

**Feasibility and acceptability of early infant
male circumcision as an HIV prevention
intervention in Zimbabwe**

Thesis submitted in fulfilment of the requirements of the University
College London degree of Doctor of Philosophy (PhD) in
Social Science

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Author's Declaration

I, Webster Mavhu, 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.

Abstract

The overall aim of the research outlined in this PhD thesis is to assess the feasibility and acceptability of early infant male circumcision (EIMC) as an HIV prevention intervention in Zimbabwe in order to inform roll out. Mathematical modelling estimates that circumcising 1.9 million Zimbabwean men aged 15-49 by 2015 could avert 42% of new HIV infections that would have otherwise occurred by 2025. Since 2009, Zimbabwe has provided voluntary medical male circumcision (VMMC) to over 300,000 adult and adolescent men. In order to ensure that the protective effect of male circumcision is sustained in the longer-term, Zimbabwe intends to roll out EIMC alongside adult MC, starting 2015. Although EIMC's effects on HIV will take longer to realise, infant circumcision is easier, safer and cheaper than adult MC. Further, EIMC may more effectively prevent HIV acquisition as the procedure is carried out before the individual becomes sexually active, negating the risk associated with acquisition or transmission of HIV during the healing period. Since large-scale EIMC for HIV prevention, or indeed for other reasons, has never been practised in Zimbabwe or more widely in Southern Africa, there are concerns around its feasibility and acceptability. Clearly, acceptability of infant MC will have a bearing on uptake, roll out and subsequent effectiveness in preventing HIV. In Zimbabwe, there are also concerns about the feasibility of rolling out EIMC for HIV prevention within the context of existing health services, many of which are already overburdened and understaffed.

The PhD research is in two phases. The first phase describes a systematic review and thematic synthesis I conducted to explore parental reasons for non-adoption of infant MC for HIV prevention in sub-Saharan Africa. Additionally, this phase qualitatively explored hypothetical acceptability of EIMC among parents and wider family as well as hypothetical feasibility and acceptability of EIMC among health-care workers. Findings from the first phase informed the design of a study to pilot EIMC roll out. The second phase was nested within a trial that assessed the feasibility, safety, acceptability and cost of rolling out EIMC using devices in Zimbabwe. It explored actual acceptability of EIMC among parents and wider family as well as actual feasibility and acceptability of EIMC among health-care workers. Findings from both phases informed recommendations for a demand generation intervention for EIMC which is currently being developed and will subsequently be tested for impact. Given that EIMC has been identified as a key HIV prevention intervention for sustaining the prevention gains anticipated through VMMC across sub-Saharan Africa, the findings of this research are likely to have broad implications for HIV prevention across the region.

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List of Abbreviations

AAP	American Academy of Pediatrics
AccuCirc	Atraumatic Circumcision device
AE	Adverse Event
AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ART	Antiretroviral Therapy
BCF	Behaviour Change Facilitator
BCG	Bacillus Calmette-Guérin
CFA	Circumcision Foundation of Australia
CINAHL	Cumulative Index to Nursing and Allied Health Literature
DAAC	District AIDS Action Committee
DMO	District Medical Officer
DNO	District Nursing Officer
DRC	Democratic Republic of Congo
EIMC	Early Infant Male Circumcision
Embase	Excerpta Medica Database
EMLA	Eutectic Mixture of Local Anaesthetics cream
ENTREQ	Enhancing Transparency in Reporting the Synthesis of Qualitative Research
FGD	Focus Group Discussion
HCT	HIV Counselling and Testing
HCW	Health-care Worker
HIV	Human Immunodeficiency Virus
HP	Health Promoter
HPO	Health Promoting Officer
IDI	In-depth Interview
IMC	Infant Male Circumcision
MC	Male Circumcision
MeSH	Medline Medical Subject Headings
mHealth	Mobile Health
MMR	Measles, Mumps and Rubella vaccine
PMD	Provincial Medical Director
PO	Participant Observation
PPTCT	Prevention of Parent to Child Transmission of HIV

PSI	Population Services International
RCP	Royal Australasian College of Physicians
RCT	Randomised Controlled Trial
SD	Standard Deviation
SMS	Short Message Service
STI	Sexually Transmitted Infection
UCL	University College London
UNAIDS	Joint United Nations Programme for HIV
UNICEF	United Nations Children's Fund
US	United States
VMMC	Voluntary Medical Male Circumcision
WHO	World Health Organisation
ZDHS	Zimbabwe Demographic and Health Survey
ZIMA	Zimbabwe Medical Association
ZNASP	Zimbabwe National HIV and AIDS Strategic Plan

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CHAPTER 1: INTRODUCTION

1.1 Overview

This chapter explains the provenance of the research outlined in this PhD thesis, whose overall goal was to assess the feasibility and acceptability of early infant male circumcision as an HIV prevention intervention in Zimbabwe to guide national roll out. The chapter begins by presenting data on the Zimbabwe HIV/AIDS epidemic. It goes on to chronicle the national response to the HIV/AIDS pandemic, including the decision to incorporate male circumcision into the National HIV/AIDS Prevention Strategy. This chapter also discusses the rationale for conducting male circumcision operational research, in addition to presenting a brief outline of the studies described in this thesis.

1.2 Background: Zimbabwe HIV/AIDS epidemic

Zimbabwe, a Southern African country inhabited by approximately 12.97 million people [1], is administratively divided into 10 provinces (Figure 1.1). The country has one of the world's most mature and sustained HIV epidemics [2,3].



Figure 1.1: Map of Zimbabwe showing country's 10 provinces

The first case of HIV was reported in 1985. Within five years, surveillance data showed 10% prevalence among antenatal care (ANC) attendees; adult prevalence peaked at around 33% between 1995 and 1997 (Figure 1.2) [4]. It is estimated that around 1.2 million adults and children are living with HIV and AIDS in Zimbabwe [5]. Prior to the recent WHO HIV

treatment guidelines which recommend initiation of Antiretroviral Therapy (ART) in all individuals with a CD4 cell count of 500 cells/mm³ or less [6], it was estimated that there were almost 700,000 adults and children who needed ART. The recent revision to the WHO HIV treatment guidelines [6], adopted by Zimbabwe in November 2013, means that the number of those eligible for ART has increased (estimated to be around 1.1 million). Mortality due to HIV and AIDS was around 4,000 deaths per week in 2003-2004 but had declined to approximately 1,100 deaths per week in 2009, and further to 760 per week in 2012 [5]. Around one million children under the age of 18 have been orphaned as a result of one or both parents having died of AIDS [7].

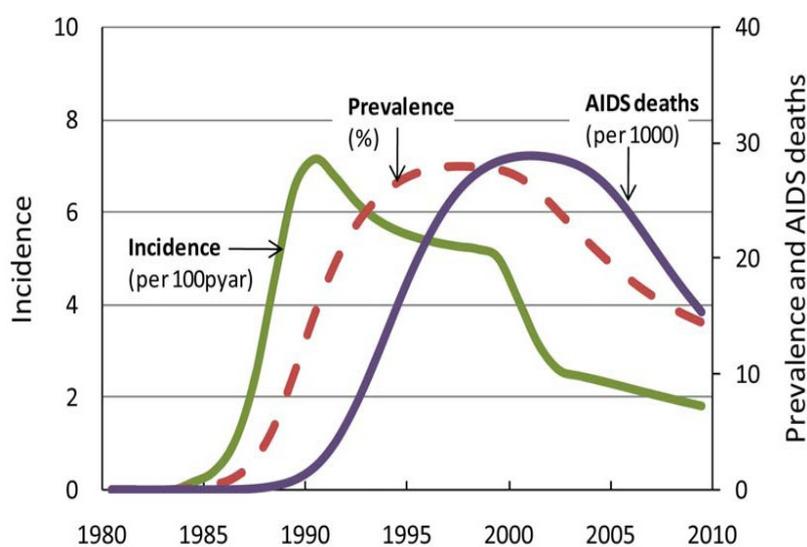


Figure 1.2: Trends in Zimbabwe's HIV incidence, HIV prevalence and AIDS deaths [4]

As in the rest of sub-Saharan Africa, HIV in Zimbabwe is mainly heterosexually transmitted; it is estimated that 92% of all HIV infections are spread via this route [7]. Factors associated with HIV transmission include multiple and concurrent sexual partnerships, characterised by low and inconsistent condom use; a high prevalence of sexually transmitted infections (STIs); gender inequality; spousal separation and mobility as well as low male circumcision prevalence [7].

Despite the severity of the HIV epidemic in Zimbabwe, there are indications that there has been a dramatic decline in both HIV prevalence and incidence. The most recent Zimbabwe Demographic and Health Survey (ZDHS) data collected in 2010/11, indicate that HIV prevalence among 15-49 years olds has come down to 15% [8]. The country has also recorded a consistent decline in HIV incidence, which declined from 11.4% in 2006 to 0.85% by 2009 [9]. There is some evidence that the decline in both HIV prevalence and incidence is

in part due to behaviour change, notably increased condom use within casual partnerships, likely stimulated by increased awareness of AIDS deaths [4,10]. However, despite recent evidence that HIV rates in Zimbabwe are declining, the current prevalence of 15% is still high, and among antenatal care attendees, around 16.1% test positive for HIV [11].

1.3 National response to the HIV/AIDS epidemic

In 1987, the Zimbabwe Ministry of Health established the National AIDS Control Programme and formulated a one year Emergency Short-Term Plan to create public awareness of HIV/AIDS [12]. Additional national initiatives to deal with the HIV/AIDS epidemic included the First Medium Term Plan (1989-1994) which focused on expanding interventions to promote behaviour change, prevention and treatment of STIs, and care and support for People Living with HIV and AIDS as well as the Second Medium Term (formulated in 1994) which focused on mobilisation of non-health sectors to integrate HIV/AIDS issues [12]. Furthermore, Zimbabwe launched the National HIV/AIDS Policy in 1999 and introduced an innovative AIDS levy (3% tax on all taxable income) to support HIV/AIDS prevention and care efforts. That same year, Zimbabwe set up the National AIDS Council to manage the AIDS levy and coordinate the multi-sectoral response to HIV/AIDS [12].

