eHealth for family planning in Botswana: acceptability and feasibility

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Declaration

I, Caitlin Bawn, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

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Supervision:

This PhD was supervised by Professor Judith Stephenson (Sexual Reproductive Health Department, EGA Institute of Women's Health, UCL), Dr Julia Bailey (eHealth Unit, Research Department of Primary Care and Population Health, UCL) and Dr Chelsea Morroni (Botswana Harvard AIDS Institute Partnership, Gaborone, Botswana)

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Abstract

Background

As many as 50% of pregnancies in Botswana are unintended, but only half of women in the country are currently using contraception. This thesis explores the barriers and facilitators for provision, choice and use of contraception in Botswana, and the feasibility and potential for an eHealth intervention in the field of family planning to address them.

Methods

I conducted a narrative review of factors influencing contraceptive choice, uptake and use in Botswana, and qualitative, semi-structured interviews with Batswana women (n=22), healthcare providers and key policy stakeholders in family planning (n=14), and Botswana-based eHealth experts (n=11).

Findings

Many Batswana women lack accurate, in-depth family planning knowledge, and experience extreme clinical and social barriers in accessing contraception. Socio-cultural barriers are more influential than physical access or availability, with partner control and patriarchal attitudes towards sex and gender the most prominent reason for women's non-use of contraception, exacerbated by urban-rural disparity and education level. Botswana's HIV epidemic has heavily dominated sexual health services and policy, leading to conflict between national approaches towards HIV and family planning.

Key challenges for eHealth innovation in Botswana are related to inconsistent Wi-Fi infrastructure, a lack of national policy, and a reliance on external partners leading to unsustainable design and implementation of interventions. Suggestions for an eHealth intervention in family planning include using a range of media platforms to address varied levels of technological knowledge and access, and ensuring content is culturally appropriate and useful to intended users.

Conclusion

There is a need, and desire, for more detailed, balanced, up-to-date family planning information for women, their partners, and the providers who counsel them. An eHealth intervention that adheres to the realities of technology and infrastructure limitations, and is Botswana-led in terms of content, design, and implementation, could be highly effective in addressing this gap.

Impact Statement

There had been no in-depth exploration of the factors influencing contraceptive choice, uptake and use in Botswana prior to this PhD project. An analysis of these factors was particularly critical due to the reduced fertility rate, improved family planning policy and increased availability of long-acting reversible contraceptive methods (LARC) witnessed over the past decade. Findings from the narrative review show that Batswana women continue to face both clinical and socio-cultural barriers in their pursuit of family planning, and highlighted some gaps in the literature and knowledge in this area – namely in-depth qualitative research around women's reasoning behind use or non-use of contraception. Twenty seven of the 31 studies included in the review were quantitative, and the qualitative studies were narrow in scope - highly focused in terms of the population or topic they were exploring.

Interviews with healthcare providers and policy stakeholders in family planning (n=14) and women from a wide range of socio-economic backgrounds (n=22) uncovered rich data about the impact of the various barriers to contraceptive provision and use, and detailed insight into how the various cultural and medical elements coalesce within individual women's experiences. As a relatively new field, there is little research exploring eHealth's potential in Botswana, and no research exploring how eHealth innovation could be utilised in the field of sexual reproductive health – making this project the first of its kind. As well as providing detailed insight into the experiences and challenges for family planning provision and use, I then explored the practical elements which could be used to design and implement a successful, sustainable eHealth solution for them. Interviews with eHealth specialists (n=11) provided insight into the feasibility of creating and running an eHealth intervention, and interviews with healthcare providers (n=14) and Batswana women (n=22) showed the need for an intervention of this type, as well as offering specific suggestions for the design and content that would be culturally acceptable and most useful for them as potential users.

The findings from this PhD research highlight the desire and need for improved family planning knowledge among both patients and providers, and provides a strong framework for designing a sustainable, culturally acceptable, and technically feasible eHealth intervention in the field of family planning. If implemented, this intervention could empower both women and their healthcare providers with more accurate, detailed contraceptive knowledge; reduce pressure on Botswana’s stretched healthcare infrastructure and personnel through improved remote access to advice and information; and encourage tailored, informed choice of more effective contraceptive methods.

Contents

Abbreviations and key definitions

AIDS: Acquired Immunodeficiency Syndrome
ARV/ART: Antiretrovirals / Antiretroviral therapy
BIH: Botswana Innovation Hub
BITRI: Botswana Institute for Technology Research and Innovation
BOFWA: Botswana Family Welfare Association
BSRHI: Botswana Sexual and Reproductive Health Initiative
BUP: Botswana-UPenn Partnership
BWP: Botswanan Pula
CC: Contraception Choices
DHMT: District Health Management Team
FP: Family Planning
GDN: Government Data Network
HIV: Human Immunodeficiency Virus
ICT: Information and Communications Technology
IDCC: Infectious Disease Care Centre
IDI: Interactive digital interventions
IfWH: Institute for Women's Health
IUD/IUCD: Intrauterine device
IUS: Intrauterine system
IPV: Intimate Partner Violence
LARC: Long-Acting Reversible Contraception
LMIC: Low-Middle Income Country (defined by WHO)
MOH: Ministry of Health
MOH TOT: Ministry of Health, Trainer of Trainers (Family Planning)
NGOs: Non-Government Organisations
PCPH: Primary Care and Population Health
PMH: Princess Marina Hospital
RA: Research Assistant
RCT: Randomised Controlled Trial
REC: Research Ethics Committee
SA: Southern Africa

SMS: Short Messaging Service

SRH: Sexual and Reproductive Health

UB: University of Botswana

UCL: University College London

USSD: Unstructured Supplementary Service Data

WHO: World Health Organisation

Sexual Health:

> "*A state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination, and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled.*" (WHO, 2006)

Family planning:

> *"Family planning allows individuals and couples to anticipate and attain their desired number of children and the spacing and timing of their births. It is achieved through use of contraceptive methods and the treatment of involuntary infertility. A woman's ability to space and limit her pregnancies has a direct impact on her health and well-being as well as on the outcome of each pregnancy."* (Inter-Agency Working Group on Reproductive Health in Crisis, 2010)

Contraception/contraceptive methods:

> *"Contraception aims to prevent pregnancy. A woman can get pregnant if a man's sperm reaches one of her eggs (ova). Contraception tries to stop this happening by: keeping the egg and sperm apart; stopping egg production; stopping the combined sperm and egg (fertilised egg) attaching to the lining of the womb"* (NHS, 2021)

eHealth:

> *"An emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology"* (Eysenbach, 2001)

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Chapter 1: Introduction

1.1 Chapter overview

This introductory chapter provides background information about the Republic of Botswana, including its political and financial history, geography, and population demographics. This chapter explores the rate and impact of unplanned pregnancy (both globally and in low resource settings), as well as the benefits of contraceptive access and uptake in addressing this. After an examination of Botswana's healthcare systems and infrastructure, this chapter will also provide insight into the specific challenges around sexual and reproductive health (SRH), including the illegality of abortion or high rates of unplanned pregnancy, and the current sociocultural barriers for provision and use of contraception. It then discusses the prevalence and implications of Botswana's HIV epidemic on policy, clinical practice and social attitudes around family planning and sexual health, particularly for vulnerable or marginalised populations.

This chapter will also provide background context around eHealth, including the growth of interactive digital interventions (IDI) and the potential these offer for creating behaviour change. I will also offer an overview of broader eHealth definitions, and how these can differ for low- or middle-income countries (LMICs) while also exploring the strong opportunity eHealth brings for low resource settings. Then, moving specifically to Botswana, I will describe the ICT landscape, existing digital interventions, as well as exploring the key barriers and facilitators to future eHealth innovation in Botswana.

Finally, I will utilise the background information from these two areas to describe the aims and rationale of this project, which aims to explore the need and feasibility of an eHealth intervention for family planning.

1.2 Global context for contraception and unplanned pregnancy

Globally, 40% of pregnancies are unintended, with 50 percent of these ending in abortion, 13 percent ending in miscarriage, and 38 percent resulting in an unplanned birth (Sedgh *et al.*, 2014). Between 2015 and 2019 it appears these rates have increased, with as many as 121 million unintended pregnancies, 61% of which ended in abortion – with unintended pregnancy rates higher in countries where abortion is restricted (Bearak *et al.*, 2020).

Unplanned pregnancies are directly associated with increased maternal and child morbidity and mortality, with the latest figures showing approximately 830 women dying from preventable causes related to pregnancy and childbirth every day (WHO, 2016). Developing regions experience these issues to an even greater extent, and account for 99% of global maternal deaths - 66% occurring in Sub-Saharan Africa alone (WHO, 2015). Approximately 47,000 women die from unsafe abortions each year, the majority of which take place in lower-middle income countries (WHO 2017; Gertrand *et al.*, 2017).

The benefits of contraception are well documented; in addition to reducing the number of abortions, infant mortality, and both maternal morbidity and mortality, increased use of contraception lowers child poverty and addresses gender inequality. By providing women with more control over family planning, and consequently greater employment or education opportunities, future children are born into a stronger financial position with a healthier mother (Canning *et al.*, 2012). Increased access to family planning in developing countries has reduced maternal deaths by 40% over the last 20 years, and a further 29% of maternal deaths could be averted if the global unmet need for contraception is addressed (Ahmed *et al.*, 2012).

Access to contraception is not always simple though, and there are many physical and social reasons for not using contraception. Side effects are a common concern for many women, and a major barrier to use of contraception – as well as a lack of basic contraceptive knowledge (Black *et al.*, 2012; Pratt *et al.*, 2014; Blackstone *et al*, 2017). External pressure, whether from partners, religious belief, or cultural stigma, can persuade women towards a particular method or against contraception altogether (Raine *et al.*, 2010; Pratt *et al*, 2014; Blackstone *et al*, 2017). Many women get contraceptive advice from friends rather than healthcare professionals, as fear of going to a doctor, concerns over confidentiality or embarrassment about purchasing birth control can make them less likely to seek medical advice (Brittain *et al.*, 2015; Pratt *et al.*, 2014; Blackstone et al, 2017). When they do visit a doctor, women can often be dissatisfied with the type or quality of information offered, especially around side effects and lack of customised support (Guendelman *et al.*, 2000). Although worldwide 64% of married or "in union" women are using contraception, it is substantially lower in less developed countries (40%) and the lowest in sub-Saharan Africa (33%) as these challenges are exacerbated in low-resource settings (UNAIDS, 2015).

1.3 The Republic of Botswana: contextual background

Botswana is a landlocked country in Southern Africa, neighboured by South Africa, Namibia, and Zambia. It is politically very stable, relatively free of corruption and Africa's longest continuous multi-party democracy (The World Bank, 2011).

Table 1.1: Republic of Botswana - Summary information

Indicator		**Source**
Official country name	Republic of Botswana	
Total population	2,350,667 (July 2021 est.)	CIA: The World Factbook (2021)
Capital	Gaborone: Population 269,000 (est)	CIA: The World Factbook (2021)
Ethnic groups	Tswana or Setswana 79%, Kalanga 11%, Basarwa 3%, Other 7% (including Kgalagadi, Indians and Whites)	CIA: The World Factbook (2021)
Languages	National language: Tswana (Setswana, Sechuana). Official language: English.	Britannica (2021)

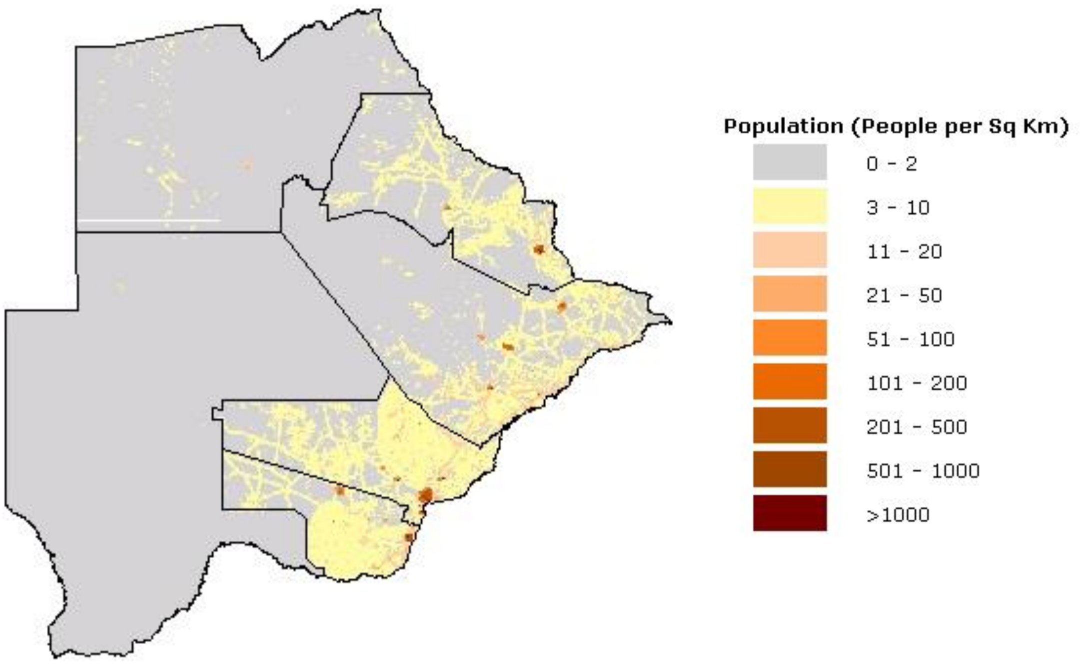
	Several other languages, including Khoe, or Khwe, and San, Kalanga, Sekgalagadi, Herero, Mbukushu, and Yei.	
Religion	Christian 79.1%, Badimo 4.1%, other 1.4% (includes Baha'i, Hindu, Muslim, Rastafarian), none 15.2%, unspecified 0.3%	CIA: The World Factbook (2021)
Life expectancy at birth (years)	Male: 66.4 Female: 72.3	The World Bank (2019e) (2019f)
School enrolment (% net)	Primary: 92.9% Secondary: 64.1%	Statistics Botswana (2021)
Literacy rate (%, aged 15 and above)	Male: 86.6% Female: 87.4%	The World Bank (2013a) (2013b)
Gross Domestic Product (current US$)	$18.34 Billion	The World Bank (2019c)
Human Development Index	0.735 (100/189 countries and territories)	UNDP (2020)

After gaining independence from Britain in 1966, “Bechuanaland” was the third poorest country in the world, with a poverty rate of over 50% (The World Bank, 2021). Now, due to the significant mineral wealth and prosperous diamond industry; strong, relatively stable governance, prudent economic management; and popular safari destinations, it is one of the world’s fastest growing economies (The World Bank, 2021). GDP has increased from $5.4 million in 2002 to $18.3 million in 2019, with an average annual growth of 9% (The World Bank, 2019c). Botswana is currently classed as upper-middle income by the WHO, with a ‘transformation agenda’ of becoming a high-income country by 2036 (The World Bank, 2021).

However, most of this economic growth has been concentrated among the ‘financial elite’, and consequently Botswana is one of the most disparate countries in the world (Belise, 2020; World Bank, 2020). Many Batswana citizens have yet to experience any benefit from the country’s relatively recent wealth, with “significant and stubborn pockets of poverty” remaining - particularly in the rural villages (The World Bank, 2011).

Urban-rural disparity is exacerbating this financial and social inequality. Botswana is also one of the most sparsely populated countries in the world, with a population density of less than 4 people per square km (Food and Agriculture Organisation of the United Nations, FAO, 2018).

Figure 1.1: Botswana's population density



Most of Botswana's population is centred around Gaborone, the capital city, and a few other relatively large towns – Francistown, Molepolole, Selebi-Phikwe and Maun – with vast areas un-inhabited or with a population density of 0-2 people per square km (FAO, 2018). This urbanisation has been very rapid, with the percentage of the population living in rural areas declining from 96.94% in 1960, to 73.2% in 1985, and just 29.8% in 2019 (The World Bank, 2019b).

1.4 Botswana's healthcare infrastructure and personnel

While there are some private healthcare institutions in Botswana, the government operates 98% of all medical facilities (Ministry of Health, 2021). Healthcare is provided through a decentralised model, with primary health care acting as the pillar of the delivery system. Primary care is provided through a network of clinics (105 inpatient clinics and 206 clinics without beds) and within the outpatient departments of the 3 national Referral Hospitals, 15 District Hospitals and 17 Primary Hospitals (Ministry of Health, 2021).

Although 95% of the population live within 8km of a healthcare facility, outside Gaborone poor road quality and weak public transport links make accessibility extremely difficult (African Health Observatory, AHO, 2018a). Additionally, not every service or high-impact intervention is available at the primary level, meaning referrals to one of two public hospitals, either in Francistown or Gaborone, are common for many healthcare issues. Healthcare resources are highly stretched, with just 1.9 beds and 0.4 physicians per 1000 people (The World Bank, 2018a; The World Bank, 2018b).

An additional challenge is that only 10% of Botswana's doctors are local, meaning that communication between patients and providers can be strained, and quality of care is hard to guarantee with such an inconsistent and stretched workforce (African Health Observatory, AHO, 2018b). Prior to 2009, all Batswana doctors were trained outside the country, contributing to a perceived 'brain drain' of local healthcare professionals; "Even though nurses leave the country to work in developed countries, almost as many nurses from the neighbouring counties take up employment in Botswana", highlighting the extent of this changeable, international workforce (African Health Observatory, AHO, 2018a).

1.5 Botswana's HIV epidemic

Botswana has the fourth highest HIV prevalence in the world, estimated at 20.7% among adults aged 15-49, and between 340,00 and 410,000 citizens are currently living with HIV (UNAIDS, 2021).

Botswana's strong policy and clinical approaches to combatting the HIV epidemic has been seen as exemplar within Sub-Saharan Africa. In 2002, Botswana became the first country in Africa country to offer free anti-retroviral therapy (ART) to its citizens; routine "opt out" HIV testing was added in 2004; and medical male circumcision programs were added in 2009 (Makhema and Wirth, 2019). This has led new infections to decrease significantly, from

18,000 in 2005, to 10,000 in 2010, down to 8,500 in 2018 (Avert 2021; UNAIDS, 2018). AIDS-related deaths have also dramatically decreased from a peak of 18,000 in 2002 to 4,800 in 2018 (UNAIDS, 2018). In 2019, President of Botswana, Mokgweetsi Masisi announced that Botswana would extend its free ARV treatment to non-citizens – a big policy change that would close a significant gap in the country's response to the epidemic (UNAIDS, 2019). There are an estimated 30,000 foreign residents living in Botswana, with less than a quarter accessing HIV treatment and many unable to afford medicines or the cost of travelling home to seek treatment (UNAIDS, 2019).

However, despite this wide promotion and uptake of anti-retroviral therapy (ART), Botswana has experienced a 4% increase in new infections since 2010, with as many as 14000 new infections in 2017 (Makhema and Wirth, 2019; UNAIDS, 2021). Over 25% of women of reproductive age, and 1/3 of pregnant women, are HIV positive, and despite the range of contraceptive methods available, as many as 50% of these pregnancies are unintended (Republic of Botswana, 2017; UNDP, 2018; UNAIDS, 2021). As stated by Jyothi Raja Nilambur Kovilakam, the UNAIDS Country Director in Botswana, "We've achieved partial success in saving lives, but these successes are giving way to complacency in HIV prevention" (UNAIDS, 2018).

The impact of HIV on women and youth

Batswana women are disproportionately impacted by the HIV epidemic; in 2019, the prevalence rate was 25.1% among adult women (aged 15-49), compared to 16.5% for men in the same age range (UNAIDS, 2021). This disparity is fuelled by prevalent gender inequality – demonstrated through the early sexual debut, forced marriage and gender-based violence experienced by so many Batswana women (UNAIDS, 2017; UNICEF, 2021). The most recent nationwide study into the scale of this gender-based violence in Botswana found that 29% of women had experienced some form of intimate partner violence during the past 12 months, and 67% reported experiencing intimate partner violence at some point during their lifetime (National AIDS Coordinating Agency, 2015).

Despite proactive government commitment to combatting this inequality, such as psychosocial services for young women, female economic empowerment, and improved focus on effective HIV prevention programmes for secondary school girls, new HIV infections among women continue to rise (National AIDS Coordinating Agency, 2015; Avert, 2021).

There is also concern that the situation does not seem to be improving among younger generations. A national survey found that fewer than half of respondents aged 15-24 could answer basic questions about HIV prevention and treatment, and there has been little change in prevalence for this age group for over a decade; in 2005, there was a 6% prevalence among young people, and in 2016 there was 5.4% prevalence among young men and 10.2% prevalence among young women (Aids Info, 2021b; UNAIDS, 2017). Additionally, in 2018, adolescents and young people aged 15-24 accounted for three in every ten new HIV infections. Young females in this age group were twice as likely to be newly infected than males the same age, and adolescent girls aged 10-19 years were three times more likely to be infected than boys of the same age (UNICEF, 2021). There is a consequently a need to target prevention programmes at young people, and specifically young women, to combat HIV and its associated challenges most effectively.

Marginalised populations, HIV, and stigmatisation

There is a persistent stigma around living with HIV in Botswana. A 2014 study found that, due to their HIV status, 39% of respondents were aware of being gossiped about in the previous 12 months, 21% experienced verbal insults, and 10% had experienced physical harassment (Avert, 2021). This stigmatisation impacts on every aspect of life for people living with HIV/AIDS (PLWHA) including psycho-emotional disturbances, job losses, poverty, concerns about children and fertility, and strain or disruption of relationships (Setlhare *et al.*, 2014).

Consequently, key marginalised populations in Botswana, such as LGBTQ+ or sex workers, are excluded from HIV services and treatment, and face both legal and social barriers - the impact of which currently remain under-researched (Avert, 2021). Homosexuality is illegal in Botswana, where the penalty for "carnal knowledge against the order of nature” is imprisonment, with a maximum of seven years (Zahn *et al.*, 2016). Consequently, men who have sex with men (MSM) have been subjected to severe human rights violations including blackmail, fear of seeking healthcare services, being denied housing – even unease just walking in the community. This stigma, and specifically fear of seeking healthcare services, can lead MSM to lack information around HIV; one study of 454 MSM found that 60% of participants were not aware that anal sex is associated with higher risks of HIV, and less than half had received any HIV related information within the past year (National AIDS Coordinating Agency, 2015).

There is also a high HIV prevalence among female sex workers, 61.9% among 4000 sex workers across three districts (National AIDS Coordinating Agency, 2015). Of these participants, while 67% reported consistent condom use, those female sex workers who reported not using condoms indicated that they were paid not to do so, and 19% reported that they were forced not to use protection (Republic of Botswana, 2012; National AIDS Coordinating Agency, 2015). A 2016 study on sex work and violence in Botswana provided further insight, where 66% of sex workers described experiencing violence from clients, exacerbated by the criminalisation of their profession. Consequently, there is an urgent need for improved HIV testing and intervention, and more inclusive policy, for these key affected populations (Aidsfonds, 2017).

Funding for HIV prevention programmes

One of the greatest challenges for Botswana is funding and maintaining its HIV response. Due to the country's economic status being upgraded to upper-middle income, international donors have been retracting their funding, or transitioning it to low-income countries; the US-based Presidents Emergency Plan for AIDS Relief (PEPFAR), for example, has more than halved its contributions to Botswana - from $84 million in 2011, to $28 million in 2016 – and the Gates Foundation has withdrawn funding for HIV programmes altogether (Avert, 2021). Though there has been little investigation into the direct impact of specific funding channels being reduced, it has raised "grave" concerns for the sustainability and consistency of the prevention programmes, clinical services, and medical treatments reliant on it (Avert, 2021).

1.6 Sexual Reproductive Health in Botswana

Context for family planning and contraception

Botswana is often cited as a success story in terms of family planning due to its remarkable fertility decline – from 6.2 births per woman in 1980, to 2.8 births per woman in 2019 (The World Bank, 2019a). Family planning has been funded and integrated with child and maternal health services since 1973, with the Government stating, "it is the basic right of each family to determine the number of children and when to have them" (Ministry of Health, 1988).

Since this original commitment, Botswana's national family planning programme has continued to grow and has been associated with some significant successes. The creation of a more favourable SRH policy and legal environment has improved service access for adolescents, and there has been a focused attention on increasing youth programming (UNFPA, 2021). There are also a relatively broad variety of contraceptive methods available in Botswana: barrier methods, including both male and female condoms; combined hormonal contraceptives including a combined oral contraceptive pill, vaginal ring, and contraceptive patch; progestogen only methods including a pill, injectable ('depo'), and two varieties of implants - Implanon and Jadelle; a non-hormonal copper IUD; and surgical methods, like vasectomy and bilateral tubal ligation (UNFPA, 2016; UNFPA, 2021). Additionally, contraceptives, and all sexual health services, are free for Batswana citizens, and the country has well-surpassed the millennium development goal of 30 condoms per man per year (Avert, 2021).

However, despite the availability and promotion of contraception in the country, in 2019 only 50.5% of women aged 15-49 were using any form of contraception, with use of long-acting reversible methods particularly low (UN, 2019; Avert, 2021). Botswana is one of the top 20 countries in the world with low contraceptive method mix, with the male condom comprising the majority of family planning use in the country (UNFPA, 2021; UN, 2015; Avert, 2021) Almost 67% of women using contraception in the most recent national survey stated they were using a male condom as their chosen method, followed by the injection at 17%, the oral contraceptive pill at 12.6%, and IUD at 1.4% (Statistics Botswana, 2017). All other methods, including the female condom, implant, male or female sterilisation, withdrawal, abstinence, and more traditional methods, were used by less than 1% of the population (Statistics Botswana, 2017). Due to the HIV epidemic, Botswana's government has heavily promoted the male condom as one of the most effective methods to protect against both HIV and unplanned pregnancy but, alongside the reduction in HIV, recent trends suggest condom use is also in moderate decline (Avert, 2021).

SRH services and contraceptive methods remain inaccessible to many vulnerable populations, including adolescents and young people who experience high rates of unplanned pregnancy (UNFPA, 2021; Avert, 2021). Additionally, in the latest national demographic survey, education level was found to be correlated with contraception use, where women with lower education were far less likely to use any form of family planning (Statistics Botswana, 2017).

Key sexual reproductive health (SRH) challenges

Abortion is illegal in Botswana under the same law as homosexuality, also carrying a prison sentence of up to 7 years. However, doctors are permitted to carry out abortions within 16 weeks of pregnancy in cases of rape, defilement, or incest; if the pregnancy puts the life of mother at risk or may cause harm to her physical or mental health; or if the unborn child would suffer or later develop physical or mental abnormalities. This leaves many women seeking unsafe abortions, which the Botswana government defines as, "the termination of an unwanted or an unplanned pregnancy by persons lacking proper skills and done in environment lacking the minimal medical standards" (Republic of Botswana, 2011).

In Botswana, maternal mortality due to unsafe abortion and its complications is one of the three leading causes of maternal death; in 2014, 21% of maternal deaths in Botswana were caused by unsafe abortions (Ray *et al.*, 2013; UNFPA, 2016; Ngwako and Banke-Thomas, 2020). However, the scale of the issue may be underestimated due to Botswana's restrictive abortion laws causing women to be afraid of prosecution. This is a possible explanation as to why only about 4% of patients in Botswana who presented in healthcare facilities requiring post-abortion care admitted that they induced the abortion by themselves (Ngwako and Banke-Thomas, 2020). Additionally, 32% of abortions occur in the second trimester which is not in keeping with spontaneous abortion, suggesting that more women have experienced unsafe abortions than statistics account for (Melese *et al.*, 2017). As well as the legal challenges in seeking safe abortion care, socio-cultural beliefs and attitudes of healthcare providers can also cause women to delay or avoid presenting at clinics, all of which can lead to poorer health outcomes (Smith, 2013; Ngwako and Banke-Thomas, 2020).

This number of unsafe abortions, coupled with the high rate of unplanned pregnancies in Botswana, highlights the need for increased contraceptive education and uptake prior to an unplanned pregnancy. Unintended pregnancy is common among Batswana women (UNFPA, 2021; Karabo, 2020; Doherty *et al.*, 2018). In a study of 160,482 women who responded to the question 'Was the last pregnancy planned?' as part of the most recent Botswana AIDS Impact Survey (BAIS), 69,732, or 43.5%, answered no (UNFPA, 2021; Karabo, 2020). Additionally, almost 50% of HIV positive women included in this survey stated that their latest pregnancy was unplanned (UNFPA, 2021). The key factors associated with unplanned pregnancy were low educational status, unemployment, being unmarried or cohabiting with a partner, and residing in rural areas (Karabo, 2020).

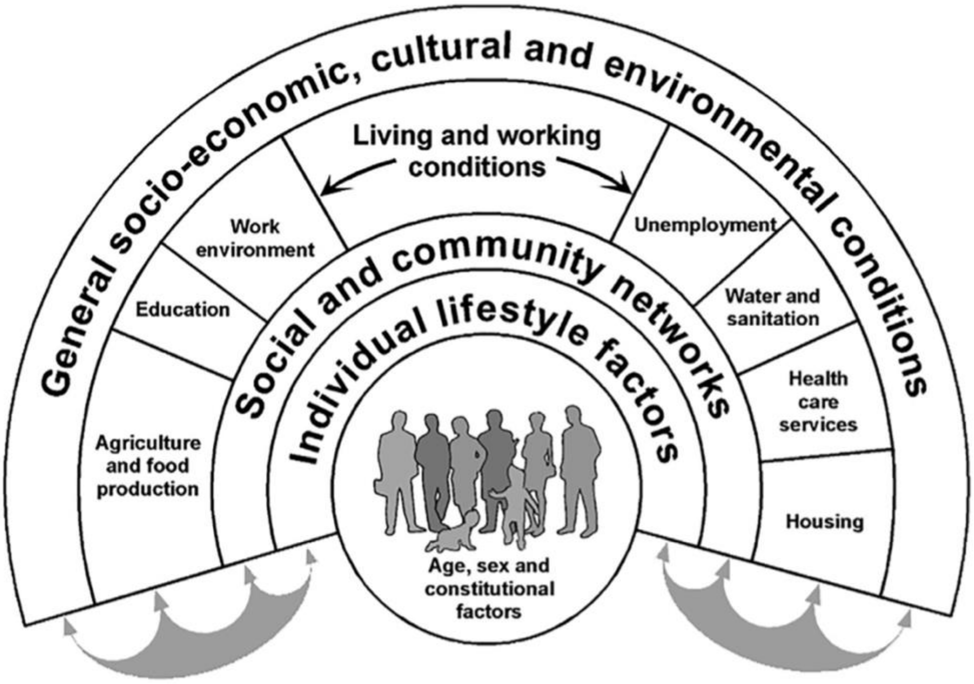
There is a significant association between unintended pregnancy and women who have had more live births, highlighting the potential of the antenatal and post-partum period as an opportunity to offer family planning counselling and contraceptive methods (Doherty *et al.*, 2018). Additionally, most women who described their pregnancies as unintended across both studies were using contraception at the time of conception, most commonly the male condom, suggesting a desire to control fertility (Karabo, 2020; Doherty *et al.*, 2018).

Unintended pregnancy is high among adolescents (UNFPA, 2021). In the latest Botswana Demographic Survey, 22.3% of students reported ever being sexually active – with 33.0% of these students having sexual intercourse before the age of 13 years (41.4% of males and 22.1% of females). Among these students who reported ever having sexual intercourse, 13.0% of males had impregnated their partner, and 13.4% of females had been pregnant (UNFPA, 2021). This highlights the need for improved, earlier, access to sexual health intervention and contraceptive methods – particularly among the demographic groups who more commonly experience unplanned pregnancy, like unmarried or younger women (Karabo, 2020; UNFPA, 2021).

1.7 Social determinants of health: the 'rainbow' model

For this project, it was especially important to consider the social and cultural determinants of healthcare decision making, and place the above statistics and background into wider regional context. Dahlgren and Whitehead's well-cited 'rainbow model' for social determinants of health (Figure 1.2) explores the non-medical influencers behind health decisions, and offered a strong framework for considering how multi-faceted these choices often are.

Figure 1.2: Social determinants of health 'rainbow model' (Dahlgren and Whitehead, 2007)



(Dahlgren and Whitehead, 2007)

Previous research, both in family planning specifically and other health conditions, suggests that these social determinants can be more influential than health care or lifestyle choices, accounting for between 30-55% of health outcomes (WHO, 2022). Additionally, the model was used as the framework for a large global review of factors influencing contraceptive choice, where these various intersectional individual, community and environmental factors were found to be highly influential on women's choices around contraception worldwide (D'Souza *et al.,* 2022 – in press). These social determinants are expected to also be highly influential for Batswana women, and will form the core of this project: exploring the multiple, interlaced factors behind use or non-use of family planning.

The rainbow model also highlights why simply having access to a health service or intervention may not equate with use, showing the myriad of constitutional and lifestyle factors, community and social influences, practical environmental conditions, and broader cultural considerations behind each individuals' pursuit of healthcare (Dahlgren and Whitehead, 2007). This makes the model especially pertinent for exploring family planning in Botswana as contraceptives are provided for free, through a strong national SRH programme, yet many women are not using any method of contraception – suggesting deeper personal, social, and cultural determinants behind non-use of family planning (UNFPA, 2021).

1.8 eHealth and interactive digital interventions (IDI)

Defining the field of 'eHealth'

eHealth is a relatively new field, and consequently its definitions are highly contested and ever-changing – a debate only made more convoluted due to the rapid growth of social media, mobile phones, and new wearable technologies. To add further complication, the term 'eHealth' encompasses multiple other associated areas of computer science and engineering - including informatics, cyber security, cloud computing and human computer interaction - across medicine, public health, anthropology, and even public policy (Clifford, 2016).

As the phrase 'eHealth' is used so differently across these fields, one unified understanding seems almost impossible. One systematic review found 51 unique definitions, with no real consensus; the authors identified two universal themes (health and technology) and six less general themes (commerce, activities, stakeholders, outcomes, place, and perspectives) - but even within these sub-themes, specific wording and meaning varied widely (Oh *et al*, 2005). Despite these multiple interpretations of the term, "the overwhelming understanding of eHealth reflects an attitude of optimism" (Oh *et al,* 2005), with definitions specifically citing improvements', 'enhancement' and 'enabling' - allowing patients and professionals to 'do the previously impossible' (McLendon, 2000).

The World Health Organisation defines eHealth as "the cost-effective and secure use of information and communication technologies in support of the health and health-related fields including healthcare, health surveillance and health education, knowledge and research" (World Health Organisation, 2005). In 2005, Gunther Eysenbach - then Editor of the Journal of Medical Internet Research - stated:

> *"e-health is an emerging field in the intersection of medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology"* (Eysenbach, 2001).

Eysenbach's definition is arguably the most cited definition to date, and the one that most closely matches my own interpretation of eHealth. Most importantly, it is inclusive enough to encompass the breadth of technological and policy development in this field, making it particularly applicable when researching eHealth within LMICs.

Defining 'eHealth' interventions

As well as the difficulty in producing one definition of 'eHealth', there has also been a lack of clarity in defining what exactly classifies as an 'eHealth' intervention. In an attempt to unify the multiple diverse communities involved in eHealth implementation - government stakeholders, technologists, clinicians, implementers, network operators – the WHO developed a classification framework for digital interventions, offering a simplified language and clear structure for categorising aims, target users and health system challenges (WHO, 2018).

The WHO framework categorises types of digital interventions into four key areas: interventions for clients; interventions for healthcare providers; interventions for health systems or resource managers; and interventions for data services (WHO, 2018). Within these categories, there are a multitude of specific digital intervention aims – including notifying, registering or certifying births and deaths; management of digitised receipts, payment information or prescription services; co-ordinating emergency transport or services; and transmitting clinical records or test results to clients (WHO, 2018).

Though this framework captures the breadth of potential ‘eHealth’ interventions, in order to address the specific aims of this project I will focus on client-facing interventions – specifically those aimed at improving access to information and enabling more informed decision making, which would fall under category 1.6.1 of the framework – ‘client look up of information’ (WHO, 2018). However, ‘client’ for some information-focused interventions can be healthcare providers, so there may inevitably overlap between those two categories of the framework.

Additionally, I will use the terms eHealth and mHealth throughout this thesis. In line with Eysenbach’s definition, ‘eHealth’ will be used as a broader term that incorporates a wider variety of interventions – including financial and clinical registration systems, electronic prescribing or appointment reminders – as well as when discussing the general potential for technological development within healthcare. ‘mHealth’, in this project, falls within the broader scope of ‘eHealth’ but specifically refers to the potential of utilising mobile technology, or existing mHealth interventions – discussed in more detail later in this chapter.

The growth and potential of interactive digital interventions (IDI)

Within the field of eHealth, there is huge potential for the growth of interactive digital interventions (IDI). The latest World Bank figures show that 57% of the world’s population was online in 2019, and between October 2020 and October 2021 internet use on mobile phones and tablets exceeded more traditional desktops by almost 15% (World Bank, 2019h; Statcounter, 2021). Alongside the rapid growth of internet access, there has been an explosion of interest in the potential of digital health to improve health care delivery and for self-care - ranging from simple appointment and medicine reminders (Bailey *et al.*, 2015a), to watches that check blood pressure, or contact lenses to monitor diabetes.

Interactive digital interventions (IDIs) provide information, support for decision making and behavioural change, and/or emotional support for health issues, including sexual health (Bailey *et al.*, 2021). They are easily personalised, and can offer highly individualised feedback, with interactivity promoting active learning while easily accommodating different pace of learning (Swanton *et al.*, 2015). Multimedia features can make topics more engaging, and consequently hold users’ attention - with images, audio, and video especially useful in low-literacy settings. Anonymity, especially around sensitive or embarrassing health issues, can be a welcome relief for patients, while online dissemination makes these interventions relatively cheap to implement, as well as quick and easy for users to access (Bailey *et al.*, 2015b).

There is also increasing evidence that digital interventions can be effective in promoting behaviour change for a range of issues - from condom use for safer sex and HIV prevention, through physical activity and weight loss, to alcohol consumption and tobacco use (Bailey *et al.*, 2021; Noar and Willoughby, 2012; van den Berg *et al.*, 2007; Saperstein *et al.*, 2007; Khadjesari *et al.*, 2010; Brown *et al.*, 2014). In the most recently published National Surveys of Sexual Attitudes and Lifestyles (NATSAL 2012), the internet was cited a major source of sexual health information, especially for 16–24-year-olds: 28.6% of men in this age category said their primary source of sex education was from the internet (excluding pornography), with a further 19.1% using sexual advice websites specifically and 14% using some other type of internet-based source. 14% of women used the internet for sexual health information too, with another 9.5% using sexual advice websites. For either gender, using the internet for sexual health information was significantly more common than going to a doctor, nurse, or clinic (Natsal, 2012).

1.9 eHealth and mHealth interventions for sexual and reproductive health (SRH)

Websites and interactive digital interventions (IDI)

There are a growing number of digital or online interventions specifically dedicated to family planning, ranging in style and device-type. Some of these interventions are more clinical, such as NHS Choices, which has a dedicated section for contraceptive advice (NHS Choices, 2021). The website contains large amounts of text, asking medical questions such as “Are you comfortable inserting contraceptives into your vagina?” As well as the general phraseology, each method contains relatively detailed medical descriptions; “The pill prevents the ovaries from releasing an egg each month (ovulation). It also thickens the mucus in the neck of the womb, so it is harder for sperm to penetrate the womb and reach an egg; thins the lining of the womb, so there is less chance of a fertilised egg implanting into the womb and being able to grow”, as one example (NHS Choices, 2021).

There are also simpler, more visually appealing websites. Bedsider.org, for example, targets younger users of contraception, offering advice and information in a style most appropriate to them: which methods are hormone free, most effective or 'party ready', as well as where to access it, and reminder services for both appointments and birth control through its mobile application (Bedsider, 2021). Bedsider has been the focus of research around intervention effectiveness, demonstrating the positive impact access to this contraceptive information can have; in a large, high quality randomised controlled trial, it was found to be effective in preventing unintended pregnancy at 12 months, with a significant result - intervention 2% vs control 6% (Antonishak *et al.*, 2015).

There are many other digital interventions which do not use a traditional website format. In a systematic review of interactive digital interventions (IDI) for contraception choice and use, currently under peer-review for publication, we searched 23 databases which generated 24,795 citations - 23,841 of which were excluded. Of the 954 abstracts screened, 74 were eligible for full text review. Of these, we found five randomised controlled trials (RCT) and one health economic analysis of tailored, interactive digital interventions for contraception choice eligible for conclusion. These studies involved 1,651 women randomised to IDI and 1,886 women randomised to comparison arms. The review explored 5 comparators: IDI vs minimal intervention (e.g., waiting list, written information, non-interactive computer packages); IDI vs. active, non-digital interventions (e.g., face-to-face educational sessions); facilitated IDI vs. minimal interventions; studies which compare two or more different designs of digital intervention; health economic analyses.

Although the questionable quality and low number of included studies meant a meta-analysis was not possible, results did demonstrate the potential for IDI as a tool for information and decision making around contraception. One high quality RCT found that an interactive computer module plus a tailored print-out of results significantly increased the uptake of effective methods of contraception - from 64.9% to 75.2% (Garbers *et al.*, 2012).

mHealth interventions for sexual and reproductive health (SRH)

There is also well cited potential for utilising mobile phones and mHealth innovation, which fall within the broader scope of eHealth but specifically utilise mobile technology. While multiple systematic reviews have found limited benefit of one-directional messaging or uni-faceted interventions, the use of interactive, multi-faceted mHealth interventions have been shown to be more impactful (Smith *et al.,* 2015a*;* Free *et al.*, 2013; Haynes *et al.* 2008).

mHealth interventions have been found to improve family planning and contraceptive outcomes, and highlight how mHealth can be used effectively in the broader field of SRH – a useful foundation for this project's aims (Aung *et al.,* 2020; Smith *et al.* 2015a). Interactive text messages improved adherence to the oral contraceptive pill in the USA after 6 months - a finding that was strongest among women who were still receiving messages at the time of their follow up (Castaño *et al.*, 2012). In Cambodia, the MOTIF study explored the potential of using automated, interactive voice messages, followed by counsellor phone support as required, to encourage women's effective use of contraception post-abortion. Those women who used the intervention were found to be significantly more likely to report effective contraceptive use after 4 months, and also significantly more likely to use a long-acting reversible contraceptive (LARC) method at both 4 months and 12 months (Smith *et al,* 2015c). Additionally, post-partum women in Kenya who used a one or two-way messaging service with a nurse were more likely to use contraception after birth, and those who received two-way messages were more likely to use 'highly effective contraceptive' methods (Unger *et al.,* 2018; Harrington *et al.*, 2019a).

Two high-quality randomised controlled trials, also in Kenya, found that text messaging interventions directly improved adherence to anti-retroviral therapy, compared to standard care (Horvath *et al.,* 2012; Lester *et al.*, 2010). One of these interventions, the Well-Tel trial, involved initially sending a simple discrete text message saying 'how are you?' to people living with HIV. If clients reported a problem, healthcare providers would follow up via a personal phone call. This intervention highlights a key potential benefit of mHealth interventions, encouraging privacy and confidentiality, which is of high importance when discussing stigmatised health conditions like sexual health, or working with vulnerable populations (Smith *et al.,* 2015a*;* Lester *et al*., 2010*).* These Kenyan study support findings from a larger systematic review of eHealth interventions for HIV prevention and management across Sub-Saharan Africa, which found significant improvements to HIV management behaviours - including adherence to ART, attendance at pharmacy visits, and linkage with and retention to HIV care (Manby *et al.*, 2022). Although there were no significant improvements to biological outcomes or prevention behaviours, such as condom use, the important finding related to HIV management highlights the potential of eHealth as a low-cost way of improving HIV outcomes, and reducing HIV prevalence in Sub-Saharan Africa (Manby *et al.*, 2022).

A systematic review of randomised controlled trials assessing mHealth interventions in Southern Africa found a largely insignificant impact on healthcare outcomes, but all included studies were seen to confirm the feasibility for mHealth in the region (Ojo, 2018). Additionally, one included RCT found that women seeking early medical abortion who received text messages related to possible side effects reported significantly lower anxiety and emotional distress, were more prepared for symptoms, and 99% of users said they would recommend the intervention to others (Constant, 2014). One interactive mobile phone quiz, where correct answers could win users mobile phone credit, was trialled with secondary school girls in Ghana (Rokicki and Fink, 2017). While this intervention did not have significant impact on pregnancy outcomes, it was effective at increasing knowledge of SRH, and those with higher levels of engagement with the intervention maintained higher knowledge scores up to a year later (Rokicki and Fink, 2017).

In this ever-expanding field, new interventions are being designed, tested, and used at an increasing rate, and more research is needed to ensure effectiveness - particularly evidence on IDI's effectiveness, and the benefits of IDI over more traditional counselling methods. High quality randomised controlled trials measuring clinical outcomes are still needed to create tangible evidence for the impact of mHealth interventions on healthcare services and patient decision making, including family planning. However, this previous research, particularly around mHealth, suggests strong potential for behaviour change and provision of sexual health information via interactive or multi-faceted interventions. This evidence provides a strong foundation for this project, which aims to explicitly explore eHealth's potential for improving access to family planning information within the Botswana context.

1.10 eHealth in low-middle income countries (LMICs)

eHealth's strong potential is seen as a promising investment for many LMICs, with a potential impact on health outcomes (Hall *et al.*, 2014; Clifford, 2016). However, the varied definitions of eHealth described above do not necessarily capture 'eHealth' in resource-limited countries, where access to and use of technology is highly disparate; ICT policy is weak or non-existent; and basic infrastructure, such as water or electricity, may not be guaranteed. Consequently, interventions in LMICs may look much simpler, or utilise older technologies. Applying Western expectations of this field to LMICs is detrimental to understanding their limitations and successes.

Despite the challenges, there has been vast growth in the use of internet-based devices in LMICs. In a 2015 analysis of 21 developing countries, a median of 54% of people from 21 emerging and developing countries owned a smartphone or used the internet at least occasionally - an almost 10% growth in just two years (Pew Research Centre, 2016). Smartphone ownership rates are growing even faster and have now reached 37% - with the vast majority of people in every country owning a mobile device of some description (Pew Research Center, 2016).

A review of eHealth interventions in LMICs highlights the potential impact of these developments, particularly around client-based interventions for education and behaviour change (Hall *et al.*, 2014). A video-based intervention containing contraceptive information in Zambia dramatically improved contraception uptake from 21.5% to 93.6% (Stephenson *et al.*, 2011), while a contraceptive education scheme delivered by SMS in Kenya improved contraception use, especially of condoms and IUDs, and increased attendance at specialist sexual health clinics (Vahdat *et al.*, 2013). TxtAlert, a South African appointment reminder SMS service for people living with HIV using ART, has significantly reduced missed appointments from 30% to 4%, and ‘lost to follow-up’ rates from 27% to 4% (Lemaire, 2011). A qualitative assessment in Malawi found strong user preference for the Baobab touch-screen electronic system over paper - the system is now in daily use for more than 35,000 HIV patients, and one of the only fully electronic point-of-care systems in Africa (Blaya *et al.*, 2010). In a rural district of Ethiopia, an mHealth tool which enabled health extension workers (HEW) to monitor forms and receive client reminders through a centralised server was associated with an increased number of women receiving 4 or more antenatal visits; higher HEW attendance at deliveries; and a reduction in home births, which carry a high maternal mortality risk (Atnafu *et al.*, 2017).

However, a white paper commissioned by Advanced Development for Africa (ADfA) specifically exploring the elements needed for successful scale-up, states that across the continent eHealth is “characterized by a proliferation of unsustainable pilot projects that often expire once initial funding is exhausted” - with 23 examples of failed projects given from just one year in Ethiopia alone (Lemaire, 2011). While some projects are undoubtedly successful, there is very little research, and consequently little data, on cost-effectiveness, efficacy, and measured impact of these eHealth projects; while over 70% of African countries have implemented at least one eHealth initiative, less than 10% of these countries have evaluated them (Shuvo *et al*., 2015).

Even fewer projects explore potential cultural backlash prior to roll-out, as reported in a literature review of factors influencing eHealth implementation in LMICs (Shuvo *et al.*, 2015). Mobile phone access or ownership, for example “is not just a matter of affordability, technical literacy, or network coverage, but is also affected by complex social and cultural factors at the household and community level, including gender” (Shuvo *et al.*, 2015). These societal nuances need to be understood and addressed well in advance of any implementation, and undoubtedly influence success or failure of these projects.

It is also important to consider potential harms associated with eHealth interventions, particularly cultural factors such as patriarchal control over women’s decision making and high levels of intimate partner violence (IPV). In a large randomised controlled trial conducted in Bangladesh, interactive voice messages delivered by a mobile phone (designed to increase long-acting contraceptive method use) was associated with higher levels of intimate-partner violence against women using the intervention (Reiss *et al*., 2019). Women’s access to mobile phones was also problematic in Zambia, where a four-year study found new forms of controlling behaviours by husbands, and the justification of violence by boyfriends through monitoring women's cell phone use (Wakunuma, 2012; Mannell *et al.*, 2019). Privacy, confidentiality, and personal data being shared without consent are common concerns around using mHealth applications, but these elements are even more important to consider in contexts where use of these interventions, or their content, may translate into violence. Conversely, as highlighted earlier in this chapter, adequately considering confidentiality and potential stigma in intervention design has been associated with improved adherence to medication (Lester *et al.,* 2010; Smith *et al*, 2015a).

1.11 Botswana’s potential for eHealth and IDI

Botswana has one of the highest mobile phone uptakes in the world, at 162.6 subscriptions per 100 people - with many people having two sim-cards on different networks (The World Bank, 2019d). In January 2021, there were 1.12 million internet users in the country, representing 47% of the population, and 1 million social media users (DataReportal, 2021). To put this growth into context, in 2010 there were just 120,000 internet users - or 6% of the population (The World Bank, 2019h).

The first Botswanan government commitment to eHealth innovation was in 2004, with a section of the ‘National ICT Policy’ dedicated specifically to eHealth. This report includes recommendations such as, “promoting a foundation for eHealth through health sector engagement and strengthening ICT infrastructure; using ICT to enable healthcare delivery; improving access to health services and information; and creating a national health surveillance network” (UNPAN, 2004). eHealth is referenced again in the Ministry of Health’s 2010 integrated health service plan, which states “it is essential to put in place a system of procurement, deployment and use of information and communication technology that will ensure that a careful balance is established between the need for the technology and the human and financial resource availability” (Ministry of Health, 2010).

However, although eHealth legislation has been ‘in progress’ for over 15 years, Botswana currently does not have a national strategy dedicated to eHealth, frequently cited as a concern for specialists in the field and causing a lack of unified direction (Ncube *et al.*, 2020; Chavez *et al.*, 2016; Mauco, 2014). Additionally, “the traditional landline and non-robust Information Technology (IT) network infrastructure characterized by slow bandwidth still dominates the health care system in Botswana” and upgrading it to meet today’s health care demands is a “tedious, long, and expensive process” (Ndlovu *et al*., 2014). In public healthcare facilities, it is not uncommon for computers to be unusable and virus-ridden, and internet access in these institutions is lower than the national average in terms of reliability and strength (Chavez, 2016).

The high number of individual mobile devices, coupled with the general growth in Botswana’s telemedicine industry, inspired a collaboration between the University of

Botswana and the University of Pennsylvania (Botswana-UPenn) which worked with local partners to explore the potential of mHealth. Pilot studies were conducted across four medical specialties, including radiology, oral medicine, dermatology, and cervical cancer screening. Findings led to the first scale-up project of a mobile telemedicine solution in Botswana, 'Kgonafalo'. The pilot studies experienced some social and infrastructure challenges, including "malfunctioning of mobile devices, accidental damage of devices, and cultural misalignment between IT and healthcare providers" (Ndlovu *et al.*, 2014). Despite these, the project was deemed highly successful: Kgonafalo obtained substantial support from multiple key stakeholders, project management was efficient and, if continued, could reduce unnecessary costs associated with referrals and improve patient outcomes (Ndlovu *et al.*, 2014).

In 2014, Botswana's readiness for eHealth more broadly was explored through dedicated research at the University of Botswana. An eHealth-readiness assessment tool was developed, in line with the Australian government's approach, containing 19 questions from across three domains - infrastructural readiness, aptitudinal, and attitudinal readiness (Mauco, 2014). This was then tested on 87 healthcare workers from across two institutions in Gaborone. Participants showed "a high level of eHealth attitudinal readiness but low levels of eHealth awareness… despite a government that has fully embraced eHealth" (Mauco, 2014). Mauco explains that this is related to the shortage of qualified eHealth experts able to carry out training, and that "it will take considerable time to adequately and appropriately 'train' healthcare workers", which should be focused on before embarking on large scale implementation of eHealth initiatives (Mauco, 2014).

Despite these challenges, there are a growing number of eHealth interventions being utilised in the country. Most of these are led by the dedicated eHealth Unit at the University of Botswana (UB), as well as private organisations such as the Botswana Innovation Hub and Botswana's Institute for Technology Research and Innovation. Some of the earliest examples include Television white space, which utilises unused TV channels to circulate healthcare information (Chavez, 2016) ; HIV/AIDS FAQ Retrieval, where an iterative system provides answers to HIV/AIDS related queries, sent by users through short text messages on low-end mobile phones (Thuma *et al*, 2014); and Peek Vision, a simple mobile phone application, operated by teachers or non-health specialists, which Botswana is utilising in its first national eye testing program for children (Peek Vision, 2021).

While these interventions are all subject to the common problems of continuity related to financing and infrastructure reliability, they have had measurable impact on healthcare outcomes. They also represent some key considerations for eHealth design; the importance of cultural understanding; realism about what is currently feasible; utilising existing and appropriate resources, such as Botswana's strong mobile phone network; addressing relevant and 'acceptable' healthcare issues; and understanding the importance of both stakeholder and user buy-in.

1.12 Project rationale

Despite strong government commitment to contraceptive promotion and a widespread national family planning programme, there is strong evidence of unmet need for family planning in Botswana, and high rates of unintended pregnancy leading to illegal abortions (Karabo, 2020; Doherty *et al.*, 2018; UNFPA, 2016; Ngwako and Banke-Thomas, 2020; UNFPA, 2021). Though there has been a dramatic reduction in fertility rates, and increased contraceptive access, over the past decade, these improvements have not been experienced by women universally. Adolescents, unmarried women, women with lower educational level, those living in rural areas, and HIV positive women continue to experience high rates of unplanned pregnancy, and are less likely to use contraception; only 50% of Batswana women are using family planning, and there is very low use of effective long-acting reversible contraceptives (LARC) despite their strong promotion (UNFPA, 2021; Karabo, 2020; UN, 2019; Doherty *et al.*, 2018; UN, 2015; Statistics Botswana, 2017).

The desire for improved access to information around family planning, or ability to make informed choices over personal sexual healthcare decisions, cannot be measured by fertility rates or whether contraceptive methods are available in clinics; the ongoing challenges for provision and uptake of contraceptives, and the reasons for use or non-use of specific contraceptive methods, need to be better researched. This depth of understanding is essential for making tailored, culturally appropriate suggestions around improving women's choice over their reproductive health. Additionally, as it is a relatively new field, there is little research into Botswana's flourishing eHealth climate, and none exploring the potential for eHealth innovation in the field of family planning. Research into the specific infrastructural and cultural considerations for Batswana-based interventions will enable more targeted and feasible recommendations around intervention design and implementation, and consequently more useful interventions for potential users.

Before any specific intervention is designed and implemented, it is essential to explore the need for it from the perspectives of Batswana women and healthcare providers, who understand the social, physical, and technological limitations it may face and, as potential users, can guide the design and content to be both useful and socially acceptable. It is also important to understand how to introduce eHealth innovation in a culturally appropriate and physically feasible way, to ensure sustainability and success.

This project aims to contribute new findings to the literature on current experiences and barriers around provision and use of family planning, and the potential for eHealth innovation in Botswana. The implications of these findings will also influence the design, content, and implementation of an eHealth intervention in family planning, as well as suggestions for both further research and policy in this area. There is a well-entrenched, strong national programme for promoting contraceptive access in Botswana, as well as high mobile phone uptake and a growing eHealth climate. Although both areas face challenges, their strengths put Botswana in a unique position for exploring the potential of eHealth innovation in the field of SRH, as well as the future design and dissemination of a specific intervention.

Chapter 2: Factors influencing choice, uptake and use of contraception in Botswana: a narrative review

2.1 Chapter overview

This chapter describes the search strategy; characteristics of included studies; process of thematic analysis; and the findings from a narrative synthesis of factors influencing choice, uptake and use of contraception in Botswana.

The review explores the barriers and facilitators to contraception choice, uptake and use in Botswana, as well as the influencers of contraceptive decision-making, and sources of contraceptive information in Botswana. It also explores the influence of HIV on contraception choice, uptake, and use according to previous literature.

After summarising the implications of findings for practice, policy, and future research, this chapter also describes how key conclusions informed the qualitative research that was undertaken in this project.

2.2 Narrative review summary

Background

As many as 50% of pregnancies in Botswana are unintended, with HIV positive women much more likely to report their pregnancy unplanned. However, despite the relatively broad range of contraceptives available, and high risk of unsafe abortion, only 56% of women in the country are currently using contraception. This review aims to explore the web of social, cultural, and financial factors that contribute to Batswana women's experiences around family planning - and their choice, uptake and use of contraception - through a systematic synthesis of qualitative, quantitative, and mixed-method studies from the past decade.

Aims

This review addressed the research question "What are the factors influencing choice, uptake and use of contraception in Botswana?" through the following objectives:

1. Determine the barriers and facilitators to contraception choice, uptake and use in Botswana
2. Assess the influencers of contraceptive decision-making, and sources of contraceptive information in Botswana
3. Explore the role of HIV in contraception choice, uptake, and effective use in Botswana

Methods

I systematically searched twelve databases for studies which address the factors influencing choice, uptake and use of contraception in Botswana, limited to those published in English from 2008 to 2019. Qualitative studies were assessed using the Critical Appraisal skills Programme tool (CASP), and quantitative studies were assessed using Centre for Evidence Based Management (CEBM) tools, though no studies were excluded based on quality. I extracted data using NVivo software and conducted a thematic analysis to combine main findings across all studies and presented findings using a narrative synthesis.

Inclusion criteria

- Studies which address the factors influencing choice, uptake and use of contraception in Botswana
- Studies published between 2008 and 2019 (inclusive)
- Qualitative, quantitative, and mixed-method studies

Exclusion criteria

- Studies focusing exclusively on physiology/pathology of the reproductive health system
- Studies exploring condom use with no reference to family planning outcomes

Findings

31 studies were eligible for this review, including 24 quantitative studies, four mixed-method studies and 3 exclusively qualitative studies. Findings fell into six broad areas: factors related to individual characteristics; factors related to individuals' social networks; sociocultural factors; factors related to contraceptive methods; factors related to healthcare services and personnel; factors related to HIV and STIs.

Socio-cultural factors are the largest influence on women's choice, use and uptake of family planning, specifically societal attitudes towards gender and male autonomy over sexual intercourse. Communication about sex and family planning is often difficult, with partners, parents, and friends. The male condom is the most popular and commonly used method of contraception, though women often feel unable to negotiate condom use due to male control over sexual health decisions, and unprotected sex associated with 'trust' in a relationship. Hormonal, long-acting contraceptive use is low, and there is limited research specifically exploring women's attitudes towards these methods.

Healthcare providers feel underconfident in contraceptive provision, specifically IUCD and contraceptive implant, and require further training. Some providers can also be biased in their counselling, particularly towards adolescents, and act as a barrier to women's use of contraception or seeking healthcare. There is concern that increased access to anti-retroviral treatment, and a reduced fear about contracting HIV, has led to increased risky sexual behaviour. Many HIV positive women expressed feeling stigmatised due to their status by providers, society and within their social networks.

Conclusion

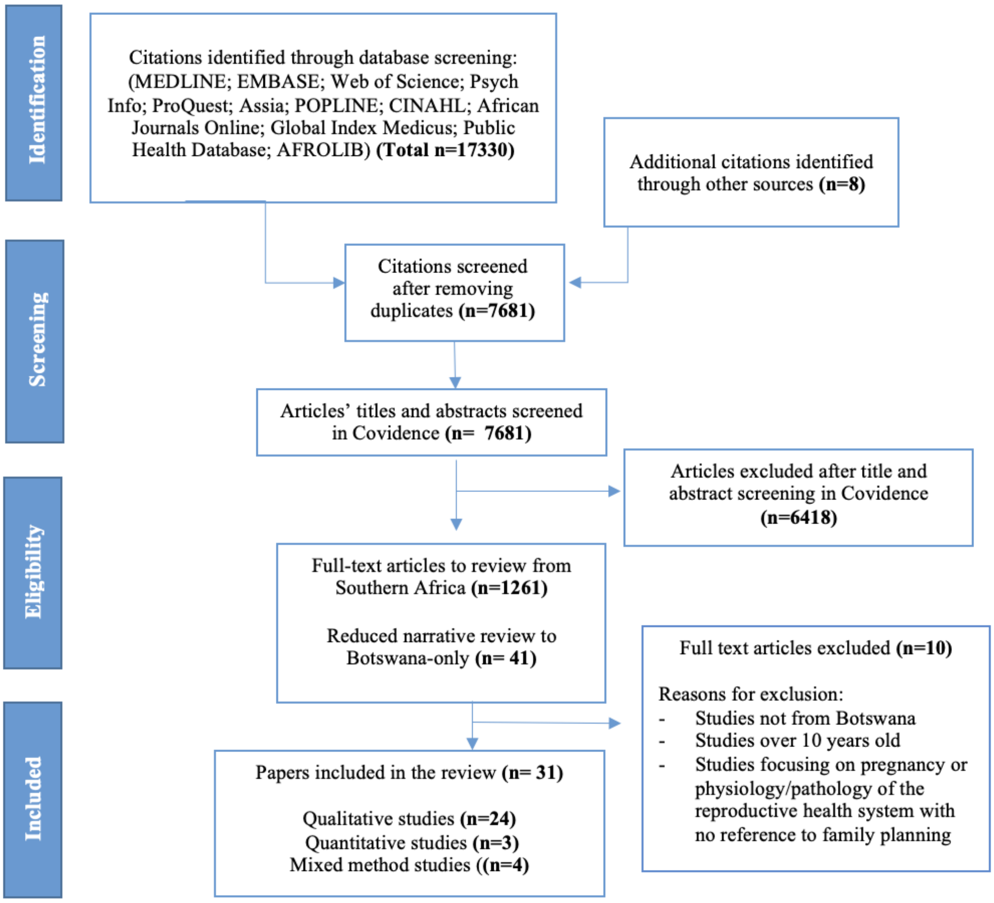
The factors influencing contraceptive choice, uptake and use in Botswana are highly dependent on an individual's demographic characteristics and social networks, which are exacerbated by cultural attitudes towards womanhood, gender, and sex. There is a need for further, qualitative, research into how these various factors coalesce in women's lives, and the extent to which they influence sexual health decision-making and use of contraception.

2.3 Narrative review method

Search strategy

I systematically searched twelve electronic databases for any studies which address the factors influencing choice, uptake and use of contraception in Botswana (See Appendix 2A for Medline search terms). Titles, abstracts, and full texts were screened for eligibility by a second reviewer (AG) using Covidence software. While the initial search included broader geographical terms related to Southern Africa, after abstract-screening the review was subsequently limited to include studies related to Botswana specifically, due to an unexpectedly large number of eligible studies. This search was then manually updated in January 2019, limiting to studies published in English from 2008 to date. With these limitations applied, 31 studies were deemed eligible for inclusion.

Figure 2.1 PRISMA flow diagram of narrative review process



Data extraction and quality assessment

I then used a standardised data extraction form to extract data on respondent characteristics, study design, aims, data collection methods, methods of data analysis and main outcomes for these included studies. I assessed the quality of all included studies, and screened for risk of bias, but no studies were excluded based on quality. We assessed qualitative studies using the Critical Appraisal skills Programme tool (CASP), exploring the appropriateness of methodology, recruitment, data collection and study findings/conclusions (Critical Appraisal Skills Programme, 2017). I assessed quantitative studies using Centre for Evidence Based Management (CEBM) tools, exploring the representativeness of sample chosen, validity of data collection, and both the significance, and generalisability, of findings (Centre for Evidence-Based Medicine, 2014).

2.4 Data synthesis

I used thematic analysis to synthesise both quantitative and qualitative studies. Thematic analysis can be "used to identify systematically the main, recurrent and/or most important (based on the review question) themes and/or concepts across multiple studies" (Popay *et al.*, 2006). It is also a means of organising and summarising the findings from large, diverse bodies of research, making it appropriate for this review, which includes qualitative, quantitative, and mixed-method studies.

I used the four elements described by Popay *et al* as the structure for the review process. The first element, "Developing a theory of change" usually occurs before synthesis proper begins. While I did not apply a formal framework prior to data extraction, I did anticipate the following broad groupings in advance of synthesis: factors related to specific contraceptive methods; factors related to healthcare services and personnel; social or cultural factors; and factors related to the individual and their immediate networks, including partner, family, friends.

The second element, "Developing a preliminary synthesis" involved summarising the main findings to organise data and conceptualise it thematically. I tabulated the key features from all studies, including respondents, setting, study design, and methods. I then used NVivo to code all included studies, both qualitative and quantitative, determining main findings through a detailed analysis of each text. As described by Gough et al, “The aim is to associate all relevant text with one or more themes or codes and, where no pre-existing theme exists to encapsulate the meaning of the text, a new code is created.” (Gough *et al.*, 2017).

The third element, “exploring relationships” involves rigorous and thoughtful comparison between studies. As patterns began to emerge from coding the studies individually, I reflected with supervisors and the co-authorship team, to determine broader themes that incorporated our specific findings. I used a combination of deductive and inductive analytic process; while I did anticipate certain groupings prior to analysis, our themes were predominantly derived from our findings.

The fourth element, “assessing robustness of the synthesis” was ensured by consistent, in-depth discussion with supervisors and other members of the co-authorship team throughout the process of analysis, where I reflected on issues of study quality, accuracy of analysis and any discrepancies or uncertainties that emerged. I then summarised our findings using a narrative synthesis.

2.5 Included studies

2.5.1 Characteristics of included studies

Of the 31 studies included in this review, 24 were quantitative, with the majority using either primary or secondary data, collected through cross-sectional questionnaires. Four studies used mixed methods, with surveys containing both closed and open questions, and three studies utilised exclusively qualitative methods – collecting data through focus groups or individual interviews.

13 studies included only women, with two of these studies recruiting HIV positive women specifically, and one study included men only. Ages of participants across all studies ranged from 14 to 90, though the majority of participants fell below the age of 50 – only two studies recruited women aged 50 and above. Studies had differing terms of ‘youth’, but 9 studies only recruited participants who were under the age of 29. Within this category, seven studies

included students only: two recruited secondary school students, and five recruited university students, with three specifying undergraduates. Four studies solely recruited healthcare workers, either nurses or doctors.

Nine studies recruited ‘nationwide’, which I defined as data being collected in more than four districts. The majority of the remaining studies took place in urban or semi-urban areas; 11 studies recruited from sites in Gaborone specifically, with seven of these also recruiting from nearby peri-urban areas: Moghodisane, Mochudi, and Kanye. Additionally, two studies exclusively recruited from Mahalpye, and one study recruited from Jwaneng - both peri-urban areas. Only two studies specifically mentioned recruiting from rural sites - Selibe Phikwe and Barolong.

11 studies recruited from a range of clinical settings, including: public hospitals; sexual and reproductive health clinics; antenatal clinics and maternity wards; family planning services; anti-retroviral therapy (ART) clinics and infectious disease care clinics (IDCCs). 5 studies recruited from universities, including the University of Botswana, Boitekanelo College and Botho University, and two studies recruited from multiple secondary schools.

See Appendix 2B for a summary table of characteristics for all included studies.

2.5.2 Assessment of study quality

I individually assessed studies for quality using two sets of criteria; Qualitative studies were assessed using the Critical Appraisal skills Programme tool (CASP), exploring the appropriateness of methodology, recruitment, data collection and study findings/conclusions. Quantitative studies were assessed using Centre for Evidence Based Management (CEBM) tools, exploring the representativeness of sample chosen, validity of data collection, and both the significance, and generalisability, of findings.

Quantitative studies

27 studies were assessed using the CEMB tool. Most studies had clearly identified research aims, and utilised appropriate methodology for answering them. All but one study recruited

participants who were representative of the population that their findings were applied to, and the statistical significance of findings was assessed and described in all but one study. However, there was a lack of clarity across many studies in two key areas; 15 did not clearly describe how the validity and reliability of their questionnaires was assessed, and over half did not state whether sample size was based on pre-study considerations of statistical power. Additionally, most studies did not provide confidence intervals for their main findings, and 18 studies were at risk for confounding factors that had not been accounted for. Generally, quality was moderate. Only one study scored highly across all criteria, and the majority were 'unclear' or scored negatively on as many as nine of the 12 questions.

Qualitative studies

Four studies were assessed using the CASP tool. Three studies used qualitative data exclusively, and one study used mixed methods; I assessed the quantitative and qualitative aspects separately. Overall, qualitative data was high quality. All studies were valuable; clearly identified research aims; used an appropriate study design; rigorously analysed data and clearly described key findings. However, each study fell short on one criterion. One did not clearly describe how the relationship between participant and researcher had been considered, while another did not adequately explain how ethical issues had been accounted for. Data-collection was found to be a problematic area in one study on condom use among adolescents; researchers only recruited patients with urogenital complaints, often caused by STIs, after they had finished their consultation and received a diagnosis - which could have biased their perceptions.

See Appendix 2C for a summary of quality assessment, and Appendix 2D for more detailed comments on individual quality assessment and risk of bias for each included study.

2.6 Findings

Contraception uptake and use in Botswana is influenced by a combination of demographic factors, such as education level, urban or rural upbringing and family finances; partner control and acceptance of family planning; socio-cultural attitudes towards women – namely their perceived inferiority in sexual decision making and intertwined perceptions of motherhood and womanhood; and overworked healthcare providers feeling the pressures of a stretched, under-resourced healthcare infrastructure.

Findings correlated to six broad areas:

1. Factors related to individual characteristics
2. Factors related to individuals’ social networks
3. Sociocultural factors
4. Factors related to contraceptive methods
5. Factors related to healthcare services and personnel
6. Factors related to HIV and STIs.

Some of these themes were inspired by Dahlgren and Whitehead’s ‘rainbow model’ for the social determinants of health, which has similar categorisation of individual, social and environmental factors (Dahlgren and Whitehead, 2007).

Please see Table 2.1 Below for details of how the included studies correlate to these themes.

Table 2.1: Mapping thematic structure to included studies

Theme	***Included studies***
Factors related to individual characteristics	*Agyei and Abrefa-Gyan, 2016* *Ama and Ngoma, 2014* *Ama and Olaomi, 2018* *Bainame et al., 2016* *Doherty et al., 2018* *Faimau et al., 2016* *Keetile, 2014* *Kanda and Mash, 2018* *Kgosiemang and Blitz, 2018* *Kraft et al., 2009* *Langeni, 2011* *Lama et al., 2015* *Letamo and Navaneetham, 2015.* *Letamo et al., 2017* *Letshwenyo-Maruatona and Gabaitri, 2018* *Mashanda-Tafaune and Monareng, 2015*

	Mayondi et al., 2016 *Mogobe and Tshiamo, 2017* *Nair and Navaneetham, 2015* *Nkosana and Nkosana, 2017* *Ray and Sinha, 2012* *Schaan et al., 2014* *Schaan et al., 2016* *Tshitenge et al., 2018*
Factors related to individuals' social networks	*Ama and Ngome, 2014* *Bainame et al., 2016* *Doherty et al., 2018* *Faimau et al., 2016* *Kanda and Mash, 2018* *Kgosiemang and Blitz, 2018* *Kraft et al., 2009* *Langeni, 2011* *Letshwenyo-Maruatona and Gabaitri, 2018* *Letamo and Navaneetham, 2015* *Nair and Navaneetham, 2015* *Nkosana and Nkosana, 2017* *Ray and Sinha, 2012* *Schaan et al., 2014* *Schaan et al., 2016*
Sociocultural factors	*Agyei and Abrefa-Gyan, 2016* *Ama and Ngome, 2014* *Faimau et al., 2016* *Letamo and Navaneetham, 2015* *Letshwenyo-Maruatona and Gabaitri, 2018* *Malinga-Musamba and Ntshwarang, 2014* *Nkosana and Nkosana, 2017* *Schaan et al., 2014* *Schaan et al., 2016*
Factors related to contraceptive methods	*Ama and Ngome, 2014* *Ama and Olaomi, 2018* *Doherty et al., 2018* *Faimau et al., 2016* *Hoque et al., 2012*

	Hoque et al., 2013 *Kanda and Mash, 2018* *Kgosiemang and Blitz, 2018* *Kraft et al., 2009* *Lama et al., 2015* *Letamo and Navaneetham, 2015* *Mashanda-Tafaune and Monareng, 2015* *Mayondi et al., 2016* *Mokgetse, 2018* *Nair and Navaneetham, 2015* *Nkosana and Nkosana, 2017* *Schaan et al., 2014* *Tshitenge et al., 2018*
Factors related to healthcare services and personnel	*Ama and Ngome, 2014* *Hoque et al., 2013* *Kanda and Mash, 2018* *Lesedi et al., 2011* *Letshwenyo-Maruatona and Gabaitri, 2018* *Mashanda-Tafaune and Monareng, 2015* *Mokgetse, 2018* *Oucho and Ama, 2009* *Schaan et al., 2012* *Schaan et al., 2016* *Tshitenge et al., 2018*
Factors related to HIV/STIs	*Agyei and Abrefa-Gyan, 2016* *Doherty et al., 2018* *Faimau et al., 2016* *Kanda and Mash, 2018* *Keetile, 2014* *Kraft et al., 2009* *Ray and Sinha, 2012* *Lama et al., 2015* *Letamo et al., 2017* *Letshwenyo-Maruatona and Gabaitri, 2018* *Mayondi et al., 2016* *Nkosana and Nkosana, 2017* *Schaan et al., 2014* *Schaan et al., 2016*

2.6.1 Factors related to individual characteristics

Demographic elements of an individuals' specific circumstances are highly influential over contraceptive use or non-use – particularly geographic location, education level and wealth or financial status. Though these factors have some impact individually, their influence is higher when combined.

Age

The influence of age on family planning was difficult to compare across most studies.

Younger women were found to be more likely to use modern contraceptives, but also more likely to report inconsistent condom use (Nair and Navaneetham, 2015; Keetile, 2014). When exploring dual-use of contraception, the majority of younger adults used condoms-only, as opposed to a modern contraceptive method or dual-protection (Kraft *et al.*, 2009). These findings were only slightly contradicted by one further study, exploring HIV specifically, which found that older respondents were less likely to use condoms than their younger counterparts (Ray and Sinha, 2012).

Those in higher years of study were significantly more likely to have used emergency contraception than younger students (Kgosiemang and Blitz, 2018). The younger generation's attitude to sexual pleasure, multiple partners, and desire to 'experience life without lack of restrictions' is a major obstacle to use of condoms (Kanda and Mash, 2018).

Younger men were found to communicate less with their partners about SRH, including family planning, than those who were middle-aged (Letshwenyo-Maruatona and Gabaitri, 2018). Women however felt that 'times were changing' and that couples were discussing their sex lives much more frequently (Schaan *et al.*, 2016).

Age, educational status, marital status, and employment were found to jointly, significantly, predict the use of family planning methods for older women (Ama and Olaomi, 2018). Women over the age of 35 were significantly less likely to plan a pregnancy, and had a higher unmet need for contraception (Schaan *et al.*, 2014; Letamo and Navaneetham, 2015).

Unintended pregnancy, however, appears to decrease with age, and is highest among women aged 18-24 (Mayondi *et al.*, 2016; Doherty *et al.*, 2018).

Education

Education is one of the largest influencers of family planning - namely the positive relationship between being adequately educated in SRH issues, and higher, more effective use of contraception.

Students with the correct information about STIs were significantly less likely to engage in risky sexual behaviour, including increased condom use (Agyei and Abrefa-Gyan, 2016). Individuals with primary-level sex education were more likely to have used a contraceptive method during their first sexual encounter than those with no sex education, particularly males, and higher education use was associated with increased likelihood of condom use with individuals' most recent sexual partners (Agyei and Abrefa-Gyan, 2016; Bainame *et al.*, 2016; Keetile, 2014).

Individuals with at least a secondary level education were found to be marginally more likely to use condoms, and had greater knowledge of HIV with much lower prevalence rates (Ray and Sinha, 2012). Later sexual initiation was associated with earlier sex education (Bainame *et al.*, 2016). Those with a primary education, rather than secondary or tertiary education, reported lower use of either effective contraceptive methods, and less consistent condom use (Keetile, 2014; Kraft *et al.*, 2009; Lama *et al.*, 2015). The influence of education on family planning use goes further than the individual, and individuals with university-educated parents also reported higher levels of condom use (Agyei and Abrefa-Gyan, 2016).

Level of education directly influences perceptions on the use of female condoms, and higher educated women were found to be about 50% more likely to use modern contraceptive methods (Mashanda-Tafaune and Monareng, 2015; Nair and Navaneetham, 2015). Multiple studies also found lower education levels to be a significant factor associated with unintended pregnancy (Mayondi *et al.*, 2016; Letamo and Navaneetham, 2015; Mogobe and Tshiamo, 2017). Older women cited lack of education and the prioritisation given to educating boys rather than girls as direct barriers to their use of family planning services (Ama and Olaomi, 2018). Illiteracy, leading to inadequate sexual health knowledge, was also a barrier, where women were unable to read or understand written material related to SRH services, and consequently more likely to rely on natural family planning methods (Ama and Ngoma, 2014).

Only one study contradicted the correlation between higher education and improved contraception use, and found those with no schooling or primary education were more likely to use family planning than those with a secondary or tertiary education (Ama and Olaomi, 2018).

Employment status and finances

Employment status was directly linked to sexual health and family planning outcomes.

Unemployed women were significantly more prone to unplanned pregnancies (Mayondi *et al.*, 2016; Mogobe and Tshiamo, 2017). Older women who are unemployed but seeking employment were much more likely to use family planning than housewives, while those in employment, retired or unemployed and not seeking employment were less likely (Ama and Olaomi, 2018). Lack of money was cited as a major obstacle to accessing sexual reproductive health (SRH) services, including family planning (Ama and Olaomi, 2018).

Financial inequality was cited as problematic for family planning use. High unemployment rate was linked to women being more dependent on others for a living, and consequently reducing their chance of using the female condom due to low bargaining powers (Mogobe and Tshiamo, 2017). Material gain was reported as the main motivation behind relationships with older men by over 500 girls, and over half expressed feeling pressured to date older men who can give them gifts (Nkosana and Nkosana, 2017). Women who felt less financially empowered compared to men saw their relationship as a way of obtaining money, which led them to older, richer partners and consequently less likely to negotiate condom use (Kanda and Mash, 2018). One male pharmacy assistant described women as ‘financially dependent’ on men, while a male sales assistant added:

> *"It's very hard for them to resist to that because they look up to those luxurious stuffs like cell phones, money and all that. Therefore, it is very hard for them to resist doing unprotected sex when they do not want to"* (Kanda and Mash, 2018).

Financial inequality, causing imbalanced power-dynamics and ability to negotiate use of male condoms, highlighted the need for better promotion of female condoms, particularly in cases of prostitution (Kanda and Mash, 2018).

Many students agreed with the statement that 'giving money or a gift after sex is a sign of appreciation' and disagreed with the statements 'giving money or gifts after sex is buying the relationship' and 'receiving money or gifts after sex is a form of prostitution' (Faimau *et al.*, 2016). Some students reported having sex in exchange for gifts or having sex by giving or receiving money (Hoque *et al.*, 2012). Respondents who reported receiving/exchanging gifts or money for sex within the past 12 months were much more likely to also report multiple sexual partners (Keetile, 2014).

Improved wealth was found to improve access to and use of family planning. Women in the top wealth quintile had the lowest unmet need for family planning, while women from the richest quintile had the lowest unmet need for family planning, and were 2.24 times more likely to be using modern contraceptives (Letamo and Navaneetham, 2015; Nair and Navaneetham, 2015). Wealth also had the strongest effect on condom usage, HIV awareness and prevalence, where wealthier individuals were statistically more likely to use condoms and be less exposed to HIV infection (Ray and Sinha, 2012).

Marital and relationship status

The influence of marital or relationship status on family planning appears to be determined by the individuals within the relationship, rather than the relationship status itself.

Those who are either married or cohabiting were almost twice as likely to accept contraception, reported less inconsistent condom use and were 83% less likely to have multiple sexual partners, compared to those who have never been married, (Nair and Navaneetham, 2015; Keetile, 2014). Married men also communicated more frequently than those who were single or in a relationship (Letshwenyo-Maruatona and Gabaitri, 2018).

There is a statistically significant link between being married and higher rates of female condom knowledge and use (Mashanda-Tafaune and Monareng, 2015).

Married couples or those living together are less likely to use condoms – though ‘living together’ includes same-sex couples, and married couples were more aware of their partners’ HIV status so less likely to use protection (Ray and Sinha, 2012). Married or cohabiting individuals were much less likely to use any contraception at all, reporting neither effective contraception use nor consistent use of condoms (Kraft *et al.*, 2009). Married or cohabiting women were also significantly less likely to have used condoms at last sex, and more likely to use hormonal or long-acting methods only, rather than condoms or dual protection (Lama *et al.*, 2015; Kraft *et al.*, 2009).

Early marriage was identified as a social barrier to older women’s access to sexual reproductive health services, including family planning (Ama and Ngome, 2014). Those who were single/cohabiting, married, or divorced/separated are respectively 4.7, 3.9 and 3.6 times more likely to use family planning services than those who are widowed (Ama and Olaomi, 2018).

Women with unintended pregnancies were significantly more likely to be single or never been married, followed by those cohabiting with their partner, and lowest among married women (Doherty *et al.*, 2018; Mogobe and Tshiamo, 2017).

Religion

Although there is a relationship between religious attitudes and family planning, the impact of religious belief varies across specific populations and generations, and is hard to generalise due to its highly personal interpretation.

Women cited ‘religious reasons’ as their reason for not using emergency contraception (Kgosiemang and Blitz, 2018). There was also a significant association between religious affiliation and agreeing with the following statements: ‘Asking my partner to use condoms is not trusting him’; ‘It is useless to use condoms with my regular partner’; and ‘It is not necessary to use condoms if I trust my partner’, as well as, ‘It is a good thing for men to always carry a condom' and 'I could say no if someone pressured me to have sex when I did not want to' (Faimau *et al.*, 2016).

Over 200 students described themselves as 'deeply religious', acknowledged that these beliefs influenced decision-making in their sexual lives, and indicated that their religion did not allow sex before marriage (Faimau *et al.*, 2016). However, most of these students had also engaged in potentially risky behaviour before marriage, describing a 'clear mismatch between perceived socio-religious norms and sexual risky behaviour' (Faimau *et al*, 2016). Healthcare providers described adolescents' more casual attitudes to sex as 'unchristian', suggesting a chasm between religion and its influence on sexual activity in reality (Tshitenge *et al.*, 2018; Faimau *et al.*, 2016).

A direct correlation between religious affiliation and increased risky sexual behaviour was found in multiple studies (Keetile, 2014; Faimau *et al.*, 2016; Mogobe and Tshiamo, 2017). Christian respondents reported inconsistent condom use more than those from other religions or with no religion, more commonly reported having multiple partners, and were much less likely to be able to negotiate sex (Keetile, 2014; Faimau, 2016). Additionally, the majority of women who reported their pregnancy unplanned were Christian – although as most Batswana identify as Christian this may reduce the impact of this finding (Mogobe and Tshiamo, 2017).

Conversely, one study found that unmet need for family planning was lowest among Christians, and 'being non-Christian' increased likelihood of unmet need (Letamo and Navaneetham, 2015). Modern contraceptive use was also marginally higher among Christian women, compared to those who identified as 'other', but not significantly (Nair and Navaneetham, 2015).

Geographical location

The disparity between urban and rural areas is highly influential, with lower unmet need for family planning, stronger knowledge and uptake of multiple methods, and more consistent use of condoms found in urban areas, compared to rural.

The location where someone grew up was significantly correlated with condom use, with those who lived in cities or urban areas using condoms more than those who lived in towns, rural villages, and cattle posts/land (Agyei and Abrefa-Gyan, 2016; Keetile, 2014). Residents of cities and towns were also more likely to have used some form of contraception during their first sexual encounter, compared to rural areas (Bainame *et al*., 2016).

Students from urban areas had statistically better knowledge of, and more positive attitudes towards, emergency contraception than those from rural areas (Kgosiemang and Blitz, 2018). Lower levels of knowledge about contraception and HIV in rural areas was found to be directly related to increased risky sexual behaviour (Ray and Sinha, 2012).

Those living in rural areas were also half as likely to use dual protection as those living in cities and towns, and reported neither effective modern contraceptive use nor consistent condom use - a much higher proportion than their urban counterparts (Kraft *et al*., 2009).

Prevalence of unmet need for family planning and unplanned pregnancy were found to be higher among rural respondents compared with urban residents (Mogobe and Tshiamo, 2017; Letamo and Navaneetham, 2015). In a national survey of over 160,000 women, 35.37% of women reporting their pregnancy as unplanned were living in urban villages or rural areas, compared to 8% of women living in cities and towns (Mogobe and Tshiamo, 2017).

Conversely, one study found that place of residence is not a significant indicator for use of modern contraceptives, with results evenly spread across both urban and rural areas (Nair and Navaneetham, 2015).

Pregnancy, childbirth, and family dynamics

Factors related to an individual's household dynamics, namely number of children and previous births, were found across multiple studies.

Women reporting their pregnancy unintended were more likely to have had a higher number of previous pregnancies and births, and have a larger household (Mayondi *et al*., 2016; Doherty *et al*., 2018). The highest need for unmet need for family planning was among married women with a parity of 5 or more (Letamo and Navaneetham, 2015). Unintended pregnancy was also less likely among women who had experienced the death of their child before the age of 5 (Mayondi *et al.*, 2016).

People with no children were more likely to consistently use condoms every time they had sex (Kraft et al., 2009). Those with three or more children reported neither effective contraception use nor consistent condom use, and having started a family at all was negatively associated with dual contraception use (Kraft *et al.*, 2009).

Men with children communicated more about SRH and family planning than those with no children, with the number of children significantly associated with the frequency of this communication (Letshwenyo-Maruatona and Gabaitri, 2018). Men who lived with their children more reported significantly more SRH communication than those living apart (Letshwenyo-Maruatona and Gabaitri, 2018).

Use of alcohol or drugs

The use alcohol or drugs was predominately linked with negative family planning outcomes.

Desire to use a condom, remembering to use a condom and ability to correctly use a condom during sex after alcohol use worsened among those with high alcohol consumption (Lama *et al.*, 2015). These individuals were also significantly more likely to have had three or more sexual partners within the last year, to have met sexual partners at drinking venues, and more likely to be in concurrent relationships (Lama *et al.*, 2015). The odds of condom use during last sexual encounter were significantly lower among men who believed that alcohol did not increase risky sexual behaviour, and 83% lower among females with high alcohol scores in the Alcohol Use Disorders Identification Test (AUDIT) (Lama *et al.*, 2015).

Alcohol and illicit drug use make youth vulnerable to unprotected sex, and if one partner was drunk, condoms were either not used correctly, or at all (Kanda and Mash, 2018). As one female adolescent explicitly states:

> *"Yes, alcohol abuse and drugs can lead you to doing sex without condoms because you will be drunk"* (Kanda and Mash, 2018).

Individuals who had ever had alcohol or used drugs were almost twice as likely to report inconsistent condom use – though the effect of alcohol and drugs did diminish when other control variables were included (Keetile, 2014).

20% of male respondents reported to have a condom on them at the time of their interview, and these individuals had higher odds of using a condom during last sex after drinking alcohol (Lama *et al.*, 2015). Female condoms were suggested as a solution for cases where the male is drunk (Kanda and Mash, 2018).

Summary of factors related to individual characteristics

Demographic factors have a large impact on family planning outcomes - particularly wealth, education, and geographical location. Most factors fall outside an individual's control, and in many cases, are decided before they are born - such as their parents education level, or where they grow-up. Even though a large majority of Batswana citizens identify as Christian, there is a wide spectrum of ways that individuals interpret and act upon their faith, making it hard to decipher the influence of religion outside of other factors.

There is noticeable disparity between rural and urban areas regarding family planning and contraception use. Additionally, education level is a key influence on contraception uptake, with use of family planning appearing to increase with education level – of women, their partners, and even their parents. Access to sex education also seems to be associated with increased age of first sex, and contraception use at first sex. If those with higher education are likely to have better employment prospects, it is unsurprising that improved wealth due to employment status appears to be associated with increased control over family planning, and a reduction in unplanned pregnancy.

