for through methods such as stochastic frontier estimation (Rosenman, Tennekoon and Hill, 2011) and should be acknowledged by researchers as a potential limitation to their findings.

Another consequence of studies performed by foreign researchers is the potential language barrier. The majority of researchers did not speak Maa and this was a commonly cited limitation to the accuracy of the data collected. Hedges (2005) attempted to overcome this by selecting participants for interview who were able to speak Swahili to allow her to communicate directly with them. However, this ultimately skews the sample population to those with a basic level of education. In addition, the limitations of being unable to communicate in one's native language has been found to impact interviewee responses, irrespective of competence in the non-native language (Sin, 2004). Additionally, many of the studies did not disclose the language in which data were collected or if any measures were taken to overcome language barriers (Table 2). It is therefore difficult to know to what extent language could have impacted data gathering.

It cannot be overstated that Maasai communities require a tailored approach to STI control due to the culture specific barriers which these communities experience. All interventions must be implemented in a culturally congruent manner in an effort to increase the likelihood of uptake and success. As discussed in many of the studies, the political structures of Maasai communities often dictate that the elders of a settlement be consulted prior to any major intervention being initiated. This is not only seen as a sign of respect to the community, but also greatly increases the likelihood of participation by individuals and the program's overall success. With cultural

respect toward age-set leaders and elders in the community generally, these political individuals are looked to for guidance and advice regarding all aspects of life. Therefore, these groups should be targeted as community champions and recruited to be included in the implementation of intervention programs. An example of the success of such an approach is a case study of the Luo community of Nyanza, Kenya. As with Maasai women, Luo women often have their land and assets confiscated from them upon their husband's death. Despite national succession laws dictating their right to ownership, Luo customary law and cultural practices removed this right from the women of the community. Many of the more disadvantaged and uneducated victims were also not aware of their rights in order to resist community intimidation and were often left homeless. After identifying the need to address this issue, the POLICY Project began an intervention in 2004 which included local marginalised women, the Luo Council of Elders and groups such as NGOs. After a series of meetings to identify the issues faced by the women in the community, culturally congruent strategies were agreed by the elders and resolutions were passed regarding their implementation to improve and empower the community. Workshops and forums then enabled these structures to be strengthened and put into practice. Any potential challenges were raised and discussed, and various members of the community consulted to ensure that the strategies were the best fit for the existing social structure. While community and faith-based organisations were utilised to facilitate action in the communities long term, the incorporation of knowledge and opinions from the community itself was imperative for the project's success. Follow up investigations over the succeeding years identified numerous cases of women having their rightful property returned to them (POLICY Project and Kenya National Commission on Human Rights, 2005). The framework used in this intervention, later published by the Kenya Legal & Ethical Issues Network on HIV and AIDS (2010), could be utilised to encourage such change in Maasai communities through their pre-existing cultural governing structure.

The only disputed facilitator of STI control in the analysed studies was the emergence of migratory changes in the Maasai. While exposure to HIV sufferers was found to decrease stigma around HIV/AIDS and increase knowledge of condoms, incorrect knowledge regarding risk and other methods of protection was also reported. Previous research into labour migrants has found factors such as the length of time spent away from family and accommodation conditions to influence individual STI risk (Weine and Kashuba, 2012). Such factors are likely to impact whether migration acts as a barrier or facilitator of STI control in migrant Maasai, however further investigation is required in order to determine their influence. Given that urban migration has been cited as a relatively recent change to Maasai lifestyles and community

structures, the age of some of the included studies may have led to under-reporting of this phenomenon in the analysis of results.