In 2003, Zimbabwe declared HIV and AIDS a national emergency. Subsequently, it launched the Zimbabwe National HIV and AIDS Strategic Plan (ZNASP) 2006 – 2010. The strategic plan emphasised the importance of evidence and results-based strategies as part of the national response to the HIV/AIDS epidemic [12]. In 2007, the Zimbabwe Ministry of Health and the National AIDS Council decided that both adult and early infant male circumcision (MC) should be integrated into the National AIDS Prevention Strategy [13]. A stakeholder meeting (which I attended) was held between 28-29 April 2009, the purpose of which was to get consensus on the goal and objectives of a national MC strategy, and to identify the strengths, weaknesses, opportunities and threats to the implementation of a full MC programme [14]. The need for operational research to inform evidence-based MC programming was highlighted at the stakeholder meeting.

1.4 Background to the PhD Project

In partnership with the Zimbabwe Ministry of Health, PSI Zimbabwe and other institutions, our research group has been leading a series of operational research studies to inform the planning and implementation of both adult and early infant male circumcision. I have coordinated all aspects of these studies, including working with collaborators to inform the design, drafting protocols, drafting data collection instruments and overseeing all aspects of the day to day implementation. Between October and November 2009, we conducted a

population-based quantitative survey of 2,746 rural Zimbabweans (aged 18-44) to evaluate Zimbabwe's National Behaviour Change Programme [13]. I ensured and drafted questions on male circumcision into the survey in order to explore MC prevalence, knowledge, attitudes and intentions among rural Zimbabweans. Survey findings indicated that 60% of women and 58% of men would be willing to have their newborn son circumcised - if circumcision was an effective HIV prevention strategy [13] (I wrote up the findings - see copy of published paper in Appendix E).

In 2010, PSI Zimbabwe funded our research group to conduct a qualitative study to explore in-depth, issues that had been identified by the quantitative survey. I designed the study, drafted the protocol and data collection tools, lead the analysis and wrote up the findings for publication. This qualitative study suggested that despite poor early infant male circumcision (EIMC) knowledge, hypothetical acceptability of EIMC was high among parents from most ethnic groups [15] (see copy of published paper in Appendix E). We were however, aware of previously-conducted studies that had shown poor concordance between hypothetical acceptability and actual uptake of early infant male circumcision [16,17]. We were also aware of the inherent limitations of relying on hypothetical acceptability and feasibility data to inform programming. Following on from this, the Bill and Melinda Gates Foundation, funded the Ministry of Health through PSI Zimbabwe, to undertake pre-qualification studies for an early infant circumcision device (Accucirc) as a pre-requisite to scaling-up EIMC in Zimbabwe and our research group received funding to lead this process. I was the project coordinator of the trial, and assisted with design, drafted the protocol and data collection tools and oversaw all aspects of trial implementation. I decided to take this opportunity to build on the previous work I had led to explore actual acceptability (and feasibility) of early infant male circumcision within these pre-qualification studies

This thesis presents a body of work undertaken to explore both hypothetical and actual feasibility and acceptability of early infant male circumcision as an HIV prevention intervention in Zimbabwe. I begin by outlining male circumcision's history, potential HIV benefits, the potential impact of rolling out adult voluntary medical male circumcision (VMMC) in Zimbabwe, and the rationale for offering EIMC alongside adult VMMC (chapter 2). I then present the results of a systematic review and thematic synthesis on parental reasons for non-adoption of infant male circumcision for HIV prevention in sub-Saharan Africa (Chapter 3). In Chapter 5 I present findings from a qualitative study that explored in-depth, the issues around early infant male circumcision hypothetical acceptability that were highlighted by the quantitative survey we conducted in 2009 [13]. The same qualitative study additionally assessed hypothetical feasibility of early infant male circumcision among health-

care workers (results appear in chapter 6). Findings on hypothetical feasibility and acceptability were used to inform the design of a pilot study of early infant male circumcision implementation in which I explored actual feasibility and acceptability (results appear in chapters 7-8). Findings from the research will contribute to the roll out of early infant male circumcision in Zimbabwe.

1.5 Aim and objectives

1.5.1 The aim of the PhD research

The study's overall aim is to assess the feasibility and acceptability of early infant male circumcision in Zimbabwe in order to guide the implementation of this public health intervention.

1.5.2 The specific objectives of the PhD research

The study is divided into two phases with the following specific objectives:

Phase I

- To explore hypothetical acceptability of early infant male circumcision among parents and wider family
- To explore hypothetical feasibility and acceptability of early infant male circumcision among health-care workers

Phase II

- To explore actual acceptability of early infant male circumcision among parents
- To explore actual feasibility and acceptability of early infant male circumcision among health-care workers

1.6 Organisation of the thesis

The thesis is organised into nine chapters. This introductory chapter briefly discusses the context within which male circumcision is being implemented in Zimbabwe, in addition to providing the rationale for the PhD research. It also outlines the PhD aim and objectives. In Chapter 2, I discuss male circumcision as part of a wider HIV prevention strategy, the potential impact of rolling out male circumcision in Zimbabwe, advantages and disadvantages of infant male circumcision for HIV prevention and the rationale for conducting the work presented here. In Chapter 3, I describe a systematic review and thematic synthesis I conducted to explore parental reasons for non-adoption of infant male circumcision for HIV prevention in sub-Saharan Africa. In chapter 4, I describe the methods used to undertake the research. Results are presented in chapters 5-8. Chapter 5 presents

findings on hypothetical acceptability of early infant male circumcision among parents and wider family. In chapter 6, I present findings on hypothetical feasibility and acceptability of early infant male circumcision among health-care workers. In Chapter 7, I present results on actual acceptability of early infant male circumcision among parents. In Chapter 8, I focus on actual feasibility and acceptability among health-care workers. Each results chapter contains a brief discussion; all study findings plus their implications are presented in chapter 9.

1.7 Role of the candidate

This work was nested within operational research that was conducted to support the scale-up of male circumcision in Zimbabwe. By its nature, the operational research was collaborative and involved multiple players. The work described in this thesis however relates to work that I conceived and led as part of this more general effort. While the overall aims of the qualitative research were guided by the information needs of the Ministry of Health and male circumcision implementing partners, I was responsible for the design of all the qualitative research studies, wrote the research protocols and obtained regulatory and ethics approval (both in Zimbabwe and at UCL). I recruited and trained all qualitative research staff, I conducted some in-depth interviews and focus group discussions myself, I ensured quality of all data collected by other researchers and I oversaw transcription and translation of all qualitative data. I personally coded all data (along with research staff) and undertook the qualitative analysis. I drafted all of the manuscripts relating to or resulting from this work (to date 2 have been published in peer reviewed journals and 5 have been presented at national, regional and international conferences).

With specific reference to the systematic review and thematic synthesis, I designed the study plus the search strategy (with assistance from Kate Cheney, a UCL librarian), undertook the literature search, identified all eligible papers, conducted the data extraction (with Zivai Mupambireyi, a fellow PhD candidate), conducted the analysis and drafted the manuscript for publication (see copy of published paper in Appendix E). With specific reference to the clinical trial (in which the second phase of the PhD research was nested), I drafted the research protocol and obtained regulatory and ethics approval (both in Zimbabwe and at UCL). I also served as the Research Coordinator for the clinical trial overseeing all aspects of the day to day implementation on behalf of the Principal Investigator. I also oversaw trial and quantitative data collection and entry.

CHAPTER 2: MALE CIRCUMCISION – HISTORY AND POTENTIAL HIV BENEFITS

2.1 Overview

This chapter outlines the history of male circumcision, its potential HIV benefits, the potential impact of rolling out adult voluntary medical male circumcision (VMMC) in Zimbabwe, and the rationale for offering early infant male circumcision (EIMC) alongside adult VMMC. The chapter also discusses general and HIV-related advantages of infant male circumcision, disadvantages of infant male circumcision for HIV prevention and concerns around acceptability and feasibility of EIMC in Zimbabwe.

2.2 Male circumcision: historical perspective

Male circumcision (MC) is the removal of the foreskin, the tissue that typically covers the head (glans) of the penis (Figure 2.1) [18]. Early infant male circumcision is performed during the first 60 days of life [19].

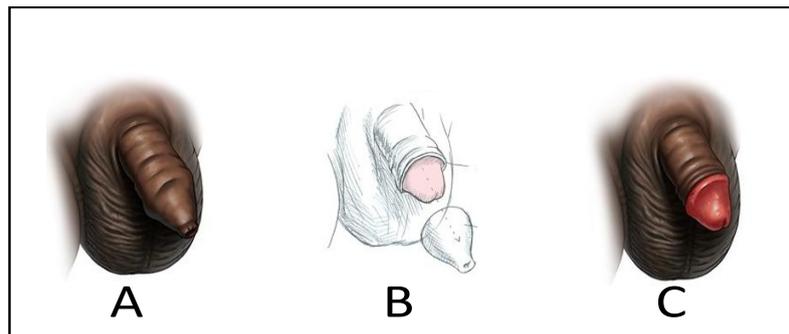


Figure 2.1: Uncircumcised penis, foreskin removal and circumcised penis (www.accucirc.com)

Male circumcision has been widely practised for cultural and religious reasons for thousands of years [20]. Earliest records depicting the practice came from Egyptian tomb work and wall paintings dating as far back as 2300 BC (Figure 2.2) [21].