Most importantly, these demographic factors co-exist and exacerbate the influence of each other. Studies tended to focus on one demographic area independently, rather than exploring their joint influence, despite the inability to separate some of these elements. For example, better education is linked to improved employment prospects, with both more likely in urban areas. A woman living in a rural area, with poor education and consequently reduced job prospects, is far less likely to effectively use contraception, compared to a university educated woman with a professional career working in the central Gaborone. Consequently, this group of factors, when considered together as co-existing demographic elements, is arguably the most influential on women's use of family planning. While these more demographic factors have an impact on family planning uptake and use individually (particularly wealth, education, and geographical location) their influence is even greater when combined.

2.6.2 Factors related to individuals' social networks

The attitude of partners is the largest influence over women's decision making around contraception, and their sexual health more broadly. Conversations with partners, friends and particularly parents about sex or sexuality are considered taboo and are often extremely difficult. However, TV, radio, and social media were cited as widely used sources of contraceptive information and offer great potential.

Influence of parents

Communication about sexual health, particularly with parents, is difficult for young adults (Faimau *et al.*, 2016; Kanda and Mash, 2018). Over 200 students from two different universities expressed feeling 'really uncomfortable discussing about sex and sexuality with their parents/guardian', with females feeling marginally more embarrassed by these discussions (Faimau *et al.*, 2016). Students also believed that their parents would think the idea of them having sex within the next 3 months was 'unacceptable', but would be supportive of abstinence (Faimau *et al.*, 2016).

Conversations about sex were considered taboo in many families, and young adults expressed personal difficulties discussing issues of sex and sexuality at home (Kanda and Mash, 2018). There was also confusion about the disparity between advice received from parents and the media (Kanda and Mash, 2018). One male sales assistant stated,

> *"The other reason why we youth do not use protection is that our parents do not talk of this at all times. I grew up with my family, my mother and father. We were never taught about how to be safe, how to practice those things."* (Kanda and Mash, 2018).

HIV positive women disagreed, believing that sexuality is becoming more openly discussed, and consequently ‘parents are coming to terms with the transition of culture and today’s lifestyle’ (Schaan *et al.*, 2016). However, this may be relative to improvements in their individual situations and influenced by reduced stigma around HIV and AIDS (Schaan *et al.*, 2016).

Influence of partner

The attitude of partners was found to be one of the largest influences on women’s use or non-use of contraception - influencing specific method choice; condom negotiation and use; and sexual health communication more generally.

Communicating openly about sex and family planning with sexual partners is not possible for many women. Traditionally women should not discuss matters of sex, particularly initiating intercourse and expressing sexual satisfaction (Schaan *et al.*, 2016). Men shared similar challenges around discussing their sex life with their partners and confiding in them with issues of a sexual nature. OM, a 58-year-old married father-of-five, said,

> *“I can discuss a few things about my health or family matters but I find it very difficult to talk about sex with my partner or friends because I consider that to be a private matter. My wife does not talk to me about sex”* (Letshwenyo-Maruatona and Gabaitri, 2018).

Older women cited their husband’s reluctance to discuss matters relating to sexuality, and ‘unwillingness to admit that they lacked knowledge on issues of sexuality’, as a direct barrier to addressing their sexual health and family planning needs (Ama and Ngome, 2014).

For women reporting their pregnancy unintended, the most common reason for lack of contraceptive use was that their husband or partner did not want to (Doherty *et al.*, 2018). ‘Partner’s disapproval of family planning’ and ‘never discussing family planning with partner’ were two of the highest variables that increased the likelihood of unmet need for modern contraceptives, and women whose partners disapproved of family planning experienced the highest unmet need for family planning generally (Letamo and Navaneetham, 2015). In a focus group Lorato, a woman aged between 25 and 35, stated,

> *"There are no negotiations. Children are just made without planning"* (Schaan *et al.*, 2016).

HIV positive women felt their partner did not approve of them using hormonal contraceptives, and many believed that it was acceptable to take hormonal contraceptives but not tell their partner (Schaan *et al.*, 2014).

Men tend to decide whether a condom is used or not, and if he was not willing, then protection is most likely not used (Kanda and Mash, 2018; Schaan *et al.*, 2014). Many university students agreed with the statement 'It is difficult to ask their partners to use condoms' (Faimau *et al.*, 2016). One male pharmacy assistant summarised,

> *"Women depend on men. If he wears a condom, they don't have any problem. If he doesn't, they don't have a problem either"* (Kanda and Mash, 2018).

Partner influence was found to be even greater for women in relationships with 'older partners', defined as someone ten years older or more (Kraft *et al.*, 2009; Nkosana and Nkosana, 2017). People in relationships with older partners reported neither effective contraceptive use nor consistent condom use, were half as likely to have used condoms consistently at last sex, and were less likely to be able to negotiate use of condoms (Kraft *et al.*, 2009; Kanda and Mash, 2018). Over 50% of schoolgirls who had sexual intercourse with older men said that they were either forced or persuaded into sex, and almost 60% of these girls indicated that nothing was done to prevent STIs/HIV or pregnancy (Nkosana and Nkosana, 2017).

Conversely, the positive influence partners can have on family planning was also highlighted. The higher the frequency of discussion with a partner, the lower the unmet need for family planning, with increased conversation leading to higher contraception use (Letamo and Navaneetham, 2015). Female students who felt comfortable using emergency contraception said they had been encouraged by either their partner, or a friend (Kgosiemang and Blitz, 2018).

For this reason, HIV positive women expressed clear desire for increased partner involvement in SRH issues. Dineo, aged between 25-35, said,

> *"I wish men could be encouraged to support us through out everything involving our sexual life. They should be involved taking decisions concerning prevention methods their partner wants to use and know the advantages and disadvantages of using the chosen method of prevention"* (Schaan *et al*., 2016).

Influence of friends

University students expressed discomfort discussing SRH and family planning with friends – even more than with parents – and believed that their friends would see it as unacceptable for them to have sex in the next three months, but would support abstinence (Faimau *et al*., 2016). Young adults also cited the influence of peers as a barrier to their use of condoms (Kanda and Mash, 2018).

TV, radio, and the media

The positive influence, and potential, of TV or radio on improving family planning knowledge and use was well cited (Letshwenyo-Maruatona and Gabaitri, 2018; Bainame *et al*., 2016; Letamo and Navaneetham, 2015).

Media discussion of SRH issues encouraged men to have more open communication with their partners (Letshwenyo-Maruatona and Gabaitri, 2018). LE, a 32-year-old university graduate, explains that,

> *"Sometimes when you listen to others speaking publicly about what they went through, it encourages you to talk about one's situation. You ask yourself why can't I do like them?... I used to be shy, I watched others on television. Every day you hear people talk about these diseases on radio and television. It is now easy for me to talk freely to my partner about my condition"* (Letshwenyo-Maruatona and Gabaitri, 2018).

Those who listened to radio and watched television were much more likely to report using a contraceptive method during their first sexual encounter (Bainame *et al*., 2016). Those who did not listen to radio or watch television had the highest unmet need for family planning, and those without access to radio were less likely to use condoms, or have basic HIV knowledge (Letamo and Navaneetham, 2015; Ray and Sinha, 2012). In a survey of 4038 women, 97%

were found to have media exposure to family planning in some capacity – highlighting the wide-reaching potential (Nair and Navaneetham, 2015).

University students also cited television and radio as their main source of information about HIV/AIDS, and the second and third most popular sources of contraceptive information, after school healthcare facilities (Kanda and Mash, 2018; Hoque *et al.*, 2013). Women also felt that the media would be the most effective tool to educate women about the female condom (Mashanda-Tafaune and Monareng, 2015).

However, TSM, a 22-year-old male, suggested that newer, more applicable platforms should be considered,

> *"Sometimes they talk about these issues on national radio and television but some of us do not listen to these stations because it is boring. They could put the information on social media, which most young people use"* (Letshwenyo-Maruatona and Gabaitri, 2018).

Summary of factors related to individuals' social networks

Partners are the key influencers of women's sexual health decisions – sometimes with positive outcomes, but predominantly negative. Communication with sexual partners is difficult, if it happens at all, and contraception use, particularly condoms, is seen as men's prerogative. These challenges are exacerbated further for women in relationships with older men, where sex is often not a choice and negotiation can feel impossible.

Culturally, conversations about sex and sexuality are extremely difficult – particularly with parents – leading to a lack of guidance, and confused information, about family planning. Discussion with friends is no easier for many people, and sex is generally a 'taboo' topic.

However, TV and radio offer promising platforms for promoting family planning content and are well-liked by those with access to them. Utilising these forms of media, as well as new social media platforms, appears to have a measurable impact on contraceptive outcomes, increasing both method use and knowledge.

2.6.3 Sociocultural factors

Cultural attitudes towards gender are highly influential on women's abilities to make decisions regarding their sexual health - particularly men's perceived superiority in Batswana culture, women's lack of agency in sexual intercourse and pressure to produce and care for a family.

Cultural attitudes towards sexual intercourse

Adolescents highlighted some cultural beliefs around sexual intercourse. Male adolescents described erections as painful, and consequently needed to immediately engage in sexual activity (Malinga-Musamba and Ntshwarang, 2014). They also believed that girls who do not have sex as adolescents suffer from 'virgin disease', will experience severe pain if they wait until they are older to have sex, and may die when having an orgasm (Malinga-Musamba and Ntshwarang, 2014).

Boys said that abstinence as a teenager can even have physiological connotations. One 14-year-old female explained:

> *"They say that if a girl takes a longer time to break virginity by the time she gives birth, her pelvic bone will make the birth difficult for the baby to come out"* (Malinga-Musamba and Ntshwarang, 2014).

Both parents and adolescents felt that fear of these potential birth complications might scare girls into having sex, and that generally boys perpetuate these stories and myths to coerce sexual intercourse. As put explicitly by one 14-year-old female:

> *"Boys like to lure girls into bed and after that they dump them"* (Malinga-Musamba and Ntshwarang, 2014).

Men are seen as the instigators of sexual activity, with cultural and physical implications (Agyei and Abrefa-Gyan, 2016; Faimau *et al.*, 2016; Nkosana and Nkosana, 2017; Malinga-Musamba and Ntshwarang, 2014). Among university students who had sex before the age of 15, 19% of men had initiated sex, compared to 1% of women (Agyei and Abrefa-Gyan, 2016). There was also a significant relationship between gender and the idea that 'one could say no when pressured to have sex when s/he does not want', with male students 3.48 times more likely to negotiate sex than female students (Faimau *et al.*, 2016). The majority of young women also agreed with the statement that Tswana culture does not expect girls to take the lead in sex (Nkosana and Nkosana, 2017).

Lack of communication about sexual health, both generally in Batswana culture and within individual relationships, disproportionately influences women (Ama and Ngome, 2014; Schaan *et al.*, 2016; Letamo and Navaneetham, 2015). Older women felt that 'prohibition of public discussions about sex', and 'cultural restrictions placed on people with regard to talking about SRH issues' were two main obstacles in addressing their sexual and reproductive health needs (Ama and Ngome, 2014).

Traditionally women cannot openly discuss sex, particularly initiating sex and expressing sexual satisfaction, for fear of being seen as promiscuous (Schaan *et al.*, 2014). Women saw their role in sexual activity, which is primarily focused on male pleasure, as a "sacrifice" (Kanda and Mash, 2018). Kaone, a woman aged between 25-35, stated,

> *"Regarding sexual satisfaction, our culture taught us not to complain about sex, a man is the only one who can complain, not a woman"* (Schaan *et al.*, 2016).

Inequality within sexual relationships can cause feelings of shame, stigma, and fear of judgement around seeking and using contraception (Kanda and Mash, 2018; Schaan *et al.*, 2014; Schaan *et al.*, 2016). Condoms are publicly available in hospitals and clinics, but young adults found it difficult to take them for fear of stigmatisation (Kanda and Mash, 2018). One young woman stated,

> *"I would not personally get into a store and buy a packet of condoms because people would start thinking I am sleeping around so much, which will harm my reputation. I will get labelled. The same would apply to clinics also, when you go to get those free distributed ones."* (Kanda and Mash, 2018).

Societal expectations of gender roles

Traditional gender roles are highly polarised in Botswana, and influence both attitude and behaviour towards sex, relationships, and position in society (Malinga-Musamba and

Ntshwarang, 2014; Faimau *et al.*, 2016; Ama and Ngome, 2014). 'Traditional attitudes and discrimination which discouraged women from working outside the home' were cited as an obstacle to addressing sexual and reproductive health needs of older women (Ama and Ngome, 2014).

Identity and success as a woman are thoroughly entwined with the ability to bear a child, taking care of the family and pleasing your partner, all key barriers for women's use of family planning (Schaan *et al.*, 2016). Many respondents describing a symbiotic relationship between mothering and womanhood, where having a child brings a woman respect and dignity, while a lack of fertility can drive a man away (Schaan *et al.*, 2016). Segomotso, a woman aged between 25-35, explained that,

> *"When you are married and unable to conceive, our culture permits your family-in-law to take you back to your family. That means you are not a woman"* (Schaan *et al.*, 2016).

Tumelo, another woman in the study aged between 25-35, added,

> *"If you can reach the age of 25 and are without a child, people start questioning whether you are fertile, and may suspect that you do abortions. In short, people will start calling you nasty names"* (Schaan *et al.*, 2016).

Kedibonye, aged between 25-35, explained the impact and pressure this cultural attitude can have:

> *"A woman is viewed as someone who has a good family full of children and our status is a challenge to us in the sense that our health limits us to prove that we are fertile, or we are real women. We live with fear that we might die any time or become weak if we try to have children. Due to this challenge, we live with emptiness in our hearts because we know that people, even our families, think that we are not real women because we are not capable of having and taking care of another person. But we still have interest in having children"* (Schaan *et al.*, 2016)

When defining their role in a relationship, women repeatedly cited being sexually obedient and pleasing their partner, with the notion of being a 'real woman' directly linked to their partner's sexual satisfaction. Khumo, a woman aged between 35 and 45, said:

> *"A real woman should be able to meet her partner's sexual needs. Giving him sex anytime he wants it and how he wants it so that you can keep him to you and not go*

> *for other women. She should also be faithful to her sexual partner"* (Schaan *et al.*, 2016).

Women also described 'keeping a man faithful' through regular sexual intercourse. Culturally, it is seen as a woman's duty to take care of the 'home' which Keikantse, a woman aged 25-35, directly linked with sex,

> *"A woman should cook well and on time, both in the kitchen and in the bedroom. You should make sure you satisfy your man sexually"* (Schaan *et al.*, 2016).

Traditional proverbs further highlight this cultural disparity between genders, encouraging boys and discouraging girls to initiate 'love relationships'. One 15-year-old female stated:

> *"Proverbs such as 'Ga di nke di etelelwa pele ke manamagadi' (They (a herd) are never led by females) tend to influence boys to think that they are in control"* (Malinga-Musamba and Ntshwarang, 2014).

Other proverbs raised were: 'Monna poo ga a gelwe lesaka' (A man is like a bull, should not be confined to one kraal); 'Monna phafana o a hapaanelwa (A man is like a calabash, he must be shared); Monna selepe o a adimanwa (A man is an axe so he can be borrowed); Monna nawa o a nama (a man, like a bean seed, spreads out.)' (Malinga-Musamba and Ntshwarang, 2014).

Cultural beliefs are often used as justification for gender imbalance within sexual relationships; men are expected to show their masculinity through their role as 'decision-maker', while women are encouraged to be 'passive tomales' (Malinga-Musamba and Ntshwarang, 2014). Parents and adolescents also worried that these gendered proverbs encourage forceful behaviour, with a 15-year female summarising:

> *"Boys have the tendency to think that they have power over girls because males are regarded as heads of households, so they usually force girls to have sex even if they do not want to"* (Malinga-Musamba and Ntshwarang, 2014).

Men's role in childbirth

Traditional beliefs about childbirth influence attitudes towards, and knowledge of, sexual health issues. Men are often denied access to delivery rooms, and 'forbidden to see anything' because culturally a man is not supposed to see a woman giving birth (Letshwenyo-Maruatona and Gabaitri, 2018). Older men agreed with this notion more than younger men, with one 58-year-old man, MJK, stating,

> *"…Even if I was allowed to see childbirth, I would not agree to watch my wife having a baby. It is against our culture"* (Letshwenyo-Maruatona and Gabaitri, 2018).

Men being absent from childbirth may lead them to have an inaccurate or romanticised view of childbirth, and a lack of knowledge about the risks associated with pregnancy, causing less urgency around the use of contraception, and less desire to utilise, or even discuss, family planning (Letshwenyo-Maruatona and Gabaitri, 2018).

Summary of sociocultural factors

Gender inequality is either directly or indirectly apparent in all factors related to culture and society found in this review; from the importance placed on women losing their virginity; traditional proverbs promoting male polygamy and superiority; the lack of control women often experience within their sexual relationships; to men not being allowed in the delivery room during childbirth.

Men were found to be the initiators of sex, and simultaneously discouraged from being faithful or 'confined' – while women saw 'pleasing their partner' as integral to their identity as a woman, and communication about their own sexual pleasure, or rejecting men's advances, as taboo.

These persistent cultural messages about male superiority, witnessed mostly through their control over sexual health decisions, inevitably impact family planning practices, or discourage them altogether. In the most extreme cases, these cultural norms and attitudes towards gender encourage non-consensual or coerced sexual relationships, and leave women extremely vulnerable to unplanned pregnancy.

2.6.4 Factors related to contraceptive methods

Attitudes, experiences, and misconceptions around specific contraceptive methods and family planning generally directly influence women’s decision making around and use of contraception.

Accessibility and availability of family planning

Certain contraceptive methods and family planning services were found to be more accessible than others. Older women mostly relied on natural methods of family planning including observation of safe periods, withdrawal, breastfeeding and abstinence, and saw these services as most accessible (Ama and Ngome, 2014; Ama and Olaomi, 2018).

Students preferred accessing contraceptives from public clinics, followed closely by university clinics, but the unavailability of condoms at these locations is a barrier to use of the method (Hoque *et al.*, 2013; Kanda and Mash, 2018). Older women saw the top family planning methods available in Botswana as condoms, breastfeeding, abstinence, IUD, injectables, combined oral contraceptives and withdrawal (Ama and Ngome, 2014; Ama and Olaomi, 2018).

Awareness of contraceptive methods

University students had good knowledge of contraceptives (Hoque *et al.*, 2013). Female students showed slightly higher awareness that contraceptives are not 100% effective, and more knew that using contraceptives irregularly will result in unplanned pregnancy (Hoque *et al.*, 2013). Just over half of all respondents knew that the statement ‘all contraceptives contain hormones’ was false (Hoque *et al.*, 2013).

Young adults had good knowledge of the female condom, mostly gained from healthcare facilities – though very few had ever used one (Mokgetse, 2018). Most men and women had full knowledge of the three behaviours for HIV prevention - abstinence, monogamy, and condom use – and knew that men should still use condoms after circumcision (Lama *et al.*, 2015).

Lack of knowledge, misconceptions, and contraceptive misuse

Lack of knowledge was cited as the primary reason for older women’s contraceptive needs remaining unmet (Ama and Ngome, 2014). Additionally, many said that ‘lack of knowledge about contraception use and availability’ was a major obstacle to accessing sexual health services (Ama and Ngome, 2014; Ama and Olaomi, 2018). The proportion of women who cite lack of knowledge as a barrier to contraceptive use is substantially lower in countries where education programmes are most active (Ama and Olaomi, 2018).

Lack of knowledge was not only witnessed among the older generation. Young adults cited ignorance about the risks of unprotected sex, and lack of knowledge about the benefits of condoms, as key barriers for condom use (Kanda and Mash, 2018). One female college student said:

> *“It’s about some people are maybe not aware of the advantages of condom use. It might therefore be difficult for those ones to use them. There are misconceptions.”* (Kanda and Mash, 2018).

Lack of knowledge about contraception can also lead to misuse of contraceptive methods. Many women who reported their pregnancy as unintended were using a contraceptive method around the time of conception, so either did not use their respective methods correctly (misuse), or experienced contraceptive failure (Mayondi *et al*., 2016; Doherty *et al*., 2018).

Male condoms

The ineffectiveness of male condoms was seen as one of the most problematic elements of the method, for women with both met and unmet need for family planning (Letamo and Navaneetham, 2015; Kgosiemang and Blitz, 2018). The majority of women who reported an unintended pregnancy despite using contraception were using the male condom at the time of conception (Doherty *et al*., 2018). ‘Ruptured condoms’ during sex was cited as the most appropriate reason for use of emergency contraception (Kgosiemang and Blitz, 2018).

Male condoms monopolise the contraceptive market as the most used and well-known method of contraception (Ama and Olaomi, 2018; Nair and Navaneetham, 2015; Hoque *et* *al*., 2013; Mayondi *et al*. 2016). The condom was the top contraceptive method known to older adults, and was also cited as the most readily available method in the country (Ama and Olaomi, 2018). Among the 268 women who reported using a contraceptive method in a nationwide survey, 219 were using male condoms, compared to just 13 using oral contraceptives and 5 using DMPA injectable (Mayondi *et al*., 2016). Participants in studies on both dual-contraception and modern contraceptive use reported using condoms as their only contraceptive method (Kraft et al., 2009; Nair and Navaneetham, 2015).

The condom was the most well-known contraceptive method among university students, and the only contraceptive method used by the majority of male and female students (Hoque *et al*., 2012; Hoque *et al*., 2013). Over 50% of sexually active students had used the male condom – much higher than any other method (Faimau *et al*., 2016). Pregnant women reported using or intending to use the male condom as their method of contraception after birth - whether by itself, alternatively with female condoms or with a simultaneous non-barrier method (Doherty *et al*., 2018). However, many of these women also reported not being able to control the use of condoms in their relationship, so actual use may be lower than these self-reported intentions (Doherty *et al*., 2018).

The majority of students believed that they could refuse sex if their partner did not want to use a condom, and would be able to tell their girlfriend of boyfriend to use a condom (Faimau *et al*., 2016). However, these findings could well be influenced by the age and education level of the university students recruited, as negotiating condom use was cited as problematic or difficult in multiple other studies (Kanda and Mash, 2018; Schaan *et al*. 2014).

Young adults said that ensuring male pleasure, and a sustained erection, were key reasons behind lack of condom use. One female university student explained:

> *"For men, if you ask them the difference when using a condom and not using it, they will tell you of the pleasure of (sex) without using condom; they can enjoy it more and more. But when using it, it's like something else. They don't really feel that pleasure*" (Kanda and Mash, 2018).

One female sales assistant added:

> *"Some guys prefer to use condoms and remove them half-way. Their view is that their erection does not last when they use a condom. It may be a psychological problem or just an excuse. I had a couple of guys complaining about that and some other ladies reported the same to me"* (Kanda and Mash, 2018).

Over one-third of HIV positive women did not believe they had control over condom use at all (Schaan *et al*., 2014). One female respondent explicitly stated:

> *"We have babies because our partner does not want to use a condom. They sometimes think or feel that condoms are for people who do not trust each other"* (Schaan *et al*., 2016).

Condom use is associated with a lack of trust and used at the beginning of a relationship when there was a lack of commitment (Faimau *et al.,* 2016). Some students agreed with the statement 'It is not necessary to use condoms if they trust their partner' - although the majority disagreed (Faimau *et al*., 2016). 'Showing trust and love' was a major reason behind young adults' lack of condom use (Kanda and Mash, 2018).

Interruption to sex is another reason behind young adults' inconsistent condom use. One female explained:

> *"When you are in that moment you don't think straight. Anything can happen, especially when you are at that stage. If someone tells you there is no condom around, you are not going to pause and go to the shops to look for them. You will just get on with the business"* (Kanda and Mash, 2018).

50% of schoolgirls who had sex with older men reported using a condom, but almost 30% indicated they had used no protection against pregnancy or STIs – both much lower statistics than girls who reported having sex with their age mates (Nkosana and Nkosana, 2017). This was directly linked to improved communication among age-mates, as discussing safe-sex is easier with a boyfriend of the same age (Nkosana and Nkosana, 2017). Young girls added that it was difficult to talk about condom use when your boyfriend is older, and that this leads to a higher risk of STI/HIV transmission (Nkosana and Nkosana, 2017).

Female condoms

Women and healthcare providers expressed strong negative feelings towards the female condom – namely the timing and complexity of insertion, required hours before sexual intercourse, and the size and appearance of the device. A female nurse explained,

> *"I have seen it, but never used it. And I do not think I will ever use it. I have never even tried it and do not ever want to. The reason being that it is too much work."* (Kanda and Mash, 2018).

A second respondent, a female sales assistant, took this notion further,

> *"The way of inserting it is complicated. One would wonder where those rings will go and how they will settle on the inside and also if they are not going to cause any infection in the vagina"* (Kanda and Mash, 2018).

Many women said that the material of female condoms made them difficult to use, indicating that the device was 'too big and too long' (Mokgetse, 2018). Insertion is a hassle, or 'tedious', and women were deterred by the condom's 'odd look' (Mokgetse, 2018). Some women also felt that information on the female condom was not readily available, and the method was not promoted enough. The female condom necessitates co-operation from both partners, which could be complicated due to relationship power dynamics (Mokgetse, 2018).

Healthcare workers disagreed with the statement that 'the female condom is readily available' (Mashanda-Tafaune and Monareng, 2015). The majority had not used a female condom within the last 12 months, which authors cited as evidence for underutilisation of the method (Mashanda-Tafaune and Monareng, 2015). Healthcare workers also raised similar concerns about difficulty of insertion or ease of use, and disagreed with the statement that the method is not expensive (Mashanda-Tafaune and Monareng, 2015).

The strong material female condoms are made of, and the effective protection against both pregnancy and STIs, were cited as the most positive attributes of the method (Mashanda-Tafaune and Monareng, 2015; Mokgetse, 2018). Healthcare workers felt that the method empowers women to make the decisions during sexual intercourse, and that the media should be utilised to teach the public about the female condom, implying that for some women it could be a viable method choice (Mashanda-Tafaune and Monareng, 2015).

Young adults felt that the female condom could be particularly effective in certain situations where women are vulnerable – such as prostitution, or when a male partner is drunk (Kanda and Mash, 2018). One female nurse explained:

> *"In situation where there is abuse, where the other partner is not considerate of the other, that is when the woman can take control. In this case, it can be very helpful. But I don't know to what extent."* (Kanda and Mash, 2018).

Emergency contraception

'Emergency contraception' in this section refers to both the oral hormonal contraceptive pill, or morning after pill, and the insertion of an intra-uterine device (Kgosiemang and Blitz, 2018).

Despite relatively good awareness of the method, many women had a negative attitude towards using emergency contraception (Kgosiemang and Blitz, 2018). Despite high rates of unintended pregnancy, and belief that emergency contraception could prevent unplanned pregnancies, less than half of women were willing to consider using emergency contraception themselves (Kgosiemang and Blitz, 2018). Women also expressed concern or uncertainty about whether emergency contraception might harm the baby, if that pregnancy continued (Kgosiemang and Blitz, 2018).

Students believed there were more acceptable times that emergency contraception could be used, including: ruptured or broken condoms; forced sex or rape; and failure of previous contraceptive method (Kgosiemang and Blitz, 2018).

Hormonal contraceptives

Use of hormonal contraceptives (here including the pill, the patch, injectables, implants and intra-uterine devices) was found to be consistently low among women in various studies, but there was little research exploring the reasoning behind this (Nair and Navaneetham, 2015; Kraft *et al*., 2009; Schaan *et al*., 2014; Doherty *et al*., 2018; Mayondi *et al*., 2016).

A large national survey found 6.1% of women were using the pill, 6.8% were using an injectable, and just 0.8% of women were using an IUD – compared to 41.7% using the male condom (Nair and Navaneetham, 2015). Older women were found to have poor or no knowledge about modern contraceptives, and saw them as less available and less accessible to them (Ama and Olaomi, 2018). Very few women were using either dual protection at last sex, or a hormonal method without simultaneous condom use (Kraft *et al*., 2009). Only one woman out of 85 HIV positive women intended to use a hormonal contraceptive (Schaan *et al*., 2014).

Side effects were found to main the main perceived issue with the pill, IUD, and injection (Letamo and Navaneetham, 2015). HIV positive women felt their partners would not support them using hormonal contraception, though many of these women also said they would still use a hormonal method but just hide it (Schaan *et al*., 2014). Healthcare professionals described feeling underconfident in providing newer hormonal methods - specifically the vaginal ring, patch, IUD, and implant - and discussing their side effects, which may have influenced women's access to quality counselling for these methods (Tshitenge *et al*., 2018).

A small number of women who got pregnant despite contraceptive use were using the pill or implant, and very few were using the IUD – in keeping with their long-term use and high effectiveness (Doherty *et al*., 2018; Mayondi *et al*., 2016).

Natural family planning methods

Alongside the male condom, withdrawal, abstinence, and 'natural' family planning methods were the most well-known, most popular and the easiest to access (Hoque *et al*., 2013; Ama and Olaomi, 2018; Kanda and Mash, 2018).

After condom use, withdrawal was found to be the second most used method among in two studies of university students and young adults (Hoque *et al*., 2013; Kanda and Mash, 2018). Women over the age of 50 were found to have relied heavily on natural family planning methods, with breastfeeding, withdrawal, and abstinence the most used and best known (Ama and Ngome, 2014; Ama and Olaomi, 2018).

Summary of factors related to contraceptive methods

Despite physical availability and accessibility of contraception often being cited as problematic in Botswana, no studies in this review explicitly found any evidence of this being the sole influence on women's use of contraception. Universal findings were especially difficult as each included study that explored availability or accessibility used different definitions, populations and means of measurement. Having good access to, and knowledge of, contraceptive methods was not necessarily associated with improved uptake or use. Other elements - namely demographic, cultural, or social factors - are more influential on women's knowledge and decision-making around family planning methods.

It is unsurprising that the largest number of studies in this area explored the male condom, simply due to the percentage of the population using them. Across almost all studies, male condoms were the most commonly used and well-known method, likely due to Botswana's high HIV prevalence and consequent strong promotion of the male condom as an effective barrier method for both pregnancy and STI prevention. Among factors related to the male condom, women's inability to negotiate condom use and showing trust within a relationship were cited as key factors behind poor or inconsistent condom use.

There seems to be a generational shift in contraceptive use generally, with students and young adults reporting higher use and knowledge of both condoms and modern contraceptives than older adults - though as no study specifically explored this it cannot be stated unequivocally. More research is needed about women's perceptions of these more modern contraceptive methods – particularly the implant and intra-uterine devices – to gain more relevant, up-to-date insight into women's reasoning behind contraceptive use, or lack thereof.

2.6.5 Factors related to healthcare services and personnel

There are large gaps in access, availability, and continuity of SRH and family planning services. Healthcare personnel feel under-confident in certain aspects of family planning, particularly newer contraceptive methods, and their attitudes directly influence method recommendations and patient advice.

Sexual reproductive health and family planning services

Public clinics were students and young adults preferred place to access contraceptives, citing positive experiences around facilities' issuing of contraceptives and condoms. (Hoque *et al.*, 2013; Lesedi *et al.*, 2011). Most young adults found services to be youth friendly, and would recommend the facility to friends (Lesedi *et al.*, 2011).

However, the wait time at these facilities was described as 'excessive', with inadequate referral services and opening hours acting as direct barriers (Lesedi et al., 2011). Some young adults also cited issue with the open display of condoms in public clinics, and were afraid of stigmatisation if seen taking the method (Kanda and Mash, 2018).

Availability of facilities was a facilitator of older women's access to SRH services, and more influential than other factors like clinic proximity to home, financial ability to pay for services, and attitudes of healthcare providers (Ama and Ngome, 2014).

Reproductive health services were less available and less accessible to immigrants and refugees, due to high cost of services and provider attitudes (Oucho and Ama, 2009). There is an urgent need to make services more accessible to these populations, particularly for clients who qualify to receive ARV treatment (Oucho and Ama, 2009).

Promotion of contraceptives

Lack of adequate publicity was a key barrier for adolescents' in accessing SRH services (Lesedi *et al.*, 2011). Many women believe that the female condom is not promoted enough, which 'could reflect some fundamental challenges at the healthcare facilities' and contribute to low usage and acceptability of the method (Mokgetse, 2018). Malebogo, a female aged 25-35, explicitly stated her desire for additional promotion from healthcare providers, saying:

> *"Healthcare workers must introduce us to a wide range of contraceptives apart from oral contraceptives, injection and condoms"* (Schaan *et al.*, 2016).

Men's involvement in SRH services

Healthcare providers stated that programmes involving men in SRH were hardly ever available to refugees or immigrants (Oucho and Ama, 2009). Men's level of comfort in accessing SRH services, and participation in these services, were both positively, significantly, correlated to perceived importance and frequency of communication around SRH issues (Letshwenyo-Maruatona and Gabaitri, 2018).

Healthcare providers' knowledge and training

Health provider knowledge was found to have a direct impact on patient care and advice, and highlighted a clear need for additional training.

Although most providers felt confident explaining oral contraceptives, many are not confident explaining transdermal contraceptive patches or vaginal rings and were either unsure or did not know about these new methods at all (Tshitenge *et al.*, 2018). One nurse stated,

> *"I have limited knowledge about contraceptives, especially new ones; therefore, will refer them to youth clinic or doctors"* (Tshitenge *et al.*, 2018).

Medical doctors were much more confident than nurses in explaining these new contraceptive methods, both the vaginal ring and the contraceptive patch (Tshitenge *et al.*, 2018). Attitude scores towards contraceptives were higher among providers who were older and had more experience in the healthcare sector (Schaan *et al.*, 2012).

Providers raised specific uncertainty over the intrauterine contraceptive device (IUCD, and many stated they would not feel confident in explaining the method to adolescents. Another nurse explained,

> *"I am not trained to prescribe and insert IUCD, will need training and booklet to help with explanation"* (Tshitenge *et al.*, 2018).

Providers had poor knowledge about the relationship between HIV and hormonal contraceptives, and some believed that 'several antiretroviral drugs have the potential to either decrease or increase the bioavailability of steroid hormones in hormonal contraceptives' (Schaan *et al.*, 2012).

The benefits of additional provider training in SRH were well cited. Adequate training in family planning helped providers confidently demonstrate the use of female condoms to clients, and give accurate information and support (Mashanda-Tafaune and Monareng, 2015). 30 out of 37 providers trained in female condom provision had used one, compared to only 22 out of 126 untrained providers (Mashanda-Tafaune and Monareng, 2015). There is also a positive correlation between healthcare workers' SRH knowledge and their attitude towards patients, with providers who had specific HIV/AIDs training, or had been working in the healthcare sector for longer, showing higher attitude scores (Schaan *et al.*, 2012). A female doctor explains:

> *"I have recently completed my internship, have limited knowledge about contraceptive, but have attended a workshop and CME on contraceptive implants which helped a lot"* (Tshitenge *et al.*, 2018).

Attitudes of healthcare providers

Healthcare providers' attitudes, and their bias in terms of family planning method promotion, negatively influence the quality of counselling women receive, and deter them from essential services.

Healthcare providers' beliefs influence their contraceptive recommendations. Many providers said they would not recommend the female condom to their patients, despite low understanding, training and usage rates among these same providers, and disagreed with the statement that 'health care workers have no judgemental attitude towards users of female condoms' (Mashanda-Tafaune and Monareng, 2015).

Some providers stated that they would express disapproval or disappointment towards an HIV positive woman becoming pregnant (Schaan *et al.*, 2012). The majority also said that they did not often prescribe contraceptives to adolescents, with one nurse stating that:

> *"It's a disgrace that adolescents indulge in sex parties, it's unchristian"* (Tshitenge *et al.*, 2018).

These attitudes are noticed by patients, and impact their sexual health decisions. HIV positive women feared that clinic staff would be angry or look down on them if they became pregnant, deterring them from essential services and care (Schaan *et al.*, 2014). Older women cited the unfriendly attitudes of healthcare providers as an obstacle to addressing their SRH and family planning needs, and suggested training for healthcare providers to be more considerate (Ama and Ngome, 2014). Adolescents are also deterred by the unfriendly attitudes of providers, and stated that judgement from healthcare providers is a direct barrier for their use of services (Lesedi *et al.*, 2011).

However, many providers did not think their beliefs influenced their counselling, and said that they were comfortable prescribing contraceptives to adolescents (Tshitenge *et al.*, 2018). Those without the necessary skills or knowledge in contraceptive services should refer patients to youth clinics or other colleagues, as one doctor expressed clearly,

> *"Adolescents are patients and their right for autonomy should be respected"* (Tshitenge *et al.*, 2018).

A nurse added,

> *"Adolescents indulge in early sexual activities, therefore they need effective contraceptive counselling; they should be allowed to make an informed decision"* (Tshitenge *et al.*, 2018).

Additionally, some HIV positive women felt comfortable talking with female healthcare providers about contraception, and many had been told about contraceptive methods at their anti-retroviral (ARV) clinics (Schaan *et al.*, 2014).

However, for many patients, high-quality, unbiased counselling remains a desired service. Kefilwe, a female aged 25–35 expressed her wish for,

> *"…effective counselling for HIV positive women with highly trained counsellors who have strong interpersonal skills in terms of temper and empathy"* (Schaan *et al.*, 2016).

Summary of factors related to healthcare services and personnel

Some providers feel under-confident in their knowledge around contraception, particularly more modern methods, and there is a need for further training in family planning provision. Doctors are more confident in this area, but nurses provide more of the counselling, and desire to be empowered with further knowledge. Additionally, providers (of all levels) should be more included in research and policy around family planning, as their confidence levels, attitudes and training directly influence their ability to provide effective contraceptive information and method recommendations to patients.

Though the physical availability of family planning services was found to directly influence access to and use of contraception, there are multiple other influential factors: stigma, wait-time, poor referral services and poor promotion, of both SRH services in general and specific methods, all contributed to an individuals' ability to access and use contraception.

Negative provider attitudes are detrimental to uptake and use of family planning. A need and desire for further training among healthcare providers is clearly a high priority, with bias and lack of knowledge directly linked with poor family planning counselling and provision.

However, these studies exploring healthcare services and personnel all discussed very different areas, making universal summaries difficult. Additionally, most studies explored provider attitudes from the perspective of providers, rather than patients. Further insight into how users of family planning services perceive healthcare providers would deepen understanding of current gaps in provision and improve future training in this area.

2.6.6 Factors related to HIV and STIs

Factors related to HIV and other STIs were found in multiple studies, ranging from broad cultural perceptions to unique considerations and concerns of people living with HIV.

Understanding of HIV

Some women cited preventing HIV transmission as the main reason behind their family planning choices, and understanding condoms' role in reducing HIV transmission was associated with consistent condom use (Kraft *et al.*, 2009). However, young women in relationships with older men used other tactics for preventing HIV and other STIs, including 'both partners testing negatively for HIV', 'making sure that our body fluids did not come in contact with either partner', 'using different towels' and 'not tongue kissing and being very careful' (Nkosana and Nkosana, 2017).

There is also a relationship between an individuals' understanding of HIV, and their practical application of family planning. Incorrect knowledge about HIV was significantly correlated with no condom use at last sex (Ray and Sinha, 2012). Women in Botswana showed greater knowledge of HIV than men, and consequently households with greater female bargaining power and greater say in decision-making are likely to be better protected from HIV (Ray and Sinha, 2012). However, while improving knowledge was beneficial, it alone did not ensure safe sex practice (Ray and Sinha, 2012).

HIV testing and treatment (ARVS)

Odds of condom use were lower among those who did not have a history of prior HIV testing (Lama *et al.*, 2015). Being tested for HIV/AIDS was also associated with a 51% increase in the odds of an individual using condoms, albeit inconsistently, with their previous three partners (Keetile, 2014).

However, one young adult interviewed for a study on inconsistent condom use said:

> *"One reason (for not using condoms) may be where there is trust, meaning having spent some time with the person and that you have tested before (for HIV). You therefore feel secure with that person"* (Kanda and Mash, 2018).

There is also 'the emerging belief that young adults were no longer afraid of HIV and AIDS because of the availability of antiretroviral drugs, freely provided in the public health sector, and the perception that treatment turned it into a manageable chronic disease' (Letamo *et al.*, 2017; Kanda and Mash, 2018). One respondent said,

> *"As far as HIV is concerned, people used to be very scared back then when it was new, but nowadays given that people know that there is medicine and treatment, they do not really fear it as much. Treatment is also free. People now live longer with HIV."* (Kanda and Mash, 2018).

Communication around HIV

Improved communication around HIV status was a positive influence on sexual health outcomes and family planning use, with most men describing the women in their lives as encouraging, supportive, and comfortable initiating discussions on sexuality issues. One married man said,

> *"There was a time I had difficulty talking to my wife about my condition, now I am comfortable talking to her about it because I realized my wife is supportive. She reminds me of my check-ups and treatment"* (Letshwenyo-Maruatona and Gabaitri, 2018).

Conversely, there are negative connotations of poor communication. Some men did not initiate discussions on sexual matters or suggest condom use because they feared that they would be suspected of infidelity (Letshwenyo-Maruatona and Gabaitri, 2018). If HIV positive, men also feared their partner's reaction if she tested HIV negative, as this might support the notion that they had been unfaithful. PLB, a 40-year-old respondent, currently cohabiting, stated:

> *"Some women may leave you when they find out that they are negative and you are positive. Sometimes you may even think of hiding the results because the partner may accuse you of being adulterous and bringing the virus home"* (Letshwenyo-Maruatona and Gabaitri, 2018).

HIV positive women also feared telling their partner their HIV status (Schaan *et al.*, 2016). Lorato, aged between 25–35 years, explained:

> *"Sometimes we have children because we are afraid to disclose our status to our partners. We have children out of fear of stigma and discrimination."* (Schaan *et al.*, 2016).

Attitudes towards HIV

Attitudes or perceptions of HIV can lead to stigma and often contribute to the fear described above. One woman said:

> *"We always fear that nurses and doctors are going to be disappointed because they discourage us to be pregnant while on anti-retroviral therapy. They are doing this for our own good"* (Schaan *et al.,* 2016).

'Stigmatisation from family and healthcare workers', and 'believing it was irresponsible to want a child if living with HIV', were statistically associated with not planning to have a child (Schaan *et al*., 2014). HIV positive women worried that healthcare providers would be angry if they became pregnant whilst HIV positive, and felt it was irresponsible for women living with HIV to want children (Schaan *et al*., 2014). Despite this, a quarter of these women were not told about contraceptives at their ART clinics (Schaan *et al.,* 2014).

HIV related myths

Myths around HIV contribute to feelings of stigmatisation. Some students did not know whether the statement "people can get HIV because of witchcraft" was valid or not, and 17 students believed it was true (Faimau *et al*., 2016). Although the majority of respondents knew that a healthy-looking person could have HIV, 28 students did not (Faimau, 2016). Additionally, 35 students believed that a person could get infected with HIV by sharing a meal, and 52 students stated that only people who have sex with gay or homosexual people get HIV/AIDS (Faimau *et al.,* 2016).

HIV and womanhood

HIV positive women raised many factors related to their own experiences of 'womanhood', particularly related to pregnancy intention. One woman shared,

> *"Our status is a challenge to us. We still have fear that if we become pregnant the virus might go up and we become weak. Even if we see other women who are also HIV positive becoming pregnant, we ask ourselves different questions such as, if she will survive the pregnancy, what kind of child is she going to give birth, her life after pregnancy."* (Schaan *et al*., 2016)

Another woman went further, stating,

> *"I feel that I am not a real woman because after disclosing my status to my long-time sweetheart he abandoned me and still today I am not able to have a child. This situation frustrates me a lot especially when I see people who are HIV positive having healthy and HIV negative children. I felt that he abandoned me because I am not worth a woman since I failed to have a child with him."* (Schaan *et al.*, 2016).

For other respondents, the concerns were more medical,

> *"Sometimes thinking about having a child brings up the issue of re-infection that may lead to your health deterioration. We do not enjoy our pregnancy like our mother did or women who are not living with the virus."* (Schaan *et al.*, 2016).

Some women disagreed, and felt being HIV positive gave them a stronger sense of responsibility over their healthcare decisions (Schaan *et al.*, 2016). Many women described feeling more responsible and consequently empowered over their behaviour, even having a stronger sense of being a woman, due to their status.

> *"If there is change, it is a positive change since we have now changed our sexual behaviour for the better. Most women who are HIV positive have reduced the number of the sexual partners and have taken full responsibility of their sexual lives. We are always curious to know more about our health status."* (Schaan *et al.*, 2016).

More HIV positive women were using contraception compared to women who were HIV negative, with the vast majority using the male condom, and no significant differences in the types of contraception being used (Doherty *et al.*, 2018). There was also a difference in women's future childbearing desires, with HIV positive women much more likely to report not desiring any more children (Doherty *et al.*, 2018; Mayondi *et al.*, 2016).

HIV, family planning and unintended pregnancy

The tension between sexual reproductive health issues and HIV status is exacerbated by a culture that promotes childbirth and motherhood as essential to the role of a 'woman', and influences HIV positive women's use of family planning (Schaan *et al.*, 2016). However, no study reported a significant reduction in unintended pregnancy, increase of contraceptive uptake or high use of any specific method within this population.

There were contradictory findings related to HIV status and rates of unintended pregnancy. Some women who knew they had HIV, or did not know their HIV status pre-pregnancy, were more likely to have an unintended pregnancy (Mayondi *et al.*, 2016), while other research found no difference between levels of unintended pregnancy reported by HIV positive and HIV negative women, nor any significant connection between STIs and pregnancy intention (Doherty *et al.*, 2018). Although "the danger of the disease spreading due to the tendency of HIV positive individuals to have multiple sex partners" is problematic, there was statistical insignificance between HIV status and using condoms in previous sexual encounters (Ray and Sinha, 2012).

Non-HIV Sexually Transmitted Infections

Factors related to sexually transmitted infections (STIs) were similar to those related to HIV but, due to Botswana's high HIV prevalence, other STIs were discussed much less frequently.

Risky sexual behaviour was the same among those who had, and those who had not, contracted non-HIV STIs (Agyei and Abrefa-Gyan, 2016). Those who had not contracted STIs did, however, report higher condom use, and those with a higher perceived condom use were more likely to demonstrate risky behaviour - suggesting varying definitions of 'safe sex' which includes condom use alone for some individuals (Agyei and Abrefa-Gyan, 2016).

Young adults are more concerned with preventing pregnancy than STIs (Kanda and Mash, 2018). Though condoms were used at the initial stage of sexual intercourse, they were dropped later because of the difficulty to sustain the erection, and many preferred to use withdrawal (Kanda and Mash, 2018). If STIs are of concern, condom use is essential throughout; withdrawal is only used to prevent pregnancy, though often ineffectively. This supports the earlier finding that there is less fear around contracting HIV among young adults due to increased access to ARVs and higher life expectancy (Kanda and Mash, 2018).

Open communication about STIs can be difficult, particularly with a sexual partner (Letshwenya-Maruatona and Gabaitri, 2018; Nkosana and Nkosana, 2017). It was difficult for young women to discuss safe sex with an older partner, which caused much greater risk of

STI transmission compared to those with a partner of the same age (Nkosana and Nkosana, 2017).

There can also be stigma and shame related to STIs. Some men stated that when they have an STI, they would keep quiet and avoid sexual relations, rather than experience the embarrassment of their infection being discovered by their partner. One respondent explains,

> *"When I was not feeling well down there, I just kept away from her. I could not dare touch her. When I got better that is when I felt comfortable touching her. I had a disease and was afraid she would discover that I had been unfaithful."* (Letshwenya-Maruatona and Gabaitri, 2018).

The consequences of not sharing this information ranged from mistrust, to complete breakdown of relationships (Letshwenya-Maruatona and Gabaitri, 2018).

Summary of factors related to HIV and STIs

Although there is concern that increased access to HIV treatment is feared to compromise safer sex, it is unclear to what extent. There appears to be a generational shift in attitudes to HIV, but no study explored this in depth enough to be conclusive. Exploring the difference in experiences and attitudes of younger and older women would help provide more up-to-date understanding of changing attitudes to HIV and associated risky sexual behaviour.

Fear of judgement from providers and family may lead HIV positive individuals to avoid healthcare facilities and consequently lack important medical information, particularly around pregnancy and sexual health. However, very few included studies explored HIV positive women's experiences exclusively, so it is difficult to make universal conclusions.

These findings highlight how difficult it is to generalise women's experiences of HIV and family planning use. For some HIV positive individuals, their status may be used as justification to continue or increase risky sexual behaviour, or disregard family planning altogether, but for others, HIV inspired careful, effective sexual and reproductive health decisions. However, for many, HIV seems to have minimal impact on family planning decisions and pregnancy intention at all.

2.7 Discussion of narrative review

Summary of overall findings

Socio-cultural factors are the most influential on women's decision-making and use of family planning. Patriarchal societal attitudes cause imbalanced power dynamics in sexual relationships, where men are seen as the instigators of sexual activity, and their pleasure is prioritised. Consequently, negotiating use of condoms or any other contraceptive method is often difficult for women. This gender inequality is experienced by women globally, and findings from this review support a myriad of previous research which shows the extent to which male partners have control over women's healthcare decisions, sexual activity and within relationships (D'Souza *et al.,* 2022 – in press; Yakubu and Salisu, 2018; Cordero *et al.* 2019; Kriel *et al.*, 2019; Hlongwa *et al.*, 2020; Saleem *et al.,* 2021).

Conversations about sex and contraception are seen as taboo, particularly with parents or elders, but also with peers and age-mates – even amongst younger generations. While the increasing presence of contraceptive information on TV and radio, and utilisation of social media, implies that this may improve, many women still feel pervasive stigma and judgement in their pursuit of sexual health counselling and contraception use is often associated with promiscuity. Stigma is felt especially among adolescents, and highlights a problematic issue faced by women in multiple other African societies (Yakubu and Salisu, 2018; Potasse and Yaya, 2021). However, access to TV, radio and other forms of traditional media has been seen to improve attitudes, contraceptive knowledge and sexual health outcomes in other countries, and highlights the potential that media-based family planning interventions may have in Botswana (Appiah *et al.,* 2020; Adedini *et al.*, 2019; Teklemariam *et al.*, 2019; Feroz *et al.*, 2021).

Healthcare providers suffer from a lack of confidence in contraceptive provision, particularly newer LARC methods, and require further training to ensure their advice is accurate and up to date. Whether due to this lack of knowledge, training or under-confidence, providers can be biased towards certain contraceptive methods or family planning in general, and their attitudes can act as a direct barrier to women's use of contraception. Previous research has found poor contraceptive information, knowledge and training among healthcare providers to be barriers to quality provision of family planning in many clinical settings, while simultaneously highlighting the benefits of improved training and access to contraceptive information for quality of care (Cordero *et al.*, 2019; Brown *et al.*, 2019; Stokholm Bækgaar *et al.*, 2021; Tessema *et al.*, 2017).

Use of long-acting reversible contraception is low, and hormonal contraception is often associated with negative side effects – a common concern for women worldwide (Cordero *et al.*, 2019; Silumbwe *et al.*, 2018; Chebet *et al*., 2015; Agyemang *et al.*, 2019; Kabagenyi *et al.*, 2014; Todd *et al.*, 2011; Saleem *et al.*, 2021). The male condom remains the most popular, accessible method of contraception, but reliance on self-reporting makes it difficult to know to what extent they are really used, and how consistently. Additionally, as effective use depends on male partners, reliance on male condoms can exacerbate men's autonomy within sexual relationships, and their ability to make family planning decisions.

HIV has heightened the popularity and use of the male condom as the only method to protect against both STI and pregnancy, often seen as the only available option by HIV positive women across the African continent (Mandell *et al.* 2021; Saleem *et al.*, 2021). There is concern that increased access to anti-retroviral treatment, and a reduced fear about contracting HIV, has led to increased risky sexual behaviour. Though some feel stigma around HIV and AIDS has diminished and encouraged these more casual attitudes to sex, many HIV positive women described feeling judged by healthcare providers and society in relation to childbearing and family planning, influencing their identity as women. HIV positive women from South Africa and Kenya felt that providers also limited their family planning choices, either discouraging their use of LARC methods, or encouraging use of injectables due to oral contraceptives potentially interacting with ART (Saleem *et al.*, 2021).

Socio-cultural and physical barriers to contraception use are further exacerbated by certain demographic factors – particularly education level, urban-rural dwelling, and financial status. Multiple systematic reviews and other studies have found these same demographic features, or a combination of them, to be highly influential over women's ability to access and use contraception across Africa – especially place of residence, education or employment level, financial position, as well as parity and loss of previous pregnancies (Adedini *et al.*, 2019; Lasong *et al.*, 2020; Wuni *et al.*, 2018; Blackstone *et al.*, 2017; Solanke, 2017; Appiah *et al.*, 2020; Ochako *et al.* 2017; Lakew *et al.*, 2013; Yakubu and Salisu, 2018). However, although they were presented separately in this chapter, these demographic factors are entwined within individual women's existence, and co-exist, overlap, and directly influence each other. There is a need to explore how these demographic, socio-cultural and health-service related factors are prioritised within individual women's lives, in order to determine their actual influence over use or non-use of family planning.

Review strengths and limitations

This narrative review of factors influencing contraceptive uptake, choice and use in Botswana specifically is one of the first to be conducted, and the most recent. Exploring research from the last decade provides a more up-to-date foundation for the qualitative part of this project, and a useful insight into the gaps in existing knowledge.

In terms of limitations, many of the individual studies were highly focused in terms of their population or study area – female condom, emergency contraception, adolescents, or healthcare providers as just some examples – which made it difficult at times to find overarching themes. Additionally, 28 of the 31 included studies were quantitative, 4 were mixed method with a relatively small qualitative component, and only 3 used exclusively qualitative methods. Consequently, while the review can indicate a range of factors which influence family planning decision-making and contraceptive use, it cannot conclude how these various factors coalesce in women's lives, and cannot provide much depth of explanation for women's experiences and decisions.

While various studies reference the usage or knowledge of contraceptive methods generally, there was little insight into women's attitudes and perceptions of specific individual methods – particularly modern contraceptives like the implant, injection, or IUD. It was therefore hard to determine whether, or how much, these attitudes influence women's decision-making and use.

Implications for future research

The socio-cultural factors found to have the highest influence on family planning uptake and use are all highly personal, and unique to an individual woman's upbringing, relationship, and cultural belief system. Consequently, more in-depth qualitative research is needed to explore the extent to which these various factors influence women's contraceptive decisions. This need for further qualitative research is supported by multiple studies from across the African continent, which have found that high contraceptive knowledge or method access do not necessarily equate with increased use or a reduced number of unplanned pregnancies, and consequently further insight into women's individual reasoning behind non-use of contraceptive methods is essential (Agyemang *et al.*, 2019; Ochako *et al.* 2015; Ndinda *et al.* 2017).

Botswana has experienced key positive developments over the last decade in terms of family planning – such as additional government investment, more inclusive policy, and increased availability of new methods. More current research is needed to understand how these changes have influenced Batswana women and providers, and offer more informed suggestions for both policy and clinical services.

Findings from this review highlight the range of socio-cultural, physical and medical elements that influence women's choice and use of family planning, but also represent the need for more qualitative research across these areas. The important themes that emerged in this analysis provide a strong foundation for project methodology to be built on, as described in the next chapter.

Chapter 3: Project methodology

3.1 Chapter overview

This chapter sets out the methodological approach of this project, as well as the specific research methods chosen to explore the research question, 'What is the need for, and what are the requirements of, an eHealth intervention to improve contraception choice, uptake, and use in Botswana?'

The first section begins with the rationale for choosing qualitative research methods, specifically semi-structured interviews, before presenting an overview of the transformative paradigm and how this approach was utilised specifically in this project.

I then analyse and reflect on my positionality and role as a researcher, and the elements of my identity that may have consciously or unconsciously influenced some aspect of study design, data collection, analysis, or conclusions. This section will explore various theoretical areas, including: African Feminism, and varying notions of gender and womanhood; white privilege and the concept of 'the field' in international research; and the emerging desire from indigenous researchers to decolonise global health research through various theoretical and practical frameworks. I will also describe how I, and this project, attempted to understand and address these important theoretical areas – both within the research process but also in my overall conduct while working in Botswana.

Finally, this section will describe the sampling, recruitment, and data collection methods for the three participant groups included in the project: healthcare providers and family planning policy stakeholders (n=14); Batswana women (n=22); and eHealth specialists (n=11). To best address the aims of the thesis, data from all three participant groups were then analysed in two distinct areas: 'Barriers and facilitators for the provision, uptake and use of family planning in Botswana' and 'The feasibility and potential for an eHealth intervention in family planning'.

3.2 Research question and objectives

While there has been some research into the factors influencing women's choice and use of contraception in Botswana, as represented by my narrative review and detailed in the previous chapter, there has been little research into how these elements coalesce in individual women's lives, or the extent to which each variant influences contraceptive decision-making and provision. Additionally, there has been no research into how a digital intervention in this field may assist Batswana women with making contraceptive decisions, seeking information about, or using family planning.

Based on these gaps in both the literature and previous research, I developed one overarching research question: What is the need for, and what are the requirements of, an eHealth intervention to improve contraception choice, uptake, and use in Botswana?

To answer this, the research will address the following specific objectives:

- Explore the barriers and facilitators to contraceptive choice, uptake and use in Botswana

- Consider the implications of Botswana's high HIV prevalence rates for family planning uptake and contraceptive provision

- Describe Botswana's eHealth infrastructure, and the challenges and successes of existing eHealth interventions

- Assess the potential for an eHealth intervention in the field of family planning from the perspective of eHealth specialists; policy and clinical experts in the field of SRH; and Batswana women

3.3 Qualitative approach

Why qualitative research?

Qualitative research encompasses a wide range of approaches and methods across various research disciplines, and allows for relatively broad interpretation and application by individual researchers (Ormston *et al.*, 2014).

Qualitative research is described as an action research, typically associated with specific data-generation methods such as observation or ethnography, semi-structured and in-depth interviews, and focus groups (Al-Busaidi, 2008; Ormston *et al.*, 2014). Due to these data collection methods, it is also associated with a large volume of rich data, made up of words or images rather than numbers (Ormston *et al.*, 2014). There are distinctive qualitative approaches for analysis and interpretation, and the kinds of output that derive from qualitative research. The qualitative process has been described as inductive in nature – where hypotheses and findings are commonly generated from analysis of the data, rather than stated at the outset (Silverman, 2011; Ormston *et al.*, 2014). However, in practice, most qualitative research uses a combination of deductive and inductive approaches – where certain themes are decided prior to data collection and provide a structure to topic guides for interviews or focus groups, but final thematic frameworks and findings are led by the data.

Qualitative research is predominantly driven by uncovering patterns of meaning, and "captures the complexity, mess and contradiction that characterises the real world" (Braun and Clarke, 2013). It aims to understand phenomena rather than quantify them by providing a set of approaches for answering questions around what happens, why it happens, and with what effects (Green and Thorogood, 2018). Consequently, qualitative research can be particularly useful when exploring sensitive or complex issues which are personal such as sexuality, violence, or drug use (Silverman, 2017).

Since challenges for healthcare practice and policy are recognised as "rooted in the social", qualitative methodology can provide a depth of understanding in the vast range of experiences, behaviours and practices that are relevant to healthcare – at a societal, clinical, and individual level (Green and Thorogood, 2018). Identifying these cultural and social factors that affect health care positively or negatively – as well as specific exploration of doctor-patient interaction or patients' perceptions of their own healthcare conditions – can be helpful in improving policy, quality of care and services, or understanding patient behaviour (Al-Busaidi, 2008).

Why semi-structured interviews?

For this project, I used semi-structured interviews with all participants. While it was important that certain topic areas were covered with all participants, I also wanted an element of flexibility within each interview to ensure I captured rich and detailed data around individual experiences and perspectives (Braun and Clarke, 2013). Semi-structured interviews allow the interviewee to determine the information provided about the topics raised, and the relative importance of each of them (Green and Thorogood, 2018). This was particularly essential for this project's exploration of the various barriers and facilitators to family planning use, and the extent or significance of their impact from participants' own perspective.

Interviews may be long, but the duration of these discussions is important for developing rapport with participants – building trust and helping them feel at ease with sharing personal information (Yeo *et al.*, 2014). Semi-structured interviews also allowed me to tailor my approach and questioning around the individual participant, further developing this rapport through discussion of their unique experiences, led by the information they had chosen to provide (Yeo *et al.*, 2014). This was of particular importance for me as a white researcher, interviewing in a country and culture different to my own, asking questions about sensitive sexual health topics.

Conducting individual interviews, rather than focus group discussions, offered a more private experience which was of high importance due to the sensitive nature of certain medical topics – such as HIV, personal contraceptive use and abortion – and the failings of healthcare providers, SRH institutions or government systems (Silverman, 2017). It was also easier to reassure participants of confidentiality in an individual interview setting, which I hoped would facilitate more candid insight into the various topics being discussed.

The interview process can be likened to a conversation, which can be therapeutic for participants (Allmark, 2009). There is a social and cultural taboo around discussing issues of sex and sexuality in Botswana, so the opportunity to discuss these issues openly, privately, and in-depth was unique – particularly for some of the Batswana women interviewed. After interviews, women would often describe a feeling of relief or freedom or discuss their own personal contraceptive options with me – as if I, and the interview process, had represented a safe space to disburden these concerns.

3.4 Research Paradigm

3.4.1 The transformative paradigm

This project, and my own belief system around knowledge and power structures, sit within the transformative paradigm (Mertens, 2007). The transformative paradigm “is rooted in the recognition that injustice and inequality are pervasive and the belief that research and evaluation are important tools for addressing these societal ills”, and views knowledge as socially formed, moulded by the knower’s individual experiences, personal characteristics, and external community (Jewiss, 2018).

Four key philosophical components need to be considered when deciding on a research paradigm. Ontology is concerned with the nature of reality, and how we can be sure something is ‘real’ at a conceptual level (Mertens, 2007). Ontologically, transformative researchers believe there are multiple realities, shaped and defined by social, political, cultural, economic, ethnic, racial, gender, age, and disability values. These elements coalesce in different levels of privilege, unearned and based explicitly on these characteristics, influencing both participants and researchers. Transformative researchers consequently need to adequately consider these societal values and privileges in “determining the reality that holds potential for social transformation and increased social justice” - the key aim of all transformative research (Mertens, 2007).

Epistemology, at a research level, is concerned about the relationship between the ‘knower’ (participant) and the person gaining that knowledge (researcher) (Mertens, 2007). As the transformative paradigm sees knowledge as entwined with society, history, and individual realities, it is essential for those seeking this knowledge to show deep respect for cultural nuances, and strong awareness of any power relations present. The relationship between researcher and the participant is dynamic and interactive (Jewiss, 2018; Mertens, 2007).

Methodology is concerned with the practical way this information or knowledge is obtained (Mertens, 2007). When it comes to methodology, transformative researchers believe that whichever specific method is chosen for the research - qualitative, quantitative, or mixed method - should allow problems and solutions to be defined by participants. The research design and practice, at both a theoretical and practical level, should: be adjusted to accommodate cultural complexity; explicitly address power issues; and recognise the potential for discrimination and oppression (Mertens, 2007).

Axiology is the ethical foundation underpinning the other elements, and the nature of what is ‘moral’ or ‘right’ (Mertens, 2007). Transformative axiology focused around regulatory ethics in research practice, is made up of three key elements: Respect, which is shown through critical examination of interactions within and across communities, and adhering to cultural norms; beneficence, which is defined by the integral promotion of human rights and equality; and justice, seen in the “explicit connection made between the process and outcomes of research in the furtherance of a social justice agenda” (Mertens, 2007).

3.4.2 Application of the transformative paradigm

Study design

The transformative paradigm’s underlying focus on empowering and amplifying marginalised voices was a key foundation for this project. In contrast to traditional post-positivist research, which promotes distance and objectivity between researcher and participant, the transformative paradigm sees the value in developing trusting relationships and collaboration with participants, seeing them as essential partners, and giving voice to the unique local knowledge held by these community members (Jewiss, 2018). In this project, participants were not equal collaborators in the way transformative research aspires to. However, it was particularly important to value each participant’s role as a potential user of this intervention, with the ability to offer unique knowledge and specific feedback around the feasibility and practicalities of designing an eHealth intervention, but also in defining the need for an intervention of this type at all.

Sampling strategy

I aspired to the transformative paradigm throughout all elements of study design, but particularly in sampling procedure and recruitment. While external international partners control most of the digital health space in Botswana, I deliberately interviewed local eHealth specialists who could provide historic and critical commentary on the challenges and failings of previous eHealth innovation, and the feasibility of an intervention in the field of SRH.

Batswana healthcare providers and policy stakeholders in family planning were sought for their ability to describe the challenges and successes around family planning promotion from their own experiences of counselling, and knowledge of the cultural sensitivities around sexual health more generally. They were also asked about the necessity and reality of designing an eHealth intervention in this space, and to describe key considerations for success from their perspective.

Batswana women were recruited from four extremely varied clinics, and from as broad a range of backgrounds as possible – in terms of geographic location, employment, education, parity, HIV status and age. They were encouraged to transparently discuss their own unique perceptions and experiences of family planning; the challenges faced in this area, both personally and those in their social networks. They were also asked whether or how an eHealth intervention can work with these needs and realities to promote effective and informed use of family planning, with the goal of promoting gender equality through reduced unplanned pregnancy.

Before I began conducting interviews, all consent forms, information sheets and topic guides were translated into Setswana – culturally, as well as practically in terms of language – to ensure that language was not a barrier to inclusion in the project, and avoid projecting my own western expectations and understanding of sexual health and contraception through the questions as far as possible. A Setswana-speaking RA attended each interview with women and healthcare providers – either to read these documents aloud or translate interview questions orally if necessary – so that literacy level and educative background did not prevent someone from contributing their experiences. While English is a national language in Botswana, this inclusion of written and oral Setswana aimed to encourage participants, particularly the Batswana women, to speak more freely, and explain terms in the most comfortable way to them. It also put the emphasis of the interviews on gaining the participant's insight and experiences, making 'me' as a white, British interviewer, subordinate to their knowledge.

Conduct within the Botswana team

The transformative paradigm goes deeper than how a researcher conducts themselves with participants, particularly when working in a culture different to their own (Jewiss, 2018). Consequently, success in this project required strong, cross-cultural collaboration with Batswana Research Assistants.

> *"When indigenous people become the researchers and not merely the researched, the activity of research is transformed. Questions are framed differently, priorities are ranked differently, problems are defined differently, people participate on different terms."* (Smith 1999, in Zavala, 2013 (p. 59))

As described in more detail later in this chapter, I completed multiple networking and observation trips to encourage strong working relationships, and gain local insight from the individuals I would be working with prior to designing or conducting the research project. Every topic guide was designed with several Batswana Research Assistants (RAs), who guided me on areas of questioning, specific wording and how to sensitively raise complex or potentially distressing topics. Throughout the process of transcription, translation, and analysis, I sought their input on societal nuances and idioms; specific language and phrasing used by participants; and checking my interpretation of findings to ensure cultural sensitivity and accuracy.

I am passionate about the need for these RAs to be fairly and publicly recognised as equal partners in this work in all outputs from this project, particularly through authorship on any research papers. To this end, I have already assisted the main RA on this project with a successful application to her own PhD programme; written numerous job and university character references; delivered training on the relevant software and qualitative research methods to promote more independent research; and provided the financial and technical resources, within my means, to make this possible.

3.5 Researcher characteristics and reflexivity

3.5.1 Positionality

Understanding positionality

‘Positionality’ both describes the world view of an individual, and the position they adopt about a research task - combined with its social and political context (Holmes 2020; Foote & Bartell 2011; Rowe 2014). These world views and approaches to research are moulded by ontological assumptions about the nature of social reality and what is knowable about the world; epistemological assumptions beliefs about the nature of knowledge; and assumptions about human nature and agency - the way we interact with our environment and relate to it (Holmes, 2020; Ormston *et al.*, 2014, Marsh *et al.*, 2018 and Grix, 2019).

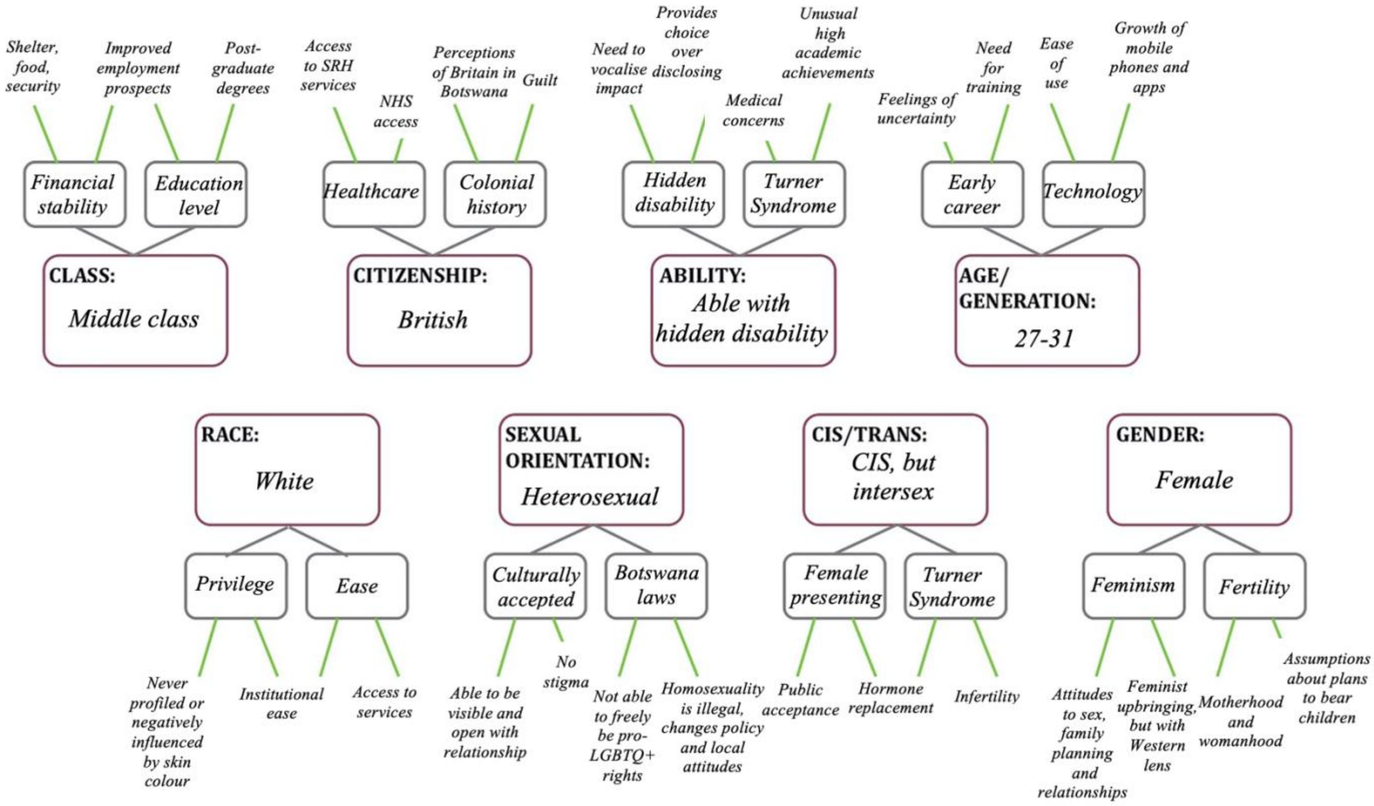
A person’s beliefs in these three areas are shaped by various aspects of their identity, including political views, religion, gender, age, sexuality, historical and geographical location, ethnicity, race, social class and (dis) abilities (Holmes, 2020; Marsh et al, 2018). It is essential for researchers to acknowledge and account for these views, values, and beliefs in relation to research design, conduct, and outputs (Holmes, 2020).

The concept of reflexivity centres around this notion that researchers should disclose themselves in their research, and attempt to understand their part in it, and potential influence on it (Cohen *et al.*, 2011; Holmes, 2020). This reflection is “both a necessary prerequisite and an ongoing process” for the researcher to be able to identify, construct, critique, and articulate their positionality (Holmes, 2020).

Social Identity Map

I produced a social identity map to help reflect on some of the key elements of my identity that may impact my belief systems, and consequently the research. This process is based on three tiers of analysis (Jacobson and Mustafa, 2019). The first tier involved deciding on terminology around key specific facets of my social identity, like race, class, age, and gender. The second tier involved going past these ‘labels’ and exploring how these positions impact my life, for example in terms of value systems or interpretations of events. In the third tier, I identified my emotional responses to these elements of my social identity. This completed Social Identity Map helped me identify and reflect on the aspects of my social identity that may impact the research interests, as well as how I approach research and participants; the questions I asked; and how I analysed and interpreted data (Jacobson and Mustafa, 2019).

Figure 3.1: Social Identity Map



Throughout my time in Botswana, and when at home conducting analysis and write-up, I wrote notes on my feelings, decisions, actions, and concerns. I discussed these issues at length with various colleagues, supervisors, and my personal social networks, at all stages analysing the potential impact of these elements on the research process or findings.

For example, I have Turner Syndrome – an intersex disorder related to an absence of the X chromosome – which causes short-stature, infertility, and various other medical complications. Taken separately, being infertile could have caused complicated reactions to my perception of gender and motherhood, but my attitude towards my infertility is shaped by my class, race, generation, and citizenship – which limit the potential negative effects.

Being white and middle class in Britain affords me physical and financial options in terms of starting a family, as well as cultural acceptance of using them. My infertility also inevitably shapes my personal experience and perceptions of contraception, which are further moulded by the country I reside in and relatively easy access to sexual health services, facilitated by my middle-class upbringing and financial position. While I need to reflect on the negative elements of infertility and my intersex variation, this process allows those emotions to be explored within the context of other demographic factors.

Exploring the most influential elements of these individual factors required deep reflection. Under the ‘Age/Generation’ category for example, I chose one more social impact (being early career) and one more practical implication (growing up alongside the ‘revolution’ of technology and social media) - but both had emotional implications which could have influenced my approach to this work. Additionally, I was away from home and my social networks for large periods of time during this research, which could have also had an impact. Discussing relationships with parents, partners, or friends, for example, may be more emotional for me personally when I was distanced from those same networks.

It is important to reflect on my relationship and knowledge of technology, ease of access to and use of eHealth interventions in my daily life, and how this may have influenced my approach to the project. I attempted to use the qualitative research as an opportunity to learn what ‘eHealth’ means to local participants, rather than projecting my own ideals of technology and intervention design. However, framing the entire project as ‘eHealth’ from the very beginning and discussing an ‘eHealth solution’ in and of itself was a conscious decision that could have impacted my line of questioning in interviews, and participants may have perceived it as the approach I had already decided to take. Additionally, my connection with the Contraceptive Choices website, and the decision to show Batswana women this website to gain feedback on specific content and design features as described later in this chapter, could have been seen as suggestive of the intervention I had decided to create, rather than information-gathering as it was intended to.

However, the two areas that required most conscious consideration and reflection for this project were notions of gender and womanhood, and issues of privilege and white fragility. This next section will explore the key challenges posed within these topics, as well as the approach taken to attempt and address them – both in terms of the research process, and my own individual reflective process.

3.5.2 Gender and 'womanhood'

Interpretation of African feminism

My ideas about femininity, womanhood and 'feminism' are rooted in my liberal, Western upbringing, and Botswanan women have a very different lived experience in terms of gender - moulded by culture, education, employment opportunity and societal expectations.

The African feminism movement has been shaped by African women's resistance to Western hegemony and its legacy within African culture, and emphasises the need to resist cultural imperialism by which the West undermines the philosophical ideologies and belief systems of African peoples. African feminists see white, Western feminisms as exclusionary of African women's experiences, and repressive to the cultural and societal nuances that make up (female) identity.

> *"The debates in many Western countries about essentialism, the female body, and radical feminism are not characteristic of the new African feminism. Rather the slowly emerging African feminism is distinctively heterosexual, pro-natal, and concerned with many "bread, butter, culture, and power" issues"* (Mikell, 1997)

In terms of the movement today, African feminism is deeply rooted in dismantling detrimental elements of patriarchal African cultures, acknowledging the specific unique challenges on the diaspora which women with the same race, class and sexual orientation, etcetera, in other parts of the world do not face (Kablay, 2017). African strands of feminism strive to create "a new, liberal, productive and self-reliant African woman within the heterogeneous cultures of Africa. Feminisms in Africa, ultimately, aim at modifying culture as it affects women in different societies." (Nhemachena *et al.*, 2007)

Sexual practice in Africa tends to be "private and considered private" (Ogundipe-Leslie, 1994 in Nkealah, 2016), and consequently African women have a different relationship with the concept of 'women's choice' and 'sexual freedom' to those projected by Western feminist ideals (Nkealah, 2016). Conversely, the miracle of birth and motherhood, as well as the complementary roles men and women play in reproduction and the continuity of humanity, are central to African feminism – with gender roles seen as asymmetrical, parallel, and autonomously linked to the ‘circle of life’, namely childbearing and motherhood (Bádéjo, 1998; Potasse and Yaya, 2021).

While I believe referencing African feminism in the context of my positionally and approach to ‘womanhood’ is of high importance, I do not purport that this explanation, or my own understanding, adequately captures the many complex debates about and within African feminism as a field, or the multitude of work from indigenous academics specialising in this area. I perceive African feminism as an umbrella term for an array of unique smaller feminisms, made up of many highly specific strains, and a large spectrum of unique geographical, cultural and socio-economic arguments which would require a much deeper exploration. ‘African feminism’, in this project, was used as a lens to assess how my own perspectives and beliefs around feminism and sexual liberality in the Botswana context may be lacking, as opposed to representing a specific stance I will be taking, or describing the individual branch of African Feminism that will be used as a theoretical foundation for this thesis.

The importance of motherhood

This cultural importance attached to bearing children is central to Batswana women’s identity, where motherhood, rather than marriage, is the indicator of social adulthood; even the formal term of address for all adult women, like Mrs or Ms, in Botswana is ‘Mma’ – which means ‘mother’ in Setswana (Van Allen, 2007). Responsibility for care giving, particularly caring for children, and women’s cultural identity as mothers, has produced a distinct gendered consciousness (Van Allen, 2007).

Women’s entrenched identity as ‘mothers’ influences the political, legal and social issues Batswana women protest. For example, women criticise men for not supporting their children – rather than inequality within their marriage or employment opportunities. They criticise government for not providing the health services they need as mothers, or their children need. Workers may phrase demands for higher wages in terms of needing to feed their children, or complain that their employers will not give them leave to go “home” to the village to take care of family needs (Van Allen, 2007).

Project implications

It was necessary, in terms of this research project, to consider family planning from the perspective of this strong maternal identity. Fear of contraception causing infertility, for example, is very salient in a society where the ability to bear children is of such cultural and personal importance. When discussing pregnancy intention, I used language like ‘spacing’ children, rather than the suggestion of ‘not having’ children until women themselves told me they had completed their family. I was careful to have questions about motherhood, parity, and pregnancy intention verified by Batswana RAs to ensure appropriateness, and guard against inadvertently projecting Western beliefs about family dynamics and childbearing into my language.

Due to my infertility, it was also essential to reflect on how the importance attached to pregnancy and childbirth in Botswana may have emotionally affected me. Research in the field of family planning had the potential to be complicated enough, but exploring fertility and sexual health in a culture where notions of womanhood and motherhood are so entwined could inevitably have become personally distressing.

There were various ways I attempted to acknowledge and address this. With participants, I was very conscious about my behaviour before, during and after interviews, and tried to ensure I was not projecting any of my own feelings or views about pregnancy and childbirth into the questions – whether in terms of language, phraseology, body-language, or facial expressions. Though I have been raised to be open about issues of sex, sexuality, and my own disorder, I was careful not to inform participants about my personal background in case they felt the need to censor or change their answers when discussing childbearing intentions or sexual histories.

With my colleagues in Botswana, it was difficult to know how much personal information to give related to Turner Syndrome – particularly those healthcare professionals who often have a better biological or medical understanding than I do. However, the individuals working closely on the project with me became my close colleagues and confidants for so many areas of the research process, that it felt almost problematic for them to not be aware of my disorder and infertility – especially as they were so entwined with the interview process and consequently the 'debriefing' or reflective process afterwards. I did decide to share this, and hoped that being transparent with such personal information would foster a stronger working relationship, and help my colleagues feel they could be honest with me in the same way – whether in terms of the research process and my interpretation of findings, or on issues of race and privilege as discussed later in this chapter.

The main research assistant on this project, Opelo Badubi, was 5 months pregnant while conducting interviews with women – almost 7 months pregnant by the time interviews finished. I knew discussing unwanted or unplanned pregnancies, or issues of abortion, may have been upsetting for women if talking to someone visibly pregnant, and care was taken to be sensitive, understanding and allow participants time if topics were distressing. In a handful of interviews, once Opelo checked that participants were comfortable interviewing in English, she would often quietly remove herself before the more sensitive or potentially difficult questions, and was open, empathetic, and non-judgemental in her approach.

Four participants were pregnant at the time of their interview, which enabled Opelo to build a personal, level of rapport. It is also generally seen as more appropriate and culturally acceptable to discuss issues of sex and family planning with someone who is pregnant or has children, as women often do not discuss family planning, even with their own family members, until the birth of their first child. I also believe it was reassuring for women to be discussing sexual health with another Batswana woman who has current, similar experience of utilising the same services and navigating the same cultural nuances – a feeling that almost validated the aims of the project for them in some way.

3.5.3 Privilege and white fragility

White researchers in 'the field'

Due to its rich physical resources and unique cultures, Africa has been seen as a "magnificent natural laboratory" for an array of medical, psychological, anthropological, botanical and racial research (Nhemachena *et al*., 2016; Tilley, 2011). During the colonial era, Jan Hofmeyr stated that "...in Africa as nowhere else, the factors which constitute these problems can be studied both in isolation and in varying degrees of complexity and inter-relationship, that in Africa we have a great laboratory in which to-day there are going on before our eyes experiments which put to test diverse social and political theories as to the relations between white and coloured races" (Tilley, 2011)

In extreme cases, this perception of Africa as a resource to be 'used' has caused indigenous people to suffer through violent, unethical, sometimes fatal research practices, where participants are seen as 'sub-human' whose consent is not necessary, and whose bodies are seen as tools for medical experimentation (Nhemachena *et al*., 2016; Tilley, 2011; Al Jazeera, 2020). Under Nazi rule, incarcerated African people were subjected to sterilisation and injections with smallpox, typhus, and tuberculosis (BBC News Africa, 2011; Nhemachena *et al*., 2016). In the early 1990s, during a severe meningitis outbreak in Kano State in Nigeria, Pfizer conducted a large-scale clinical trial to test a drug on children - without informing or gaining consent from their parents (BBC News, 2007; Nhemachena *et al*., 2016; Al Jazeera, 2020). Even as recently as 2014, during the West Africa Ebola outbreak, French, British and American laboratories collected over 250,000 blood samples without consent to help these Northern researchers create a vaccine (The Telegraph, 2019; Al Jazeera, 2020).

While formal European colonial rule in Africa had ended by 1980, contemporary scholars express concern over the "resilient invisible global matrix of power" which perpetuates colonial perceptions of Africa as inferior (Ndlovu-Gatsheni, 2013; Nhemachena *et al*., 2016). Research conducted among indigenous people in Africa, for example, has often not led to improved health outcomes for participants, but enriches the Northern researchers and organisations relying on their participation (Keikelame and Swartz, 2019). If the 'raw data' being extracted comes from indigenous people, and data collection is reliant on other indigenous researchers, there needs to be greater recognition of their essential involvement, rather than seeing African researchers as 'hunter gatherers' of information that is taken away to be analysed and processed in the Global North - where the 'real' research processes happen (Keikelame and Swartz, 2019; Nhemachena *et al*., 2016).

Acknowledging this history of colonial research was uncomfortable but necessary for completing transformative, locally driven research. While I am acutely aware of my privilege as a Northern researcher and cannot personally overhaul the system of colonial or imbalanced power dynamics in 'the field', I did attempt, as far as possible, to ensure that I did not use the team, or Botswana, as simply a resource of information to "take back" for my own benefit.

I included the Batswana team in every stage of study design, data collection, analysis and write-up, and will continue to throughout dissemination and publication of findings. I worked with my supervisor Chelsea Morroni (CM) to ensure that RAs were fairly compensated for the time they were working on my project, as well as organising additional payment for any work completed that fell outside their job description.

I was keen to ensure that RAs and all participants were aware of the real-world impact their contribution would have for the design and implementation of an eHealth intervention for family planning. The key aims of this project were to improve sexual health equity for Batswana women, ease pressure on Batswana healthcare providers, and include local technical knowledge to create sustainable Botswana-lead eHealth innovation. With these in mind, I believe the project was transformative and, if utilised effectively, findings could actively lead to improved health outcomes.

Privilege and white fragility

Racism is systemic and often utilised to advance white, Northern, agendas. Though individual whites may be 'against' racism, they still benefit from the "system of advantage based on race", where whiteness is more than a racial classification, but an identity imbued with political, legal, economic, and social privilege (Diangelo, 2019).

This notion can be uncomfortable for white individuals to accept.

> *"Given our racial insulation, coupled with misinformation, any suggestion that we are complicit in racism is a kind of unwelcome and insulting shock to the system. If, however, I understand racism as a system into which I was socialised, I can receive feedback on my problematic racial patterns as a helpful way to support my learning and growth"* (Diangelo, 2019)

Though it required conscious, consistent effort, I did attempt to adhere to this premise, and accept my 'whiteness' as a systemic privilege I will always benefit from, addressing and discussing issues of race without feeling personally offended, and listening to, rather than defending, myself in these conversations. Encouraging this open dialogue also provided practical insight into how international, white researchers could empower the local communities and individuals who make their project possible in ‘the field’. I sought regular commentary from my Batswana colleagues and friends on the way I was conducting myself, and how I was being perceived by participants and team-members.

Project implications: Decolonising the research process

Acknowledging the entrenched colonial practices around research in low- and middle-income countries, and specifically Sub-Saharan Africa, I sought practical insight into decolonising the research process for my own project. This can be approached through 5 key areas: power; trust; culture and cultural competence; respectful and legitimate research practice; and recognition of individual and communities’ assets (Keikelame and Swartz, 2019).

Power

Power is influenced by insider-outsider dynamics, and historic experiences of colonial practice. Emphasising the notion of ‘power with’ rather than ‘power over’ puts emphasis on equal power sharing, and recognises the importance of the knowledge the interviewee has, and the interviewer needs (Wilson and Neville, 2009; Redman-MacLaren, 2014).

Consciously addressing this power imbalance was essential with both participants, and the research team. I also attempted to empower my participants through building a good rapport which fostered a transparent, non-judgemental atmosphere, where participants were encouraged to lead discussions and share their personal experiences. Gaining insight and suggestions for a specific eHealth intervention may have fostered a sense of ownership with participants, where their insight could have practical implications for intervention design and content.

Trust

Trust is an essential foundation for good research practice but, for the reasons described previously, has been eroded by colonialism and apartheid, and there is a lack of trust in international researchers and scientists (Keikelame and Swartz, 2019). A "cultural revolution" in this space will require prioritising community engagement within the research process, and should be based on values of respect, reciprocity, collaboration, and co-operation (Liamputtong 2010; Moodley and Singh 2016; Keikelame and Swartz, 2019).

In terms of trust, one frustration I heard consistently from Batswana researchers was that international researchers can 'fly in and fly out' with their projects, leaving the local team feeling used or uninvolved once data has been collected and they have fulfilled their 'role'. This feedback is the reason I was so determined to provide the resources and training for local RAs to complete work independently, rather than seeing themselves as conducting 'my' project. I will ensure fair recognition in all publications, and ensure the collaboration that was required for this project is reflected in all research outputs. I will also return to Botswana once the PhD is complete to present findings to both the team and participants – to show the direct result of their work and input, and express my keen hope for their involvement and feedback on future dissemination and intervention design.

Culture and cultural competence

Cultural competence has various definitions, but generally relies on researchers both reflecting on and engaging with the culture they are researching, and accepting the significance of cultural beliefs, values, practices, and norms (Smith, 2008; Keikelame and Swartz, 2019).

> *"African researchers are the ones who can bring the true originality of the African traditional customs through their heritage…and heritage must not exclude culture, Ubuntu, nature and language"* (Congress of Traditional Leaders of South Africa, 12 May 2013 - Keikelame and Swartz, 2019).

Ubuntu refers to an African ethic of interdependence and relatedness, where personhood is understood in relational terms; 'A person is a person because of other people' (Keikelame and Swartz, 2019). Adhering to this cultural belief in Ubuntu can enhance trusting relationships and can also foster the notion of research *'with'* the researched and not of research *'on'* them (Khupe et al, 2016; Keikelame and Swartz, 2019).

I aspired to embrace the cultural uniqueness that made this project so interesting to complete, both within the research itself and in my personal conduct. As previously stated, topic guides were designed with local RAs to ensure appropriate cultural terminology around sex and contraception. I was also led by these RAs in how to conduct the research in a “Botswana” way, adhering as far as possible to their work patterns and locations; forms of transport; filing systems; phone and email style with participants; and filling out receipt books and paperwork. I also hoped that simple acts such as introducing myself in Setswana, or using local colloquial terms as much as possible – “loop” instead of IUD, or “combi” instead of bus, for example – showed a willingness to learn. I also ensured that what was being defined as ‘culturally important’ such as myths or misconceptions around contraceptive methods, came from Batswana participants, rather than me.