5.2 Limitations

With the majority of the studies analysed being published or using data from before 2010, this is a possible limitation to the data gathered. In addition to potentially under-reporting the impact of urban migration, there is little information regarding the effect of increased access to technology. The utilisation of mobile technology has been highlighted in the literature as a method of increased health education and service utilisation in African pastoralists (Abakar *et al.,* 2016) as well as a potential tool to increase the empowerment of Maasai women (Summers *et al.,* 2020). Maasai communities have been greatly impacted by the increase in availability of mobile phones in recent years and the resultant access to the internet (Baird and Hartter, 2017; Butt, 2015). It is therefore possible that the impact of online STI education tools was under-reported in this analysis, as only one study referenced the benefits of online sex education resources.

Another limitation that was frequently identified by the study authors was the size of sample populations. While one journal paper justified their sample size statistically, most of the study populations were limited to opportunistic sampling or by the time available to the authors to perform the research. The constraints associated with surveying rural and/or mobile populations are well documented in the literature (Carr-Hill, 2014) and can affect researchers' ability to investigate these populations over extended periods. This not only impacts the time taken to gain the trust and respect of a community necessary to effectively gather data (Israel *et al.,* 1998), but also restricts the potential participants to those available in a shorter time span. One study, for example, was only able to survey children at a boarding school during the break in between teaching terms, impacting the pool of participants substantially (Pakdamana and Azadgolia, 2014). There is a possibility that such factors contributed to participant samples not being truly representative of the Maasai population.

While all of the included studies addressed the issues surrounding sexually transmitted infections, the majority of them concentrated their focus on HIV. This is unsurprising, given the high mortality and morbidity rates of HIV and AIDS (Global Burden of Disease Collaborative Network, 2020) and its disproportionate impact on Africa (UNAIDS, 2021a). However, this can be considered a limitation to research regarding non-HIV STIs, as the results of this analysis will likely be skewed towards addressing HIV-specific issues. However, given that HIV and STIs other than HIV share infection pathways and risk factors (Ong *et al.*, 2019), these data remain relevant

for the design of interventions to decrease levels of all STIs in these communities. Further studies should endeavour to include all major STIs in their study design in order to overcome bias towards to the publication of HIV data.

Regarding limitations of this systematic review's methodology, the strong inclusion and exclusion criteria aided identifying relevant papers from early stages in the literature gathering process. However, it is likely that publication bias from Western researchers skewed the results of the literature search. Full text papers from outside of North America and the United Kingdom were more difficult to access and two of the three papers which could not be retrieved were from African publishers. While this research aimed to be as accurate to the culture of Tanzania and Kenya as possible, it is likely that a more diverse or African literature base would have produced some different conclusions. In future research, additional funding to enable the inclusion of more obscure databases would be recommended.

The restriction to papers with English text could also have contributed to this phenomenon. While English is widely spoken by academics in the East and Central African region, collaboration with a Swahili speaker would have allowed a larger pool of non-English studies to be included in the research. Future studies would benefit from a collaboration with a Tanzanian or Kenyan university which would be able to provide a different cultural perspective.

Regarding the overall quality of the studies included, the use of the Critical Appraisal Skills Programme (2018) quality checklist prior to data extraction enabled low quality studies to be excluded. Results and discussions were generally balanced and appeared to be unbiased or at least acknowledge the potential for their own bias. In particular, multiple studies utilised Participatory Action Research Methodology, which aims to include the subjects of the research as participants in the research process. These co-researchers are therefore able to contribute from a place of knowledge regarding their own community and, therefore, increase the likelihood of the results being applicable and beneficial culturally (Given, 2008).

As previously discussed, Maasai populations are under-studied in terms of health data collection and analysis. Consequently, no systematic reviews of this kind have previously been published. While Maasai communities differ slightly in their circumstances and geography, they share a common culture and history. With many communities relocating over border lines, the review of data relating to Maasai communities, irrespective of nation, allows analysis that accommodates this behaviour. This pioneer review of findings from multiple communities in both Kenya and Tanzania allows individual studies to be generalised more successfully to the

wider Maasai population. This increases the extent to which these findings can be used to inform social policy in order to benefit the Maasai as a whole.