Among the Jews, male infants have always been circumcised on their eighth day of life. The justification among the Jews is that a covenant was made between Abraham and God; for all Jewish males, circumcision is meant to be an outward sign of being a party to that covenant [21]. Male circumcision continues to be universally practised among the Jews. Muslims also practise male circumcision as part of their faith, and as a confirmation of their relationship with God; the practice is known as *tahera*, which means 'purification'. Among Muslims, the

preferred age is around seven years although some males are circumcised as early as the seventh day of life and as late as puberty [22].

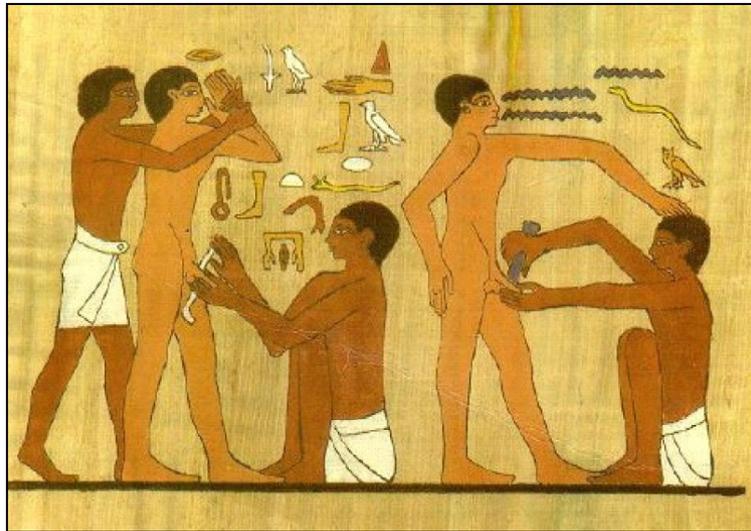


Figure 2.2: One of earliest MC records (http://en.wikipedia.org/wiki/Image:Egypt_circ.jpg)

As from the 19th century, male circumcision began to be additionally performed for health-related reasons in both circumcising and non-circumcising cultures [21]. The health benefits of male circumcision were documented as early as 1855, when observational studies of Jewish and Christian patients with sexually transmitted diseases showed “the well-known greater exemption of the Jew to syphilitic infection, owing to the protecting influence of circumcision” [23]. Around the mid 20th century, observational studies demonstrated that cervical cancer was highly unusual in two groups of women: Jewish women and nuns, and this observation suggested that a risk factor for cervical cancer could be having sex with an uncircumcised man [24]. Studies conducted to explore this hypothesis indeed confirmed the association between cervical cancer and a lack of male circumcision in women’s sexual partners [23]. Following these findings, male circumcision began to be performed for its protective role against sexually transmitted diseases (mostly in the US) [23]. Additionally, male circumcision was adopted as a treatment option for medical conditions such as phimosis (a condition where the foreskin is so tight that it cannot be retracted, posing difficulties with hygiene) and paraphimosis (a condition where the foreskin is so drawn back or swollen, causing inability to return to its normal position) [23].

2.3 Estimated global prevalence of male circumcision

It is estimated that about a third of the world’s male population aged 15 years or older, representing a total of approximately 665 million men, is circumcised [21]. Of these, more than two thirds (69%) are Muslim [21]. Male circumcision is almost universal in the Middle

East and some parts of Asia where the procedure is undertaken primarily for religious and cultural reasons [25]. During the 20th century, when male circumcision gained popularity both for its health benefits and social reasons, infant and childhood circumcision rates soared. In the US, they rose to around 80% in the 1960s [26]. The US male circumcision prevalence remains high, and currently ranges between 76% and 92% [26]. In contrast, Australia, Canada and the United Kingdom have seen a decline in male circumcision [18]. In Central and South America, male circumcision is quite uncommon and prevalence is less than 20% [27,28]. In Africa, male circumcision is almost universal in North Africa and most of West Africa but until recently, was less common in Southern Africa [29]. Prior to voluntary medical male circumcision (VMMC) scale-up, male circumcision prevalence ranged from 0 to 30% in most parts of Southern Africa [18], and MC was mostly practised for cultural and religious reasons [20,30].

2.4 Social and cultural significance of male circumcision in Southern Africa

In Southern Africa, male circumcision continues to be traditionally performed mainly on adolescents, particularly as an initiation ritual and a rite of passage into manhood, and marks an individual man's change in status [31]. Cultural information about the ritual is only known and shared by men who undergo the ritual [15,32]. In addition, it is considered taboo to share information about the ritual with women, children and outsiders [15,32]. As a result, detailed accounts of the ritual itself are rare [33]. Nonetheless, the ritual is a process that involves at least three phases: separation, transition and reintegration [32].

Initially, the initiate is translocated to a temporary shelter, which is isolated from the community (separation) [32]. There, he is circumcised and stays for up to a month as he heals and is taught about manhood according to tradition (transition) [32]. Themes considered to be a part of the teachings include: sexual mores, the proper control and expression of sexuality, marriage and familial responsibility [33]. The period of seclusion ends with the initiation hut together with bandages, sticks and other personal belongings being burned in a symbolic break with the past [33]. After the teachings, the initiate is welcomed back to the community and the ritual concludes with a celebration of his newly-acquired manhood (reintegration) [32]. Initiates are often given new names, new clothes and new blankets; among the Xhosa, their faces are painted with red ochre as a mark of status as a 'new man' [33]. It has been suggested that this phase represents a process of 'desacrilisation' in which the participant re-enters society as a new, transformed individual who will typically be expected to fulfil new roles in society [33].

In most Southern African communities, male circumcision for cultural reasons is performed in a non-clinical setting by an elder of the same tribe as the male initiate, and does not involve use of anaesthesia to minimise pain [32,34]. As illustrated later, experiencing pain is considered an important component of male circumcision among traditionally circumcising communities, and has strong associations with masculinity. Among these communities, traditional circumcision is considered superior to medical male circumcision (which involves use of anaesthesia) and men who are circumcised in medical settings are ridiculed [35]. For example, since traditional circumcision does not involve suturing, Xhosa men circumcised medically could be recognised because of the suture marks (labelled cat's claws) leading to their mockery of lacking the bravery to undergo traditional circumcision [33,35]. Ill-treatment is even worse for uncircumcised men; these will forever be regarded as adolescents and their peers and women will treat them with contempt and disrespect, which renders it difficult to find a marriage partner in the community [32]. Among the Shangani of Zimbabwe, in the case of a dispute between a circumcised man and an uncircumcised one, traditional courts always rule in favour of the circumcised men (personal communication Shangani Traditional Leader).

2.5 Male circumcision and prevention of HIV acquisition

The possible link between HIV and non-circumcision was first hypothesised in 1986, the same year HIV was officially labelled the etiologic agent of AIDS [36]. Three years later, findings from a prospective study of male clients of female sex workers in Kenya were published. The prospective study found a greater than 8-fold increased risk of HIV acquisition among uncircumcised men [37]. Ecological studies also found that populations with the highest HIV prevalence were those in which small proportions of men were circumcised [38,39,40].

A meta-analysis of 27 observational studies from sub-Saharan Africa published in 2000 demonstrated a 58% protective effect of circumcision in males [41]. Moreover, a prospective study of discordant couples conducted in Uganda showed zero sero-conversions among 50 circumcised male partners of HIV-positive women, compared with an incidence of 17 per 100 person-years among the 137 couples where the male partner was uncircumcised [42]. Furthermore, findings from 'the four cities study' which was designed to explore the reasons for the variation in HIV prevalence across different parts of Africa demonstrated that variations in non-male circumcision was the greatest predictor of variation in HIV prevalence [43].

Although ecological and observational data strongly supported a causal relationship between circumcision and reduced HIV incidence, doubts remained due to potential confounding by unknown or inadequately measured factors including sexual behaviours, cultural practices, religion, and hygiene [23]. In addition, observational data measured the association of HIV prevalence with presence or absence of circumcision (often many years earlier), but was not able to answer whether circumcising adult and already sexually active men would be protective [23].

By 2007, conclusive evidence of the protective effect of male circumcision against HIV had been demonstrated in three randomized controlled trials (RCTs) that were conducted in South Africa [44], Kenya [45] and Uganda [46] among over 11,000 men. These trials individually and collectively demonstrated that male circumcision reduces the risk of HIV acquisition in men by up to 60% [44,45,46]. All three trials were stopped early as it would be unethical to continue withholding male circumcision from men in the control arm when trial data had shown that male circumcision was protective against HIV. Longer-term follow up suggests that the protective effect of male circumcision persists [47,48], and appears to strengthen over time (i.e. up to 73% protection over a five-year period) [48]. Additionally, recent findings on population level impact from South Africa, confirm those from the randomized controlled trials [49].

There are at least three ways by which the foreskin increases risk of HIV acquisition. Firstly, uncircumcised men are at increased risk of abrasions or penile ulcers which may facilitate HIV entry [50]. Secondly, the same men are susceptible to STIs, including ulcerative ones (e.g. herpes simplex virus type 2, syphilis) which facilitate HIV acquisition [51,52]. Thirdly, the inner surface of the foreskin mucosa contains HIV-1 target cells (CD4+ T cells, macrophages and Langerhans cells). The HIV target cells in the inner foreskin are closer to the surface than those situated elsewhere on the penis, due to the lack of keratinisation (toughening) [53]. If the foreskin is removed, so is a large area of highly vulnerable mucosa (see Figure 2.3).