Respectful and legitimate research practice

To address the problematic history of research among indigenous people, there is a need for clearer guidelines for conducting culturally appropriate, ethical research practices (Mohindra, 2017). ‘Code of research ethics’ documents created by indigenous people - such as the one designed by the South African San Institute and leaders of three San communities of the !Xun, Khwe and !Khomani - can foster the key principles of respect; honesty; justice and fairness; and care, ensure the interests of those individuals being researched (Callaway 2017; Keikelame and Swartz, 2019).

As previously described, I worked closely with my Batswana colleagues, seeking their guidance and feedback on every aspect of the research process, and ensuring legitimate research conduct throughout. I was also guided by the Batswana team on how to ethically conduct research in this setting, with initial introductions often led by them. This led me to seek individual permission letters from all clinics involved in the project, which involved strong networking with matrons or clinic management prior to any data collection – something considered good research practice in Botswana.

Appendices 3A to 3F show the carefully designed information sheets, consent forms and topic guides used in this project, which were approved by both international and local research ethics boards. All project documentation was translated and checked by multiple different Setswana speakers, and offered orally if required.

Recognition of individual and communities' assets

Finally, decolonising the research process relies on recognising the individual and community health assets: any factors or resources which enhance the ability of individuals, communities, and populations to maintain and sustain health and well-being and assist in reducing health inequalities – which can operate at the individual, family, community, and societal levels (Whiting *et al.*, 2012)

Recognising and utilising these assets helps the researcher avoid problematising indigenous people, instead encouraging a focus on their strengths, capacities, and resilience (Sweet *et al.*, 2014). This in turn can empower individuals, communities, and societies to engage more proactively with issues of social justice (Vaandrager and Kennedy, 2017; Keikelame and Swartz, 2019).

This project was designed to allow Batswana women, healthcare providers and policy specialists in both family planning and eHealth to define key challenges from their own experiences, but equally their suggestions for a positive eHealth solution to these barriers. I hope the findings from this project will contribute to the development of a locally driven intervention that empowers Batswana women to make more informed decisions regarding their sexual health - made more sustainable due to the utilisation of Botswana-led eHealth innovation, and early inclusion of Batswana healthcare professionals and policy specialists.

In Chapter 9, I will reflect more my limitations and successes in 'decolonising the research process', as well as the strengths and limitations of this methodology.

3.6 Research ethics

Ethical approval

Ethical approval was obtained from UCL's Research Ethics Committee (Reference 11863/001).

In Botswana, ethical approval was obtained from:

- Health Research and Development Committee at the Ministry of Health (Reference: HPDME 13/18/1)
- Ethical Research Committee at Princess Marina Hospital (PMH), Gaborone's main referral hospital (Reference: PMH 5/79(405-1-2018))
- Institutional Review Boards at the University of Botswana (UB) (Reference: UBR/RES/IRB/BIO/023) and the Botswana-UPenn partnership, based at UB (Reference: 826919)

Institutional authorisations

In addition to approval from the above review boards, I sought individual permission letters from each institution involved in the study. I also organised meetings with relevant senior personnel at each institution to introduce myself and the team; present my research aims and study design; and allow an opportunity for questions, input or concerns prior to research.

Permission letters were gained from the Princess Marina Hospital (PMH); the Infectious Diseases Care Clinic (IDCC) at PMH; the District Health Management Team (DHMT), which operates multiple clinics across the country; Botswana Family Welfare Association (BOFWA), the largest NGO providing family planning and SRH services; and the University of Botswana. All permission letters and correspondence prior to study commencement can be seen in Appendix 3A.

Study site networking and observation

Before commencing with interviews, I conducted two trips (totalling 12 weeks) to Botswana. These trips were exclusively focused on observation of clinical practice around family planning, and building strong relationships with the colleagues who would be working with me on the project from the Botswana Sexual and Reproductive Health Initiative (BSRHI), founded and run by my in-country supervisor Chelsea Morroni (CM).

Throughout study design, data collection and analysis, I was eager to show respect for and utilise the team's insight into Botswana's socio-cultural and political context, as well as their extensive experience of conducting qualitative research projects in the field of sexual health in Botswana. Consequently, during my first trip I conducted informal group discussions with Research Assistants to provide an overview of key study aims and objectives, as well as discuss sampling and recruitment strategy for the study - particularly how to ensure inclusivity within the various participant groups.

I also spent these trips observing Botswana's healthcare infrastructure, particularly family planning clinics, and shadowed individual contraceptive counselling sessions led by both international and local medical professionals. Observation provided insight into various important aspects of family planning: the language being used in consultations; the misconceptions and challenges being raised, and both women and healthcare providers' understanding of the various contraceptive methods. Spending time in the clinical settings also gave me an insight into some of the more practical elements of contraceptive provision, such as the physical clinical spaces providers were working in; method availability in clinics, hospitals, and pharmacies; medical equipment and procedure; and registration processes and paperwork.

Observation also:

> "*…allows the researcher to record the mundane and unremarkable (to participants) features of everyday life that interviewees might not feel were worth commenting on, and the context within which they occur"* (Green and Thorogood, 2018).

A Batswana provider, for example, asked to describe a typical family planning counselling session in an interview setting may overlook key elements of the process that have become entrenched in their daily practice - such as the detailed registration paperwork required for each patient, the specific medical equipment used, or information about the clinical space they were working. Shadowing real interactions between patients and providers also enabled me to learn the more colloquial terminology and culturally appropriate language around family planning, which I could then use with participants.

This networking with colleagues and observation of relevant clinical and social practices was used to shape topic guides, and inform my strategy for recruitment, data collection and thematic analysis –described in greater detail later in this chapter.

Though certain elements of this project had been proposed as part of the scholarship I applied to - namely the connection with Contraception Choices and focus on exploring ‘eHealth’ - there was a lot of flexibility to amend or focus the specific research question, aims and methodology as the project progressed. While the initial strategy was to design then pilot a specific mHealth solution through targeted workshops and user-testing, preliminary networking trips and initial discussions highlighted the need to refocus the project aims on seeking deep, qualitative insight into the clinical, social and practical experiences Batswana women face. Through these interviews I realised that the initial plan to adapt a website into an mHealth solution would not adequately explore the range of technology access, or geographical and socio-cultural challenges that could prevent women using this intervention. Understanding the practical and cultural barriers to family planning use as perceived by Botswana women and healthcare providers first would enable more tailored, sustainable intervention recommendations, and changed the direction of the project to a more qualitative, preliminary assessment of the need for this intervention at all, and the desired design and content as described by potential users. However, my connection with Contraception Choices, focus on eHealth and many initial project aims remained, the limitations of which are discussed further in Chapter 9.

3.7 Sampling, recruitment, and data collection methods

This section will describe the sampling, recruitment, and data collection methods for the three participant groups included in the project: healthcare providers and family planning policy stakeholders; Batswana women; and eHealth specialists. To best address the aims of the thesis, data from all three participant groups was then analysed in two distinct areas: ‘Barriers and facilitators for the provision, uptake and use of family planning in Botswana’ and ‘The feasibility, and potential for an eHealth intervention in family planning’.

3.7.1 Healthcare providers and family planning policy stakeholders

Sampling strategy

Purposive sampling was used to identify healthcare providers with experience in providing family planning and sexual reproductive health (SRH) services. Participants were all working in clinical positions in SRH services at the time of their interview, and directly responsible for providing family planning counselling, and administering contraception methods, in their role. Purposive sampling was also used to identify family planning stakeholders, with senior and highly focused experience in policy and planning around contraceptive provision. While most had worked as healthcare providers previously in their career, all policy stakeholders in this study were actively working in management positions within dedicated family planning services at the time of their interview.

Recruitment

My supervisor CM and I developed a list of individuals with suitable job roles and experience. Eligible individuals were approached individually via email or text message. Initial contact was made by me and then followed up by CM, due to her previous connections with participants through her positions as head of BSRHI, and liaison for family planning services at the Ministry of Health.

The recruitment message offered information about the general PhD project; why they had been approached to take part; and how their input would be used. If they agreed to take part, I asked participants to choose any convenient time and location. The day before or morning of the interview, I contacted each participant to make sure the timing was still convenient. While a few interviews were postponed or rearranged at this point, some numerous times, every participant who had agreed to take part initially was eventually interviewed.

Data collection

Semi-structured interviews were conducted in a quiet space chosen by the participant, at a time convenient to them. Healthcare providers were all interviewed in a private area within their clinical practice, either an empty office or ward, while all policy stakeholders opted to be interviewed in their private offices. Research assistant Opelo Badubi (OB) was in attendance for all interviews in case providers wished to speak Setswana or required any translation – an option that did not end up being utilised by participants.

Before commencing each interview, I provided an information sheet for each participant to read and keep (see Appendix 3B). I then gave each participant the opportunity to ask any questions or raise any concerns, before obtaining written consent through a separate signed form (see Appendix 3C). While the consent form explained that interviews will be audio recorded for accuracy, I also gained verbal consent to begin recording. Interviews were recorded on two devices – one traditional digital recorder, and on my iPhone using the encrypted iTalk app for back up.

Topic guides used for interviews with healthcare providers and policy stakeholders varied slightly (See Appendix 3D and 3E). Both covered the main myths, misconceptions, and concerns about contraception, as well as provider training, and the benefits or challenges associated with an eHealth intervention in the field of family planning. However, healthcare providers were also asked about the more clinical aspects of family planning provision, while key stakeholders were asked about higher-level issues of funding, policy development and government strategy. These topic guides were thoroughly vetted by supervisors and local research assistants before use to ensure questions were culturally appropriate, and comprehensive.

All interviews were conducted exclusively in English, ranging in length from 45 to 90 minutes but most lasted around 60 minutes. Data saturation was reached after 14 interviews – ten with healthcare providers, and an additional four with policy stakeholders. I decided that I had reached saturation when anecdotes became highly overlapped, and no distinct new themes had emerged for three or four consecutive interviews. Healthcare providers were compensated 50BWP for their time and transport costs associated with the interviews.

3.7.2 Batswana women

Sampling strategy

A combination of purposive and quota sampling was used to recruit women of reproductive age, who were consequently potential users of contraception with current experiences in the area. Quota sampling was used to ensure the sample was as diverse as possible, including a variety of ages, employment status, education levels, socio-economic backgrounds, and HIV status.

Women were recruited from four clinics: Botswana Family Welfare Association (BOFWA), the Infectious Disease Care Clinic (IDCC) at Princess Marina Hospital, the sexual reproductive health service at Old Naledi, and Nkoyaphiri. These clinics represent the disparity felt within Gaborone in terms of healthcare infrastructure, and assist individuals from high and low-income backgrounds, both in urban and semi-urban districts, which assisted with ensuring variety within the findings.

Recruitment

Eligible women were approached by a Research Assistant in the waiting rooms of the four clinical settings described above, most commonly after registration but before their appointment began. We worked closely with the healthcare providers at each clinic to ensure participation would not impact the timing of women's appointments, as this may have deterred women from participating.

Women were given a summary of the research project in either English or Setswana, and asked if they would be interested in further information. At each clinical location, management allocated a private, quiet space where interviews could take place: at two locations, this was a separate porta-cabin; in one location this was an empty ward, and in the final location I was provided with an empty office to conduct interviews. If women expressed interest, the RA would bring them to the private space, where I waited, and we then offered more detail about the aims of the project and what would be expected, asked a few questions about their background and demographics, and offered the chance to raise any concerns or questions.

Data collection

Once women had understood and agreed to participate, they were provided with an information sheet in either English or Setswana (see Appendix 3F), which we talked through point by point. This allowed me or the RA to strongly reiterate the that if at any point the content or duration of the interview became overwhelming, they were in control of what they told me and could stop or take a break. We also stressed the anonymity of these interviews and any outputs from this project, as well as which language would be most comfortable. The majority of interviews were conducted in English with minimal amounts of Setswana, with only two out of 22 interviews conducted predominantly in Setswana, facilitated by a Setswana-speaking RA. Once we had gone through the information sheet, which women were encouraged to keep, we provided a consent form in either English or Setswana (See Appendix 3G), which was orally discussed point by point and signed. Although the information sheet and consent form said interviews would be audio-recorded, I also gained verbal permission before recording.

Interviews were semi-structured, and followed a relatively broad topic guide (See Appendix 3H), with areas of questioning informed by the narrative review of factors influencing contraception choice, uptake and use described in the previous chapter. Topic guides were designed with close input from multiple Batswana RAs. Their insight was essential in ensuring cultural appropriateness of both content and language - for example, sensitive phrasing of demographic questions around marriage and age, or using local terms for contraceptive methods, like ‘loop’ instead of IUCD. RAs also expressed the importance of rephrasing certain questions to allow women the option of discussing more personal elements in the third person first. For example, “Do you think HIV changes the way women decide on their family planning method?” or “Have you heard of family planning causing any problems in relationships?”, and then probing based on women’s responses – which were mostly very transparent and personal.

The topic guide was structured to ease women into the interview process. Interviews started with demographic or knowledge-based questions, then transitioned through more sensitive questions around individual contraceptive histories and barriers to family planning use. Finally, participants were asked specific questions around their use of technology and digital health interventions, as well as specific feedback around the design and content of Botswana-based family planning intervention in the field of eHealth. I used my own laptop to show all women elements of the Contraceptive Choices website, and gain feedback on the usefulness and appropriateness of various elements, such as using videos to provide contraceptive information; a tailored, interactive decision-making tool with specific medical and personal questions; and information about the side effects and effectiveness of each method.

All interviews were audio recorded and lasted for 90 minutes on average – ranging from 50 minutes to 2 hours. After the interview ended, I asked if the participant needed any further information or support from me and offered the chance to ask any questions. I also highlighted the section on the information sheet which contained my contact information, as well as the list of organisations and NGOs that women could approach for support in terms of HIV, SRH, or domestic abuse.

Data saturation was reached after 22 interviews. While it was harder to decide when saturation had been reached in this study due to the personal nature of the anecdotes and questions, the broad themes remained largely unchanged for the final few interviews. Women were compensated 100BWP for their time and transport costs associated with the interviews.

3.7.3 eHealth specialists

Sampling strategy

eHealth is a small field in Botswana, with very limited numbers of people with expertise in the area – particularly those who have been educated and employed in Botswana long enough to be deemed a local ‘expert’. Due to this, my inclusion criteria were broad: participants must be working in an eHealth specific role in Botswana at the time of their interview and have worked in Botswana for at least a year. This was used to exclude participants who had recently moved to the country, or were only there temporarily, who would not have adequate understanding of the cultural or physical infrastructure to discuss limitations or make recommendations.

‘eHealth’ in Botswana incorporates many other specific terms, which was taken into consideration when assessing whether a participant could be deemed an ‘eHealth’ specialist. For example, experts from a ‘Health Informatics’ department and ‘TeleHealth’ were included; most individual job titles did not feature the word eHealth specifically.

I used a combination of snowball and purposive sampling to recruit eHealth specialists from a range of public and private institutions, with job roles ranging in seniority and area. The final sample included: technical specialists in system maintenance; program managers and researchers from various nation-wide eHealth projects; managers at two private IT research and innovation companies; eHealth academics, ranging from PhD students to senior researchers and department managers; and government representatives working exclusively in eHealth innovation.

Recruitment

Eligible individuals were approached individually via email, the content of which was approved by a local eHealth researcher to ensure appropriateness. The recruitment message provided an overview of the overall PhD project; why their eHealth expertise was so important to the project; and how their input would eventually be used. I provided my local phone number, and many participants either replied by text or call rather than email.

After they had agreed to take part, I asked participants to choose any convenient time and location. The day before or morning of the interview, depending on the interview time, I contacted each participant to make sure it was still convenient. While a few interviews were postponed at this point, some numerous times, every participant who had agreed to take part initially was eventually interviewed.

Data collection

All eHealth specialists chose to be interviewed at their place of work, and all interviews were conducted in a quiet space chosen by the participant. In all but two cases, this was the participant's private office. In the two cases where office space was shared, one was moved to a nearby private room, and one participant felt comfortable talking in the corner of the shared room as nobody was in direct earshot.

Before commencing each interview, I provided an information sheet for each participant to read and keep (See Appendix 3I). I then gave each participant the opportunity to ask any questions or raise any concerns, before obtaining written consent through a separate signed form (see Appendix 3J) While the consent form explained that interviews will be audio recorded for accuracy, I then also gained verbal consent to begin recording. Interviews were recorded on two devices – one traditional digital recorder, and on my iPhone using the encrypted iTalk app for back up.

Interviews were semi-structured. I used a topic guide (See Appendix 3K) which was separated into various sections: participant background and existing interventions/research; readiness, successes, and challenges for eHealth in Botswana; and the potential for eHealth intervention in field of FP/SRH. This topic guide was thoroughly vetted before use to ensure questions were culturally appropriate, and also exhaustive. I used probes, or re-wording of questions, to clarify my understanding of their answers, or to gain more depth to the comment or anecdote than had been given initially.

All interviews were conducted exclusively in English. Interviews ranged in length from 17 minutes to 90 minutes. However, these were the two extremes, with 9 of the 11 interviews lasting between approximately 30 and 40 minutes. Data saturation was reached after 11 interviews. I decided that I had reached saturation when anecdotes became highly overlapped, and no distinct new themes had emerged for 3 or 4 consecutive interviews.

3.8 Data processing and analysis

Data management

Data was recorded on two devices – one traditional digital recorder, which was kept in a locked filing cabinet between interviews, and on my password-protected iPhone using the encrypted iTalk app for back-up. Participant data was kept confidential and stored in accordance with the data protection act (1998) and GDPR (2018). copies of the signed consent forms were stored in a locked filing cabinet within a locked office. Non-anonymised recordings and transcripts were held in an encrypted password-protected folder on my password-protected computer. All project paperwork was transported back from Botswana with me in a locked transportable filing system, and then transferred to a locked draw of my desk in my locked home office – where I was working due to the Covid-19 pandemic.

Transcription and translation

Interviews with eHealth specialists (n=11) and family planning policy stakeholders (n=4), conducted exclusively in English, were transcribed verbatim either by a professional transcribing company, or myself. Interviews with healthcare providers (n = 10) were transcribed verbatim by Rebecca Howett (RH) and Opelo Badubi (OB) - members of the BSRHI team.

Interviews with women (n=22) were transcribed verbatim in either Setswana or English, and then translated into English by Neo Moshashane (NM) and Kehumile Ramontshonyana (KR), members of the BSRHI team.

Accuracy was checked by listening to original audio recordings alongside a close reading of all individual transcripts. Once approved, all transcripts were imported in NVivo V12 for data management.

Thematic analysis

I then conducted thematic analysis - a method of identifying, analysing and reporting patterns (themes) within data (Braun and Clarke, 2013). I took both a deductive and inductive approach to analysis. Inductive analysis involved coding data without trying to fit it into a strict pre-existing coding frame, or without deciding my findings in relation to the themes that previous research on the topic might have identified (Braun and Clarke, 2013). However, I had designed topic guides and areas of questioning prior to interviews and analysis, which inevitably influenced initial coding themes, making the process more deductive.

Within NVivo I separated transcripts into the three population groups: healthcare providers and family planning stakeholders; Batswana women; and eHealth specialists. Within these groups, each transcript was coded thematically, line-by-line. After each set of two or three interviews had been coded, I reassessed and updated the broader thematic framework in line with any emergent findings. Once all transcripts had been coded, I then identified both common and divergent themes, and decided on the final thematic structure of parent and sub themes. Throughout the coding process, I produced multiple PowerPoint presentations for my supervisory team - to present key findings and quotes, discuss the coding structure, and decide themes and subthemes. I also presented the final thematic frameworks for both studies to members of the BSRHI team, to discuss my cultural interpretations and gain their insight as collaborative interviewers, transcribers, and translators of the interviews.

3.9 Structure of findings

The analysis and findings from this project are split into two distinct areas: “Barriers and facilitators for the provision, uptake and use of family planning in Botswana” and “The need, feasibility, and potential for an eHealth intervention in family planning”, with separate key objectives detailed below. These headings also reflect how findings will be structured in the results chapters of this thesis.

3.9.1 Barriers and facilitators for the provision, uptake and use of family planning in Botswana

Key objectives

- Describe SRH and family planning (FP) services, including contraceptive availability and the format of FP counselling in Botswana
- Explore the social, physical, and cultural challenges for contraception provision in Botswana - both in terms of policy and planning, and at a clinical level

- Determine the depth and quality of provider training and knowledge in the field of family planning in Botswana, from the perspective of both policy stakeholders and healthcare providers themselves
- Determine the sources, quality and depth of women's education and knowledge about family planning, contraception, and sexual health
- Explore women's medical, physical, and socio-cultural concerns around contraception, including any myths and misconceptions
- Explore the barriers and facilitators for women's choice, uptake and use of family planning in Botswana
- Explore the influence of Botswana's HIV epidemic and high HIV prevalence on women's use of contraception, and clinical and policy approaches to family planning provision

3.9.2 The feasibility and potential for an eHealth intervention in family planning in Botswana

Key objectives

- Describe the landscape for eHealth in Botswana, and the barriers and facilitators for existing eHealth interventions
- Describe Botswana's eHealth strategy, and implications for policy and future intervention design
- Determine key socio-cultural, economic, and physical challenges for eHealth innovation in Botswana, and gain insight into how to adequately consider, and address, these potential barriers
- Discuss the practicalities of designing and implementing an eHealth intervention in the field of family planning
- Discuss the feasibility and acceptability of an eHealth intervention in the field of family planning from the perspective of both clinical and policy stakeholders
- Discuss the need for, and requirements of, of an eHealth intervention in the field of family planning from the perspective of potential users, and key stakeholders in both eHealth and SRH

3.9.3 Included study sites and participant characteristics

Study sites

This project included semi-structured interviews with healthcare providers (n=10), key policy stakeholders in family planning (n=4), Batswana women (n=22) and individuals with expertise in eHealth and ICT (referred to as 'eHealth specialists', n=11).

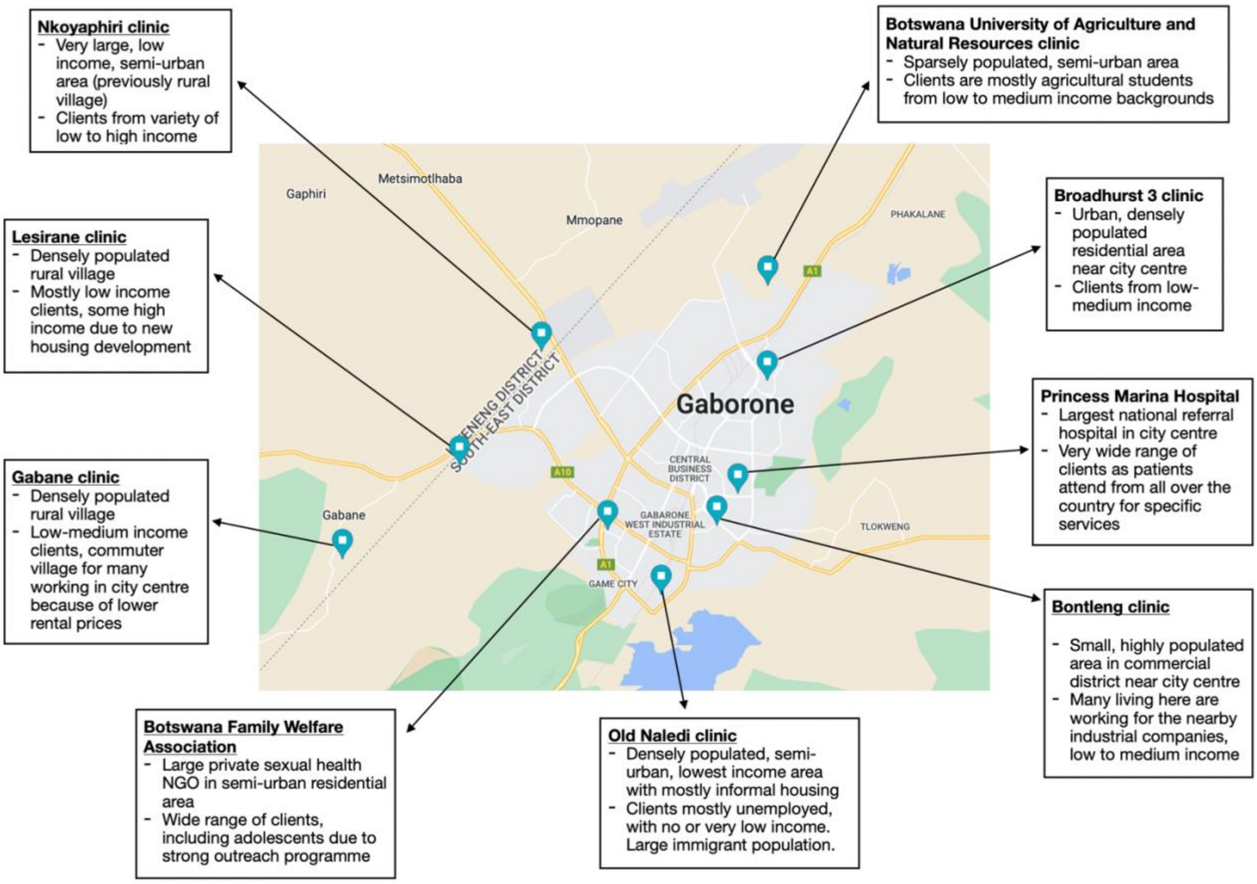
Table 3.1: Included organisations and participant numbers

Organisation name	Organisation type	Location	Recruited
Ministry of Health and Wellness (MOH)	Government department responsible for health services and policy	Urban, government offices in city centre	Stakeholders (n=1) eHealth specialists (n=2)
Old Naledi clinic	Public, medium-sized local hospital	Semi-urban, lowest income area, surrounded by low income, informal housing	Providers (n=1) Women (n = 5)
Broadhust 3 clinic	Public out-patient clinic w/ maternity	Urban, low-medium income residential area close to city centre	Providers (n=1)
Bontleng clinic	Public out-patient clinic w/ maternity	Urban, densely populated commercial district	Providers (n=1)
Lesirane clinic	Public out-patient clinic w/ maternity	Rural, densely populated village with large agricultural community	Providers (n=1)
Gabane clinic	Public out-patient clinic w/o maternity	Rural, densely populated village with large agricultural community	Providers (n=1)
Nkoyaphiri clinic	Public out-patient clinic w/o maternity	Very large, semi-urban, low economic area. Previously classified as a village but has grown exponentially both in size and population	Women (n=7)
Botswana University	Public university (medical centre and dedicated eHealth research unit)	Urban, city centre location	eHealth specialists (n=4)

Botswana University of Agriculture and Natural Resources (BUAN)	Public university specialising in agricultural courses	Semi-urban, sparsely populated area mostly serving students and staff from the university	Providers (n=1)
Princess Marina Hospital (PMH)	Botswana's largest public referral hospital	Urban, large referral hospital serving wide range of clients from across the country.	Providers (n=2) Stakeholders (n=1) Women (n = 5)
Botswana Family Welfare Association (BOFWA)	Private NGO sexual health clinic, affiliated with IPPF and outreach programmes with sex workers, nominal fees for some services, focus on youth-friendly services	Semi-urban, residential area with mix of low to high income housing.	Providers (n=1) Stakeholders (n=2) Women (n= 5)
Botswana-UPenn partnership	Health Informatics department for University of Pennsylvania, international programme/team exploring digital interventions and technology	Urban, offices based centrally at the University of Botswana	eHealth specialists (n=3)
Botswana Innovation Hub (BIH)	Science and technology park led by Ministry of Tertiary Education Research Science and Technology	Urban, central location	eHealth specialist (n=1)
Botswana Institute for Technology Research and Innovation (BITRI)	Research parastatal for Ministry of Tertiary Education, Research, Science and Technology	Urban, central location	eHealth specialist (n=1)

Clinical sites were selected from urban, semi-urban and rural areas of Gaborone, and represented a range of socio-economic areas. This socio-economic information refers to where the clinics are located, rather than the individual clients who can attend any chosen clinic in Gaborone. A map of included study sites and their clinical, socio-economic and geographical information can be seen in Figure 3.2.

Figure 3.2: Map of included clinical sites



Nkoyaphiri clinic
- Very large, low income, semi-urban area (previously rural village)
- Clients from variety of low to high income

Botswana University of Agriculture and Natural Resources clinic
- Sparsely populated, semi-urban area
- Clients are mostly agricultural students from low to medium income backgrounds

Lesirane clinic
- Densely populated rural village
- Mostly low income clients, some high income due to new housing development

Broadhurst 3 clinic
- Urban, densely populated residential area near city centre
- Clients from low-medium income

Princess Marina Hospital
- Largest national referral hospital in city centre
- Very wide range of clients as patients attend from all over the country for specific services

Gabane clinic
- Densely populated rural village
- Low-medium income clients, commuter village for many working in city centre because of lower rental prices

Bontleng clinic
- Small, highly populated area in commercial district near city centre
- Many living here are working for the nearby industrial companies, low to medium income

Botswana Family Welfare Association
- Large private sexual health NGO in semi-urban residential area
- Wide range of clients, including adolescents due to strong outreach programme

Old Naledi clinic
- Densely populated, semi-urban, lowest income area with mostly informal housing
- Clients mostly unemployed, with no or very low income. Large immigrant population.

Gaborone is a very diverse city. Patients are not mandated to go to their local or a specific clinic and women will travel a long way for services – related to contraceptive method availability, where they work, transport options etc. Consequently, while the map above highlights the variety of clients, geographical and financial areas covered by the included clinical sites, socio-economic status of clients cannot be entirely based on the clinic they attend.

Characteristics of healthcare providers and family planning policy specialists

Confidentiality is extremely important for all participants in this study, for varying personal and professional reasons, and consequently careful attention has been made to ensure anonymity is protected. For healthcare providers, there were often only one or two trained healthcare providers at each clinical site who would be eligible for inclusion in this study.

Consequently, to ensure professional anonymity, participants' specific job roles will not be linked with the clinic they represent at any point during this thesis or associated publications.

As described earlier in this chapter, I ensured sample diversity through careful choice of recruitment sites as well as ensuring that policy stakeholders and healthcare providers represented a range of clinical experience and seniority.

The duration of clinical service among healthcare providers ranged widely; two providers had around 5 years of experience, five had between 10 and approximately 15 years, and three had over 20 years. Due to the high level of seniority associated with their positions, the four family planning policy specialists had a longer duration of experience - ranging from 20 years to over 30 years of clinical service. 13 of the healthcare providers and family planning policy specialists were female; only one male was included.

Specific job roles also varied, though at the time of their interview all included participants were directly involved with family planning provision, either in clinical services or at national advocacy or management level. All providers and family planning policy specialists were working, or had worked in, clinical positions as a ward nurse or midwife in various public clinics in Gaborone, and many providers with longer duration of service had worked in other cities or more rural areas in northern Botswana. Three providers had background as a counsellor, either in a University setting or on post-abortion wards. Additionally, participants represented two levels of the Ministry of Health's family planning training programme - as Trainer of Trainers, who directly educate healthcare providers on contraception provision, and Master Trainers, who co-ordinate this training.

Characteristics of Batswana women

I purposively sampled women to cover a range of other key demographic areas – namely age, HIV status, education level. The characteristics of all Batswana women included in the study can be seen in Table 3.2 below.

Table 3.2 Characteristics of women included in study

Variable (at time of interview)	**Number of participants**
Age	
18-24	5
25-30	6
31-35	5
36-40	4
40-44	2
Relationship Status	
Single	4
In a relationship	10
In a relationship and co-habiting	5
Engaged/Married	2
Widowed	1
HIV Status	
Positive	9
Negative	13
Education level	
Primary	1
Secondary	12
Tertiary (University)	9
Employment Status	
Student	5
Employed	8
Self-employed/Freelance	3
Unemployed	6
Location	
Urban	5
Semi-urban	10
Rural	7
Religion	
Christian (church-attending)	20
Religious (non-practicing)	2

Contraception use	
No contraception (currently pregnant)	4
Male condom	9
Depo-Provera	2
Implant	5
IUCD (‘the loop’)	2
Number of children	
0	5
1	6
2	3
3	5
4+	3
Current pregnancy	
Pregnant (with first child)	1
Pregnant (not first child)	3
Not pregnant	18

Women’s employment histories included self-employed caterers; custodial and cleaning staff; security guards and security management; a Public Health attendant; a Public Officer with the Office of the President; and an interior designer/architect. The sample also included multiple women who were unemployed or looking for work (n=6) or still pursuing tertiary education (n=5) - including undergraduate degrees in Psychology, Health Information Management, and Physiotherapy.

I hoped that including this spectrum of ages, HIV-status, parity, employment and education background, and relationship status would offer a range of perspectives on sexual health services and contraceptive use, but also use of technology and the potential for eHealth. It was expected, for example, that a university student recruited from the private SRH clinic may have a more positive attitude towards both modern contraceptives and accessing information on a mobile phone, so including the range of clinics, and as many different participants as possible, would enable stronger recommendations. I will discuss the strengths and limitations of this sample further in Chapter 9.

Barriers and facilitators for the provision, uptake and use of family planning in Botswana (Chapters 4, 5 and 6)

Section overview: Barriers and facilitators to the provision, uptake, and use of contraception in Botswana

This next section of the thesis explores the barriers and facilitators to the provision, uptake, and use of contraception in Botswana, detailing the findings from semi-structured interviews with Batswana women (n=22) and healthcare providers and policy stakeholders in family planning (n=14). Three chapters represent the three key thematic areas of findings:

- Women’s knowledge of, and attitudes towards, contraception (Chapter 4)
- Clinical and policy factors influencing contraceptive provision and use (Chapter 5)
- Influence of social networks and wider society (Chapter 6)

Throughout the rest of this thesis, quotes from healthcare providers and policy stakeholders will be identified by job role and the type of organisation - for example, Clinic co-ordinator, private SRH clinic’. Quotes from Batswana women will be identified by ‘P(number)’ followed by age and HIV status.

Chapter 4: Women’s knowledge of, and attitudes towards, family planning and contraceptive methods

4.1 Chapter overview

The first chapter of this section explores women’s knowledge of, and attitudes towards, contraception. It addresses myths, misconceptions or concerns attached to using contraception, as well as attitudes towards the individual contraceptive methods available in Botswana. This chapter also addresses women’s contraceptive histories, including their reasoning for choosing, changing, or stopping, their method of family planning.

Findings: Women’s knowledge of, and attitudes towards, contraception

4.2 Analysis of women’s contraceptive histories

Individual contraceptive history timelines for all 22 women included in the study, starting at age of first sex and ending with current family planning use, can be seen in Appendix 4A.

Women’s age of first sex ranged from ages 14 to 23, with almost half between ages 17 and 19. There was no distinct reason behind age of sexual initiation, with women of all education levels, employment status, HIV status and parity seen across all age ranges.

Each woman had a unique timeline of contraceptive method choice and duration of use, but there were several unifying features. Initial contraceptive use for almost all women was either irregular condom use, withdrawal, or no contraception at all for varying amounts of time. In almost all cases, family planning counselling was only sought or received after their first pregnancy scare or, more commonly, after the birth of their first child.

Partner control over family planning decision-making plays a large role in women’s family planning choices. Having a supportive partner was often cited as the reason for choosing and using a more long-term, effective contraceptive method. However, at some point in their contraceptive history almost all women described a lack of partner support as the reason behind their non-use of family planning, often resulting in unintended pregnancy – sometimes multiple unintended pregnancies in quick concession. Men often did not want to use condoms because they reduced their pleasure. In certain cases this led to men lying about using the method, leading to unintended pregnancy, or threatening to end the relationship if women insisted on use. Condom use also appeared to be more irregular and harder to enforce in newer relationships.

For women using a more long-term hormonal method, negative side effects - irregular bleeding, changes to weight and concerns about fertility - were cited as the reason they stopped or changed method. Women often then reverted to using no contraception or the male condom, rather than changing to another LARC method. Some women also cited side effects for their partner as the reason their partner wanted to stop using the method –

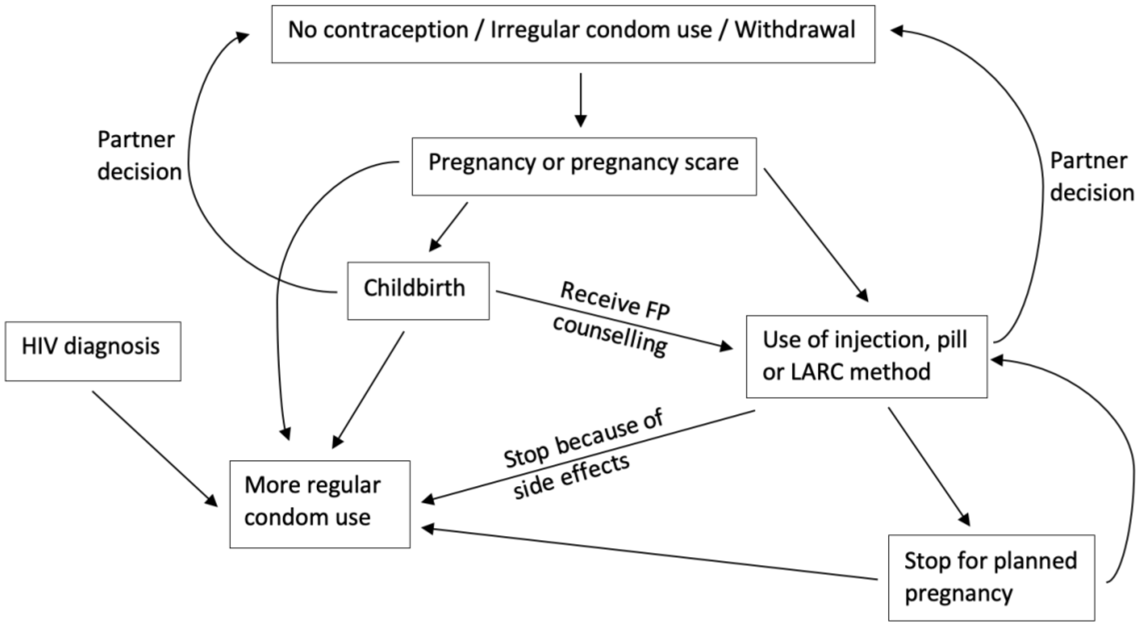
including the condom making him itch and have kidney pains, or the pill affecting libido and stamina. These concerns are explored further later in this chapter.

Younger women had fewer children than older women did at the same age, though the pattern of family planning use only occurring after the birth of a woman's first child appears to remain the same. There is also more use of LARC methods earlier in younger women's contraceptive histories, which could imply a desire for more spacing between children among younger generations, or alternatively could simply reflect the improved access of LARC methods over the past decade.

For many HIV positive women, their HIV status is the key influence over their choice to use only the male condom, sometimes but rarely supported with a secondary longer acting method. Women who are negative and not in a long-term partnership also described higher, more consistent use of condoms - citing their ability to protect against both HIV and unintended pregnancy as a key importance.

A flow diagram of the key elements found across women's contraceptive history timelines can be seen in Figure 4.1 below:

Figure 4.1: Flowchart of women's contraceptive histories



4.3 Women's perceptions of contraception and family planning

Previous experiences and fear of side-effects from contraception, as well as myths and misconceptions around family planning, are prominent reasons behind women's use or non-use of contraception. There is a need, and strong desire, for more in-depth, accurate contraceptive information – particularly about the long-acting reversible methods with most rumours and concerns attached to them.

4.3.1 Women's attitudes towards individual contraceptive methods

Women expressed the most negative feelings towards the injection, female condom and IUCD. Those using the implant generally described positive experiences, but other women expressed many concerns about the method's location under the skin, its ability to move, and the hormone levels it contains. Most women used the male condom due to ease of access and lack of side effects, but expressed concerns about their ability to control use of condoms 'in the moment', and the method's unreliability or potential to break.

Male condom

Women said that the dual protection provided by male condoms was one of the main benefits of the method, as well as a lack of hormones, the wide availability and ease of both access and use.

> *"It's one hundred percent, it prevents sexually transmitted infections, unwanted pregnancy, and HIV… Yes, it's all-around protection."* (P10: Age 32, HIV positive)

> *"Let's say these other contraceptive methods, they're readily available. But when you go to the hospital the process may be long to be able to be helped to get those. So you find that a condom is readily available. It's easy to use."* (P12: Age 19, HIV negative)

Prevention of HIV and 'diseases' was mentioned specifically as important to most women, with many describing what they had been taught about how to correctly use the method – including checking expiry dates, checking for any holes, and avoiding fluid exchange after sex.

> *"The doctors usually advise us that we should use condom always, because there are STI's, HIV… So condom usually protects us from those diseases. Even if you are using other contraceptives we should always use a condom because there are STI's and HIV are there. That's what I know about condom."* (P9: Age 25, HIV negative)

> *"So from there as a lady, maybe you can assist him put it in, you can assist him, you can take it out so that because the outer fluids are yours, you can… you're the one who is supposed to take it out and tie it so that the inside thing does not come out. And then dispose of it safely."* (P6: Age 40, HIV negative)

Women described allergies to the latex or material causing a rash for men, and sometimes themselves, as one negative aspect of using condoms. They also expressed concern over condom's tendency to break, and almost all had personally experienced, or knew someone who had, a pregnancy scare or unplanned pregnancy because a condom had burst.

> *"It's not hundred percent effective. It can burst just at any moment if the erec, I don't know what to call it. If the penetration is too rough. Yeah. It's not that effective. ... Some people say they are allergic to the latex or something like that. Yeah. So they prefer withdrawal."* (P1: Age 20, HIV negative)

> *"Maybe the person who is using this condom didn't use it perfectly akere (right). Then the condom can blast then I can fall pregnant… Umm it happened to the other lady, then he told me that she was using a condom with the partner then the partner, the condom blast then she fall pregnant. That's what I can say. Ah this one is not 100%. Sometimes it can blast, then you having a problem."* (P18: Age 37, HIV positive)

Women said that men often did not want to use a condom because it reduced their pleasure.

> *"Some say they are irritating. Some say to have a condom sex is a suddenly different. Having sex with that, with a, without a condom is actually more nicer than having sex with a condom. That's what the guys say. Yes, but to my guy there is no problem with the male condom. But most guys say that there is a difference."* (P22: Age 21, HIV negative)

Condom use is often seen as a man's decision, before and during sex, which makes it difficult for women to ensure correct, consistent use.

> *"I heard about the male condom. I know that when we are using it, as a lady I have to be very careful because if the guy is using it, he can put it and then remove it and then put it the other side, then he can infect you. So I have to be very careful on that*

> *one…Ah ladies, sometimes they don't, when it comes to sex it's their boyfriends duty. Most of girls are like that. Even me… Yes, they don't take part. They only open the legs and then that's it. (Laughter) They cannot ask. They cannot say 'no let's do this, let's do this.'"* (P17: Age 39, HIV positive)

There has been a drive from family planning specialists to encourage dual protection, ensuring that condoms are available and provided alongside all other family planning methods. However, the nature of the male condom requires a high level of trust that clients will consistently use the method, and the real prevalence of use is hard to measure.

> *"But all we know is that we distribute, even through our facility dispensing those small boxes. We cannot like to say it's using, it's just distribution… But then now when they access services, now that's when sometimes after inserting the implant you sort of like, a condom is sort of like a take home. The client doesn't usually really emphasise now I want the condom. It's sort of like now you as the clinician would be saying it's a package, take home with the IUCD materials. You give even the condoms, you are not sure whether they've agreed they will use it or not."* (Senior manager for programmes, private SRH clinic)

Female condom

The female condom is one of the least-popular methods, conversely to the popularity of the male condom. Very few women described being open to using it, and providers struggle to promote or recommend it.

> *"The female condom is not really accepted. I remember the first time I was trained on female condom, I was really… I was really struggling... Since then, because I was struggling to put it in the model, I have honestly not confident or not really interested in talking about it. I cannot really talk about it and encourage people to use it, you know, just like I would do with other methods... Partly it's us and partly it's… It's the family because they say a lot of things about it… They say it makes noise, it's difficult to insert, you know… So such kind of things."* (Principal nurse, University clinic)

> *"I think in 2006 did we launch the female condom … as an alternative for those people who had allergies, and women who said that men are refusing to use condoms… But now I think the challenge in acceptance is that it needs more technique than the male condom… a lot of people are not conversant with their anatomy and I think that is the greatest barrier"* (Senior manager in family planning, Ministry of Health)

Women said that they were often deterred before even trying the female condom due to the size of the method, even in its packaging.

> *"Ah nna (I) I just saw a big thing. (Laughter) It's just big… Yes I just saw a big thing. I have never ever have interest in using it.… I only have a problem with the female one because it's just a big plastic. I don't understand it."* (P17: Age 39, HIV positive)

> *"Because, have you seen what it looks like? It's a tent. I learned about that one in high school. And they showed us like, you know, opened it up, you know we are like wow so big pack and it's like - what's that a sanitary pad, because the pack is so long. Actually not even a sanitary pad but, you know those wet towels, the ones they give you in a restaurant? That's what it looks like. And then when they open it up like - oh, no."* (P21: Age 33, HIV positive)

Women described feeling scared of the ring, both the size and plastic material it is made of, and felt it would be uncomfortable and difficult to insert.

> *"Aahh…is too big… Is too big. Aahh it's too big, I'm afraid of that ring of it. Mmhh, am afraid, I haven't used it"* (P16: Age 25, HIV positive)

> *"I've never used it… It seems painful to get the big round thing inside*" (P22: Age 21, HIV negative)

> *"I don't feel comfortable about it… No, this ring. The first time I touched it, it's like it's hard and it's like it would remain inside."* (P20: Age 38, HIV positive)

Women also said the female condom was inconvenient for sex – particularly having to insert it a certain amount of time before intercourse, and the noise it makes. Most saw it as a much more complicated process than the male condom for the same amount of protection.

> *"Female you have to insert it, they are saying 10 minutes before intercourse. Then how would you know you're going to have sex? Because sex is this thing that just comes. You see, again, about that round big thing. It's a problem."* (P22: Age 21, HIV negative)

> *"I mean there are two rings and then you have to like get and pop up your tent in there and, I can't remember properly but they said you have to wait a certain time before you have sex. Now imagine with a male condom you just pop it on and you carry on with life. So it's more convenient"* (P21: Age 33, HIV positive)

Women described some empowering benefits to the method, namely being able to guarantee protection without relying on a sexual partner.

> *"At first, I was I was I was relying on a man to use a condom because by then I think it was, I was immature. But when I, when I grew up I decided that if a man is not using a condom that's why, that's when I started to use a female condom. If a man doesn't have a condom, a male condom, I must have a condom to protect myself. Not for him but for me. Mm hmm."* (P7: Age 34, HIV negative)

> *"One of my friends was [using the female condom]… It's just fine to just, feel free when she's using it, [more] than when she's using the male condom… She knows that most of guys always cheat, he can say that I have inserted the condom but lying to me. She knows that when she inserted it herself, she can feel free."* (P15: Age 32, HIV negative)

Other women, however, felt that this perception of the female condom putting sex and family planning under a woman's control sometimes made it difficult to access and use the method.

> *"The thing is we ladies sometimes we are shy to use our condom… So we are shy to go to the clinics or any health place to go and take the female condom. But the males, mostly they are the ones who always carry it. Mm… But the thing is kana when you go to the clinic and you take this [female condom] people will think – ah, this one. This one likes the action. So that's why us ladies we are shy to go and take it."* (P7: Age 34, HIV negative)

Injection

Many women had negative feelings towards the injection, predominantly weight gain and unpredictable bleeding patterns caused by hormones. The accumulation of 'dirt' caused by this lack of menses was cited as problematic, exacerbating weight gain.

> *"I have heard of depo. But the disadvantages with depo was that one gets huge and some can go months without seeing their period. Yes, most of them they are complaining about depo… I think it's just the hormones."* (P5: Age 29, HIV negative)

> *"I heard that this one, people that are condemning it again… They say the dirt is kept in the body because some do not get their periods. The dirt is kept in the body, some are saying it makes them gain weight because the dirt is kept inside."* (P9: Age 25, HIV negative)

Women felt that unpredictable bleeding could indicate multiple other medical problems, including cancer, kidney issues, low blood pressure and dizziness.

> *"The injection, mostly others say it makes them have period for a long time, others say it makes them not have any periods and they gain weight because the dirt does not go out. So it ends up making a woman sick, like the ones that have long periods, like my cousin who has her periods for 2 weeks in a month, now she might lose a lot of blood and become low blood."* (P9: Age 25, HIV negative)

> *"Aahh, I heard the depo is not okay, is dangerous. It can stop the period… Because the kidney is not moving dirty [blood] so it can block some veins to move nicely."* (P10: Age 32, HIV positive)

Providers said that it is more often a lack of menses, rather than irregular bleeding, which causes women to stop using the injection. Experiencing a monthly period is culturally very significant for women in Botswana, and there is a deep concern about the potential medical issues caused by not bleeding regularly – a common side effect of Depo-Provera.

> *"If they are not bleeding, they will think… They associate the menses with dirt, or that dirt is accumulating inside. If they gain weight, they think that blood is accumulating in them, it makes them fat… Then if they are using something very effective, if they are using the depo, they will get rid of that thing so that the blood can come and cleanse them. They feel they are unclean if they are not bleeding"* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

There were also financial concerns attached to using the injection. Depo-Provera is prone to stockouts in public clinics, meaning women often have to purchase it from a pharmacy, if they can afford to. Additionally, managing heavy periods over a long period of time can be costly.

> *"Eerr there was no depo all over Gaborone that time. Then I just decided, ah let me just break. Coz I didn't have money so that I can go buy depo from the pharmacy right… Mm they didn't have it in the clinic. Ee (yes) I didn't have the money to buy it at the pharmacy."* (P18: Age 37, HIV positive)

> *"And my main problem was when I go on period for a month and it will be just a small drops, small drops, small drops, small drops. So, we have to buy pads, pads, pads. You see. Which is very difficult."* (P17: Age 39, HIV positive)

Contraceptive pill

Women had relatively neutral views about the pill compared to other methods, with very few describing severe side effects. Some women associated the pill with weight gain – though not as much as the injection – and worried it could cause high blood pressure.

> *"I believe it depends on an individual because they are hormonal things so we react differently ... [I had] no, no, side effects. I only stopped them because of the weight, I'm fighting the weight."* (P2: Age 21, HIV negative)

> *"It's only that by that time I had asked my sister, no my friend about the pill. She tell me that I'm fat, I can't use that"* (P20: Age 38, HIV positive)

Some women raised concerns about the pill going through their blood stream, causing long-term infertility and other medical issues.

> *"And when you, you, you, when you stop, let me say now I need a child I have to stop the pill, I'm going to take a long period of time to conceive because it will be running in my blood. It takes time. Yes."* (P17: Age 39, HIV positive)

> *"I've never actually considered it and also because I think pills are bad… I feel like you are intoxicating your kidney. Like one day maybe your kidney won't work."* (P1: Age 20, HIV negative)

The strong likelihood of forgetting the pill or missing a day made women associate the pill with higher risk of unplanned pregnancy.

> *"Mmhh am afraid of it because I might forget it… Yeah, my friend she is using it. but I think she was not taking it properly. She ended up being pregnant. It was a mathata (problem) because she was not planning the pregnancy"* (P16: Age 25, HIV positive)

> *"I heard that if you [take] it, you miss it, is very easy for you to fall pregnant. If you miss the pill and then you have sex with your boyfriend no protection, no condom. It means it is very easy for you to have a child"* (P17: Age 39, HIV positive)

IUCD and implant

Few women had detailed knowledge about the implant or IUCD, and many had not heard of either method. The women who were using them shared largely positive experiences, citing long-term protection against pregnancy, and reliability of the methods compared to other shorter-term options.

> *"I love it. Yes. I love it because I can't get pregnant, I don't want any child anymore… And it's not giving me any problem. I had not contacted any problem since I put it in. And I just came for checkup, it's not giving me any problem. Yes. So I don't have to forget that I haven't taken the pill, or the man hasn't used the condom or the condom has blasted or what. Am safe."* (P6: Age 40, HIV negative)

Women associated both methods with similar side effects to the injection and the pill, namely weight gain and changed bleeding patterns caused by hormones. Other concerns were predominantly about the ability for both methods to move within the body, and the potential consequences of that.

> *"One of my friends is saying she's a consequence of Loop. Her mother used Loop and she had her… She was saying that it shifted, something like that. I don't know whether it's true that it can shift."* (P5: Age 29, HIV negative)

> *"They are lying to us saying that when you lift heavy things [the implant] can come out… When you are working too much it can come out."* (P9: Age 25, HIV negative)

Both methods were seen as more ineffective for pregnancy prevention than the injection, pill, or condoms. Many women shared stories of friends or family experiencing unplanned pregnancy despite using the implant or IUCD.

> *"But the implant, there was somebody who was using it next to my location and he said, if somebody can push it, it can move. Then you can fall pregnant whatever."* (P18: Age 37, HIV positive)

> *"They say that you can pregnant even if the IUCD is inside, the baby can come carrying this IUCD with their hand so (laughs loud), am not sure if they're telling the truth."* (P10: Age 32, HIV positive)

Patch, Vaginal Ring and Diaphragm

Women had very little to no knowledge about the contraceptive patch, vaginal ring or diaphragm, and providers had equally little experience of providing these methods – both caused by the methods not being easily available in clinics or pharmacies.

> *"Some of the methods are there, but I'm yet to find - like the diaphragm, the patch and the vaginal ring"* (Principal nurse, DHMT clinic)

> *"We used to have the vaginal ring and the patch, but they've been out of stock for a while now, so I wouldn't say they are available"* (Clinic co-ordinator, private SRH clinic)

The few women who had heard rumours about these methods shared predominantly negative opinions, but none had seen the method in person. Women worried that the vaginal ring would be unpopular with male partners, and likely to move, and the patch was associated with problematic side effects.

> *"I heard about [the patch], but I was scared of it… There are some people who told me it's not good and just the thought of it I just became scared of using it… They're saying it has some side effect like It can affect the skin since it is inserted here. It can cause some sickness like cancer. That's what they told me."* (P7: Age 34, HIV negative)

However, those who had friends or relatives using the method were more positive.

> *"Yes. I had a friend in varsity who was on the patch. I thought that was the coolest thing ever. Because it's just the patch, like once a day you change your patch and you put it there and she showed it to me - it looks like plaster and I thought, wow. Yeah. You just carry on with your life. You can go swimming, you can do whatever."* (P21: Age 33, HIV positive)

Withdrawal

Withdrawal was seen as risky, unsafe, unreliable and a last resort, though most women described using on it at some point, some for extended periods of time. Many women said that relying on withdrawal had caused their unplanned pregnancy.

> *"Ah that one I don't believe in it. But I heard about it. Because my firstborn child, I thought I have done that but I just fall pregnant. Yes."* (P17: Age 39, HIV positive)

> *"Well my cousin was telling me some other time that withdrawal is not safe. Because one of the workers was saying she was using withdrawal, but one time she was using withdrawal when she went to the clinic she found that she's pregnant I don't think it's safe… I will use it when I'm desperate, or if I'm not using anything for, but I'll still use it"* (P19: Age 41, HIV negative)

The trust in men that withdrawal requires was seen as problematic, as it puts the control entirely in their hands.

> *“I just once heard, it was just girls’ talk, “I don't use condom. I just withdraw with my boyfriend but it's just fine for us.” Aah [not] me, I don’t trust men.”* (P15: Age 32, HIV negative)

> *“It's not such a good contraceptive method because sometimes, I don't know a guy gets carried away or they just forget to pull out. So I don't think it's a good one.”* (P1: Age 20, HIV negative)

Women said that it was often difficult to know if a man had withdrawn during sex, and described high anxiety when they did not believe the man had withdrawn as promised.

> *“That one is risky because you will be depending on the other party. Let's say maybe we agree that you want to, to do withdrawal but we don't know how we'll be enjoying. He may take time and say ‘I withdrew’, whereas he [finished] inside. Mm hmm.”* (P7: Age 34, HIV negative)

> *“Ah that’s what we were using with my boyfriend at start. Yeah. Like most boys will prefer that, but it's not safe… I didn't like it, but because I couldn't tell him I just rolled with him. But I didn't like it. I was always scared. Like every time after having sex, I always feel pregnant. I always feel those things. Like akere (because) they will tell you that pregnancy you feel cramping, what. Every time after sex I feel those things. But I wasn’t pregnant, until one day”* (P22: Age 21, HIV negative)

Fertility Tracking

Not many women had used fertility tracking for contraception. They saw it as unreliable due to confusion over the number of days after a woman’s period she was infertile for, and the unpredictability of an individual woman’s cycle.

> *“Some of my classmates are using it. Even though it's not that accurate. It’s not accurate because sometimes you can have imbalances, and you might be late before the expected time.”* (P2: Age 21, HIV negative)

> *“No, they will just say… let me say I am on my periods then it stops. After 3 days they said if it’s like that you’re on your safe period, you can have sex without using a condom. I said I don’t believe in that… My believe is when you sleep with a man without a condom when you are fertile you should know you will get pregnant, whether you are from the periods or not”* (P20: Age 38, HIV positive)

Relying exclusively on fertility tracking was associated with unplanned pregnancy for one woman. As pregnancy is most likely during the first half of the cycle, this was of particularly concern.

> *"They told me if it is three days after menstruation you can't get pregnant. By that time, I tried the method, but I got pregnant…Yeah, not good"* (P19: Age 41, HIV negative)

Younger women, especially students, had heard of or used fertility tracking apps, but used them more track fertility in order to get pregnant than for prevention.

> *"Yeah. I use Flow… It's so informative. I like it because it just explains symptoms and everything. It, you log in, like the symptoms that you're having that day, and then it explains better. And then if you need to see a doctor. And it also explains the types of discharges you'd have. Like if you have a certain discharge, it tells you why. Maybe you're ovulating and stuff like that."* (P1: Age 20, HIV negative)

> *"When you want to be pregnant, there is a certain way to calculate your periods… I also did that myself, with the last one (pregnancy), yes."* (P6: Age 40, HIV negative)

Sterilisation

Most women were aware of both male and female sterilisation but deterred by the permanence of the method. Providers were seen as unsupportive of women undergoing sterilisation, with many accounts of women asking for the procedure but being denied.

> *"They usually refuse people to cut the tubes… You want to cut the tubes so that you don't get pregnant, the doctors refuse. I don't know why they refuse"* (P9: Age 25, HIV negative)

> *"Yes. I wanted to do that… I wanted to cut. They said they could have done that when I was delivering because I had caesarean, they could have done that during that time when I was, but they didn't do it… They just pretended like they forgot, but it was there in my, my pregnancy card where it says what was the method you want to use after this. I told them I want to cut… I didn't want any pregnancy. I was done, I have three children, that's enough"* (P6: Age 40, HIV negative)

Legally, women can only undergo sterilisation with the permission of their spouse, or in some cases their parents can provide consent if they are unmarried. It was seen as taboo and difficult for women to seek sterilisation outside marriage, or at what society deemed a young age due to a cultural importance placed on motherhood.

> *"I hear that if you want to sterilise your partner need to sign for you to sterilize. Because when I was having my forth kid, I was tired of being pregnant - four kids, not married, you know. So I thought of - if I am like this, it means I get pregnant very easily. So I wanted to go to the to cut these things. So my mother was telling me you can't cut this before you get married, unless your partner signs for you… I felt disappointed. That's how I felt but still I wanted it."* (P19: Age 41, HIV negative)

> *"Which woman is gonna [get sterilised]? Because it's hard for a woman. Okay, you know, like I said, I was recently engaged. One of the things was he said he's only gonna marry me after I fall pregnant."* (P21: Age 33, HIV positive)

4.3.2 Women's concerns about contraception

As well as the specific comments on individual contraceptive methods, women expressed concerns or comments about hormones or contraceptive use more generally.

Side effects and changes to body

Women described physical changes to a woman's body, including weight gain, irregular bleeding patterns, high blood pressure, acne, blood clots, headaches and dizziness, as their main concerns about using contraception.

> *"I heard that you can use [hormones] and not see your period, some can use it then have their periods. It can cause some changes to your body, you can feel nauseous, have a headache. You can bleed but not feeling sick, just having the side effects"* (P8: Age 29, HIV negative)

> *"I don't like it, you don't have menstruation… yeah, it stops but the time when the menses come you can be bleeding a month, they can take me a month. Sometimes they will be heavy, sometimes they will be drops only."* (P19: Age 41, HIV negative)

The consequences of not having a regular period were of high concern for many women.

> *"And now if you're using the family planning method it means all this dirt, they call it dirt, it accumulates somewhere… And if it accumulates somewhere your womb is going to get sick and you're going to get cancer, you're going to get all sorts of illnesses."* (Clinic co-ordinator, private SRH clinic)

These side effects, as well as those attached to specific individual methods, made choosing and using contraception difficult for women, due to the unpredictability of their impact.

> *"They find it difficult to make decisions about [family planning] because of the side effects. Like they think too much about the effects. When she finds out that with the implant it means that you're not going to get a period for like three months or so they would feel like I can't live without my period and stuff like that."* (P1: Age 20, HIV negative)

Contraception causing infertility

Infertility and difficulty conceiving children was one of the most frequently cited concerns about using hormonal contraception, particularly for younger women.

> *"Only problem we can find is that when you haven't any one child, then you use that method, one of them - you can end up not having a child. They damage some parts… normally you can end up not being able to have a child because of the method"* (P16: Age 25, HIV positive)

Most concerns were associated with the pill and injection, which were seen as the most likely to impact fertility long term. Although there can be a delay in return of fertility following the injection, women's concerns were more related to permanent, irreversible infertility.

> *"I couldn't have a baby… I knew I couldn't have because the rumours are that the medicine will still be in you. Yes, from the injection"* (P19: Age 41, HIV negative)

> *"No, I just came because I asked my mother about the injection she said no, you can't use the injection. It's like when you see injections like you will never get you will never be able to have a child. I think she didn't know that time about the depo, how the depo works and you can still leave it and still have a child."* (P15: Age 32, HIV negative)

Some women who did not cite permanent infertility as a concern were still worried about delayed return to normal, predictable fertility levels, and the implications of this once someone had decided they did want to start a family.

> *"And sometimes you can even fail to have a child well in time because your blood will be full of maybe the pill, maybe injection. Your blood will be, you see. You're going to*

> *have time maybe after marriage, and then you decided that you're going to have a child. [But] one year, two years, three years - that is when you have another child."* (P17: Age 39, HIV positive)

Getting pregnant despite contraceptive use

Women were also worried about failure of hormonal contraception, sharing multiple stories of people who had got pregnant and had an unplanned pregnancy despite using an injection, implant or IUCD. This was frustrating and distressing for women who had experienced it first-hand, but also a deterrent for those who were considering a long-acting method.

> *"Ah a lot of people they complain about, especially the contraceptive. They are saying you can take it then the pregnancy happen."* (P13: Age 21, HIV negative)

> *"And what she told me, she told me that the other child, the small one that she had she got pregnant while still using the Depo… Mm, ah she was crying. We even went to the clinic. The nurse that told us that yeah it possible, you can get pregnant while using the Depo."* (P20: Age 38, HIV positive)

4.3.3 Myths and misconceptions around family planning

Myths related to IUCD and implant

Providers had heard many myths and misconceptions around family planning during consultations, predominantly related to newer methods such as the implant or IUCD.

> *"With the implant, they are saying it causes cancer. It will be inserted into the veins, so sometimes it will be moving through the veins until it blocks the heart."* (Principal nurse, DHMT clinic)

> *"Some would say, especially when it comes to IUCD, some of the partners, the male partners, would complain that it hurts him when he's having intercourse… And then some of them would think that it might move from the uterus to somewhere else."* (Nurse Midwife, DHMT clinic)

Myths around hormonal contraceptives

Women also expressed multiple fears about rumoured permanent physical changes for women caused by hormonal contraception.

> *"And the darkening, sometimes they think, these [hormones], they make them dark."* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

> *"They say you'll gain weight forever [laughing] and since it's something that is implanted into the skin some don't feel comfortable. They will say, "ah it will cause cancer" these things."* (Nurse Midwife and MoH Master Trainer, semi-urban clinic)

The medical impact of contraception on male partners

Myths about the impact of contraception on male partners are prominent reasons for women's non-use of family planning, especially the pill. Providers said that these male-centred myths highlight the ingrained cultural focus on men's pleasure during sexual intercourse.

> *"Even the men, they will think that, especially when the women are on the pill, they think... The misconception they have, is that those pills will make them have liver pains. So they will tell those women, "Stop using those pills". It is said, "If a woman uses contraception and I sleep with her, then I will get problems with my kidneys."* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

> *"And then they would say the pills, they make the women [pause] not have good vaginal tone. So, sex would not be as pleasurable with a woman who is using contraception as that."* (Senior manager in family planning, Ministry of Health)

Hormonal methods have also been rumoured to make men sick, particularly the injection. Men believe that having sex when women have this 'dirt' inside them will cause an array of medical problems for them, including kidney failure, and skin problems.

> *"I just heard another man saying that his girlfriend is using, I don't know if it's depo the injection. But he's very sick, can have rash. So saying that the depo is the one who makes him feel sick."* (P10: Age 32, HIV positive)

> *"You know that thing, that the blood makes the inside dirty. Then it ends up that, if they have sex that time it can kill me or that boyfriend - because of that dirty blood that doesn't come every month."* (P16: Age 25, HIV positive)

Men often state medical issues as the reason for their refusal to use condoms, as well as long-acting hormonal methods.

> *"No, they don't want to use contraceptive at all, the men, even the condom they don't want to use it… They say it make them have a rash so they don't want this oil. Maybe sometimes it makes them this, what do you call - itching on the body. They blame the condoms."* (P10: Age 32, HIV positive)

4.3.4 Perceptions and attitudes of HIV positive women

Influence of HIV on contraceptive method choice

HIV status had varying levels of influence on women's contraceptive method choice, with some women saying they prioritised an effective family planning option alongside consistent use of ARV treatment.

> *"[When choosing my method] I just decided, I just made the decision looking at birth control not my HIV status."* (P3: Age 29, HIV positive)

> *"HIV/AIDS doesn't mean anything changes, if you take your drugs, just drinking your medication as you should there's nothing change… You are like anybody who doesn't take treatment… It doesn't change any method. Male condom prevents the virus if CD4 counts are high, you can have a risk that your boyfriend gets attacked by the virus, but if you are taking your medication as you should the virus/HIV is not too much"* (P16: Age 25, HIV positive)

For other HIV positive women, however, their status was the defining factor behind their choice to use only the male condom, mostly to protect their partner and themselves from reinfection.

> *"It's not gonna change the decision I made because it's all I can do. If I don't use it means I'm going to infect my partner. So I have to always protect myself with a condom."* (P11: Age 28, HIV positive)

> *"Because I don't want to, I don't want any reinfection. Yeah that's why I'm choosing to use condoms. If I just go around, maybe I just use a loop or use an injection. I'll be facing on the pregnancy, not facing on the other infections. So I don't want to have you to be reinfected and I don't want to reinfect anyone."* (P4: Age 33, HIV positive)

4.4 Chapter summary: Women's knowledge of, and attitudes towards, contraception

This chapter explored the attitudes and knowledge which may influence women's use or non-use of contraception.

There are many concerns around contraceptives in Botswana, namely that being exposed to hormones could lead to cancer or permanently alter your body, causing infertility for example. However, women were predominantly concerned with relatively common side effects of contraception, particularly changed bleeding patterns and weight gain. Side effects were some of most common reasons for women stopping or changing contraceptive method, alongside their partner deciding for them.

Male condoms were the most commonly distributed and available form of contraception, but providers said it was hard to tell how often they were actually being used. Many felt that most women just told them what they wanted to hear, describing consistent and effective condom use, when they were actually relying more on withdrawal or unprotected sex.

There are many concerns about the impact of contraception on men, particularly LARC methods which men say makes them ill – either with kidney or liver pains, itching or skin rashes, or generally making women less 'pleasurable' to them. Women also described many socio-cultural and practical reasons why condom use was not always possible - namely due to prioritisation of male pleasure, and men having control over sexual activity.

Although there were concerns attached to specific contraceptive methods, women did not imply that these exclusively encouraged or discouraged them from use. These attitudes and concerns to individual family planning options seemed to represent broader, more influential, cultural or clinical factors, which will be further explored in the next two chapters.

Chapter 5: Clinical and policy factors influencing contraceptive provision and use

5.1 Chapter overview

This chapter explores the clinical and policy factors that influence provision and use of contraception. Findings are related to the successes, and gaps, in family planning policy and clinical services; attitudes, knowledge and trust in healthcare personnel; national management and administration; and specific factors related to Botswana's HIV epidemic and its influence on healthcare services and policy.

Findings: Clinical and policy factors influencing contraceptive provision and use

Clinical and educative services around sexual health tend to be curative rather than preventative, and consequently women, their partners and providers lack adequate family planning information. Physical barriers to family planning access - like a lack of trained providers, national resource management systems or method stock-outs - are problematic for both provision and use of contraception. A lack of trained personnel exacerbates these challenges for those clinics and individuals who are filling the gaps and adds pressure to an already stretched infrastructure – influencing the quality of counselling and services women receive.

5.2 Positive developments in contraceptive provision and policy

When asked to describe the improvements seen in the field of family planning over their career, participants expressed pride in the Ministry of Health's strong, admirable commitments to family planning - namely improved method availability, increased number of specialised family planning services and free contraceptives nationwide.

> *"It's affordable: you don't have to pay. It's available: all the clinics, they have, except some new methods, like I imagine the implant, maybe there and there the IUCD, those are not trained. But otherwise the government of Botswana has made them accessible, made them available, made them affordable."* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

> *"You know, for a very long time we have been using short-acting. I remember as long as I've worked with the government it was mostly short-acting reversible contraceptives. Not meaning that IUCD wasn't there but the uptake and the capacities of providers were challenged… So, one of the biggest things that I really could say is that the provision of implants has brought. It is like now there's a hype, you know young people are excited about implants, you know they are excited about this kind of commodity."* (Senior manager for programmes, private SRH clinic)

Many women had personally witnessed the improved method options and availability, with younger women expressing excitement about the longer-acting methods becoming more accessible to them.

> *"When I was sitting in, you know, the gynae ward, I did see that - oh they now have a ring, and then something that like a stick. It's not the loop if I'm not mistaken, I thought I saw a stick too… like the implant. And I was like wow, how far things have come."* (P21: Age 33, HIV positive)

Other government contributions – such as compulsory education or changes to national policy – were cited to show an improving, more inclusive acceptance of family planning.

> *"Because [pause] family planning okay, we have brought it out, we have made it accessible. We have made policies that are friendly for anybody, marriage and age are not a barrier… And then I think education assisted us by making education also free and the majority of the people going to school … And as a result, you know our total fertility rate right now is at about 2.7. And a lot of women go to school, they have their professions, they are able to achieve the active professional lives as well as their reproductive life. And celebrate their sexuality without fear."* (Senior manager in family planning, Ministry of Health)

The inclusion of teenagers in family planning services and policy was cited as a very positive step for reducing unplanned teenage pregnancy, and providers hope that culture and attitudes would follow the legal protections.

> *"There's a clause that says if a young person comes to you asking for family planning please give it. And you know we have these issues of incest, age of consent and I think for me it's an ethical dilemma to say if she is 14 ideally, she should not be having sex. But then, if I don't give her this contraception and she goes and gets pregnant you know ultimately what do I get? Does she die from an unsafe abortion, does she die due to complications of birth and delivery? …Let's not moralise about it, she is clearly coming to you in confidence and telling you "I am sexually active. I need contraceptive" so I think I really like that clause."* (Senior manager, private SRH clinic)

5.3 Sex education

Sex education for teenagers

Most women and providers felt that sex education programmes should begin to target girls at primary school or before puberty, so that they have adequate knowledge of contraceptive methods prior to sexual debut, which commonly occurs as teenagers.

> *"But I think if a girl child could be educated at the age of 12. And by then she will be developing the feelings and with time she will decide what to do before getting into a*

> *relationship… when I start the relationship the first thing I need to do is to protect myself from getting pregnant. And the other thing I need to protect myself from catching any disease, and what is the best method to use. Yeah. Because sometimes you find that we get into relationships but not knowing how to protect ourselves from all these diseases and from staying away from the pregnancies."* (P7: Age 34, HIV negative)

Providers hope that, as societal attitudes are becoming more accepting of young people using contraception, sex education can also become less 'awkward', more comprehensive, and open to younger children.

> *"They should be knowledgeable before they start having sex. So, in Botswana the study has found that generally girls start having sex around the age of 13. So, I would say around the age of 13 every young girl should know that there are family planning methods available."* (Clinic co-ordinator, private SRH clinic)

Offering this education to younger women was seen as especially important in populations where traditional beliefs are more likely to influence choices around sex and family planning, and intervention becomes more difficult, and less likely, later in life.

> *"A lot of people really are pro-family planning except just I think three tribes… for religious reasons; the other ones are because they practice early marriages and also, what is it, polygamy. So, if somebody gets married when they are very young they don't know much so it already takes away their opportunities to grow and learn more and make informed decisions. So, they get into there before they are influenced by anything that is external. Because obviously if they are getting married early it means they've also missed an opportunity for education at a certain level. And then they are guided more by the belief system of the culture."* (Senior manager in family planning, Ministry of Health)

Descriptions of existing sex-education programmes

Providers feel that sex education is not sufficiently detailed or universally received, due to being led by untrained or underconfident teachers rather than healthcare professionals. These conversations are also made more difficult due to the prominent cultural taboo around discussing sex with elders.

> *"We do have our general curriculum, they have family life part where they are taught about the physiological changes that occur in the boys and the girls. As well as introduction to family planning and they do get introduced to the different methods… And if the teacher is not confident in it because it talks about sexuality. And a lot of*

> *our people are not free to talk about sexuality, or talk about anything that has got anything to do with it. So, you find that much as it's part of the formal curriculum, a lot of people go through it without necessarily internalising it and applying it. And we have just had a study where we are asking…. you have heard about this [contraception] so, how do you take it? And what is coming out is you know, much as it's part of the formal curriculum, those who are teaching it to us are not very comfortable with it. So, it doesn't really have the impact." (Senior manager in family planning, Ministry of Health)*

Women of all ages described being taught basic information about certain contraceptive methods at school, namely the pill, injection and condoms. Most felt that their sex education was not comprehensive enough, and did not include information about all available options.

> *"Yeah, maybe they could have taught us more about all these contraceptions. Maybe I should have, I should have had more information and I should have made decisions back then."* (P4: Age 33, HIV positive)

> *"Now I know very little about it. If I had known a lot right now all this wouldn't be new to me. Yeah, most of the things you said are new to me."* (P13: Age 21, HIV negative)

Possibly due to the emergency of Botswana's HIV epidemic at the time, older women described their sex education as being only focused on condom promotion more than other methods.

Gaps in existing sex education programmes

Involving parents in sex education programmes, and encouraging these conversations to continue at home was seen as a large gap in the current approach.

> *"So, much as it's part of the curriculum but parents themselves never had that. It has created a gap of communication that we need to address, so that we improve parent-child communication and mentoring. And comprehensive education really, because when you are a mother you will not just talk to your child about they need to use family planning. You would actually show them the advantages and disadvantages and why use it and when to use it and why to use it and with whom. So, generally in the family planning education is embedded, the comprehensive reproductive life plan that a mother or a father would actually share with their own child. So, I think that is a gap."* (Senior manager in family planning, Ministry of Health)

> *"I just feel the learning could just be at home. You know, children trust their parents better than the teachers and the health practitioners. So if at all the parents can be well informed, and they can be the one who add on information from the health professionals and teachers…I believe everyone will have much more information"* (P2: Age 21, HIV negative)

Sex education was also seen as an opportunity for female empowerment within relationships, on top of the medical advice. Some women felt that being exposed to adequate information at school would possibly have helped them prevent their own unplanned pregnancy.

> *"But you find that maybe I will meet a man who is not responsible enough. That man will be there just to take what he wants to take and go away. He doesn't care whether I will get the disease. He doesn't care whether I will fall pregnant. So if I have this education, I will be able to say "no stop I want it to be done this way." … But you find that we lack that information. We lack the confidence. Because confidence comes with education, I cannot be confident in something that I haven't been taught. So once I've been taught I will be able to get, to gain the confidence and say 'no, this is not how I want it to be done.'"* (P7: Age 34, HIV negative)

5.4 Structure and content of family planning consultations

Decisions made prior to counselling

Decisions about family planning and specific contraceptive options are often already made before women seek clinical counselling.

> *"Usually when they come for family planning… When it is their initial visit, they have already made up their minds. When they sit in front of you, they have already decided what I'm going to use."* (Principal nurse, DHMT clinic)

> *"When they come to a clinic normally what they will say, they will come with a method preferred in their head. So, they will come and say for example, they will say 'I want an injection'"* (Clinic co-ordinator, private SRH clinic)

Some women said that they would be unwilling to change their mind about their decisions, regardless of any advice or other options given.

> *"I already have information of what I need, what I want, what to expect. So you can't make me change my mind about it… Because I already have information, I'm just there to collect it. It's just that I will listen to you because that's protocol."* (P2: Age 21, HIV negative)

> *"I didn't go there to find about the methods. Okay, I just went there to tell them 'I want to use this'"* (P20: Age 38, HIV positive)

Elements of family planning consultations

Other elements of their family planning consultations include discussion of contraceptive options; medical examination; discussion of side effects and the importance of informed choice.

> *"I will go through all the available methods in Botswana. I will explain to them all the methods and give the advantages and disadvantages of all of them so they can choose. I make the clients choose for themselves, I don't choose for the clients. I make an option, and then I assist them in their choices, looking at the drug interactions, side-effects, the health and all the like."* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

> *"They take your blood pressure actually and then your height, temperature, weight. And then afterwards the Gynae just checks if you have any signs before she like consults you further. If she knows like, do you have any STI or is there something unusual about your vaginal tones? Oh yeah. And then afterwards, you have to wait. And then when you get inside, you just fill out some stuff [paperwork] and then you get the implant. That's it. It's not that complex.... Before they even offer you a contraceptive method, like they let you know of the different types before they actually... Okay, so you come here decided that I want to put an implant and then she'll ask you "are you sure? Do you know other methods?" Yeah. And then they just go into in depth of every other contraceptive method so you can know." (P1: Age 20, HIV negative)*

In most public clinics women must be on their period in order to be given a contraceptive method, so this was cited as a key part of any contraceptive counselling session.

> *"They should be on their menses, that's what they're saying in the clinics so that the provider can really be sure that the clients are not pregnant... you just do physical exam and confirm that this patient is not pregnant and then you just give."* (Post-abortion counsellor and ward nurse, national referral hospital)

> *"You must go there when you are on your periods, then they can just give you. But if you are not on your periods, they will think you are pregnant; you must check make sure you are not pregnant then they can give you the method."* (P10: Age 32, HIV positive)

Detailed discussion of drug-drug interaction between certain HIV treatments and the implant is seen as highly important, some clinics and individual providers require HIV positive women to sign physical paperwork to prove they have been told about the need to use condoms in addition to the implant.

> *"I have already 3 patients who are on Jadelle, and they are pregnant. Other said they didn't understand. I talked about it now, I've said - if you come and you're HIV positive and on atripla, then we reach a consensus me and you. You sign a witness form that I have already told you this thing, and you have agreed on the dual protection so that next time when it comes it won't backfire on me. Because when they are pregnant, they will be crying and you, you sympathize with them because she was preventing pregnancy, and it happened while she was using the method - but it wasn't because of the method, it was because of the drug interaction. That's why we reach the consensus and you have to sign the form."* (Nurse Midwife and MoH Master Trainer, semi-urban clinic)

Quality and depth of counselling

Providers also described the additional ways that they ensure thorough counselling – whether by asking in-depth medical history to avoid drug-drug interactions, or physical aids to ensure all methods are discussed equally.

> *"So after that we sit down, we've got a flip chart that helps us to do the counselling and teaching. I use the flip chart. On the other hand, I've made a small chart, whereby I've split the Jadelle, I've split the IUCD, all the methods I've stuck on that paper."* (Nurse Midwife, DHMT clinic)

> *"You also ask their conditions, because there are some conditions that are… Like treatments that people are taking, that also affect the effectiveness of the hormones. ... So it's very difficult, even if you can tell then, "You know, you are on this treatment… Like, you have decided you want to use the pill, and you are on this treatment, this treatment reduces its effectiveness." You will be just talking. So it is just as to give them, and then we advise them on dual methods."* (Principal nurse, DHMT clinic)

This depth or support from providers was not felt by all women. Many described more simple interactions without any discussion or side effects or other options, and some described feeling problematic if they did not have information or their decisions made prior to their appointment.

> *"Like not having that knowledge about something and then when you ask, the person may not give you that, give you that comfort, or the exact answer that you want. And then you may feel that this person is just ba go latlhella (mishandling you)… Because if you really do not know other methods, you may not, let's say maybe their names or something, and then you just come and describe like 'I want this and this'. They may not give you, not give you that information. They may maybe say like, umm like you should come knowing what you want."* (P12: Age 19, HIV negative)

5.5 Attitude and knowledge of healthcare providers

Lack of provider knowledge, information, and training

Providers stated that their own insufficient knowledge around contraception and lack of training is a main barrier to women receiving high-quality, consistent access to contraception when attending clinics.

> *"We are the ones who are supposed to be having the right information… But the problem is that some providers, they are not well trained, they will be giving wrong information, they will be giving… Sending the patients back for the wrong reasons, stopping the patients' from contraceptives."* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

> *"Most of the healthcare providers, they don't have… They are not more informed about the different methods … Clients will come in and say they want a vaginal ring, or a patch, of which they don't know… Because, you know, I will be giving someone an injectable of Depo-Provera, but I don't know how it is going to work, I don't know it's effectiveness, and advantages and disadvantages. And, you know, people will be coming in saying, "I suffered on depo, now I want to stop it", because they don't really have more information about it. And also that healthcare provider, whom they are approaching, doesn't know the side effects [either]"* (Principal nurse, DHMT clinic)

This lack of training has led directly to a lack of skill in certain areas of contraceptive provision, which prevents providers recommending a method.

> *"Healthcare workers, they don't sell the method to the women, because of the lack of skill, I believe. That is the biggest challenge with IUCD: they do not promote the method because a lot of them cannot insert."* (Principal nurse and MoH ToT, rural SRH clinic)

Providers expressed a strong desire for more in-depth, regular training on family planning, and for it to feature more heavily in relevant medical school curriculums.

> *"We need more training… We need to spend time on the family planning programme. Like, for instance, I have been here for almost eighteen months, like I said, but there hasn't been any training, and a lot of my colleagues haven't been under family planning training. So when I talk about this thing, they say, "Nah." Training is where they teach you how to… But there are so many [family planning] users in Gaborone and so many problems."* (Principal nurse and MoH ToT, rural clinic)

> *"And again, we need more skilled personnel, we need even ourselves we need to be trained. Because you know health in general it evolves all the time and usually just all the time. So, we need to keep updated on those changes."* (Clinic co-ordinator, private SRH clinic)

Confidence in contraceptive provision

Due to this lack of knowledge and training, many providers are under-confident in providing certain contraceptive methods, predominantly IUCD and implant.

> *"But with the implants I'm not too sure whether it is availability or skill related because it's fairly new. Luckily, we have a master trainer who trains in all this… So, I'm not too sure whether people refer to us because maybe they feel a bit uncomfortable."* (Senior manager, private SRH clinic)

> *"They are not confident about [IUCD]… They will say that, how about if this thing is not inserted properly? Others are saying, they think it will pop the uterus, they don't know what you mean when you say this is too short to… Others, they don't want to try"* (Nurse Midwife and MoH Master Trainer, semi-urban clinic)

Provider stigma or bias

Provider bias – whether to do with personal contraceptive preference, lack of training, confidence, or ease of method delivery, like providing the pill versus the implant – directly influences the advice and counselling women receive.

> *"Like if a healthcare worker, especially with the IUCD, if they have their own attitude, they won't be giving that family planning. Female condom… And now, with the implant, those who have not been trained, they will say "No, you don't want this method."* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

> *"And the providers they are in their comfort zones, so you find that the methods are more provider-influenced… So, I'll sell and provide what I want, what I'm*

> *comfortable with. And anything that is too demanding I can easily de-campaign it and not provide it. So, I think it's more provider influenced."* Senior manager in family planning, Ministry of Health

Providers also expressed concern that their minimal or non-existent discussion of side-effects and lack of in-depth counselling can cause some of the negative perceptions towards family planning or specific contraceptive methods, simply because women were not informed.

> *"I think some of the issues might be negligence because… Umm… Lack of information, yes, information sharing. Because if I don't share you information that when you are taking an injectable, there are possibilities that you can not have your menses, you will be experiencing amenorrhoea, the person will go out not knowing that they will experience that. And when they experience that, they will come back and say, 'I don't want to use this anymore, because I'm not having my menses'. And if you could have told them, they will not do that."* (Principal nurse, DHMT clinic)

Experiences of provider bias can deter women from using specific methods, or deter their use of services altogether.

> *"Most of the time [women] can't go to local clinics or anything like that because people at local clinics are very unkind… They don't, they're not really pleasant to speak with. They just use words that you wouldn't want to be used. Like my mom the day she gave birth to me she was being insulted while she was giving birth. So yeah, yeah that was the last time she went to a local hospital or clinic."* (P1: Age 20, HIV negative)

Poor patient-provider communication and feeling judged or unaccepted were seen as the main reasons women felt some providers were unfriendly in their practice.

> *"Participant: Their interpersonal communication with their patients is not really that… the relationship is not really good. Yes, the interpersonal communication and that thing can be a barrier between the patient and the doctor. (Setswana) Research Assistant's oral translation of participant speaking Setswana: Patients and doctors. There is not a good rapport that is built, especially by the doctors. Those patients do not feel comfortable disclosing, sometimes they feel like the doctor isn't really being considerate. They are just being told whatever just to finish the consultation."* (P12: Age 19, HIV negative)

Women also felt that some providers were biased in the information they offered women, projecting their own opinions into consultations, and providing an unbalanced view of family planning options.

> *"I think the providers maybe there should be a course for them on behaviour and attitude or something? Because when you are providing something that you know people are having a hard time deciding on getting it, you should be more friendlier, don't be bias. You can't tell me the bad things about that thing. At least just give both of them to me. And then I weigh myself, don't weigh them for me."* (P22: Age 21, HIV negative)

> *"You'll find the ones that do have bad attitude, like they bring that values and views and personal opinions, you know, to work with them, and that's not how it's supposed to be… You don't even have to tell you a whole life story, you just have to say, 'I want to get on the pill, want to get on the injection.' But I found that some health care workers in the public sector are very nosy. They want to like ask you a question just so they can use it against you."* (P21: Age 33, HIV positive)

Some women also felt that providers were more supportive of them using contraceptives after they have multiple children, due to the cultural importance placed on having children.

> *"But is still like I was saying with this one that I wanted to cut [have sterilisation], they didn't do it at Marina. It is the one that I've always told them, after this child I want to cut. But they didn't. I think they are a little worried about you are you still stand a better chance of giving us another child."* (P6: Age 40, HIV negative)

> *"Normally the doctors, they only advise to use contraceptives when you already have a child or children"* (P16: Age 25, HIV positive)

Trust in healthcare providers

Most women expressed strong trust in the information, knowledge and experience of providers – citing their training, and the professional nature of their role.

> *"They are trained. They are trained for that, they know much better."* (P9: Age 25, HIV negative)

> *"I do [trust them]. I know they're professionals. And I know that my information is safe and I know whatever I'm telling them is safe."* (P4: Age 33, HIV positive)

Some women said that, although they do trust the information providers give them, they like to conduct their own research after consultations.

> *"I trust them but most of the time I read for myself. I get the information and then I read something, a pamphlet. So that I can understand more."* (P17: Age 39, HIV positive)

> *"If you tell me something, and then I research it and I find that is true, that's when I trust you. You can't tell me something, and then I believe you [immediately]. I have to go and research myself... You tell me what implant is doing, this this this this. I'll say okay, then thank you, bye. When I get home I research, trying to see that the points that you told me are they correct."* (P22: Age 21, HIV negative)

Shared experiences and anecdotes were seen as more trustworthy and unbiased than healthcare providers for some women, due to the individual, non-generalised advice.

> *"I trust people's experiences much more. Because this information given by a healthcare professional is the one from studies, it's general, it's more like a stereotype. 'The average number got this side effects', but sometimes when you get to meet people you might find out about this one, the experiences they got is not there in the books, is not there in the studies."* (P2: Age 21, HIV negative)

However, as providers feel underconfident in their training and ability to provide certain contraceptives, in certain situations this trust can be problematic for method use and adherence.