5.3 Future Research

While this systematic review has provided much needed oversight of the issues facing Maasai people, there is still a need for primary data to be gathered. The relative lack of any Maasai health data is not a recent phenomenon. However, as Maasai communities become further integrated into mainstream society, the need for accurate infectious disease data becomes all the more important. Before any STI control measures can be implemented and assessed for effectiveness, reliable data regarding baseline STI levels must be known. Therefore, a mixed methods approach to further research is recommended in order to both gather this data and assess the cultural appropriateness of STI control interventions. Target populations would ideally include the communities included in this review, as well as expanding to other settlements in Maasailand. While multiple studies recommended the implementation of STI control programs as a result of their research, there were no follow-up investigations undertaken analysing their implementation or efficacy. The use of a longitudinal study would enable the analysis of STI control interventions over an extended period (Caruana *et al.*, 2015; Hill *et al.*, 2016). Such data are imperative to intervention effectiveness analysis and should be a fundamental component of further research. With these factors considered, the following strategy is recommended for future study into STI control in the Maasai:

1) a. Gather quantitative data regarding STI incidence and prevalence in Maasai communities including chlamydia, gonorrhoea, trichomoniasis, syphilis and HIV
   b. Gather qualitative data regarding knowledge and attitudes regarding STI control
2) Implement an STI control program that aims to empower women and girls through education, include elders of the community and provide language appropriate materials to inform regarding the risks and prevention methods
3) Continue to monitor engagement with the program over an extended period of at least 6 months
4) a. Gather quantitative data regarding STI incidence and prevalence 2 years after intervention implementation
   b. Gather qualitative data regarding subsequent knowledge and attitudes regarding STI control and prevention 2 years after intervention implementation

Particular attention should be made to ensuring study funding allows for long term investigation, as well as returning to target communities to assess the effectiveness of intervention implementation. Such investigative research would further inform healthcare policy and investment into services which better serve Maasai communities. The outcome of which would provide this disadvantaged, high-risk population with effective STI control programs informed by accurate and appropriate data.

6 Conclusion

Sexually transmitted infections continue to present a substantial challenge to healthcare globally. Data must be gathered in order to address this persistent threat to global health with an emphasis on prevalence and incidence rates in high-risk populations. The Maasai of Kenya and Tanzania have been neglected historically in terms of STI data gathering. Thus, they do not have access to suitable, culturally appropriate intervention programs to address their specific requirements.

The collation of cross-border data identified particular areas of concern, such as the continued high-risk sexual practices inherent in Maasai culture and their disproportionate impact on the females of the society. Issues known to negatively impact other pastoralist communities, such as reduced access to formal education and health services, are also relevant to these communities. This highlights the importance of involving the Maasai in country-wide initiatives to improve health and education opportunities for all, despite the challenges posed.

This pioneer review marks the first step towards increasing the data available regarding barriers and facilitators of STI control across Maasai communities. The data gathered highlights the unique barriers experienced by the Maasai relating to their reproductive health, as well as the pre-existing facilitators which could be utilised for STI control. These data enable informed, evidence-based decisions to be made regarding how best to serve this population, highlighting areas which can be targeted by both policy makers and health organisations. It also lays the groundwork for further investigation into STIs in collaboration with the Maasai, both to overcome the dearth of data available in the literature and to empower these communities to be involved in improving their health outcomes. The recommendations for further research through the incorporation of pre-existing facilitators would enable long-term, impactful improvements to health in these disadvantaged societies. With such research, in tandem with the implementation of culturally congruent interventions, substantial and lasting progress can be made towards improving the sexual health of the Maasai people of East Africa.

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8 Appendix

Systematic Review Protocol

Adapted from de Vries, R.B.M., Hooijmans, C.R., Langendam, M.W., van Luijk, J., Leenaars, M., Ritskes-Hoitinga, M. & Wever, K.E. (2015). A protocol format for the preparation, registration and publication of systematic reviews of animal intervention studies. *Evidence-based Preclinical Medicine*, 1(1), pp. 1-9.