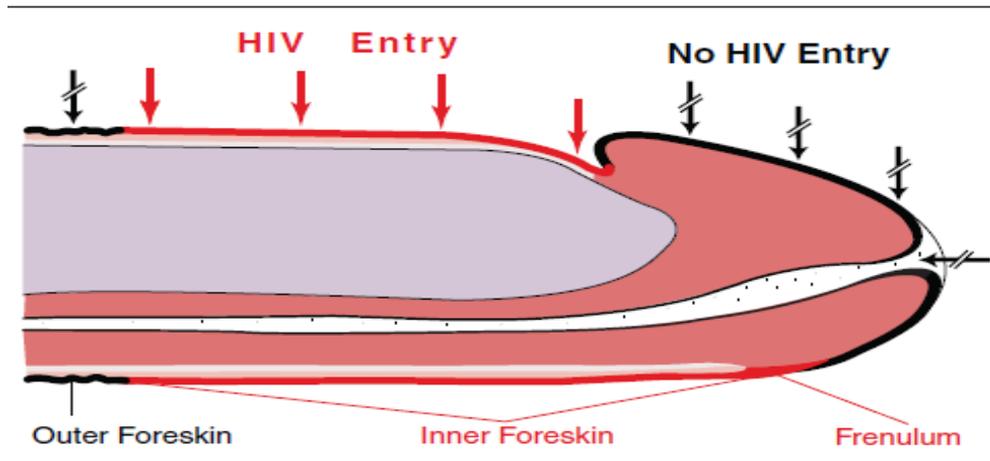


Figure 2.3: The penis and possible HIV entry points [53]

2.6 Comparison of male circumcision with other biomedical interventions

Over the last five years trials have reported several, other promising biomedical HIV prevention approaches. These include topical ART-based microbicides, oral pre-exposure prophylaxis with antiretroviral medication, ART for index case to prevent onward transmission, and HIV vaccines [54]. Male circumcision has an important advantage over these other methods in that once the procedure has been performed, the person is (at least partially) protected for life. There are no concerns about adherence or timing of application in relation to sex. In addition, since the procedure is carried out once, at a cost of US\$60 or less, this accords male circumcision an additional advantage of being cost-effective [55,56,57,58]. Mathematical modelling estimates that averting a single HIV infection leads to savings in antiretroviral treatment costs ranging from US\$150 to 900, using a ten-year time horizon [59,60].

2.7 WHO/UNAIDS recommendations for male circumcision scale-up

Upon publication of randomized controlled trial results, WHO/UNAIDS held a consultative meeting to review scientific evidence and develop male circumcision technical and policy guidance. The consultative meeting, held in March 2007, led to 11 conclusions containing 43 recommendations for scale-up of voluntary medical male circumcision (VMMC) in high HIV prevalence countries to maximise intervention effectiveness at a population level [61]. Additionally, the recommendations identified 13 VMMC priority countries in sub-Saharan Africa (Botswana, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe). These 13 countries are characterised by generalized heterosexual HIV epidemics, high HIV prevalence, and low male circumcision prevalence (Figure 2.4). The 13 countries immediately piloted and subsequently scaled-up voluntary medical male circumcision as part of a comprehensive HIV

prevention strategy [57,62,63]. The Gambela region of Ethiopia started scaling-up voluntary medical male circumcision later than the afore-mentioned countries [57].

Mathematical modelling estimates that if 80% of men aged 15-49 are circumcised in the 13 VMMC priority countries, this would result in a 45-67% decline in HIV prevalence within a decade [57,64]. However, to reach this target, 20.3 million circumcisions need to be performed by 2015 to close the current coverage gap, in addition to a further 8.4 million by 2025 [57].

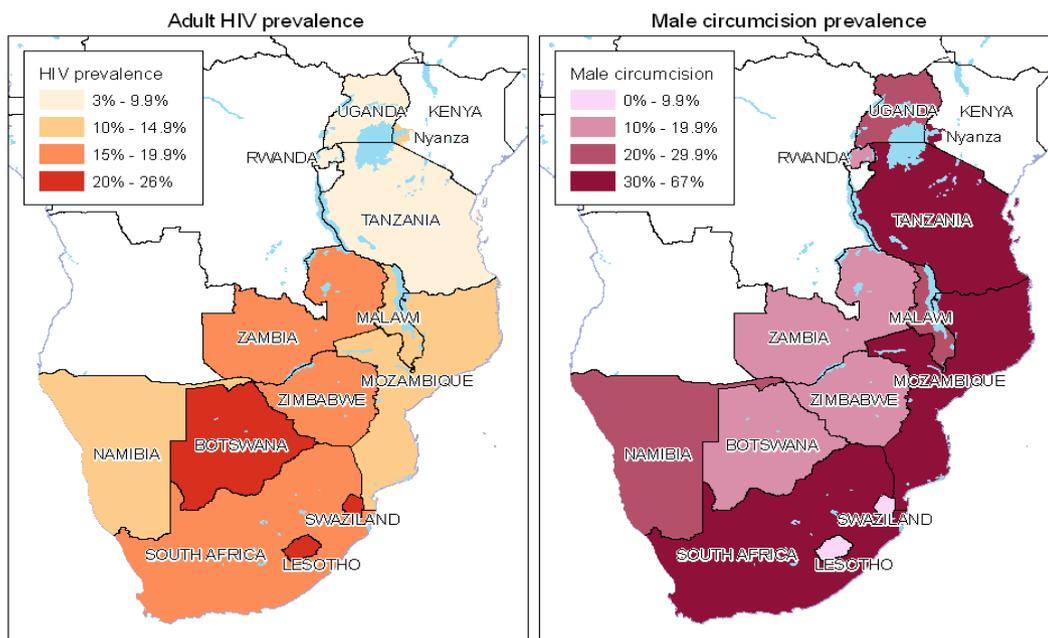


Figure 2.4: VMMC priority countries: adult HIV plus MC prevalence [18]

In order to ensure that the HIV prevention benefits of male circumcision are sustained in the longer-term, WHO/UNAIDS also recommend that infant male circumcision be implemented alongside adult voluntary medical male circumcision [61]. Presuming high uptake, it will then be possible to entirely phase out the “catch up” adult voluntary medical male circumcision as infants circumcised now come of age. In addition to these recommendations, WHO/UNAIDS has made several other recommendations which have policy and programmatic implications for rolling out male circumcision. These include the recommendation that male circumcision should not replace other known HIV prevention methods, and should always be considered as part of a comprehensive HIV prevention package which includes among other initiatives, promoting abstinence and condom use, encouraging reduction in number of sexual partners, and providing HIV testing and counselling services [61]. Other recommendations highlight the need to offer voluntary medical male circumcision in a safe, culturally acceptable and

sustainable manner. And of course, voluntary medical male circumcision service delivery must be guided by human rights as well as legal and ethical principles.

Importantly, WHO highlights the need to continue to conduct research that guides male circumcision implementation (recommendation number 11). Subsection 11.5 of the recommendation specifically states that, '*Simpler and safer methods for performing male circumcision in resource-limited settings, including the use of suture-less, blood-free procedures and devices, need to be developed and assessed*' [61]. As a result, several adult and infant male circumcision devices are currently being piloted in sub-Saharan Africa, including the PrePex™ [65,66] and Shang ring [67,68] (VMMC) as well as Gomco clamp, Mogen clamp and Plastibell [16,69,70] (EIMC).

2.8 Adult voluntary medical male circumcision for HIV prevention

Adult voluntary medical male circumcision (VMMC) for HIV prevention involves several steps. In Zimbabwe, VMMC clients are first tested for HIV and those that test HIV positive receive intensive post-test counselling - addressing psychosocial issues, disclosure support, and individual treatment and care options. Tuberculosis symptom screening and point of care CD4 cell count is offered to every VMMC client that tests HIV positive. HIV positive men who still express willingness to undergo VMMC receive clinical staging, including CD4 cell count (a low CD4 cell count poses a higher-risk of procedure-related complications e.g. delayed wound healing). Clients with advanced HIV infection or AIDS and/or a CD4 cell count of 350 cells/mm³ or less immediately become ineligible for VMMC and the procedure is postponed to when the client has been stabilised on ART [71].

VMMC clients that test HIV negative are subsequently referred for VMMC. Prior to undergoing male circumcision, a client receives preoperative counselling which focuses on the benefits and potential risks of male circumcision as well as the fact that the procedure is only partially protective against HIV. A preoperative assessment then follows. This involves enquiries about allergies to medication, general health and any medical conditions (specifically diabetes and HIV), and bleeding disorders a client may have. Additionally, clients are briefly examined to exclude any contraindication to surgery (e.g. an STI or anatomical anomaly) [72,73,74].

The surgical area is then cleaned with a scrub solution. Local anaesthesia is then injected into the base of the penis to minimise pain. The foreskin is subsequently freed from the penile glans and removed. For standard cases, the forceps-guided surgical technique (Figure 2.5) is used to remove the foreskin. Although WHO recommends two additional

surgical techniques (dorsal slit and sleeve resection), and all three methods produce a good long-term result, the forceps-guided method consistently produces desirable results, and is characterised by low complication rates [19,21,75]. Additionally, the forceps-guided method is technically simple to perform and easy to teach. Furthermore, the forceps-guided method is the fastest of the three recommended surgical techniques. In fact, use of the forceps-guided method is now recognised as one aspect of optimising the volume and efficiency of VMMC services [72,73,75,76,77]. Due to its comparative advantages, the forceps-guided method is now the most widely used technique in voluntary medical male circumcision programmes. In a limited number of cases, certain medical conditions (e.g. phimosis and paraphimosis) necessitate the use of the other surgical techniques. However, the forceps-guided is appropriate in the vast majority of cases [72,73].