> *"The other challenge is the doctors, they are not really trained, or they are not all conversant, with family planning. They will stop some family planning method because of what they think, and they will stop them unnecessarily. And because women trust doctors so much, they will end up removing this, like, last... I've had a woman who had elevated blood pressure, she was on the implant, but medically she was eligible, but when she went to the doctor, the doctor said, "No, you have to remove this thing." But because the doctor was saying that and now the client knew, I had to remove it. But to me, I know that she could go on with the implant even with the high blood pressure because she could get medication and that blood pressure would drop."* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

5.6 Clinical challenges for provision and use of family planning

Stockouts and inconsistent medical resources

Issues with centralised commodity management and national stockouts contribute to pressure on healthcare clinics and providers and are one of the main barriers in consistent provision of contraception. The intermittent availability of specific contraceptive methods, either locally or nationwide, directly determines what providers are able to offer their clients – particularly newer methods, which may be announced by the government as ‘available’, but in reality can be difficult to source.

> *“And even just the supply chain of the family planning community is sometimes we get stock-outs. And that is not nice to toss the client around to go and check if another health facility.”* (Clinic co-ordinator, private SRH clinic)

> *“And also stockouts, like I was saying, sometimes it takes some months without having these family planning methods. And sometimes we will introduce a method, like we will introduce a patch, and it will not come. So people will be coming here, “I want to use a patch”, and we don’t have it.”* (Principal nurse, DHMT clinic)

A lack of physical medical equipment, also caused by gaps in this supply chain and commodity management, is a frustration for providers.

> *“There are those shortages of instruments, like I said with the mosquito forceps: there is no pack today; you use a pack today, another patients comes, you won’t be able to perform it because that was the last pack.”* (Principal nurse and MoH ToT, rural SRH clinic)

This lack or inconsistency of resources means providers commonly have to recommend women try an alternative clinic, or send them away altogether.

> *“They’re going to have unplanned pregnancies and they’re going to lose confidence in the system, yeah. And they might not trust that they will get the method whenever they want to. You know with family planning you need to convince the people that this is what you need to use, and you can get it whenever and wherever you want”* (Clinic co-ordinator, private SRH clinic)

> *“It is really bad, because people end up… they come here for family planning, they have decided what they want to use. So if they say they want to use the implant and it’s not here, they will go back home, and what happens - they end up getting pregnant with an unwanted baby.”* (Principal nurse, DHMT clinic)

Many women had personally experienced their chosen method being ‘out of stock’, particularly implants or Depo-Provera, or had to visit multiple public clinics to find free contraceptives. Pharmacies stock the pill and Depo-Provera, and women are often told to go and purchase these methods and return to the clinic – particularly Depo-Provera which requires a healthcare professional. This was problematic for the women who cannot afford this option, and often this led to them using condoms as an interim method.

> *"There was no depo all over Gaborone that time. Then I just decided ah let me just break. Coz I didn't have money so that I can go buy depo from the pharmacy. Or I just say ah let me stop because the date I had been given they passed, so they just said 'ah we don't have depo, so you can use the pill.' And then I said, ah I don't want to use the pill, I just need the depo. Then I just decided to use the condom until I found that depo is back."* (P18: Age 37, HIV positive)

> *"If you don't have money you just have to wait for the free one to come, sometimes it's not there in the clinics… Women just go home and wait for the one to come."* (TKP10: Age 32, HIV positive)

National administration and management

A heavy reliance on one centralised system and unified approach to method delivery, led by the Ministry of Health, can lead providers to feel micro-managed in their counselling, and influences the methods or services they are allowed to provide.

> *"For example, implant removals people are having a tough time removing implants especially from public health facilities. They are being told various reasons why they cannot remove the implant. One, 'there is no one there to remove it', 'it's too soon, you can't remove it - you've just inserted it', 'the implant is too expensive, you cannot remove it', you know."* (Clinic co-ordinator, private SRH clinic)

This rigidity of protocol and rules set 'from above' can directly influence patient care and cause additional hurdles for women seeking family planning, and the providers supplying it.

> *"Because there are protocols which are there, which really need to be broken… Like a woman, she should have a full examination before you give her a family planning methods, physical examination and vaginal examination, so that you exclude any abnormalities. And sometimes when they come, there are no packs, the packs maybe for the speculum. And then sometimes, because it's one of the requirements, you can't do them… You can't assist the woman… Because of lack of equipment for the protocols which are there. But some people, some providers, can be so rigid about the whole thing. But if you are understanding… you can always give them what they want and then appoint for them another day to do it… But at least you can make arrangement… but without denying them the methods they have come for."* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

As described earlier, many institutions keep some funds aside to fill gaps in resources and government investment, which can cause a divided approach towards resource management.

> *"We keep the funding until the point where the central medical stores doesn't have something, and we make sure that we procure. But we can only procure for BOFWA facilities, we cannot even gift anything to the government. And you know some facilities as close as here, block nine won't be having something yet we are having something here."* (Senior manager for programmes, private SRH clinic)

Effective management - both from a policy and planning perspective, and within the clinics themselves - is made more difficult due to a dependence on manual paperwork rather than computerised systems.

> *"Unfortunately, we don't have sort of like a soft, a computerised system of managing our drugs. We are using the hard copies, we have files and files… That's the component where we are lacking and even in central medical stores I don't know how they do their commodity management."* (Senior manager for programmes, private SRH clinic)

Client behaviour and attitudes

Client behaviour, such as infrequent method use, poor follow up, with-holding information, and changing clinics or providers, can causes issues in consistency of family planning provision.

> *"Some they just stop using the method without consulting the provider. And then they will come back after a year saying, "no I want to start this method again". Some they don't even tell you that they've used the method before, you know there isn't so much commitment to using the method from the client side. But they keep having unplanned pregnancies, yeah, and it comes as an after though that 'no, I should have done this, I should have continued the method - now let me go back to the facility to use this method again.' So, I think it's a matter of being, feeling a bit lazy to go to the clinic frequently"* (Clinic co-ordinator, private SRH clinic)

> *"So, you know a client they are very tricky because sometimes when you counsel them like that, they will seem to agree with you. But in the deepest of their mind they are saying I wanted to remove [the implant]… You know some of them even move facilities. You will see they have moved here, they have gone, they get the same counselling, they get agitated. They just listen but they're not listening, and they move to another facility."* (Senior manager for programmes, private SRH clinic)

Women often make decisions about their family planning prior to consultations, based on myths or anecdotal evidence. Battling these misconceptions about contraception within consultations is time consuming and can be a further frustration for providers – with many women remaining obstinately determined regardless of medical or provider advice.

> *"Some come uninformed, some come having discussed with their friends and relatives, they are already coming with whatever information. Normally, they say, "I want to use family planning, but my aunt says it's not good for me because I'm still young, I will have infertility". What do you say, as a nurse, to those kind of things? ... Every time when we talk about family planning, they always refer to, you know, "My aunt said she experienced this…", "My friend experienced this…", "I saw on Facebook, this person said this…". You see? So I don't know how that can be broken."* (Principal nurse, University clinic)

Women also described certain elements of their own behaviour as problematic for use of family planning services or contraceptive methods, including a lack of openness or embarrassment about discussing sex and contraception with providers, or desire for privacy. For some women this stopped them seeking sexual health counselling, or influenced their decision to use methods that did not require attendance at clinics.

> *"But the problem is going to the clinics. The thing is, you find that we want to do it but the problem is where we are going to do it. If it was, there was a private place to do it, like getting the pills at the pharmacy. I think most of people opt for other methods."* (P7: Age 34, HIV negative)

Lack of trained personnel

A lack of trained personnel causes women to be turned away from services, and prevents them from accessing specific methods – primarily IUCD and implant.

> *"There are rare, rare places where you can get this Norplant. Because when I first wanted to put it, in I went to this clinic. They said, we don't have to, the doctor who inserted is on leave and bla bla bla, he's the only one… They referred me here, yes, and it wasn't easy for me to find this place. It's hidden… The decision [to use Norplant] was easy, getting it was not… So I went to [Princess Marina Hospital], 'we don't do this', or doctor was not there as well. So it wasn't easy, I tried three places, yes."* (P6: Age 40, HIV negative)

As well as being problematic for the consistency of care women receive, a lack of trained personnel causes additional pressure for both the clinics and individual providers who do have adequate resources.

> *"Participant: The challenges, sometimes, is there are few trained personnel… If they want a certain method, in a certain clinic maybe there is nobody covering for that method. Methods such as the IUCD, many nurses are not skilled in the IUCD… The implants, not everybody is capable in the implants… Most of them, they are not comfortable, they will keep on sending them to one [different clinic] or another, so it becomes a challenge.*
> *Interviewer: Which is [your clinic]?*
> *Participant: Yeah! Therefore all the clients, sometimes it's overwhelming, and you have to send them back to come another day"* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

This demand on limited personnel and an already stretched infrastructure can exacerbate the lack of time providers are able to allocate for individual consultations, and lead to rushed, inadequate discussion of family planning options.

> *"Maybe for [women] to understand and end up making a good choice to decide what method to use, we don't have time as providers, because we find we have got a queue outside. With that little time, you have to teach someone, and sometimes they come one by one. And if they come one by one, it means you have to spend maybe fifteen minutes trying to make someone understand"* (Nurse Midwife, DHMT clinic)

Whether to do with a lack of time, or insufficient training in family planning counselling, some providers felt they needed to do more to simplify contraceptive information.

> *"Yeah, because sometimes we make this mistake of keeping things to ourselves and think that we cannot tell this to the clients because they cannot comprehend it. But they need to, you need to if it's complex you need to simplify it to the client. And let them know at their level what information is there on family planning."* (Clinic co-ordinator, private SRH clinic)

Availability of family planning services and methods

The most popular contraceptive methods are the male condom, combined oral contraceptive pill, and Depo-Provera injection, with providers offering both method-specific and supply management reasons for this. These methods are also available in pharmacies, requiring minimal or no attendance at clinics and generally the most consistently available methods.

> *"But depo, it is popular. I think it is because women don't want to come to the clinic on a regular basis. And maybe taking oral contraception on a daily basis, also, they will tell you that they missed to take the tablets, so sometimes they forget them."* (Nurse Midwife, DHMT clinic)

> *"So, they will just depend on whatever they are using because the supply has been consistent…Yeah, the condom, the pill, the injection….It's on rare occasions that you'll, find them out of stock and if they're out of stock it's not for a long time."* (Senior manager, HIV clinic)

Contraception is seen as widely available and accessible in Botswana; even if specific methods are not in stock, there are often other options offered, and women do not perceive stock-outs as a long term problem.

> *"It is easy because akere (because) you get them free in these hospitals. Very easy. ... [If not available] you buy for yourself and then you come to the hospital. They do it for you. But it is not often. Sometimes. Maybe once in a year."* (P17: Age 39, HIV positive)

> *"There was no Depo all over the clinics. I just go, they say ah all over, the clinics, we don't have depo, it's either you go to the pharmacy and go buy for yourself then you come to our clinic ... I'm working with another lady, they buy from the pharmacy twice… Ah if they are having money some of them they buy, but some of them they just use a Pill. They just use pills."* (P18: Age 37, HIV positive)

The lengthier clinical process required for certain contraceptive methods, like implant and IUCD, can deter some women from using them, which makes them seen as less accessible than others – such as pills, the injection and, most commonly, condoms.

> *"Let's say these other contraceptive methods, they're readily available. But when you go to the hospital the process may be long to be able to be helped to get those. So you find that a condom is readily available. It's easy to use."* (P12: Age 19, HIV negative)

> *"It doesn't need a lot of procedures. Mm it's just easy. You can do it by yourself. You don't need to come to a doctor. You just read and do it."* (P22: Age 21, HIV negative)

5.7 Gaps in family planning services and management

Physical and financial gaps in FP services

NGOs and individual providers described having to fill gaps in government provision – both financially, and in terms of education or outreach.

> *"So, we have a small budget to cater for services. Like for example we have not necessarily family planning, yeah in fact we have even secured implants that were not there at one point. We have also secured oral contraceptives that were out of stock at one point. One other thing that we've also managed to secure is a rapid syphilis and rapid chlamydia test which the government is not providing. We have also managed to secure a CD4 machine and also buy ourselves the cartridges to use for that."* (Senior manager for programmes, private SRH clinic)

> *"We talk to young people in schools, we visit the tertiary institutions. So, certain tertiary institutions have got a school clinic. So, usually what we will do is we will take commodities to here and especially where they don't have a school nurse. And then we provide services from there, somebody wants an implant they will do it from there."* (Senior manager, private SRH clinic)

Providers feel there is not enough urgency from 'the top' around providing services and resources in family planning, and even where services are available there is a lack of focus on demand creation at a national level.

> *"Creation, community family planning is not there. We are not doing it from the community, we are doing waiting, as if we are waiting for emergencies. Family planning is not an emergency, it's supposed to be something that young people have knowledge of... Our government is more into curative services. Prevention yes, they speak prevention but when you get into a facility you see mostly curative services. Where is the prevention component, that is why we have like lots of unwanted pregnancies, we have 15% of our maternal deaths due to abortion, we could have prevented that. We are busy curing ailments that are coming because we did not prevent, yeah."* (Senior manager for programmes, private SRH clinic)

Lack of age-appropriate services

Sexual health services for young people are not currently as friendly, physically inclusive or tailored as they should be.

> *"We have about I think more than 30 supposed to be 'youth friendly clinics' ... But I think for me we are not as targeted as we otherwise should be. Because at times we have a youth friendly corner within the hospital and it's manned by someone my age. Still, it doesn't talk to you know the guidelines of youth friendly clinics. You know their operating hours are a problem, you run clinics during the day when you know adolescents and young people are in school."* (Senior manager, private SRH clinic)

> *"Because the services are not friendly most of the time. When they come here, they know certain services are not really, really friendly, they will get those healthcare workers who have those kind of attitudes… And from the other clinic, they will say, "They were not friendly', so they will be going from one clinic, to another, to another."* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

There are also age limitations that deter younger women from accessing youth friendly services.

> *"The health professionals, I don't think children have that confidence to go to them even though they are 'youth friendly' clinics. Getting to that clinic in the uniform or get into that clinic at a certain age, is it under 16 you can't access these things alone. Yeah. So those are the limitations."* (P2: Age 21, HIV negative)

Older women are also excluded from sexual health services due to a lack of tailored advice and provider knowledge.

> *"You know menopausal women have difficulties accessing education or knowledge on whatever that is going through their systems. You know some of them, even as providers sometimes we are at a dilemma not knowing when she is 50 she is still having her menses ... We don't have that much knowledge, we google sometimes because we don't know. She wants to prevent, you know that she is having her menses. She might get pregnant if she's not using, but you are wondering giving hormones won't that affect her pre-menopausal stages?"* (Senior manager for programmes, private SRH clinic)

Lack of integrated services

For providers, these issues highlight the need for a more comprehensive sexual health approach that merges HIV, family planning, STI testing and treatment, pre-and-post-natal care, menopause care – for women of all ages.

> *"As we discus family planning let's also discuss fertility, childbearing… You know we don't even have tests for fertility, for hormonal. We have nothing that addresses, you know fertility is part of family planning. When now somebody wants to have a child*

> *because we help them prevent a child. Now when they want to have a child it's like you are looking under the table, we are looking for, there is nothing. You are thinking of where to refer her to. She will be surprised, 'when I didn't want a baby they were busy inserting implants…Now I want a baby and my return to fertility has delayed because of maybe depo and because of maybe implants, hormonals. And then the only thing they can tell is just let's wait and see, it will come.'"* (Senior manager for programmes, private SRH clinic)

Additionally, this lack of integration causes problems at a practical level, where women are required to attend different clinical locations to receive cohesive sexual health care, sometimes travelling from a family planning clinic to the pharmacy, and then back to an HIV specialist before they have a full 'package' of services and medication.

> *"You know, it would be nice if services were integrated so that they get medication and pills and everything at one point. So they have to come back tomorrow. Lack of integration of services is the problem."* (Principal nurse and MoH ToT, rural SRH clinic)

5.8 Influence of HIV prevalence, policy, and services

Botswana's HIV epidemic has heavily monopolised sexual health services and policy, thereby influencing the promotion and availability of contraception and moulding socio-cultural attitudes towards sex and family planning. As access to anti-retroviral treatment continues to improve and stigma reduces, there is a strong desire to consider HIV less unilaterally. HIV positive women feel limited in their choice of family planning due to their status, and require more in-depth, tailored information about their options.

5.8.1 National response to HIV

Condom promotion and uptake

Botswana's historic epidemic shifted the priorities of sexual health programmes and policy, changing providers' approach to family planning counselling, and promoting condoms above all other contraceptive methods.

> *"I think there was a time when you know when HIV was big in this country where we kind of undersold all the other family planning methods… I think we were desperate*

> *then… So, because of I think the burden of some of that disease at that point we were kind of just focused on okay, what is it that we can do? Condom, condom, condom, condom"* (Senior manager, private SRH clinic)

> *"IUCD then was by far the one that was more preferred… Because of its privacy and the fact that you don't really need to go to the health facility for lots of visits… And then, that was followed by the pill and the condoms. Condoms, people did not really like them until we got HIV. Then we had no choice because a lot of people were dying, and it was very clear that this was an STI. So, we really had to intensify and go house to house and go company by company."* (Senior manager in family planning, Ministry of Health)

This continues to influence women's perceptions of other contraceptive methods, where condom use, sometimes instead of long-acting methods, is seen as the best option.

> *"You can't continue using this Depo. I think here in Botswana we are the highest in HIV. That's why people they change to use condoms."* (P14: Age 42, HIV negative)

National policy and healthcare strategy around HIV

A dominating HIV presence, and an underlying prioritisation of HIV prevention in almost all healthcare policy, and within individual counselling sessions, was seen as problematic for contraceptive uptake and provision.

> *"Do we have the contraceptive language with us every day as clinicians? Or because of the environment, the health environment in our country, we have the HIV language mostly. You know, there's a contradiction between HIV and family planning where now we are looking more into preventing new infections… So, the only question that I would wonder to myself is do we really speak family planning to our clients? … A typical example… there was something I was given from the ministry of health, I think it was for family planning. And then the officer was giving me that thing and then he said, "you know how HIV… it enters into every programme. You know when you do something for family planning they will say yes, while they're using implants include condoms, include the message for HIV"… So, it seems like every message in that we develop we have to integrate HIV into every programme. So, that is why some of the, at the end of the day it's like I was asking myself do we speak family planning language, or we are always speaking the HIV language?"* (Senior manager for programmes, private SRH clinic)

5.8.2 Promotion of dual-protection

There has been a drive from family planning specialists to encourage dual protection, ensuring that condoms are available and provided alongside all other family planning methods. However, the nature of the male condom requires a high level of trust that clients' will consistently use the method, and the real prevalence of use is hard to measure.

> *"Because that one it comes to condom as family planning or condom as prevention, mostly we count distributed… We have not done much study to say really who are the people using condoms, who are not using condoms? … Why are they not using condoms? But all we know is that we distribute"* (Senior manager for programmes, private SRH clinic)

> *"I would say, the challenge is consistent use of the condom. Because, you know, with partners, they'll start being… When they're still new to each other, the first few months, they will consistently use it. After that, it is like, "No, we have gone for tests anyway". You know? So consistency with the condom, because people still get pregnant when they are using the condom. Yes."* (Principal nurse, University clinic)

However, this promotion of dual protection had not translated into use of a secondary method among HIV positive women, almost all of whom said they exclusively used male condoms on the advice of HIV testers and healthcare providers. Providers worry that HIV positive women are less likely to seek family planning advice at all because they feel their status limits their contraceptive options, and there is confusion around drug-drug interactions between ARVs and certain hormonal contraceptives.

> *"Most of the time they think they can only us the condom, and when asked about family planning they will say "condom" most of the time. [They need] education yeah, it's education"* (Senior manager, HIV clinic)

5.8.3 Unification of services and policy between HIV and FP

At a national policy level, clashes between HIV and family planning are detrimental to both areas - with priorities of provider training, financial support and physical service availability split between the two.

> *"You know if you could see these people at programme level, family planning and HIV AIDS. Sometimes in meetings they don't see eye to eye, especially with the*

> *implant once they brought. ... They're really into saying "you [family planning] guys, so you want these girls to have sex", you know. Their mindset is like we say "no, we are providing a comprehensive package". We are saying you know in most cases, even if we don't provide implants they will still have sex without protection. So, we are trying to say okay, let's prevent the unwanted pregnancy and also facilitate the use of condoms."* (Senior manager for programmes, private SRH clinic)

The historic fear of HIV has permeated so much into all aspects of sexual health, often to the detriment of family planning aims, that providers want an overhaul of the entire national approach.

> *"And I think this was skewed by us as the service providers because we were just so scared of HIV that we would push everybody onto condom, condom all the time. But I think now that the prevalence is levelling down I think we need to then go back to the drawing board and say how do we do this all over again"* (Senior manager, private SRH clinic)

One specific suggestion that emerged consistently was the potential for integrating family planning into existing HIV services, which was seen as an untapped potential. HIV clinics offer systemic care rather than emergency medicine, meaning there is more time for in-depth discussion; and attending these consultations is often already a well-established part of people's routine.

> *"Another challenge, you have women who don't come to SRH, for whatever reason, maybe they have limited time, they have very little time from work, they went for [HIV care]... But they want family planning and to have their pills... But they can't... You know, it would be nice if services were integrated so that they get medication and pills and everything at one point. So they have to come back tomorrow. Lack of integration of services is the problem."* (Principal nurse and MoH ToT, rural SRH clinic)

5.9 Chapter summary: Clinical and policy factors influencing contraceptive provision and use

This chapter explored the various clinical and policy factors that may influence women's use of family planning, but also act as key barriers or facilitators for provision of contraceptives. The largest of these barriers is the lack of integration between HIV and family planning services, which seems to be especially problematic for clinical provision and national promotion of LARC methods.

Clinical barriers – though seen as a large issue for provision and use of family planning by providers – did not seem as influential for women. Providers and stakeholders cited problematic method stock-outs as a key barrier to women's use of contraception, but most women seemed very positive about the range of contraceptives available in clinics, and stated they were always given a solution if one specific method was not in stock - like visiting the nearby pharmacy, or being given a method similar to their previous choice.

Though healthcare providers and stakeholders described many times they had stigmatised women or been biased in their counselling, most women did not raise provider bias as a problem for them – possibly due to their decisions being made prior to consultations, which may have reduced the impact of provider comments. However, for women who had felt stigmatised by a healthcare provider, this had a lasting impact on their use of and attitude towards healthcare services and provider knowledge.

Providers also lack up-to-date or detailed knowledge around family planning, and desire further, regular training. Many feel underconfident in providing certain contraceptive methods – namely the IUD or implant – which influences the advice they provide their patients. Government officials need to ensure that healthcare providers have the knowledge, resources, support and training to facilitate quality family planning provision at a clinical level.

Though these providers described feeling under-confident and untrained in contraceptive provision, women saw healthcare providers and clinics as their most trusted source of family planning information, citing providers' strong training and knowledge in this area. Although women often come to medical consultations with their contraceptive decisions already made, this level of trust does suggest the potential for providers to ask more questions and maybe have more influence on effective contraceptive use than they currently think they have.

Healthcare providers believe that sex education programmes need to be more comprehensive, and delivered to students at a much younger age – ideally before puberty or sexual initiation. Women and providers feel that there needs to be a more realistic acceptance about teenagers' sex life, particularly from parents, who could play a larger role in educating their children prior to an unplanned pregnancy, and encourage more effective, long-term contraceptive use.

Chapter 6: Influence of social networks and wider society on women's choice and use of family planning

6.1 Chapter overview

This chapter explores the influence of social networks and wider society on women's use or non-use of family planning, and the challenge these can pose for provision of contraceptive services and methods. As well as the specific individual influences on women's decision-making, it addresses the broader socio-cultural factors that impact provision and use of contraception, including religion; cultural attitudes towards women's use of contraception; men's control of sexual health decisions; urban-rural disparity; and changing societal attitudes towards HIV.

Findings: Influence of social networks and wider society on women's choice and use of family planning

A woman's choice and use of family planning is heavily moulded by her friends, family and social media, though conversations with parents or elders about sex and contraception are seen as taboo and happen rarely, if at all. Socio-cultural attitudes towards gender and womanhood mean that male partners are the most influential barrier or facilitator to women's use of family planning, though in many cases men are uninvolved in family planning decisions and services. Demographic factors - such as religion, geographical location, and education level - either heighten or reduce the influence of these social networks.

6.2 Influences on women's contraceptive decision-making

Cultural hearsay and 'information sharing' among women

Sharing information among women was seen as very important, and many saw it as their responsibility to share their own experiences with others – colleagues, friends, age-mates and even in clinic waiting rooms.

> *"Some women learn from other women, like I am here in the hospital, when I get to them they ask me where I got the information, then I tell them I am from the hospital and this is what I was taught."* (P3: Age 29, HIV positive)
>
> *"Some may just get advice from others. "Okay I used this and this so you may also use this and this, go to the clinic and get that."* Yeah." (P12: Age 19, HIV negative)

This focus on information-sharing can be problematic for healthcare providers, as it leads women to make decisions prior to consultations or have incorrect, biased advice, and makes it harder in time-limited sessions to address these rumours.

> *"Others will just talk through Facebook that the implant, it can move to the legs and whatnot, so they will come with all that information. And during counselling it will be very difficult to convince someone, you need more time to really tell them that is not going to happen."* (Post-abortion counsellor and ward nurse, national referral hospital)

Parents and extended family

Female family members can influence women's decision-making on contraceptive use and be a valuable source of information – but mostly after the birth of their first child.

> *"I was still young and my mother…. Yes, she was the one who was supportive. She said, she told me that this is a beautiful thing my child because now you have learned a lesson. Now you can take care of your child until you have another one. That's very good… Ah! I trusted her… She knows it better."* (P17: Age 39, HIV positive)

Aunts were cited by multiple women as their key support network in seeking family planning, and those who were aunts saw their role as important and influential.

> *"It's only my aunt, when I was still in school she will tell me if I want to start to having boyfriends and girlfriends because she knew. She just told me come to me I will take you into the clinic. By that time she moved to America. So I didn't have anyone to advise me. But she was good. She could advise me."* (P19: Age 41, HIV negative)

> *"I have heard about it on the, some programs the TV, I usually watch the family planning channel… Deliver me. Mm, I usually watch it with my younger sister's daughter, she is a teenager, she is 16 years. So since I am not working, I am a single mother, I'm always telling her it's difficult to have children while you are not working. I want her to grow up knowing that you have to work hard before she can have children, so she is the one who introduced me to that channel… Yeah, I watch it with her, she'll, when I have forgotten she will call 'aunty, come and watch'"* (P20: Age 38, HIV positive)

Friends and peers

Providers felt that women often attend family planning consultations with their own information, misconceptions and anecdotes, and that decisions are primarily made using information sought from friends and peers.

> *"Maybe they get the wrong information from at home, family, friends, about certain methods. That's why, when they come in, they have those preconceived ideas about certain methods."* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

> *"Because when I am your friend, and I tell you, you know, "I was using injectable and this is what is happening around me, and this is this…", you follow me. If I am telling you, you know, "Don't take an injectable, if you take it you will be having*

> *prolonged menses", you will not take it. So the influence comes all around."* (Principal nurse, DHMT clinic)

TV and radio

Radio and TV were cited as important sources of family planning information for women, and a way of easily accessing trustworthy information. Women highlighted some specific programmes - like the family planning channel, Deliver Me; a play that discussed contraception aired on Botswana TV (BTV); and a health channel called Botsogo, also aired on BTV.

> *"On TV there are programs that taught. That programme is known as Tsa Botsogo. They talk a lot about that, they talk about AIDS and HIV, they talk a lot about sexually transmitted diseases, they even talk about family planning. That is where we can get information again… That's very good, because most of the people they have TV's and radios. I think that one is, I think they trust that if, they trust what the people say, what, these Tsa Botsogo people. They help people, they, how they teach us, I think they trust them."* (P17: Age 39, HIV positive)

Specific methods being advertised or shown on these programmes was seen as a positive way to reduce stigma and share information, encouraging some women to try or consider an alternative method.

> *"I think the radios and TVs they have the influence on the decisions that we make. More especially concerning this family planning and the use of contraceptives. Because sometimes when, like this female condom, when it was introduced and in when it was advertised in TVs and radios, you would you'd want to, to use it, so that you experience what they said."* (P7: Age 34, HIV negative)

Older women saw utilising TV and radio, but particularly TV, as especially promising for younger generations.

> *"So that even the teenagers they can have the information. Because they like TVs and radios. So we are olders we can have it in the clinic right, but the teenagers they can have it in the TVs and the radios… Yes, the teenagers they like TV very much. Even, but the radio not much, but TV - ah if you can use the TV so that they can take the information, that they can learn many things."* (P18: Age 37, HIV positive)

There are also specific Ministry of Health schemes which provide high quality information about contraceptives nationwide - including pamphlets, booklets, wellness days and training for school nurses – often utilising more traditional forms of media to ensure inclusivity.

> *"You know, these days, the radio, there is this information. The Ministry of Health is able to go to the radio stations and give information on family planning. We also have pamphlets and booklets which we issue the women outside. So they can pick different methods. Any leaflet, they can go read it."* (Principal nurse, DHMT clinic)

Social media

Many younger women said they predominantly used social media to gain first-person narratives and experiences about contraception use and sexual health.

> *"But I have, like this person that I watch on YouTube, that's like, talks about the stuff that people go through in life, she was talking about her journey with contraceptives."* (P1: Age 20, HIV negative)

> *"I've seen a lot on social media asking about the contraceptives before they could make decisions, even others giving their testimonies just to motivate others. So I feel it plays a crucial role… Yes, you have a conversation, you can ask the person, how long have you been using it? Why did you experience that? What did the doctor say about it and all that?"* (P2: Age 21, HIV negative)

This ability to share unverified personal feelings publicly made information gained from social media untrustworthy for some women, with extreme positive and negative viewpoints about the same method or issue causing confusion.

> *"Sometimes they will put new information. The next time, they will give another information, a different thing. They all complain about something like this [method], obviously, this is good. They are the ones who say 'this is not good' like that. That's why you never know what is the truth, that's my problem with social media."* (P19: Age 41, HIV negative)

> *"That one I don't trust at all, aah social media! No… Some people will never tell the truth, there are so many stories there... I don't believe the stories"* (P11: Age 28, HIV positive)

Providers feel this growth of social media is changing the way younger women communicate about family planning, and another source of, often biased, information about contraception that they bring with them into consultations.

> *"They don't come first here to know about the methods. They get the message… They will get their information first from the WhatsApp feeds, from the social media, who will tell them about all the negative things and that is what they will remember."* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

> *"And the social media! You know, people research so much, they google… They are exposed now to the internet so they… They research and they will tell you, "I read from google, one, two, three". So they know, they are now exposed to social media."* (Nurse Midwife, DHMT clinic)

Clinical settings and healthcare providers

Clinical settings were almost unanimously described as the best place for women to seek information about family planning – either specific NGO services, public clinics, or hospitals. Women said that, even if they sourced information from friends or social media, they should verify it with healthcare professionals at these locations.

> *"Yeah, they get information from friends. Sometimes they can tell you that this one is fine, even though you don't know the disadvantage and the advantage…. Mmhh but eventually you get to the hospital, they will tell you this one how it works… I want [information] from the doctor, from the nurses."* (P16: Age 25, HIV positive)

Many women described learning about methods from other sources in public clinics, such as pamphlets or posters in waiting rooms.

> *"Sometimes in the clinics they are trying to tell us about the family planning, and they are having some pictures, posters… So that there is somebody who can able to read to just take, there are some booklets like this one… If you want to take it, if you able to read you can read it for yourself. Ee (yes) here they can take the booklet"* (P18: Age 37, HIV positive)

> *"And then when I visit clinics, you find that there are posters raising awareness about family planning. Yes, I read them. I just read them, I haven't really asked a medical practitioner for those"* (P12: Age 19, HIV negative)

6.3 Socio-cultural attitudes towards sex, gender, and family planning

Patriarchal attitudes towards sex and gender

Women feel that many men do not see them as equals in their relationships, and are primarily there for men's sexual pleasure.

> *"You find in a lot of instances, they're not there for the woman. They're just there to you know, get pleasure and leave*." (P21: Age 33, HIV positive)

This focus on male pleasure in sexual activity provide a major barrier for women seeking, using, and adhering to family planning. Contraceptives are seen to 'change' women's appeal to men, which is problematic for women keeping relationships.

> *"Guys, they believe that these things of family planning, they think they destroy girls… That is, if I am using some [contraceptive], I'm going to be, I'm not going to be enjoyable."* (P17: Age 39, HIV positive)

> *"They say once you are using these family planning commodities especially like I said the hormonals you, the guys they call it, you become what. You know in Setswana they call it like, sort of like the vagina becomes, it gapes, it becomes big, and you are not - to the men you don't become tasty… You know we use the African language [laughing]… They think that you know somebody becomes too big for them, they could like easily you know abuse a woman verbally by saying that. You know it's not a nice thing that you are trying to prevent pregnancy, and somebody says, "you're not the same person that I know, you are not tight". Because here in Africa we believe in very rigid sex where you know the man is in control."* (Senior manager for programmes, private SRH clinic)

Even within marriages, this can be of concern – particularly among older women – and is something providers are trying to fill with specific programmes.

> *"How do you engage, especially with the male counterpart so that he doesn't go out there having sex with young girls and then bringing HIV into the house and all the like? So, that they should be aware that as women as you grow older and relax in your own space and say you don't want sex. Some men do go out and have it. And then one instance that now you want to have sex with him you will receive HIV from him"* (Senior manager for programmes, private SRH clinic)

Women felt that culturally, children are seen as their responsibility and men often do not participate in pregnancy or child-raising.

> *"I mean, half of Batswana men they don't care about kids… They don't care about taking care of their kids. They would rather do kids and run away, most of them"* (P15: Age 32, HIV negative)

Women said that men's casual attitudes towards sex and relationships can make them feel alone when faced with unplanned pregnancy.

> "*One of the reasons why I left him was because he couldn't even help me. Like most of the time I had to help myself with this whole thing. It's like a guy messes up during sexual stuff. And then a woman has to fix it for herself"* (P1: Age 20, HIV negative)

> *"I was, really I was not happy because I was always stressed out. I even got, my blood pressure was not pumping well. I have stress related diseases because the father[s] were giving me a headache. They didn't want to see me. They will not help me. I was alone in the pregnancies."* (P17: Age 39, HIV positive)

Stigma around family planning use

Family planning use can often be associated with promiscuity, and consequently women seeking contraception can be met with judgement – from parents and friends, teachers providing sex education, or even strangers within the community.

> *"Another myth would be if you are using contraceptives is it means that you are sleeping around, you know. You have so many boyfriends now you don't want to get pregnant, that's why you're using contraceptive."* (Clinic co-ordinator, private SRH clinic)

> *"Because it's such a small community everybody knows the other. If they go to the clinic a distant relative is there and they are going to go start asking the mother "was she having a headache, was she"? I mean like really, and then we have those in our communities where our communities are quite cohesive, they discuss issues. And you know you can imagine being labelled in that small community, what it does to you as a young person. Which really destroys the person that you are."* (Senior manager, private SRH clinic)

Some women said stigma was an influencing factor behind their choice of contraceptive method.

> *"Stigma also has a play in it. Because you say, okay, if I put a loop, nobody will see it. If I put an implant and then somebody accidentally sees a mark, like, Oh, she has an implant. So most people will choose something that is not visual to other people."* (P22: Age 21, HIV negative)

Women also described the public availability of condoms at clinics and in shops as bringing potential for stigmatisation, as it makes it obvious to other people in the community, family members and peers that they are sexually active.

> *"I was scared to go to the clinic and get the female condom because by then I was still under the supervision of my parents. So if someone sees me go into the clinic and get that, they might tell my mother that we saw your child picking a condom there it means she has started doing it. So I was scared to go and do that."* (P7: Age 34, HIV negative)

> *"You're going to get judged especially in the country that we live in now… Already they label you as you know, promiscuous. I mean already is kind of hard for some men to go into a shop and buy condoms. I imagine how much worse it is for a woman."* (P21: Age 33, HIV positive)

Male partners associate family planning use, particularly long-term hormonal contraceptives, with a lack of commitment within relationships due to this promiscuity and ability to 'sleep around' if a woman is protected against pregnancy.

> *"In my culture, people who use contraceptives like implant and tubes, they are viewed as a prostitutes. Yeah. Or somebody who's just wanting to have sex all around. Wa bona (you see). That's why most boyfriends have problems when their girlfriends wants to do contraceptives. They think now this girl wants to cheat. This girl doesn't want to fall pregnant"* (P22: Age 21, HIV negative)

There is also stigma around women encouraging condom use, which male partners associate with women not trusting them, not wanting to carry their children and not loving them.

> *"Eish, [men] were just giving me problems. The other one was just telling me you refuse to make love without condom, maybe you are cheating on me, so maybe that's why you don't want to do it without using it? Maybe you don't love me, aah! And the main problem that he don't want to test himself… When I just talk about HIV status hey, he just get angry with me. And I didn't trust him because he was partying every time, he was always drunk, that's why I didn't trust him and feel free"* (P15: Age 32, HIV negative)

Stigma related to teenagers and youth

There is additional stigma attached to adolescents seeking family planning, with the fear of gossip amongst the community preventing young women from being seen at family planning clinics.

> *"Because most youth, they want to [use contraception] but because of the stigma from the society, they're not free to do it. Wa bona (you see). If they see [me] at [the clinic[, they'll be like 'Oh I saw [you] there so obviously she was doing this, this, this."* (P22: Age 21, HIV negative)

> *"There is [stigma], especially with teenagers. When a teenager comes into a facility and says, "I want to start on family planning methods", they are sort of looked down upon… either by the health worker, or by the community."* (Principal nurse, DHMT clinic)

Due to this, young women often have to lie about accessing family planning services, and hide contraceptive use from family, teachers and religious leaders.

> *"But you know what, you have to lie that you are sick at school so that you go there. Because you don't, you cannot just miss classes and tell the teacher that you went to take family planning… So you've got to lie at school, so that you go to the clinic; 'I'm not well teacher, can I go to the clinic?' You go there when you know you're going to get your pregnancy prevention thing. But you can't tell the teacher it is my time to go for my pills."* (P6: Age 40, HIV negative)

Even if they do attend these clinics, young people can experience additional barriers in accessing family planning, primarily caused by stigma from providers which can directly cause them to leave clinics without a contraceptive method.

> *"You feel like, how is this doctor going to look at me? Like I told you, yesterday we went at a certain clinic in Gaborone for implant booking. Oh my god that man gave us attitude… So when we got there we asked him go re (if) is this where we have to book for an implant? He was like "Yes." And then we told him okay, we are four, all of us want to book. And he was on some like, "Hey why, you are young so you want to have sex, this thing is for people who are old." Wa bona (you see). He was just telling us a lot of things, and then we actually went. We just went out without telling him."* (P22: Age 21, HIV negative)

Teenage pregnancy is highly stigmatised, and young women are judged heavily by society and within their own families.

> *"Eish! Aahh, they were saying things to my family… My mom was so angry with me that she just pushed me away."* (P15: Age 32, HIV negative)

> *"I was not free. Ee (yes) scared of people. Because I was young…. Ee (yes) people will talk, discuss about me - ah they say I'm young"* (P14: Age 42, HIV negative)

Younger women were seen as more promiscuous and casual in their attitudes towards sex.

> *"Those teenagers, aah I don't think they just take it seriously… Because I always see more teenagers pregnant than older ones, aah I always see them pregnant more than the older ones… I guess maybe they like unprotected sex"* (P15: Age 32, HIV negative)

Several women shared distressing stories of the impact of this stigma and relative lack of options when faced with an unplanned pregnancy as a teenager – including dropping out of school, and attempting suicide or at-home abortions in extreme circumstances.

> *"I was traumatised. I even went for counselling. Because yeah, I tried killing myself. I tried doing abortions. Heish luckily my family noted something about me because I was depressed. I didn't even sit in the living room. I was just alone thinking of how can I kill the baby? How can I kill myself? But the sooner they realised and then they took me for counselling. And then they helped me."* (P22: Age 21, HIV negative)

Women also raised the importance attached to losing your virginity at a young age, and the indirect power this gives men over sexual initiation.

> *"And once you are attracted to them, men will come. They'll come and they'll want to be the first in your life… Yes. They will want to be the first. But the thing is the responsibility. It's more like it lies on the man because by then you are still young by then you are, you're still raw in education in terms of this stage. So we, we tend to be more reliant on the men."* (P7: Age 34, HIV negative)

Communication around sex and contraception

Culturally, women initiating communication around sex and contraception is seen as taboo or uncomfortable.

> *"A woman is given that image that she shouldn't discuss certain things out in public and stuff like that, like her sex life or whatever… So you just grow up knowing that*

> *you're not supposed to talk about this or you're gonna get weird looks or whatever."* (P1: Age 20, HIV negative)

Communication with partners about family planning is difficult for women due to men's control over sexual relationships. These conversations often require women to reassure their partner about their reasoning for contraceptive use.

> *"He was saying that I'll start sleeping around because now I have the contraceptive… But I told him you know what, I delivered through C-section. I told him with C-section I have to take a break from having a baby up to a certain time, I have to have a baby after certain years. I also have school. I also have a career to pursue. So I want to have a baby after a certain period of time. I don't want to say it was a mistake or I didn't plan it."* (P2: Age 21, HIV negative)

Several women described themselves as 'free' but felt restrained by a lack of openness from other women and a cultural resistance to discussions of sexuality.

> *"We have a chatting group. Motherhood group. We, I think we are more than, we are more than 200 [women]… when it comes to chat about family planning, only 3 will communicate, the rest will keep quiet... Some says they're shy. Some says they'll lose the boyfriends and all the likes…. When you tell them to discuss and chat about [family planning] they will change the topic. Even if they paid you a visit and they sit in the same room with you. You start talking about [family planning], they'll tell you that me I have to do laundry, I have to go"* (P20: Age 38, HIV positive)

Almost all women saw it as particularly inappropriate to discuss sex and family planning with elders or parents, particularly mothers, at a young age. Many younger women laughed or looked shocked or even appalled when asked whether they would discuss family planning with their parents.

> *"No! African parents, imagine telling your mom that "you know mom, I'm going to get an implant." She'll probably kill me. So should, because she'll be like, "wow, so she's sexually active at this age." You know? No! Never gonna happen."* (P1: Age 20, HIV negative)

Communication with other younger women, like friends, sisters, cousins or even aunts, was seen as much more comfortable, and these individuals were often cited as good sources of contraceptive information and advice.

> *"It's more comfortable talking with friends than your parents. And maybe it's also comfortable talking with your cousins of your sisters. Yeah. But as for mothers and fathers you may find it's more difficult… Yes, it's an age thing."* (P12: Age 19, HIV negative)

> *"My aunt, she advised me to use them… She don't want me to fall pregnant again. She wanted myself to take care of my kid until she's a grown up somebody. She helped me."* (P15: Age 32, HIV negative)

Most women also said they felt comfortable sharing their own experiences with their peers, and those younger women who were using long-acting methods described promoting them amongst their age-mates.

> *"Participant: I will try to convince my other friends after they see me, [telling them] guys you can do this, blah blah blah. Yeah.*
> *Interviewer: So it's comfortable talking to your friends?*
> *Participant: Friends, yeah. Peer groups, it's easier. But imagine me telling an older woman that you can get this [contraceptive method], hey it's difficult… But in my age mates it's easier."* (P22: Age 21, HIV negative)

For most women, the ability to communicate about sex and contraception with parents, particularly mothers, changed entirely after the birth of their first child.

> *"Okay with mom we discussed after I gave birth, which method do you want to take? After birth what are you going to do? Which method do you want and all that?… Some parents you can't discuss certain things with them. It was the first time to discuss it with my mom after I fall pregnant. Before that no, we don't discuss such conversations."* (P2: Age 21, HIV negative)

> *"Now after my son was born, I can go to my parents and then ask them questions. … [Having my son] that's what made it easier. Even me I have freedom to ask them anything, at anytime… Unlike my younger sibling. You can't expect her to ask my parents how is this, how is this because she is still in high school"* (P22: Age 21, HIV negative)

The importance of childbearing and motherhood

The cultural importance of pregnancy and having children means contraceptive use is commonly associated with 'birth spacing' rather than pregnancy prevention. Women felt providers, families and peers were more understanding of them using family planning for this purpose, possibly explaining why discussions of family planning commonly only occur after the birth of a first child as explored above.

> *"I tell my sisters and my mother that I like to use [contraception] and they said it's okay, because your children are going to go step by step, they're going to grow nice… with good space"* (P16: Age 25, HIV positive)

> *"You have to seek information to be able to have children at a certain interval. If you don't go for contraceptives you might even have children who are a year apart, and that's lot of baggage"* (P2: Age 21, HIV negative)

Being seen as a woman in Botswana culture is synonymous with becoming a mother, leading to pressure to have children from both society and within families.

> *"Like in Botswana there is a culture. Culture plays a big role in the decisions we* make because *parents will expect you, if you are married, they'll expect you to have a lot of children. They will even ask you, when is the next one coming?"* (P22: Age 21, HIV negative)

> *"Do you know when people find out that I'm 30? They ask me, how many kids do you have? And I'm like, I don't have any kids. Then they wonder, 'are you going to make them? You know that a child is easy to make?'… You know, it's like a rite of passage in this country…. you carry on with life, like as long as you've had a child."* (P21: Age 33, HIV positive)

Men also have a strong desire for multiple children, which women said was a key barrier to them not using family planning, and the reason behind men's attitudes towards contraceptive methods.

> *"No, they are not supportive [of contraception], they say they want children… Aahh I don't know, maybe so they can show that they are real men."* (P9: Age 25, HIV negative)

> *"I remember my neighbour was beaten to death by her husband because he find pills in her bag… She nearly died. He said, 'I married you so that you can give me kids not to use this.'"* (P20: Age 38, HIV positive)

Men's desire for children was also cited by multiple women as the reason behind men forcing unprotected sex, cheating, or having multiple partners.

> *"In some relationships because the boyfriend can tell you that he wants a baby, and that time you can't afford to have a baby then he gets cross with you and goes to have a baby somewhere else."* (P16: Age 25, HIV positive)

> *"He was really angry, very angry because he said, [using contraception] it means I don't want to give him kids. I said 'I already given your kids, what do you want?' That's when he started cheating and getting married to that other lady."* (P20: Age 38, HIV positive)

This importance of having children was also seen as problematic for some women, forcing them into coercive or dangerous situations, and encouraging unprotected sex in order to provide men with children.

> *"You know I think Batswana guys, I think they love kids. They don't want a girl who prevents. They need kids… Even if, even if there is no money in home, a man can force himself to have a kid. Even if there is no money for that kid to be raised, a man can force himself until he have a kid."* (P17: Age 39, HIV positive)

> *"For most women is like, also you need to look at like the socio-economic circumstances because now you've got someone who I mean, I'm sure a lot of women would have jumped at my option because like, 'Oh, you have this guy who's gonna take care of you, and all you have to do is just pop one out.'... I don't care if you want to take care of me or not, I can take care of myself. But a lot of women don't have those options."* (P21: Age 33, HIV positive)

Abortion and emergency contraception

Abortion is a highly 'taboo' issue, excluded from conversations and clinical practice. This stigmatisation has led to a lack of education, and consequently women are left seeking illegal options.

> *"I think for me the most difficult issues are abortion, that is where you really trigger a lot of you know opposition and discomfort…. You know abortion is a very silent topic in this country, it's very, very silent ... The numbers of young people from this country for me I would say it's concerning, yeah…. And I think for me it's like do we even know the provisions of the abortion law in this country? Do people know what is allowable and what is not allowable? ... Some people become desperate after rape and incest and they will go [to South Africa] when they could actually get abortion in the country. So, for me I think we have this comprehensive post-abortion care that is like the guidelines with the ministry of health. And what we used to do I think two years back is we would go to the [gynaecology] ward in Marina and then kind of pick young people so that we can provide post-abortion contraceptives. So, yeah it*

> *becomes an opportunity to deal with contraception."* (Senior manager, private SRH clinic)

Few women are open about their experiences of abortion, but those who has gone through the process legally in Botswana found it lengthy and emotionally draining due to the multiple barriers put in place to prevent them going through with the termination – even if that pregnancy was the result of sexual assault.

> *"It's illegal to do an abortion. So I had to get the police's permission and already they were doing everything they could to prove that I was lying [about the assault]. Yeah. And then it didn't help because I was referred to, it says also by law you're supposed to get examined by two gynaecologist specialist, I was only examined by one. And after I came back from the scan, he's like, no, you were obviously pregnant before this, that was not the conception date, it was not from the assault. And I said, but that's impossible… He didn't even want to hear anything that I have to say"* (P21: Age 33, HIV positive)

It is illegal to terminate a pregnancy after 3 months, which caused additional barriers for this particular woman and months of delays while procedure between police and the hospital was finalised, making her experience of the termination process more risky.

> *"I was asking for, you know, anything to take the pain away and they couldn't give me anything. They gave me paracetamol. What does that do? You know, then like, that's the only thing that we can give you because otherwise the injection that you give me every night, then I know we can't give you that because you have to be aware, you have to push. I was just like, this is animalistic… That's what I'm saying I literally gave birth, the only the only thing was the child was dead."* (P21: Age 33, HIV positive)

Women attempting abortion themselves, or seeking illegal options, are more common, as well as giving up children after termination is not permitted or successful.

> *"I tried different things [to terminate]. I was just researching go re (that) what can I use. They told me about Stameta [liquid emergency contraceptive]. And then there was this other man who sold me pills but they didn't work. I don't know how. But I just tried everything… Tota (honestly) it's not fair, cause I feel like every time we get pregnant and you don't want it, it's your choice to remove it akere (right). Because that's, that's the reason why people will have children that they end up abandoning because they didn't want them. So why can't we just prevent a lot of children who are thrown away by just killing it while it's still not something that's a big issue. Wa bona (you see). I think that the reason why most people abandon their children… If you go for counselling you get a different perspective. But if you don't, like in my case if I didn't go for counselling I wouldn't know where my son would be at this time. Maybe*

> *I would just leave him at the hospital or do something crazy."* (P22: Age 21, HIV negative)

Very few women had used emergency contraceptives, though many knew of their availability. Any barriers were to do with procedure, rather than socio-cultural attitudes.

> *"So it wasn't quite easy because he had to go in every chemist and look for those. And some chemists, they would say that, some pharmacists would say he has to bring me with him so that I can take the pill at the pharmacy. But he actually bought it from another pharmacy. And then I drank it."* (P12: Age 19, HIV negative)

Generational shifts in attitudes towards sexual health and contraception

Teenagers were seen as more open and transparent about sex and contraception than previous generations, and teenagers had felt a public shift in acceptance of communication about these issues.

> *"Yes, some are becoming more confident in discusses these issues. But let's say maybe, let's say teenagers like tertiary's they are becoming more, becoming more relaxed about this. But for people who are 30 and upwards, maybe it's more difficult to discuss these issues."* (P12: Age 19, HIV negative)

> *"Two years, three years back, it was different… But nowadays there are TV shows where just a doctor will just tell you go re (that) this is this. You don't do this [condom] you get HIV… And even advertisements in the roads, you see billboards about these things. That's how my friends heard about [this clinic]. Through advertisements and social media, Facebook. And Facebook has been popular."* (P22: Age 21, HIV negative)

Mothers also cited feeling more comfortable talking about contraception with their daughters than their mother had been with them, and described intervening earlier to try and support what school-based sex education was teaching them.

> *"I talk to [my daughters] because we are in new generation. So it's not like those days. They are free [to talk to me], yeah."* (P14: Age 42, HIV negative)

> *"I guess these days they can just feel free because this new generation, even in standard five they were being taught about contraceptives… (Laughs) when I just talk to [my daughter] she just laughs. She will say to me, 'mommy, I don't have boyfriend, am still young, please stop that…' Yeah, it does feel comfortable [talking to her]. And*

> *then she told me that, even our teacher is always saying that to us."* (P15: Age 32, HIV negative)

6.4 Partner attitudes and behaviour

Batswana men are seen as generally unsupportive of family planning use, in control of sexual relationships, and one of the strongest physical and social barriers to women's choice, use and adherence of contraceptive methods.

Partner control over sexual health decisions

Men's control over sexual health decisions and intercourse are one of the key barriers for women using contraception, and women see their attitude as a large reason behind unplanned pregnancies.

> *"I don't know but it ended up causing fights at home because the man does not want to use condom, he doesn't not want the pill… A friend of mine yeah, aah the boyfriend will always cause, I mean, force her to make love without condom then sometimes tell her to stop using pills. She had a kid, you know."* (P11: Age 28, HIV positive)

> *"Some say your partner can even steal [the pills] and drink them, then he can make you pregnant."* (P19: Age 41, HIV negative)

Men are seen as the instigators of sexual activity, which can lead women to feel excluded from decisions about what happens during intercourse.

> *"Most of the time women don't decide. Honestly. Because some men, it's like when you're making out or there's foreplay, they think because there's foreplay, you can just move on to the next level… Yeah, instead of involving the woman, like most of the time, the women are so uninformed about that, because they are never involved in decision making. It just happens."* (P1: Age 20, HIV negative)

> *"Majority of women, I think we are in abusive relationships. Even if we have sex, like I was telling you that most of girls they think guys are responsible for that. It is because guys they always overpower us."* (P17: Age 39, HIV positive)

This control over sex also gives men the power to make decisions over whether condoms are used. Women shared multiple anecdotes about friends, family or themselves wanting to use condoms, but men overpowering them or feeling they were 'owed' unprotected sex.

> *"And you'll get surprised when I tell you that my friend called me this morning. She told me that mma (ma'am), the boyfriend insulted me. I just nicely asked him that we should use condoms. He told me that 'why should I use condom when I give you the money [to go] without condom use.'"* (P20: Age 38, HIV positive)

> *"We were just plain. We were not using anything. My boyfriend, I always ask him to use a condom but he said "No!"… Now I'm having a baby."* (P17: Age 39, HIV positive)

In the moment of sexual intercourse happening, women can feel unable to comment about the lack of condom use – especially in new relationships.

> *"I had a problem telling my boyfriend can we use a condom. Coz at first he would be like, "why are you cheating? Why, why?' You see, so I was telling him no it's not about cheating. It's about pregnancy and some diseases. Yeah so girls, especially when it's a new relationship, they start being shy to tell your guy, let's use a condom. That's where the most problem comes from. Yeah, girls are shy."* (P22: Age 21, HIV negative)

Discussing HIV status is also problematic in new relationships, and women described feeling coerced into unprotected sex even though they did not know their partner's status – some becoming HIV positive because of this.

> *"Yeah, [the man] who bought me this HIV thing… Ooh that one he didn't want a condom at all. He was [HIV positive] but I didn't know, he didn't tell me, and I realised because I was dating him as the only one. That's why I'm saying he's the one who infected me… For a year we didn't use a condom. I tried but that one phew (sighs) God bless him."* (P11: Age 28, HIV positive)

If women attended family planning services, they had often been instructed to by their partner, and it was often related to spacing children at his request – often related to financial worries.

> *"My husband told me. He informed me to go to the clinic to have depo. He was trying for us to space the kids."* (P14: Age 42, HIV negative)

Providers said that men's authority over decisions about family planning was also witnessed in the number of their clients using, or removing, contraceptive methods because of their partner.

> *"Some, they come for implant, others for IUD, removals because the partner told them to go and remove it."* (Clinic co-ordinator, private SRH clinic)

> *"Men have an upper hand in decision making on issues of sexual pleasure. So, if they don't want to use the condom that's when the woman will run to the facility for contraception."* (Senior manager, HIV clinic)

Partner support or involvement in family planning choice and use

Though some women described their current partner as tolerant or supportive of them using contraception, men in general were mostly seen as unsupportive of contraception use, leading to unplanned pregnancy and HIV infections.

> *"They do not like to prevent. They don't like prevention. And then they have lots of kids. And the main problem with these guys is because they have kids with different mothers. They don't give kids to one lady, they go around no condom, no nothing. That's why most of us are HIV positive. I think it's because of that."* (P17: Age 39, HIV positive)

Women felt that men's lack of support for newer or long-acting contraceptive methods sometimes comes from a lack of knowledge about them, describing their partners as ill informed.

> *"But the only thing that I know is that most men use condoms but do not engage in other contraceptive methods… Men really they know only about the male condom. That's why they resort to it most of the time, they really do not know about those other methods… It has to change. Because there has to be awareness that apart from the condom there are other there are other contraceptive methods that can be used. And maybe, and these other contraceptive methods they are more effective."* (P12: Age 19, HIV negative)

> *"I feel men in terms of contraceptives they are way behind… They are not supporting. I don't think they are well informed… You can support something that you are well informed about it."* (P2: Age 21, HIV negative)

Men were seen as less supportive of hormonal methods due to the influence on sexual intercourse, or changes to their partners' body.

> *"They are ok [with contraception] provided it does not develop acne on their women, it doesn't make their women fat. Because if it does, then the men will be the one pressurizing the women to come and remove the implant and all that"* (Post-abortion counsellor and ward nurse, national referral hospital)

> *"[Prolonged bleeding] brings problems in the family, the husband or the partner, because we have come across those who came back for removal because of the problems with the partners' now… Yes, or because when there's prolonged bleeding you don't indulge in sexual acts"* (Post-abortion counsellor and ward nurse, national referral hospital)

Hiding contraceptive use or using an 'invisible' method

This lack of support from men over contraceptive use led to women hiding their contraceptive method from their partner, and lying about attending family planning services.

> *"Here in the clinic I just hear another woman talking 'I don't want to tell my husband what am using, I just lie to him that I have a headache so that's why I am going to the clinic. So they won't even tell them they're going to the clinic."* (P10: Age 32, HIV positive)

Providers said that the desire to hide use of contraception from partners was a key influence over women's decision-making about the various methods.

> *"And then there is the partners, sometimes they don't want the women to be using the family planning methods, and the women will hide whatever they are using, or they will use a more private one, like the depo."* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

> *"They want to use something that the partner cannot see… You know, if it's the pill the partner might see it at home, so…. Yeah, so they will rather use the IUD. And the implant some who are not staying with their partners they do use the implant. And you know if you are staying with your partner then your partner is going to see the bandage around the implant once you have inserted it. But if the partner is not around they do start the method and they feel it's safe for the partner to see."* (Clinic co-ordinator, private SRH clinic)

As well as hiding specific methods, women described situations where they would hide evidence over accessing family planning services at all, including appointment cards or method information provided during appointments, due to men's physical attempts to stop them attending clinics.

> *"There is a girl at home, when she registered [at the clinic] her boyfriend would tear the [appointment] card because he did not want her to use family planning, then the girl had many children. I was not bothered though because we kept advising the girl to hide the card from her boyfriend so that she can be able to space her children."* (P8: Age 29, HIV negative)

Some women said the process of hiding contraception use that caused conflict within relationships, and that providers actively encouraged discussion with partners prior to use.

> *"Some will go and use contraception before they talk to their partners. Though they may be a couple and you just decided to go there and use that method though your partner wants a baby then it will cause friction between you guys."* (P4: Age 33, HIV positive)

> *"If a man finds out that you're involved in family planning he'll probably lose it, you see. So most of the time it's better for you to decide. But my doctor told me that it's better to tell your partner before you actually do it. So that they know about the [side] effects and stuff"* (P1: Age 20, HIV negative)

The implications for this can be medically dangerous, cited by some providers as the reason they believe male involvement in SRH services is highly necessary and a barrier to women's use of certain methods – specifically those with more visible, potentially longer-term side effects, like the implant or IUCD.

> *"And these young people they insert implants without informing their partners because of privacy, and sometimes this can lead to trouble. There was one [male] who tried to remove it, to bite the incision site to remove the implant, these are the things that can happen"* (Service Delivery Officer, private SRH clinic)

Men's involvement in SRH services

Though providers described counselling some women with highly supportive partners, most felt that partners are often uninvolved in, or a negative influence on, women seeking contraceptive care at their clinical practices.

> *"I would say 80% of the women who come here they come without the knowledge of their partners… If their partners could come during the counselling sessions they would understand more about the method, you know. But they never come with their*

> *partners, it's a very few number of people who are coming in as a couple"* (Clinic co-ordinator, private SRH clinic)

To remedy this, providers described the need to encourage male partners' attendance at family planning consultations, and help fill their current gaps in SRH knowledge.

> *"It is improving, but slowly. Because first off it was SRH, now we have included male involvement into SRH, now they are really supportive. But it's not that much. I'm really not happy about it. ... I think in the beginning they were really left out, they were really left out of the system, that's why."* (Principal nurse, DHMT clinic)

> *"Here, because we are dealing with young people, we have, you know, encouraged the culture of coming along with their partners for whatever service, especially SRH services, and antenatals, you know, postnatal care, and all that. So, they always come along with their partners."* (Principal nurse, University clinic)

Providers felt it was a lack of information, exacerbated by poor involvement in services and family planning decisions, which made men barriers to women seeking and using contraceptives.

6.5 Influence of religion

Church or pastor attitude towards family planning

While most providers described contraceptive use as tolerated by the church, depending on the situation of the individual woman, religious belief can be a major determining factor for women using, and even providing contraception.

> *"Like, there is this religion, they put on white clothes, those people, they call it "Bazezuru". They are not allowed to use modern medicine, but they have so many babies. The husbands, they have so many wives, they have more than one wife. They are not allowed to use family planning. Then when they come here, they come here in hiding, and you have to… The husband shouldn't know, the church shouldn't know, that they are using these family planning methods. It is a hindrance. It is a barrier. It really is a barrier."* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

Religious belief, like the attitude of partner, can also be a reason for women hiding their contraceptive method or avoiding family planning services – with these two areas often intertwined.

> *"But still just a few weeks back there was a Muslim lady, she came here. She wanted to use the implant and I asked her about her religion. And she told me that they don't allow them. So, she's just doing this and then she's going to stay home to heal and then she will go back to church. Even the husband doesn't know anything about it."* (Clinic co-ordinator, private SRH clinic)

Women commented on the large difference between church attitudes towards married and unmarried women in terms of sex and family planning. For married women, the church can be a source of support and advice, with some describing church-led group sessions on using condoms, and church leaders who sit with individual couples or families to discuss family planning options, and offer relationship counselling. For those who are unmarried or single, the promotion of no sex before marriage can lead to the exclusion of younger women.

> *"The thing is, for us who are not married at church it's, it's difficult to, what can I say, to open up and discuss with other women. Because first of all you're not supposed to, to have sex before marriage. So this thing is for married people. I'm not sure about married ones because I never interact with them. But for us it it's like, we keep it a secret though we are doing it, but we keep it secret."* (P7: Age 34, HIV negative)

> *"They'll say that there is a marriage conference or something. Where married people come in a meeting with a prophet and then that's where the family planning stuff are said. But you can't hear a prophet calling a youth conference, and then start talking sex."* (P22: Age 21, HIV negative)

The cultural hearsay and stigma around younger women using contraception described previously was also present within churches, from both pastors and the congregation.

> *"It may cause conflict with the pastor or something. Like people will notice you… maybe the congregation. Like why, why do you have this thing? So are you having unprotected sex? Are you having sex before marriage?"* (P12: Age 19, HIV negative)

The influence and trust in individual pastors was concerning for some women, who felt it limited information seeking and even prevented women accessing family planning services.

> *"A pastor is someone who's a deemed innocent, holy, godly. So someone like that, they think he won't lie to you. But I don't. A pastor is just someone like me. He is just telling you what he's thinking, what God is saying, but if you don't believe you can still go your way. But most people believe, pastors have big influence on people."* (P22: Age 21, HIV negative)

> *"So the fact that [religious leaders] just say they are against this sex before marriage things, now people are doing it behind closed doors. Now people have that fear to go to the clinics to ask for information because you be like, 'oh this person from this religion asking for contraceptives, are they not saying they don't allow things like sex before marriage?' you see, so they have that fear to just go into these contraceptives and all that….Because they fear to be judged"* (P2: Age 21, HIV negative)

'ABC' programme (abstain, be faithful, use a condom)

Botswana, like many other countries facing HIV, implemented a nationwide ABC campaign (Abstinence, Be faithful and use a Condom) at the peak of their HIV epidemic. While religious institutions were essential in promoting abstinence and 'one-partner', they often remained silent on promoting the use of contraceptive methods – something providers are concerned could further stigmatisation.

> *"They are silent about all other [contraceptives]. But they promote abstinence, they promote be faithful… So, it means at the end of the day young girls in churches might even hide if they have implants, if they are using anything. You know they might and then once they are pregnant do they still go to church? They will fall out of church and falling out of church you know sometimes when you have grown in faith and you know that the only space that you are comfortable is with Jesus. And then when you drop out because you're pregnant what happens to you out there and all the likes? So, it really influences the uptake and the contraception's, the attitudes of communities towards family planning.*" (Senior manager for programmes, private SRH clinic)

Though the 'ABC' approach is described as the primary approach of their church or pastor – when women described pastor teachings, many did not see the three areas as equally promoted.

> *"Participant: Because we were told at a church, we are told to be faithful. We are told, they say the use of condom but to be faithful is good to stick to one partner or to abstain, that's what the church is saying until you get the right partner.*
> *Interviewer: But they don't tell you to use a condom?*
> *Participant: No… they never say why. They don't promote it."* (P19: Age 41, HIV negative)

Condom use was seen as acceptable by the church within the context of HIV and other diseases, but there was less support for contraceptive methods focused on pregnancy prevention.

> *"I don't think there is any church that can teach about that [contraception]…I have visited more than 3 churches. I haven't heard them talking about that. They only talk about HIV/AIDS"* (P20: Age 38, HIV positive)

> *"Participant: They feel like even birth control, even using a condom is you know it's ungodly… So this is why they don't allow abortions This is why they don't allow morning afters. We're lucky they allow condoms because the world, they have to because the disease otherwise… but you know that it's ungodly.*
> *Interviewer: Okay. So you think that the only reason that that churches kind of allow condom use is because of the diseases?*
> *Participant: It's because of the disease, when the virus isn't...yeah."* (P21: Age 33, HIV positive)

Influence of faith on women's contraception use

The influence of faith on women's attitude towards and use of contraception is one of the areas that was most dependent on an individual woman's personal interpretation, and their specific Christian denomination and pastor. For many women, their Christianity was non-consequential, and Church was more for a sense of community than a set of ethical guidelines. For others, it determines their views on marriage and family values, and consequently their contraceptive use.

Some women said that faith could influence the decision to use any family planning at all, as preventing pregnancy was morally wrong due to their beliefs over when 'life' begins.

> *"Some people they believe that you are not supposed to [use contraception], ke go re (that is) they believe that doing that it's more like killing. Mm because when you contain those sperms or you take them away, you are killing. There is a living thing inside that. That's what they believe in… They'll tell you that if it is not time for you to fall pregnant, it's not time for you to fall pregnant, but there's no need to throw away this living things."* (P7: Age 34, HIV negative)

God and religious belief were also raised as key influences for some women when asked about their attitudes to individual contraceptive methods – particularly those involving more of a medical procedure, like sterilisation.

> *"I can't do that. Because this is the body of Christ. You don't have to cut cut cut. God will ask us "Why did you cut yourself here?" What do you want me to tell God? Because I have born you fully now you are cut."* (P17: Age 39, HIV positive)

Church encouragement of pregnancy and childbearing was also given as a reason women felt faith may prevent some couples from using contraception.

> *"There are other religions, certain churches that say you don't have to use things because God gave you, you are a woman and you got to bear children, as many as you possibly can."* (P6: Age 40, HIV negative)

In terms of specific methods, using a more permanent, obvious contraceptive method could raise questions from the pastor, compared to a short-term temporary option.

> *"They choose condoms mostly. Yeah because a condom is more likely, like you use it and then you throw it away. But if it's a depo… Yes, you'll have it the whole time. It may cause conflict with the pastor or something. Like people will notice you."* (P12: Age 19, HIV negative)

6.6 Urban-rural disparity

Disparity in family planning education or knowledge

Barriers to women's use of family planning are heightened by Botswana's extreme urban-rural disparity, with a lack of family planning information cited as a key barrier for women in more rural areas.

> *"Yeah, I think for me the biggest challenge is the reach. You know Botswana is one of the most unequal countries in the world, so you find that a whole lot of things are concentrated here in town. These are the kids who have education on contraception, they go to good schools, their mums talk to them. Where the needs are… we are not available as service providers."* (Senior manager, private SRH clinic)

> *"And there at the village in the remote area people are not much informed. And I think that's the kind of people who will rely on whatever they are using and maybe uncomfortable to change. Because they are not well educated, they are not well informed"* (Senior manager, HIV clinic)

Men's attitudes and participation in family planning services also noticeably differ between urban and rural areas, according to providers.

> *"But it looks like, if you compare those who are in the remote areas of Botswana, where I used to work a few years back, and here: it's like here partners are very supportive of them all, they know they are here, they come with them… In rural areas, they do not."* (Principal nurse and MoH ToT, rural SRH clinic)

There is concern that this makes women in impoverished rural areas more likely to have multiple children, with less spacing.

> *"They have kids, very little ones. Maybe a year, a year, a year, a year. A kid, a kid, a kid, a kid. I don't think that is good. And most of those people are those who, who are very poor. Who are poor. They just have kids but they can't afford to have them. Maybe they have kids from different guys like me. Boyfriend, one boyfriend, two boyfriend, until boyfriend eight. It's not good. Yes. Not at all."* (P17: Age 39, HIV positive)

Physical service access in rural areas

As well as a lack of information, women in these more rural areas face more physical difficulties in accessing services too – with methods more likely to be out of stock, and even fewer personnel than urban clinics.

> *"I'm thinking of more remote areas. The commodities will be there, sometimes the nurse will not be there, because some facilitates operate with only one nurse. So if the nurse is not there and you are due for your injection, you will not get it. You are asked to go to the nearest facility, you might need to have money to go to that facility. It is a challenge, that."* (Principal nurse and MoH ToT, rural SRH clinic)

6.7 Societal attitudes towards HIV

Promotion and consistency of ARVs

While providers are optimistic about the recent, dramatic improvements in the availability of ARVs, they are concerned about the influence this has had on the quality of HIV counselling, and the general attitude towards diagnosis and treatment.

> *"Because I think the way that the HIV drugs have been marketed it's like it's the answer to everything. We're not even talking about the side effects of those and the fact that some of the people may not necessarily benefit from that… We no longer talk about abstinence, we no longer talk about faithfulness, sticking to one partner. We*

> *just talk about condom, get tested, get your ARVs and move on… What about the other areas of my life when I'm HIV positive?"* (Senior manager in family planning, Ministry of Health)

HIV positive women agreed that the ease of access and use of ARVs has caused a relaxed attitude among undetectable people, and a less conscientious approach to protecting others by using condoms.

> *"One thing that I've discovered is almost like people really don't care… Like the way that people are so blasé here. But it was just like - so if people who are taking the meds can be so like you know, haphazard about it, then what if you're taking them and you know you are not undetectable, like I'm undetectable. For me it happened very quickly, like I became undetectable. That's why I say I have zero chance of infecting anyone even during unprotected sex or whatever. But I'm not going put someone in the situation, you know, because still for me is like someone did this to me. I would not put someone else through that… But you can imagine like, even if people are on the meds, it's like already you see, by the way that that idea of taking the meds, what makes you think that the idea of protecting another person, this is gonna be any different."* (P21: Age 33, HIV positive)

Lack of fear around HIV

Providers expressed concern that reduced stigma, coupled with the wide promotion of ARVs, has contributed to a lack of fear around HIV, increasing risky sexual behaviour and reducing condom use - especially among adolescents.

> *"We do promote dual protection and family planning but at the end of the day mostly we find out that young people when they're using other family planning commodities, they tend to forget about the condom."* (Senior manager for programmes, private SRH clinic)

> *"One thing that I hear from young people informally is their, I don't know whether to call it perception or what… they were not here when we were having those… HIV is not scary to them, some of us have got, you know, like it's vivid on how it was back in 2000, so I think you know to them HIV is normalised so much that they are more scared of pregnancy than HIV… [But] younger people are getting more new infections. I mean for me these are kids who should know nothing else but condoms. But we are having new infections, what is it that we are doing wrong?"* (Senior manager, private SRH clinic)

Women feel that unplanned pregnancy is now feared more than HIV, which has reduced the use of barrier methods alongside long-acting reversible contraceptives.

> *"You see! Because I believe in Botswana we fear pregnancy more than HIV. So people feel - now that I have contraceptive, now that I can't get pregnant, there's no need for me to use protection. They only looking at pregnancy not other things"* (P2: Age 21, HIV negative)

> *"I also feel it is not okay because the youth will have sex without a condom and get HIV because they think, they like it because it prevents pregnancy, they do not think that when you do not use a condom you can get STI's and viruses."* (P9: Age 25, HIV negative)

These attitudes have led older women to be more concerned about the growth of long-acting reversible contraceptives, and some younger women described their family members trying to deter them from using them.

> *"Yeah, [my mum] was worried. Yeah. Again, she didn't like these contraceptives. She says when you are using this one you just let yourself sleep with everyone without using condoms, you will get sick."* (P15: Age 32, HIV negative)

6.8 Chapter summary: Influence of social networks and wider society on women's choice and use of family planning

This chapter explored the socio-cultural factors influencing provision, uptake and use of contraception in Botswana, and the influence of wider society and social networks.

Hearing personal experiences, peer communication, and conducting independent 'research' were cited as very important to women when deciding on contraception use, and problematic for providers. Most women, when describing their attitudes towards individual contraceptive methods, cited anecdotes from sisters, friends or cultural hearsay as the reason behind their decision to avoid using that method.

Culturally, communication about sex is taboo and seen as culturally unacceptable. Though the findings from the narrative review described women feeling relatively uncomfortable discussing family planning with peers, some women in this study described being open about sexual health issues with sisters, cousins, age-mates, and colleagues - though this freedom to discuss sex and contraception use was not universal. Difficulty of communication was more related to age or status, with conversations with parents, elders, religious leaders, and teachers happening rarely, if at all.

Decisions about whether contraception was used is often seen as men’s prerogative, particularly the male condom which are reliant on male compliance and difficult for women to insist on. Many women consequently hide any contraceptive use from their partners, or chose an ‘invisible’ method, which can cause further issues and conflict if discovered. Male partners consequently were seen as the biggest socio-cultural barrier to women’s use of contraception, due to their authority over sexual activity and within relationships. They were also described as physical barriers to women’s access to family planning services, including ripping up appointment cards and medical records to prevent registration, or violently hurting their partner to prevent them accessing family planning methods.

The cultural importance of having children, for both men and women, was also cited as a key reason behind women’s non-use of family planning, and changes cultural attitudes around contraception towards ‘birth spacing’ rather than prevention. Women of all ages described only receiving family planning intervention after the birth of their first child – likely due to a combination of poor sex education for younger girls; socio-cultural attitudes towards sex and gender which prioritise men’s authority; and communication about sex and family planning being seen as inappropriate with parents.

Though many women described distressing experiences of being stigmatised, judged, and even disowned by their families due to a teenage pregnancy, there is still stigma around adolescents seeking family planning, exacerbated by biased providers and a lack of youth-friendly clinical services.

6.9 Section summary: Barriers and facilitators for contraceptive provision, uptake, and use in Botswana

Though there are some physical barriers to both provision and use of family planning, namely inconsistent national management and method stockouts, women felt the influence of these was minimal compared to various cultural considerations – like partner control, and patriarchal, stigmatised views of sex and family planning use. Most women stated that contraception was relatively easily available to them if desired, but other cultural and social considerations were more prominent reasons for them not using the options available.

Male partners are the largest barrier to women's use of family planning – due to their lack of support for contraceptive use and involvement in family planning services, and autonomy over sexual health decisions and sexual activity. This is exacerbated by the HIV epidemic, which has led male condoms to be heavily promoted, and the cultural importance for men to have children, and women to become mothers.

For healthcare providers and stakeholders working in family planning, HIV is a barrier for strong national policy, and clinical provision, around contraception. Unification of sexual health services at a national and clinical level is needed to facilitate more effective, less stigmatised, use of contraception for women.

Chapter 7: The feasibility and potential for an eHealth intervention in family planning in Botswana

7.1 Chapter overview

This next chapter explores the landscape, challenges, and future potential for using eHealth innovation to address SRH issues in Botswana. It uses elements from two theoretical frameworks for eHealth sustainability and readiness, both developed within Southern Africa, to address four key areas for eHealth innovation:

- Technological factors
- Organisational and institutional factors
- Societal and cultural factors
- Factors related to healthcare services and personnel

Chapter 8 then uses this framework to describe key considerations for the design and content of an eHealth intervention in family planning, and provides practical suggestions for intervention design, content, and implementation.

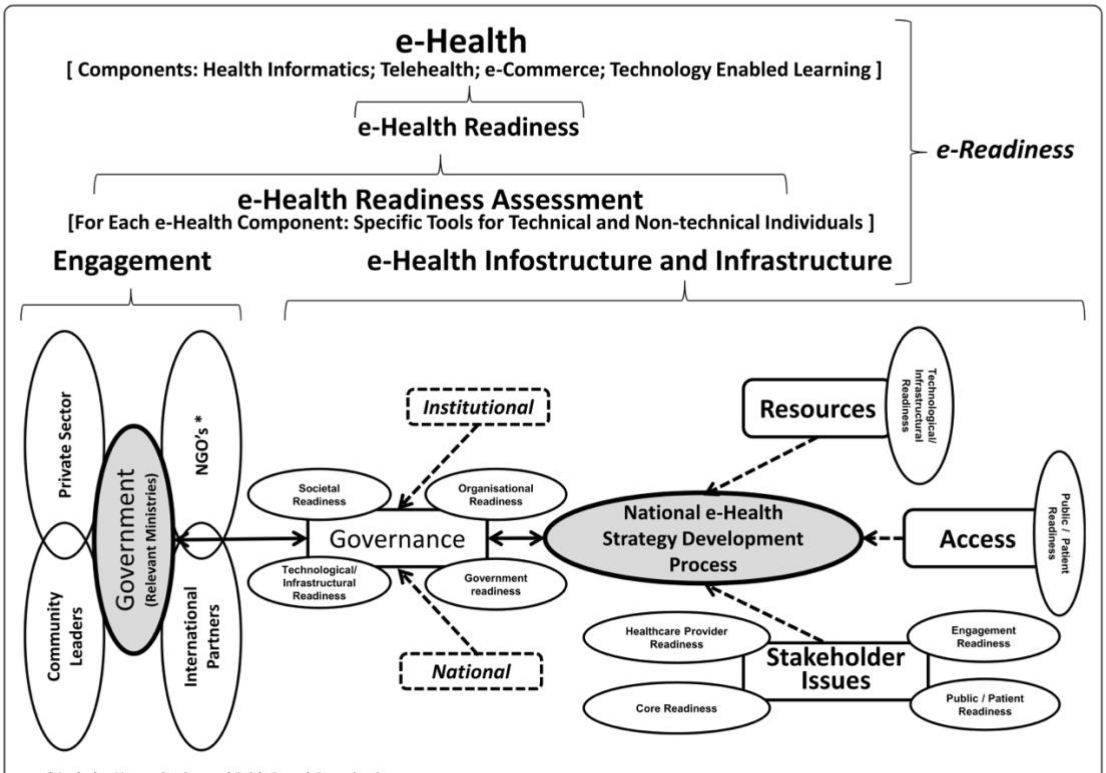
Quotes from healthcare providers and policy stakeholders for family planning will be referred to in the same way as in previous chapters. eHealth specialists will be referred to by their job role, ‘eHealth Monitoring and Evaluation Specialist’ for example.

7.2 Conceptual frameworks for assessing eHealth readiness and sustainability

The conceptual framework used to explore the feasibility for eHealth innovation in Botswana was derived from features of two existing eHealth frameworks.

The first, an **eHealth readiness assessment framework for developing countries**, was developed in Botswana after a lack of 'readiness' was cited as the largest barrier for sustainability and success of eHealth interventions (Mauco *et al*., 2020). Though this project, and these findings, do not discuss the theoretical concept of readiness directly, this framework provides key conceptual areas to consider prior to implementing eHealth innovations, to reduce chances of project failure. It is also the only framework of its type in Botswana, and consequently offers important insight into the specific infrastructural, technological, and cultural considerations the country is facing (Mauco *et al*., 2020).

Figure 7.1 eHealth readiness assessment framework for developing countries (Mauco et al., 2020)



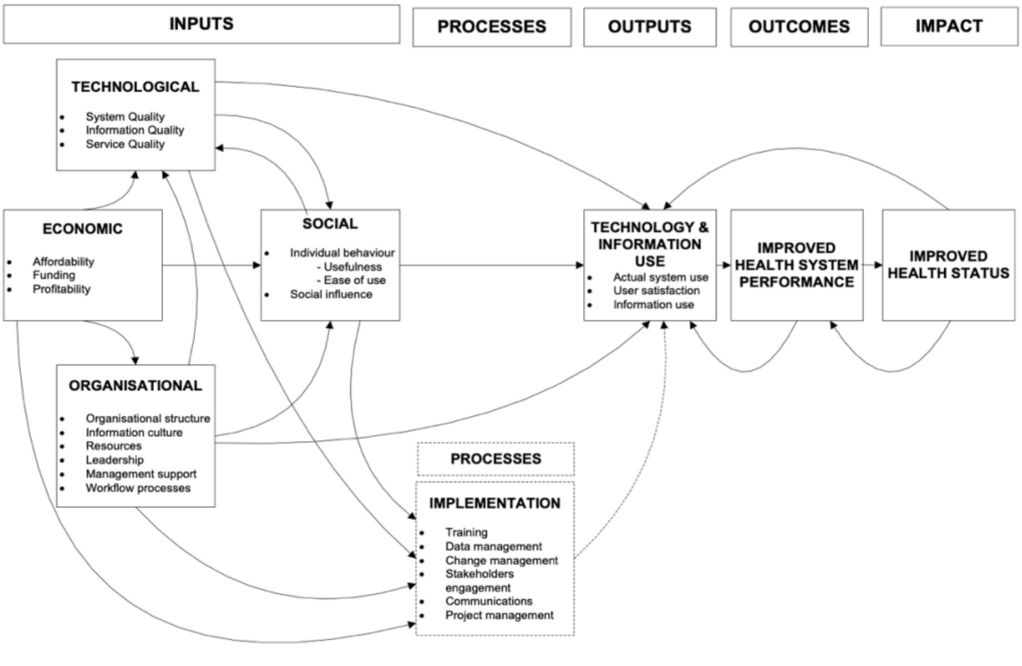
* Includes Humanitarian and Faith-Based Organisations

Fig. 2 e-Health readiness assessment framework for developing countries (Mauco KL, Scott RE, Mars M: Development of a conceptual framework for e-health readiness assessment in the context of developing countries, submitted)

The areas defined by this framework are: Organisational Readiness; Technological / Infrastructural Readiness, Government Readiness; Societal Readiness; Public-Patient readiness; Healthcare Provider Readiness; Engagement Readiness; and Core Readiness (Mauco *et al.*, 2020). Though some of these elements are highly specific to the theoretical concept of ‘readiness’, many offer important key populations or thematic areas to consider when exploring challenges and potential for eHealth. This framework would be particularly useful testing the ‘readiness’ of a specific intervention, rather than the theoretical potential for one.

The second conceptual framework for **sustainable eHealth implementation in resource-constrained settings** was developed in South Africa, which shares many of the same barriers and facilitators for eHealth design and implementation to Botswana (Fanta and Pretorius, 2018). This framework presents chronological stages of eHealth design, implementation, outputs, and impact. The most relevant themes for this project came from the first section, ‘Inputs’, which describes four key thematic areas for consideration prior to eHealth design: technological factors; social factors; economic factors; and organisational factors (Fanta and Pretorius, 2018).

Figure 7.2 A conceptual framework for sustainable eHealth implementation (Fanta and Pretorious, 2018)



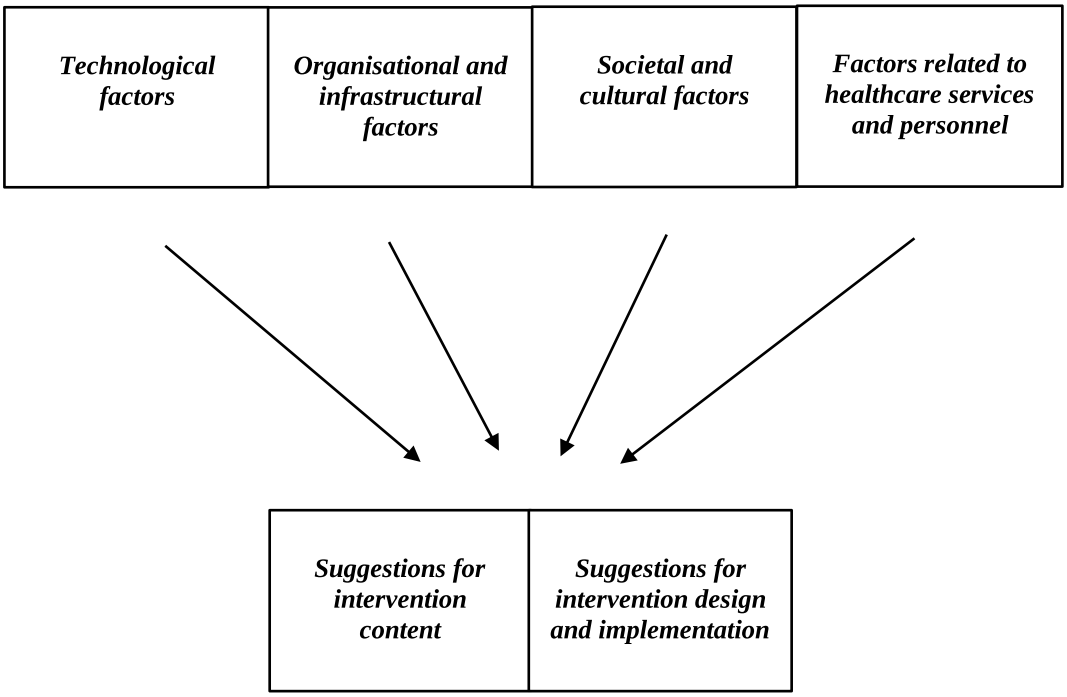
There was overlap between the two frameworks, with both highlighting the need to consider technological, societal, and organisational factors prior to intervention design. I then also integrated key features from the first readiness framework that seemed especially pertinent to Botswana and this project: factors related to healthcare providers, and infrastructure.

Consequently, findings are presented in the following four themes:

- Technological factors
- Organisational and infrastructural factors
- Societal and cultural factors
- Factors related to healthcare services and personnel

These areas will then be used as the foundation for specific suggestions for the design and content of an intervention in family planning in Chapter 8.

Figure 7.3: Conceptual framework for assessing the feasibility and potential of an eHealth intervention for family planning in Botswana



7.3 Technological factors

Poor Wi-Fi connectivity and infrastructure

While there has been vast growth in mobile network coverage, Wi-Fi connectivity remains a large nation-wide barrier for implementing large-scale eHealth development in Botswana.

> "*Of course there's more that can be done to improve on the connectivity, you know, especially when you go to the rural areas, you know, or primary hospitals, clinics - I think those are not yet, you know, set up properly in terms of infrastructure."* (Senior eHealth Researcher)

Even in areas where there is connection, network speeds are slow and it can take a couple of minutes to upload a single photo or document. This changes the type of eHealth interventions that can be designed, how successfully they operate and can cause great frustration for daily clinical operations.

> *"A lot of clinicians are actually complaining about waiting for a certain page to load while the patient is still waiting... They would rather leave the system and tend the patient … And then we realise they have tend the patient and then they don't have any data for that patient. And then if you want to get some decisions from that data, there's really a very big gap between the data and patient care."* (Project Manager, Health Informatics)

The Government Data Network (GDN) used within public healthcare clinics is particularly problematic. Regular connectivity failures and low network speeds cause the system to be unreliable, time-consuming, and inefficient.

> *"So, if you train [a provider] that they should be entering patient data on a daily basis whenever it is available, they try to do that, and that application is not available. Because there's network connectivity issues, that frustrates people. So, they want to see things that work all the time. So, if you say you know "I need you guys to help by entering this data on a daily basis or a weekly basis", they don't want to get into the system and it's not functional. Or they're entering data and then tomorrow they are looking for the same data and it's not showing them what they know they have entered."* (eHealth Monitoring and Evaluation Specialist)

Wide mobile phone uptake and mobile data network

There is strong potential attached to Botswana's widespread uptake of mobile phones, and the changing culture towards mobile platforms as sources of information across a wide variety of topics. Many Batswana own multiple mobile phones, often with varying levels of functionality, or have two or more sim-cards on different networks.

> *"I think research has shown that there are about, uh, uh, 2 to 3 mobile phones per person here in Botswana. So, yeah, so – I have 2 mobile phones, I have this one and then I've got another one, I think I left it in my other office. So almost everyone here has a low and then a high-end device."* (Senior eHealth Researcher)

These 'high-end' devices tend to be smartphones, which have become much more common over recent years and enable a much wider range of interventions to be designed and implemented.

> *"If you look at the dynamics, things are changing. Because back then we were looking at the population of Botswana that okay, you know these people, most of them they don't have high end smartphone, okay. But nowadays we can actually."* (Post-Doctoral eHealth Researcher)

Botswana's mobile network coverage has expanded rapidly over the last decade, and in many areas is stronger than Wi-Fi networks, further supporting the potential for utilising mobile phones.