Title	Barriers and facilitators of sexually transmitted infection control in Maasai communities: a qualitative systematic review
Author	Catriona Oliver
Contact person	Dr Aileen Jordan

Objectives

Background

There is a need to identify the best strategies to increase awareness of sexually transmitted infections (STIs) in Maasai communities as well as strategies to improve surveillance and control. Africa is disproportionately affected by STIs, with the highest prevalence of HIV (UNAIDS, 2021), syphilis and trichomoniasis infection globally (Newman *et al*., 2015). While prevalence data are available for sedentary communities, there is an absence of information regarding the continent's mobile communities such as the Maasai. Various aspects of traditional Maasai culture increase the likelihood of contracting an STI, such as polygamous family structures and young age at sexual debut. Societal expectation to produce large families leads to women engage in high-risk sexual behaviour in order to conceive (Talle, 2007). This also contributes to the low use of contraceptives including condoms (Muvandi, 2003; Stats, Hill and Ndirias, 2020).

Social and environmental factors such as drought and disagreements over land possession have led to an increase in Maasai migration to more urban areas (Heaney and Winter, 2016). This movement from very remote to densely populated areas increases the likelihood of exposure to infectious diseases such as STIs (Neiderud, 2015). With many returning to Maasailand in circular migrations (Jowell *et al*., 2018), there is an increased risk of STI outbreaks in these areas where access to healthcare is poor (Sikar and Hodgson, 2006).

No current qualitative review of STI awareness, treatment and prevention in Maasai communities is publicly available at the time of writing. In particular, while the transient nature of the Maasai is independent of country borders, no review or study includes geographical regions from both Kenya and Tanzania. This dissertation would be the first collation of both Kenyan and Tanzanian data sources, to give a more complete picture of the impact of STIs on the Maasai people.

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Research question	
Population to study	Maasai people
Phenomena of interest	Sexually transmitted infections including HIV
Context	Maasai communities in Northern Tanzania and Southern Kenya
Methods	
Search and study identification	
Literature databases to search	Web of Science PubMed ASSIA ProQuest Dissertations and Theses African Journals Online Global Index Medicus Scopus
Define search strategies	Example: Web of Science "ALL=(("ma$sai") AND ("sexually transmitted infection$" OR "sexually transmitted disease$" OR "venereal disease$" OR "HIV" OR "HIV/AIDS" OR "human immunodeficiency virus"))", no publication date restrictions or peer review preferences
Other sources and strategies	Citation chaining from reference lists and manual searching
Study selection	
Screening phases	Use of EndNote bibliographic software to group searches by date performed and database. Manual removal of duplicates and initial screening of abstract, with further screening of full text where necessary to inform in/exclusion. Remaining records assessed for eligibility and reasons for exclusion detailed.
Eligibility criteria	• Full text available in English • Primary qualitative or mixed methods data • Maasai included in investigation population • Study population located in or around Maasailand in Kenya or Tanzania • Data regarding sexually transmitted infection control (such as prevention, testing and treatment), prevalence/incidence or knowledge/attitudes • Grey literature included • Any publication year
Study records	
Data management	Use of EndNote bibliographic software to group searches by date performed and database. Manual removal of duplicates and application of inclusion criteria, before requesting full texts if not readily available.
Outcomes and prioritisation	Primary outcome: Collation and analysis of qualitative data regarding STI knowledge and prevention awareness. Secondary outcome: Collation of quantitative data regarding STI prevalence among the Maasai in both Kenya and Tanzania, if enough data available in mixed methods papers.
Risk of bias	Thorough searches of diverse selection of databases will attempt to overcome publication bias. Any discrimination or prejudice inferred in publication will be noted and commented upon. Critical Appraisal Skills Programme checklist will be used to analyse the quality of the articles before inclusion.