Figure 2.5: Male circumcision using forceps-guided method [21]

During the procedure, bleeding is controlled with either electrocautery/diathermy (achieving coagulation by creating heat with an electrical current passing through the tissue) or ligating sutures, after which suturing of the skin plus bandaging follows. A postoperative assessment is subsequently conducted. The client then receives postoperative counselling where previous male circumcision/HIV messaging is reinforced. The client also receives a specific reminder to abstain from sex for at least six weeks post-circumcision [72,73]. In Zimbabwe, VMMC clients are asked to return to the male circumcision site on day 2 (to have the bandage removed), on day 7 (to be checked for possible adverse events) and on day 42 (to assess healing and receive intensive counselling around the need to desist from risky sexual behaviour) [72,73]. Superficial wound healing after circumcision in adults takes

approximately 5-7 days; about 4-6 weeks are however needed for the wound to heal completely [19] hence the recommendation to abstain from sex for six weeks.

2.9 Zimbabwe: history and prevalence of male circumcision

Until recently, male circumcision was uncommon in Zimbabwe, particularly among the predominant ethnic groups, the Shona, who constitute about 70% of the population and the Ndebele, who constitute about 16% of the population [78]. Male circumcision was primarily undertaken among the smaller ethnic and migrant groups (each of which constitute less than 2% of the population) such as the Chewa (from Malawi), the Xhosa/'Fengu', Tonga, Venda and the Shangani as part of initiation rites of passage to manhood, and partly for medical reasons [14].

Among the traditionally circumcising groups, there is no terminology that specifically refers to male circumcision since the procedure is part of a comprehensive 'rites of passage' ritual; terminology therefore holistically refers to the entire ritual. However, among the predominant population, the Shona, male circumcision is known as *kudzisingisa*, meaning 'to get rid of something bad' (e.g. bad omen or misfortune) and *kuchecheudza*, meaning 'to cut out nicely' (as someone would do when removing the rotten part of an apple or pumpkin). Both terms suggest that male circumcision is the removal of something 'bad'. There is therefore close equivalence between the Shona terms and the Muslim one, *tahera* (purification). This suggests that the Shona terms are coinages that were probably created when the Shona came into contact with Arab (Muslim) traders around the 15th-16th century [79]. It also seems likely that the Shona learnt about male circumcision from these traders.

Although formal Shona terms for male circumcision denote 'purification', until recently when the procedure's HIV and other health benefits became widely known, male circumcision was a source of stigma among the Shona. This is evidenced by the fact that terms for a circumcised penis are generally derogatory, including *shondo/shorira* meaning 'that which sticks out its head whilst the whole body is inside'. Informal and slang terms also contain overtones of scorn. These include *mugarandakateya* meaning 'ever ready' (to strike), suggesting owner's aggression and high libido, and *mubviswadhuku* meaning 'the unveiled', suggesting disgraceful exposure.

I have already hypothesised that the Shona probably adopted male circumcision around the 15th-16th century. As in the rest of Southern Africa, male circumcision (both infant and adolescent) continued to be traditionally performed until the 19th century when the practice was abandoned as a result of European missionaries' influence [80]. The missionaries were

concerned that traditional male circumcision is extremely painful as the procedure does not involve anaesthesia. Also, since traditional male circumcision is often conducted in non-sterile environments (see Figure 2.6), the missionaries were additionally worried about possible infections and unwarranted adverse events.

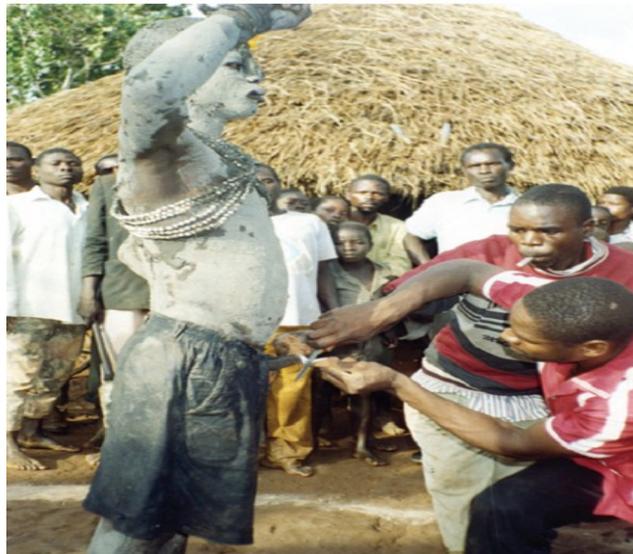


Figure 2.6: Traditional adolescent male circumcision [21]

When male circumcision gained popularity both for its health benefits and social reasons during the 20th century, circumcision of infant and adolescent males resumed in Zimbabwe, albeit at a low rate. The most recent ZDHS findings suggest that Zimbabwe's male circumcision prevalence is around 10% among adult men; the distribution is fairly uniform across the country's 10 provinces, with the exception of Matabeleland North (18.8%) and Mashonaland Central (5.3%) [8]. These male circumcision prevalence data are however, based on self-report rather than medical examination; they should therefore be interpreted with caution.

A study conducted in the US as early as 1958 demonstrated poor reliability of self-reported male circumcision [24]. In that study, researchers first asked men about their male circumcision status and then physically examined them. Thirty-four percent of men who self-reported being circumcised were uncircumcised [24]. Recently, scholars examined self-reported male circumcision against physician examination in Lesotho. Of the men self-reporting male circumcision, physical examination showed that 23% had no evidence of MC, 27% had partial MC, and 50% had complete MC [81].

2.10 Potential impact of rolling out male circumcision in Zimbabwe

Mathematical modelling estimates that circumcising 1.9 million Zimbabwean men aged 15-49 by 2015 could avert 42% (600,000) of new HIV infections that would have otherwise occurred by 2025 [57]. The simulation additionally suggests that initially prioritizing males aged 15-29 will lead to the greatest reduction in HIV incidence in the short-term, whilst scaling-up male circumcision to reach the targeted number will likely yield US\$2.9 billion net savings in antiretroviral treatment costs over 15 years [57]. Modelling data additionally suggest that among the 13 voluntary medical male circumcision priority countries, Zimbabwe is the country with the least number of adult male circumcisions needed to avert a single HIV infection (i.e. 4 as compared to 44 for Rwanda) [57]. This is because Zimbabwe has a high HIV prevalence and a low male circumcision prevalence.

Since 2009, Zimbabwe has provided circumcision to adult and adolescent men through a collaborative effort between the government and technical agencies. Initially, the programme aimed to reach 1.3 million 15-29 (or 1.9 million 15-49) year-old men by 2015 [13]. As it became apparent that the target could not be reached by 2015, the country extended the deadline to 2017. In addition to adult voluntary medical male circumcision, Zimbabwe aims to roll out early infant male circumcision, starting in 2015 [14]. Of note is that by the end of August 2014, slightly over 300,000 adolescent and adult men had been circumcised (personal communication Ministry of Health and Child Care). Below, I briefly discuss adolescent and adult men's reasons for non-adoption of voluntary medical male circumcision.

2.11 Reasons for non-adoption of VMMC for HIV prevention in Zimbabwe

A qualitative study we conducted in 2010 plus a quantitative population-based survey conducted by PSI Zimbabwe in 2013, highlighted several barriers to voluntary medical male circumcision (VMMC) for HIV prevention in Zimbabwe [82]. In both the qualitative and quantitative studies, fear of excessive pain emerged as the main reason for non-adoption of voluntary medical male circumcision. Additionally, quantitative survey participants' responses suggested that men did not adopt voluntary medical male circumcision because they perceived themselves to be at low risk of contracting HIV [82].

Although voluntary medical male circumcision for HIV prevention is freely available in Zimbabwe, some participants who took part in the qualitative and quantitative studies cited concerns about the cost as the reason for not undergoing the procedure. Both qualitative and quantitative findings also suggested that partner refusal (due to concerns about possible MC-related risk compensation or behavioural disinhibition) was a significant barrier for

voluntary medical male circumcision among older men. Moreover, during focus group discussions, older men felt that the waiting time before being able to resume sex (six weeks) was too long. Qualitative findings additionally suggested that fear of an HIV test was an additional barrier to voluntary medical male circumcision uptake. Myths and misconceptions also seemed to be a significant deterrent. For example, some participants were concerned about the infertility that may arise as a result of male circumcision [82]. The various factors that hinder uptake of adolescent and adult voluntary medical male circumcision for HIV prevention accord early infant male circumcision several comparative advantages which I discuss below.

2.12 General and HIV-related advantages of infant male circumcision

The general, non HIV-related advantages of conducting male circumcision during the infant period rather than among adolescents or adults are well-documented. Healing following infant male circumcision is usually complete within a week (rather than in 6 weeks) [70,83,84]. When surgical devices are used, infant male circumcision does not require sutures and is often characterised by minimal bleeding (the devices crush the foreskin edges which minimises bleeding) [70,83,84]. Infant male circumcision also results in fewer surgical errors, infections and post-operative complications. A systematic review conducted in 2010 reported a 1.5% complication rate for medical male circumcision performed on infants and 6% for that on older children [85]. Moreover, data consistently show that complications are usually minor and easily resolved [70,83,86,87,88]. Furthermore, compared to the former, infant male circumcision is quicker and easier to perform [89].

Within the context of HIV prevention, infant male circumcision has the added advantage that it takes place before the individual becomes sexually active. This negates the possibility of resuming sexual activity prior to complete wound healing, and the associated risk of HIV acquisition or transmission [80]. Resumption of sex before the recommended post-circumcision abstinence period (six weeks) is a major issue with older men [44,90,91]. In a study conducted in Zambia, 24% of circumcised men reported resuming sex earlier than six weeks. Of these, 46% had sex during the first three weeks, 82% reported at least one unprotected sex act, and 37% reported sex with two or more partners [90]. In addition, results from a trial to determine the effect of text messaging to deter resumption of sex before 42 days post-circumcision showed that this particular intervention does not result in delayed sexual resumption [91]. Worryingly, modelling data estimate that of the 61,000 men circumcised in one year, early resumption of sex leads to 69 extra HIV infections (32 among men, 37 among women) [90]. Nonetheless, the same data estimate a net effect of 230 fewer HIV infections in one year, predominantly among men [90].