> *"So mobile connectivity is very high but also I think that's an advantage in the sense, that's an advantage for eHealth, in the sense that even the mobile telecoms infrastructure is very good compared to the traditional type of connectivity, you know, so you've got from edge to 2G to 3G up to 4G type of connectivity in Botswana."* (Senior eHealth Researcher)

Most eHealth experts said they would only use Wi-Fi in their offices if compulsory, or if provided by an external company. Out of choice, the majority rely on mobile networks. Participants also agreed that mobile networks have much greater physical reach and reliability when designing eHealth interventions.

> *"B-Mobile literally reaches those remote places, yeah. I think for now my mother is seated in the village they can communicate clearly with her on the cell phone… For eHealth, I think it has a positive impact. Like for example one of the projects that I*

> *was talking about we impact on the real time reporting of some of our HIV AIDS related indicators. And we're using cell phones because we have challenges with internet. So, most of the clinics, almost all the clinics we find that they have coverage, a network coverage."* (System support, Ministry of Health)

This combination of increased cellphone ownership, strong mobile phone networks, and ability to design more inclusive interventions for a wider range of communities has led to a unanimous excitement among eHealth specialists about the potential for mHealth in Botswana.

> *"That's actually a low hanging fruit, I mean if you want to reach out to more people, especially those in the remote areas, consider going the mHealth route."* (Senior eHealth Researcher)

Disparity in access to and use of technology

Despite the excitement about mHealth's potential, there are a spectrum of cellphones being used in Botswana, particularly in more rural areas, and smartphone usage is not as guaranteed. Assumptions about widespread smartphone uptake could be problematic for intervention success and require additional training, resources, and infrastructure.

> *"There are interventions on smart phones, and interventions that needs basic phones. So some people, when we went to Peek, we assumed that everyone has a phone, just a basic phone, but it's not everyone who has a smartphone, so when you get there you need to train a person on how to use a smartphone."* (Health Informatics Officer)

As not everyone has access to a smart phone, and laptop ownership is low, these high-end devices are often associated with wealth. It was seen as very important that women were not excluded from information or services based on the type of technology being used for eHealth innovation.

> *"Aah I feel those who do not have access to those more sophisticated phones won't be able to get that information. No, because it's a website so some people don't have access to these phones, some do not know how to use them, or how to access the website so they will be disadvantaged."* (P2: Age 21, HIV negative)

> *"Like now, I'm using a phone without internet. Yes my phone, it doesn't have internet... I'm missing out on information."* (P17: Age 39, HIV positive)

The cost of airtime, or mobile data, was raised by several woman as a large reason behind this disparity, and a barrier to their use of the internet. Some said they would use Wi-Fi when at work, but otherwise would not use any intervention that required downloading or opening multiple pages.

> *"Others will not be able to use that technology because it's not all that can afford to buy the things that you can access social media from."* (P9: Age 25, HIV negative)

> *"The bad might be I can't open website, it wants Wi-Fi... Yeah, it might be a problem because it want money to open website... And website I think is more expensive because it have more information."* (P16: Age 25, HIV positive)

Potential of Unstructured Supplementary Service Data (USSD)

USSD is a messaging protocol, similar to text messaging, that utilises short codes made up of the characters available on a mobile phone. USSD messages can be up to 182 characters long, and they create a real-time communication session between the phone and another device, usually a network or server. It is most commonly used for banking, or for checking the balance of a pre-paid phone, but has great potential for providing other information in low-income areas with poor smartphone uptake. This relatively simple technology was raised as a popular and already very successful tool in Botswana, with wider potential than currently being utilised.

> *"So I think that, you know, that type of service [USSD] is, you know - it doesn't matter whether you have a high end or low end device, you can actually access core services. So if eHealth or mHealth interventions also could utilise that, I think it could reach out to more people, especially those in the remote facilities who don't have high end devices.* (Senior eHealth Researcher)

Growth of social media

Alongside the growth of mobile phones, the increased use of social media was seen as a strong indication of the way information-seeking is changing.

> *"I think [social media] is becoming almost now a natural, you know - older generation people are now saying, 'I read that Facebook is now for the over 50s, you know, that the millennials now they are going to other platforms'. So yes, so I mean it's quite common now that you hear people, 'oh by the way, my mum is now on Facebook, or we talk over WhatsApp', and so I think these are - even as much as we*

> *did say that it's not everyone that may be comfortable with the technology and all that, but the general trend is that now these are becoming fairly, you know, common place."* (Research and Development Specialist)

Providers had witnessed both the challenges and benefits associated with this uptake of social media. Improved access to information was empowering, particularly for younger women, but being unable to ensure medical accuracy meant some misinformation was directly influencing client behaviour.

> *"Yeah there's a chat group on Facebook, it's called, I think it's called Young Mothers Botswana something. People usually peep in to see what is being discussed. Most of the issues that are being discussed there is the implant. There really, you know they are aware that young people can encourage and discourage each other. And once somebody gives their experience and the third one supports. Then the clinician here told me that the moment you see such moments in that chat group, the following week you will see them coming, 'we are removing, we are removing'"* (Senior manager for programmes, private SRH clinic)

> *"We need to put the right information there, you know so that the client can consume the right information. And can balance between wrong information and right information, they can see that this is wrong, this is right..."* (Clinic co-ordinator, private SRH clinic)

Utilising the existing popularity of social media for future eHealth innovation is more likely to be successful. Women said they regularly use certain sites, particularly Facebook and YouTube, and would like to see stronger health messaging on these applications.

7.4 Organisational and infrastructural factors

Positive government investment in infrastructure

Government support for Wi-Fi infrastructure, and strong financial investment from external partners, has created a relatively strong infrastructure and noticeable growth, even in more remote areas.

> *"We have actually experienced that growth… Now when you even drive outside of the towns and cities, like for 80 kilometres, 100 kilometres, out of the cities and towns you are able to still have connection, data connection."* (Programme Manager, Health Informatics)

This Government investment in Wi-Fi connectivity is particularly noticeable in hospitals, which form an important foundation for eHealth innovation.

> "*In terms of infrastructure, I think our government has done quite a lot, in terms of setting up, or improving the current ICT infrastructure. So the government has invested a lot in, you know, improving the connectivity or the bandwidth in hospitals - I think almost all primary, or rather all the referral hospitals in Botswana."* (Senior eHealth Researcher)

Funding for eHealth innovation

The expense of developing the ICT infrastructure was raised as a key concern among eHealth specialists, and was the main reason for the failure of previous projects. Even if an individual project has adequate funding, it is very tightly allocated and does not help with progression of Botswana's eHealth field as a whole.

> *"The cost of trying to progress technology in this country becomes very expensive. It's very expensive to say, "I want to lay the groundwork for better communications e.g. using fibre". Fibre cable seems like allowing effective and fast communication around the country, so it becomes very expensive. So, technology and these networks and the costs of doing this become bigger hurdles than they should be to implement these things"* (Technical Support Officer)

Reliance on external donor funding creates a lack of accountability, and a lack of certainty, over project funding – directly influencing longevity and sustainability of projects.

> *"You might have the technology, you might have the idea. But do you have the funds as well as the human resources to sustain that project? Because as you remember most of these initiatives the funds are not directly coming from government but from donors. Maybe wanting to achieve one or two agendas after which they say, "hey, we are done, keep the equipment" and then it just gathers dust. Those are some of the things that are usually the problem."* (PhD Student in eHealth)

Project ownership and management

Lack of ownership and poor project management makes eHealth interventions unsustainable, causing large problems for communication and system maintenance – exacerbated by the reliance on external funding discussed above.

> *“No-one really knows who’s owning what, you know. People, the project is there but who’s really owning it? It’s a problem, project management. It’s always a challenge. I think we need more professionals in project management to ensure that all partners are on the table.”* (Health Informatics Officer)

Even if a project has the necessary funds and personnel to operate as planned, a lack of forward-planning can cause projects to reach a stalemate once initial funders have left, and stops them reaching their full potential.

> *“It’s amazing how people come into the country, like funders or investors come, and they say we want to do this project, and it will be sustainable for those two years, and then when it’s supposed to be taken up by the government it’s not – one, because sometimes you know, the maintenance of the system, those people are no longer involved in the maintenance of the system. That one it breaks the whole thing now.”* (Health Informatics Officer)

Electronic healthcare systems: creation and management

The reliance on multiple, incompatible clinical systems which do not communicate with each other has led to a fractured infrastructure and causes difficulty for future eHealth design and implementation.

> *“I think we had 35 plus systems if I remember. Disparate systems, standalone systems, duplicated functionalities, data in various formats and not, not properly secured also. ... I think the bigger challenge in terms of, you know, improving the infrastructure you know is that they currently don’t talk to each other.”* (Senior eHealth Researcher)

These multiple systems also cause frustration during day-to-day practices, with healthcare professionals using as many as 5 different systems every day - impacting patient care, and causing highly connected health-conditions to go un-connected according to medical systems.

> *“People come with systems all the time, and this month they’re on this system, tomorrow they’re on this system, another HIV system, so they get extremely irritated from using multiple systems at a whole”* (Health Informatics Officer)

> *“There is the issue of mostly donor systems which now fail to communicate to each other. So, you have a system containing data on TB not able to communicate to a system containing data on HIV.”* (PhD Student in eHealth)

Lack of national eHealth strategy

There is a strong need for a unified national policy around eHealth, which has been underway for over a decade but remains incomplete. Specialists said this makes Botswana appear like it is 'lagging behind', and exacerbates the complicated, fractured ICT infrastructure described previously.

> *"For the Ministry, you know, at the least they should, you know, make their eHealth strategy known, so that people can align whatever interventions with the bigger strategy, so we don't come up with haphazard or you know just random solutions."* (Senior eHealth Researcher)

This lack of national eHealth strategy is one of the largest barriers for eHealth's progression in Botswana, particularly for developing nationwide interventions that reach rural areas.

> *"Oh, the main challenge for eHealth is there is no strategy to deploy the eHealth to the areas where it is required, namely the rural areas. There should be a strategy, there should be an implementation plan, an action plan, how to go about it and [distribute] funding"* (Senior eHealth academic)

Once implemented, a national strategy would help future designs enhance existing projects, rather than create yet more competing systems, and help unify organisations, as well as individual interventions and personnel.

Importance of stakeholder involvement in intervention design and implementation

eHealth specialists described the essential collaboration and partnerships that had been involved in designing and implementing eHealth interventions, often citing multiple other specific stakeholders – including the Ministry of Health; Botswana Innovation Hub; Botswana Institute for Technology Research and Innovation; BOCRA (Botswana Communications Regulation Authority); Orange Botswana; Mascom; Microsoft; Botswana University-/UPenn partnership; and multiple other private companies or donors. Most projects rely on several of these organisations contributing different resources or support, contributing to the issues of project management described previously.

Involving relevant, high-level stakeholders early on in eHealth projects was seen as essential for developing sustainable, successful eHealth innovation by all participants, particularly the

Ministry of Health and key clinical specialists for health-related projects. Failure to include the correct stakeholders was a key reason behind the failings of previous unsuccessful interventions.

> *"Buy in. High level stakeholder buy in, that's the first thing. Because if you don't have buy in from the top, no-one will listen to you. Yeah… Culturally it can be suitable, but if you don't have that buy in no-one will want to do anything."* (Health Informatics Officer)

> *"You have to include or involve all the key stakeholders from the beginning. People don't like to be brought in when you know the train is already moving to say "oh, by the way we forgot to include you initially, but you know we feel you are supposed to be part of this". So, if you include all the stakeholders and make them understand the nature of the project and what are the objectives of that project, then people embrace it because then they will understand where it's coming from, and where it's going."* (eHealth Monitoring and Evaluation Specialist)

7.5 Societal and cultural factors

Cultural desire for privacy

Batswana value their privacy, particularly when it comes to healthcare. This is a potential challenge when it comes to designing eHealth interventions, particularly in rural areas.

> *"But let's say an intervention that helps to improve like something that's related to let's say genitalia right. An intervention that targets something like that would be looked at as no because people here, Botswana are proud people. Not that it's a bad thing but because of that it becomes like you're now targeting my private life."* (Technical Support Officer)

> *"You know health issues they are very, should I say secretive or taboo kind of. So, you just need to be mindful when maybe one is doing the research especially on issues related to the health sector. Maybe going to the rural areas, just need to be maybe mindful of the culture, maybe the norms and the taboos."* (System support, Ministry of Health)

Participants stated that this attitude was stronger amongst men, and directly influences their seeking healthcare advice. However, this was seen as a positive feature of eHealth interventions, which offer individuals higher levels of privacy and more personal information-seeking.

> *"Most of them are more private especially the men… If you look at mostly, that's what the health people are actually saying - that most ladies are the ones who when they feel sick they quickly go to the hospital. But for us guys… Yes, so if you can have something that can actually inform us to know that you are in danger. Like, for cancer, for example - you can see the symptoms, but the men will say ah brush it off, brush it off. And that kills a lot of people, the disease develops"* (Post-Doctoral eHealth Researcher)

Women felt it would be useful to be able access sexual health information privately and without judgement. As described in previous chapters, clients can sometimes feel stigmatised by providers, or embarrassed to go to the sexual health clinic at all for fear of being seen by someone within their community, so an intervention of this type could help eliminate some of those concerns.

> *"You see, that way it takes away the shame factor, because this is what the main problem is with getting information to people. Now you are reliant on asking another person, and you're not comfortable with that person. Maybe that person looked at you funny, and then you're like, never mind, or even before you even open up to them you just get this bad vibe. But it also it's a personal thing… [A provider] is not supposed to have that much power over information that has to do with you… So it's best if it's like, you know, accessible through an app. That will be great. Or through websites, or through a pamphlet. Yeah."* (P21: Age 33, HIV positive)

> *"You won't be shy to ask that person the question because you don't know her or him into doesn't know you… Because some of the some of the questions will feel like, ah, I wanted I want to ask this question, but I don't know how to put it. But you have the question, but you don't know how to put it. At the end of it all, you won't ask the question and the question won't be answered. But in the website you can ask freely the question, after all it doesn't know you, and it will give you the answer."* (P7: Age 34, HIV negative)

Most women said they personally could use mobile phones, social media and technology freely, but that some other women may have difficulty if partners control their media use – a potential challenge for eHealth, especially over taboo sexual health issues.

> *"The challenges can only be there if you're not using your phone alone, if there is another one who can search your phone and see and look what you see… More especially when you're in a relationship where by another one don't like to use prevention. More especially guys, because they don't like these [contraceptives]"* (P17: Age 39, HIV positive)

Generational disparity in attitudes and use of technology

Due to the very recent growth of technology in Botswana, ICT literacy and uptake of technology is poorer amongst older generations, excluding them from many new developments and interventions. The growth of new platforms and technologies has exacerbated this, particularly the perception of social media as 'young' which deters some individuals in the older generation from using it.

> "*I was speaking to one of my aunties the other time, we have like a WhatsApp group. And I was communicating, "why are you not part of this group" and she was like I, "think this is only for youngsters"… You see because I think the old people, maybe it's because by the time when they grew up these things were not there. So, for now they think that some of this social media, internet is only for young people."* (Systems support, Ministry of Health)

> *"And then socially, I think it also causes like a separation, a very high separation between the older generation and the younger generation. Because the way we interact socially with each other becomes much different."* (Research and Development specialist)

This hesitancy about embracing technology, particularly in more rural areas and older generations as described above, can lead to a reliance on manual paperwork and resistance to new systems. Specialists were wary of relying too heavily on mHealth or smart phone usage, for fear of isolating these individuals who have not embraced these new technologies.

> *"Technology has always been seen as it causes a culture shock. So, people don't want to adopt technology because they feel like it changes their way of life."* (Technical Support Officer)

> "*There's this myth that people always say that 'everyone has a smartphone, everyone can use a smartphone', but it's not everyone who can use an application, you know. So it's really between that – some people are hesitant to use this because they've been using those old methods for so long they feel that they cannot be changed anyhow."* (eHealth Research Assistant)

There are specific medical conditions that have been traditionally targeted by eHealth interventions, but the much older generations who may suffer more with the condition often do not feel the benefit.

> *"From a pragmatic point of view, we know some of these conditions, they tend to affect, you know, elderly people, and so then you have to factor in the use of technology, you know. My grandmother, who may be diabetic, is she always going to be comfortable with working on a mobile phone?"* (Research and Development specialist)

Those in higher management positions within hospitals and clinics are of the older generations. Although they have the ability to embrace technological development, they are often reluctant to adapt any of their day-to-day practices, particularly towards conceptual technologies like cloud-storage or online medical record systems.

> *"They are in the positions that should allow this to be possible and to be easier. But because they're from a time when it's much harder to adopt such things... So, you find out a lot of people that are in the positions that would really help push this are very technology-adverse… Older people kind of want to maintain the traditional cultures that they have. Whereas younger people who are more, who adopt technology much faster - they want to adopt all these things but are not in a position to spread it."* (Technical support officer)

In the medical field, most senior positions are held by people in this older generation, who were educated and trained without even basic ICT, making their reasons for paper-based systems much more practical.

> *"And some of them, they are expected to use medical records, and create medical records, but they have no background of what a computer is, how to use a computer, something like that. So there's a great gap between those born before technology"* (Programme Manager, Health Informatics)

> *"There is resistance in the sense that we still have people in the [healthcare] system who joined at a time when there were no computers. And we still need those people to enter the data. So, for you to implement such a system or such technology you need to train those people thoroughly, so they can gain confidence. Because they always think that they are destroying something you know when you're using something that you're not familiar with, you're always think what if I'm breaking this? What if I'm not doing the right thing?"* (Web Application Developer)

Urban-Rural disparity in access and use of technology

Despite nationwide investment in improving eHealth infrastructure, there is still great disparity between urban and rural areas, causing social and physical challenges for access and use of technology and electronic systems. Issues with the Government Data Network (GDN) are worsened in rural areas, where many clinics are either not on the network at all, or revert to manual paperwork due to lack of training, maintenance or local ICT specialists.

> *"If you were to implement a system in Gabs most of the facilities here are in the GDN. Most of these facilities when the network is down, it's fixed within a day or two. That's because this is the capital city and people don't want to go without communication, not even for a day. So, that's the advantage of being you know at a city rather than in a rural area where it can go for months without the issues being attended to… These issues of network and you know maintenance of government systems is contracted to a company, a private company. And that private company has to go to a certain place where there's a fault to fix it. But they can only leave and go there if that fault is reported at that local level. There is supposed to be an IT officer in each district, but some districts don't have IT officers. So, that means users can actually go for months because there's a fault and there's no one to report a fault to."* (eHealth Monitoring and Evaluation Specialist)

Basic literacy is not guaranteed in the more rural areas, which means there is a limited foundation to build any ICT literacy or technological education onto.

> *"There is a difference, the major difference being even the kind of people. You find that in Gaborone those are people are working, they've got financial power, they've got the higher level of literacy. But as you go out in the villages you find that the level of literacy reduces. Yeah, you have more people who are not literate, yeah but funny enough they are able to use phones."* (Web Application Developer)

The disparity is further exacerbated by physical access to technology; while in Gaborone there is relatively easy access to computers, televisions, or mobile phones, rural villages may not be able to guarantee consistent electricity or water.

> *"Even if you look at the mobile phones, okay almost everyone in Gaborone they have smartphones. But [pause] I would say the use of technology is not the same because one there are some villages without electricity… And in a village, there are some villages whereby they probably, there are two laptops, or three laptops are in the whole village."* (Post-Doctoral eHealth Researcher)

> *"Then because you'll find that there's still a number of these facilities that don't have, for example, electricity and so basic, something like electricity, you can't talk about eHealth"* (Research and Development Specialist)

Women felt that any family planning intervention would need to be further simplified for rural areas, to ensure everyone has the same access to information.

> *"Umm I think if it can be an intervention just not for the urban areas but also in the rural areas. The information must reach more of the people."* (P5: Age 29, HIV negative)

> *"It is just a method of how other people in rural areas get the information appropriate for them. The best way so they can have as much as in urban areas, so that we get information the same."* (P6: Age 40, HIV negative)

Ensuring culturally sensitive eHealth design

Being realistic about the disparate access to and use of technology, generational differences, and physical limitations associated with eHealth in Botswana was raised as a key component of successful intervention design.

> *"It's very important to know your target audience, what do you think they will be comfortable in use of? ... And also, whatever media that you envisage to use for intervention make sure that you bear in mind the technology level of the people. Yes, because we are at a different level. And also, the reliability and the availability of whatever intervention media you are going to use, yes."* (System Support, Ministry of Health)

Embracing local knowledge goes further than designing a technologically feasible intervention. Botswana's reliance on external partners for project ownership and funding can lead to local experts, or the users of any intervention designed, feeling excluded or even patronised.

> *"So, the people here appreciate someone who understands where they are coming from right. So, if you know how they are and you know where they're coming from it's much easier for them to listen to you. As opposed to you're just someone who is coming in from outside the country and wants to give us a solution because you think it will help us... So, if you get to know the people and understand where they're coming from not just individually but the culture as a whole. Because people here are very, very traditional, they live the culture. So, if you can understand their culture you've basically understood 50% of the individual. And that will really help in delivering a solution"* (Technical Support Officer)

This notion of avoiding the 'fly-in, fly-out' approach to eHealth design, or applying a blanket solution that is far removed from the reality on the ground, emerged repeatedly. While it was raised as a way of building a successful intervention, the implication is that previous projects have not adequately explored the issues they are addressing, or the intervention users.

> *"You need to have a very broad view of this, where this is not really just, as we have said, 'well everyone has got a smart phone so I can develop an app' or whatever, but I think you have to look broadly at, not just at the technology but also at the, you know, the social aspects, or the human side of whatever intervention you may be developing."* (Research and Development Specialist)

> *"You know you don't bring technology here and say "this is eHealth. You know you can operate anywhere, anytime" - you know it's not going to work here. You learn the things here, what is required of here and you change, adapt it. And then provide it, okay"* (Senior eHealth academic)

Involving those individuals who will be using the intervention being designed was cited as an obvious but essential component of successful projects - specifically the importance of addressing a need as perceived by users.

> *"Number one, like top, top priority is for it to satisfy the users' needs... So, yeah, it doesn't matter how fancy the software look or how, you know, well developed the solution looks, but if end users are not happy and not seeing value in having it then it's not, it's not a successful project."* (Senior eHealth Researcher)

> *"The approach you should take, you should go out there and meet your target audience, both in towns and also in the rural areas. Chat with them, see their environment before you design a solution for them. I think it's very, very important to go to the rural area and see them at the clinic for example… so that whatever intervention you come up with, it's an intervention which should actually fit in their environment. Because if we sit here in the office and we design a solution, and we try to roll it out we will be surprised to find that down their target audience there's a big gap. Our solution is here, the people are here, and the solution doesn't reach the people."* (Web Application Developer)

Encouraging informed, effective choice of contraception

Stigma from healthcare providers in sexual health clinics, towards adolescents, specific methods or due to personal beliefs, is problematic for women's access and use of family planning, and policy stakeholders feel an eHealth intervention in sexual health could encourage a better patient-provider dynamic and allow women to make their own choices more freely.

> *"And if we could have something like that, that would be an up app that can give you all the information and answer all the questions, so that when you go you are also empowered and you can negotiate. And that is what we want, we want people who can negotiate safer sex, choose on the basis of information what they want to use and*

> *when they want to use it. Rather than depend on a biased healthcare provider."* (Senior manager in family planning, Ministry of Health)

Women added that access to this information would encourage them to choose more effective long-acting reversible contraceptive methods, and potentially reduce their reliance on the male condom.

> *"I would have chosen that implant over the injection. I would have been like, I am safe. ... I've always said, I don't want anything that mess with my hormones, you know? And look at that - I could have had that option, I could have had that one… Oh, and look - maybe it would have prevented like one situation [unplanned pregnancy] during that horrible time [after sexual assault]… Oh, my gosh, it would have made a lot of difference"* (P21: Age 33, HIV positive)

> *"Us in Botswana I think we're used to one thing like condom. We only know condom. We only use a condom but while there are lot of things to be used and I think we lack information… It would have changed a lot of things, a lot of our lifestyles. I think you could have managed to limit kids. Because there are a lot of people who have kids and they cannot even take care of those kids but this [information], they are very helpful. Yes."* (P17: Age 39, HIV positive)

Several women agreed that access to contraceptive information in this format would have led them to have fewer unplanned pregnancies, and smaller families.

> *"It would have helped me because I would have understood a lot of things. I would have read for myself and know how good it is, how bad it is before I got pregnant. Maybe I'll reduce the children, yes maybe I would have two kids or three kids, instead of five because lack of education… It would be better for me."* (P14: Age 42, HIV negative)

> *"I could have read, I could have learnt about the advantages and disadvantages about not using the contraceptives… Yeah. I could have been far by now rather than staying home babysitting, you know… Oh, I'll use something like this because I have got lot of kids. That's why I'd prefer to use the family planning."* (P20: Age 38, HIV positive)

7.6 Factors related to healthcare services and personnel

eHealth benefits for healthcare systems

As well as broader benefits of utilising eHealth interventions, there are specific benefits for healthcare systems and personnel, including improved referral pathways, reduced costs, and increased access to specialists whilst reducing physical consultations.

> "*They responded back and patients were treated and this helped in terms of reducing the number of referrals, number of associated costs when patients are being referred… I foresee also savings in costs, you know, printing all those brochures, all those materials about different contraceptives – I think it's costly"* (Senior eHealth Researcher)

Botswana has a lack of senior healthcare professionals across several medical specialties, meaning patients often travel a long distance and experience high wait-times before getting advice. eHealth could allow appointments that are non-essential or do not require physical consultation to be conducted remotely.

> *"At this clinic there is currently one specialist who looks after about 500 patients… but you find that some of these may not necessarily, if someone's just coming for routine check-up, some of these could actually have been seen at their local facilities, local clinics, yeah, so that is what we are trying to say – well, can we try to make it possible, you know for, you know, appropriate technology solutions, ICT solutions, to still allow, you know, the specialist to know what is happening with her patients without them actually having to come physically, because the other implications of having to travel fairly long distances"* (Research and Development Specialist)

As well as reducing travel time and reducing pressure on healthcare specialists, eHealth can empower local clinicians to provide higher quality care outside of Gaborone.

> *"It can actually assist more especially in developing countries where there's a shortage of experts. For example, there was that lady, the dermatologist you know that other time… Where she is actually helping a lot of healthcare workers out there who are not conversant with issues to do with dermatology. So, it is playing a major role in that regard."* (PhD Student in eHealth)

Challenges and benefits for providers

Providers felt that saving time within sexual health consultations would be one of the main benefits of an eHealth intervention for them. Clinics are overwhelmed, with long wait-times, and it can feel difficult to provide all the contraceptive information needed in such a short time frame. Women coming to consultations with more accurate family planning information in advance would make the educative part of their role easier.

> *“Women, when they come here, they would be well, well informed about each and every method… And [this intervention] is going to make work easier for the providers, because you are not going to take that much time teaching and trying to dig what they know.”* (Nurse Midwife, DHMT clinic)

> *“It will really help because, like I said, we don’t educate as much as we are supposed to, so at least they will come with some information and we will be able to go over things quickly without much time taken on education.”* (Principal nurse and MoH ToT, rural clinic)

Providers also said, as well as their clients, they themselves require further information about contraception, so the intervention would be useful for their own knowledge and education.

> *“Even the providers, they can use that. Some of the providers, they need the information too, so if there is somewhere where they can go and get information, they will have good information, reliable information”* (Nurse Midwife and MoH Master Trainer, DHMT clinic)

> *“We would be equipped with a lot of information. Because if you don’t know anything, you go into the [intervention], you ask, and you are given answers there. If you are not sure of anything, you go into the [intervention]”* (Principal nurse, DHMT clinic)

However, eHealth specialists felt a reluctance to changing to electronic healthcare systems, often linked to the perceived extra workload brought by eHealth innovation, and the additional training or learning required. This was felt to be of particular concern for those healthcare professionals whose use of new technologies appears to take them away from their core medical responsibilities.

> “*Yes, I think they feel like it’s a burden, it’s like it’s adding to a lot of work maybe that they already have. You are bringing a computer and you are asking for example a nurse to start, keep tab on the patient details while the nurse is supposed to be attending to a long queue of patients. You are bringing a cell phone and asking a healthcare provider to start texting and giving out the statistics of how many condoms registered they’d had.”* (System support, Ministry of Health)

Botswana’s stretched healthcare infrastructure means that completing clinical responsibilities can be difficult enough for healthcare providers, and often exacerbates their resistance to any change.

> *"Most healthcare workers, they will tell that, you know "I got so much to do. Basically, I do not have time for this". So, uptake by health workers is still a challenge while we can always blame them, they're overwhelmed..."* (PhD Student in eHealth)

ICT training and education for healthcare providers

Nationwide, poor ICT education has led to large gaps in ICT literacy. ICT is not part of the curriculum for healthcare professionals, and these new ICT-based systems have been introduced after years, if not decades, of working in the field. Though current university students would not be phased to see a computer in the workplace, many locally-trained nurses or doctors would not have even seen a computer until well into their adult life.

> *"The bigger challenge here in Botswana in terms of eHealth adoption is the ICT literacy. I think a lot of people are still, you know, not used to – especially clinicians, they were not properly trained on how to use electronic health systems or health information systems"* (Senior eHealth Researcher)

> *"Most of them, the clinicians, the nurses, and those kind, they haven't - they haven't really learnt anything about technology at school, so they were just focused on their nursing or whatever they were learning."* (Project Management, Health Informatics)

Consequently, healthcare providers do not have the basic ICT training to utilise the electronic systems efficiently, or adapt quickly to any new interventions that are designed and implemented. This causes a lack of drive from the healthcare providers and institutions which eHealth interventions are designed to help, and stops them being promotors of eHealth innovation with their patients and wider communities.

Tailored ICT training for nurses, doctors and other healthcare professionals was suggested as one way to improve their support for eHealth innovation, as well as integrating training on existing eHealth interventions and medical systems with the medical school curriculum taught to future medical professionals.

> *"But then you know the ministry acknowledges that, you know, there is need for more training on the clinicians so they are capable to use whatever eHealth interventions are being introduced."* (Senior eHealth Researcher)

> *"I think this is the time where we need to review those curriculums, for the nurses, the doctors - we need to review the curriculums, need to put in there - just some few lines*

> *of eHealth, so they can just be up to speed."* (Programme manager, Health Informatics)

Healthcare provider involvement in eHealth innovation

Healthcare providers are acutely aware of the medical and physical challenges they are facing on a day-to-day basis, and should consequently be more involved in designing the eHealth interventions which aim to fix those challenges.

> *"Yeah, go to those divisions and actually, you see sometimes it is always good to come up with an intervention that actually addresses a need that exists. So, sit with those nurses there, actually find out how easy it is or how difficult it is to share family planning information with the general population. And how do they think it can be improved and then you can actually address that gap."* (PhD Student in eHealth)

If healthcare providers see the benefits of eHealth and the interventions being designed, they are more likely to use them effectively. Utilising healthcare providers as promoters of eHealth interventions has strong potential, given their respected position in communities.

> *"These guys are the ones who are having the most interaction with the patients, mostly the nurses and the doctors - they meet patients almost every day. So if those people are aware of eHealth, if these people understand and appreciate the importance of eHealth, there is that high chance of them escalating that, that information to the patients, of which those patients would actually also share with their families, and share with their siblings, and that gets extended down to the ground level."* (Programme manager, Health Informatics)

Timesaving, convenience, and efficiency for clients

As well as timesaving within consultations, it was felt that some women may not need to attend clinics at all if the family planning information they needed was accessible at home – especially useful for women in more rural areas where clinic access and literacy are lower.

> *"And a lot of people do not really want to go and sit down in front of a nurse and get everything from her, like those people who were illiterate. They want to get information for themselves at their own convenience."* (Senior manager in family planning, Ministry of Health)

> *"You know some of people, they don't have time. Especially the young ones, who did not do well at school - they are working as labourers, they are working in the shops, in the retailers, so they are asking permission to come here for family planning,*

> *sometimes they don't have that chance. So if it is there electronically, each and every one has a cell phone, so they will be able just to read at home."* (Nurse Midwife, DHMT clinic)

Women said that ease of access to information and saving time were two of the benefits they would want most from an intervention of this type, and felt it may even translate into financial savings due to reduced travel to clinics if not absolutely necessary.

> *"First of all, it will cut off the time, time usage and the expenses, let me say. Because for me, if I want the information, for me to move from one place to where I'll be getting the information, obviously I have to spend time and the money. Yeah… Because this thing [intervention] I can go through it while, after work. While I'm relaxing and I want to spend thirty minutes going through it and I can learn a lot. But when I'm someone who is my schedule is tight, I cannot have time to go to the clinics."* (P7: Age 34, HIV negative)

7.9 Chapter summary: The feasibility and potential for an eHealth intervention in family planning in Botswana

This chapter explored the ICT landscape, challenges, and future potential for eHealth innovation in Botswana across various thematic areas: technological factors; organisational and institutional factors; societal and cultural factors; and factors related to healthcare services and personnel.

Though there are some key areas of success for Botswana, such as government investment, strong mobile data networks and wide mobile phone uptake, there are multiple barriers to eHealth innovation. Societal and cultural factors, such as a resistance to technology, or disparity between generations and urban-rural dwellers, are often entwined with more physical barriers, like poor Wi-Fi connectivity, and exacerbated by a lack of ICT education and knowledge. For design and implementation of eHealth interventions, the main considerations are a lack of sustainable funding, local ownership, and project management.

Chapter 8: Suggestions and recommendations for design, content, and target users of an eHealth intervention in family planning

8.1 Chapter overview

This chapter summarises the suggestions from potential users of an eHealth intervention in family planning (Batswana women and healthcare providers) related to intervention design, content, and implementation. Using these suggestions, as well as key findings from previous chapters, I make specific recommendations for the prospective eHealth intervention in family planning including: the key populations this intervention should address; sexual health content to prioritise; specific media platforms to consider; and how to implement the intervention within existing clinical infrastructures.

8.2 Recommendations for intervention content

Comprehensive, tailored contraceptive information

Women, providers, and policy stakeholders expressed a desire for detailed, accurate information about the full range of contraceptive methods available in Botswana – including effectiveness, advantages and disadvantages, how you use the method, and medical contraindications. Using this detailed information to dispel rumours or address common myths was also seen as a key benefit for women's uptake of contraception but also for ease of provision.

> *"I would like it to contain, umm… like, the manual we are having for the methods which are provided in a specific area, like in Botswana. And then its effectiveness, its mode of action, its use, its advantages and disadvantages. And then whether it's long or short acting method… And then also, it should include maybe myths and misconceptions about the method. So that, as a health worker, when you are providing a method, you should clear off all those myths. Because there are regular myths and misconceptions that come along with each and every method."* (Principal nurse, DHMT clinic)

The idea of being able to express personal preferences and tailor contraceptive information by demographic factors such as age or HIV status was also seen as very empowering for women, offering a level of individual choice in family planning decisions.

Detailed information about the various contraceptive methods is needed to address women's misconceptions and concerns associated with hormonal methods – particularly side effects, like weight gain, permanent infertility, or long-term medical issues caused by a lack of menses.

Fertility, preconception, and pregnancy advice

As well as comprehensive information about contraceptive methods, it was seen as essential to provide this knowledge as part of a broader education about women's reproductive health, including fertility advice, pre-conception information, pregnancy advice and menstruation.

> *"I want my intervention to have everything from sex, to contraceptive to effects. pregnancy. That is, everything that is realistic and is happening in life you see. Tell me, tell me about experiences and sex. Okay I'm having sex, what can I do to make it safe? Yeah. And then the effects of the things that I'm doing to make it safe. Yeah. And then pregnancy. Okay, now you're pregnant, what can you do? You see, advice."* (P22: Age 21, HIV negative)

Integrating information about family planning within broader information about women's sexual and reproductive life course could help destigmatise the use of contraception. Providing information about the high risk of pregnancy after childbirth, or advice for couples who are trying to get pregnant, may be a more acceptable way to approach family planning in a country where childbearing is so culturally important.

Balanced discussion of side effects

Women also desired balanced, honest information about side effects of hormones, and clear discussion of both the positive and negative elements associated with individual contraceptive methods.

> *"Umm yeah. I don't know anything about the side effects, negative side effects. Whether they can cause infertility or not. Maybe [this intervention] can clarify it… I would like to see, I think [providers] are just giving us the positive side of the contraceptives. I would like to know and see the negative side"* (P4: Age 33, HIV positive)

> *"You have to know what you're getting yourself into…If you get to miss your periods, you get to take time without getting a menstruation; is it bad, is it good? Because you have to make a decision based on, being well informed about the good part of what you're choosing and the bad part of what you are getting into"* (P2: Age 21, HIV negative)

Providers expressed the current lack of discussion around side effects within their SRH consultations, and said that providing this information through an eHealth intervention could help with client adherence to their contraceptive method.

> *"We also need to learn a culture let me say of becoming open with side effects. You know some products when they come [we act] it's as if they don't have side effects, but we need to be honest. So, we really, when you package a message that is talking about implants, IUCDs let it be clear of the side effects, and that of course they can be managed so that it doesn't come as a surprise when this young person is excited*

> *about this [method]… Then we also at facility we talk about side effects as if they are nothing, but they are something, it's a very big thing to have abnormal PV bleeding… These young girls are saying now when you want to remove it, the clinicians will refuse. Because with us we regard side effects as nothing, but to an individual who is going through that side effects it's a very big issue."* (Senior manager for programmes, private SRH clinic)

Women being made aware of potential side effects, and reassured about any medical concerns, prior to use could help with adherence to their contraceptive method, particularly LARC methods like the implant or IUD. Additionally, many women are not aware of the varying levels of effectiveness, or medical contraindications, so can become frustrated at method failure. More transparent, balanced information would help women make informed decisions regarding their healthcare, and is especially important in Botswana culture - where women put so much value in other women's experiences, and cultural hearsay can deter clients from both SRH services and specific methods.

Tailored information for HIV positive women

Strong, clear messaging about HIV and its influence on contraceptive options was also seen a high priority, particularly for providers. HIV positive women often believe they have to exclusively use the male condom, and hear confusing messages regarding drug interactions with ARVs, so a dedicated space where these two sexual health areas can be integrated could be empowering.

> *"First of all, I think consider the rights of those patients who are HIV positive, that they still have the right to have kids. But help them in the right way at the right time, yeah. And that again, they should not only rely on the condom."* (Senior manager, HIV clinic)

> *"I would like to know like in future if there will be contraceptive injections that will be given to people who are taking ARV'S… For HIV+ patients, I think they can even, they should advise the HIV positive to use two methods. If they can, if maybe opt to use the, use depo or implant, they should also encourage you to use the condom"* (P4: Age 33, HIV positive)

Asking about HIV status, of both women and their partner, as part of family planning decision-making was raised as an essential pre-requisite, and important in tailoring the contraceptive advice.

> *"You should ask about [HIV status]. Because, sometimes. Let me tell you something. If I'm using depo I'll never know whether, I'll never know - it is dangerous to use depo and then I didn't use the condom. Depo, it's just preventing pregnancy. It didn't prevent STDs."* (P18: Age 37, HIV positive)

Including the risks and prevention strategies for HIV and other STIs alongside pregnancy prevention in this intervention could help unify women's approach to sexual health, and their contraceptive use, by encouraging dual protection for those vulnerable to unwanted pregnancy, and/or STIs.

Additionally, accurate information about drug interactions between contraceptive methods and ARVs may reassure HIV positive women about using longer term family planning methods rather than relying only on the male condom, which many said they felt was their only contraceptive option.

Encouraging men's involvement in family planning decision making

Including content or advice that may help men become more involved in family planning decision making, and increase their own knowledge, was seen as essential due to men's dominance over women in sexual activity. As described in Chapter 6, women can feel the need to hide their contraceptive use, which should also be considered in this intervention.

> *"I think women should be asked if they did consult their partners when they wanted to use their contraception, and they should be asked if they know about STIs and other infections… Do they test first and know their status? Not only the HIV status even the STI, other STIs. Do they know if they have other STIs? Do they know about their partner's statuses, because some of these contraceptives don't prevent them from getting infections"* (P4: Age 33, HIV positive)

> *"Not everyone is a superwoman who can tell you what she wants in her life, what she wants for her body. Other people more consider that it involves the partner. So, yeah, I think [the intervention should ask] - have you talked to your partner? Which method do they prefer? And then that we can give you like, your preference, his preference and then it tells you"* (P21: Age 33, HIV positive)

Sharing personal experiences around family planning

Information sharing amongst women (as described in Chapter 6) was seen as something that should feature in this intervention. Women felt that hearing other women's experiences around contraceptives offered depth to the information, and could help answer a lot of personal questions.

> *"You know, women are the ones who are using family planning. I think their feedback would be of great help. Sometimes I think they should be given the time, or the chance, to talk, maybe with social media, maybe on the radio, maybe in the clinic here, teaching others about their experiences, because they are the ones using these methods and they are the ones to give the best feedback."* (Nurse Midwife, DHMT clinic)

> *"I would just compare the whole experience that woman had faced during that whole contraception period, like which contraception they used and which effects with it… I like to hear more like, the experiences. More like, how was the bleeding? Did you have regular pains during the time you had those irregular bleeding periods? What else, your moods what were they like? Yeah, were they worse than the time, than before you got the contraceptive method? Yeah, stuff like that."* (P1: Age 20, HIV negative)

Women sharing their own experiences around family planning, whether related to how a method is inserted, side effects, or even what to expect at clinics, could help reassure other women about using contraception. Some women may not feel comfortable asking these types of questions within their own networks, but would still prefer hearing personal experiences.

Importance of medical accuracy

Women expressed profound trust in advice from healthcare providers, and it was seen as very important for the intervention and all content within it to be delivered or approved by a medical professional. If women are sharing their personal experiences, for example, it would be important to balance or confirm these with more clinical information.

> *"[I would trust it] because I've seen the doctor in there… When it comes to these contraceptive things I believe there should be a doctor."* (P11: Age 28, HIV positive)

> *"The doctor could be an actor but, you know, psychologically you feel like this is more accurate… I mean, imagine if there's someone who wears a truck cap there, you*

> *know, and a plain shirt… Even though he says 'no, this information is accurate' you know, are you gonna trust a guy in a truck cap and on the plain shirt? No, you want to see a lab coat and beds, lights, hospital."* (P21: Age 33, HIV positive)

Practical details around clinical services and method availability

It was seen as very important to include practical information about sexual health clinics and where to access specific services, and ideally also method availability. This could help women know which clinics are 'friendly', and also address the more practical barriers that cause frustration when specific methods or services are not available and clients have to be sent away.

> *"Imagine I'm in a situation I removed my implant and I need to get morning afters or I need a doctor's assistance. I'll just log on to that website and click, I find a clinic near me. And then it just leads me to a clinic which is more friendly."* (P1: Age 20, HIV negative)

> *"Information about getting contraception, visiting a clinic, like what you should expect when you go there, confidentiality, privacy, a clinic finder, which is like where the actual methods are available… Can you make a booking on there? Can't that be a cool feature, or WhatsApp number where we can like speak to the person who does the booking?"* (P21: Age 33, HIV positive)

Clinicians said that a barrier for consistent provision of contraception was the national management system and frequent stock outs. Though this cannot necessarily be improved through an eHealth intervention, providing information about the services and methods currently available and at which clinic could help reduce frustration from clients, and avoid wasted time for both women and healthcare providers.

Women having more accurate information about specific clinic attributes – being youth friendly, or offering HIV services as well as family planning methods, for example – could help them make a more tailored, informed choice about where to access services, and improve their overall experience of sexual health counselling.

8.3 Recommendations for intervention design and media platforms

Tiered approach to intervention delivery platforms

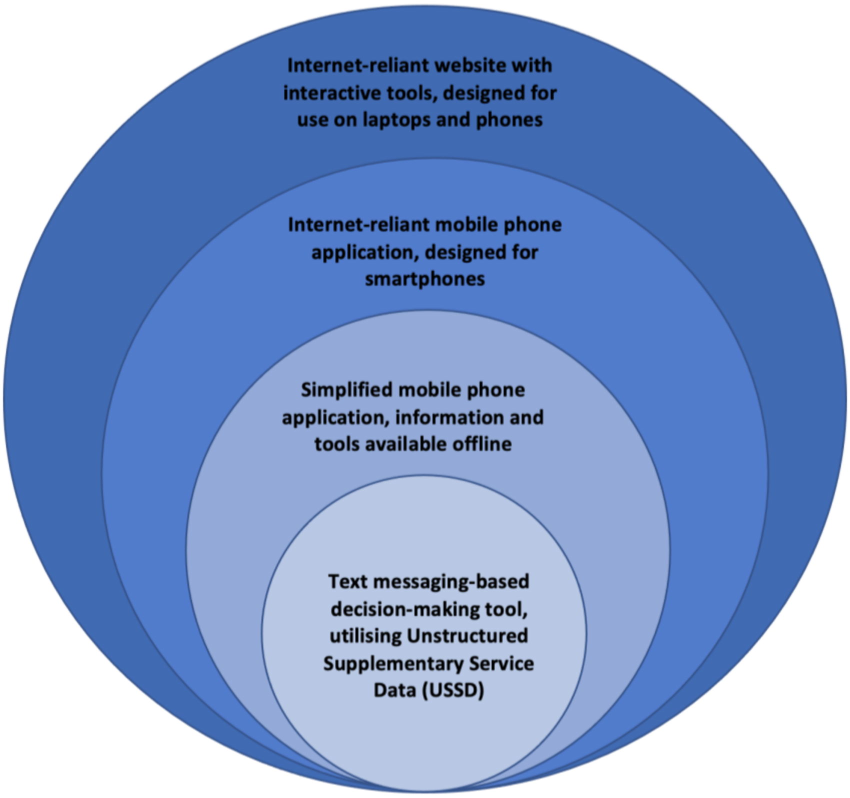
Using various platforms simultaneously, from more internet-reliant websites to offline smartphone apps, was seen as the best way to ensure equality in information access. Some women felt that during the transition to eHealth, it would be important to continue providing paper pamphlets – particularly in rural clinics – so women in these areas are not excluded.

> *"Ah, they can't use it. Because maybe they don't have laptops or phones. That's why I said you can use pamphlets [as well] and you can use phones … All of the method is good because sometimes I don't have a laptop, I can use the pamphlet. Sometimes I don't have pamphlet, I can use the phone."* (P18: Age 37, HIV positive)

A tiered intervention, where the desired content is offered on different platforms simultaneously to target different populations and incorporate varying levels of technology use, could be a highly effective way of providing information to the widest range of women. All tiers would be built around the same core aim, empowering women to make informed sexual health decisions through improved access to family planning information, while also addressing the varied levels of technological access in Botswana. This way, those with access to the internet and smartphones would not be excluded from innovative eHealth design, but those without the same access to technology and services would not miss out on the sexual health information and advice.

The proposed tiers of the intervention are presented in Figure 8.1 below.

Figure 8.1: Tiered approach to intervention delivery platforms



Mobile phone applications

Mobile phones are a popular and technically feasible way to approach eHealth innovation, and could be utilised for disseminating contraceptive information – particularly due to the privacy of using individual devices protecting the sensitive nature of the sexual health content. Being able to access family planning information remotely, and privately, could help remove some stigma around attending family planning services, as certain methods may not require physical consultation or intervention, such as the pill which is available at pharmacies.

Due to the high mobile phone uptake in Botswana, a mobile phone app was suggested as a potentially inclusive platform, provided that the information is available offline, and the application download is free.

> *"I think an app will do because we are mostly, we mostly have our phones. And that way having a phone is more efficient than going for internet and like, people do not*

> *really know about websites, links. Yeah. So I think an app will do because it's more like having WhatsApp."* (P12: Age 19, HIV negative)

Though mobile phones are very popular, there are a wide range of individual devices in use. It is important to ensure information is available to those with lower end, non-internet enabled phones, as well as those with smartphones. Utilising mobile phone-based technologies, namely text messaging (SMS) or Unstructured Supplementary Service Data (USSD), which are not as expensive and do not require internet access could be effective in rural areas which have a poorer infrastructure. Providing family planning information and a contraceptive decision-making tool to women and providers through this simpler technology would help reach women otherwise excluded from eHealth innovation, and be more realistic for the devices, and level of technical knowledge, within these populations.

User-focused, client-centered design

Lack of user-buy in can be detrimental to the success of any eHealth innovation, as described earlier in this chapter. For sexual health issues, it was seen as even more important to be realistic and accepting of what clients know, or would use, due to the sensitive nature of the content.

> *"My only plea is that let us not be running after the exciting things, let us genuinely look at the client. Let us genuinely look at the client and be patient… Because what is in our minds is not necessarily what is needed. So, it takes time for them to understand and take time to educate them."* (Senior manager in family planning, Ministry of Health)

Interactive, internet-reliant website

Women, healthcare providers and eHealth specialists said that exclusively using a website to provide family planning information would be problematic for many of the reasons described in Chapter 7, such as cost of mobile data, lack of access to internet-enabled devices, and low ICT literacy.

> *"Ah not all of people will use website… Not all the people will see the website because some of us we don't have laptops, we don't have [smart]phones."* (P14: Age 42, HIV negative)

> *"Challenges for a website, firstly it's the internet. The network is very expensive. And then not all of us are internet literate. Yeah. Especially in Botswana, heish it's a problem. Yeah, I think probably just communication and network. Yeah. And the phones that we use. Not all of us have phones that can upload to websites."* (P22: Age 21, HIV negative)

However, smartphone use is high in Botswana, and increasing rapidly, so as part of a tiered solution it could offer a more interactive, digital approach to eHealth, and target women or clinicians who do have laptop access, either at work or at home.

Use of videos

Videos were seen as more engaging than long excerpts of text and help visualise some of the more medical elements of contraception, like method insertion or what to expect at a consultation. Those with low literacy said listening and watching is more accessible than reading, and consequently would be more likely to use an intervention if it had visual aids.

> *"Yes I mostly use videos to get information. That would really be of use because seeing people testifying you get to hear more about that, to me is much better listening than writing."* (P12: Age 19, HIV negative)

> *"I would like it to teach with a video, so that a person can see how it's done. Like loop [IUD], most women we don't know how its inserted, but if you hold it like this and show a woman, they can learn something useful"* (P3: Age 29, HIV positive)

Integrating short, informative videos and visual aids, such as informatics regarding method effectiveness or an interactive decision-making tool as used in Contraception Choices (Contraception Choices, 2021), could be a very popular way to share family planning information with women who do have access to devices that would support more interactive elements.

Ensuring inclusivity in intervention content and reach

It was seen as essential for any family planning intervention to be inclusive of the various levels of technological literacy design, and to reach women in rural areas. Careful consideration of language, both in terms of English/Setswana, and family planning terminology, is one of the key areas for achieving this.

> *"Do not put medical terminology there that you won't understand. No, so nice and simple. Yes, just nice and simple, we need the information to reach the intended people and bring about the intended change"* (Clinic co-ordinator, private SRH clinic)

> *"I think [inclusive] language would be something that have to be included. Like coz some people are illiterate. But not too illiterate, they are able to read a little in English and a little in Setswana. So languages should be there. And maybe you find that there are words that we, people do not really know. Like terminology words. So it would really be better to have something that explains a bit about that word."* (P12: Age 19, HIV negative)

It is important for all information to be carefully translated into Setswana, and offered on all platforms regardless of the level of literacy or technological knowledge of the specific target populations. Additionally, Setswana speakers should be consulted to include colloquial, Batswana focused, family planning terminology, and ensure all questions, advice and discussion of sexual health is culturally appropriate.

Additionally, providers raised the importance of being inclusive of all populations who require sexual health information who have previously been excluded from services – particularly due to age.

> *"When you consider packaging the intervention, also consider the marginalised and the underserved adolescent who might have access to information at a very small percentage within those communities… Programme using the language that addresses different age cohorts and different age populations"* (Senior manager for programmes, private SRH clinic)

8.4 Tailoring intervention content and promotion for target users

Target user group: Batswana women of reproductive age

There are barriers to use of family planning that impact almost all Batswana women at varying levels - namely partner control over decisions and cultural attitudes towards childbearing, womanhood, and sexual activity. Targeting an intervention towards women specifically could address the current inequality in their decision-making ability, but content should also encourage open communication with male and participation of male partners in sexual health services wherever possible.

All women in this study expressed a strong desire for more in-depth, balanced sexual health information, and providing this should be the core aim for all tiers of the intervention. This impartial, accurate medical insight could help women make informed decisions about their contraceptive use and family planning options, and encourage more effective method choice.

Healthcare providers are seen as a trustworthy source of information, and clinics are women's preferred place to access contraceptives. Using the existing clinical infrastructure for eHealth implementation would help reach more women of varying backgrounds, and any intervention being recommended is likely to be seen as more valid.

Target user group: Male partners

Male partners are the largest barrier to women's uptake and use of family planning; are one of the key reasons they change or stop using a contraceptive method; and are a large incentive behind women choosing an 'invisible' method that is unnoticeable to their partner.

Though this eHealth intervention cannot address the depth and nuance of patriarchal cultural attitudes towards women, nor the control men have over women within their relationships, it can attempt to educate men alongside women and encourage their involvement in key SRH services. Providers felt that some men's lack of support for contraceptive use came directly from a lack of knowledge and exclusion from services, which this intervention could aim to address.

More research with men, and with couples, would be required to make tailored content suggestions for including male partners. However, promotion within medical settings which men also attend, such as HIV clinics, could reach a wider range of couples, and help men associate the advice with existing clinical infrastructure.

Target user group: Women in rural areas

Women in rural areas experience many of the same barriers to women in urban areas, but often on a higher level. Access to sexual health services, method stockouts, and a lack of trained providers were all seen as more likely, and problematic, for women living in rural areas.

Utilising existing infrastructures that are more available to women in remote areas would be the most effective way to ensure their access to the intervention. Dedicated research in these rural areas would be needed to determine exactly how to reach most women, but working with community leaders around promotion and implementation of the intervention, or utilising local pharmacies rather than less accessible sexual health clinics, may be more effective.

There is also technological disparity in rural areas, so it would be more important to offer simplified interventions, and ensure information is inclusive of lower literacy levels. Additionally socio-cultural barriers, such as male partners' lack of support for family planning and control over sexual health decision-making, may be more severe in remote areas where there is reduced access to services, education, and information. These issues need to be addressed sensitively through in-depth research around any necessary adaptations to intervention content for the prospective users of a sexual health intervention in remote areas.

Target user group: Adolescents and younger women

Younger women can feel stigmatised by providers, their community, and peers for accessing sexual health services and using contraception. Tailored advice for adolescents and young women that is accessible privately, and provides information about where to access youth friendly services, could help girls have more control over their use of contraceptives.
Many women, including older adolescents, said they only received family planning advice after the birth of their first unplanned child, and encouraging family planning information and counselling prior to sexual initiation could help address this current barrier.

Many women had heard about Gaborone's most youth friendly SRH clinic, where some recruitment took place, from advertisements on Facebook, and were encouraged to attend services because of this social media presence. Using these platforms, particularly Facebook and YouTube, could be particularly effective at targeting younger generations, who are more frequent users of social media.

There is also a desire for more accurate, in-depth sex education within schools, for adolescents of a younger age. Promoting the eHealth intervention for family planning within the school system could help the information reach more young women. It could also take pressure off the educators currently teaching the sexual health content, which can be uncomfortable, and remove some concerns for students about discussing issues of a sexual nature with an elder.

Target user group: HIV positive women

It is essential to consider HIV positive women's unique experiences with family planning and address any specific needs around their sexual health. HIV positive women expressed feeling like their options were limited when it came to contraception, only relying on the male condom. Providing accurate information about drug interactions and the potential of using dual methods could help empower them with the ability to make more informed, effective choices.

Promoting the eHealth intervention through Infectious Disease Care Centres (IDCC), which are the central location for accessing ARVs, could help provide family planning advice to more HIV positive women, through a service they already utilise and trust.

Target user group: Healthcare providers

Healthcare providers expressed the same need for detailed, up to date family planning information as their clients, and felt this was a barrier to their provision, and women's use, of contraception. While the eHealth intervention may not need to target healthcare providers exclusively, ensuring the information is detailed enough and accessible to them in both urban and rural areas could address their gaps in knowledge, and assist with training needs.

Promoting the intervention at sexual health clinics and using eHealth within individual client consultations could help healthcare providers have more regular access to family planning information, and improve their confidence in contraceptive provision.

WhatsApp is used widely for communication in Botswana. It could provide a strong platform for sharing family planning information and advice between providers in urban and rural areas, which could help address disparity in family planning knowledge and training. Additionally, WhatsApp is less technical than other applications, so may be more acceptable to older providers, who are in more senior or specialist roles and often have higher levels of training and knowledge that could be disseminated.

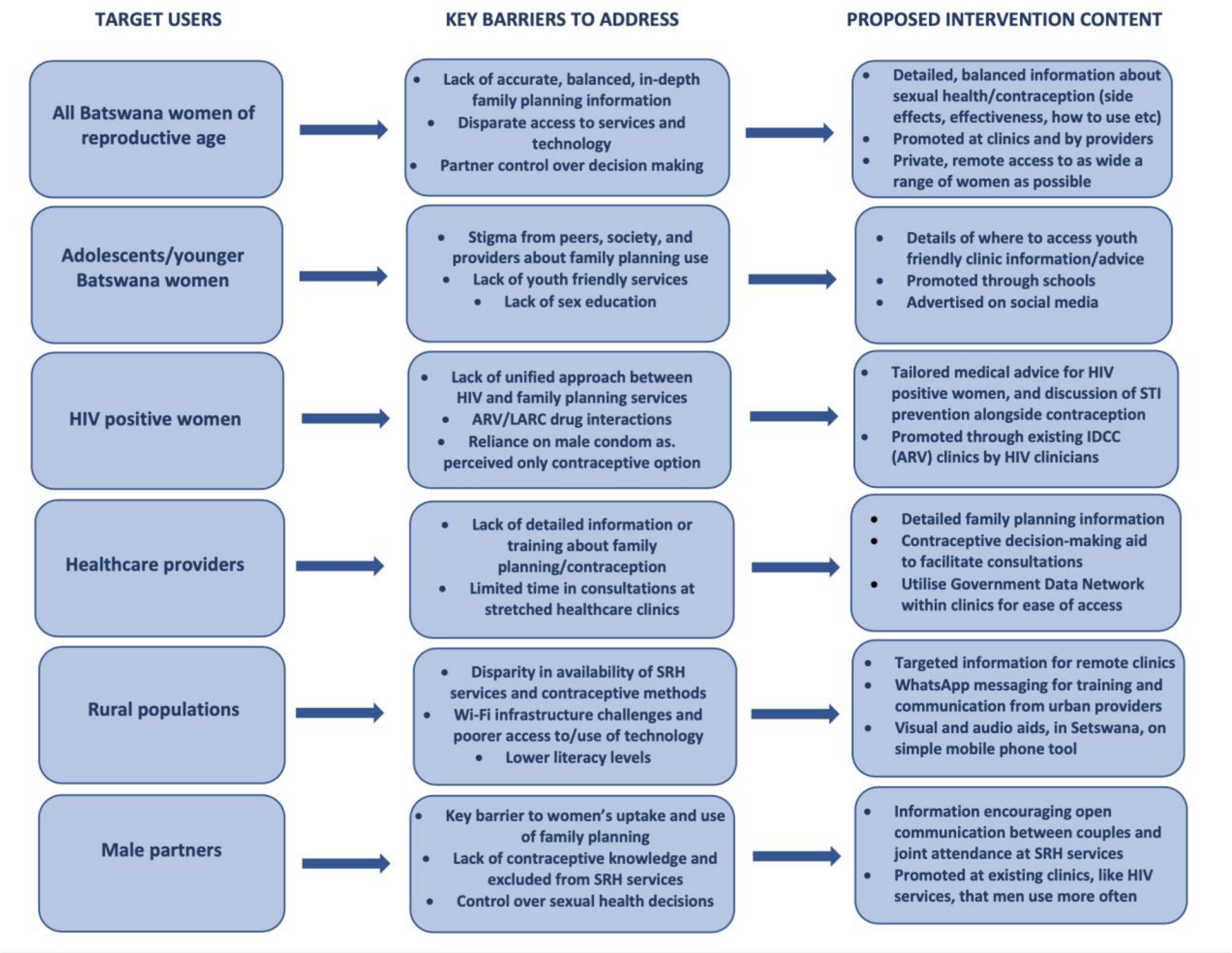
8.5 Overview of recommendations for eHealth intervention in family planning

8.5.1 Conceptual overview of target populations/barriers and potential intervention approach

My thesis findings and recommendation for intervention design are summarised in the diagram below, which highlights how key populations, and their unique healthcare needs, can be addressed by the proposed intervention content.

The content desired by and for target users, based on key barriers within these populations, should be addressed at every technological level of the tiered system described previously – see Figure 8.1.

Figure 8.2: Overview of target populations, key barriers, and proposed intervention content



TARGET USERS	KEY BARRIERS TO ADDRESS	PROPOSED INTERVENTION CONTENT
All Batswana women of reproductive age	• Lack of accurate, balanced, in-depth family planning information • Disparate access to services and technology • Partner control over decision making	• Detailed, balanced information about sexual health/contraception (side effects, effectiveness, how to use etc) • Promoted at clinics and by providers • Private, remote access to as wide a range of women as possible
Adolescents/younger Batswana women	• Stigma from peers, society, and providers about family planning use • Lack of youth friendly services • Lack of sex education	• Details of where to access youth friendly clinic information/advice • Promoted through schools • Advertised on social media
HIV positive women	• Lack of unified approach between HIV and family planning services • ARV/LARC drug interactions • Reliance on male condom as. perceived only contraceptive option	• Tailored medical advice for HIV positive women, and discussion of STI prevention alongside contraception • Promoted through existing IDCC (ARV) clinics by HIV clinicians
Healthcare providers	• Lack of detailed information or training about family planning/contraception • Limited time in consultations at stretched healthcare clinics	• Detailed family planning information • Contraceptive decision-making aid to facilitate consultations • Utilise Government Data Network within clinics for ease of access
Rural populations	• Disparity in availability of SRH services and contraceptive methods • Wi-Fi infrastructure challenges and poorer access to/use of technology • Lower literacy levels	• Targeted information for remote clinics • WhatsApp messaging for training and communication from urban providers • Visual and audio aids, in Setswana, on simple mobile phone tool
Male partners	• Key barrier to women's uptake and use of family planning • Lack of contraceptive knowledge and excluded from SRH services • Control over sexual health decisions	• Information encouraging open communication between couples and joint attendance at SRH services • Promoted at existing clinics, like HIV services, that men use more often

8.5.2 Evidence from existing eHealth interventions for family planning

There are no eHealth interventions in the field of sexual health from Botswana, but there are existing eHealth interventions in other LMICs and the wider African region that have aimed to address each of the 'key barriers' described in the diagram above. These interventions offer both strong evidence for the potential impact this type of intervention can have, and provide invaluable insight into best practice for design and implementation.

As described previously in this thesis, there are examples where use of mHealth interventions has improved women's contraceptive knowledge, uptake and use – whether in adherence to oral contraceptives, uptake of contraceptives among post-partum women, or general contraceptive knowledge (Castaño *et al.*, 2012; Smith *et al.*, 2015c; Aung *et al.*, 2020).

One Kenyan study highlights the particular potential of a client-facing contraceptive decision making mHealth tool (Dev *et al.,* 2019). The 'Mobile Application for Contraceptive Choice (iMACC), tested in four maternal and child health clinics, was highly popular and described as useful for helping to dispel myths and misconceptions; setting realistic expectations about potential side effects; and maintaining confidentiality (Dev *et al.,* 2019) – all elements that Batswana women suggested as important for this intervention. Additionally, both providers and women who used iMACC raised concerns about low literacy, and suggested use of video or audio as a potential solution – also recommended by participants in this study (Dev *et al.,* 2019).

Previous research has also highlighted specific potential of mHealth for reaching adolescents. An interactive mobile phone quiz was highly effective in improving SRH knowledge among adolescent girls in Ghana (Rokicki and Fink, 2019), and young adults in South Africa who used the interactive site 'iloveLive.mobi' reported more protective sexual health behaviour, including confidence in condom use and increased HIV testing (Visser *et al.,* 2020). A recent systematic review of mHealth interventions for young adults in LMICs also found improvements in access to SRH services, sexual health knowledge and contraceptive use following mobile phone interventions (Feroz *et al.,* 2021). Studies included in this review found mobile phones to be an effective tool for education and behaviour change communication with adolescents and young people across various African countries – improving adherence to HIV care, ART and HIV education programmes; increasing access to family planning information; and improving reproductive and sexual health knowledge and ensuring safer sexual behaviour (Feroz *et al.,* 2021). Though it can be difficult to directly relate an individual's behaviour change with their use of an mHealth tool, the positive outcomes from these existing interventions does suggest that utilising a mobile phone application with Batswana adolescents could also be effective at improving sexual health outcomes.

The 'iloveLive.mobi' interactive website described above was also found to be successful in reaching young men, which can be difficult, with more males than females reported as high frequency users (Visser *et al.,* 2020). This potential for male involvement in mHealth has been seen previously, where a systematic review found improved contraceptive uptake in interventions which included male partners in their application (Aung *et al.,* 2020; Harrington *et al.,* 2019a; Smith *et al.,* 2015c). mHealth communication from community healthcare workers was also found to increase men's attendance at post-natal care (PNC) services in rural Ethiopia, despite these men being previously uninvolved in any PNC, and their involvement was found to improve uptake of post-natal care services overall (Ayiasi *et al.,* 2015). Though unrelated to contraception directly, the potential for mHealth to encourage male involvement in healthcare services they have previously not attended could be useful in Botswana, as participants in this study cited lack of male involvement in SRH as a direct barrier to women's contraceptive use.

Previous studies have also found a significant difference in mHealth knowledge between men and women, particularly in rural areas, and more men were privy to use of mobile phones – cited as a potential barrier for mHealth solutions addressing women, including reproductive health and maternal, newborn and child health (Peprah *et al.,* 2019; Khatuna *et al.,* 2016; Wesolowski *et al.,* 2012). Additional research with men in the Botswana context would be needed to assess their attitudes towards mHealth and technology, and there is a need for more evidence that specifically explores how men's attitudes towards and use of mHealth influences women's health choices.

There is also some evidence that utilising mHealth to improve contraceptive uptake in rural populations can be successful. In a rural area of Maharashtra in India, use of reversible contraception increased by 18% following the use a mobile phone based SRH helpline, managed and operated by a local NGO, compared to just 2% growth in the control area (Kulathinal *et al.,* 2019). However, social barriers, such as gender inequality around use of technology, as described above, can be more problematic in rural areas and should be considered alongside design and implementation (Peprah *et al.,* 2019; Khatuna *et al.,* 2016; Wesolowski *et al.,* 2012).

Though this evidence does not address each proposed intervention element, it does highlight that various mHealth interventions have previously, successfully, addressed many of these target populations and key barriers. Conducting additional systematic exploration of existing interventions and specific mHealth tools will be necessary alongside the design of a pilot intervention, particularly once exact aims and outcomes have been decided. Additionally, previous research with these different populations across Africa has found similar concerns and barriers for eHealth to those raised in this study: low technology use, literacy and access; poor network coverage; low literacy rates; high cost of data and technology services; and wider socio-cultural beliefs and expectations limiting access (Akinfaderin-Agarau *et al.*, 2012; Rokicki and Fink, 2019; Peprah *et al.*, 2019; Mengesha). Continuing to consider how to best address these alongside pilot design will be of high importance.

8.5.3 Next steps for design and implementation of an eHealth intervention in family planning

As multiple target populations and topic areas for a family planning intervention were raised by this research, the next step requires focusing and prioritising the aims and target population for a specific intervention or tool. This would inform the future research required throughout the next steps of practical design, implementation, and evaluation; help focus funding options and necessary resources; and help decide which specific stakeholders and populations would need to be included.

In deciding next steps, prioritisation of target populations and key intervention aims, I would utilise the OPtimising HEalth LIterAcy (Ophelia) framework, designed to help build successful eHealth interventions which aim to improve health literacy and equity, and promote successful co-design of interventions in partnership with marginalised populations (Batterham *et al., 2014;* Beuachamp *et al.*, 2017; Aaby *et al*, 2020; Cheng *et al.*, 2020*)*.

Figure 8.3: The OPtimising HEalth LIterAcy (Ophelia) approach to intervention co-design

Step 1. Aim, scope, and set-up.
Identify project aim and scope to guide the following data collection.

Step 2. Needs assessment.
Identify health literacy needs and contextual assets and barriers.

Step 3. Idea generation.
Allow local stakeholders to interpret local needs and generate improvement ideas through co-design workshops.

Step 4. Program logic model.
In the project management team select interventions to test and develop program logic model and define specific goals.

Step 5. Plan intervention details.
Together with stakeholders plan intervention details and their testing and evaluation.

Step 6. Pilot testing.
Pilot the interventions using repeated improvement cycles.

Adapted from Batterham et al, 2014 and Aaby et al, 2020

Within the Ophelia model, this project has focused on Steps 1 – 3: **scoping the potential for an intervention**, **identifying key aims and health literacy needs**, and **idea generation for intervention aims**. Consequently, the next step would be to work with local stakeholders – in this context, healthcare providers, policy specialists and Batswana women – to produce a formal logic model that describes the required inputs and resources, specific design and implementation activities and who would be involved, and the desired outputs and impact this intervention would have. I also believe that, while this project has generated many suggestions for the intervention, Step 3 should be an ongoing process. Other stakeholders – who may have been excluded from this study due to time or financial restraints, such as external funding bodies or international agencies and partner institutions – need to be consulted and included in idea generation. Additionally, as discussed further in Chapter 9, the socio-economic reach of this sample is a limitation. There are other potential users – namely male partners, healthcare providers and Batswana women in rural areas, and wealthier women utilising private clinics – who should also be consulted throughout future research. This would help this intervention address the guiding principles of the Ophelia approach (Figure 8.4), and is representative of the inclusive approach I aspired to in my personal conduct within the research process.

Figure 8.4: OPtimising HEalth LIterAcy (Ophelia) approach: guiding principles

Outcomes focused	Improve health and reduce health inequities, e.g., by meeting project aims and intervention objectives, and implementing logic models.
	All activities at all stages prioritise disadvantaged groups and those

Equity driven	experiencing inequity in access and outcomes, e.g., by identifying and acting upon the needs of disadvantaged groups
Co-design approach	In all activities at all stages, relevant stakeholders engage collaboratively to design solutions
Needs-diagnostic approach	Participatory assessment of local needs using local data, e.g. using multidimensional health literacy tools.
Driven by local wisdom	Intervention development and implementation is grounded in local experience and expertise.
Responsiveness	Organizational response to health literacy diversity and other unique needs in the target population takes account of individuals, contexts, cultures and time
Systematically applied	A multilevel approach in which resources, interventions, research and policy are organised to optimize health literacy, e.g., by improving client's skills, enabling clinicians, changing organisational processes or engaging with external agencies.
Sustainable	Optimal health literacy practice becomes normal practice and policy, e.g., when small interventions at one level build up over time to achieve organisational priorities and objectives.

Adapted from Beauchamp et al, 2017 and Aaby et al, 2020

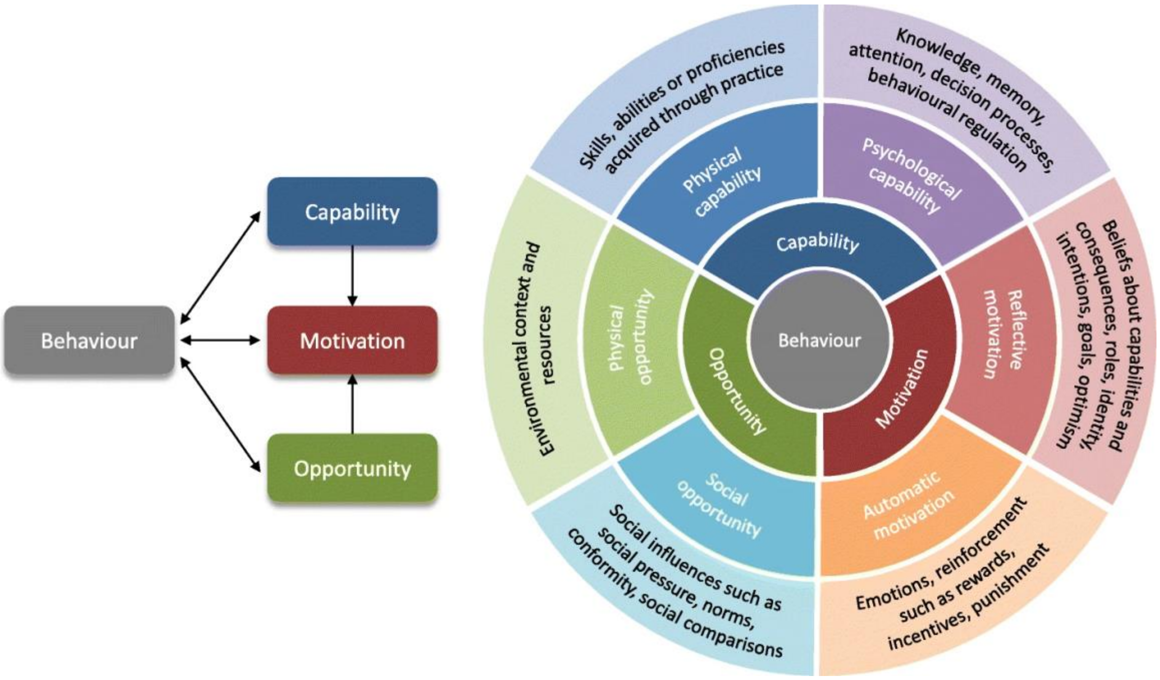
Deciding intervention aims and behaviour change elements

One of the key findings from this project was the desire, and need, for women to be able to access in-depth information about family planning options and make more informed decisions about their sexual health. Consequently, referencing the WHO 'Classification of digital health interventions' used in the introduction (WHO, 2018) the preliminary aim of this intervention would fall under 1.6.1, 'client look-up of health information', where 'client' may be a woman wanting information about her own contraceptive choices, or a healthcare provider in a consultation wanting to check information and be confident in the advice they are giving to their patient. However, there are other intervention aims raised by the WHO classification tool that could be secondary, important additions to this intervention, and would need in-depth discussion throughout the next design stages. For example, 1.5.1 - 'reporting of health system feedback by clients' - may be very powerful for women in Botswana (WHO, 2018). Almost all women raised in their interviews that they trust health information from other women, and like hearing personal experiences. Younger women, for example, expressed difficulty in knowing whether a family planning service was 'youth friendly', and even described leaving a clinic after a long wait based on their negative experience or bias from providers. The ability to share these experiences with each other could be empowering for women, but would also offer a great source of information and may enable a more positive clinical experience for future clients. Exploring this WHO framework with relevant stakeholders to decide exact intervention aims and how to address them would be an important next step in intervention design (WHO, 2018).

Additionally, while the preliminary aim of this intervention would be providing comprehensive family planning information, it is hoped that access to this information would positively influence women's decision making and behaviour. If the core aims of clarifying misconceptions; addressing concerns or side effects; sharing other women's experiences; and encouraging inclusion of men in family planning services and discussions are met, this intervention could improve uptake of more effective contraceptives, and adherence to methods once chosen. During step 5 of the Ophelia model, 'planning intervention details', discussion of how to measure these contraceptive outcomes should directly inform the choice of behaviour change techniques and specific evaluation methods.

The Behaviour Change Wheel (BCW) has been successful in developing tailored, successful interventions, and is well suited for addressing target behaviours with specific intervention functions (Michie *et al.,* 2011; Webster *et al.,* 2016; (Michie *et al,* 2018). In the BCW, behavioural change is seen to require a shift in capability, opportunity or motivation – where capability can be physical or psychological; opportunity can be physical or social; and motivation can be reflective or automatic – see Figure 8.5 for a summary diagram.

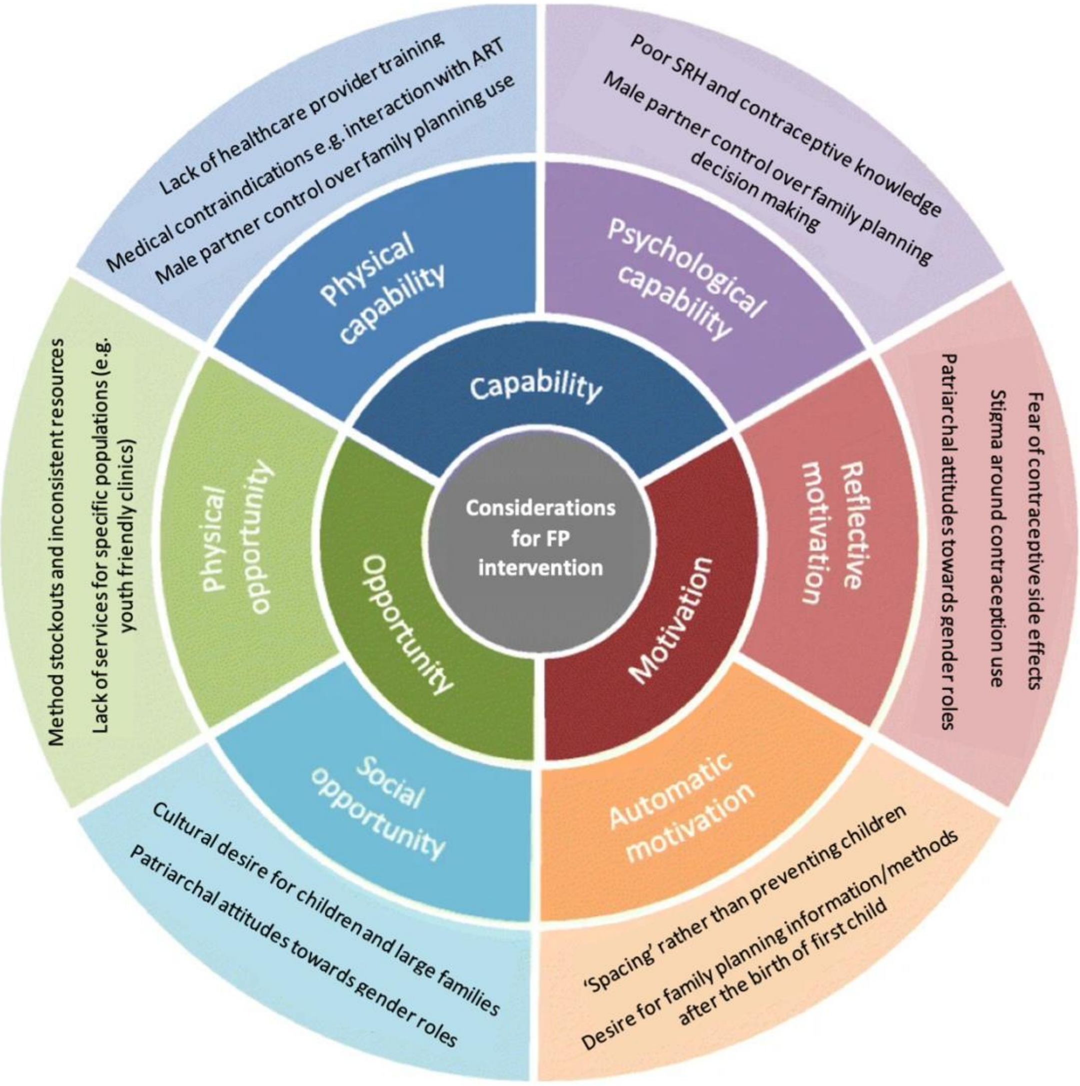
Figure 8.5: The COM-B model (Michie et al., 2011)



McDonagh et al., 2018; Michie et al., 2011

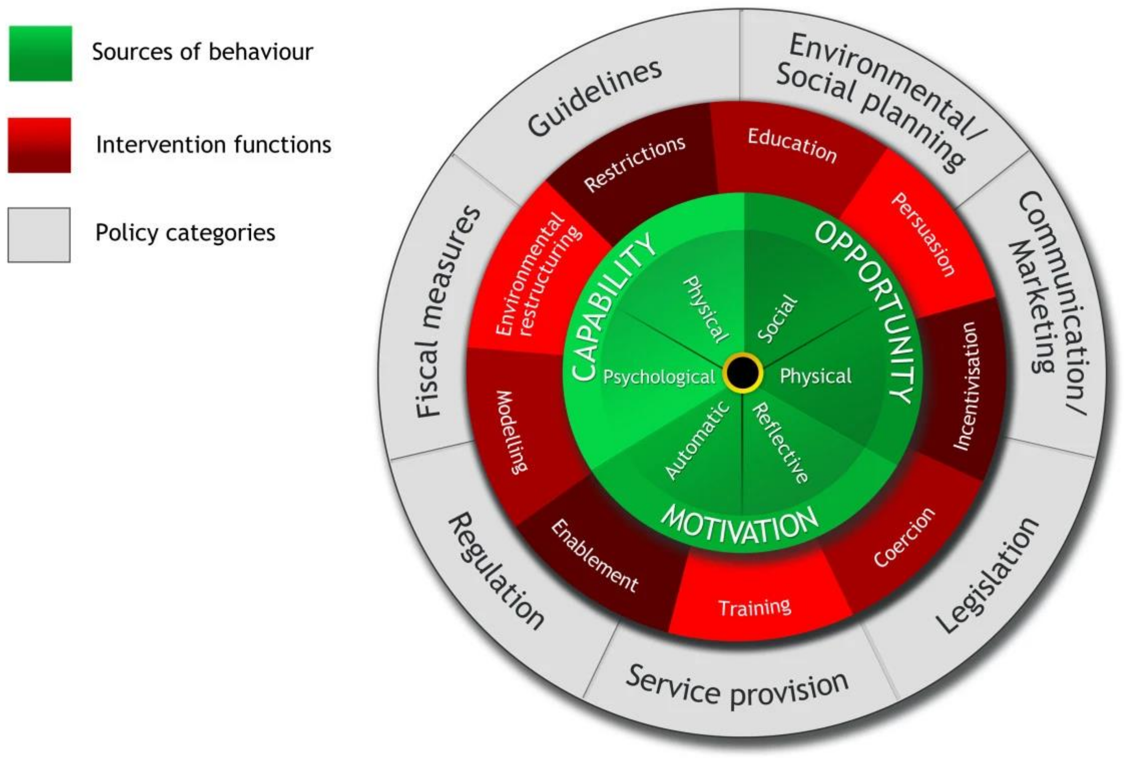
I then used this model to match the various social, practical, and medical factors raised in this project to specific behaviours that may influence women’s use of an intervention – see Figure 8.6 below.

Figure 8.6: Considerations for family planning intervention (COM-B model)



The BCW also includes nine intervention functions and nine policy categories for consideration – see Figure 8.7. While I believe policy categories are important for implementing large scale behaviour change, such as influencing legislation or implementing fiscal changes, these were not considered relevant to this individual level intervention (Webster *et al.*, 2016). Additionally, not all intervention functions were considered useful for this project – namely persuasion or coercion, which directly go against the core intervention aim of women making their own informed choices based on the improved provision of accurate, non-biased contraceptive information.

Figure 8.7: The Behaviour Change Wheel (BCW) (Michie et al., 2011)



Michie et al., 2011

I then used some of the most relevant BCW intervention functions to prioritise suggestions of the intervention for family planning – see Figure 8.8 below. The definitions for intervention functions used are the same as those referenced in the Behaviour Change Wheel (Michie *et al.*, 2011).

Figure 8.8: Overview of BCW intervention functions and suggestions for FP intervention

Intervention function	**Definition**	**Suggestions for FP intervention**
Education	Increasing knowledge or understanding	- Detailed, accurate information about contraception and sexual health – potential side effects, changes to menses etc - Tailored information for HIV positive women

		- Written, approved and/or delivered by medical professionals, ideally doctors, to reassure of trustworthiness
Training	Imparting skills	- Contraceptive information and specific tools (e.g. videos of method insertion) could be helpful for healthcare provider training and improving their SRH knowledge - Access to intervention could also improve confidence in new or untrained healthcare providers
Environmental restructuring	Changing the physical or social context	- Contraceptive decision-making tool could be used individually, or with providers, to improve consultations - Include advice and tools for communicating with male partners - Information about clinical services and where/how to access them (e.g. which are youth friendly, which providers are trained in implant removal etc)
Modelling	Providing an example for people to aspire to or imitate	- Include honest descriptions of women's personal experiences around family planning e.g. what concerns they had, or why they decided on a specific method - Use videos and images showing method insertion/removal, how to use contraceptives, and what to expect at clinical consultations
Enablement	Increasing means/reducing barriers to increase capability or opportunity*	- Intervention able to be used by women privately, which could reduce bias and stigma from partners and providers - Increasing awareness of youth-friendly clinics could improve adolescents access and use of family planning - Utilise a spectrum of technology to provide this information (including non-internet enabled devices) to be more inclusive of rural areas, and women from a lower socio-economic status

* Capability beyond education and training; opportunity beyond environmental restructuring

Michie et al., 2011

To ensure acceptability and that ‘behaviour change’ is being defined within the Botswana context, all of these elements of the BCW should be considered alongside more conceptual frameworks for creating sustainable change in resource limited settings, referenced in Chapter 7 (Fanta and Pretorious, 2018; Mauco *et al.*, 2020).

Potential limitations for intervention next steps

These next steps for an intervention could be influenced by multiple external factors, which would need to be carefully considered and incorporated into a logic model or monitoring and evaluation plan – including and in addition to those raised in Figure 8.6. Firstly, there is an assumption that funding and necessary resources can be secured. As described in Chapter 7, lack of stable project management and financial sustainability are a large reason behind failed interventions in Botswana. It would be essential to work with local eHealth experts to explore sources of funding that would enable this intervention to remain locally led, and sustainable. Secondly there is an assumption or expectation that there are high-level stakeholders who want to invest their time or resources into this intervention design and implementation. While the eHealth and clinical specialists I spoke to as part of this project were enthusiastic and hopeful about the potential of an eHealth intervention for family planning, this may not necessarily be translated into active participation in its design, implementation or future research. Building relationships with the right stakeholders in Botswana, in both technology and sexual reproductive health, will be essential for a successful co-design process .

Finally, one key barrier that has been well cited by eHealth specialists in Botswana, and could hinder success of this or any eHealth intervention, is Botswana’s lack of national eHealth strategy, and stagnant progress in developing a formal policy for eHealth development over the past 15 years. In the qualitative interviews, eHealth specialists expressed frustration at this lack of direction, especially as there seems to be no specific reason or cause behind the delay. As part of the Ophelia principles, interventions need to be ‘systematically applied’, where a multi-level approach includes policy organisation in order to optimise health outcomes and sustainability. As part of ‘idea generation’ it would be essential to explore the barriers to this national strategy and work with relevant agencies, stakeholders and experts to drive forward a national policy that could unify future eHealth innovation – as far as I would be able to do this.

8.6 Chapter summary

This chapter makes key suggestions for the design, content, and implementation of an eHealth intervention in family planning, including:

- Comprehensive information about contraception, including balanced descriptions of side effects, effectiveness, any medical contraindications, how the method is used or inserted, and where to access methods and services
- Tailored information for HIV positive women, and an integration of HIV and family planning information
- Ensuring inclusivity: of age, literacy level, language (both Setswana and family planning terminology), and disparity in both technology and sexual health services between urban and rural areas
- A multi-platform approach to implementation, including a website, mobile phone application, and SMS tool, to incorporate the spectrum of technological experiences and range of devices

Chapter 9: Project discussion and recommendations

9.1 Chapter overview

This final chapter provides an overview of key findings related to the barriers and facilitators to contraceptive provision, uptake and use, and the feasibility for eHealth intervention in family planning. It also provides recommendations for future research, policy, and clinical practice, before summarising specific recommendations for the prospective design and implementation of an eHealth intervention in the field of family planning. The chapter also discusses project strengths and limitations, as well as my personal reflections around African feminism and attempting to ‘decolonise the research process’, before summarising project conclusions.

9.2 Summary of key findings

9.2.1 Barriers and facilitators for the provision, uptake and use of family planning

Women's knowledge of, and attitudes towards, contraception

There are multiple misconceptions around contraception, and women are concerned with side effects, particularly changed bleeding patterns, weight gain, headaches, dizziness, high blood pressure, acne and infertility. Side effects were one of the most common reasons given for women changing their contraceptive method, alongside partners being in control of contraceptive decision-making. Contraception side effects are of deep concern to women globally, and are an important factor behind contraceptive decision making – exacerbated in settings where side effects are entwined with the myths, rumours and misconceptions that often stem from a lack of accurate information (D'Souza *et al.,* 2022 – in press; Cordero *et al.,* 2019; Silumbwe *et al.*, 2018; Chebet *et al.*, 2015; Agyemang *et al.*, 2019; Kabagenyi *et al.,* 2014; Todd *et al.,* 2011; Ochako *et al.* 2015).

Use and provision of hormonal methods is low (Nair and Navaneetham, 2015; Letamo and Navaneetham, 2015; Kraft *et al*. 2009; Doherty *et al.*, 2018; Mayondi *et al*., 2016). Of the hormonal methods, women expressed most concerns about the injection and IUCD, due to the increased likelihood of experiencing side effects attached to these methods. There is also cultural significance attached to experiencing regular menses, and fear about the medical complications caused by 'dirt' accumulating in the womb due to a lack of menstruation – a concern that has also been expressed by women from across Africa, and cited as a direct reason behind non-use of hormonal contraception, as well as the vaginal ring for HIV prevention (Rothschild *et al.,* 2021; Duby *et al.,* 2020; Brunie *et al.,* 2019; Marston *et al.,* 2018; Schwarz *et al*., 2019). Contraceptive methods which allow more regular periods are usually more popular in Botswana, and it is very important to provide information about how methods may influence menses prior to use.

Male condoms are the most used and most well-known form of contraception, due to ease of use and accessibility, as well as the strong promotion during the HIV epidemic – supporting evidence from multiple studies that highlight the extent to which male condoms monopolise the contraceptive market, across Botswana and the African continent (Ama and Olaomi, 2018; Nair and Navaneetham, 2015; Hoque *et al*., 2013; Mayondi *et al*., 2016; Agyemang *et al.,* 2019; Hlongwa *et al.,* 2020; Blackstone *et al.* 2017). Many HIV positive women see exclusively using male condoms as their only contraceptive option, supported by several studies that found direct relationships between knowing your HIV status and increased consistent condom use (Kraft *et al*., 2009; Ray and Sinha, 2012). Although some had considered or used dual-methods, this was not well promoted by healthcare providers, and dual-use of contraception remains low in Botswana, as in many other African countries (Kraft *et al.,* 2009; Toska *et al.,* 2020; Mandell *et al.,* 2021).

There are multiple issues with reliance on the male condom, namely their ineffectiveness and ability to rupture (Letamo and Navaneetham, 2015; Kgosiemang and Blitz, 2018). Even if condoms are being well distributed by providers, it is difficult to know whether male condoms are being used consistently or effectively, and their promotion encourages men's control over contraceptive decision-making. It can also be difficult for women to ask their partner to use a condom, and men often refuse to use one (Kanda and Mash, 2018; Schaan *et al*., 2016). However, the female condom is not popular or well recommended, due to the size, difficulty of insertion, and general inconvenience for sexual intercourse (Mokgetse, 2018; Mashanda-Taufane, 2015; Kanda and Mash, 2018).

Factors related to healthcare services and personnel

National management of contraceptive distribution is a key barrier to the provision of family planning. A reliance on one centralised system causes many supply-chain delays and stockouts, which providers are concerned makes family planning seem unreliable and deters women from clinics. This is predominantly an issue for women entirely reliant on free contraceptives from public clinics, but rarely the reason for non-use of family planning. These findings differ from previous research, which found national management and health system related barriers to have greater influence over women's individual contraceptive use in other African countries – particularly for women experiencing financial constraints (Potasse and Yaya, 2021; Silumbwe *et al*., 2018; Yakubu and Salisu, 2018; Cordero *et al.,* 2019). This is likely due to Botswana's promotion of free contraceptives and strong government programme for family planning, which have both been found to be facilitators of higher contraceptive use (Silumbwe *et al.*, 2018).

Providers do not have up-to-date or sufficiently detailed knowledge around family planning, and desire further, regular training. Many are underconfident in providing certain contraceptive methods – namely the IUD or implant – which influences the advice they provide their patients, and limits clients' options. This supports previous research, where a lack of confidence in method insertion meant providers did not recommend long-acting reversible methods to their clients, despite the higher effectiveness (Tshitenge *et al.*, 2018). Additionally, biased or untrained health workers; long waiting time; lack of privacy at clinics; and non-friendly adolescent reproductive services were found to be almost universal barriers for young women in a systematic review exploring determinants of adolescent pregnancy across Sub-Saharan Africa – the same concerns raised by both providers and Batswana women in this project (Yakubu and Salisu, 2018).

Providers said that lack of trained personnel is one of the largest barriers to consistent provision of family planning. It can cause women to be referred between multiple clinics, told to return or visit a different provider at a later date, or in some cases leave the clinic with neither contraceptive protection nor a plan to seek further clinical intervention. Women suggested that, although this does happen, it did not feel especially problematic to them, and rarely deterred them from using contraception completely.

Women did express a need for additional, high-quality information around contraceptive options and method side effects within SRH appointments – a gap experienced in clinical settings across multiple other African countries (Cortero *et al.*, 2019). Healthcare providers agreed the information they provided was often not adequate or thorough enough, whether due to time constraints, poor training or lack of information – challenges faced across Southern Africa for provision of contraception (Brown *et al.*, 2019). Offering healthcare providers training and access to quality family planning guidelines, protocols or information can improve client satisfaction with SRH services, as well as improve use and adherence to contraception, and could address this current gap in Botswana (Stokholm Bækgaar *et al.*, 2021; Tessema *et al.*, 2017).

Women see healthcare providers are a trustworthy source of knowledge and advice, despite providers themselves feeling underconfident in certain methods due to a lack of knowledge and poor training, leading to potential bias and lack of depth in contraceptive counselling. Women who had experienced judgement or negative attitudes from providers, whether due to lack of knowledge or personal beliefs, felt it was a key deterrent to their use of services – an issue raised by HIV positive women, older women, adolescents, and providers themselves in several previous studies (Schaan *et al*., 2014; Ama and Ngome, 2014; Lesedi *et al*., 2011; Mashanda-Tafaune and Monareng, 2015; Yakubu and Salisu, 2018; Hlongwa *et al*., 2020).

Women and providers felt a need for high-quality, inclusive sex education programmes that target younger girls, ideally at age 11 or 12. Parents and younger women believed that sex education programmes could encourage parent-child communication around contraceptive use, as well as facilitate more unified policy and provision of family planning information – a current problematic gap in Botswana, as well as the wider African region (Faimau *et al,* 2016; Kanda and Mash, 2018; Silumbwe *et al.*, 2018; Yakubu and Salisu, 2018).

A prioritisation of HIV within sexual health services has prevented the adoption of a strong national policy, and clinical provision, for family planning. Unification of sexual health services at a national and clinical level is needed to facilitate more effective, less stigmatised, use of contraception for women. Integrating family planning and HIV services may help address the often-conflicting advice and resource-competition between these two areas, and ease pressure on both healthcare providers and policy stakeholders. Being HIV positive was less influential on individual women's contraceptive choices than other medical or social concerns, and HIV was more associated with these policy or clinical barriers to the provision of family planning.

Integration of HIV and family planning services has been highly successful in other LMICs. One large systematic review evaluating integrated FP–HIV programs found that, as well as being generally feasible and cost-effective, integrating FP and HIV services was associated with improved uptake of contraceptives – both condoms and long-acting reversible methods (Haberlen *et al.,* 2017). Additionally, HIV positive women who were counselled within integrated services in South African clinics had significantly lower rates of unplanned pregnancy (Adeniyi *et al.*, 2018), and a study conducted across three Kenyan cities found integrating FP into other SRH services also improved healthcare provider knowledge of family planning (Mutisya *et al.*, 2019). In Botswana specifically, results of a recent study which assessed a clinical intervention that introduced family planning services into an existing HIV clinic, offered some evidence to support the potential of integrating HIV and family planning clinical services – increasing the number of patients who discussed contraception with their HIV provider, and the number of patients who wanted to use LARC methods (Hawkins *et al.*, 2020). Though this assessment was only completed in one Gaborone clinic, it does support the hope expressed by healthcare providers in this project that unifying these two areas of sexual health counselling may improve contraceptive outcomes for Batswana women, as they have in other African countries (Haberlen *et al.*, 2017; Adeniyi *et al.*, 2018; Mutisya *et al.*, 2019).

Influence of social networks and wider society

Socio-cultural barriers to uptake and use of family planning, particularly the role of male partners and patriarchal attitudes towards sex and gender, are the most influential for women's uptake and use of family planning.

Male pleasure is prioritised in sexual relationships, and women feel they are often used for sex and then left to deal with any consequences – consistent with findings from several previous studies (Schaan *et al*., 2016; Faimau *et al*., 2016; Kanda and Mash, 2018). Men are also the instigators of sexual activity, and consequently in control of family planning use, which makes it very difficult for some women to assert themselves in their relationships – particularly over condom use. These issues are exacerbated for women in relationships with older men (Nkosana and Nkosana, 2017; Yakubu and Salisu, 2018; Hlongwa *et al*., 2020), and due to the myths and cultural importance that encourages loss of virginity (Malinga-Musamba and Ntshwarang, 2014). These findings support a multitude of previous research that shows how socio-cultural attitudes, gender dynamics, and lack of male involvement in sexual health services can cause male partners to be a large barrier to women's family planning use across the world. 'Mwenye (husband) syndrome', or male control over decision making, prevents women accessing SRH services; reduces use of long-acting reversible contraceptives; and weakens bargaining power around condom use, and is the largest universal barrier to women's contraceptive use and broader sexual health inequality (D'Souza *et al.*, 2022 – in press; Yakubu and Salisu, 2018; Cordero *et al.* 2019; Kriel *et al.*, 2019; Hlongwa *et al.*, 2020; Saleem *et al.*, 2021 – in press).

Conversely, men who communicate openly about contraception with partners, and attend sexual health services, are one of the largest facilitators for effective contraceptive use – raised by providers as a current gap that should be addressed in sexual health counselling (Letamo and Navaneetham, 2015; Kgosiemang and Blitz, 2018). The desire for men to be more involved in SRH services in order to facilitate shared decision making is not unique to Batswana women, and has also been raised by participants in multiple previous studies across the region (Cordero *et al.*, 2019; Harrington *et al*., 2019b; Kriel *et al*., 2019). There is also some global evidence that improving men's access to family planning information and involvement in SRH services leads to better sexual health and contraceptive outcomes, further supporting this suggestion (Ochako *et al*., 2017; Wuni *et al*., 2018; Aung *et al.*, 2020; Harrington *et al.*, 2019a; Smith *et al.*, 2015c).

There is stigma attached to the use of family planning, from partners, healthcare providers and the wider community, and seeking or using contraceptives is associated with promiscuity, being unfaithful in relationships, or a lack of trust in your partner – feelings that have been raised in multiple other studies (Kanda and Mash, 2018; Schaan *et al*., 2016). Women in this project described how the stigma directly influences their decision making and use of family planning, either causing them to avoid specific clinics for fear of being seen, or choose an 'invisible method' that will not be noticeable to their partner. Covert contraceptive use and stigma are barriers to family planning by HIV positive women in previous research from Botswana, and appear to be important reasons behind contraceptive decision making across the African continent (Harrington *et al.*, 2019b; Schaan *et al*., 2014; Potasse and Yaya, 2021; Cordero *et al.*, 2019; Yakubu and Salisu, 2018).

Communication around sex and family planning is culturally taboo, particularly with elders or parents, and is a well cited issue for young adults initiating sexual health discussions (Faimau *et al*., 2016; Kanda and Mash, 2018). Due to this lack of sex education, most women are only offered contraceptives after the birth of their first child when it is deemed appropriate. Some women felt more comfortable discussing issues of sex with friends, cousins, and sisters, and expressed a cultural importance around hearing other women's experiences and personal information sharing – opposing young adults in a previous study who described poor peer communication as a direct barrier to sexual health and condom use (Faimau *et al*., 2016; Kanda and Mash, 2018).

The cultural importance of having a child, for both men and women, is a key reason for non-use of contraception, and language such as 'spacing' children is more appropriate than 'prevention' when it comes to family planning. This supports one previous study with older women in Botswana, who felt their female identity was directly related to the ability to bear children, and described an almost symbiotic relationship between motherhood and womanhood (Schaan *et al*., 2016). This cultural significance given to pregnancy and strong desire to have a large family is an important driving force behind women's contraceptive decision-making in many other African countries, and a large reason behind non-use of family planning (Abdi *et al.,* 2020; Kabagenyi *et al.*, 2014; Ahinkora *et al.*, 2020; Todd *et al.,* 2011).

Providers are concerned that a reduced fear around contracting HIV and increased access to ARVs has encouraged risky sexual behaviour and reduced condom use, particularly among adolescents, and women are now more concerned with unplanned pregnancy than HIV - similar to attitudes raised by young Batswana adults in previous focus groups, and younger women from a study across Kenya, Brazil and South Africa (Kanda and Mash, 2018; Todd *et al.,* 2011).

Recent research which focused specifically on the barriers and facilitators to family planning for younger women in Botswana (aged 18-24) uncovered very similar issues to those expressed by the younger women included in this project: stigma from parents, providers and the wider community around attending sexual health clinics; high cultural value placed on motherhood and unbalanced power held by male partners (Henry *et al*., 2021). Additionally, health system stakeholders raised similar issues around promoting both pregnancy prevention and HIV prevention when there is such conflict between the two clinical areas, and expressed a strong desire to integrate services – supporting the findings described in this project (Henry *et al*., 2021).

9.2.2 The potential and feasibility for an eHealth intervention in family planning in Botswana

Feasibility for eHealth innovation in Botswana

There has been a strong growth in Botswana’s eHealth infrastructure, and some positive examples of successful interventions improving healthcare outcomes such as Peek Vision, which was delivered teacher-led eye testing to thousands of students using a simple mobile phone app (Peek Vision, 2021). Botswana’s key strength is in this wide uptake of mobile phones, supported by a relatively stable national 3G network, and strong use of social media, particularly amongst the younger generations. This supports previous research from Botswana, which described the popularity of media for distributing sexual health information (Mashanda-Tafaune and Monareng, 2015; Letshwenyo-Maryatona, 2018).

The key benefits of eHealth interventions for clients are time and financial savings associated with fewer unnecessary clinic visits, and the promotion of privacy and confidentiality, particularly important for more sensitive sexual health issues. Providers saw the benefits of improved access to health information, which would make consultations more efficient and empower patients, but saw problems with the additional workload that initial training and setup of eHealth systems or infrastructure may require.

Lack of buy-in and poor technological knowledge among healthcare providers is a barrier to large-scale implementation in Botswana, exacerbated by a lack of formal ICT training. Healthcare professional competence, influenced by lack of training, concerns about inaccurate medical decisions in the application of telemedicine systems, and low e-awareness/readiness, has been found to be a major organisational barrier for eHealth across Southern Africa, reflected in low uptake of technology among clinicians (Dodoo *et al.*, 2021). Providers and eHealth specialists saw a need for improved focus on eHealth in medical school curriculums specifically, which other research from Botswana suggests can improve comfort-levels with technology in general, as well as specific medical applications (Chang *et al*, 2012).

There are multiple practical challenges facing prospective eHealth innovation. Botswana's Wi-Fi and ICT infrastructure is weak and inconsistent, particularly the Government Data Network used by public healthcare clinics. This means there is a poor foundation for the design and maintenance of eHealth interventions, exacerbated by a reliance on multiple incompatible healthcare systems within clinics. These barriers are the same as those found by a national scoping review conducted in 2020, where several studies described the same notable infrastructural constraints for telemedicine in Botswana: poor connectivity, bandwidth costs, increased workload of medical practitioners, unreliable network coverage, and lack of clinical and technical expertise, training, stable electrical power, and user acceptance (Ncube et al, 2020; Oluoch *et al.*, 2012; Akhlaq *et al.*, 2015; Akhlaq, 2016). Disparity between rural and urban areas exacerbates all of these technological challenges, and makes it difficult to develop national programmes and interventions – an issue that needs to be explored in greater detail to assess the actual impact of these eHealth barriers for both users and providers in remote areas.

A lack of national eHealth strategy and reliance on external partners has caused a lack of buy-in from local stakeholders, poor project ownership and management, and concerns over financial sustainability. A lack of focused policy direction is well cited by Batswana eHealth specialists as the largest barrier to intervention design and implementation (Ndlovu *et al*., 2014; Chavez *et al*, 2016; Ncube *et al*, 2020). Poor legal and regulatory frameworks for ICT are problematic across Southern Africa, and can contribute to concerns around the legitimacy of eHealth interventions (Dodoo *et al*., 2021).

Social and cultural barriers are less influential than the infrastructural or policy issues described above, but still need to be adequately considered when designing and implementing eHealth interventions. Reluctance towards technology, inequality between urban and rural areas, generational disparity and cultural importance of privacy over healthcare are the largest areas that influence access and use of eHealth interventions. Resistance to change, for example, was raised as a reason behind healthcare providers refusal to move from manual paperwork to electronic systems, and contributes to the lack of support from senior professionals in both ICT and healthcare for eHealth innovation. One previous study found that this cultural resistance to technology also deters patients from using digital interventions to treat illness, particularly in rural areas (Ndlovu *et al*, 2014; Dodoo *et al*, 2021). Research around digital interventions from across Africa and other LMICs have found almost identical barriers for mHealth, highlighting how these infrastructural and social challenges coalesce in individual user experiences, and need to be strongly considered alongside eHealth design (Akinfaderin-Agarau *et al*., 2012; Rokicki and Fink, 2019; Peprah *et al.,* 2019; Mengesha *et al.,* 2018).

Additionally, the Botswana-based conceptual eHealth readiness framework for developing countries used in Chapter 7 (see Figure 7.1) is the first of its kind, and a lack of formal assessment criteria in Sub-Saharan Africa is problematic for the development of high-quality interventions (Mauco *et al*., 2020). This is supported by a global systematic review of eHealth assessment tools, which found a prioritisation of certain factors (such as technological readiness and IT readiness) over socio-cultural readiness (Yusif *et al*., 2017). There is also a distinct lack of reliable measurement tools in even the most core readiness areas, and a need for greater attention to societal readiness in assessing eHealth's potential (Yusif *et al*., 2017). Developing appropriate guidelines for assessing eHealth readiness in lower middle-income countries, and tailored national strategies, will enable countries like Botswana to pursue more culturally acceptable and technically feasible interventions.

Recommendations for intervention design, content, and implementation

An eHealth intervention in the field of family planning could be highly successful in Botswana, providing it:

- Is culturally sensitive in terms of implementation, avoiding the 'fly in, fly out' approach to intervention development
- Utilises popular existing media and technologies, namely mobile phones and social media
- Develops interventions with local partners and leaders to make it sustainable
- Is inclusive in terms of language, technology, and geography
- Includes appropriately tailored sexual health content for Botswana
- Is heavily client-driven in terms of both design and need, seeking consistent feedback from target users

eHealth specialists, healthcare providers and Batswana women all offered various suggestions for specific elements to include in an eHealth intervention for family planning, such as:

- Balanced, comprehensive information about family planning: side effects; method effectiveness; and both the benefits and potential challenges of individual methods
- Doctor-approved, trustworthy sources of information
- Reassurance about existing myths, misconceptions, and fears
- Advice for parents on how to discuss family planning with teenagers
- Videos and visual aids, such as demonstrations of method insertion/removal
- Using real women's experiences to provide anecdotal context
- Offering broader sexual health information (such as fertility and pre-conception advice) alongside family planning advice
- Specific, tailored messaging and advice for HIV positive women
- Information for male partners, and discussion of how to include men in decision-making
- Practical information about where to access services, current stock-outs, and clinic times/availability

Utilising multiple tiers of technology – from an internet based, interactive website to a more simple text messaging based tool – would ensure this information reaches the widest number of intended users. Target populations, who face key barriers for uptake and use of family planning that could be addressed by the knowledge provided through this intervention include Batswana women of reproductive age, specifically HIV positive women, younger women or adolescents, and women in rural areas; healthcare providers in both urban and rural areas; and male partners. Research from across multiple African countries, and other LMICs, offers some evidence that these target populations and recommendations can be addressed through eHealth innovation. mHealth, in particular, has been found to improve sexual health and contraceptive outcomes for women (Dev *et al.,* 2019; Castaño *et al.*, 2012; Smith *et al.,* 2015c; Aung *et al.,* 2020); adolescents and young adults (Rokicki and Fink, 2019; Feroz *et al.,* 2021); and in rural areas (Kulathinal *et al.*, 2019); as well as increasing male involvement in SRH services (Visser *et al.*, 2020; Ayiasi *et al.*, 2015).

9.3 Study strengths and limitations

9.3.1 Qualitative research

This is the first study that uses qualitative research to explore the views of women, healthcare providers, policy stakeholders and eHealth specialists related to sexual health in Botswana simultaneously.

As described in Chapter 3, the strength of qualitative research is in seeking nuance and personal insight around complex, often sensitive, issues. Conducting qualitative interviews was especially pertinent for this project, which focused on uncovering the barriers and facilitators to provision and use of family planning, as well as challenges faced in implementing eHealth innovation. The rich anecdotes from Batswana women offer insight into the extent to which these experiences and barriers around family planning can impact their personal lives and relationships. Using qualitative interviews with healthcare providers and policy stakeholders offered in-depth understanding into the complex, multi-faceted reasons influencing contraceptive uptake and provision on a national level, as well as the personal impact of working within such a stretched healthcare infrastructure. Semi-structured interviews with eHealth specialists enabled me to ascertain the potential challenges in designing and implementing an eHealth intervention within Botswana’s ICT context, as well as seeking local knowledge into how to best ensure success and avoid pitfalls of previous interventions. Additionally, asking for highly specific feedback around the design and content to include in an eHealth intervention for family planning has enabled me to make tailored suggestions for future research and practice – stated later in this chapter.

Although findings in this thesis are highly specific to Botswana, the themes derived from this project can be used as a framework for exploring the barriers and facilitators to the provision, uptake and use of family planning in many other contexts, particularly other countries in Southern Africa and those with a high HIV prevalence.

9.3.2 Participant sampling and recruitment

One of the strengths of this project was the diverse sample of participants. Interviewing Batswana women of different ages, employment, relationship, education, and HIV status provided insight into the range of experiences faced in seeking and using contraception. Healthcare providers held a wide range of job roles, and duration of clinical experience, across a range of socio-economic areas in both urban and rural districts. Policy stakeholders held highly specified senior positions in either clinical or national family planning administration, with rich understanding of the financial and physical factors influencing commodity and service management. eHealth specialists represented multiple organisations, both private and public, and held a wide range of specific roles at various levels of seniority – from more technical specialists ‘on the ground’, to senior financial experts and managers. It was hoped that the combination of these viewpoints would allow more cohesive conclusions around the barriers and facilitators to women’s uptake and use of family planning, and a multifaceted exploration of the potential for an intervention to address them.

However, there were also limitations within sampling and recruitment. There are a small number of local eHealth specialists, and limited number of eligible participants. There were also a limited number of suitable eHealth institutions to recruit from, leading to the potential for large overlap in the type of projects and challenges for eHealth innovation being described. eHealth is also a heavily male-dominated field, and 10 of my 11 interviews were with men. While arguably reflective of the individual workplaces and the field, this means that the extremely positive attitude stated by eHealth specialists towards an intervention in family planning comes almost exclusively from men. However, I sought to address this through interviews with healthcare providers and women, where I gained further insight about women’s use of technology, and the potential for a family planning eHealth intervention from a female perspective.

My recruitment of family planning policy stakeholders was limited due to the highly specific experience, responsibilities, and seniority I was sampling. Consequently, only 4 senior policy specialists from specific institutions were involved in this study. While I feel I gained good understanding of the issues, as all raised very similar concerns and challenges, more research is needed into the even higher-level players influencing contraceptive supply chain and financing – particularly external NGOs and organisations. There are multiple external partners involved with contraception policy and resource management, and a reliance on foreign medical practitioners in general healthcare provision. Though gaining insight from these organisations, international researchers and foreign medical professionals would be unable to offer the depth of cultural understanding of Motswana providers, it would provide an additional perspective on the barriers and facilitators influencing women's ability to use family planning.

All healthcare providers and policy stakeholders included in the study were Batswana, despite the reliance on external medical professionals (African Health Observatory, AHO, 2018a). Although this is arguably a strength, due to their in-depth localised knowledge of sexual health services and broader socio-cultural factors, it is possible that these individuals would be less likely to critique or comment negatively on their own projects or clinical practices. This potential conflict was exacerbated by the fact that participants were recruited from clinical locations where they either worked or were seeking healthcare. Providers did appear to speak frankly about their experiences and specific clinical settings, even describing bias and stigmatisation within their own medical practice. However, women were almost unanimously positive about their experiences of healthcare providers, expressing deep trust in their knowledge and experience. As these interviews were taking place in the clinical settings where women would seek family planning with these providers, there is a possibility that women felt unable to speak freely about the counselling they had received. To try and mitigate this, all interviews were completely private, and women were reassured of confidentiality and offered the chance to speak about their care or other women's care in the third person. Some women also did raise highly negative experiences with healthcare providers, suggesting that they did not feel obligated to speak positively of the clinical services they were seeking.

Additionally, my Botswana based supervisor was very influential in recruiting the most relevant clinical providers and senior policy stakeholders, which I do not believe I could have done without her support, and these participants offered important insight into the top-end national strategy for family planning. Her involvement in the project was made clear to healthcare providers and, as she is so central to training, opportunity and clinical practice in SRH across the country, this could have influenced those providers with a connection to her. Throughout the design and implementation process of any future intervention, it will be essential to gain feedback from as broad a range of providers, stakeholders and potential users as possible.

I believe the sample of participants included in this study gave in-depth insights into the experiences around sexual health and family planning for women in Botswana, there were also some limitations in my sample of Batswana women. As described in the introduction of the thesis, wealth is highly disparate in Botswana. Recruiting almost exclusively from public government clinics offering free contraceptives means I did not gain full insight into sexual health counselling or contraceptive access for the wealthier elite - though arguably this approach did give better insight into contraceptive use for the majority of Batswana women, and those who are possibly more likely to require this intervention due to the stretched public health infrastructure. Research in a selection of the private hospitals and private clinics in Gaborone may have offered a wider range of wealthier women's experiences, and highlighted different or new barriers to their contraceptive use. Further research in these private institutions will be necessary to ensure appropriate design and targeting of any future intervention to reach as many Batswana women as possible - including those at the top end of the wealth spectrum.

I used employment status, education level and other demographic factors to assess wealth disparity in my sample, and did recruit impoverished, non-English speaking Batswana women due to strong involvement from local RAs. However, in future research, obtaining additional demographic factors which would better indicate an individual's financial status could better reflect Botswana's disparity.

This PhD project was restrained by time and funding, and the limitations attached to the slightly narrow socio-economic and geographical sampling strategy this led to could reduce the transferability of my findings. Though interviews did capture a broad range of barriers to SRH equity for women in Botswana, there is a need for further insight from the wealthier elite recruited from high-end private clinical practices, and the lower socio-economic rural areas, both in Gaborone and in other Botswanan cities in order to capture the full range of women's experiences.

9.3.3 Interview content and language

While English is the formal language of Botswana it is not the oral language many Batswana use in daily life. It is therefore likely to be tiring to participate in an interview filled with multiple contraceptive or medical terms – particularly Batswana women who do not frequently use them. Both ICT and medicine are filled with acronyms, both technical terms and names of organisations, with eHealth specialists and healthcare providers used frequently during their interviews. Many of these acronyms required clarification, which could have influenced the flow of conversation, or reduced my ability to probe in the moment due to a lack of full understanding about the organisation or term being discussed. This was aided by having RAs in the interview, who could interject with more details if they felt it was important for me to know.

Overall, I believe it was a strength to encourage participants to speak in Setswana, as I hoped it would create a more comfortable interview experience. However, on a few occasions women would continue to struggle to explain concepts to me in English, or go back and forth between the two languages. While RAs carried out rigorous translation and transcription, language barriers did occasionally make it more difficult for me to ascertain meaning within the interview itself, and possibly lose the ability to probe or follow up certain lines of questioning. These potential issues were addressed by oral translation by the Setswana-speaking RA Opelo within the interview if required, and then close checking of both translation and transcription against the audio recordings by two additional Setswana-speaking RAs.

The content of the interview questions could also have been emotionally draining and introspective, particularly discussing personal, distressing accounts of partner control or sexual abuse. I tried to be highly aware of participants' mental and physical state during the interview, and attempted to be highly empathetic, supportive, and encouraged breaks whenever needed if the process was overwhelming. At the end of each interview, I also highlighted the list of potentially relevant support organisations provided on each information sheet.

9.3.4 Limitations associated with eHealth commentary

As described in Chapter 7, Botswana is heavily reliant on external funding and partnerships for eHealth development, so it would be understandable for participants to avoid criticising the infrastructure or readiness for eHealth innovation – particularly to someone from a high-income country where potential funding investors could see published results. I attempted to reassure participants that all publications would be completely anonymised, and hoped this would encourage them to speak freely and critically about their own projects, but a protectiveness over this emerging field could have led to slightly unrealistic aspirations about eHealth's potential.

Additionally, while I feel I received very candid commentary about the multiple challenges around eHealth design and implementation, the response to the proposed family-planning focused eHealth intervention was overwhelmingly positive – from all perspectives. I have to consider the possibility that participants were telling me what they believed I wanted to hear, or were not comfortable criticising what they perceived as my idea. As detailed in Chapter 3, project links with Contraception Choices, a well-established UK-based website, were made transparent to stakeholders, and Batswana women were asked specifically to comment on various elements of the website's design and content. This could have made participants feel less inclined to critique a pre-existing intervention which I was involved with. In general, framing the project as 'eHealth' prior to any data collection could have excluded the discussion of other non-eHealth solutions to family planning provision and uptake, which participants may have felt would better address their needs. Though arguably this approach did better address the research question and specific focus on eHealth I hoped to explore, it undoubtedly limited discussion of other non-eHealth intervention options.

9.3.5 Power dynamics and researcher position

Throughout every aspect of the project, I was acutely aware of my position as a white, European, female researcher, and I was conscious of how I conducted myself, both within the research process and in my personal relationships. As described in Chapter 3, there were two specific areas where this was most important: African feminism and womanhood, and 'decolonising' the research process.

Attitudes to womanhood and motherhood

A core belief of African feminists is that women on the diaspora face a unique lived experience in terms of gender, moulded by culture, education, employment opportunity and societal expectations, that is excluded by Western feminist thought (Kablay, 2017; Nhemachena *et al*., 2016). I relied heavily on local RAs to ensure my Western attitudes towards sexual freedom, contraceptive use and liberal discussion of sexuality did not influence topic guide design, my approach to analysis, or any aspect of findings. Sexual practice is "private and considered private" and there is a different relationship with the concept of sexual freedom (Nkealah, 2016). I was aware of how this may influence recruitment, and encouraged women to approach me instead of assuming their interest in the study, or relied on a Setswana speaking RAs to approach potential participants in a way they would deem appropriate. I also prioritised including third-person questions within sensitive areas of the interview topic guides, in case a participant did not want to discuss their personal sexual health experiences, though it was very rarely necessary to rely on these.

The cultural importance of childbearing and motherhood is central to African feminism, and entirely changes the terminology and attitude towards family planning and contraception. It was therefore essential I did not allow my own attitudes towards pregnancy and childbearing to influence interview questions or analysis, as these would inevitably be influenced by my own infertility, and my Western expectations of family size or paternal involvement in childrearing, for example. Avoiding potentially loaded terms like 'unwanted pregnancy', 'abortion', 'rape' or 'preventing children' until the participant had used them helped Batswana women define their own perceptions of their sexual health experiences, and offered much more useful insight into how they really discuss these issues within their own social networks. For example, one woman described her sexual assault, which resulted in an unplanned pregnancy and HIV, as 'that difficult time', which in itself highlighted the taboo nature of the topic, even within a private interview. This approach offered more culturally appropriate terminology to use in the proposed eHealth intervention, and allowed me to make highly Botswana-focused recommendations.

All language relating to sexuality, family planning and gender was discussed and approved by the Botswana team, who advised on colloquial terms to use for various contraceptive methods, as well as the culturally appropriate structure for questions, such as asking about demographic factors like age or marital status after some rapport building. Local RAs were in attendance at all interviews in case women needed any clarification of questions, or would prefer to use Setswana terminology around family planning.

Due to the combination of my gender and race, participants may have been more wary about discussing certain elements of family planning or sexual health – such as abortion, or their attitudes towards certain contraceptive methods – for fear of insulting me, or my own belief systems. Conversely, participants may have felt more comfortable discussing contraception and sexual health with a female interviewer, due to the ability to empathise with, or personally relate to, specific medical or relationship issues.

‘Decolonising’ the research process

One of the strengths of this study was the cautious attention given to ‘decolonising’ the research process, as far as this is ever achievable – especially by a white, Western researcher. As detailed in Chapter 3, this can be considered from 5 perspectives: power, trust, culture and cultural competence, respectful and legitimate research practice, and recognition of individual and community assets (Keikelame and Swartz, 2019).

The strength of findings from this project, lies in the application of this approach, and the centralising of indigenous knowledge. Relying on Batswana researchers to help design and implement the research project, and encouraging Batswana women to define the barriers to sexual health equity and pose suggestions for an eHealth intervention from their own perspective, gave all power to local insight. RA advice about which clinics we should recruit participants from directly improved the project sample, through inclusion of a semi-urban clinic and rural hospital in less economically developed areas. I would not have been able to go and conduct research in these spaces without sensitive introductions, initial meetings, and practical support from Setswana-speaking RAs, who encouraged senior professionals at these clinics to participate and have trust in the project.

As described in Chapter 3, colonialism and apartheid have eroded trust in white researchers, and perceptions of Africa as a ‘resource’ has led to extremely unethical research practice

(Keikelame and Swartz, 2019; Nhemachena *et al*., 2016; Tilley, 2011; Al Jazeera, 2020). Many women in Southern Africa have been subjected to forced or coerced sterilisation, particularly HIV positive women, with deep physical and psychological impacts (Durojaye, 2018; Essack and Strode, 2012). Consequently, it would be more than understandable for Batswana women to be suspicious or uncertain about the intentions of an intervention aimed at encouraging contraception use, led by a white European researcher. While these concerns were never expressed to me directly, I made sure to reassure every participant about the core aims of the project, and their control over the information they chose to tell me. I also stressed the direct link between their contributions and a prospective Botswana-led eHealth intervention that would allow more choice over their family planning options, rather than less. At no stage did I assume trust in me or the project, and I continuously sought guidance on my interpretation of findings, the direction of the project, and aimed to foster a sense of collaboration over project outputs. However, as discussed previously in this section participants were made aware of my connections with Contraceptive Choices – a UK website – and women were shown this website to spark discussion of particular tools or elements they would find useful. This may have implied pre-existing decisions had been made, and consequently altered women's perceptions of this proposed intervention as being entirely 'Botswana-led'. Additional research and workshops with Batswana women and healthcare providers throughout the design process will be essential to foster trust in intervention aims and my approach, and ensure indigenous knowledge continues to remain central.

I attempted to carry out 'respectful and legitimate research practice' by Botswana terms, adhering to all suggestions of how to conduct the project in their unique context. For example, a key strength of provider interviews was the rapport built in preliminary meetings with clinic matrons, and repeated reassurance of my intentions prior to any formal interviews. I shadowed multiple local providers and sexual health clinics, and spent a lot of time during my first few trips to Botswana observing the RAs as they conducted other research projects to understand the local approach to sexual health research. This initial work was essential in assessing how I could best complete this project respectfully and produce the most useful recommendations for Batswana women, and also helped me avoid projecting my own ideas of 'legitimate' research practice onto the seasoned Batswana sexual health researchers I was working with.

This also feeds into the notion of cultural competence, which I aimed to ensure through careful observation of clinical settings, systems, and practices prior to study design. I aspired as best possible to the notion of Ubuntu, an African ethical practice that sees identity as entirely entwined in other people (Khupe et al, 2016; Keikelame and Swartz, 2019). As this project involved discussion of the key influencers over women's family planning choices, male control over women within relationships, and the role of society and community attitudes to sex and gender, this felt especially pertinent to keep central throughout interviews and analysis.

As well as fair financial compensation, I will ensure recognition of individual and community assets by disseminating and summarising findings for all study participants back in Botswana, which can often be left out from global health research. Once an international researcher has completed their data collection and leaves, all outputs and outcomes from the study can often leave with them, and indigenous researchers and research participants see no benefit from their participation. I have been conscious to remain present within the BSRHI team to help reassure RAs of my continued commitment to project aims and their recognition.

One area where this project could be improved, and something I would make sure to include in future research, is the viewpoints of other Black African academics and patient representatives through a dedicated African steering group. While I believe I gained great insight from those on the 'inside' of the project, discussion and feedback with external academics, technology experts and senior clinicians both in Botswana and the wider African region could have strengthened the methodology, findings and my own recommendations. Within this steering group, it would also be beneficial to include experts who have designed and implemented eHealth interventions in the wider African region, to explore best practice and build on what has been previously learned – something that should be prioritised in the next steps for this intervention as described in Chapter 8.

9.4 Key recommendations for research, policy, and clinical practice

Recommendations for future research

Due to ethical approval limitations, the youngest women interviewed for this project were aged 18. Research with school-aged children (aged 13-18) would more accurately explore the impact of current sex education programmes, as well as any societal changes to technology use or attitudes towards contraceptives among this age group. Previous literature highlights some unique sexual health barriers for younger adolescent girls - including stigma from teachers, being in relationships with older men, pressure for girls to lose their virginity and the persistent high rates of teenage pregnancy (Nkosana and Nkosana, 2017; Malinga-Musamba and Ntshwarang, 2014; Ramabu, 2021). There is a need for deeper understanding around the specific impact of these issues on contraceptive use, and in the additional socio-cultural barriers faced by younger women in accessing family planning services.

The most influential barrier or facilitator to women's use of family planning was the attitude and behaviour of male partners. Without further qualitative research into the reasoning behind men's attitudes towards contraceptive use, as well as the impact of societal attitudes on their sexual behaviour, there will not be a deep enough understanding into the socio-cultural factors impacting women's choice and use of family planning. In terms of developing the eHealth intervention, it is also important to include men before and during the design process to ensure acceptability; women's use or non-use of family planning is heavily influenced by their partner's attitude, and consequently men's input is essential for any future intervention to actually improve healthcare outcomes.

As stated earlier in this chapter, one limitation of this study was the small number of family planning policy stakeholders, all from local organisations. Further research with external NGOs, medical professionals and funding bodies may offer a different perspective on the barriers to family planning provision on a national scale, and offer suggestions for how these can be addressed in the design and implementation of any future intervention. Similarly, eHealth specialists were all from local organisations, despite a strong reliance on external funding and partnerships in the field. Further research with these international partners may add an additional level of understanding to the challenges for eHealth innovation, and offer insight into how to ensure sustainability from their perspective as funders.

Urban-rural disparity is a key barrier for provision and use of family planning, and the potential for eHealth innovation. Further qualitative research in rural areas is essential for ensuring inclusivity, and gaining accurate insight into the experiences of individuals living in these remote areas. It is not possible to make national recommendations for policy, or design a ‘Botswana’ based intervention when large parts of the population are excluded from research.

In Chapter 3, I described the process of ‘decolonising’ the research process, with the key aim of empowering indigenous people, both as participants and as researchers. This project highlighted the importance of including local stakeholders for the success of eHealth innovation, but also showed the benefits of strong inclusion of local researchers in the research design and process more broadly. Further qualitative research with indigenous RAs who work with international researchers in health-related areas would offer insight into their perspective and experiences of working on this type of project, and offer tangible suggestions for how international researchers can be more inclusive of their knowledge, expertise and skills.

Recommendations for policy

There is a clear need for a dedicated, national eHealth policy in Botswana, which would unify existing ICT organisations, focus the national strategy and streamline the process around intervention design and implementation. The issues caused by this lack of national approach are widely acknowledged, and long-standing – leading to a reliance on multiple incompatible systems, poor project ownership and financial losses (Mauco, 2014; Ndlovu *et al.*, 2014). This project highlighted the deep desire for a policy of this type from eHealth specialists, and also the impact of these problems for healthcare providers. The current incompatible electronic systems lead to stock-outs and supply-chain issues; time taken away from patient care in consultations to use manual paperwork; and frustration around failing eHealth solutions. A national policy around eHealth would provide a stronger foundation for future innovation and partnerships, which if successfully implemented may consequently encourage providers to see the benefits of eHealth in their clinical practice and become promoters among their patients. Without this national policy, success of any future eHealth innovation may be limited so it is an essential consideration and priority alongside intervention design.

It is also essential to integrate top-level national policy around HIV and family planning to ensure that the national strategy reflects a more unified approach to sexual health. National policy needs to provide a blueprint for the way clinical practice should operate, as sexual health services cannot fully address clients' needs if healthcare personnel are facing conflicting messages and resource management at a government level. Family planning policy is currently competing with a well-entrenched culture for HIV prevention, which exacerbates physical barriers to contraceptive access and limits women's options. Integrating these two areas could encourage use of long acting reversible contraceptives alongside condom use, assuming these policy changes are reflected in method provision, adequate resources, and improved training across both areas for all personnel.

There are multiple medical and cultural benefits for providers and their clients of adopting more inclusive policy around sexual health, such as allowing younger adolescents to access family planning services (UNFPA, 2021). These inclusive changes should continue to be implemented and improved on, as there are still many marginalised groups who are excluded from routine clinical care and sexual health services, such as sex workers, MSM or adolescents (UNFPA, 2021; Avert, 2021). Policy change is the first step to broadening family planning options for these groups, and creating a safer environment which protects those in these vulnerable populations.

Recommendations for clinical practice

Healthcare providers require more regular, in-depth training across both family planning, and eHealth. Implementing eHealth interventions within clinics will only be successful with clinician buy-in, but basic ICT training is required before any more complex innovation can be added. Sexual health providers require more up-to-date knowledge to help them feel more confident in contraceptive provision, and ensure clients are being offered high-quality counselling and accurate medical advice. Additionally, cultural-sensitivity training could help address issues of bias and stigma from some providers, particularly towards younger women, if led by senior Batswana medical professionals with a more inclusive attitude to family planning.

Findings also showed that a strong national sex education strategy, that provides more in-depth family planning information to younger adolescents, is needed urgently. Working with 'youth-friendly' clinical practices to design and implement a sex education programme would remove the stigma attached to discussing sexual health issues with teachers, and offer more accurate information about the physical services on offer.

Recommendations for eHealth intervention design, content, and implementation

An eHealth intervention in the field of family planning that is sufficiently tailored to Botswana, and adheres to all cultural and physical limitations, could be highly successful in improving access to family planning information, and may in turn lead to reduced unplanned pregnancy. Detailed recommendations can be seen in Chapter 8, but are summarised here.

The intervention design needs to utilise the existing popularity of mobile phones. However, an internet-based mobile phone application would exclude some women from use, so ensuring information is also available offline is of high importance. A multi-faceted approach where the same information is offered on various platforms would be the most successful in Botswana, where both knowledge of and physical access to technology is disparate. See Figure 8.1 in Chapter 8 for a diagram of the proposed tiers of intervention delivery platforms.

This project highlighted a multitude of barriers to provision and use of family planning, and proposes a number of eHealth solutions for how to address them. However, further collaboration with women, their partners, eHealth specialists, funding bodies, healthcare providers, and family planning policy stakeholders will be required throughout the design and implementation process. Seeking consistent feedback from these various groups will ensure the specific intervention designed and built remains useful, feasible and acceptable to intended users, and offers the best chance of improving healthcare outcomes.

This initial research should utilise the later stages of the conceptual framework for sustainable eHealth implementation, as detailed in Figure 7.2 (Fanta and Pretorious, 2018). This recommends a more in-depth exploration of processes, including intervention implementation, training, stakeholder engagement and plans for project management, as well as measuring targeted outputs, outcomes, and impact, including user satisfaction, improved healthcare services or medical outcomes (Fanta and Pretorious, 2018).

9.5 Conclusions

Many Batswana women still experience extreme practical and social barriers in accessing contraception - with partner control over decision making, and patriarchal cultural attitudes towards sex and gender the most prominent and influential. There is a strong need, and desire, for more detailed, balanced, up-to-date family planning information for women, their partners, and the providers who counsel them.

Healthcare providers are underconfident in offering comprehensive contraceptive provision, particularly newer methods such as the IUCD and implant. Consequently, government officials need to ensure that healthcare providers have the knowledge, resources, and training to facilitate high-quality family planning counselling – which could be assisted by the proposed eHealth intervention. Strong unification of HIV and family planning at both a clinical and policy level is necessary to address the often-conflicting advice and resource-promotion between these two areas.

Despite the challenges for eHealth innovation in Botswana, the idea of creating a family planning intervention was highly popular. Suggestions for ensuring success included involving local stakeholders and potential users throughout the design process; making the intervention inclusive in terms of language, technology, and geography; utilising popular technology platforms, such as mobile phones and social media; and adhering to the realities of current infrastructure limitations.

If designed and implemented both sensitively and sustainably, an intervention of this type could empower women with the accurate, detailed contraceptive information required to make informed choices about their sexual health; reduce unplanned pregnancies and increase spacing between pregnancies; educate providers and improve their confidence in contraceptive provision, while easing pressure on Botswana’s stretched healthcare infrastructure by offering more remote access to high quality family planning information.

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Appendix

Appendix 2A: Medline Search Terms

Database: Ovid MEDLINE(R) Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) <1946 to Present>
Search Strategy:
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1. exp Contraception/ (24976)
2. Contracept*.mp. (85663)
3. Family planning.mp. (46596)
4. exp Family Planning Services/ (23711)
5. birth control.mp. (4948)
6. Reproductive behavio?r*.mp. (6792)
7. exp Reproductive Behavior/ (8069)
8. ((reproductive or reproduction) adj4 (health or healthcare)).mp. (15926)
9. exp Contraception Behavior/ (7163)
10. exp Contraception, Barrier/ (51)
11. exp Contraception, Postcoital/ (910)
12. exp contraceptive devices/ (23546)
13. exp contraceptive devices, female/ (12766)
14. exp contraceptive devices, male/ (10240)
15. exp contraceptive agents/ (67411)
16. exp contraceptive agents, female/ (61590)
17. exp contraceptive agents, male/ (8998)
18. fertility control.mp. (6733)
19. fertility awareness.mp. (206)
20. withdrawal method*.mp. (111)
21. rhythm method*.mp. (380)
22. Abstinence.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (21617)
23. modern contracept*.mp. (1248)
24. barrier method*.mp. (2825)
25. condom*.mp. (21052)
26. femidom*.mp. (14)
27. long acting reversible method*.mp. (66)
28. LARC.mp. (1083)
29. (contracept* adj4 implant*).mp. (1596)
30. intrauterine device*.mp. (12409)
31. IUD*.mp. (8807)
32. intrauterine system*.mp. (1079)
33. IUS*.mp. (1275)
34. loop.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (135307)
35. contracept* injection.mp. (71)
36. (depo?provera or dmpa).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (1095)
37. (net-en or nuristerate).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (135)
38. (contracept* adj 2 coil*).mp. (0)

39. 39 progest*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (119131)
40. (?estrogen adj4 pill*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (343)
41. (combined adj3 pill*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (825)
42. mini pill*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (107)
43. emergency contracept*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (2296)
44. (morning after adj2 pill*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (216)
45. (contracept* adj 2 diaphragm*).mp. (0)
46. contracept* cap.mp. (2)
47. vaginal ring*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (859)
48. vaginal sponge*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (191)
49. vaginal shield*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (28)
50. contracept* patch*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (187)
51. spermicid*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (1868)
52. or/1-51 (422812)
53. exp africa, southern/ (56571)
54. exp angola/ (846)
55. exp botswana/ (1484)
56. exp lesotho/ (361)
57. exp malawi/ (4241)
58. exp mozambique/ (1935)
59. exp namibia/ (890)
60. exp south africa/ (36811)
61. exp swaziland/ (464)
62. exp zambia/ (3825)
63. exp zimbabwe/ (5289)
64. South* Africa*.mp. (52720)
65. Angola*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (1493)
66. Botswana*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (2186)
67. Lesotho.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (633)
68. Malawi*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (6327)

69. Mozambi*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (3258)
70. Namibia*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (1507)
71. Swazi*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (817)
72. Zambia*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (5419)
73. Zimbabwe*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (6919)
74. Motswana*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (3)
75. Batswana*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (40)
76. Mosotho*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (1)
77. Basotho*.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms] (31)
78. 78 or/53-77 (76732)
79. 52 and 78 (3552)
80. limit 79 to yr="2007 -Current" (1956)
81. limit 80 to (english language and humans) (1595)

Appendix 2B: Characteristics of included studies table

Article	Study design	Method	Setting	Participants	Sample size	Study objective(s)/research question(s)	Contraceptive methods
Agyei and Abrefa-Gyan, 2016	Quantitative	Structured, self-administered questionnaire	University of Botswana, Gaborone	Undergraduate students aged 17-24.	331	Examining the risky sexual behavioural patterns and condom use among the young people in Botswana	Male condom
Ama and Ngome, 2014	Mixed-method	A questionnaire, administered by trained research assistants, with both closed and open questions	Gaborone, Kweneng East, Selibe Phikwe and Barolong – two rural and two urban health districts	Women aged 50 and older.	444	Explore the challenges faced by older women who are 50 years of age and older in accessing healthcare services needed to meet their SRH/FP needs.	Observation of periods; withdrawal; abstinence; norplant; vasectomy; diaphragm; emergency contraception; sterilisation
Ama and Olaomi, 2018	Mixed-method	A questionnaire, administered by trained research assistants, with both closed and open questions	Gaborone, Kweneng East, Selibe Phikwe and Barolong – two rural and two urban health districts	Women aged 50 and older.	444	To determine the family planning desires of older adults, availability and accessibility of services, and factors that enhance or deter the utilisation of these services.	Condom, breastfeeding, abstinence, IUD, pills injectables, combined oral contraceptives, withdrawal, observation of periods
Bainame *et al*., 2016	Quantitative	Secondary analysis of data collected through the Botswana Family Health Survey IV (2007)	“Nationally representative sample” from both urban and rural areas	Men aged 12-29	4030	Does exposure to sexuality education influence men’s sexual and HIV risk practices/behaviours?	Use of ‘contraceptive method’, no further specification
Doherty *et al*,. 2018	Quantitative	Secondary analysis of data collected in a prospective cohort study	Princess Marina Hospital, Gaborone	Women aged 18 years or older, with a gestational age of less than 35 weeks	231	Assess the frequency of reported unintended pregnancy and determine contraceptive use/type among women with unintended pregnancy	Male condoms, oral contraceptives, injectable contraceptive, intrauterine device, dual methods
Faimau *et al.*, 2016	Quantitative	Cross-sectional questionnaire	University of Botswana and Boitekanelo College, Gaborone	Registered students at either study site	445	To explore and examine the knowledge and attitudes of college students at tertiary educational level in Botswana in relation to risky sexual behaviour	Condoms (did not specify male or female)
Hoque *et al.*, 2012	Quantitative	Descriptive, self-administered cross-sectional questionnaire	University of Botswana’s main campus, Gaborone	Registered full-time undergraduate students from all years of study	346	Provide empirical data about the sexual behaviours of university students in Botswana.	Condom or unspecified “other methods”

Hoque *et al.*, 2013	Quantitative	Descriptive, self-administered cross-sectional questionnaire	University of Botswana's main campus, Gaborone	Registered full-time undergraduates from all years of study	346	Investigate the awareness and practices of contraception among the University students in Botswana.	Condom, pill, loop, injection, natural methods, norplant
Kanda and Mash, 2018	Qualitative	In-depth interviews	Mahalapye District Hospital and Airstrip Clinic, Mahalapye (Central District of Botswana)	Sexually active men and women, aged 18-28, willing to discuss condom use	11	Explore young adults' attitudes, beliefs and behaviours with regard to condom use	Male condom
Keetile, 2014	Quantitative	Secondary data from the 2008 Botswana AIDS Impact Survey (BAIS) III	Nationwide, with households per enumeration area (EA) proportional to size	Men and women aged 20 or older	10,159	Assess the high-risk behaviours associated with HIV/AIDS prevalence and the implications of the selected high-risk behaviours on HIV prevention efforts.	Male condom
Kgosiemang and Blitz, 2018	Quantitative	Descriptive survey using a self-administered questionnaire	University of Botswana, Gaborone (Pilot conducted at Botho University, Gaborone)	Full time female students attending day classes	371	Assess the level of knowledge, attitudes and practice of female students at the University of Botswana towards emergency contraception	Emergency contraception
Kraft *et al.*, 2009	Quantitative	Population based survey	Nationwide: 30 households selected to be proportionally representative, from 7 of the 11 most populous health districts	Setswana-speaking men and women, between the age of 15-49	807	To better understand use of dual-protection strategies (consistent condom use-only or dual-method use) in a sub-Saharan country with high HIV prevalence.	Long acting (sterilization, IUD); hormonal (pill, injection); condom; other method (withdrawal, periodic abstinence)
Lama *et al.*, 2015	Quantitative	Desk review and in-depth interviews with stakeholders helped develop standardised structured questionnaire – paper only focuses on questionnaire findings	Venues in Gaborone, licensed and registered with the Botswana Ministry of Trade and Industry, where alcohol can be both purchased and consumed on-site	18 years of age or older; residents of Gaborone; a patron of one of the study venues, with intent to purchase and drink alcohol	896	To investigate the association between hazardous and harmful levels of alcohol use and high risky sexual behaviour after drinking alcohol, and whether gender modified this association	Male condom
Langeni, 2011	Quantitative	Secondary analysis of data from the Botswana AIDS Impact Survey (2001) questionnaire	Nationally representative sample from both urban and rural areas.	Women aged 40-64	4494	Investigate the intergenerational transmission of reproductive behaviour patterns in Botswana	'Contraceptive use' analysed, but specific methods not referenced
Lesedi *et al.*, 2011	Quantitative	Cross-sectional self-administered questionnaire	Gaborone and Kanye	Young people, aged 15-29, who had visited facilities more than once	110	To investigate the user-friendliness of SRH services offered at Botswana Family	'Contraceptives' referenced in general, and condoms

						Welfare Association (BOFWA) facilities through a youth survey	
Letamo and Navaneetham, 2015	Quantitative	Secondary analysis of data from Botswana Family Health Survey IV (2008) questionnaire	Nationally representative sample from both urban and rural areas.	Women aged 15-49, who are married or living with their partner at the time of the survey	2601	To estimate the prevalence of unmet need for family planning among married women, and identify associated risk factors	Pill, IUD, Injection, diaphragm, condom, female sterilisation, male sterilisation
Letamo *et al.*, 2017	Quantitative	Secondary analysis of data from Botswana AIDS Impact Survey (2013) questionnaire	Nationally representative sample from both urban and rural areas.	Men or women aged 15 years or older, with sexual experience	6239	To investigate the impact of ART perception on risky sexual behaviours in Botswana: Do wrong perceptions about ART increase risky sexual behaviours?	Male condom
Letshwenyo-Maruatona and Gabaitri, 2018	Mixed methods	Cross-sectional questionnaire, complemented with 10 in-depth interviews	13 public sexual and reproductive health clinics in Gaborone	Males aged 21 years or above, who have participated in SRH services in the past 2 years (individually or with partner)	390 (Pilot: 50)	Men's views about and communication patterns of SRH issues; the relationship between men's demographic characteristics and communication patterns and facilitators and challenges to SRH communication	'Contraceptives', individual methods not specified
Malinga-Musamba and Ntshwarang, 2014	Qualitative	Secondary analysis of focus group data from a larger study, 'Adolescent Research: Capacity building program on HIV and AIDS'	Schools from semi-urban and urban regions	Students aged 14-17, and parents of students at the schools	Not given	Explore the role of cultural myths in creating sexual norms among adolescents.	Condom-use mentioned specifically
Mashanda-Tafaune and Monareng, 2015	Quantitative	A structured self-reported questionnaire, containing closed-ended questions	Bokamoso hospital, Extension 2 clinic and the Village Clinic, Gaborone Botswana	Male and female healthcare workers, aged 18 or above, with more than two years of experience	164	Examine factors related to the perception and attitude of healthcare workers towards the use of female condoms	Female condom
Mayondi *et al.*, 2016	Quantitative	Secondary analysis of baseline data collected in Tshipidi: a prospective observational cohort study of child health and neurodevelopment	28 antenatal clinics and 5 maternity wards in Gaborone and Mochudi village	Pregnant or recently post-partum women, aged 18 years or older	473 HIV non-infected, 468 HIV infected (941 total)	Assess pregnancy intention, contraceptive use, and future childbearing desires among pregnant and recently post-partum HIV positive and HIV negative women	Oral contraceptive pills, injectable contraception, condoms
Mogobe and Tshiamo, 2017	Quantitative	Secondary analysis of data from Botswana Aids	Collected nationwide, from a representative range of	Women aged 15-49 (extracted by the authors from larger	160482	What are the demographic characteristics of women who	Contraceptive use mentioned broadly,

		Impact Survey IV (BAIS IV) sectional survey	cities, towns, urban villages and rural areas.	data set of men and women aged 10-64)		reported an unplanned pregnancy in Botswana?	individual methods not specified
Mokgetse, 2018	Quantitative	Self-administered questionnaire	Family planning services in Jwaneng	Young women aged 15-34 residing in Jwaneng	95	Determine young women's views, level of knowledge, and barriers to use of the female condom, and identify their predominant methods of contraception	Female condom
Nair and Navaneetham, 2015	Quantitative	Secondary analysis of the Botswana Family Health Survey (2007)	Not given	Women aged 15-49	4038 (for Botswana specific data)	To study the patterns and determinants of contraceptive use in southern Africa	Tubectomy, Condom, IUD, pill, injectable, implants, 'modern methods', traditional methods
Nkosana and Nkosana, 2017	Quantitative	Self-administered questionnaire	The four public senior-secondary schools, Gaborone	Girls in the final two years of secondary school education	600	To examine schoolgirls' involvement in intergenerational sexual relationships	Male condom
Oucho and Ama, 2009	Quantitative	Self-administered questionnaire	Various hospitals and clinics across 23 health districts	Medical doctors and nurses	678	Measure the views of the primary healthcare providers in Botswana on the perceived reproductive health needs of immigrants and refugees, and the availability and accessibility of these services	Contraceptive use mentioned broadly, individual methods not specified
Ray and Sinha, 2012	Quantitative	Secondary analysis of data from the 2004 Botswana AIDS Impact Survey (BAIS II), made up of household, individual, work-place and community questionnaires	Nationally representative of population and range of locations	Men and women, aged 10-64	Not given	To measure awareness and knowledge of HIV/AIDS in Botswana: does the adoption of safe sex practices lower the chance of being infected with the disease?	Male condom
Schaan *et al.*, 2012	Quantitative	Secondary analysis of data from a larger study, which used self-administered, semi-structured questionnaires	24 antenatal care and anti-retroviral therapy clinics in Gaborone, and nearby peri-urban villages, Mochudi and Mogoditshane	Healthcare workers	105	To assess the knowledge, attitudes and practices of health care workers, with regard to providing SRH services to HIV positive women in Botswana	Contraceptive use mentioned broadly, individual methods not specified
Schaan *et al.*, 2014	Quantitative	Secondary analysis of data from a larger study, where female research assistants	Six government ART clinics located in Gaborone, and nearby peri-urban	HIV infected Batswana women aged 21-50, who were not pregnant	155	To identify and understand pregnancy planning and contraceptive use.	Male condom, pill, female condoms, intra-uterine devices (IUDs), hormonal contraceptives

		collected data using structured questionnaires	villages Mochudi and Moghoditshane				
Schaan *et al.*, 2016	Qualitative	Secondary analysis of data from larger study, which used semi-structured focus group discussions	Six government infectious disease care clinics offering ART in Gaborone and the nearby peri-urban villages of Moghoditshane and Mochudi	HIV infected Batswana women, aged 21-50	61	Provide women with an opportunity to openly discuss womanhood and how HIV has affected their sense of womanhood, with an emphasis on childbearing and sexual relationships	Contraception and family planning mentioned broadly
Tshitenge *et al.*, 2018	Quantitative	Cross-sectional study using a self-administered questionnaire	Mahalapye's 'District Health Management Team' (Mah-DHMT) facilities, including two hospitals, 15 clinics and ten health posts	Healthcare providers with experience of adolescent care, and prescription of contraceptives to adolescent patients	101	Investigate the knowledge, attitude and practice of healthcare providers towards the use of contraceptives in adolescents in the Mah-DHMT catchments area.	IUCD, vaginal ring, oestrogen patch, oral contraceptive, injectable contraceptive. Notably, condoms were excluded from the questionnaire

Appendix 2C: Summary of quality assessment (all studies)

Quality Assessment Summary (Quantitative studies)

Author (Year)	Is there a clearly focused research question/area?	Is the method (study design) used appropriate?	Is there a clear description of participant selection?	Could recruitment method cause selection bias?	Are participants representative for population that findings are referred to?	Is sample size based on pre-study considerations of statistical power?	Was a satisfactory response rate achieved?	Are the measurements (questionnaire) likely to be valid and reliable?	Was the statistical significance assessed?	Are confidence intervals given for the main results?	Could there be confounding factors that haven't been accounted for?	Can results be applied to your organisation?
Agyei and Abrefa-Gyan (2016)	Yes	Unclear	No	Unclear	No	Yes	Yes	Unclear	Yes	Yes	Unlikely	Yes
Ama and Ngome (2014)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	No	Unlikely	Yes
Ama and Olaomi (2018)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unlikely	Yes
Bainame *et al.* (2016)	Yes	Yes	Yes	Unlikely	Yes	Yes	Yes	Unclear	Yes	No	Unclear	Yes
Doherty *et al.* (2018)	Yes	Yes	Unclear	Unclear	Yes	Unclear	Yes	Unclear	Yes	No	Yes	Yes
Faimau *et al.* (2016)	Yes	Yes	Unclear	Unclear	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	No
Hoque *et al.* (2012)	Yes	Yes	Yes	Unlikely	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Hoque *et al.* (2013)	Yes	Yes	Yes	Unlikely	Yes	Yes	Yes	Yes	Yes	Yes	Unlikely	Yes
Keetile (2014)	Yes	Yes	Yes	Unlikely	Yes	Yes	Yes	Unclear	Yes	No	Unlikely	Yes
Kgosiemang and Blitz (2018)	Yes	Yes	Yes	Unlikely	Yes	Yes	Yes	Yes	Yes	No	Unlikely	No
Kraft et al. (2009)	Unclear	Yes	Yes	Unclear	Yes	Unclear	Yes	Unclear	Yes	Yes	Yes	Yes

Lama et al. (2015)	Yes	Yes	Unclear	Yes	Yes	Unclear	Yes	Unclear	Yes	Yes	Unclear	Yes
Langeni (2011)	Yes	Yes	Yes	Unlikely	Yes	Unclear	Yes	Unclear	Yes	No	Yes	Yes
Lesedi *et al*. (2011)	Yes	Yes	No	Unclear	Yes	Yes	Unclear	Yes	Yes	Yes	Yes	Yes
Letamo and Navaneetham (2015)	Yes	Yes	Unclear	Unclear	Yes	Unclear	Unclear	Unclear	Yes	Yes	Unlikely	Yes
Letamo *et al.* (2017)	Yes	Yes	No	Unclear	Yes	Unclear	Unclear	Unclear	Yes	No	Unlikely	Yes
Letshwenyo-Maruatona and Gabaitri (2018)	Yes	Yes	Yes	Unlikely	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Mashanda-Tafaune and Monareng (2015)	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Unclear	Unlikely	Yes
Mayondi *et al.* (2016)	Yes	Yes	Yes	Yes	Yes	Unclear	Unclear	Unclear	Yes	Yes	Yes	Yes
Mogobe and Tshiamo (2017)	Yes	Yes	Unclear	Unclear	Yes	Unclear	Unclear	Unclear	No	No	Yes	Yes
Mogketse (2018)	Yes	Yes	No	Unclear	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Nair and Navaneetham (2015)	Yes	Yes	No	Unclear	Yes	Unclear	Unclear	Unclear	Yes	No	Yes	Yes
Nkosana and Nkosana (2017)	Unclear	Yes	Unclear	Unclear	Yes	Unclear	Unclear	Unclear	Yes	No	Yes	Unclear
Oucho and Ama (2009)	Yes	Yes	Yes	Unclear	Yes	Yes	Yes	Unclear	Yes	No	Yes	Yes
Ray and Sinha (2012)	Yes	Yes	Yes	Unclear	Yes	No	Unclear	Unclear	Yes	Yes	Unlikely	Yes
Schaan *et al*. (2012)	Yes	Yes	Yes	Unlikely	Yes	No	Yes	Unclear	Yes	No	Yes	Yes
Schaan *et al*. (2014)	Yes	Yes	Yes	Yes	Yes	Unclear	Unclear	Yes	Yes	Yes	Yes	Yes
Tshitenge *et al.* (2018)	Yes	Yes	Yes	Unlikely	Yes	No	Yes	Yes	Yes	No	Yes	Yes

Quality Assessment Summary (Qualitative studies)

Author (Year)	**Is there a clear statement of research aims?**	**Is a qualitative methodology appropriate?**	**Was research design appropriate for addressing aims?**	**Was recruitment strategy appropriate for addressing aims?**	**Was data collected in a way that addressed research issue?**	**Has researcher / participant relationship been adequately considered?**	**Have ethical issues been taken into consideration?**	**Was data analysis sufficiently rigorous?**	**Is there a clear statement of findings?**	**Is the research valuable?**
Kanda and Mash (2018)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Letshwenyo-Maruatona and Gabaitri (2018)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Can't tell	Yes	Yes
Malinga-Musamba and Ntshwarang (2014)	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes
Schaan et al. (2016)	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes

Appendix 2D: Risk of bias/quality assessment tables (individual studies)

Agyei and Abrefa-Gyan, 2016

CEBM Quality Assessment Questions	**Author's judgement (Yes, No, Can't Tell)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Clear section titled "Research Question and Hypotheses'	
Is the research method (study design) appropriate for answering the research question?	Unclear	Structured survey exploring indicators risky sexual behaviour (condom use, sexual partners, HIV testing and prevention), unintended pregnancies, and socio-demographic characteristics. However, "data collection was carried out through the use of structured self-administered questionnaire. For details of study design and sampling procedure, see Agyei *et al*. (2014)" so full information on study design is not given	The reference, given in their bibliography, is for a paper presented at the 2014 Southern Demographic Association Annual Meeting, which is very difficult to find
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	No	As above, selection of subjects is not described - second paper is referred to for obtaining these details	
Could the way the sample was obtained introduce (selection) bias?	Can't tell	The sampling information about how participants were recruited is not provided in this paper	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	No	The paper title refers to 'youth in Botswana', the research questions refer to 'young men and women' and 'youth', and findings are applied to Batswana youth more generally. However, all participants were undergraduate college students,	Not referred to in discussion or conclusion, or cited as a limitation/potential for future research

		so more highly educated than average population, and only recruited from one university	
Was the sample size based on pre-study considerations of statistical power?	Yes	Multi-stage probability proportionate to the size-sampling design was used to select sample (396 students: 202 females and 194 males)	
Was a satisfactory response rate achieved?	Yes	Final sample size was 331 (202 females and 129 males) – approximately 83.6% response rate	
Are the measurements (questionnaires) likely to be valid and reliable?	Can't tell	Information about how either the reliability or validity of the questionnaire was ensured is not provided	
Was the statistical significance assessed?	Yes	Statistical significance shown in multiple results tables and discussion/conclusion write-up in	
Are confidence intervals given for the main results?	Yes	Confidence intervals provided in table 6	
Could there be confounding factors that haven't been accounted for?	Unlikely	Many demographic elements, which for risky sexual behaviour could all have been confounding factors (age, urban/rural upbringing, parental education level) are accounted for	
Can the results be applied to your organization?	Yes	Although specific to one university, findings about risky sexual behaviour of youth can provide useful data for future nationwide research or policy	

Ama and Ngome, 2014

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Overall aim described in both abstract and introduction, expanded in dedicated 'objectives' section – to explore challenges faced by elder	

		women in accessing services which address their SRH/FP needs	
Is the research method (study design) appropriate for answering the research question?	Yes	A mixed-method questionnaire that covered demographic characteristics, the sexual activities and needs of older women; and the needs, limitations, biases and stigma that relate to access to SRH/FP services. Some responses were provided on a five-point Likert scale, while open-ended questions gave the older women an opportunity to express their opinions	Trained research assistants administered the questionnaires, particularly appropriate given the age of some of the participants
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	Snowball sampling used in 4 districts - Gaborone, Kweneng East, Selibe Phikwe and Barolong – by trained research assistants, who then conducted the questionnaires	
Could the way the sample was obtained introduce (selection) bias?	Yes	Purposive, followed by snowball sampling used, both of which could be open to selection bias.	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings are specifically applied to elder women throughout discussion. The sample was split across four districts, using probability proportional to size, where the size = number of older women aged 50 years and older from each district, so findings are even further localised	
Was the sample size based on pre-study considerations of statistical power?	Yes	Online sample size calculator programme used, allows 95% confidence (and an error margin of 5%)	Sample size calculator also "posits that the sampled population's response should be the same as that of the entire population"
Was a satisfactory response rate achieved?	Yes	444 out of 454 women responded, 98% response rate	

Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	Experts in public health and ageing reviewed the questionnaire prior to submission to the ethics committee of the University of Botswana (content validity) but paper does not describe how reliability is assessed	
Was the statistical significance assessed?	Yes	Statistical significance referenced and provided throughout results section	
Are confidence intervals given for the main results?	No		
Could there be confounding factors that haven't been accounted for?	Unlikely	Multiple demographic factors which could impact the number of variables included in the study were accounted for	
Can the results be applied to your organization?	Yes	Understanding the barriers faced by elder women in accessing SRH/FP services provides a solid framework future research with younger participants, or in different geographical areas of Botswana	

Ama and Olaomi, 2018

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim (to determine the family planning desires of older adults, availability and accessibility of services, and factors that enhance/deter the utilisation of these services) is referenced in both abstract and introduction	
Is the research method (study design) appropriate for answering the research question?	Yes	Questionnaire included demographic characteristics of the older adult women, their	

		sexual activities and needs, family planning needs, availability, access and limitations	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	Snowball sampling was used due to the sparse nature of the population	
Could the way the sample was obtained introduce (selection) bias?	Yes	Purposive then snowball sampling could be open to selection bias	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Large sample size, proportional to elder women in Botswana's population, and results also then only applied to women in this age bracket	
Was the sample size based on pre-study considerations of statistical power?	Yes	Creative Research System, a sample size calculator, gave a statistically adequate sample size of 378 - 20% was added to account for those who were in the original sample but might refuse to participate or unavailable for interview	
Was a satisfactory response rate achieved?	Yes	444 out of 454 women responded, 98% response rate	
Are the measurements (questionnaires) likely to be valid and reliable?	Yes	The instrument was reviewed by experts in public health and ageing, the University of Botswana ethical committee, the Ministry of Health Research and Ethical Committee and the District Health Management Teams in the study health districts before being used. Questionnaire was then piloted with a similar population in Tlokweng.	
Was the statistical significance assessed?	Yes	Statistical significance referenced and provided throughout results section	
Are confidence intervals given for the main results?	Yes	Provided in Table 2	

Could there be confounding factors that haven't been accounted for?	Unlikely	Multiple demographic factors which could impact the number of variables included in the study were accounted for	
Can the results be applied to your organization?	Yes	The family planning desires of older women could be explored in many other geographical areas of Botswana, though four different districts are represented	

Bainame *et al*., 2016

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Overall aim is stated in introduction: to examine the effects of sexuality education on the sexual reproductive health outcomes of young men in Botswana – specifically focusing on sexual relations, contraceptive methods, childbearing, number of partners with biological children and partner antenatal attendance. There is also a clear section titled 'research questions' with more detailed ojectives	
Is the research method (study design) appropriate for answering the research question?	Yes	Secondary analysis of large nationwide data set - Botswana Family Health Survey (BFHS-IV), with the sample for this study restricted to men aged 12-29 (sample size of 4030)	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	Large section detailing the sampling strategy for BFHS-IV and the various formula used to decide and ensure proportional sample size	

Could the way the sample was obtained introduce (selection) bias?	Unlikely	Results from household questionnaires automatically identified eligible participants for the individual questionnaires, and high return rate	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	All 4030 participants for this study were men aged 12-29, and findings were only applied to this group	
Was the sample size based on pre-study considerations of statistical power?	Yes	Two stage statistical process applied for household surveys initially, then individual surveys. See section “Sampling Strategy for BHFS-IV”	
Was a satisfactory response rate achieved?	Yes	Household surveys: 7031 returned out of 7860 (90% response). Individual women’s surveys: 6916 returned out of 7319 (94.5% response) Individual men’s surveys: 6101 returned out of 6712 (90.9% response) Children’s surveys: 2786 out of 2837 returned (96.1% response rate)	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	Fourth iteration of a national demographic survey. Details of how the questionnaire’s validity or reliability not specifically given	
Was the statistical significance assessed?	Yes	Statistical significance referenced throughout body of results section, and highlighted specifically in Table 3	
Are confidence intervals given for the main results?	No		
Could there be confounding factors that haven’t been accounted for?	Unclear	Secondary data set, authors did not control all demographic questions asked, but likely that most have been accounted for due to nature of demographic survey	

Can the results be applied to your organization?	Yes	Large data set, with high return rate, including participants from a wide range of backgrounds – applicable to men nationwide	

Doherty *et al*., 2018

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Clear aim states in introduction: to assess the frequency of and socio-demographic factors associated with unintended pregnancy and contraception use contraceptive use/type among these women	
Is the research method (study design) appropriate for answering the research question?	Yes	Planned secondary analysis of baseline data, collected in a prospective cohort study designed to determine STI prevalence, treatment uptake, and cure rates among pregnant women receiving outpatient antenatal care.	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Unclear	Participants were pregnant women receiving outpatient antenatal care at Princess Marina Hospital, aged over 18, with a gestational age of less than 35 weeks, but the exact way they were recruited in the original study, and who by, is not described	
Could the way the sample was obtained introduce (selection) bias?	Unclear	As the specific recruitment strategy of the original study is not described, it is unclear whether it could have introduced selection bias - for example, had the patients' doctor encouraged them to take part. Secondary analysis was completed on all respondents who	

		answered the question: "When you got pregnant this time, were you trying to get pregnant?" so no selection required	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings in both results and discussion sections are clearly related to the population of pregnant women specifically	
Was the sample size based on pre-study considerations of statistical power?	Unclear	270 women were found eligible for participation, but the paper does not state how this number was decided	
Was a satisfactory response rate achieved?	Yes	Of the 270 eligible women, 231 (86%) were enrolled	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	The paper does not describe how questionnaire validity was tested, or whether it was piloted/assessed by any external experts, but in the discussion key findings are linked to/supported by multiple other larger studies, suggesting reliability	
Was the statistical significance assessed?	Yes	Statistical significance is referenced throughout results and discussion, and specifically detailed in Table 1	
Are confidence intervals given for the main results?	No		
Could there be confounding factors that haven't been accounted for?	Yes	Secondary data set, so authors did not control all demographic questions asked	
Can the results be applied to your organization?	Yes	Though this study took place at one hospital (Princess Marina or PMH), findings could be applied to Botswana more broadly – PMH represents 85% of births in Gaborone	

Faimau *et al.*, 2016

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Specific section titled 'study aim and objectives' states overall aim to "explore and examine the knowledge and attitudes of college students at tertiary educational level in Botswana in relation to various sexual risky behaviours", supported by four detailed research objectives	
Is the research method (study design) appropriate for answering the research question?	Yes	Cross-sectional survey, with 78 questions split into five sections: demo- graphic profile, knowledge of HIV/AIDS, attitudes towards sexual risk and sexual behaviour change, perceived sociocultural and religious norms and communication with peers and parents	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Unclear	Although the study focused on two universities, it is not stated how participants were approached, by who or where specifically within these institutions recruitment took place	
Could the way the sample was obtained introduce (selection) bias?	Unclear	Random sampling means that selection bias was unlikely, but the paper does not detail where or how participants were approached, and by who	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings were applied only to university students, and gained from an appropriate, representative sample across the two universities	
Was the sample size based on pre-study considerations of statistical power?	Unclear	Statistical justification for sample size is not described, though the authors reference the	

		number of students in both universities which implies this was taken into consideration	
Was a satisfactory response rate achieved?	Yes	Of 470 questionnaires, 445 were returned – a 5.3% refusal rate	
Are the measurements (questionnaires) likely to be valid and reliable?	Yes	Says that questionnaire was 'designed to be replicable by an independent researcher', and participants were encouraged to question or comment on the questions being asked/study design itself (face validity)	
Was the statistical significance assessed?	Yes	Statistical significance is referenced throughout results section	
Are confidence intervals given for the main results?	Yes	Confidence intervals are highlighted specifically in table 3	
Could there be confounding factors that haven't been accounted for?	Yes	Although a lot of demographic factors are highlighted, certain things (urban-rural upbringing, parents' education level) could be confounding factors	
Can the results be applied to your organization?	No	Though two universities were included, one public and one private, participants represent a highly educated proportion of the population in Gaborone so broader research would be needed to make findings nationally applicable	

Hoque *et al.*, 2012

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Clear purpose described in abstract and introduction: to investigate the sexual	

		behaviours of 346 undergraduate students at Botswana University	
Is the research method (study design) appropriate for answering the research question?	Yes	Self-administered questionnaire with two sections – one on demographic information, and one on participants' sexual behaviours – including contraceptive use at last intercourse	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	All registered, full time, undergraduate students from all years of study, at the main campus of the University of Botswana were included in the study, from 7 faculties: Business, Education, Engineering, Humanities, Science, Social Sciences and School of Medicine	
Could the way the sample was obtained introduce (selection) bias?	Unlikely	Random sampling was conducted at strategic points within the university community accessed by all the students, including the University Library entrance, the Dining Area, the tuck-shop, and the students' community centre	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings and results are specifically applied to Botswana University students	
Was the sample size based on pre-study considerations of statistical power?	Yes	The minimum sample size for the study was calculated using a standard formula for known population size for a cross sectional study – reference Reid and Boore, 1991	
Was a satisfactory response rate achieved?	Yes	346 students completed the questionnaire out of 428 (80.8% response rate)	
Are the measurements (questionnaires) likely to be valid and reliable?	Yes	The questionnaire was piloted with 20 students from the Institute of Health Science (College) who suggested modifications and were then excluded from the main study. In the discussion,	

		findings are supported by other studies with similar results	
Was the statistical significance assessed?	Yes	Statistical significance is referenced throughout results section, and specifically highlighted in all three results tables	
Are confidence intervals given for the main results?	No		
Could there be confounding factors that haven't been accounted for?	Yes	Although a lot of demographic factors are highlighted, certain things (urban-rural upbringing, parents' education level) could be confounding factors	
Can the results be applied to your organization?	No	Students from one university were included, and participants represent a highly educated proportion of the population in Gaborone - broader research would be needed to make findings nationally applicable	

Hoque *et al.*, 2013

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim to investigate the awareness and utilisation of various contraceptive methods, among university students in Botswana, clearly stated in multiple places	
Is the research method (study design) appropriate for answering the research question?	Yes	Questionnaire had three sections – one consisting of demographic information, one consisting of 'awareness' regarding questions on contraception, and the exploring respondent's utilisation of contraceptives.	

Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	All registered, full time, undergraduate students from all years of study, at the main campus of the University of Botswana were included in the study, from 7 faculties: Business, Education, Engineering, Humanities, Science, Social Sciences and School of Medicine	
Could the way the sample was obtained introduce (selection) bias?	Unlikely	Random sampling was conducted at strategic points within the university community accessed by all the students, including the University Library entrance, the Dining Area, the tuck-shop, and the students' community centre	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings and results are specifically applied to Botswana University students	
Was the sample size based on pre-study considerations of statistical power?	Yes	"The minimum sample size for the study was calculated using a standard formula for known population size for a cross sectional study" – reference Reid and Boore, 1991	
Was a satisfactory response rate achieved?	Yes	346 students completed the questionnaire with a response rate of 80.8%	
Are the measurements (questionnaires) likely to be valid and reliable?	Yes	The questionnaire was piloted with 20 students from the Institute of Health Science (College) who suggested modifications and were then excluded from the main study. In the discussion, findings are supported by other studies with similar results	
Was the statistical significance assessed?	Yes	Statistical significance is given throughout results section, and specifically highlighted after each 'main finding'	

Are confidence intervals given for the main results?	No		
Could there be confounding factors that haven't been accounted for?	Yes	Although a lot of demographic factors are highlighted, certain things (urban-rural upbringing, parents' education level) could be confounding factors	
Can the results be applied to your organization?		Students from one university were included, and participants represent a highly educated proportion of the population in Gaborone - broader research would be needed to make findings nationally applicable	

Kanda and Mash, 2018

CASP Quality Assessment Questions	**Author's judgement (Yes, No, Can't Tell)**	**Evidence for judgement**	**Comments**
Was there a clear statement of the aims of the research?	Yes	Last paragraph of introduction clearly describes aim to explore the reasons why condoms (female and male) were not consistently used by young adults in Mahalapye despite government's current campaign on preventing HIV and AIDS	
Is a qualitative methodology appropriate?	Yes	Research aim was to explore young adults' reasoning and experiences around condom use, or lack thereof, and get specific feedback on a media intervention for HIV/AIDS	
Was the research design appropriate to address the aims of the research?	Yes	Semi-structured interviews would be highly effective in gaining young adults' feelings and experiences around condom use	

Was the recruitment strategy appropriate to the aims of the research?	No	Only recruiting patients with urogenital complaints after a consultation, neither of which are required to directly address any research aims, could potentially bias results as patients' diagnosis could influence attitude towards condom use	
Was the data collected in a way that addressed the research issue?	Yes	Topic guide used to ensure all relevant topic areas and specific questions were raised with each participant	
Has the relationship between researcher and participants been adequately considered?	Yes	Paper describes principal researcher being 'conscious of his own knowledge and beliefs about the topic and the negative effect he might have as the doctor on participants' freedom to express their views.	Use of pilot interview, assessed by supervisor, and topic guide aimed to remove any potential issues of interviewer's role as a doctor. Also states that emergent themes were presented to six participants for validation, and the supervisor audited the process of analysis.
Have ethical issues been taken into consideration?	Yes	Ethical approval gained from Health Research Ethics Committee at Stellenbosch University (N10/10/334), and the Research Committee of the Ministry of Health in Botswana	As described above, principal researcher appears highly aware of his position and potential for bias, and sought feedback at every stage of the data collection and analysis
Was the data analysis sufficiently rigorous?	Yes	Data went through various analytic stages: familiarisation, where transcripts were thoroughly read and the audio-taped interviews listened to and checked for accuracy; Thematic indexing, where key codes were categorised; All data was then coded using the thematic index, and data related to each category was then grouped together to form charts, before those	The thematic index was validated by both the local family physician and supervisor

		charts were interpreted and key themes identified.	
Is there a clear statement of findings?	Yes	After results section, detailed findings were summarised in discussion and then further condensed into one conclusory section/paragraph	
How valuable is the research?	Yes (valuable)	Some key findings which may influence future research or policy were found: Participants thought more focus should be given to socio-cultural issues in the HIV prevention campaign. They also expressed concern about misunderstandings regarding the effect of male circumcision on the risk of HIV transmission.	

Keetile, 2014

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim described in abstract and introduction: to assess; (i) The high-risk behaviors associated with HIV/AIDS prevalence and (ii) the implications of the selected high-risk behaviors on HIV prevention efforts.	
Is the research method (study design) appropriate for answering the research question?	Yes	Used secondary data from the Botswana AIDS Impact Survey III (BAIS III)	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	The method from the original survey is described in detail, as well as how the authors chose the relevant questions to include and the independent / dependent variables	

Could the way the sample was obtained introduce (selection) bias?	Unlikely	Study used data already obtained, from a sample of randomly selected individuals	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Study limited included surveys to people aged 20 and above, and findings were then only applied to adults	
Was the sample size based on pre-study considerations of statistical power?	Yes	Stratified two-stage probability sample design was used for sample selection	
Was a satisfactory response rate achieved?	Yes	15,878 out of 16,992 eligible respondents were successfully interviewed in the main survey (93% response rate). This paper limited sample to men and women aged 20 and above (10,159 surveys)	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	Third iteration of a nationally representative demographic survey, and findings are supported by other large-scale studies in discussion. Paper does not describe how the questionnaire was validated, and the secondary analysis limits author's control – highlighted in limitations section	
Was the statistical significance assessed?	Yes	Referenced throughout the write-up, but specifically highlighted in tables 4 and 5	
Are confidence intervals given for the main results?	No		
Could there be confounding factors that haven't been accounted for?	Unlikely	Numerous demographic factors which could be confounding factors for risky sexual behaviour are well discussed and accounted for	
Can the results be applied to your organization?	Yes	Large data set, of both men and women, highlights key high-risk behaviours for HIV	

		prevention from a wide range of geographic areas and socio-economic backgrounds	

Kgosiemang and Blitz, 2018

CEBM Quality Assessment Question	Author's judgement (Yes, No, Unclear)	Evidence for judgement	Comments
Did the study address a clearly focused question / issue?	Yes	Dedicated 'study aim and objectives' section describes aim to assess the level of knowledge, attitudes and practice of female students at the University of Botswana towards emergency contraception	
Is the research method (study design) appropriate for answering the research question?	Yes	Descriptive survey was conducted using a self-administered questionnaire, focused on university aged female participants	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	The sample was selected equally from the eight faculties (Business, Education, Engineering and Technology, Graduate Studies, Health Sciences, Humanities, Science and Social Sciences) by randomly selecting classes (between 09:00 and 12:00) on specified dates and then inviting all female students to complete the questionnaire until the sample size was obtained.	
Could the way the sample was obtained introduce (selection) bias?	Unlikely	As described above, classes were randomly decided and all females invited to complete questionnaire	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings applied only to female university students, and sample size assumed 50% of respondents would not be aware of emergency contraception	

Was the sample size based on pre-study considerations of statistical power?	Yes	Online sample size calculator used	
Was a satisfactory response rate achieved?	Yes	371 female students completed the questionnaire; classes were randomly selected until calculated sample size was reached	
Are the measurements (questionnaires) likely to be valid and reliable?	Yes	Questionnaire was initially used in an Ethiopian study, questions were redesigned for Botswana students. Questionnaire was also piloted with 10 students from a different university, also in central Gaborone	
Was the statistical significance assessed?	Yes	Referenced throughout results section, highlighted in section "Determinant factors related to knowledge, attitudes or practice"	
Are confidence intervals given for the main results?	No	Confidence interval given for study population but not for results	
Could there be confounding factors that haven't been accounted for?	Unlikely	Numerous demographic factors which could be confounding factors for risky sexual behaviour are well discussed and accounted for	
Can the results be applied to your organization?	No	Only female university students from one university included - broader research would be needed to make findings nationally applicable	

Kraft et al., 2009

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Unclear	Abstract describes aim to explore the use of dual-protection strategies in a sample of 15-49-	Exploring use of dual protection appears to be main aim, but

		year-old men and women in Botswana, but method section also describes the main objective to assessing exposure to Makgabaneng, a mass-media-based HIV intervention.	clearer study objectives would explain how these various elements coalesce
Is the research method (study design) appropriate for answering the research question?	Yes	The survey included questions about demographic factors; individual and relationship factors that might influence dual-protection, condom or other contraceptive use; and psychosocial variables related to HIV transmission. Survey also explored how frequently participants listened to Makgabaneng.	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	Researchers went to each household and interviewed one participant, if available – participants were eligible if aged between 15 and 49 years old, and a Setswana speaker	
Could the way the sample was obtained introduce (selection) bias?	Unclear	Paper states that eligible participants were 'identified and randomly selected' in each house but does not say how this was randomised. Also, before the individual participant selection, houses were 'randomly' selected from their clusters, but the process is also not described	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Broad inclusion criteria for participants meant findings could be referred to a relatively wide population	
Was the sample size based on pre-study considerations of statistical power?	Unclear	After randomly selecting seven health districts from among the 11 most populous health districts in Botswana, 60 census enumeration areas (EAs) were selected with the probability of selection proportional to district population	Interviewers attempted to visit 1736 households, but exact reasoning for this number (or whether it came from the previously described random

		size. Based on estimates of the number of households needed to obtain the desired sample size, we segmented EAs into clusters of 30 residential plots (some plots had more than one household) and randomly selected one cluster from each EA.	selection of health districts, EAs and households) is unclear
Was a satisfactory response rate achieved?	Yes	Out of 961 eligible participants identified from 1472 households, 807 interviews were conducted (84% response rate)	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	No description of how the questionnaire's validity or reliability was tested is given. Key findings are supported by other studies in the discussion	
Was the statistical significance assessed?	Yes	Statistical significance is well referenced throughout results section, supporting key findings, and highlighted in all tables	
Are confidence intervals given for the main results?	Yes	Highlighted in Table 3	
Could there be confounding factors that haven't been accounted for?	Yes	Limitations highlighted in the discussion show potential confounding factors – the survey did not measure HIV status or motivation to use condoms for disease prevention, and had a limited number of measures of family formation. They also did not capture condom use with other partners.	
Can the results be applied to your organization?	Yes	Relatively large data set, of both men and women, across a wide age range (15-49) from a wide range of geographic areas and socio-economic backgrounds	

Lama et al., 2015

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim described in abstract and introduction: to investigate the association between hazardous and harmful levels of alcohol use and high risky sexual behaviour after drinking alcohol and whether gender modified this association	
Is the research method (study design) appropriate for answering the research question?	Yes	Standardised structured questionnaire, followed by HIV testing and counselling for all consenting participants.	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Unclear	Desk review, in-depth stakeholder interviews and time-location sampling were used to map and screen eligible venues. At each venue, an invisible enumeration line was drawn and patrons who crossed it were deemed to have 'intent to enter' the venue. Participants were then approached by data collectors, but no further details were given about who conducted interviews, or how participants were randomised.	
Could the way the sample was obtained introduce (selection) bias?	Yes	Participants were approached by data collectors after entering a venue, but no further detail is given about how they avoided selection bias. Interviewers also subjectively assessed whether participants were 'under the influence of alcohol that would impair their decision to participate in the study' themselves	
Was the sample of subjects representative with regard to the	Yes	In the discussion findings were only applied to those who consumed alcohol – separated into	

population to which the findings will be referred?		'high', 'medium', or 'low' users based on the Alcohol Use Disorders Identification Test (AUDIT)	
Was the sample size based on pre-study considerations of statistical power?	Unclear	896 participants were recruited into the study, but justification or explanation for this number is not given	
Was a satisfactory response rate achieved?	Yes	Of the 896 participants recruited, 887 participants (99 %) agreed to complete the survey	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	Main results are well supported by additional studies, cited in discussion, but how the questionnaire was designed, particularly reliability, is not described – paper does not describe piloting the instrument with similar population, or seeking expert comment before commencing the study	
Was the statistical significance assessed?	Yes	Statistical significance is referenced throughout results section alongside all key findings, and highlighted in all 3 tables	
Are confidence intervals given for the main results?	Yes	Confidence intervals are given throughout results section and provided specifically in Table 3	
Could there be confounding factors that haven't been accounted for?	Unclear	Given the nature of alcohol, and the subjective way interviewers decided whether participants were too 'under the influence' to take part, that could have been a confounding factor – particularly for self-reported condom use. A wide range of demographic factors were obtained in the survey and analysed though.	
Can the results be applied to your organization?	Yes	Large data set, from a broad range of participants, show clear findings related to	

		alcohol consumption and risky sexual behaviour which can be applied nationwide	

Langeni, 2011

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim described clearly at end of introduction, aims to explore intergenerational transmission of reproductive behaviour patterns, and specifically the impact of original family size on women's subsequent completed fertility. Specific section on hypothesis adds further detail.	
Is the research method (study design) appropriate for answering the research question?	Yes	Used secondary data from the Botswana AIDS Impact Survey (2001)	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	Stratified two-stage probability sample design is described in detail – both the initital selection of households and then individuals aged 10-64	
Could the way the sample was obtained introduce (selection) bias?	Unlikely	Randomisation was ensured at household level, and all eligible participants were interviewed	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Analysis focused on women aged 40-64, based on the assumption that childbirth at this age is less common. Findings were then specifically applied to this group.	