Studies have also shown that infant male circumcision is more cost-effective than adult VMMC [55,56]. In a cost-effectiveness study from Rwanda comparing adult VMMC and infant male circumcision, the latter cost about a quarter of the adult procedure (US\$15 vs. US\$59) [56]. In the long term (15-19 years), infant male circumcision will yield greater dividends than adult VMMC although these benefits will take much longer to realise [56,88]. Following the findings from Rwanda, it was concluded that providing universal access to male circumcision, *including infant* male circumcision, in conjunction with other effective HIV prevention interventions, will reduce the overall cost of fighting severe HIV epidemics driven by heterosexual transmission [56]. Infant male circumcision can therefore be viewed as background population-level protection for future generations, who could then be educated about comprehensive HIV prevention well before their sexual debut [80].

2.13 Disadvantages of infant male circumcision for HIV prevention

Despite the potential advantages of wide-scale infant male circumcision for HIV prevention in sub-Saharan Africa, there are those who are concerned about possible harms arising from this approach. Arguments against infant male circumcision centre on the fact that HIV in Southern Africa is mainly spread through multiple and concurrent heterosexual partnerships, compounded by several other factors such as female subjugation and poverty [92]. Opponents of infant male circumcision therefore argue that these broader societal issues need to be tackled before mass infant male circumcision [92]. There is also concern that the procedure is painful and risky [92,93], and that infant male circumcision raises human rights as well as legal and ethical issues. Some question the ethics of removing healthy tissue from a patient who is unable to consent to the procedure [94,95].

Paediatric organisations that have weighed in on the debate have provided conflicting views. For example, The Dutch Paediatric Association maintains that,

A broad alliance of medical organisations in the Netherlands has officially adopted the view that circumcision of underage boys without a medical reason violates children's human rights and contravenes the Dutch constitution. The possible medical advantages are insufficient to justify circumcision on grounds of prevention [96].

Conversely, The American Academy of Pediatrics (AAP) issued a policy statement stating that,

Evaluation of current evidence indicates that the health benefits of newborn male circumcision outweigh the risks and that the procedure's benefits justify access to this procedure for families who choose it [97].

The AAP statement went on to state that specific benefits of infant male circumcision include prevention of urinary tract infections, penile cancer, and acquisition of some sexually transmitted infections, including HIV [97].

Similar to the AAP's guidance, a policy statement by fellows of the Royal Australasian College of Physicians (RACP) and fellows of other medical bodies on behalf of the Circumcision Foundation of Australia (CFA) concluded that,

Our analysis finds [IMC] is beneficial, safe and cost-effective, and should optimally be performed in infancy...In the interests of public health and individual wellbeing, adequate parental education, and steps to facilitate access and affordability should be encouraged in developed countries [98].

The CFA's report additionally outlined infant male circumcision's advantages as follows, 'A risk-benefit analysis shows benefits exceed risks by a large margin...over their lifetime up to half of uncircumcised males will suffer a medical condition as a result of retaining their foreskin' [98]. The report went on to conclude that 'The ethics of (IMC) and childhood vaccination **are comparable**' [my emphasis].

Although it is debatable, in a setting like the Zimbabwean one, and indeed most of sub-Saharan Africa, where the HIV epidemic is generalised, a parent's decision to circumcise their infant son in a bid to prevent future HIV may be considered to be in the 'best interests of the child'. This is especially so given the challenges around access to quality health-care for HIV and non-HIV patients alike in sub-Saharan Africa in general and Zimbabwe, in particular. For example, Zimbabwe's economic meltdown, which peaked in 2007/2008, severely compromised health-care. Availability of vital drugs in 2008 was between 29% and 58%; some public health-care institutions even ran out of simple painkillers before closing for several months [9,99].

After weighing early infant male circumcision's potential advantages and disadvantages as well as debates surrounding the procedure, the Zimbabwean Ministry of Health and Child Care (formerly called Ministry of Health and Child Welfare) has decided to incorporate early infant male circumcision for HIV prevention into its National Male Circumcision Strategic

Plan [14]. However, there are some general concerns around acceptability and feasibility of early infant male circumcision in Zimbabwe, which I focus on below.

2.14 Concerns around acceptability and feasibility of EIMC in Zimbabwe

As wide-scale early infant male circumcision for HIV prevention, or indeed for other reasons, has not yet been implemented in Zimbabwe or more widely in Southern Africa, there are concerns around whether parents will be willing to circumcise their sons. Clearly, acceptability of infant male circumcision will have a bearing on uptake, roll out and subsequent effectiveness in preventing HIV [15]. The very first study on hypothetical acceptability of early infant male circumcision in Zimbabwe, which we conducted in 2009, indicated that 60% of women and 58% of men would be willing to have their newborn son circumcised [13]. Other studies on infant male circumcision acceptability have however, shown that there is often poor concordance between hypothetical acceptability and actual uptake [83,100]. In a study conducted in Zambia, although 97% of mothers who participated in a quantitative survey indicated that they definitely or probably planned to have their newborn son circumcised, only 11% of participants subsequently brought their newborn sons for infant male circumcision [100].

In Zimbabwe, there are also concerns about the feasibility of rolling out early infant male circumcision for HIV prevention within the context of existing health services, many of which are already overburdened, understaffed and underequipped [101]. The Zimbabwean economic crisis, which was alluded to earlier, resulted in a massive shortage of health-care workers as they left the county to seek employment elsewhere. In 2008, vacancy levels in the public health sector were at 69% for doctors, over 80% for midwives, over 63% for medical school lecturers and over 50% for pharmacy, radiology and laboratory personnel [99].

The formation of the Government of National Unity in 2009 plus the introduction of multi-currency in the same year, helped stabilise the economy. These two occurrences paved way for initiatives to resuscitate the Zimbabwe health-care system, including recruitment of staff and provision of retention allowances to key health-care staff [102]. Although these initiatives resulted in an improvement in health-care staffing levels, Zimbabwe still has a critical shortage of health-care professionals (defined by WHO as not meeting a threshold of 2.5 health-care professionals - physicians, nurses and midwives - per 1,000 population) [103]. It is estimated that there are 0.16 doctors and 0.72 nurses/midwives per 1,000 population [103]. As illustrated later, the shortage of equipment and resources in most Zimbabwean health-care facilities has a bearing on the design and implementation of wide-scale EIMC.

3.1 Overview

This chapter describes the methods and findings of a systematic review and thematic synthesis I conducted to explore parental reasons for non-adoption of early infant male circumcision for HIV prevention in sub-Saharan Africa.

Publications were eligible for review if they reported qualitative findings on barriers to infant male circumcision for HIV prevention entirely or in combination with quantitative ones, and were conducted in sub-Saharan Africa. Literature searches were conducted in three databases: Medline, Embase and CINAHL Plus. In combination with findings from the first phase of the PhD research, results emanating from the thematic synthesis informed the design of the second phase, as well as recommendations for interventions to tackle parental barriers to early infant male circumcision for HIV prevention. An abridged version of this chapter has been previously published (see published paper in Appendix E) [104].

3.2 Background to the systematic review and thematic synthesis

As described earlier, infant male circumcision has several advantages. Moreover, acceptability of infant male circumcision for HIV prevention has several implications for the intervention's uptake, scale-up and subsequent effectiveness in preventing HIV [15]. It is therefore crucial to identify and address parental concerns that may act as barriers to infant male circumcision for HIV prevention. Identifying parental barriers and specifically working to address them will likely improve uptake and maximise the intervention's benefits.

This study sought to collate in-depth, qualitative data which explore parental reasons for non-adoption of infant male circumcision for HIV prevention in sub-Saharan Africa. The main question that the study sought to answer is 'Why do parents fail to adopt infant male circumcision for HIV prevention in sub-Saharan Africa?' Findings will be used to inform the development of a package of approaches for overcoming these parental barriers (that could subsequently be tested for impact). The synthesis is described in line with a recently-developed set of guidelines for reporting synthesis of qualitative studies - 'Enhancing transparency in reporting the synthesis of qualitative research (ENTREQ)' [105]. ENTREQ consists of 21 items grouped into five main domains: introduction, methods and methodology, literature search and selection, appraisal, and synthesis of findings [105].

3.3 Debate surrounding qualitative synthesis

In addition to being comparatively new (albeit growing), the practice of synthesising qualitative studies is a subject of on-going debate [106,107]. Some maintain that it is not valid to take qualitative findings from a specific context, time and group and generalise beyond that setting [108,109]. However, a strong case has been made for qualitative synthesis to be valued as it brings together qualitative evidence from a range of settings for a wider audience, identifies research gaps and provides evidence for health-care and policy [105,106,107,109,110,111,112]. This thematic synthesis was conducted in the hope that it would contribute to the design of interventions to tackle parental barriers to early infant male circumcision for HIV prevention in Zimbabwe.

3.4 A brief description of qualitative synthesis approaches

A number of approaches are used to synthesise qualitative research including: thematic synthesis, grounded theory synthesis, framework synthesis and meta-ethnography [105,107,111]. While there may be differences in approaches in these methods, there is a core set of techniques common to them [105]. In fact, many of the “newer” methods being developed have much in common with meta-ethnography, the pioneer approach [106]. Meta-ethnography, as the name suggests, was developed as a method for synthesising ethnographic research [106]. However, the method has been shown to be applicable to qualitative research beyond ethnography [109,113].