Was the sample size based on pre-study considerations of statistical power?	Unclear	Sample size for original survey based on a stratified two-stage probability sample design. For this secondary analysis, sample size was already dictated	
Was a satisfactory response rate achieved?	Yes	Households: Of 2023 occupied houses, 1781 households were successfully interviewed - 88% response rate (90% for urban areas and 86% for rural areas) Individuals: 4728 eligible, 4494 persons successfully interviewed - 95% response rate	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	Paper does not detail how the original survey designed or tested their questionnaire. It is the third iteration of a well-used survey, so likely to be reliable, but not certain	
Was the statistical significance assessed?	Yes	Detailed throughout results, and referenced specifically in multiple tables	
Are confidence intervals given for the main results?	No		
Could there be confounding factors that haven't been accounted for?	Yes	Multiple factors which influence reproductive behaviour, (e.g. cultural beliefs about the value of children, gender preferences, demographic elements) were not assessed in the original survey	
Can the results be applied to your organization?	Yes	Large data set, specific findings from nationwide study – good representation of rural and urban districts	

Lesedi *et al*. 2011

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim to assess the user-friendliness of youth-focused sexual reproductive health (SRH) services clearly described in introduction	
Is the research method (study design) appropriate for answering the research question?	Yes	Cross sectional quantitative survey conducted with young people aged 15-29, who had used the SRH services more than once	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	No	Paper states "The researcher sampled youth who had utilised the services twice or more..." but does not provide more detail	
Could the way the sample was obtained introduce (selection) bias?	Unclear	The specific way participants were approached, and by whom, is not detailed. It is not clear if or how participants were randomised.	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	The process of selecting a proportional sample for both Kanye and Gaborone is well described. Youth aged 15-29 were included in the study, and findings were only applied to this population in discussion	
Was the sample size based on pre-study considerations of statistical power?	Yes	Sample size was calculated using Epi-Info software, and was completed for the two sites individually	
Was a satisfactory response rate achieved?	Unclear	Minimum sample size determined separately for Gaborone (112) and Kanye (116). 110 participants interviewed so 98% response rate for Gaborone sample size and 95% for Kanye	

Are the measurements (questionnaires) likely to be valid and reliable?	Yes	Survey was based on a questionnaire used in a previous large study. Tool was translated into Setswana, pre-tested on 20 patients from a different healthcare facility and modified. This version was then pilot tested.	
Was the statistical significance assessed?	Yes	Statistical significance is referenced throughout results, and specifically highlighted in tables 2-7	
Are confidence intervals given for the main results?	Yes	Confidence intervals for main results provided in table 7	
Could there be confounding factors that haven't been accounted for?	Yes	Though many demographic factors were accounted for, some (such as religion, parental education/employment and urban or rural upbringing) were not considered and may impact attitudes to healthcare services	
Can the results be applied to your organization?	Yes	Youth from two different geographic areas surveyed, with findings useful for youth-friendly services nationwide	

Letamo and Navaneetham, 2015

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Clear objectives: to estimate the prevalence of unmet need for family planning among married women using Botswana Family Health Survey 2007 data and, identify risk factors for unmet need for family planning among married women	

Is the research method (study design) appropriate for answering the research question?	Yes	Study used secondary data from the Botswana Family Health Survey IV (BFHS IV), nationally representative survey and specific analysis on questions asked to women of reproductive age	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Unclear	Detail on participant recruitment for original survey is not given, but describes the four specific questionnaires included in this analysis	
Could the way the sample was obtained introduce (selection) bias?	Unclear	Detail on participant recruitment for original questionnaires is not given	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Broad, large nationwide sample of 2601 women, aged 15–49 years - findings can be relatively widely applied	
Was the sample size based on pre-study considerations of statistical power?	Unclear	The process of deciding the sample size for the original survey is not given	
Was a satisfactory response rate achieved?	Unclear	2601 female participants answered the four specific questions, which seems satisfactory, but details of how the original survey decided it's response rate not given	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	Fourth iteration of a national survey, but details of the four questionnaires not given	
Was the statistical significance assessed?	Yes	Statistical significance referenced throughout results and highlighted clearly in tables 5 and 6	
Are confidence intervals given for the main results?	Yes	Given alongside key results in results section and summarised in Table 5	
Could there be confounding factors that haven't been accounted for?	Unlikely	Study considered multiple covariates (residence, age, education, religion, wealth, parity, media exposure, etc)	

Can the results be applied to your organization?	Yes	Large data set, with important and useful findings about the unmet need for family planning, and key influencers of this	

Letamo *et al.*, 2017

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Clear research question defined in introduction - do wrong perceptions about ART increase risky sexual behaviours?	
Is the research method (study design) appropriate for answering the research question?	Yes	Study used secondary data from the Botswana AIDS Impact Survey (BAIS III) conducted in 2013	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	No	Detail on participant recruitment for original survey is not given	
Could the way the sample was obtained introduce (selection) bias?	Unclear	Detail on participant recruitment for original survey is not given	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Broad, large nationwide sample of the perception of ART impact on risky sexual behaviour - findings can be relatively widely applied	
Was the sample size based on pre-study considerations of statistical power?	Unclear	The process of deciding the sample size for the original survey is not given	

Was a satisfactory response rate achieved?	Unclear	6239 respondents selected for this analysis (those with sexual experience, aged 15 or older) but how the sample of the original survey was decided is not described	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	Paper does not describe how the original survey was designed or tested. It is described as a 'standardised' instrument, and is the third iteration of a national survey	
Was the statistical significance assessed?	Yes	Statistical significance referenced throughout results and highlighted clearly in tables 2, 3 and 4	
Are confidence intervals given for the main results?	No		
Could there be confounding factors that haven't been accounted for?	Unlikely	Study considered multiple covariates (age, educational attainment, religious affiliation, marital status, place of residence, and wealth status)	
Can the results be applied to your organization?	Yes	Large data set, with important and useful findings about the relationship between perceptions of ART and risky sexual behaviour which could be utilised in future education programmes or policy around HIV	

Letshwenyo-Maruatona and Gabaitri, 2018

Cross sectional questionnaire:

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim to investigate men's communication patterns about reproductive health issues clearly stated in abstract and introduction	
Is the research method (study design) appropriate for answering the research question?	Yes	Cross sectional quantitative survey conducted with males aged 21 years and above who reported to have participated SRH services in the past 24 months, either individually or with their partners	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	Stratified proportional sampling was used to select 13 public clinics then criterion sampling was used to select men who had used the services (as described above)	
Could the way the sample was obtained introduce (selection) bias?	Unlikely	Participants approached researchers after fliers were distributed in the clinics and all those who met the criteria were included	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings were only applied to men, and specifically those who used SRH services	
Was the sample size based on pre-study considerations of statistical power?	No	Clinics were stratified based on high, medium or low case load. Medium effect size of .20 (estimated the sample size for the study at 379, rounded to 390) Authors state that the sample size had sufficient statistical power (.8) to detect	

		small and significant effect size of .20 but not how they assessed this	
Was a satisfactory response rate achieved?	Yes	100% of the desired sample (390 men completed surveys, and data saturation was reached after 10 men for qualitative interviews)	
Are the measurements (questionnaires) likely to be valid and reliable?	Yes	Cronbach's alpha score of .89, indicating adequate reliability	
Was the statistical significance assessed?	Yes	Statistical significance referenced throughout body of results and highlighted clearly in tables 3 and 4	
Are confidence intervals given for the main results?	No		Chronbach's alpha provided alongside main findings
Could there be confounding factors that haven't been accounted for?	Yes	The demographic factors of those men specifically interviewed	
Can the results be applied to your organization?	Yes	Large dataset, demographically representative and the study highlights importance of male involvement in SRH communication and services, useful for future policy or interventions in this area	

In-depth interviews:

CASP Quality Assessment Questions	**Author's judgement (Yes, No, Can't Tell)**	**Evidence for judgement**	**Comments**
Was there a clear statement of the aims of the research?	Yes	Aim to investigate men's communication patterns about reproductive health issues clearly stated in abstract and introduction	

Is a qualitative methodology appropriate?	Yes	After the quantitative aspect of the study, interviews were utilised to explore men’s experiences and attitudes around SRH communication in depth	
Was the research design appropriate to address the aims of the research?	Yes	Gaining male perspective on sexual health communication issues, in-depth individual interviews appropriate for sensitive content	
Was the recruitment strategy appropriate to the aims of the research?	Yes	Participants who had completed the survey were asked to consent to being contacted about individual interviews	
Was the data collected in a way that addressed the research issue?	Yes	Open-ended questions about men’s communication practices – included SRH issues discussed with partners, comfort with communication and challenges encountered when communicating with partners.	
Has the relationship between researcher and participants been adequately considered?	Can’t tell	Details of researcher/research assistants involved in these interviews are not given in detail – one of the researchers is a woman, which could influence men’s openness about sexual health issues had she completed interviews	
Have ethical issues been taken into consideration?	Yes	Permission for the study was granted by the University of Botswana (Office of Research and Development Ethics Committee), the Health Research Development Commit- tee (HRDC) of the Ministry of Health and local authorities in charge of clinics. Anonymity was also ensured through removing any identification of men included in the study	
Was the data analysis sufficiently rigorous?	Can’t tell	“Data from interviews were transcribed, translated and analysed through identification of emerging codes, categories, and themes” – but	

		no more detail about these stages of analysis is given	
Is there a clear statement of findings?	Yes	Clearly written and structured findings section, with well-defined sub headings, and a concise, clear conclusion	
How valuable is the research?	Yes	Very interesting findings regarding the main barriers to sexual health communication for men, and clear suggestions for interventions in both education and medical settings to address them	

Malinga-Musamba and Ntshwarang 2014

CASP Quality Assessment Questions	**Author's judgement (Yes, No, Can't Tell)**	**Evidence for judgement**	**Comments**
Was there a clear statement of the aims of the research?	Yes	Aim of both the larger study this data was collected for, and this specific analysis are given clearly in Method section. This paper aims to explore 'the role of cultural myths in creating sexual norms among adolescents'	
Is a qualitative methodology appropriate?	Yes	Original study used ethnographic and culturally sensitive (Indigenous) methods such as songs, storytelling, metaphorical sayings, and proverbs	
Was the research design appropriate to address the aims of the research?	Yes	Focus groups would enable participants to use their own words – appropriate when discussing sensitive and personal issues of culture and sexual behaviours	
Was the recruitment strategy appropriate to the aims of the research?	Yes	Both adolescents and parents (not necessarily of students in the study) were recruited through urban and peri-urban schools, with support from teaching staff	

Was the data collected in a way that addressed the research issue?	Yes	Focus groups with parents, and a mixture of focus groups with adolescents (some separated by gender, and others mixed) ensured that findings were not influenced by gender disparity. The questions analysed all focused around proverbs specifically related to sexual behaviour.	
Has the relationship between researcher and participants been adequately considered?	Unclear	The relationship between the researcher and the participants is not described. Teachers assisted with recruitment which may have influenced the students wanting or refusing to participate.	
Have ethical issues been taken into consideration?	Yes	Ethical approval was granted by the Ministry of Health and Ministry of Education. The headteachers of the schools involved were also consulted, and a guidance/counselling teacher from each school was selected to serve as the research liaison.	
Was the data analysis sufficiently rigorous?	Yes	Researchers conducted thematic analysis – all focus groups were transcribed and coded verbatim. Researchers then explored 'patterns of experience', supported by direct quotes, and salient themes were decided from the recurrent proverbs/themes and myths.	
Is there a clear statement of findings?	Yes	Large results section, with various sub-headings. In each theme, authors summarise the key findings and provide quotes from the focus groups. These various sub-headings are then summarised/condensed in the discussion.	
How valuable is the research?	Yes	Very valuable – these focus groups with adolescents highlight the cultural undercurrent that influences their sexual behaviour, and the belief systems that education/ healthcare services	

		should consider when creating policy or interventions in this area	

Mashanda-Tafaune and Monareng 2015

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim clearly stated in abstract, section 1.2 (Aim of the study) and section 1.3 (Objectives of the study) - To identify and examine factors that influence the perception/attitude of healthcare workers towards the use and distribution of female condoms	
Is the research method (study design) appropriate for answering the research question?	Yes	A quantitative, explorative and descriptive survey conducted with healthcare workers from 3 facilities, with different job roles and experience levels	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	Convenience sampling, in three different clinics of varying size, in different socio-economic areas. Participants had to be over 18 with more than 2 years of experience, but no other eligibility criteria	
Could the way the sample was obtained introduce (selection) bias?	Yes	Convenience sampling, so not randomised. Researchers also chose the 3 facilities – however, all healthcare workers deemed eligible were interviewed.	

Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Yes – relatively large sample of one specific job role, and findings only applied to healthcare workers	
Was the sample size based on pre-study considerations of statistical power?	No	Convenience sampling based on healthcare providers currently working at the clinics	
Was a satisfactory response rate achieved?	Yes	Of the 164 healthcare workers deemed eligible, 100% were interviewed	
Are the measurements (questionnaires) likely to be valid and reliable?	Yes	Section titled 'validity and reliability' describes seeking input from the three experienced doctors, a statistician and academic experts in the field to test readability and content. An 'extensive' literature review was also conducted to provide conceptual definitions of key concepts. Cronbach's alpha reliability was also done – results were 0.7 which indicate internal consistency	
Was the statistical significance assessed?	Yes	Significance of key findings provided throughout results section	
Are confidence intervals given for the main results?	Unclear	Provided alongside some demographic factors in results section, but not key findings	
Could there be confounding factors that haven't been accounted for?	Unlikely	Numerous demographic factors which could be confounding factors for attitude of providers are well discussed and accounted for	
Can the results be applied to your organization?	Yes	Healthcare providers were recruited from a range of institutions, and key findings could prove useful for nationwide policy and interventions on female condoms	

Mayondi *et al*., 2016

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim clearly stated in abstract and introduction: to assess pregnancy intention, contraceptive use, and future childbearing desires among pregnant and recently post-partum HIV positive and HIV negative women	Four detailed specific objectives also provided
Is the research method (study design) appropriate for answering the research question?	Yes	Planned analysis of baseline data in a prospective observational cohort study – this analysis was conducted on results from specific questions about pregnancy intendedness and HIV status	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	Women aged 18 or older, recruited by study nurses from 28 antenatal clinics and 5 maternity wards in two locations – Gaborone and Mochudi (large peri-urban village).	
Could the way the sample was obtained introduce (selection) bias?	Yes	Nurses could select patients they know would provide particular answers based on their medical history. Also, does not consider the potential power relationship between nurses and the pregnant or recently post-partum women under their care.	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings were discussed specifically in relation to pregnant and post-partum women, particularly around contraception use or non-use.	
Was the sample size based on pre-study considerations of statistical power?	Unclear	The desired sample size of the original study, or how it was decided, was not described	

Was a satisfactory response rate achieved?	Unclear	The desired sample size of the original study, or how it was decided, was not described. Large data set of 941 women utilised in this analysis.	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	Details of how the questionnaire was designed, tested or piloted are not provided	
Was the statistical significance assessed?	Yes	Statistical significance provided throughout results section and clearly highlighted in all tables	
Are confidence intervals given for the main results?	Yes	Confidence intervals are provided alongside all key findings in results section	
Could there be confounding factors that haven't been accounted for?	Yes	Secondary analysis so authors could not control for all factors they may have wanted to -	
Can the results be applied to your organization?	Yes	Large data set, collected from multiple facilities – important findings about women's pregnancy intendedness and contraception use which definitely could be applied nationally	

Mogobe and Tshiamo, 2017:

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim to share findings on demographic characteristics of childbearing women who reported unplanned pregnancy detailed in clear section titled 'aims' in both abstract and introduction	

Is the research method (study design) appropriate for answering the research question?	Yes	Secondary analysis of data from the 4th Botswana AIDS Impact survey (BAIS IV) – multiple demographic factors collected, and specific questions about intendedness of pregnancy	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Unclear	Paper describes the inclusion criteria and relevant questions from the larger survey used for this analysis were decided, but original study design is not detailed	
Could the way the sample was obtained introduce (selection) bias?	Unclear	How participants were originally approached and by whom for the original survey is not detailed	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings were exclusively applied to women of reproductive age	
Was the sample size based on pre-study considerations of statistical power?	Unclear	Sample size for this analysis was based on the number of women who had answered two specific questions in the survey about unintended pregnancy, but how the original sample size was decided is not detailed	
Was a satisfactory response rate achieved?	Unclear	As intended sample size was not given, it is not clear how many women were originally approached/how many responded. However, it is a very large data set - 160482 women surveyed said they had an unintended pregnancy and consequently their demographic information was analysed.	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	Details of how the original questionnaire was designed, tested or piloted are not given. It is the fourth iteration of a large national study	

		though so likely to be well tested and has given valid results previously	
Was the statistical significance assessed?	No	Paper only details the percentages of responses to various demographic questions among women with unintended pregnancy	
Are confidence intervals given for the main results?	No	As above	
Could there be confounding factors that haven't been accounted for?	Yes	Authors did not control all demographic questions asked as this was a secondary analysis. Unplanned pregnancy is also a highly sensitive topic which multiple factors could have impacted/not been assessed in formal survey	
Can the results be applied to your organization?	Yes	Very large nationwide survey that highlights important relationships between unplanned pregnancy and certain demographic factors – widely applicable across the country	

Mokgetse 2018

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Clear aim and specific research questions detailed in introduction and abstract – to knowledge, views and barriers to the use of female condoms according to young women	
Is the research method (study design) appropriate for answering the research question?	Yes	Self-administered questionnaire conducted with women aged 15-34 - including sections on demographic information, knowledge and use of	

		the female condom, general views about the female condom, and recommendations	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	No	Paper describes data collection at 3 healthcare facilities but does not say which ones, or any details about them. Similarly, it describes a simple random sampling approach of participants but not exactly how this was conducted. Inclusion criteria specific – age and number of visits to family planning service (minimum 6)	
Could the way the sample was obtained introduce (selection) bias?	Unclear	Randomisation process is not described in detail.	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings only applied to young women, and the specific geographical area this study was conducted in (Jwaneng)	
Was the sample size based on pre-study considerations of statistical power?	Yes	Raosoft online sample size calculation was used to determine sample size of 136	
Was a satisfactory response rate achieved?	Yes	136 women (100%) were surveyed but after data cleaning 95 were included in analysis (70%)	
Are the measurements (questionnaires) likely to be valid and reliable?	Yes	Questionnaire adapted from a previous tool. Cronbach's alpha coefficient was measured, and some questions removed to make it more reliable (final questionnaire, $\alpha = 0.741$). Also used exploratory factor analysis data reduction, measured through Keiser–Meyer–Olkin Measure of Sampling Adequacy (MSA)	

Was the statistical significance assessed?	Yes	Statistical significance given alongside key findings throughout results section, and highlighted in Table 3/4	
Are confidence intervals given for the main results?	No	Confidence level given for sample size statistics but not key findings	
Could there be confounding factors that haven't been accounted for?	Yes	While multiple demographic factors were measured, it was not exhaustive – for example, though it measures education level, it does not measure urban vs rural upbringing which could heavily influence knowledge	
Can the results be applied to your organization?	Yes	Fairly representative range of demographic factors mean findings likely to be able to be applied nationally. Understanding barriers to use of the female condom could prove useful for future marketing and promotion.	

Nair 2015

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim detailed in abstract and introduction: to study the patterns and determinants of contraceptive use in four Southern African countries, including Botswana	
Is the research method (study design) appropriate for answering the research question?	Yes	Secondary analysis of data from the Botswana Family Health Survey, which collected demographic information and detailed insight into contraceptive use	
Is the method of selection of the subjects (employees, teams,	No	Method and study design section, for all four surveys in the different countries selected, is a	

divisions, organizations) clearly described?		paragraph long. Details of the Botswana survey, where it was conducted and by whom are not given.	
Could the way the sample was obtained introduce (selection) bias?	Unclear	Details about study design or how/where participants were selected were not given – only the year the study was conducted	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings and results all referred back to Southern Africa specifically, and only reference the contraceptive methods measured by the various surveys conducted	
Was the sample size based on pre-study considerations of statistical power?	Unclear	The way the sample size of the original survey was decided or collected is not detailed	
Was a satisfactory response rate achieved?	Unclear	A large sample of 4038 eligible (for this analysis) women in the Botswana study, but the original or intended sample size is not provided	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	Details of how the validity or reliability of the questionnaire was tested are not provided	
Was the statistical significance assessed?	Yes	Statistical significance is discussed in results section, and provided in table 5, alongside adjusted odd ratios	
Are confidence intervals given for the main results?	No		
Could there be confounding factors that haven't been accounted for?	Yes	Authors did not control all demographic questions asked as these were secondary analyses	
Can the results be applied to your organization?	Yes	Large nationwide dataset, analysis highlighted some key patterns in women's contraceptive use	

Nkosana and Nkosana, 2017

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Unclear	Not specified clearly in body of text, but abstract briefly says the study reports the results of surveys with 600 senior secondary school girls (aged between 18 and 22 years) in urban Botswana regarding their involvement in intergenerational relationships	
Is the research method (study design) appropriate for answering the research question?	Yes	All female students from all four public senior secondary schools in Gaborone were surveyed	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Unclear	Survey was self-administered, and the reason for participants being senior secondary school aged children is well justified, but how schools or the individual participants were approached is not detailed	
Could the way the sample was obtained introduce (selection) bias?	Unclear	As the way participants were approached is not detailed, the potential for selection bias is unknown	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings were applied exclusively to senior secondary school girls, with the specific challenges and pressures they face discussed at length	
Was the sample size based on pre-study considerations of statistical power?	Unclear	Authors state that large sample size was needed to enable an estimate of the prevalence of intergenerational sex, but not how this was decided	
Was a satisfactory response rate achieved?	Unclear	As the intended sample size and number of participants approached are not detailed, it is not	

		clear if the number is satisfactory – 600 is a large sample	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	This is an amended version of a well-validated questionnaire used globally. However, new questions were added and details of how these were tested, or if their version was piloted, are not given	
Was the statistical significance assessed?	Yes	Statistical significance is referenced in the results section and highlighted in table 4	
Are confidence intervals given for the main results?	No		
Could there be confounding factors that haven't been accounted for?	Yes	Although many demographic factors were accounted for, certain factors (like family financial status, or parents' employment or education status) were not discussed but may have had an impact. More information is needed about the older partners' to account for confounding factors associated with them	
Can the results be applied to your organization?	Unclear	Specific age group targeted and all in Gaborone – while multiple findings can be applied nationally, further research would be needed to determine whether similar challenges are faced by schoolgirls in rural areas	

Oucho and Ama, 2009

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim clearly defined in abstract and introduction: to measure the views of the	

		primary healthcare providers in Botswana on the reproductive health needs of immigrants/refugees and the availability and accessibility of SRH services to these populations	
Is the research method (study design) appropriate for answering the research question?	Yes	Questionnaires were conducted with healthcare providers from across 23 health districts by trained research assistants, with questions related to the opinions around SRH needs of immigrants/refugees, and access to/availability of SRH service access for these individuals	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	Sample size was allocated to the 23 healthcare districts using probability proportional to size. Providers were then selected randomly and in proportion to the number of doctors and nurses in each district.	
Could the way the sample was obtained introduce (selection) bias?	Unclear	Though providers were ‘randomly selected’, specific process of randomisation is not described.	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings are only applied to healthcare providers, though the proportional selection of healthcare districts and range of jobs/experience levels included means findings can be applied to healthcare providers relatively broadly	
Was the sample size based on pre-study considerations of statistical power?	Yes	NCS Pearson was used to determine sample size of 851	
Was a satisfactory response rate achieved?	Yes	Out of targeted sample size of 851, 678 individuals were interviewed (approximately 80% response rate) which was made up of 15% doctors, 82% nurses and 3% other/did not specify	

Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	Authors raise some limitations to reliability – 23% of participants were ex-patriates so their service expectations may be different to native Batswana; All participants were government employees, who may not be able to speak critically about service provision; and 8 of the 20 RA's conducting the study were expatriates so power/cultural dynamic could be challenging	
Was the statistical significance assessed?	Yes	Statistical significance for some key findings referenced in results section, and highlighted in Table 2	
Are confidence intervals given for the main results?	No		
Could there be confounding factors that haven't been accounted for?	Yes	As referenced in the issues with reliability, many factors could impact an individuals' attitude to service expectations and provision, and not all demographic factors were accounted for	
Can the results be applied to your organization?	Yes	Large survey of a range of providers, from across the 23 healthcare districts – findings nationally applicable and useful for revisions to service provision or SRH policy for refugees/immigrants	

Ray and Sinha, 2012

CEBM Quality Assessment Question	Author's judgement (Yes, No, Unclear)	Evidence for judgement	Comments
Did the study address a clearly focused question / issue?	Yes	Clear research aims laid out in introduction - does soundness of knowledge of HIV/AIDS	

		matter in the adoption of safe sex practice?; and does the adoption of safe sex practice help to prevent HIV prevalence in Botswana?	
Is the research method (study design) appropriate for answering the research question?	Yes	Secondary analysis of data from the Botswana AIDS Impact Survey, which collected demographic information and insight into men's awareness of HIV and condom use	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	Method describes the parts of the national survey used in this analysis, and how the original survey selected subjects (using the 2001 population housing survey)	
Could the way the sample was obtained introduce (selection) bias?	Unclear	Data was already collected, and all data related to the relevant questions was used in this analysis – but details are not given about how sample in the original survey was selected	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Nationally representative demo- graphic surveys of population aged 10–64 years, documenting knowledge, attitudes, behaviour, and cultural factors that might influence HIV infection, prevention and impact mitigation	
Was the sample size based on pre-study considerations of statistical power?	No	Secondary analysis of all data from nationwide survey, details of how original survey considered sample size not given	
Was a satisfactory response rate achieved?	Unclear	Numbers of participants in the original survey not given	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	Second iteration of a nationally representative demographic survey, but details of how this survey ensured validity not given	
Was the statistical significance assessed?	Yes	Statistical significance given throughout results section and in several dedicated summary tables	
Are confidence intervals given for the main results?	Yes	Written under key results in various tables	

Could there be confounding factors that haven't been accounted for?	Unlikely	Numerous demographic factors which could be confounding factors for risky sexual behaviour are well discussed and accounted for	
Can the results be applied to your organization?	Yes	Interesting findings related to the relationship between HIV awareness, knowledge, and risky sexual behaviour – particularly important due to analysis of how these various elements influence condom use	

Schaan et al. 2012

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Assess the knowledge, attitudes, and practices of healthcare workers in providing SRH services to HIV positive women	
Is the research method (study design) appropriate for answering the research question?	Yes	Healthcare workers from 24 facilities across 3 urban/peri-urban areas given self-administered, semi-structured questionnaire with four sections: general HIV/AIDS knowledge; SRH and HIV knowledge; attitudes about SRH and HIV services and SRH and HIV care practices.	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	All healthcare workers at the 24 study sites were invited to participate by being given a letter with information about the study and a questionnaire to complete and return in a sealed envelope	
Could the way the sample was obtained introduce (selection) bias?	Unlikely	Nobody was selected as all healthcare providers at the study sites were invited to participate	

Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings and attitudes were attached to healthcare workers only, and the two specific types of clinic recruited from (antenatal and anti-retroviral)	
Was the sample size based on pre-study considerations of statistical power?	No	Justification for the study sites selected, and number of healthcare workers invited to participate, is not given	
Was a satisfactory response rate achieved?	Yes	Of the 148 envelopes/questionnaires distributed, 105 were returned (71% response rate)	
Are the measurements (questionnaires) likely to be valid and reliable?	Unclear	Internal consistency was assessed (Cronbach alpha 0.603) but other measures of testing reliability/validity are not detailed	
Was the statistical significance assessed?	Yes	Statistical significance detailed throughout write-up of results	
Are confidence intervals given for the main results?	No	Interquartile range is given for key findings but not confidence intervals	
Could there be confounding factors that haven't been accounted for?	Yes	Multiple factors related to healthcare background were provided, but not many demographic factors related to the individual healthcare workers - which would definitely impact attitudes toward SRH for HIV positive women	
Can the results be applied to your organization?	Yes	Healthcare providers were recruited from 24 sites in 3 different geographic areas, and findings are very applicable to nationwide policy and interventions on HIV/SRH services more broadly	

Schaan et al. 2014

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim stated in introduction: to understand the fertility desires, including pregnancy planning and contraceptive behaviour, among women on anti-retroviral therapy (ART)	
Is the research method (study design) appropriate for answering the research question?	Yes	Secondary analysis of larger study which investigated factors which contribute towards pregnancy among women living with HIV – sample was filtered to specifically answer the research question	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	Process of data collection in the original study is well described – trained female research assistants (RAs) approached women waiting in ART clinics, assessed eligibility and then conducted interviews in private room using structured questionnaire	
Could the way the sample was obtained introduce (selection) bias?	Yes	Women being selected and approached by RAs could be open to selection bias – does not detail how this was decided or whether every woman in the clinic during a particular time frame was asked to participate	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Findings were applied to women living with HIV, seeking ART from government facilities and specifically those who did not plan to have a child	
Was the sample size based on pre-study considerations of statistical power?	Unclear	The way the sample for the original study was decided is not detailed	

Was a satisfactory response rate achieved?	Unclear	In the original study, 230 women were recruited and interviewed but in this analysis, only women with a current sexual partner were included (155 women). However, what percentage this was of the intended original sample is not known	
Are the measurements (questionnaires) likely to be valid and reliable?	Yes	The instrument was translated into Setswana, back translated and pre-tested with a representative group of women living with HIV for question clarity and appropriate-ness	
Was the statistical significance assessed?	Yes	Statistical significance is provided for all key findings and highlighted in tables 1,2 and 2	
Are confidence intervals given for the main results?	Yes	Confidence intervals are given alongside statistical significance for all key findings and highlighted in tables 1,2 and 2	
Could there be confounding factors that haven't been accounted for?	Yes	Authors did not control all demographic questions asked, as this is a secondary analysis. Many cultural factors may influence the decision to have a child which are not discussed	
Can the results be applied to your organization?	Yes	Although only government facilities were included, the role of healthcare workers in family planning education is definitely applicable nationwide. Participants also represent a broad range of urban/rural dwelling, age and education level.	

Schaan et al. 2016

CASP Quality Assessment Questions	**Author's judgement (Yes, No, Can't Tell)**	**Evidence for judgement**	**Comments**
Was there a clear statement of the aims of the research?	Yes	The research question (How does living with HIV affect womanhood, specifically sexual behaviour and reproductive desires and realities?) is detailed in the introduction	
Is a qualitative methodology appropriate?	Yes	Womanhood, HIV and sexual health are emotional topics – qualitative research is well suited to exploring women's individual experiences in this area	
Was the research design appropriate to address the aims of the research?	Yes	Focus group questions were grouped into three headings: womanhood, womanhood and HIV and sexual and reproductive healthcare.	
Was the recruitment strategy appropriate to the aims of the research?	Yes	HIV positive women were approached at one of the six infectious disease care clinics, assessed for eligibility (if they were interested in participating) and given details about the next focus-group discussion date, time and location.	
Was the data collected in a way that addressed the research issue?	Yes	Focus groups were conducted in participants' language of choice (Setswana or English) and contained the sub-categories detailed above	
Has the relationship between researcher and participants been adequately considered?	Unclear	Female research assistants led the discussions, which may be to ensure participants are comfortable discussing womanhood and sexuality but this is not explicitly described	
Have ethical issues been taken into consideration?	Yes	Study approval was obtained from the Health Research and Development Unit within the Botswana Ministry of Health, the Harvard School of Public Health Human Subjects	

		Committee and the Biomedical Research Ethics Committee of the University of Kwazulu Natal. All participants were read details of the study at multiple times and signed informed consent forms.	
Was the data analysis sufficiently rigorous?	Yes	Transcripts were read multiple times, before line by line coding and then focused coding were carried out – reviewed repeatedly throughout this process – before codes were grouped into themes. Memos were also kept throughout process about variations and relationships between themes	
Is there a clear statement of findings?	Yes	Results are laid out under 3 main headings, under which are multiple sub headings supported by quotes from focus groups	
How valuable is the research?	Yes	These findings highlight some of the socio-cultural aspects of "womanhood" that inadvertently or directly influence use of family planning and the 'role' of women being directly associated with childbearing	

Tshitenge *et al*., 2018

CEBM Quality Assessment Question	**Author's judgement (Yes, No, Unclear)**	**Evidence for judgement**	**Comments**
Did the study address a clearly focused question / issue?	Yes	Aim described in abstract and introduction: to assess the knowledge, attitude and practice of healthcare providers towards the use of contraceptives in adolescents	

Is the research method (study design) appropriate for answering the research question?	Yes	Cross sectional, self-administered questionnaire assessing: background; the healthcare provider’s attitude to contraceptive use in adolescence; their practice, knowledge and the influence of their religion or culture in the provision of contraceptives to adolescents	
Is the method of selection of the subjects (employees, teams, divisions, organizations) clearly described?	Yes	The paper describes the many hospital departments and two clinics selected for the study in good detail. All medical officers, interns, residents and nurses prescribing contraceptives to adolescents were included, and announcements were made in all relevant meetings. Consent was obtained physically or over the phone, before questionnaires were sent.	
Could the way the sample was obtained introduce (selection) bias?	Unlikely	Inclusion criteria is relatively broad, and all prescribing healthcare providers were invited to participate	
Was the sample of subjects representative with regard to the population to which the findings will be referred?	Yes	Participants had a wide range of roles within the healthcare field. Findings were applied to healthcare providers only, and the specific geographic area these faciltiies were in (Mahalapye)	
Was the sample size based on pre-study considerations of statistical power?	No	Study aimed to recruit all 101 prescribers of contraceptives to adolescent clients in the selected hospital and clinics	
Was a satisfactory response rate achieved?	Yes	Of the 101 eligible providers, 80 questionnaires were returned (response rate of 79.2%)	
Are the measurements (questionnaires) likely to be valid and reliable?	Yes	Questionnaire was based on a literature review, and then piloted with 5 volunteer doctors and	

		10 contraceptive-prescribing nurses from facilities not included in the main study	
Was the statistical significance assessed?	Yes	Statistical significance of key findings is referenced throughout results section and highlighted in Table 3	
Are confidence intervals given for the main results?	No		
Could there be confounding factors that haven't been accounted for?	Yes	Though some demographic factors are accounted for (age, religion etc) others are noticeably absent – whether the provider has any children, or adolescent children specifically, which would impact attitude to their contraceptive use	Authors do highlight this in discussion
Can the results be applied to your organization?	Yes	Mahalapye is a relatively representative peri-urban area, and the providers have a wide range of ages, healthcare experience and education level. Findings, particularly around attitudes to adolescents, are important for nationwide policy in this area	

Appendix 3A: Study site permission letters

Botswana-UPenn Partnership
Building a Healthy Future Together

Thuto ke thebe
University of Botswana

1st November 2017

To Whom it May Concern,

This letter serves as support and permission for Miss Caitlin Bawn to conduct the research project entitled “A digital intervention to improve contraception choice, uptake and effective use in Botswana: acceptability, feasibility, design and content”. This is a sub-study of “Development of a Tool to Measure User Preferences for Contraceptives in Botswana” - an ongoing study on which I am the Co-Principal Investigator, funded by a grant from the Bill and Melinda Gates Foundation, and ethically approved by all necessary institutions in Botswana (The University of Botswana and the HRDC, which is the ethics committee of the Botswana Ministry of Health).

I will serve as Miss Bawn’s supervisor and mentor for her research work in Botswana. I am the Director of the Botswana Sexual and Reproductive Health Group at the Botswana-University of Pennsylvania Partnership (BUP) (Lead Sexual and Reproductive Health Consultant Physician and Epidemiologist), and a special advisor to the Botswana Ministry of Health Family Planning Programme. A long-standing Memorandum of Understanding (MOU) between BUP, the University of Botswana, and the Ministry of Health is in place and Caitlin’s work here will fall under that MOU.

I am also a senior research associate at Botswana-Harvard AIDS Institute Partnership, and an adjunct Senior Lecturer in the Department of Public Health in the School of Medicine at the University of Botswana. I hold an honorary research affiliation with the Institute for Women’s Health at UCL.

We will fully support and facilitate Miss Bawn’s research project. Research and recruitment locations include the Ministry of Health District Health Management Team (DHMT) clinics in Gaborone, the Botswana Family Welfare Association Clinics and the Infectious Diseases Care Clinic at Princess Marina Hospital.

Please see attached all Botswana ethics approvals and letters of support and permission from the Botswana Ministry of Health District Health Management Team, the Botswana Family Welfare Association, and the Princess Marina Hospital Infectious Diseases Care Clinic.

Botswana-UPenn Partnership *Botswana Headquarters*
University of Botswana Main Campus
244G - Room 103
(Postal Address: PO Box AC 157 ACH)
Gaborone
Botswana
Tel: +267.355.4855
Fax: +267.393.2267

IPPF
International
Planned Parenth
Federation

Re: A digital intervention to improve contraception choice, uptake and effective use in Botswana: acceptability, feasibility, design and content

To Whom It May Concern,

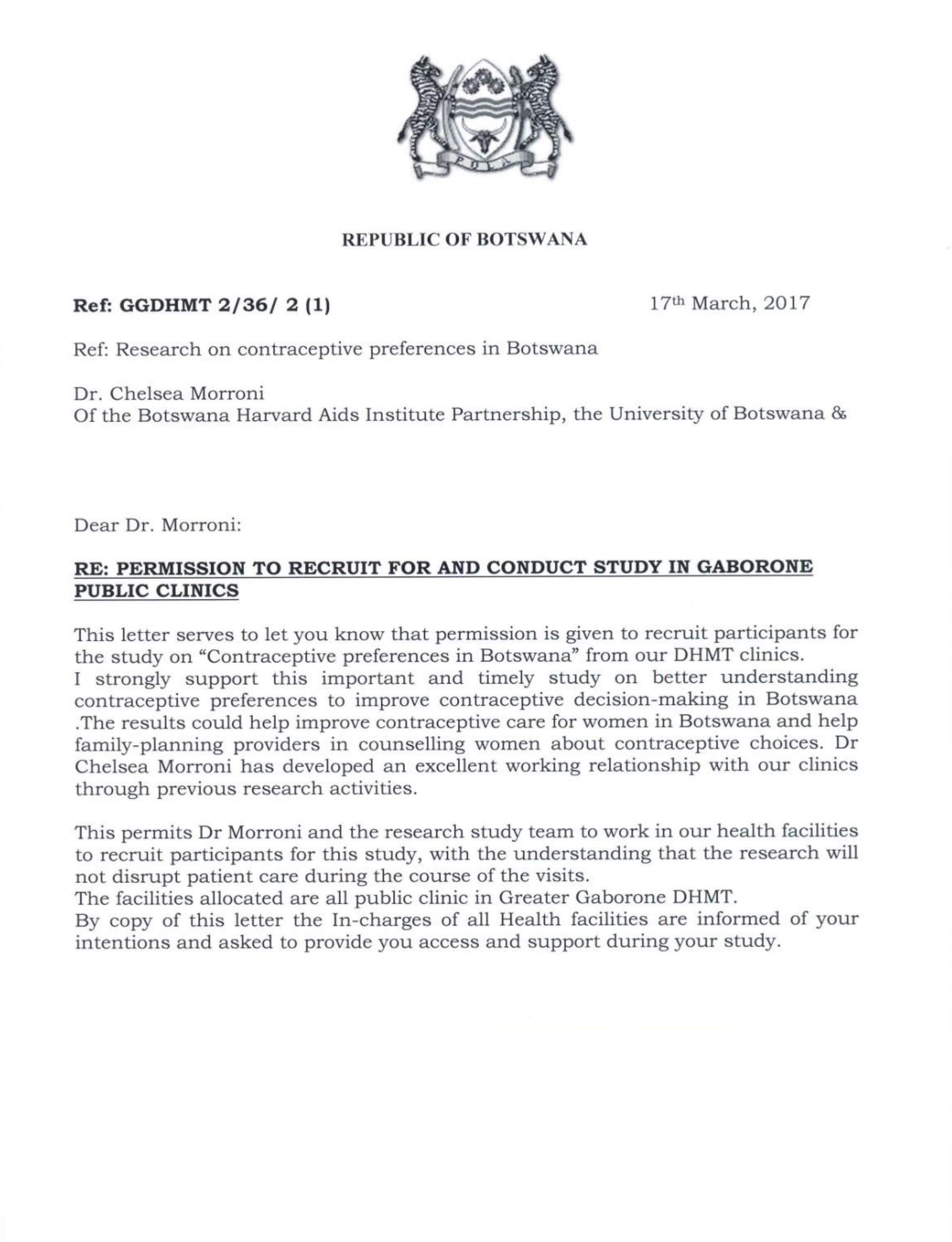
I am writing on behalf of the Botswana Family Welfare Association (BOFWA) to assure our support of Caitlin Bawn's research project A digital intervention to improve contraception choice, uptake and effective use in Botswana: acceptability, feasibility, design and content. At BOFWA, we follow the global priorities set by the International Planned Parenthood Federation. I believe Caitlin's project will contribute to these priorities and our vision for every person in Botswana to have control over their sexual and reproductive health.

BOFWA was founded in 1988, and since then has been the only NGO continually providing sexual and reproductive health (SRH) advocacy, training and clinical services in Botswana. It is committed to promoting sexual and reproductive health and rights (SRHR) with responsibilities to young people, adults, and families in Botswana. It currently provides more than 150,000 clinical services a year, two-thirds of which are related to family planning. BOFWA has been a pioneer in Botswana in several key areas, including advocacy for development of youth friendly services, provision of SRH services to female sex workers, and the provision of contraception and other SRH services in remote areas. More information can be found at www.bofwa.org.bw

We are pleased to take part in this study as it will yield important data for BOFWA and Botswana. We are very pleased for Caitlin Bawn under the supervision of Dr Chelsea Morroni and the BUP Sexual and Reproductive Research Group to conduct this study in collaboration with the BOFWA and we give permission for the research team to recruit participants and conduct aspects of the study at BOFWA.

Sincerely,

Una Ngwenya
Chief Executive Officer
BOFWA



REPUBLIC OF BOTSWANA

Ref: GGDHMT 2/36/ 2 (1) 17th March, 2017

Ref: Research on contraceptive preferences in Botswana

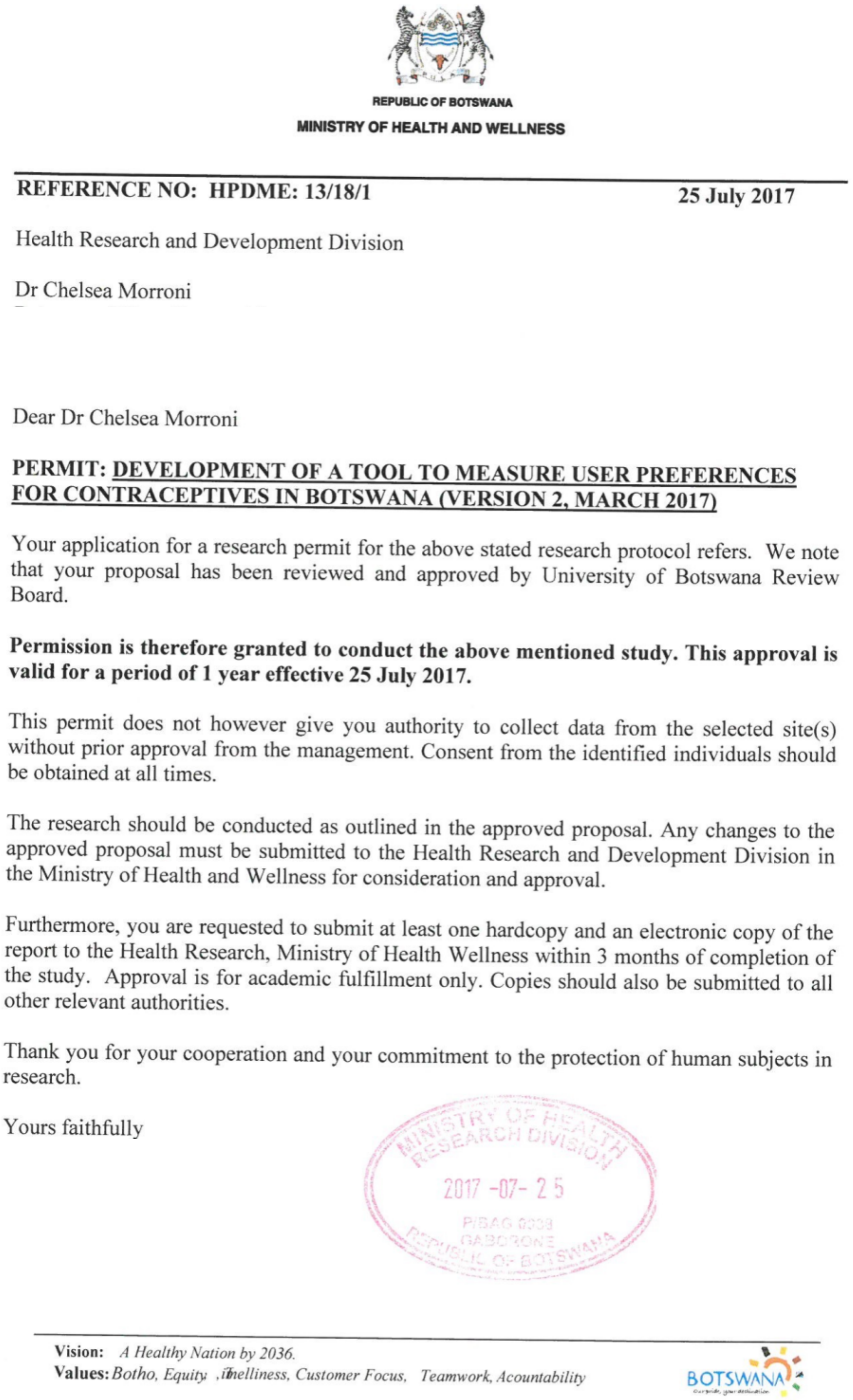
Dr. Chelsea Morroni
Of the Botswana Harvard Aids Institute Partnership, the University of Botswana &

Dear Dr. Morroni:

RE: PERMISSION TO RECRUIT FOR AND CONDUCT STUDY IN GABORONE PUBLIC CLINICS

This letter serves to let you know that permission is given to recruit participants for the study on "Contraceptive preferences in Botswana" from our DHMT clinics.
I strongly support this important and timely study on better understanding contraceptive preferences to improve contraceptive decision-making in Botswana .The results could help improve contraceptive care for women in Botswana and help family-planning providers in counselling women about contraceptive choices. Dr Chelsea Morroni has developed an excellent working relationship with our clinics through previous research activities.

This permits Dr Morroni and the research study team to work in our health facilities to recruit participants for this study, with the understanding that the research will not disrupt patient care during the course of the visits.
The facilities allocated are all public clinic in Greater Gaborone DHMT.
By copy of this letter the In-charges of all Health facilities are informed of your intentions and asked to provide you access and support during your study.



REPUBLIC OF BOTSWANA
MINISTRY OF HEALTH AND WELLNESS

REFERENCE NO: HPDME: 13/18/1 **25 July 2017**

Health Research and Development Division

Dr Chelsea Morroni

Dear Dr Chelsea Morroni

PERMIT: <u>DEVELOPMENT OF A TOOL TO MEASURE USER PREFERENCES FOR CONTRACEPTIVES IN BOTSWANA (VERSION 2, MARCH 2017)</u>

Your application for a research permit for the above stated research protocol refers. We note that your proposal has been reviewed and approved by University of Botswana Review Board.

Permission is therefore granted to conduct the above mentioned study. This approval is valid for a period of 1 year effective 25 July 2017.

This permit does not however give you authority to collect data from the selected site(s) without prior approval from the management. Consent from the identified individuals should be obtained at all times.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health and Wellness for consideration and approval.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health Wellness within 3 months of completion of the study. Approval is for academic fulfillment only. Copies should also be submitted to all other relevant authorities.

Thank you for your cooperation and your commitment to the protection of human subjects in research.

Yours faithfully

MINISTRY OF HEALTH
RESEARCH DIVISION
2017 -07- 25
P/BAG 0038
GABORONE
REPUBLIC OF BOTSWANA

Vision: *A Healthy Nation by 2036.*
Values: *Botho, Equity, Timeliness, Customer Focus, Teamwork, Acountability*

UNIVERSITY
of
BOTSWANA

Ref: UBR/RES/IRB/BIO/023

20th July 2017

Permanent Secretary
Ministry of Health and Wellness

RE: REQUEST FOR EXPEDITED REVIEW OF A RESEARCH PROPOSAL SUBMITTED BY DR. CHELSEA MORRONI

Since it is a requirement that everyone undertaking research in Botswana should obtain a Research Permit from the relevant arm of Government, The Office of Research and Development at the University of Botswana has been tasked with the responsibility of overseeing research at UB including facilitating the issuance of Research permits for all UB Researchers inclusive of students and staff.

I am writing this letter in support of an application for a research permit by Dr Chelsea Morroni, an adjunct lecturer at the Faculty of Medicine, University of Botswana. Dr Morroni has proposed to conduct a study titled **"Development of a Tool to Measure User Preferences for Contraceptives in Botswana".** The overall objective of the proposed study is to develop and pilot a method of assessing individual user preferences that will inform healthcare decision-making for men and women seeking contraceptives in Botswana. It is hoped that this study will help improve decision-making for men and women seeking contraceptives in Botswana.

The Office of Research and Development is satisfied with the process for data collection, analysis and the intended utilisation of findings from this research.

We will appreciate your kind and timely consideration of this application.

We thank you for your usual cooperation and assistance

Sincerely

2017-07-20

Dr M. Kasule
Assistant Director for Research Ethics, Office of Research and Development

31 October 2017

Dear Research and Ethics Committee,

Re: Development of a Tool to Measure User Preferences for Contraceptives in Botswana, and the digital intervention to improve contraception choice, uptake and effective use in Botswana sub-study

This letter serves to confirm our support for the above mentioned research study.

I have granted Dr. Chelsea Morroni and Miss Caitlin Bawn and their research team permission to conduct this study in the IDCC at Princess Marina Hospital. Once all relevant ethics permissions are obtained we will finalize logistics of the implementation of the study in the clinic so that it does not burden clinical staff or patients in any way.

This study is important and timely and will improve reproductive services for our patients living with and affected by HIV. We fully support the implementation of this study, and look forward to the collaboration.

Sincerely,

Dr. Letumile Rodgers Moeng
IDCC, Acting Head
Princess Marina Hospital

Appendix 3B: Information sheet (healthcare providers and FP stakeholders)

Participant Information Sheet For Key Stakeholders in Family Planning

UCL Research Ethics Committee Approval ID Number: 11863/001

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

Title of Study:
“A digital intervention to improve contraception choice, uptake and effective use in Botswana: acceptability, feasibility, design and content”: a sub-study of “Development of a Tool to Measure User Preferences for Contraceptives in Botswana”

Name and Contact Details of the Researcher(s):
Ms. Caitlin Bawn, B.A., M.S., M.Sc.
EGA Institute for Women’s Health, University College London (UCL)

Name and Contact Details of the Principal Researcher:
Dr Chelsea Morroni, B.A., M.P.H., M.Phil., MBChB, Ph.D., DTM&H, DFSRH

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1. **Invitation Paragraph**
   You are being asked to take part in a research study. Your participation is voluntary, which means you can choose whether or not to participate. Before you make a decision you will need to know the purpose of the study, the possible risks and benefits of being in the study and what you will have to do if you decide to participate. The research team is going to talk with you about the study and give you this consent document to read.

   Please ask the researcher to explain anything you do not understand, including any language contained in this form. If you decide to participate, you will be asked to sign a consent form and a copy will be given to you. Keep this information sheet, in it you will find contact information and answers to questions about the study. You may ask to have this form read to you.

2. **What is the project’s purpose?**
   The purpose of this study is to develop and test a tool for measuring user preferences in regard to contraceptive characteristics in Botswana, and to utilise feedback from potential users, healthcare providers and experts in both family planning and eHealth to design an eHealth intervention that will improve contraceptive care and use.

3. **Why have I been chosen?**
   You are being asked to be in this study because you have expertise in family planning, policy and programming in Botswana. Your feedback and insight will be invaluable to the design and content of the intervention.

4. **Do I have to take part?**
   Taking part in the study is entirely voluntary. If you decide to participate or not to participate there will be no loss of benefits to which you are otherwise entitled. You may discontinue participation at any time, without giving a reason without penalty or loss of benefits. If you decide to withdraw you will be asked what you wish to happen to the data you have provided up that point.

5. **What will happen to me if I take part?**
   You are being asked to participate in an interview on family planning in Botswana, and will be participating in a single individual interview that will vary in length from half an hour upwards to one hour. You will be asked about the acceptability and feasibility of an eHealth intervention to improve contraception uptake from the perspective of your area of expertise. This study will take place at the time and place of your choosing. You will complete all study-related questionnaires at this location, and will not be asked to go anywhere else for your participation in this study.

6. **Will I be recorded and how will the recorded media be used?**
   The interview will be audio- recorded and transcribed for research purposes. If you choose not to be recorded, you will no longer be able to continue to take part in the study. However, it is important to know that your name or other identifying information will not be on the recording or the transcription. These recordings will be kept in a secure location – in a locked filing cabinet in a locked office in the University of Botswana. Only research staff will have a key to access this office. Audio recordings will be destroyed two years after the study is over (in 2020). You will also be asked to complete a demographic questionnaire, which we will use for descriptive purposes of this study.

7. **What are the possible disadvantages and risks of taking part?**
   A possible risk is a breach of confidentiality, which could cause embarrassment or discomfort when interacting with others, or when discussing existing interventions. To reduce this risk, your privacy will be carefully protected by standard procedures including protecting your identity by de-identifying data (removing all personally identifying information, such as your name, age, gender, from your record), and the storage of all data in locked cabinets or on secure, password-protected computer servers.

8. **What are the possible benefits of taking part?**
   You will not benefit directly from taking part. However, the result of this study may lead to the development of an intervention that could improve uptake of contraception. Understanding the current situation around contraception in Botswana, in combination with your feedback and insight, could significantly impact the success of the potential intervention.

9. **What if something goes wrong?**
   If you have questions, concerns or complaints regarding your participation in this research study or if you have any questions about your rights as a research subject, you should speak with the principal investigator, Dr. Chelsea Morroni. If a member of the research team cannot be reached or you want to talk to someone other than those working on the study, you may contact the Chair of the UCL Research Ethics Committee.

10. **Will my taking part in this project be kept confidential?**
    Every attempt will be made by the investigators to ensure that all information collected in this study remains strictly confidential, except as may be required by law. Information about child abuse or intent to harm self or others will be reported to authorities as required by law.

    Prior to analysis, all data from this study will be de-identified (any personally identifying information, such as your name, age, gender, will be removed from your record). Authorized representatives from the University of Pennsylvania and the Institutional Review Boards will have access to records from your participation in this study. Any documents you sign, from which you can be identified by name, will be kept in locked drawer at the University of Botswana and will be kept private. These documents will be destroyed when the study is over. Audio recordings from this study will be destroyed two years after the study is over (in 2020). If any publication or presentation results from this research, you will not be identified by name.

11. Limits to confidentiality

Confidentiality will be respected unless there are compelling and legitimate reasons for this to be breached. If this was the case we would inform you of any decisions that might limit your confidentiality.

12. Use of Deception

No deception will be used as part of the study. Your input will help mould the intervention described above and will serve no other purpose.

13. What will happen to the results of the research project?

The results of this research project will be written up as part of a PhD thesis, and potentially published in various peer-reviewed journals. Findings will also be presented to the various clinics involved, Botswana’s Ministry of Health, and at relevant international conferences. No participant will be able to be identified in any write up or presentation of the study. Once the study is completed, all participants will be invited by phone/text to attend a special presentation of findings at the clinics, specifically designed for participants.

14. Data Protection Privacy Notice

Notice:

The data controller for this project will be University College London (UCL). The UCL Data Protection Office provides oversight of UCL activities involving the processing of personal data, and can be contacted.

Your personal data will be processed for the purposes outlined in this notice. The legal basis that would be used to process your personal data will be [the provision of your consent.] You can provide your consent for the use of your personal data in this project by completing the consent form that has been provided to you.

Your personal data will be processed so long as it is required for the research project. If we are able to anonymise or pseudonymise the personal data you provide we will undertake this, and will endeavour to minimise the processing of personal data wherever possible.

The following individuals may use or share your information for this research study:

- The investigators for the study and the study team
- The University of Pennsylvania and Botswana Institutional Review Boards (the committees charged with overseeing research on human subjects) and University of Pennsylvania Office of Regulatory Affairs
- The University of Pennsylvania Office of Human Research (the office which monitors research studies)
- University College London (UCL)’s Research Ethics Committee (the committee that oversees research involving human subjects)

- Other authorized personnel at UCL, Penn and the University of Botswana, including offices that support research operations
- Other research personnel with access to the databases for research and/or study coordination and as otherwise approved by the IRB

If you are concerned about how your personal data is being processed, please contact UCL in the first instance. If you remain unsatisfied, you may wish to contact the Information Commissioner's Office (ICO). Contact details, and details of data subject rights, are available on the ICO website at: https://ico.org.uk/for-organisations/data-protection-reform/overview-of-the-gdpr/individuals-rights/

15. Who is organising and funding the research?

Funding sponsor: The Bill and Melinda Gates Foundation

The project is organised by researchers from the University of Botswana, University of Pennsylvania and University College London.

16. Contact for further information

If you have any queries or need further information, please contact:

Dr Chelsea Morroni

Ms. Caitlin Bawn

Thank you for reading this information sheet and for considering to take part in this research study.

Appendix 3C: Consent form (healthcare providers and FP stakeholders)

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: "A digital intervention to improve contraception choice, uptake and effective use in Botswana: acceptability, feasibility, design and content": a sub-study of "Development of a Tool to Measure User Preferences for Contraceptives in Botswana"

Department: EGA Institute of Women's Health, University College London
Name and Contact Details of the Researcher(s):
Caitlin Bawn, B.A., M.S., M.Sc.
EGA Institute for Women's Health, University College London (UCL)

Name and Contact Details of the Principal Researcher:
Chelsea Morroni, B.A., M.P.H., M.Phil., MBChB, Ph.D., DTM&H, DFSRH

Name and Contact Details of the UCL Data Protection Officer:
UCL's Data Protection Officer is Lee Shailer, who can be contacted.

This study has been approved by the UCL Research Ethics Committee: Project ID number: 11863/001

Thank you for considering taking part in this research. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

I confirm that I understand that by ticking/initialling each box below I am consenting to this element of the study. I understand that it will be assumed that unticked/initialled boxes means that I DO NOT consent to that part of the study. I understand that by not giving consent for any one element that I may be deemed ineligible for the study.

		Tick Box
1	I confirm that I have read and understood the Information Sheet for the above study. I have had an opportunity to consider the information and what will be expected of me. I have also had the opportunity to ask questions which have been answered to my satisfaction, and would like to take part in an individual interview	
2	I understand that I will be able to withdraw my data from the study before 2020, when it will be destroyed.	
3	I consent to the processing of my personal information (provide information on what personal information specifically will be collected) for the purposes explained to me. I understand that such information will be handled in accordance with all applicable data protection legislation.	
4	I understand that all personal information will remain confidential and that all efforts will be made to ensure I cannot be identified (unless you state otherwise, because of the research design or except as required by law). I understand that my data gathered in this study will be stored anonymously and securely. It will not be possible to identify me in any publications.	
5	I understand that my information may be subject to review by responsible individuals from the University (to include sponsors and funders) for monitoring and audit purposes.	

6	I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason, without my legal rights being affected. I understand that if I decide to withdraw, any personal data I have provided up to that point will be deleted unless I agree otherwise.	
7	I understand the potential risks of participating and the support that will be available to me should I become distressed during the course of the research.	
8	I understand the direct/indirect benefits of participating.	
9	I understand that the data will not be made available to any commercial organisations but is solely the responsibility of the researcher(s) undertaking this study.	
10	I understand that I will not benefit financially from this study or from any possible outcome it may result in in the future.	
11	I agree that my anonymised research data may be used by others for future research, and understand that no one will be able to identify me when this data is shared.	
12	I understand that the information I have submitted will be published as a report and I wish to receive a copy of it. Yes/No	
13	I consent to my interview being audio/video recorded. I understand that the recordings will be stored anonymously, using password-protected software and will be used for training, quality control, audit and specific research purposes, and then destroyed two years after the study ends (2020) To note: If you do not want your participation recorded you cannot take part in the study.	
14	I hereby confirm that I understand the inclusion criteria as detailed in the Information Sheet and explained to me by the researcher.	
15	I hereby confirm that: (a) I understand the exclusion criteria as detailed in the Information Sheet and explained to me by the researcher; and (b) I do not fall under the exclusion criteria.	
16	I have informed the researcher of any other research in which I am currently involved or have been involved in during the past 12 months.	
17	I am aware of who I should contact if I wish to lodge a complaint.	
18	I voluntarily agree to take part in this study.	

19	Use of information for this project and beyond: I would be happy for the data I provide to be archived at UCL's electronic data safe haven. I understand that other authenticated researchers will have access to my anonymised data.	
20	I understand that my personal data will be used by a researcher in London, and that safeguards will be put in place by UCL to protect my data. I can contact the UCL data protection officer with any concerns or queries.	

If you would like your contact details to be retained so that you can be contacted in the future by UCL researchers who would like to invite you to participate in follow up studies to this project, or in future studies of a similar nature, please tick the appropriate box below.

Yes, I would be happy to be contacted in this way	
No, I would not like to be contacted	

Name of participant	Date	Signature
Name of witness (If applicable)	Date	Signature
Researcher	Date	Signature

Appendix 3D: Topic Guide for Interviews - Healthcare provider experiences around contraception provision

Introduce interviewer(s) and background to research:
We are developing an intervention to help women to decide which method of contraception might be the best choice for them, and give information about the different methods on offer.

Aim of today:

We would like to ask questions about your experiences as a healthcare professional providing contraception in Botswana.

The interview will take between 30 minutes and 1 hour and you will be compensated 50BWP for your time. Feel free to pause the interview at any time.

Reassure of confidentiality:
We will keep everything confidential, and nothing you say will be able to be linked back to you.

Let us know at any point if you have any further questions about the research.
We will be recording this for accuracy. If you have an issue with that please raise it now.

Consent form: Sign, and keep information sheet. Ask if the participant has any questions before the interview begins.

[Ask about themselves - broad, non-specific questions before starting interview.]

Start of questions:

A. Background

- Tell me about your background in healthcare - how long have you been practicing, what brought you to specialise in this area?
- Where do you work? What type of clinic is it?
- How long have you been working there?
- What is your position?
- How many total years of clinical experience do you have?
- What training did you do? What are your credentials?

B. Contraception in Botswana: Patient access, understanding and concerns

- Please could you tell me what you know about different contraceptive methods available in Botswana?
- Do you feel uncomfortable with providing any of these methods or providing counseling on any of these methods?
- What methods are currently on offer? What challenges or benefits does [a particular method] bring for you as a provider? E.g. longevity of method, resources or training needed
- Could you describe the current clinical practice around contraception? How do women access it, pay for it, what is the cost, how readily available are the methods etc?
- Could you please describe a typical interaction around contraception? What do you say, what advice to you tend to give?
- How many patients at [specific clinic] come requesting contraception advice?
- What do you, as a provider, think of the contraceptive information that patients have? Are you the primary source, or do women come with information from elsewhere?
- What are the common concerns women have about contraception in general?

- Does contraception carry any stigma in Botswana – either from partners, society, religion etc?
- Are there any specific methods that have more stigma or concerns attached to them? What are those concerns?
- What are the biggest overall challenges for you in providing family planning?
- What age do you think women should learn about contraception? Why?
- Is there a need for more contraceptive information? If so, what do you think would be the most effective way?

C. Potential for eHealth intervention

- Do you think eHealth is a suitable way to disseminate information about contraception to patients?
- As a healthcare provider, what benefits or challenges would an eHealth intervention bring for you?
- What do you think are the most important tools or information to include in this intervention?

Any last comments or questions?

Reassure participant of confidentiality and remind them that they can get in touch if they feel uncomfortable about anything to do with the research/their participation, or if they have any further questions or comments. If appropriate, offer details of services or other organisations that may be of interest.

Organise payment, and then thank you!

Appendix 3E: Topic Guide for Interviews: Key stakeholders in family planning

Introduce interviewer(s) and background to research:
We are developing an intervention to help women to decide which method of contraception might be the best choice for them, and give information about the different methods on offer.

Aim of today:

We would like to ask questions about your experiences as a family planning specialist in Botswana, discussing the current situation around contraception, policies, successes, challenges and the potential for an intervention to improve contraception uptake/use.

The interview will take between 30 minutes and 1 hour. Feel free to pause the interview at any time.

Reassure of confidentiality:
We will keep everything confidential, and nothing you say will be able to be linked back to you.

Let us know at any point if you have any further questions about the research.
We will be recording this for accuracy. If you have an issue with that please raise it now.

Consent form: Sign, and keep information sheet. Ask if the participant has any questions before the interview begins.

[Ask about themselves - broad, non-specific questions before starting interview.]

Start of questions:

A. Background and current interventions

- Tell me about your background, specifically in family planning - how long have you been working in this field, what brought you to specialise in this area?
- What is your current job title, and what exactly does that entail?
- Can you talk about any interventions that you’re aware of which are currently aiming to improve contraception uptake? Government, NGOs, within the education system, digital health etc
- What is the main research happening in the area of family planning at the moment?
- What changes have occurred in the field of contraception during your time in the field? E.g. method choice, availability, myths and misconceptions etc

B. Contraception in Botswana

- Could you please describe the broader logistics of providing contraception in Botswana – funding, specific method availability, ordering systems etc. What challenges are associated with this, and how do you try and overcome them?
- How available is contraception for women that want to use it?
- What do you think the main reasons are for usage and non-usage of contraceptives?
- There is good method choice in Botswana – why do you think there has been less uptake of modern contraceptives, or dual method use? Are there any myths or misconceptions associated with specific methods, or contraception more broadly, that you have heard?
- The male condom is still the most commonly used method by far. Why do you think this is?
- How do you think HIV impacts the broader family planning policies and specific contraceptive methods promoted in Botswana?

- How do you think religion impacts the broader family planning policies and specific contraceptive methods promoted in Botswana, for both government and individual people?
- What in your opinion are the biggest challenges for providing contraception in Botswana, at both a national and individual level? And what have been Botswana’s biggest successes?

C. Potential for eHealth intervention in field of contraception/sexual health

- What, if anything, do you know about eHealth at the moment?
- Do you think eHealth is a suitable way to disseminate information about contraception to patients?
- Do any eHealth interventions exist in the field of contraception/sexual health? If so, what are they, and what successes/challenges have they faced? If not, why do you think that is?
- What do you think we should consider when designing this intervention?
- Is there any content, or specific tool, you would like to see included?
- Who do you think should be the target users to make the biggest impact?
- How can I sensitively consider HIV in the content and design? Is there anything specific I should include for HIV positive users?
- As a family planning specialist, what challenges do you see an eHealth intervention for contraception facing?

Any last comments or questions?

Reassure participant of confidentiality and remind them that they can get in touch if they feel uncomfortable about anything to do with the research/their participation, or if they have any further questions or comments. If appropriate, offer details of services or other organisations that may be of interest.

Thank you!

Appendix 3F: Information sheet (women)

Participant Information Sheet For Women/Potential Users

UCL Research Ethics Committee Approval ID Number: 11863/001

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

Title of Study:

“A digital intervention to improve contraception choice, uptake and effective use in Botswana: acceptability, feasibility, design and content”: a sub-study of “Development of a Tool to Measure User Preferences for Contraceptives in Botswana”

Name and Contact Details of the Researcher(s):
Ms. Caitlin Bawn, B.A., M.S., M.Sc.
EGA Institute for Women’s Health, University College London (UCL)

Name and Contact Details of the Principal Researcher:
Dr. Chelsea Morroni, B.A., M.P.H., M.Phil., MBChB, Ph.D., DTM&H, DFSRH

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1. **Invitation Paragraph**
   You are being asked to take part in a research study. Your participation is voluntary, which means you can choose whether or not to participate. Before you make a decision you will need to know the purpose of the study, the possible risks and benefits of being in the study and what you will have to do if you decide to participate. The research team is going to talk with you about the study and give you this consent document to read.

   Please ask the researcher to explain anything you do not understand, including any language contained in this form. If you decide to participate, you will be asked to sign a consent form and a copy will be given to you. Keep this information sheet, in it you will find contact information and answers to questions about the study. You may ask to have this form read to you.

2. **What is the project’s purpose?**
   The purpose of this study is to develop and test a tool for measuring user preferences in regard to contraceptive characteristics in Botswana, and to utilise feedback from potential users, healthcare providers and experts in both family planning and eHealth to design an eHealth intervention that will improve contraceptive care and use.

3. **Why have I been chosen?**
   You are being asked to be in this study because you are an individual of reproductive age (aged 18 and older) seeking contraceptive information from your health care provider, and a potential user of the intervention we are designing. Your feedback and insight will be invaluable to the design and content of the intervention.

4. **Do I have to take part?**
   Taking part in the study is entirely voluntary. If you decide to participate or not to participate there will be no loss of benefits to which you are otherwise entitled. You may discontinue participation at any time, without giving a reason without penalty or loss of benefits. If you decide to withdraw you will be asked what you wish to happen to the data you have provided up that point.

5. **What will happen to me if I take part?**
   If you are being asked to participate in an individual in-depth interview about contraceptive preferences, your participation will require a single visit, which will vary in length from half an hour upwards. You will be asked questions about your current and previous contraception use, your thoughts about the various contraceptive methods, and how you access healthcare and contraceptive information. This will require in-depth discussion with an individual researcher.

6. **Will I be recorded and how will the recorded media be used?**
   The interview will be audio- recorded and transcribed for research purposes. If you choose not to be recorded, you will no longer be able to continue to take part in the study. However, it is important to know that your name or other identifying information will not be on the recording or the transcription. These recordings will be kept in a secure location – in a locked filing cabinet in a locked office in the University of Botswana. Only research staff will have a key to access this office. Audio recordings will be destroyed two years after the study is over (in 2020). You will also be asked to complete a demographic questionnaire, which we will use for descriptive purposes of this study.

7. **What are the possible disadvantages and risks of taking part?**
   One potential risk to you may include any discomfort in revealing personal information.
   Another possible risk is a breach of confidentiality, which could cause embarrassment or discomfort. To reduce this risk, your privacy will be carefully protected by standard procedures including protecting your identity by de-identifying data (removing all personally identifying information, such as your name, age, gender, from your record), and the storage of all data in locked cabinets or on secure, password-protected computer servers.

8. **What are the possible benefits of taking part?**
   You will be compensated 50 Botswanan Pula on completion of the interview. The result of this study may lead to the development of an intervention that could improve uptake of contraception. Listening to your feedback and taking into account potential users' experiences and preferences will improve the likelihood of success of any intervention developed from this study.

9. **What if something goes wrong?**
   If you have questions, concerns or complaints regarding your participation in this research study or if you have any questions about your rights as a research subject, you should speak with the principal investigator, Dr. Chelsea Morroni. If a member of the research team cannot be reached or you want to talk to someone other than those working on the study, you may contact the Chair of the UCL Research Ethics Committee.

10. **Will my taking part in this project be kept confidential?**
    Every attempt will be made by the investigators to ensure that all information collected in this study remains strictly confidential, except as may be required by law. Information about child abuse or intent to harm self or others will be reported to authorities as required by law.

    Prior to analysis, all data from this study will be de-identified (any personally identifying information, such as your name, age, gender, will be removed from your record). Authorized representatives from the University of Pennsylvania and the Institutional Review Boards will have access to records from your participation in this study. Any documents you sign, from which you can be identified by name, will be kept in locked drawer at the University of Botswana and will be kept private. These documents will be destroyed when the study is over. Audio recordings from this study will be destroyed two years after the study is over (in 2020). If any publication or presentation results from this research, you will not be identified by name.

11. **Limits to confidentiality**

Confidentiality will be respected unless there are compelling and legitimate reasons for this to be breached. If this was the case we would inform you of any decisions that might limit your confidentiality.

12. Use of Deception

No deception will be used as part of the study. Your input will help mould the intervention described above and will serve no other purpose.

13. What will happen to the results of the research project?

The results of this research project will be written up as part of a PhD thesis, and potentially published in various peer-reviewed journals. Findings will also be presented to the various clinics involved, Botswana's Ministry of Health, and at relevant international conferences. No participant will be able to be identified in any write up or presentation of the study. Once the study is completed, all participants will be invited by phone/text to attend a special presentation of findings at the clinics, specifically designed for participants.

14. Data Protection Privacy Notice

Notice:
The data controller for this project will be University College London (UCL). The UCL Data Protection Office provides oversight of UCL activities involving the processing of personal data, and can be contacted.

Your personal data will be processed for the purposes outlined in this notice. The legal basis that would be used to process your personal data will be [the provision of your consent.] You can provide your consent for the use of your personal data in this project by completing the consent form that has been provided to you.

Your personal data will be processed so long as it is required for the research project. If we are able to anonymise or pseudonymise the personal data you provide we will undertake this, and will endeavour to minimise the processing of personal data wherever possible.

The following individuals may use or share your information for this research study:

- The investigators for the study and the study team
- The University of Pennsylvania and Botswana Institutional Review Boards (the committees charged with overseeing research on human subjects) and University of Pennsylvania Office of Regulatory Affairs
- The University of Pennsylvania Office of Human Research (the office which monitors research studies)
- University College London (UCL)'s Research Ethics Committee (the committee that oversees research involving human subjects)
- Other authorized personnel at UCL, Penn and the University of Botswana, including offices that support research operations
- Other research personnel with access to the databases for research and/or study coordination and as otherwise approved by the IRB

If you are concerned about how your personal data is being processed, please contact UCL in the first instance. If you remain unsatisfied, you may wish to contact the Information Commissioner's Office (ICO). Contact details, and details of data subject rights, are available on the ICO website at: https://ico.org.uk/for-organisations/data-protection-reform/overview-of-the-gdpr/individuals-rights/

15. Who is organising and funding the research?
Funding sponsor: The Bill and Melinda Gates Foundation

The project is organised by researchers from the University of Botswana, University of Pennsylvania and University College London.

16. Contact for further information
If you have any queries or need further information, please contact:

Dr Chelsea Morroni

Ms. Caitlin Bawn

Thank you for reading this information sheet and for considering to take part in this research study.

Appendix 3G: Consent form (women)

CONSENT FORM FOR WOMEN/POTENTIAL USER INTERVIEWS

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: "A digital intervention to improve contraception choice, uptake and effective use in Botswana: acceptability, feasibility, design and content": a sub-study of "Development of a Tool to Measure User Preferences for Contraceptives in Botswana"

Department: EGA Institute of Women's Health, University College London
Name and Contact Details of the Researcher(s):
Caitlin Bawn, B.A., M.S., M.Sc.
EGA Institute for Women's Health, University College London (UCL)

Name and Contact Details of the Principal Researcher:
Chelsea Morroni, B.A., M.P.H., M.Phil., MBChB, Ph.D., DTM&H, DFSRH

Name and Contact Details of the UCL Data Protection Officer:
UCL's Data Protection Officer is Lee Shailer, who can be contacted.

This study has been approved by the UCL Research Ethics Committee: Project ID number: 11863/001

Thank you for considering taking part in this research. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

I confirm that I understand that by ticking/initialling each box below I am consenting to this element of the study. I understand that it will be assumed that unticked/initialled boxes means that I DO NOT consent to that part of the study. I understand that by not giving consent for any one element that I may be deemed ineligible for the study.

		Tick Box
1	I confirm that I have read and understood the Information Sheet for the above study. I have had an opportunity to consider the information and what will be expected of me. I have also had the opportunity to ask questions which have been answered to my satisfaction, and would like to take part in an individual interview	
2	I understand that I will be able to withdraw my data from the study before 2020, when it will be destroyed.	
3	I consent to the processing of my personal information (provide information on what personal information specifically will be collected) for the purposes explained to me. I understand that such information will be handled in accordance with all applicable data protection legislation.	
4	I understand that all personal information will remain confidential and that all efforts will be made to ensure I cannot be identified (unless you state otherwise, because of the research design or except as required by law). I understand that my data gathered in this study will be stored anonymously and securely. It will not be possible to identify me in any publications.	

5	I understand that my information may be subject to review by responsible individuals from the University (to include sponsors and funders) for monitoring and audit purposes.	
6	I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason, without my legal rights being affected. I understand that if I decide to withdraw, any personal data I have provided up to that point will be deleted unless I agree otherwise.	
7	I understand the potential risks of participating and the support that will be available to me should I become distressed during the course of the research.	
8	I understand the direct/indirect benefits of participating.	
9	I understand that the data will not be made available to any commercial organisations but is solely the responsibility of the researcher(s) undertaking this study.	
10	I understand that, except for 50BWP on completion of the interview, I will not benefit financially from this study or from any possible outcome it may result in in the future.	
11	I agree that my anonymised research data may be used by others for future research, and understand that no one will be able to identify me when this data is shared.	
12	I understand that the information I have submitted will be published as a report and I wish to receive a copy of it. Yes/No	
13	I consent to my interview being audio/video recorded. I understand that the recordings will be stored anonymously, using password-protected software and will be used for training, quality control, audit and specific research purposes, and then destroyed two years after the study ends (2020) To note: If you do not want your participation recorded you cannot take part in the study.	
14	I hereby confirm that I understand the inclusion criteria as detailed in the Information Sheet and explained to me by the researcher.	
15	I hereby confirm that: (a) I understand the exclusion criteria as detailed in the Information Sheet and explained to me by the researcher; and (b) I do not fall under the exclusion criteria.	

16	I have informed the researcher of any other research in which I am currently involved or have been involved in during the past 12 months.	
17	I am aware of who I should contact if I wish to lodge a complaint.	
18	I voluntarily agree to take part in this study.	
19	Use of information for this project and beyond: I would be happy for the data I provide to be archived at UCL's electronic data safe haven. I understand that other authenticated researchers will have access to my anonymised data.	
20	I understand that my personal data will be used by a researcher in London, and that safeguards will be put in place by UCL to protect my data. I can contact the UCL data protection officer with any concerns or queries.	

If you would like your contact details to be retained so that you can be contacted in the future by UCL researchers who would like to invite you to participate in follow up studies to this project, or in future studies of a similar nature, please tick the appropriate box below.

Yes, I would be happy to be contacted in this way	
No, I would not like to be contacted	

__________________________ _________________ ____________________

Name of participant Date Signature

__________________________ _________________ ____________________

Name of witness Date Signature
(If applicable)

__________________________ _________________ ____________________

Researcher Date Signature

Appendix 3H: Topic guide (women)

Topic Guide for Interviews: Women's experiences around contraception

Introduce interviewer(s) and background to research:
We are developing an intervention to help women to decide which method of contraception might be the best choice for them, and give information about the different methods on offer.

Aim of today:
We would like to gain your experiences about accessing and using contraception in Botswana, and where you currently gain your contraceptive information from.

The interview will take between 30 minutes and 1 hour, and you will be compensated 100BWP at the end – 50BWP for questions about your experiences around contraception, and 50BWP for questions around mobile phone and internet use in healthcare. Feel free to pause the interview at any time, and take bathroom breaks whenever necessary.

Reassure of confidentiality:
We will keep everything confidential, and nothing you say will be able to be linked back to you.

Let us know at any point if you have any further questions about the research.
We will be recording this for accuracy. If you have an issue with that please raise it now.

Consent form: Sign, and keep information sheet. Explain that if anything makes the participant feel uncomfortable, or they don't want to answer, you can move onto the next question or stop the interview entirely. Ask if the participant has any questions before the interview begins.

Demographic questions:

Age	
Relationship Status (single, married, in a relationship – boyfriend, living together, how long for - concurrent partners)	
Employment status	
Education level	
Religion	
HIV Status – when were you diagnosed, are you using anti-retroviral therapy and if so, which medication?	
Maternal history - Number and ages of children, number of pregnancies, age of first pregnancy, current pregnancy	

A. Contraception use and knowledge

"Now we'll be discussing what you've heard about the different methods of contraception. What do you think is good or bad about [insert type of contraception from list below]?"

[Ask women about what they've heard said about the different methods; any concerns or myths they have heard of; any experiences thy have had, or heard about from friends or family]

Method	Any comments?

The pill	
The patch	
The vaginal ring	
Male condom	
Female condom	
Injectable (Depo-Provera)	
IUD (Copper T or ‘the loop’)	
Implant (Implanon NXT or Jadelle)	
Sterilisation (male or female)	
Withdrawal	

Fertility awareness/period tracking	

- Are you currently using contraception? If so, what method? Do you like it, and if so why? If not, why did you decide not to use a contraceptive method? What helped you make that decision?

- What age did you become sexually active?

- What age did you start using family planning, if you use it?

- What was the first method you used, and why?

- What other methods have you used previously?
  - How long did you use that method for?
  - Why did you change method?
  - What method did you use next?

Method used	For how long?	Reason for change

[Red = third person variations of questions]

- [How do you think women get the information needed about contraception or family planning? Why would they look for it?]

- Previously, how did you get the information you needed about contraception or family planning? Why were you looking for it – what caused you to look? What specific information were you looking for? Did you find it?

- [How do women decide what contraceptive method to use? Why do you think they trust this source of information?]

- How do you decide what contraceptive method to use? School, nurse/clinic, church, TV, Radio, social media, family, friends, partner etc. Did you trust this source of information, and if so why did you trust it?

- Did someone specifically help you with the decision to use contraception, or which method to use:
  - Teacher, nurse/doctor, partner, mum, sister, friend etc?
  - How much did you trust the information that person gave you?

- [Do you think women find it easy or difficult to decide what contraceptive to use? Why do you think this is?]

- Did you find it easy or difficult to decide what contraceptive to use? If yes, why? If no, what was hard about it? What would have made it easier?

- [Do you think women feel comfortable discussing contraception - with partner, mother, father, friends etc? Why/why not?]

- Do you discuss contraception openly - with partner, mother, father, friends etc? Are these discussions comfortable? If not, why?

- [Do you think contraception causes problems for some people? E.g. relationships, with partner, physical/medical. Have you heard of any friends or family members having problems because of contraception?]

- Has being on contraception caused any problems for you? E.g. relationships, with partner, physical/medical. Expand on any specific situations: how did that make you feel? What happened after that? Has that stopped now? Etc.

- [Do you think men, or partners, are supportive of women using contraception? Why/why not? Do women communicate openly with men about contraception and family planning?]

- How does your current partner feel about your choice of contraceptive method? How did previous partners feel about you using family planning?

B. Contraception access and education

- What age do you think women should learn about contraception?

- Did you learn about contraception at school?
    - If so, what did they teach you?
    - If no, what would you have wanted to learn?

- Where would you find information about contraception?
    - E.g. friends, family, school, TV, radio, social media

C. Access to contraception

- Could you describe the process of getting contraception? Where do you go, what does it cost? How easy or difficult is it to get?

- [Do you know of anyone that has been to a clinic for advice contraception? What happened in those consultations?]

- Have you ever been to a clinic about contraception yourself? Can you describe what happened in those consultations?

- Do you think healthcare professionals are supportive of women using contraception?
    - If so, what makes you think this? If not, why not?
    - Do you trust the advice given to you by healthcare professionals? Why/why not?

D. Contraception and sexual health Advice via mobile and internet

- Do you currently use your phone or the internet for healthcare advice?
    - If so, do you like getting information this way? If not, why?

- Do you think you may use your phone or the internet to get healthcare advice in the future?
    - Why or when would you do this?

- Do you think a phone or internet-based intervention promoting contraception use would be popular in Botswana?
    - Why/why not?

- What type of intervention would you use, if any?
    - E.g. website, mobile phone, videos, social media

- As a potential user, what would be the benefits or challenges of an intervention like this?

- What would you want an intervention like this to do? What do you think are the most important features or information to include?

E. Contraceptive Choices website

Before questions start, give a guided tour of the website to highlight some key features: show the main page; effectiveness (and highlight how it changes depending on method chosen); on one of the methods, select “read more about” and read one or two method-specific pages, including the “benefits and side effects” and “did you know” sections; show the selection of videos available and play one or two (depending on time); show the broader range of “did you know” pages on offer and read one in more detail; finally show what’s right for me, answer the questions and show how results can be sent via SMS.

- What was good or bad about the website?

- Did you find the information useful?

- Were the methods discussed appropriate for women in Botswana? What did you think of the information given about the specific methods?

- What did you think of the information in the other areas about contraception more broadly - hormones, infertility, periods etc?

- Was there any information you would like to know that this website did not contain?

- Do you think a Batswana woman would use an intervention like this? If so, why do you think they would? If not, why not?

- Is there any information about family planning you feel you’re missing out on?

- Would a tool like this have helped you get the information you needed when you wanted it? Would it have changed your decisions around family planning?

“What’s Right for Me” tool:

- What did you think of the questions asked?
    - Are there any other questions that you think should be included?
    - Are there any questions that did not seem relevant to you?

- Do you think you would have used this feature, or something similar, to help with your decision making about contraception in the past?

- Do you think you would use this feature, or something similar, in the future?

Videos:

- Would you use videos like these to get information about contraception?

- Did you like the style of the videos? E.g. Doctors answering patient concerns

- Is there any different content or contraceptive information you would like to watch in the form of a video?

- Do you like the way the videos are displayed on the website?

Other comments/Open discussion:

- What do you think of the overall look or design of the website? Would you change anything? E.g. logo, colours, fonts, images, more or less text/pictures/images/videos

- Is there anything else you would have liked in this website?

- Is there anything you think is unnecessary and could be removed?

F. Conclusion

- Do you have any further comments?

Reassure participant of confidentiality and remind them that they can get in touch if they feel uncomfortable about anything to do with the research/their participation, or if they have any further questions or comments. If appropriate, offer details of services or other organisations that may be of interest.
Organise payment, and then thank you!