In brief, meta-ethnography involves identifying key concepts from one study and recognising the same concepts in another study, a process often referred to as ‘translating concepts into one another’ [106,114]. The next step involves pulling corroborating concepts together and, crucially, going beyond the content of the original studies by coming up with either a “line of argument” synthesis (a broader picture of the phenomenon), or a refutational synthesis, which examines contradictions between the findings of individual studies [106,115]. Scholars view the notion of ‘going beyond’ the primary studies as a critical component of qualitative synthesis, and one that typically distinguishes it from traditional literature reviews [106,113]. This study was undertaken using the principles of thematic synthesis: line-by-line coding of study findings, developing descriptive themes and generating analytical themes [105,106,111]. Later, I describe each of these overlapping stages in detail.

3.5 Methods for the systematic review

3.5.1 Inclusion criteria for publications

Studies were selected for review if they met the following criteria: published in peer-reviewed journals, reported qualitative data on barriers to infant male circumcision for HIV prevention entirely or in combination with quantitative ones, and were conducted in sub-Saharan Africa.

3.5.2 Exclusion criteria

Studies were excluded if they reported only quantitative data, were conducted outside sub-Saharan Africa, and focused only on adult male circumcision. Abstracts for conference proceedings were excluded because abstracts for qualitative studies seldom provide detailed results, making it difficult to judge their suitability for synthesis [107].

3.5.3 Search strategy

The challenge of coming up with a search strategy for a systematic review is to strike a balance between being too broad and finding too many irrelevant articles and being too specific. To a certain extent, the process does involve some trial and error (personal communication UCL librarian). To come up with a search strategy, I first split the research question into four components: a) male or infant circumcision, b) HIV prevention, c) acceptability, and 4) qualitative research. Synonyms for the four components were identified through reading relevant literature. Additionally, once I began reviewing results of pilot searches, additional synonyms started to emerge.

The search was first conducted using the following Medline Medical Subject Headings (MeSH) terms: Circumcision, Male; HIV Infections; qualitative research. The following text search terms were used: (male or infant* or neonat* or newborn* or child* or baby or babies or son or sons) adj2 circumcis*; (HIV adj3 prevent*) or (HIV adj3 intervention*); (accept* or belie* or barrier* or attitude* or willing* or inten* or view* or perspective* or perceive* or perception*); (focus group* or interview* or qualitative or finding* or theme*) (Appendix A).

Thereafter, two searches were conducted in Embase and CINAHL Plus using key terms and thesaurus relevant to each database. In addition to allowing for adjacency for words in a phrase, word endings were truncated to ensure inclusiveness of text searches. The Boolean operator “OR” was used to identify all papers related to each component after which search returns of all four components were combined using the operator “AND”. The final search in the three databases was run and closed on 22 January 2013. Both the search terms and strategy were discussed with a UCL librarian.

Identified papers from each of the databases, including their abstracts and key words, were imported into an Endnote reference management software file (library). Duplicates were identified and removed.

3.5.4 Selection of eligible papers

Titles and abstracts were used to screen papers for relevance to the systematic review. If it was clear that a paper was ineligible based on the title and/or abstract review, it was dropped. Where the title and/or abstract were insufficient to make a determination, the full paper was downloaded and read. If the paper was deemed ineligible, it was excluded and reasons for exclusion were documented. Reference lists for all eligible papers were scrutinised for any additional relevant papers. I conducted the eligibility review.

3.5.5 Assessment of quality of included studies

Assessing quality of qualitative research is not only challenging but also contentious [105,106]. There is little consensus on how quality should be assessed as well as whether it can or should be assessed at all [106,112]. Selected studies were assessed using an adaptation of previously derived quality criteria for assessing validity of qualitative research [109,116]. Two researchers first conducted this process independently and then jointly. The adapted criteria covered three main issues: *reporting* of a study's methods, *reporting* of a study's findings, and *interpretation* of findings (Table 3.1). Based on the criteria, studies were assigned a quality score ranging from poor to fair/good (see Table 3.3 for full assessment).

Table 3.1: Criteria used to assess quality of studies

1. Paper reports findings from qualitative methodology
2. Clear statement on aims/objectives
3. Sampling strategy explained and appropriate
4. Data collection methods mentioned/described and appropriate
5. Mention of ethical considerations
6. Theoretical approach mentioned/described
7. Analysis adequately described
8. Analysis done by more than one person to minimise subjectivity
9. Results can be linked back to study objectives
10. Sufficient data presented to support the results (including quotes)
11. Discussion and conclusions adequately supported by the data

3.6 Results of systematic review

3.6.1 Identified and selected papers

Of the 143 references reviewed, 10 papers met the inclusion criteria (Figure 2.1).

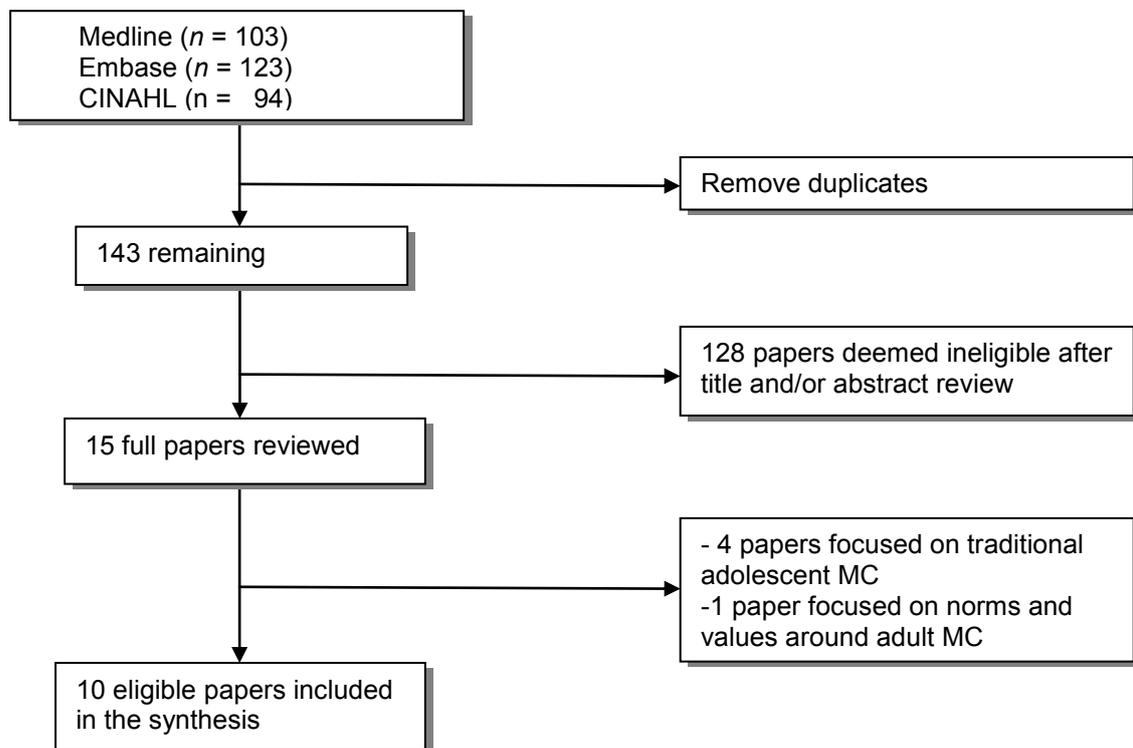


Figure 3.1: Selection of eligible papers

3.6.2 Characteristics of included studies

The 10 studies [15,117,118,119,120,121,122,123,124,125] were conducted in seven Eastern and Southern African countries (Kenya, Malawi, South Africa, Tanzania, Uganda, Zambia and Zimbabwe). Four of the studies [117,118,122,123] were conducted before the results of the three male circumcision randomised controlled trials were known (Table 3.2). Additionally, two studies [15] that were conducted between 2009 and 2010 specifically explored acceptability of infant MC. Seven of the 10 studies (70%) were perceived to be of good quality and three (30%) of fair quality. Overall, studies rated as fair either did not report how some aspects of data analysis were conducted and/or did not include participants' verbatim quotes to substantiate findings. Two of the three papers rated as fair reported mixed methods research. In the first case [123], focus group discussions (FGDs) and in-depth interviews were conducted alongside two cross-sectional studies. In the second [119], qualitative research was ancillary to household and provider surveys.

Table 3.2: Characteristics of included studies

Date	Country	Authors [Ref]	Time of study	Study population	Setting	Data collection methods	Quality rating
2002	Kenya	Bailey et al. [117]	1998	16-80 year-old men and women	Rural and urban	Focus groups and interviews	Good
2003	South Africa	Rain-Taljaard et al. [123]	1999-2000	13-59 year-old men and women	Peri-urban	Focus groups and interviews	Fair
2006	Malawi	Ngalande et al. [122]	2003	16-80 year-old men and women	Rural and urban	Focus groups	Good
2007	Zambia	Lukobo & Bailey [118]	2003	18-67 year-old men	Rural and urban	Focus groups	Fair
2011	Tanzania	Mwanga et al. [121]	2008-2009	40-59 year-old men and women	Rural and urban	Interviews	Good
2011	Uganda	Albert et al. [119]	2008	16-80 year-old men and women	Rural and urban	Focus groups	Fair
2012	Tanzania	Tarimo et al. [124]	2009	24 male and 10 female police officers	Urban	Interviews	Good
2012	South Africa	Milford et al. [120]	2008	16 females and 4 males	Rural and urban	Interviews	Good
2012	Zambia	Waters et al. [125]	2009-2010	18-74 year-old men and women	Urban	Focus groups	Good
2012	Zimbabwe	Mavhu et al. [15]	2010	16-80 year-old men and women	Rural and urban	Focus groups and interviews	Good