Appendix 3I: Information sheet (eHealth specialist)

Participant Information Sheet For eHealth Specialists

UCL Research Ethics Committee Approval ID Number: 11863/001

YOU WILL BE GIVEN A COPY OF THIS INFORMATION SHEET

Title of Study:
"A digital intervention to improve contraception choice, uptake and effective use in Botswana: acceptability, feasibility, design and content": a sub-study of "Development of a Tool to Measure User Preferences for Contraceptives in Botswana"

Name and Contact Details of the Researcher(s):
Ms. Caitlin Bawn, B.A., M.S., M.Sc.
EGA Institute for Women's Health, University College London (UCL)

Name and Contact Details of the Principal Researcher:
Dr. Chelsea Morroni, B.A., M.P.H., M.Phil., MBChB, Ph.D., DTM&H, DFSRH

1. **Invitation Paragraph**
   You are being asked to take part in a research study. Your participation is voluntary, which means you can choose whether or not to participate. Before you make a decision you will need to know the purpose of the study, the possible risks

and benefits of being in the study and what you will have to do if you decide to participate. The research team is going to talk with you about the study and give you this consent document to read.

Please ask the researcher to explain anything you do not understand, including any language contained in this form. If you decide to participate, you will be asked to sign a consent form and a copy will be given to you. Keep this information sheet, in it you will find contact information and answers to questions about the study. You may ask to have this form read to you.

2. **What is the project's purpose?**
   The purpose of this study is to develop and test a tool for measuring user preferences in regard to contraceptive characteristics in Botswana, and to utilise feedback from potential users, healthcare providers and experts in both family planning and eHealth to design an eHealth intervention that will improve contraceptive care and use.

3. **Why have I been chosen?**
   You are being asked to be in this study because you have expertise in e-health. Your feedback and insight will be invaluable to the design and content of the intervention.

4. **Do I have to take part?**
   Taking part in the study is entirely voluntary. If you decide to participate or not to participate there will be no loss of benefits to which you are otherwise entitled. You may discontinue participation at any time, without giving a reason without penalty or loss of benefits. If you decide to withdraw you will be asked what you wish to happen to the data you have provided up that point.

5. **What will happen to me if I take part?**
   You are being asked to participate in an interview on eHealth in Botswana, and will be participating in a single individual interview that will vary in length from half an hour upwards to one hour. You will be asked about the acceptability and feasibility of an eHealth intervention to improve contraception uptake from the perspective of your area of expertise. This study will take place at the time and place of your choosing. You will complete all study-related questionnaires at this location, and will not be asked to go anywhere else for your participation in this study.

6. **Will I be recorded and how will the recorded media be used?**
   The interview will be audio-recorded and transcribed for research purposes. If you choose not to be recorded, you will no longer be able to continue to take part in the study. However, it is important to know that your name or other identifying information will not be on the recording or the transcription. These recordings will be kept in a secure location – in a locked filing cabinet in a locked office in the University of Botswana. Only research staff will have a key to access this office. Audio recordings will be destroyed two years after the study is over (in 2020). You will also be asked to complete a demographic questionnaire, which we will use for descriptive purposes of this study.

7. **What are the possible disadvantages and risks of taking part?**
   A possible risk is a breach of confidentiality, which could cause embarrassment or discomfort. To reduce this risk, your privacy will be carefully protected by standard procedures including protecting your identity by de-identifying data (removing all personally identifying information, such as your name, age, gender, from your

record), and the storage of all data in locked cabinets or on secure, password-protected computer servers.

8. **What are the possible benefits of taking part?**
   You will not benefit directly from taking part. However, the result of this study may lead to the development of an intervention that could improve uptake of contraception. Understanding the current situation in Botswana for eHealth, in combination with your feedback and insight, could significantly impact the success of the potential intervention.

9. **What if something goes wrong?**
   If you have questions, concerns or complaints regarding your participation in this research study or if you have any questions about your rights as a research subject, you should speak with the principal investigator, Dr. Chelsea Morron. If a member of the research team cannot be reached or you want to talk to someone other than those working on the study, you may contact the Chair of the UCL Research Ethics Committee.

10. **Will my taking part in this project be kept confidential?**
    Every attempt will be made by the investigators to ensure that all information collected in this study remains strictly confidential, except as may be required by law. Information about child abuse or intent to harm self or others will be reported to authorities as required by law.

    Prior to analysis, all data from this study will be de-identified (any personally identifying information, such as your name, age, gender, will be removed from your record). Authorised representatives from the University of Pennsylvania and the Institutional Review Boards will have access to records from your participation in this study. Any documents you sign, from which you can be identified by name, will be kept in locked drawer at the University of Botswana and will be kept private. These documents will be destroyed when the study is over. Audio recordings from this study will be destroyed two years after the study is over (in 2020). If any publication or presentation results from this research, you will not be identified by name.

11. **Limits to confidentiality**
    Confidentiality will be respected unless there are compelling and legitimate reasons for this to be breached. If this was the case we would inform you of any decisions that might limit your confidentiality.

12. **Use of Deception**

No deception will be used as part of the study. Your input will help mould the intervention described above and will serve no other purpose.

13. **What will happen to the results of the research project?**
    The results of this research project will be written up as part of a PhD thesis, and potentially published in various peer-reviewed journals. Findings will also be presented to the various clinics involved, Botswana’s Ministry of Health, and at relevant international conferences. No participant will be able to be identified in any write up or presentation of the study. Once the study is completed, all participants will be invited by phone/text to attend a special presentation of findings at the clinics, specifically designed for participants.

14. **Data Protection Privacy Notice**

Notice:
The data controller for this project will be University College London (UCL). The UCL Data Protection Office provides oversight of UCL activities involving the processing of personal data, and can be contacted.

Your personal data will be processed for the purposes outlined in this notice. The legal basis that would be used to process your personal data will be [the provision of your consent.] You can provide your consent for the use of your personal data in this project by completing the consent form that has been provided to you.

Your personal data will be processed so long as it is required for the research project. If we are able to anonymise or pseudonymise the personal data you provide we will undertake this, and will endeavour to minimise the processing of personal data wherever possible.

The following individuals may use or share your information for this research study:

- The investigators for the study and the study team
- The University of Pennsylvania and Botswana Institutional Review Boards (the committees charged with overseeing research on human subjects) and University of Pennsylvania Office of Regulatory Affairs
- The University of Pennsylvania Office of Human Research (the office which monitors research studies)
- University College London (UCL)'s Research Ethics Committee (the committee that oversees research involving human subjects)
- Other authorized personnel at UCL, Penn and the University of Botswana, including offices that support research operations
- Other research personnel with access to the databases for research and/or study coordination and as otherwise approved by the IRB

If you are concerned about how your personal data is being processed, please contact UCL in the first instance. If you remain unsatisfied, you may wish to contact the Information Commissioner's Office (ICO). Contact details, and details of data subject rights, are available on the ICO website at: https://ico.org.uk/for-organisations/data-protection-reform/overview-of-the-gdpr/individuals-rights/

15. Who is organising and funding the research?

Funding sponsor: The Bill and Melinda Gates Foundation
The project is organised by researchers from the University of Botswana, University of Pennsylvania and University College London.

16. Contact for further information

If you have any queries or need further information, please contact:

Dr Chelsea Morroni

Ms. Caitlin Bawn

Thank you for reading this information sheet and for considering to take part in this research study.

Appendix 3J: Consent form {eHealth specialist}

CONSENT FORM FOR E-HEALTH SPECIALISTS

Please complete this form after you have read the Information Sheet and/or listened to an explanation about the research.

Title of Study: “A digital intervention to improve contraception choice, uptake and effective use in Botswana: acceptability, feasibility, design and content”: a sub-study of “Development of a Tool to Measure User Preferences for Contraceptives in Botswana”

Department: EGA Institute of Women’s Health, University College London
Name and Contact Details of the Researcher(s):
Caitlin Bawn, B.A., M.S., M.Sc.
EGA Institute for Women’s Health, University College London (UCL)

Name and Contact Details of the Principal Researcher:
Chelsea Morroni, B.A., M.P.H., M.Phil., MBChB, Ph.D., DTM&H, DFSRH

Name and Contact Details of the UCL Data Protection Officer:
UCL’s Data Protection Officer is Lee Shailer, who can be contacted.

This study has been approved by the UCL Research Ethics Committee: Project ID number: 11863/001

Thank you for considering taking part in this research. The person organising the research must explain the project to you before you agree to take part. If you have any questions arising from the Information Sheet or explanation already given to you, please ask the researcher before you decide whether to join in. You will be given a copy of this Consent Form to keep and refer to at any time.

I confirm that I understand that by ticking/initialling each box below I am consenting to this element of the study. I understand that it will be assumed that unticked/initialled boxes means that I DO NOT consent to that part of the study. I understand that by not giving consent for any one element that I may be deemed ineligible for the study.

		Tick Box
1	I confirm that I have read and understood the Information Sheet for the above study. I have had an opportunity to consider the information and what will be expected of me. I have also had the opportunity to ask questions which have been answered to my satisfaction, and would like to take part in an individual interview	
2	I understand that I will be able to withdraw my data from the study before 2020, when it will be destroyed.	
3	I consent to the processing of my personal information (provide information on what personal information specifically will be collected) for the purposes explained to me. I understand that such information will be handled in accordance with all applicable data protection legislation.	
4	I understand that all personal information will remain confidential and that all efforts will be made to ensure I cannot be identified (unless you state otherwise, because of the research design or except as required by law). I understand that my data gathered in this study will be stored anonymously and securely. It will not be possible to identify me in any publications.	
5	I understand that my information may be subject to review by responsible individuals from the University (to include sponsors and funders) for monitoring and audit purposes.	
6	I understand that my participation is voluntary and that I am free to withdraw at any time without giving a reason, without my legal rights being affected. I understand that if I decide to withdraw, any personal data I have provided up to that point will be deleted unless I agree otherwise.	
7	I understand the potential risks of participating and the support that will be available to me should I become distressed during the course of the research.	
8	I understand the direct/indirect benefits of participating.	
9	I understand that the data will not be made available to any commercial organisations but is solely the responsibility of the researcher(s) undertaking this study.	
10	I understand that I will not benefit financially from this study or from any possible outcome it may result in in the future.	

11	I agree that my anonymised research data may be used by others for future research, and understand that no one will be able to identify me when this data is shared.	
12	I understand that the information I have submitted will be published as a report and I wish to receive a copy of it. Yes/No	
13	I consent to my interview being audio/video recorded. I understand that the recordings will be stored anonymously, using password-protected software and will be used for training, quality control, audit and specific research purposes, and then destroyed two years after the study ends (2020) To note: If you do not want your participation recorded you cannot take part in the study.	
14	I hereby confirm that I understand the inclusion criteria as detailed in the Information Sheet and explained to me by the researcher.	
15	I hereby confirm that: (a) I understand the exclusion criteria as detailed in the Information Sheet and explained to me by the researcher; and (b) I do not fall under the exclusion criteria.	
16	I have informed the researcher of any other research in which I am currently involved or have been involved in during the past 12 months.	
17	I am aware of who I should contact if I wish to lodge a complaint.	
18	I voluntarily agree to take part in this study.	
19	Use of information for this project and beyond I would be happy for the data I provide to be archived at [insert location]. I understand that other authenticated researchers will have access to my anonymised data.	
20	I understand that my personal data will be used by a researcher in London, and that safeguards will be put in place by UCL to protect my data. I can contact the UCL data protection officer with any concerns or queries.	

If you would like your contact details to be retained so that you can be contacted in the future by UCL researchers who would like to invite you to participate in follow up studies to this project, or in future studies of a similar nature, please tick the appropriate box below.

Yes, I would be happy to be contacted in this way	

No, I would not like to be contacted	

Name of participant ________________ Date ________________ Signature ________________

Name of witness
(If applicable) ________________ Date ________________ Signature ________________

Researcher ________________ Date ________________ Signature ________________

Appendix 3K: Topic guide (eHealth specialist)

Topic Guide for Interviews: eHealth specialists

Introduce interviewer(s) and background to research:
We are developing an intervention to help women to decide which method of contraception might be the best choice for them, and give information about the different methods on offer.

Aim of today:
We would like to ask questions about your experiences as a eHealth specialist in Botswana, discussing current successes, challenges and the potential for an intervention to improve contraception uptake/use.

The interview will take between 30 minutes and 1 hour. Feel free to pause the interview at any time.

Reassure of confidentiality:
We will keep everything confidential, and nothing you say will be able to be linked back to you.

Let us know at any point if you have any further questions about the research.
We will be recording this for accuracy. If you have an issue with that please raise it now.

Consent form: Sign, and keep information sheet. Ask if the participant has any questions before the interview begins.

[Ask about themselves - broad, non-specific questions before starting interview.]

Start of questions:

A. Background and current interventions

- Tell me about your background in eHealth - how long have you been working in this field, what brought you to specialise in this area?
- What projects are you working on at the moment? What existing projects do you think we should know about?
- What research is happening in this area at the moment?

B. eHealth in Botswana: readiness, successes and challenges

- Botswana’s eHealth readiness: Is the infrastructure ready for eHealth interventions? Is the culture ready for eHealth interventions?
- What makes an intervention likely to work?
- What current initiatives are proving most successful, and why?
- What health conditions are proving most usable by the field of eHealth? Why are these specific conditions acceptable for use in eHealth interventions?
- What challenges do eHealth interventions face in Botswana? Infrastructure, social and cultural aspects, usability etc

C. Potential for eHealth intervention in field of contraception/sexual health

- Do you think eHealth is a suitable way to disseminate information about contraception to patients?
- Do any eHealth interventions exist in the field of contraception/sexual health? If so, what are they? If not, why do you think that is?
- As an eHealth specialist, what challenges do you see an eHealth intervention facing?
- What would make this specific intervention most successful? Considering the content, what infrastructure should be utilised and why?

Any last comments or questions?

Reassure participant of confidentiality and remind them that they can get in touch if they feel uncomfortable about anything to do with the research/their participation, or if they have any further questions or comments. If appropriate, offer details of services or other organisations that may be of interest.

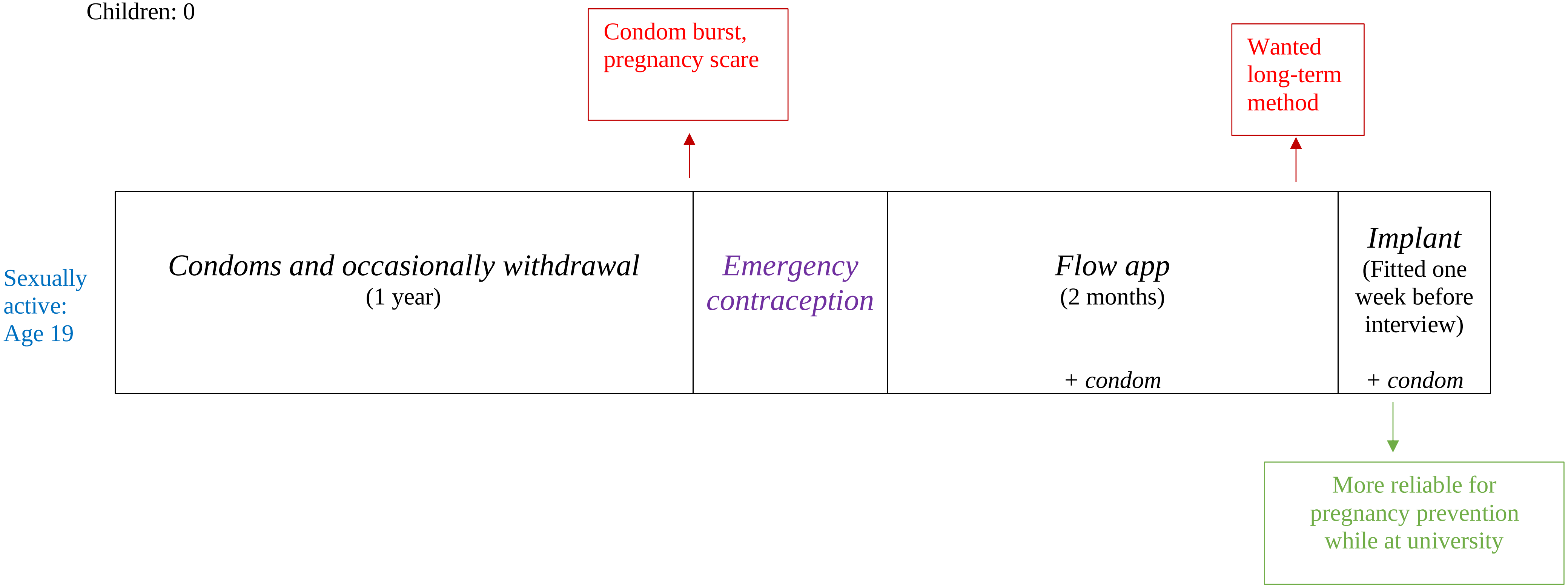
Thank you!

Appendix 4A: Individual timelines of women's contraceptive histories

Key:
Reasons for stopping or changing method
Reason for current contraceptive method

Contraceptive method
Pregnancy/childbirth

Participant 00101
Age: 20
Education: Tertiary
HIV Status: Negative
Children: 0



Sexually active: Age 19

Condoms and occasionally withdrawal
(1 year)

Condom burst, pregnancy scare

Emergency contraception

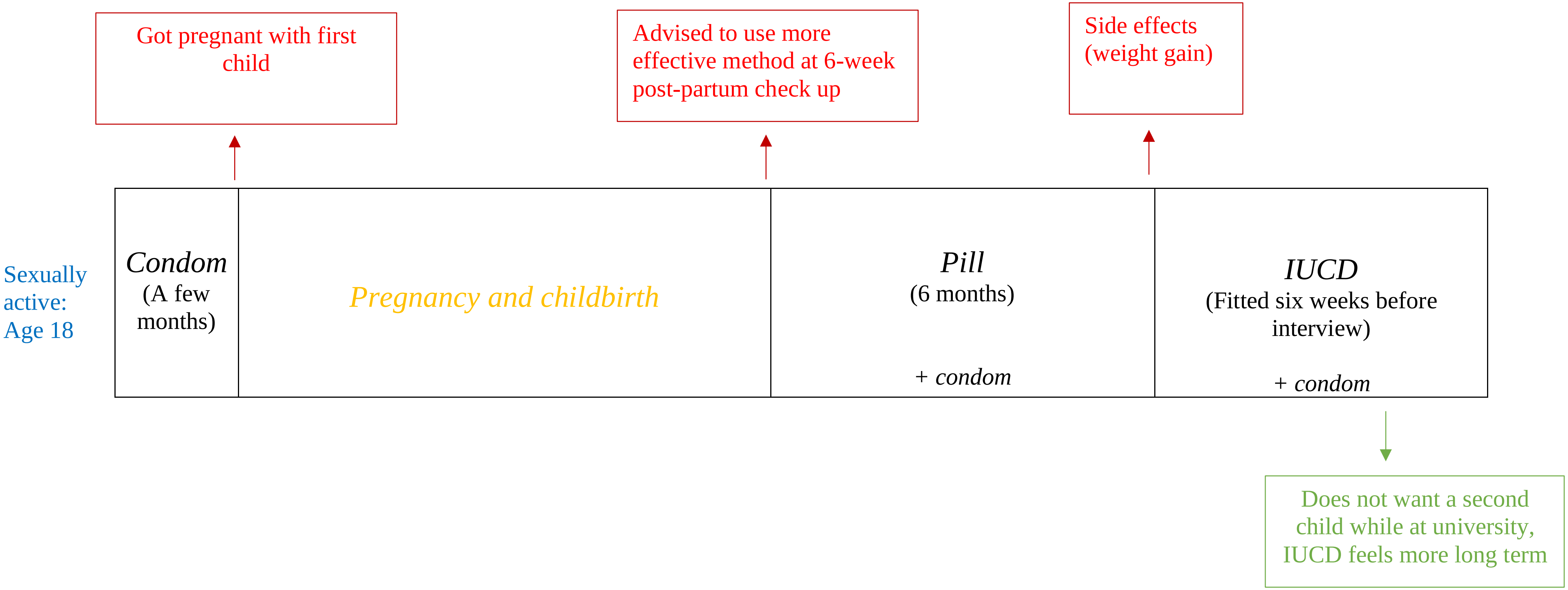
Flow app
(2 months)
+ *condom*

Wanted long-term method

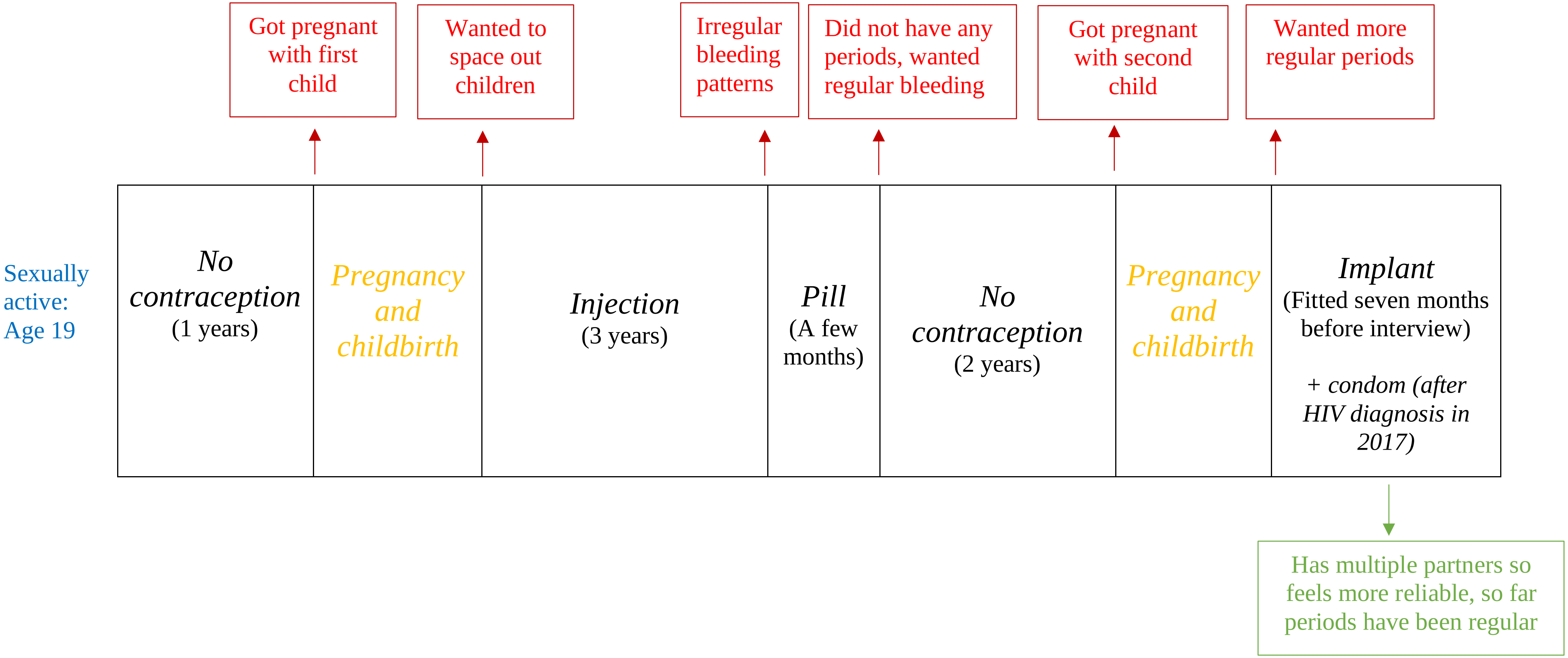
Implant
(Fitted one week before interview)
+ *condom*

More reliable for pregnancy prevention while at university

Participant 00201
Age: 21
Education: Tertiary
HIV Status: Negative
Children: One (19 months old)



Participant 00302
Age: 29
Education: Secondary
HIV Status: Positive (diagnosed 2017)
Children: Two (9 years old, 3 years old)



Sexually active: Age 19

No contraception (1 years)

Got pregnant with first child

Pregnancy and childbirth

Wanted to space out children

Injection (3 years)

Irregular bleeding patterns

Pill (A few months)

Did not have any periods, wanted regular bleeding

No contraception (2 years)

Got pregnant with second child

Pregnancy and childbirth

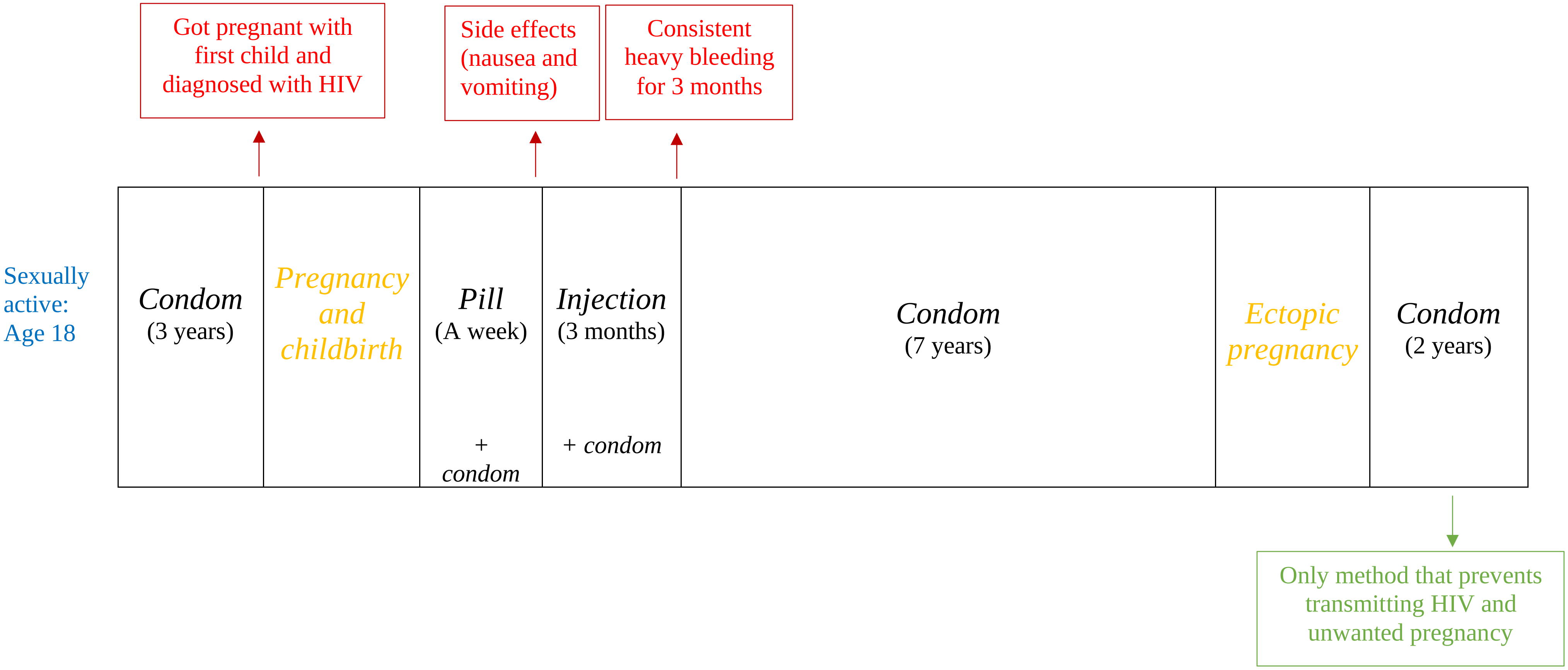
Wanted more regular periods

Implant (Fitted seven months before interview)

+ *condom (after HIV diagnosis in 2017)*

Has multiple partners so feels more reliable, so far periods have been regular

Participant 00402
Age: 33
Education: Secondary
HIV Status: Positive (diagnosed 2008)
Children: One (12 years old)



Got pregnant with first child and diagnosed with HIV

Side effects (nausea and vomiting)

Consistent heavy bleeding for 3 months

Sexually active: Age 18

Condom (3 years)

Pregnancy and childbirth

Pill (A week) + *condom*

Injection (3 months) + *condom*

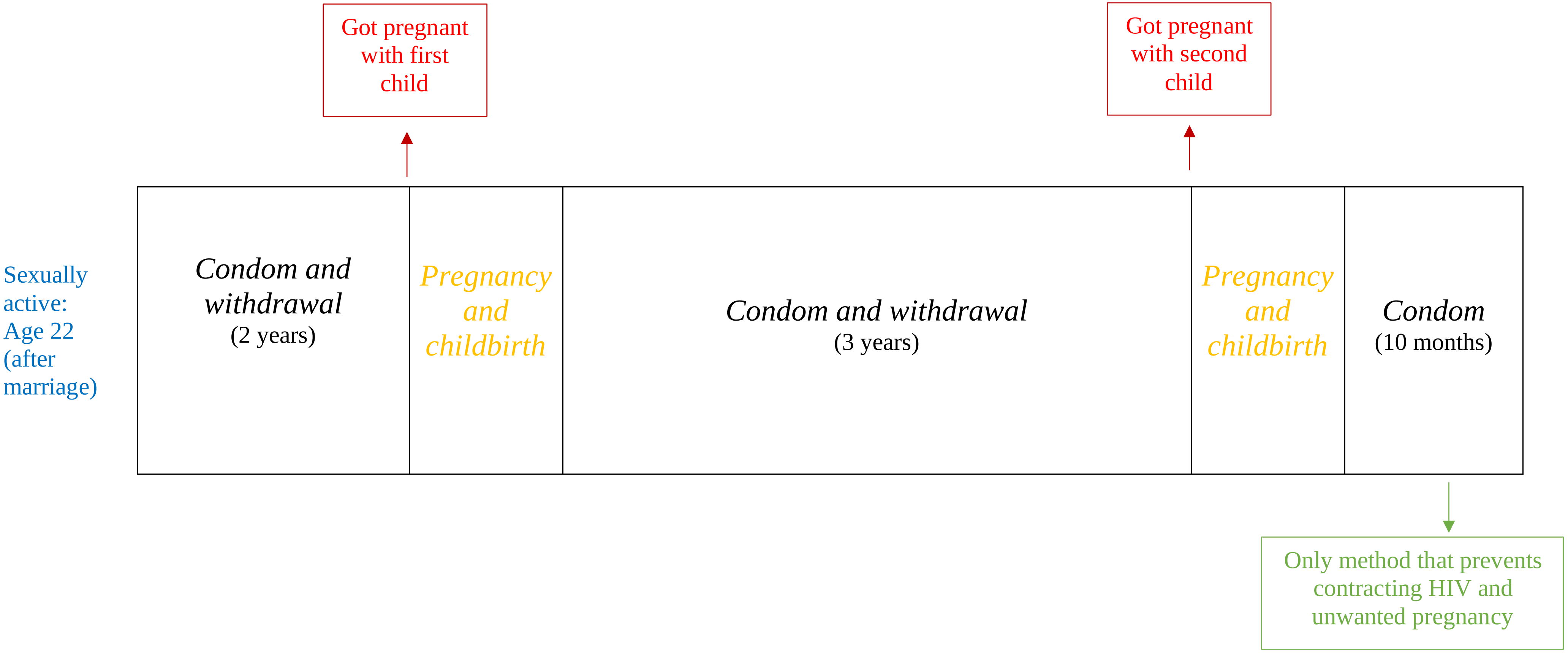
Condom (7 years)

Ectopic pregnancy

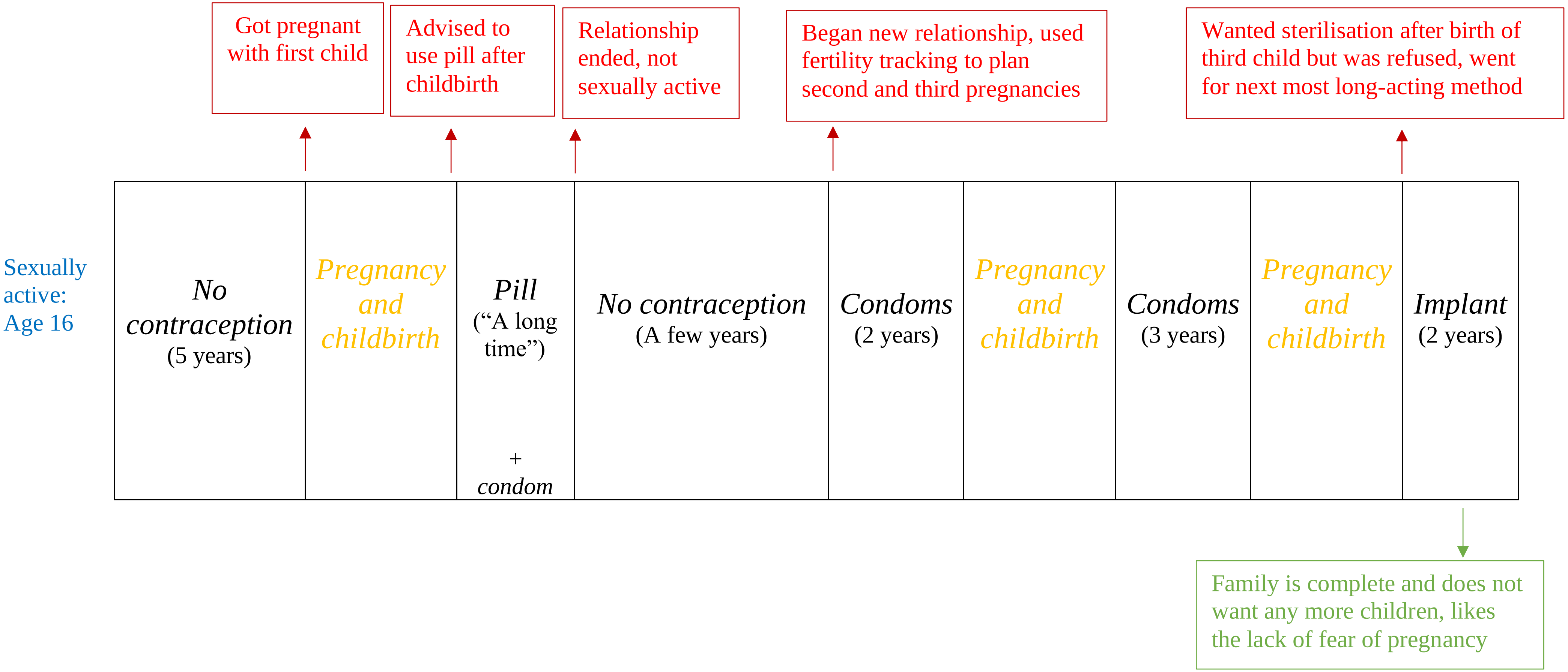
Condom (2 years)

Only method that prevents transmitting HIV and unwanted pregnancy

Participant 00502
Age: 29
Education: Tertiary
HIV Status: Negative
Children: Two (5 years old, 10 months old)



Participant 00601
Age: 40
Education: Tertiary
HIV Status: Negative
Children: Three (19 years old, 6 years old, 2.5 years old)



Got pregnant with first child

Advised to use pill after childbirth

Relationship ended, not sexually active

Began new relationship, used fertility tracking to plan second and third pregnancies

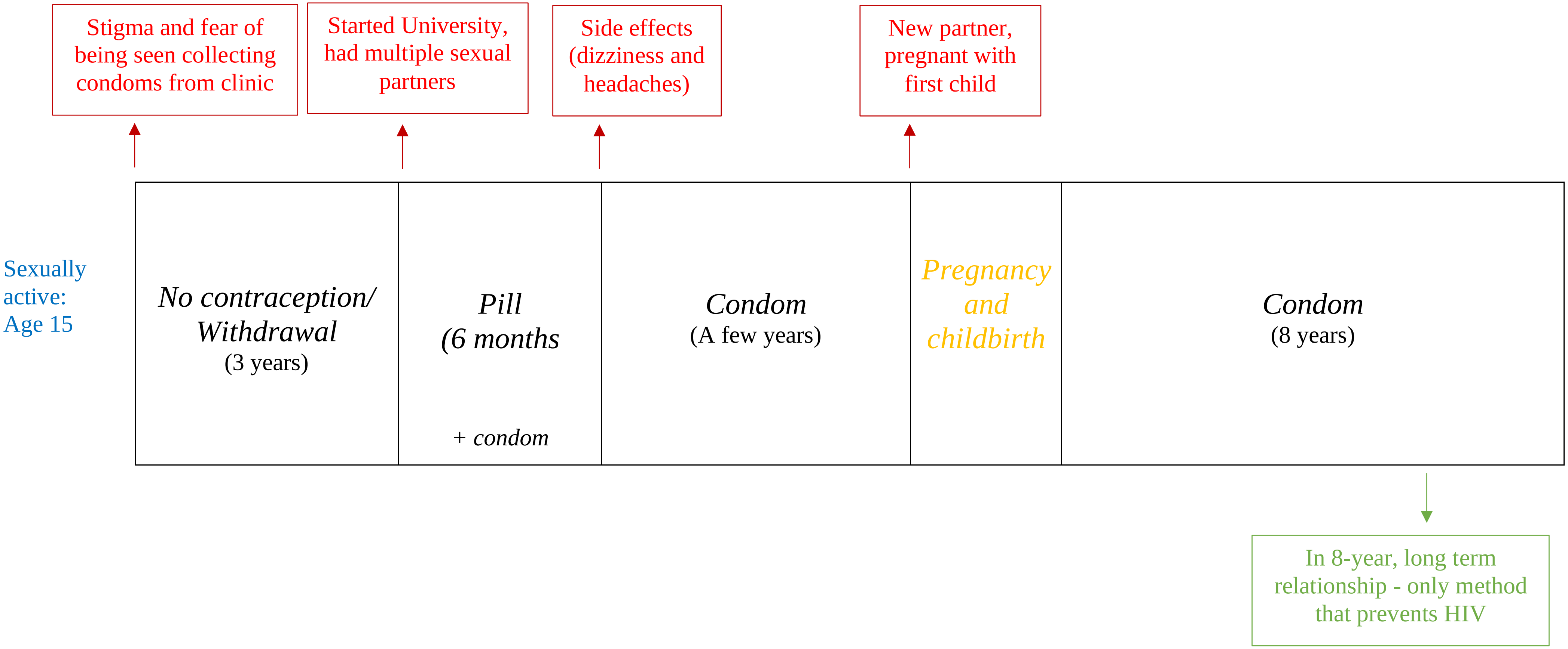
Wanted sterilisation after birth of third child but was refused, went for next most long-acting method

Sexually active: Age 16

No contraception (5 years)	*Pregnancy and childbirth*	*Pill* (“A long time”) + *condom*	*No contraception* (A few years)	*Condoms* (2 years)	*Pregnancy and childbirth*	*Condoms* (3 years)	*Pregnancy and childbirth*	*Implant* (2 years)

Family is complete and does not want any more children, likes the lack of fear of pregnancy

Participant 00701
Age: 34 / Education: Tertiary
HIV Status: Negative
Children: One (8 years old)



Stigma and fear of being seen collecting condoms from clinic

Started University, had multiple sexual partners

Side effects (dizziness and headaches)

New partner, pregnant with first child

Sexually active: Age 15

No contraception/ Withdrawal (3 years)

Pill (6 months + *condom*

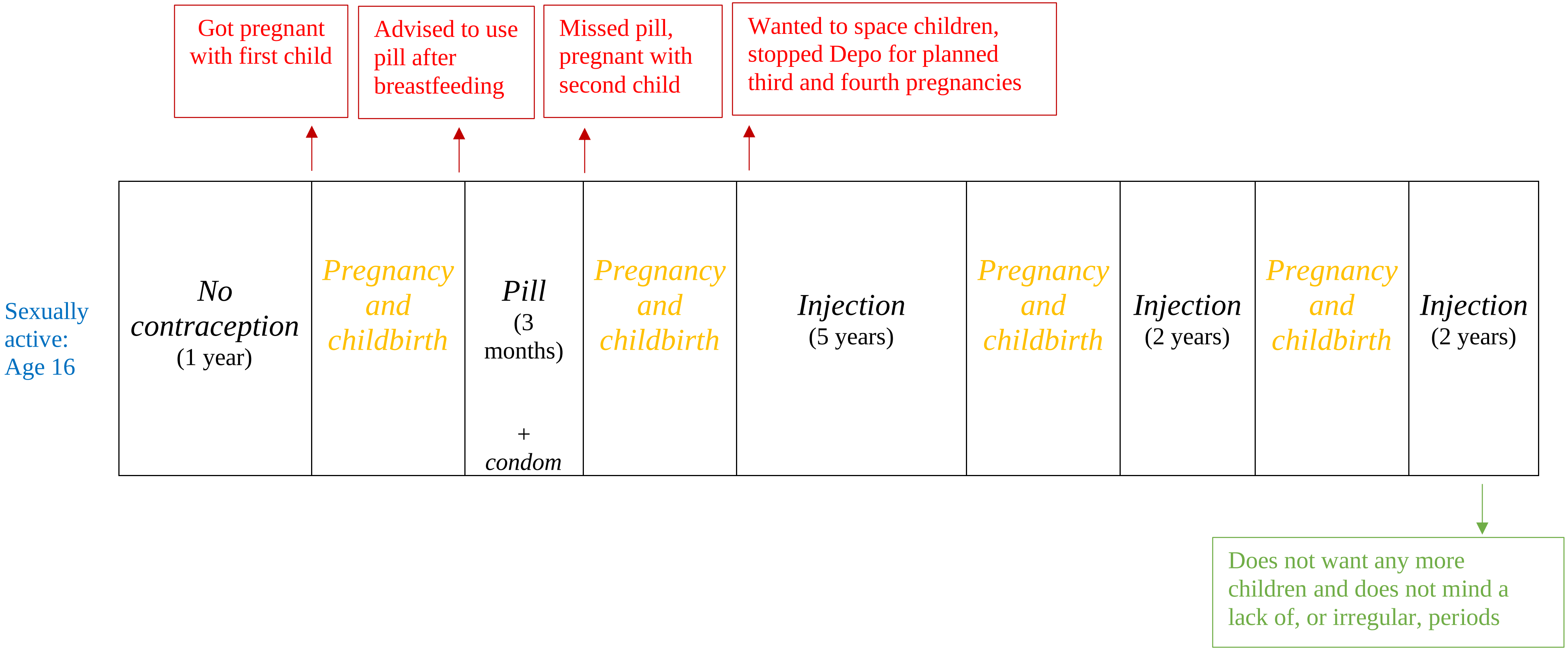
Condom (A few years)

Pregnancy and childbirth

Condom (8 years)

In 8-year, long term relationship - only method that prevents HIV

Participant 00803
Age: 29
Education: Primary
HIV status: Negative
Children: Four (13 years old, 10 years old, 5 years old, 2 years old)



Got pregnant with first child

Advised to use pill after breastfeeding

Missed pill, pregnant with second child

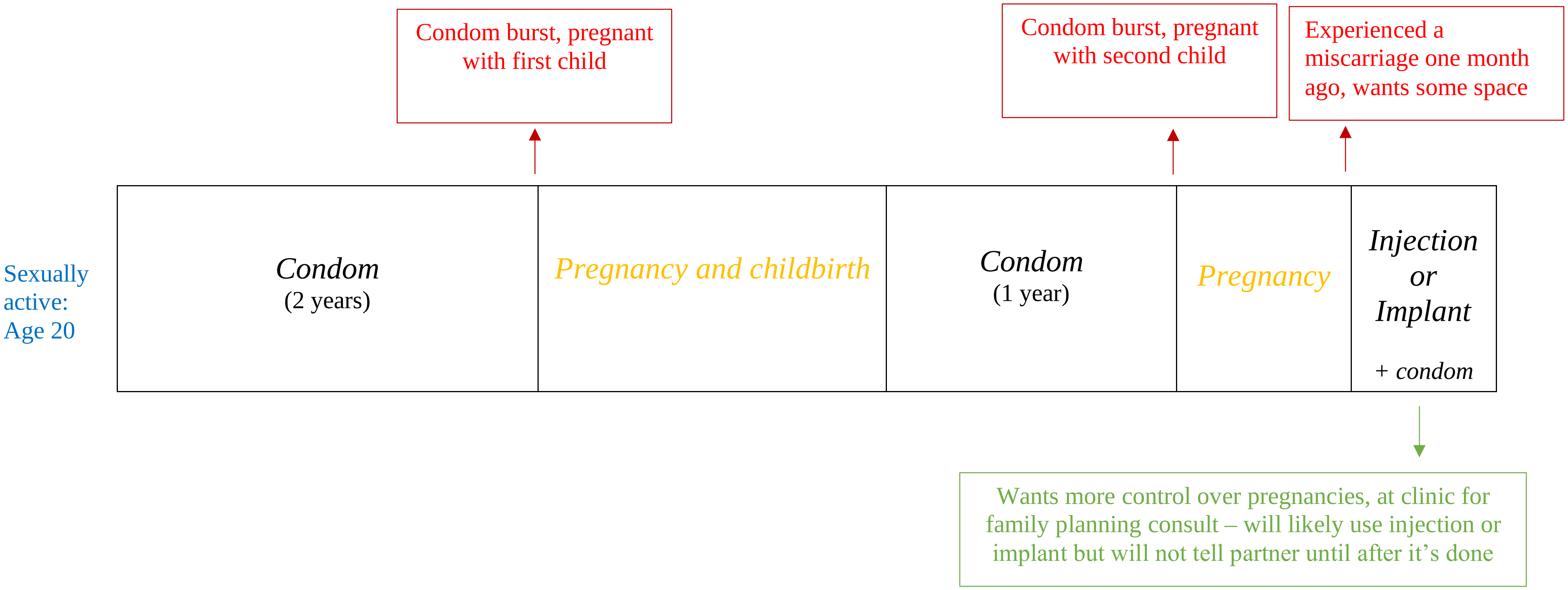
Wanted to space children, stopped Depo for planned third and fourth pregnancies

Sexually active: Age 16

No contraception (1 year)	*Pregnancy and childbirth*	*Pill* (3 months) + *condom*	*Pregnancy and childbirth*	*Injection* (5 years)	*Pregnancy and childbirth*	*Injection* (2 years)	*Pregnancy and childbirth*	*Injection* (2 years)

Does not want any more children and does not mind a lack of, or irregular, periods

Participant 00903
Age: 25
Education: Secondary
HIV Status: Negative
Sexually active at 20



Sexually active: Age 20

Condom
(2 years)

Pregnancy and childbirth

Condom
(1 year)

Pregnancy

Injection or Implant
+ *condom*

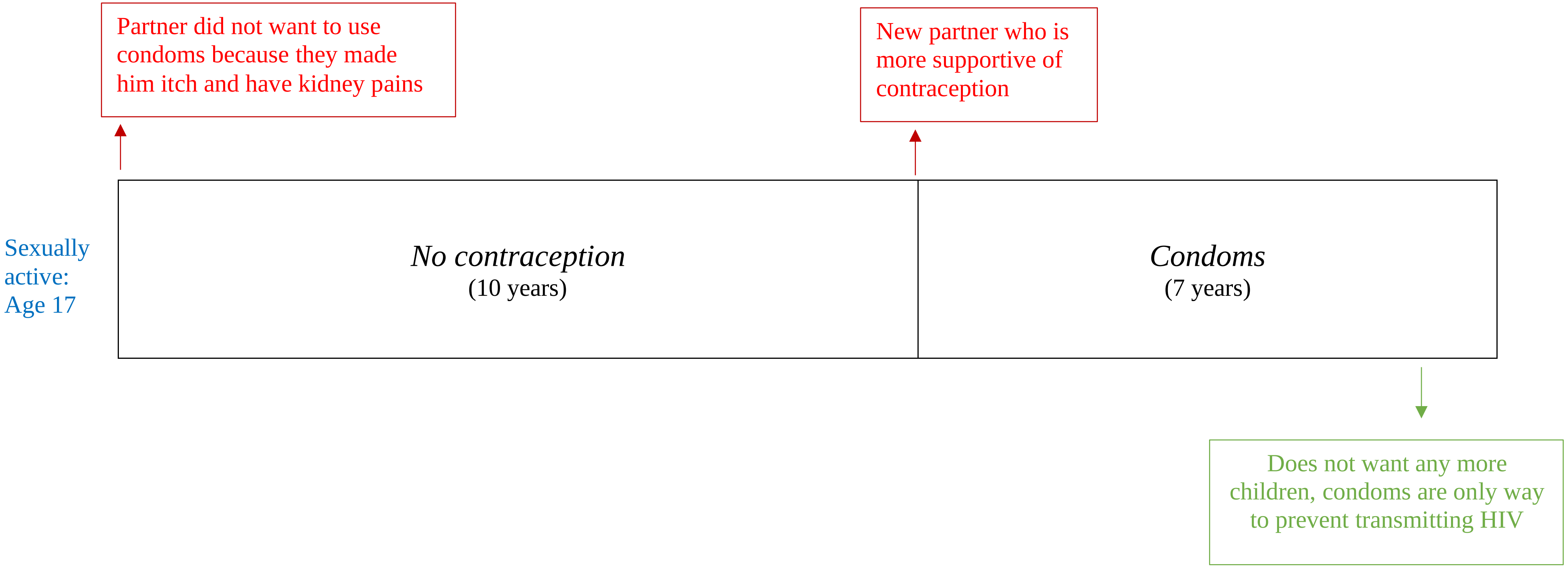
Condom burst, pregnant with first child

Condom burst, pregnant with second child

Experienced a miscarriage one month ago, wants some space

Wants more control over pregnancies, at clinic for family planning consult – will likely use injection or implant but will not tell partner until after it's done

Participant 01004
Age: 32
Education: Secondary
HIV positive, diagnosed one month ago (May 2019)
Sexually active at 17
Children: Three (14 years old, 13 years old, 9 years old)



Partner did not want to use condoms because they made him itch and have kidney pains

New partner who is more supportive of contraception

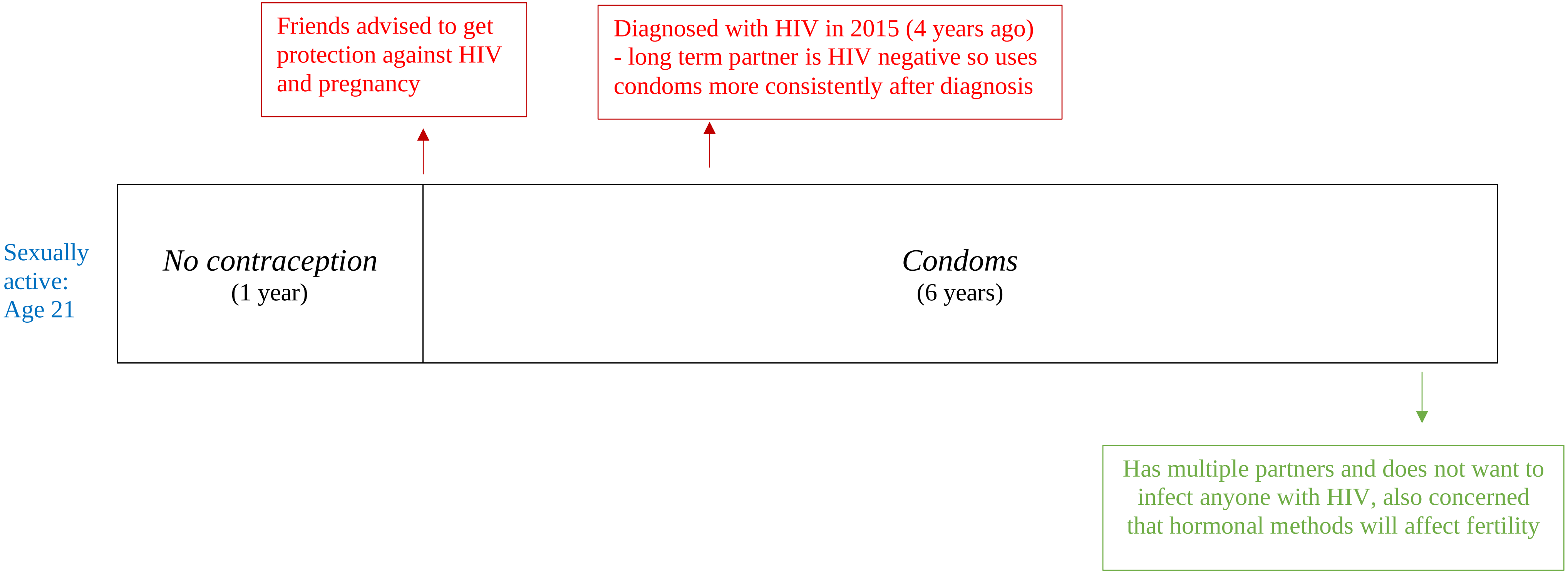
Sexually active: Age 17

No contraception
(10 years)

Condoms
(7 years)

Does not want any more children, condoms are only way to prevent transmitting HIV

Participant 01104
Age: 28
Education: Secondary
HIV: Positive, diagnosed 2015
Children: 0



Friends advised to get protection against HIV and pregnancy

Diagnosed with HIV in 2015 (4 years ago) - long term partner is HIV negative so uses condoms more consistently after diagnosis

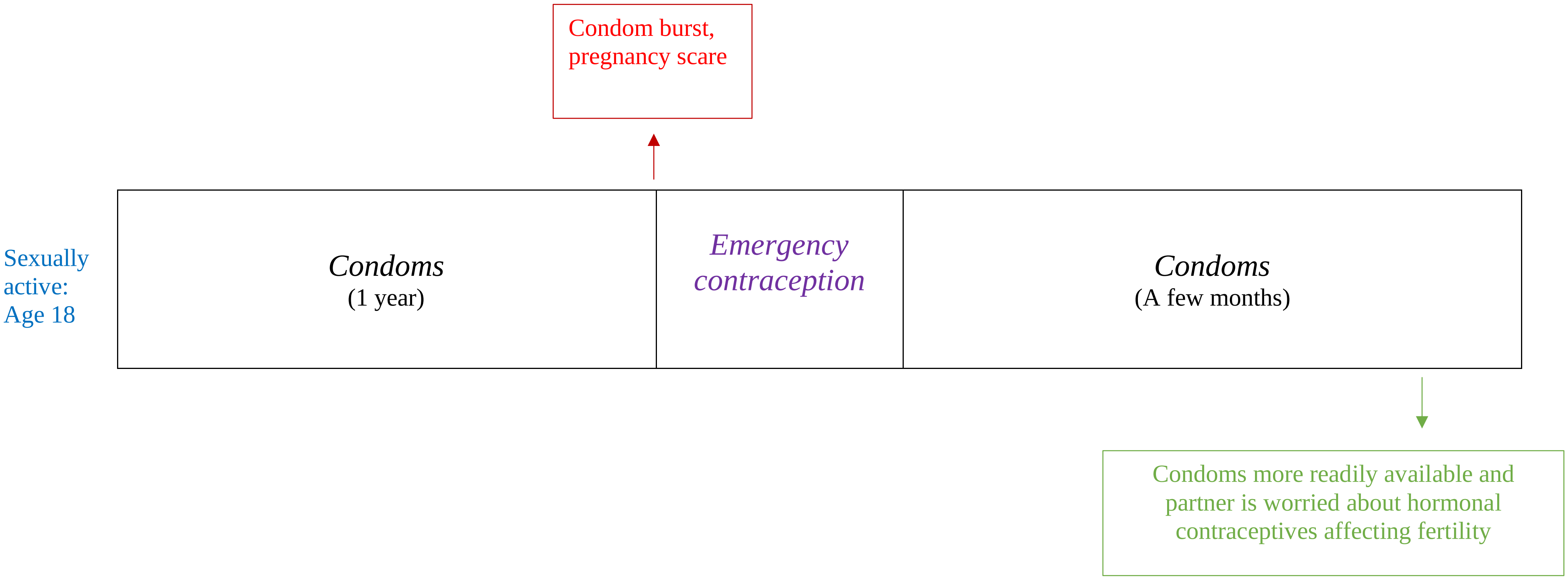
Sexually active: Age 21

No contraception
(1 year)

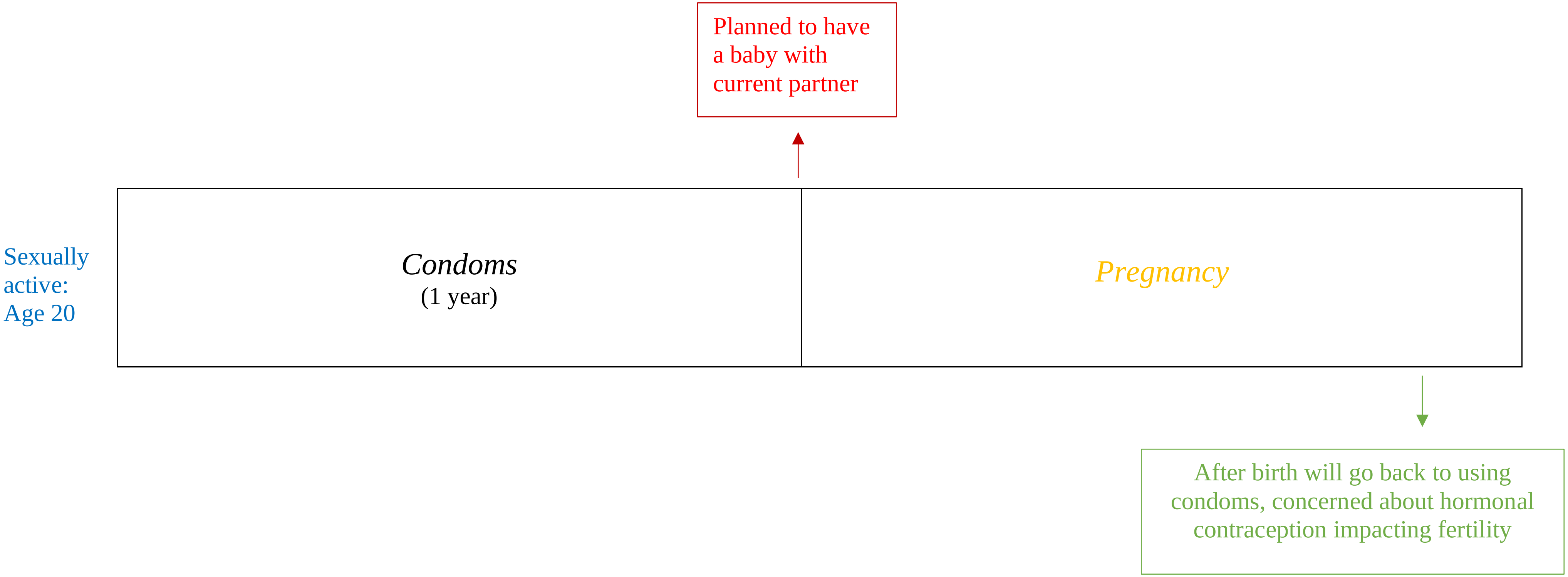
Condoms
(6 years)

Has multiple partners and does not want to infect anyone with HIV, also concerned that hormonal methods will affect fertility

Participant 01204
Age: 19
Education: Tertiary
HIV status: Negative
Children: 0



Participant 01304
Age: 21
Education: Tertiary
HIV status: Negative
Children: Currently pregnant with first child



Planned to have a baby with current partner

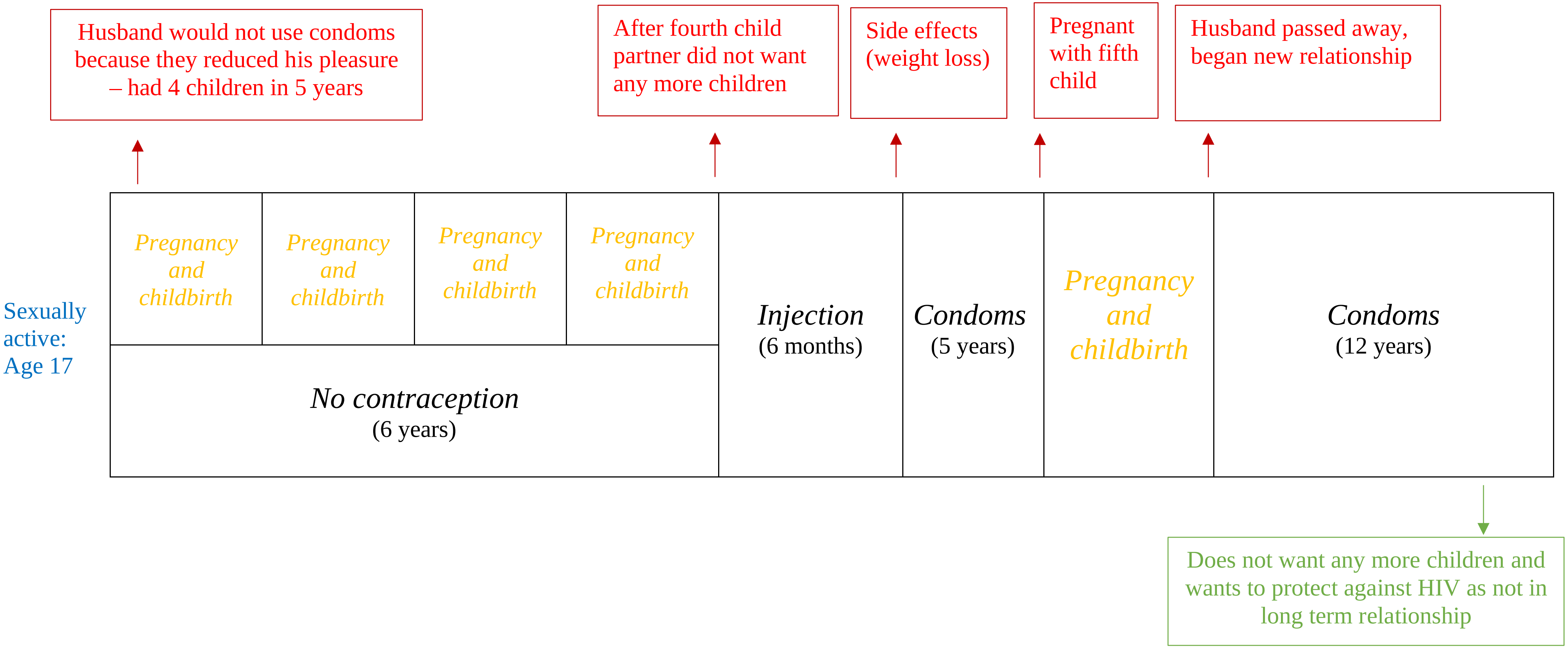
Sexually active: Age 20

Condoms
(1 year)

Pregnancy

After birth will go back to using condoms, concerned about hormonal contraception impacting fertility

Participant 01404
Age: 42
Education: Secondary
HIV status: Negative
Children: Five (24 years old, 22 years old, 21 years old, 19 years old, 13 years old)



Husband would not use condoms because they reduced his pleasure – had 4 children in 5 years

After fourth child partner did not want any more children

Side effects (weight loss)

Pregnant with fifth child

Husband passed away, began new relationship

Sexually active: Age 17

Pregnancy and childbirth

Pregnancy and childbirth

Pregnancy and childbirth

Pregnancy and childbirth

No contraception (6 years)

Injection (6 months)

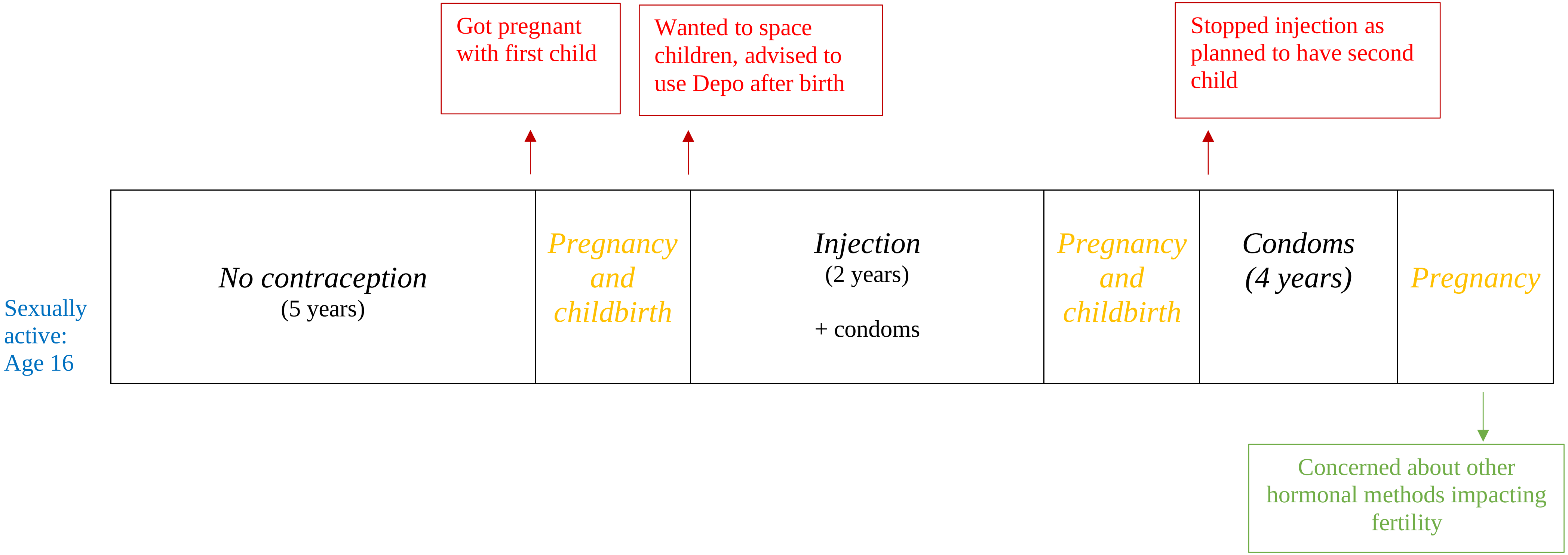
Condoms (5 years)

Pregnancy and childbirth

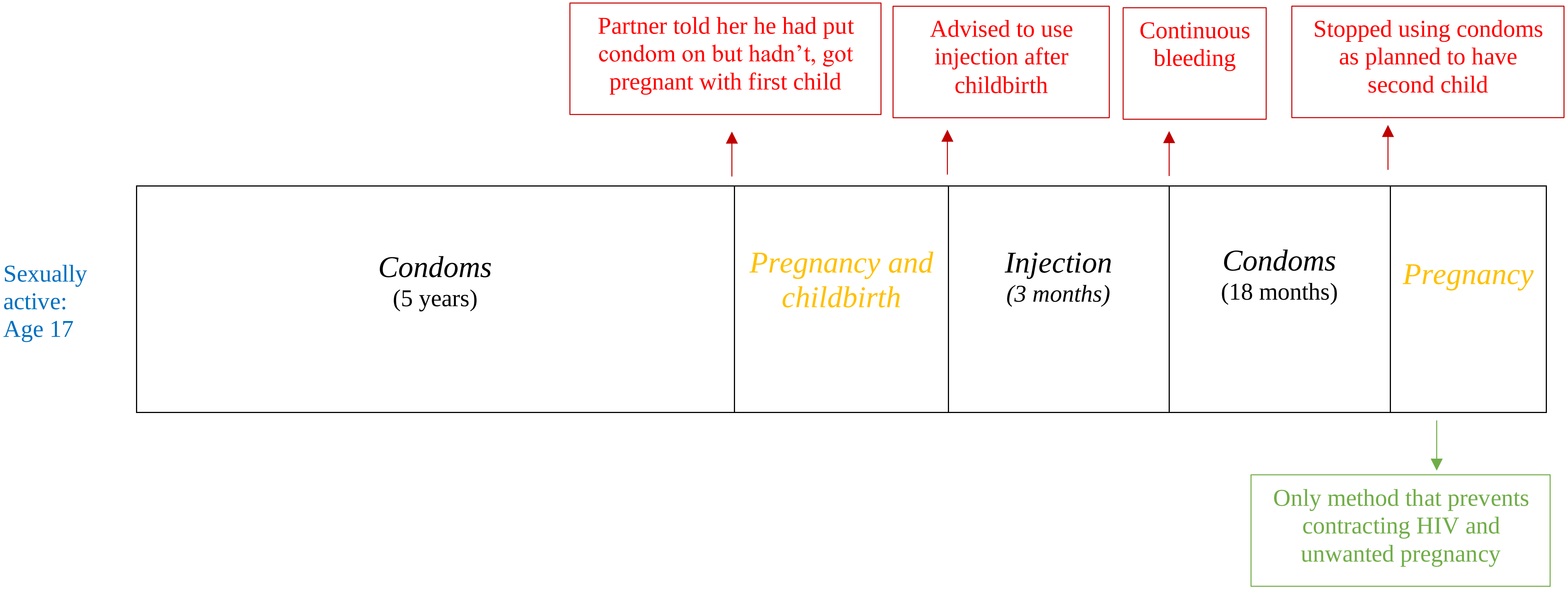
Condoms (12 years)

Does not want any more children and wants to protect against HIV as not in long term relationship

Participant 01503
Age: 32
Education: Secondary
HIV Status: Negative
Children: Three (11 years old, 5 years old and currently 5 months pregnant)



Participant 01604
Age: 25
Education: Secondary
HIV status: Positive (diagnosed as a baby)
Children: One year 8 months old, 2 months pregnant



Sexually active: Age 17

Condoms
(5 years)

Partner told her he had put condom on but hadn’t, got pregnant with first child

Pregnancy and childbirth

Advised to use injection after childbirth

Injection
(3 months)

Continuous bleeding

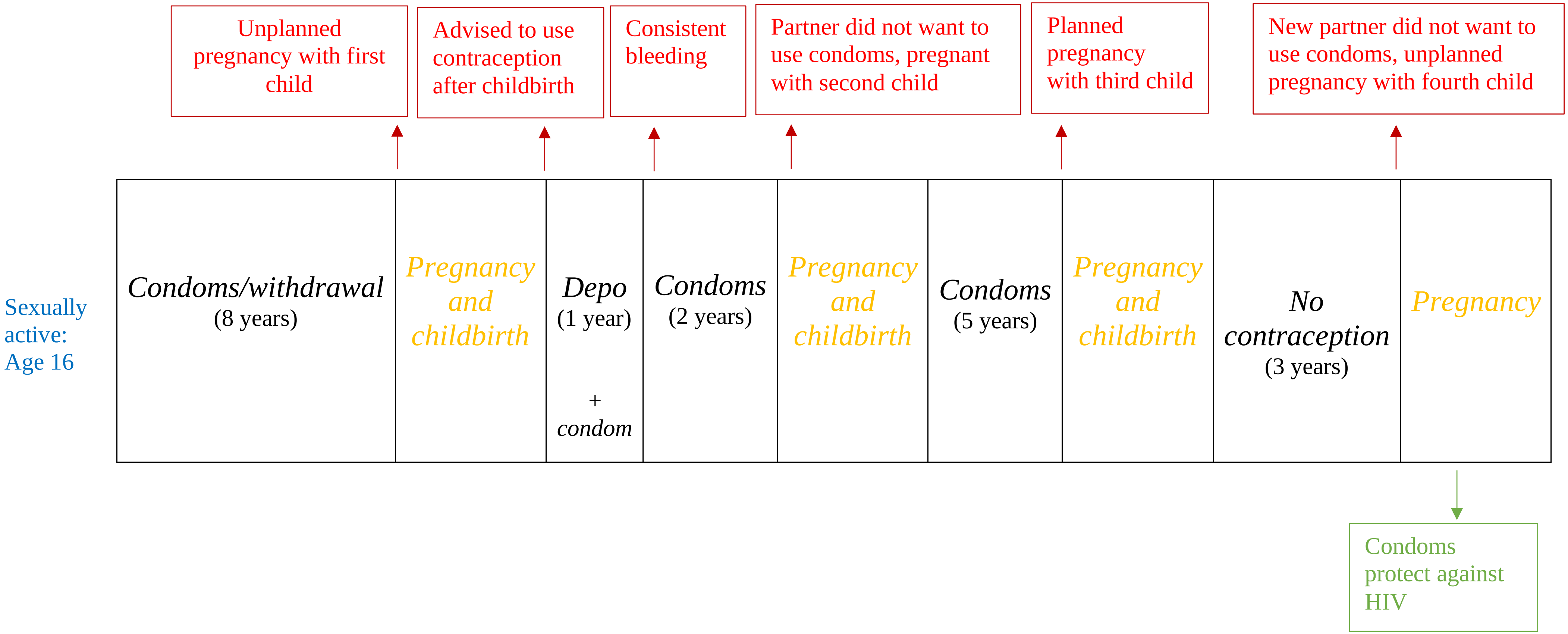
Condoms
(18 months)

Stopped using condoms as planned to have second child

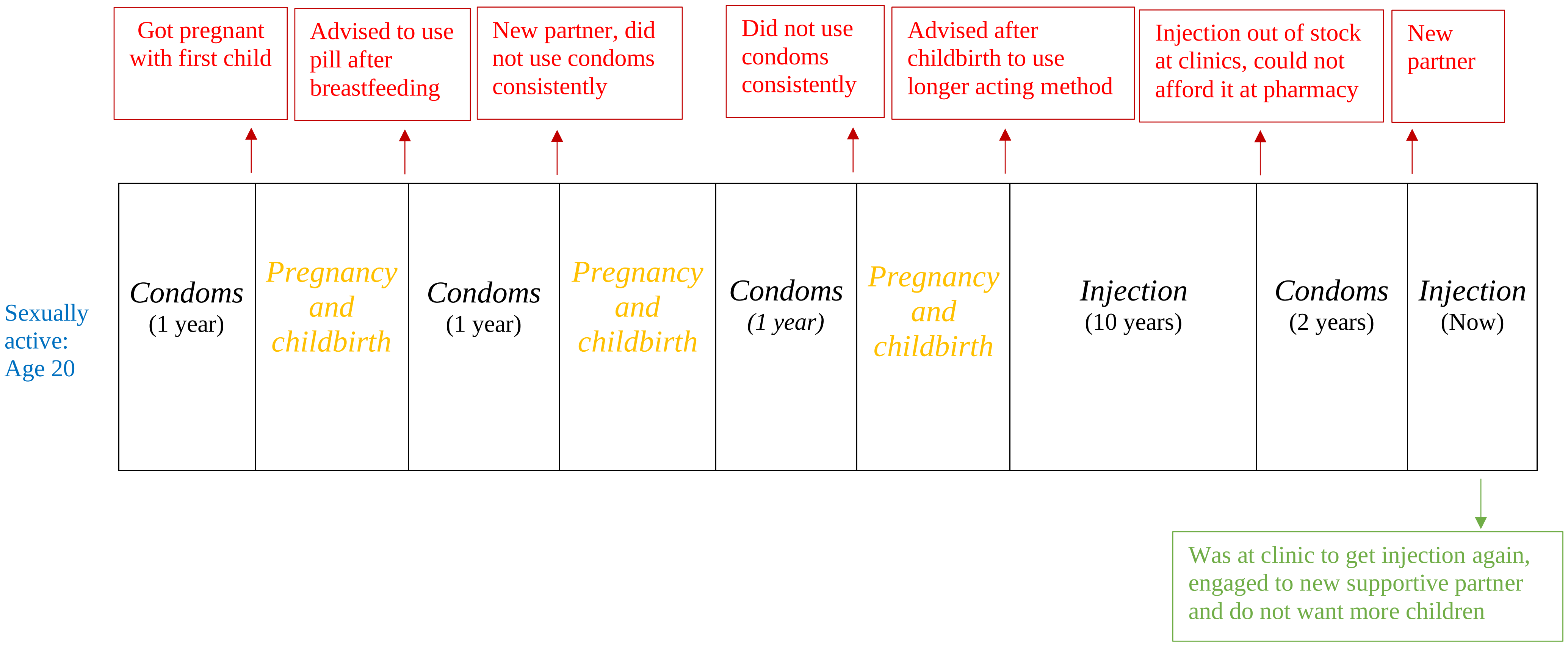
Pregnancy

Only method that prevents contracting HIV and unwanted pregnancy

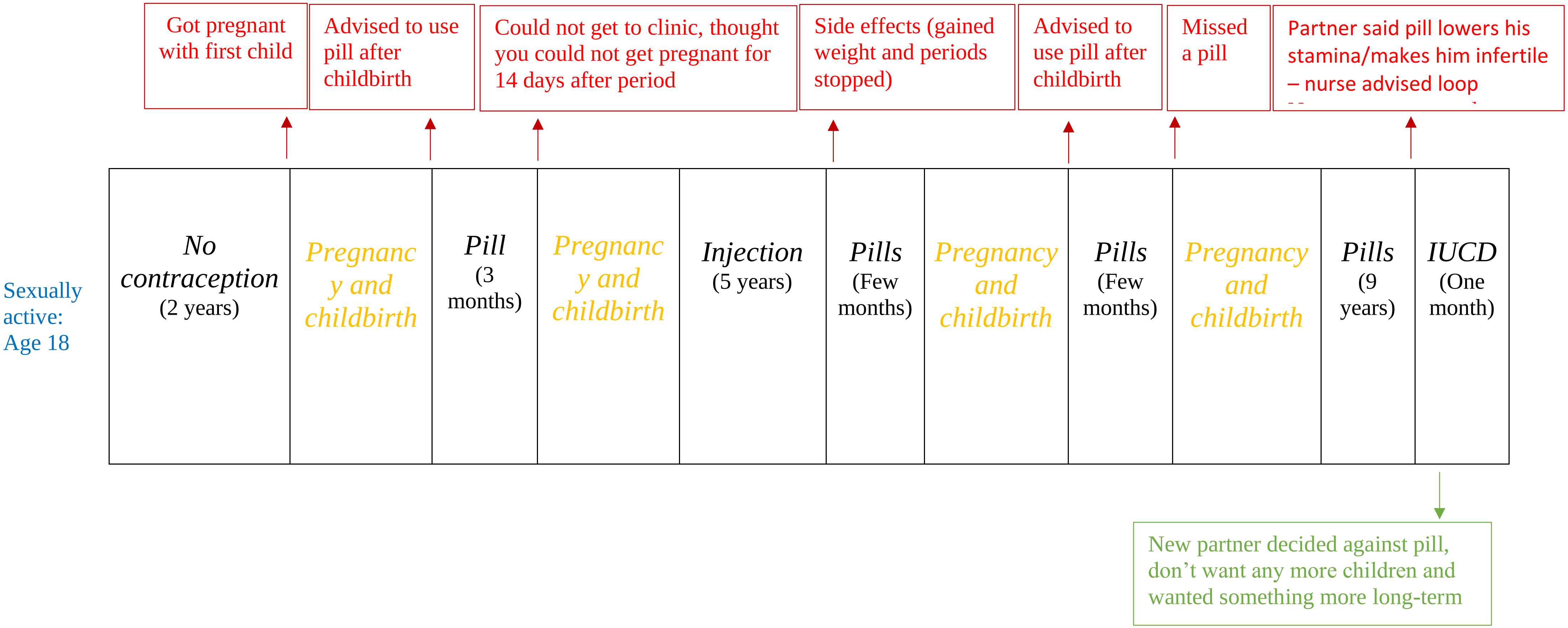
Participant 01704
Age: 39
Education: Secondary
HIV status: Positive (diagnosed after third child, 2016)
Children: Four (14 years old, 10 years old, 3 year old, 3 months pregnant)



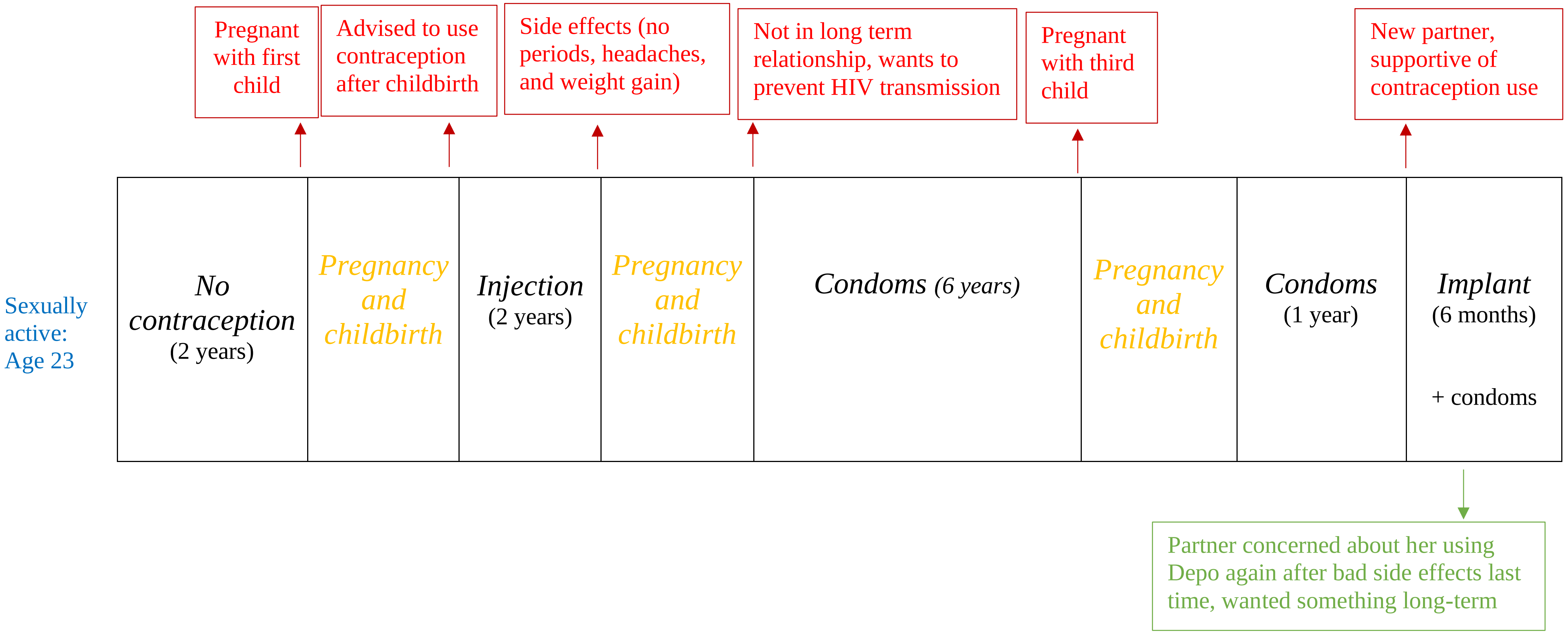
Participant 01803
Age: 37
Education: Secondary
HIV status: Positive, (diagnosed 2004)
Children: Three (17 years old, 15 years old, 13 years old)



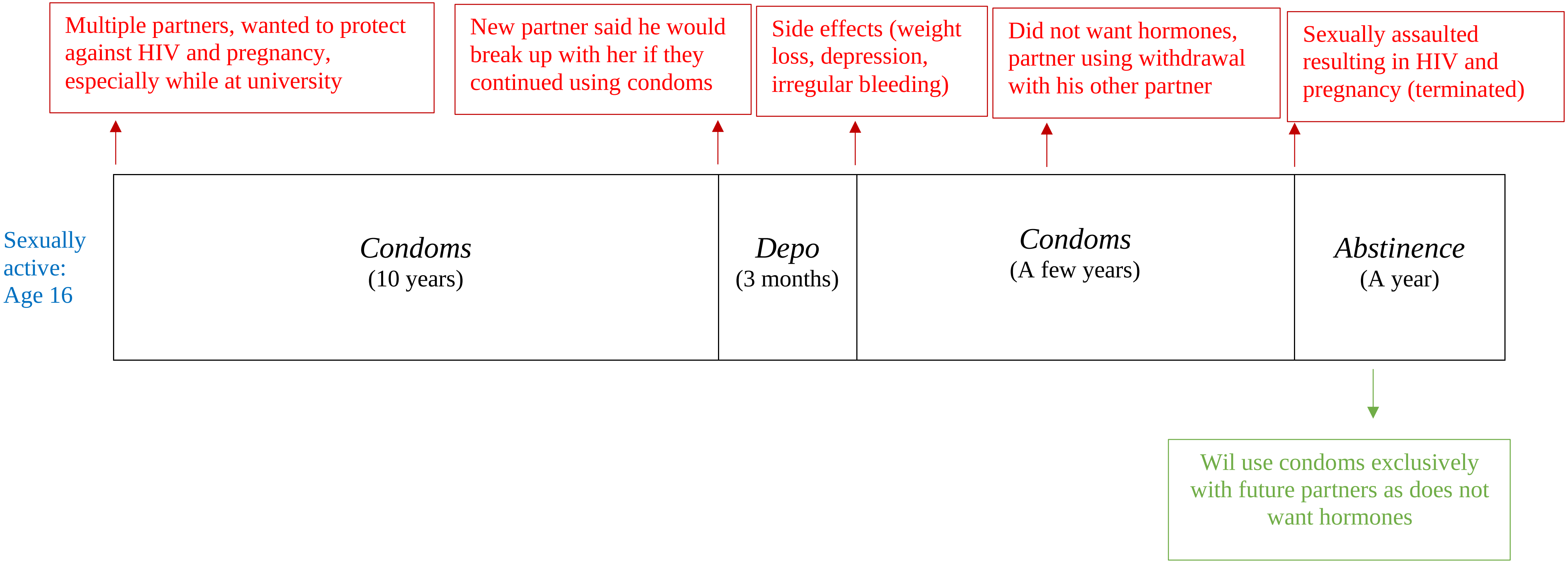
Participant 01903
Age: 41
Education: Secondary
HIV status: Negative
Children: Four (21 years old, 19 years old, 12 years old, and 10 years old)



Participant 02002
Age: 38
Education: Secondary
HIV status: Positive (diagnosed 2002)
Children: Three (12 years old, 10 years old, 2 years old)



Participant 02103
Age: 33
Education: Tertiary
HIV status: Positive (diagnosed 2017)
Children: One pregnancy (terminated 2017)



Multiple partners, wanted to protect against HIV and pregnancy, especially while at university

New partner said he would break up with her if they continued using condoms

Side effects (weight loss, depression, irregular bleeding)

Did not want hormones, partner using withdrawal with his other partner

Sexually assaulted resulting in HIV and pregnancy (terminated)

Sexually active: Age 16

Condoms
(10 years)

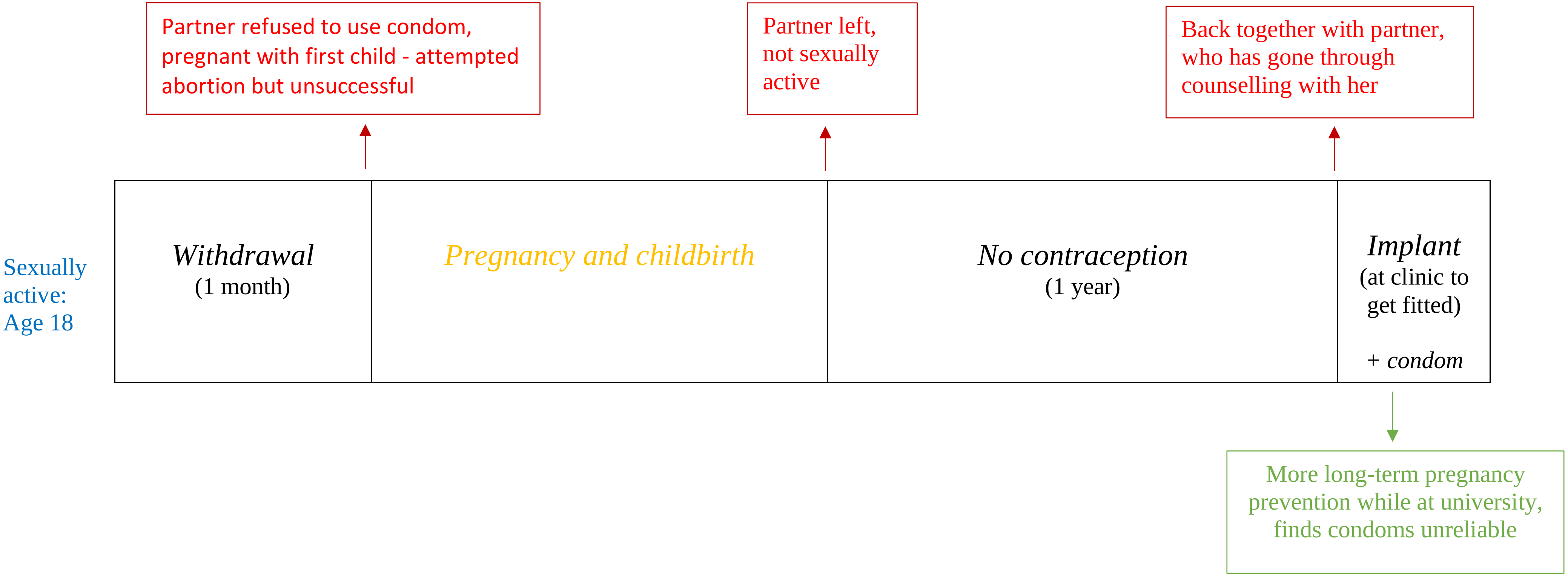
Depo
(3 months)

Condoms
(A few years)

Abstinence
(A year)

Wil use condoms exclusively with future partners as does not want hormones

Participant 02201
Age: 21
Education: Tertiary
HIV status: Negative
Children: One (3 years old)



Partner refused to use condom, pregnant with first child - attempted abortion but unsuccessful

Partner left, not sexually active

Back together with partner, who has gone through counselling with her

Sexually active: Age 18

Withdrawal
(1 month)

Pregnancy and childbirth

No contraception
(1 year)

Implant
(at clinic to get fitted)
+ *condom*

More long-term pregnancy prevention while at university, finds condoms unreliable