Table 3.3: Results – Quality assessment of included studies

Author/country/date	Bailey et al. [117] Kenya 2002	Rain-Taljaard et al. [123] South Africa 2003	Ngalande et al. [122] Malawi 2006
Paper reports findings from qualitative methodology	Yes	Yes – Mixed methods	Yes
Clear statement on aims/objectives	Yes – to assess acceptability and feasibility of MC as an intervention to reduce HIV and STDs	Yes – to assess acceptability of MC as a tool for HIV prevention	Yes – to assess factors to be addressed to enhance MC acceptability should RCTs show that MC prevents HIV
Sampling strategy explained and appropriate	Yes – FGD participants were selected to represent a range of ages and groups with varying risk profiles	Yes – FGD participants were selected to represent four housing types	Yes – FGDs were conducted in four representative districts of rural/urban Malawi, with various ethnic groups
Data collection methods mentioned/described and appropriate	Yes – FGDs and semi-structured interviews	Yes – Mixed methods. FGDs and in-depth interviews in combination with two cross-sectional studies	Yes – FGDs
Mention of ethical considerations	Yes – participants were informed of their right to refuse to answer any question or to withdraw their participation at any time	Yes – participants gave written informed consent	Yes – participants gave verbal informed consent
Theoretical approach mentioned/described	Not specifically mentioned – used codes from discussion guides and emerging themes	Not specifically mentioned – data were analysed using emerging themes	Not specifically mentioned – used codes from discussion guides, previous studies and emerging themes
Analysis adequately described	Yes	Yes	Yes
Analysis done by more than one person to minimise subjectivity	Not discussed	Not discussed	Yes
Results can be linked back to study objectives	Yes	Yes	Yes
Sufficient data presented to support the results (including	Yes – quotes included	Yes – no quotes	Yes – quotes included

quotes)			
Discussion and conclusions adequately supported by the data	Yes	Yes	Yes
Quality rating	Good	Fair	Good

Author/country/date	Lukobo & Bailey [118] Zambia 2007	Mwanga et al. [121] Tanzania 2011	Albert et al. [119] Uganda 2011
Paper reports findings from qualitative methodology	Yes	Yes	Yes – Mixed methods
Clear statement on aims/objectives	Yes – to assess knowledge, attitudes, beliefs and acceptability around MC to reduce HIV	Yes – to understand attitudes towards MC, policy, regulatory environment and health system readiness for MC	Yes – to assess attitudes and opinions around MC to inform policy
Sampling strategy explained and appropriate	Yes – FGD participants were selected to represent urban and rural areas plus various ethnic groups and circumcision practices profiles	Yes – key informant interviews were purposively sampled	Yes – FGDs participants were assigned to groups based on sex, age and MC status (men)
Data collection methods mentioned/described and appropriate	Yes – FGDs	Yes – key informant interviews	Yes – Mixed methods. FGDs were conducted alongside household and provider surveys
Mention of ethical considerations	Yes – participants were informed of their right to refuse to answer any question or to withdraw their participation at any time	Yes – participants gave written informed consent	No
Theoretical approach mentioned/described	Not specifically mentioned – used codes from discussion guides, previous study and emerging themes	Yes – thematic coding	No
Analysis adequately described	Yes	Yes	No

Analysis done by more than one person to minimise subjectivity	No – just by one person	Yes	Not discussed
Results can be linked back to study objectives	Yes	Yes	Yes
Sufficient data presented to support the results (including quotes)	Yes – no quotes just summary of findings	Yes – quotes included	Yes – just two quotes included
Discussion and conclusions adequately supported by the data	Yes	Yes	Yes
Quality rating	Fair	Good	Fair

Author/country/date	Tarimo et al. [124] Tanzania 2012	Milford et al. [120] South Africa 2012	Waters et al. [126] Zambia 2012	Mavhu et al. [15] Zimbabwe 2012
Paper reports findings from qualitative methodology	Yes	Yes	Yes	Yes
Clear statement on aims/objectives	Yes – to assess perceptions of MC among police officers	Yes – to explore views and suggestions regarding introduction of MC as an HIV prevention strategy	Yes – to explore the acceptability of circumcising newborn boys	Yes – to explore acceptability of early infant MC for HIV prevention
Sampling strategy explained and appropriate	Yes – sampling was done according to age, sex and religion	Yes – key informant interviews were purposively sampled	Yes – FGD participants were purposively sampled	Yes – FGD participants and key informants were purposively sampled
Data collection methods mentioned/described and appropriate	Yes – in-depth interviews	Yes – key informant interviews	Yes – FGDs	Yes – FGDs and key informant interviews

Mention of ethical considerations	Yes – participants gave written informed consent	Yes	Yes – participants gave written informed consent	Yes – participants gave written informed consent
Theoretical approach mentioned/described	Yes – content analysis and SEM enhanced data analysis	Not specifically mentioned – coded data using emerging themes	Thematic content analysis	Principles of grounded theory mentioned but not described
Analysis adequately described	Yes	Yes	Yes	Yes
Analysis done by more than one person to minimise subjectivity	Yes	Yes	Yes	Yes
Results can be linked back to study objectives	Yes	Yes	Yes	Yes
Sufficient data presented to support the results (including quotes)	Yes – quotes included	Yes – quotes included	Yes – quotes included	Yes – quotes included
Discussion and conclusions adequately supported by the data	Yes	Yes	Yes	Yes
Quality rating	Good	Good	Good	Good

3.7 Methods for the thematic synthesis

Electronic copies of the 10 studies were directly imported into NVivo 10 (QSR International, Melbourne, Australia), a qualitative data storage and retrieval program. The thematic synthesis of findings was done in three previously-validated and recommended stages: line-by-line coding of study findings, developing descriptive themes and generating analytical themes [106,111].

3.7.1 Stage one: line-by-line coding of study findings

Two researchers independently conducted line-by-line coding of qualitative findings presented in the selected studies. During this stage of the synthesis, the two researchers also examined each other's codes to check consistency of interpretation and to see whether additional levels of coding were needed [106]. This exercise resulted in 24 codes (Table 3.4). The codes are listed in order of the two researchers' own perceptions of their relative weight with regards to influencing non-adoption of early infant male circumcision (with 1 being perceived as most significant) and not by the number of times each code appears in the studies. Later, I discuss the challenges around reliance on frequency counts to determine the significance of qualitative findings.

Table 3.4: Codes identified from the studies

Code	Frequency
1. Fear of infant death	5
2. Fear of penile injury	4
3. Fear of HIV infection	1
4. Fear of excessive bleeding	6
5. Fear of excessive pain	5
6. Fear of infection	2
7. Don't understand rationale	1
8. Scepticism about preventative benefits	1
9. Lack of confidence in procedure safety	2
10. Lack of confidence in medical personnel	2
11. Not understanding advantages of infant MC over later in childhood	2
12. Concerns about cost	5
13. Suspicion about/of program	1
14. Unfamiliarity with procedure, father uncircumcised	2
15. Fear of loss of penile sensitivity	2
16. Fear of loss of sexual desire	2
17. Non-MC a major distinguishing feature	1
18. Preserving tradition	4
19. Fear of rejection/derision/ostracisation	3
20. Associated religious connotations	2
21. Fear of witchcraft	2
22. Fear of excessive sexual desire (womanizing)	1
23. Fear of risky sexual activity/behaviour later	2
24. Respect for child autonomy	2

Although some of the codes are closely related, they have certain nuances within them and as such, we felt it was justifiable to treat them separately. However, the codes were subsequently grouped into themes, sub-themes and sub sub-themes as illustrated in Table 3.5.

3.7.2 Stage two: developing descriptive themes

The two reviewers looked for similarities and differences between the codes in order to group them [106]. New codes were created to capture the meaning of groups of initial codes through an iterative, inductive process. This process resulted in 5 descriptive themes, 15 sub-themes and 8 sub sub-themes. Due to the overlapping nature of the 3 stages of thematic synthesis, some codes were adopted as themes/sub-themes in their original form.

In summary, barriers to non-adoption of infant male circumcision for HIV prevention in sub-Saharan Africa include a **lack of information**. An additional recurrent theme is **fear of harm** – both immediate (death, HIV infection, excessive bleeding and pain, infection) and future (decreased penile sensitivity and sexual desire, increased sexual desire, risk compensation, ostracisation, derision and rejection). **Cultural and traditional beliefs** also seem to be significant barriers. **Concerns about cost** came out as a significant barrier especially within the context of competing interests. Surprisingly, the **need to respect a child's autonomy** featured (albeit in only one setting) as a barrier despite the fact that in most African settings, children are seldom left to make independent decisions. All of these factors result in reluctance to adopt infant male circumcision for HIV prevention by either or both of the infant's parents.

Table 3.5: Themes - Parental reasons for not adopting infant male circumcision for HIV prevention

Theme

Lack of information

- Rationale “Respondents also reported that if they live a healthy, satisfied life without MC, they do not see the necessity for their children to be circumcised” [[123], p323].
- Preventative benefits “I am still not convinced that circumcision reduces the spread of HIV” [[126], p17].
- Advantages (over MC later in life) “It [MC] should be done when they [babies] are about six months old” [[15], p2].

Fear of harm

- Immediate harm
 - Death “They [providers] might kill my child, like the case in Kafue of the child that died after an MC operation” [[126], p17].
 - HIV infection “The most commonly expressed reasons not to circumcise were fear of infection, including HIV...” [[122], p381].
 - Excessive bleeding “The danger of excessive bleeding is of particular concern for mothers considering circumcision for young children...Some said that infants and small boys *simply do not have sufficient blood to spare*” (our emphasis) [[117], p31].
 - Excessive pain “Many were against circumcising babies because of excessive pain during and after the procedure” [[118], p474].
 - Infection “Although you may be told the instruments were boiled [sterilized], you may find out that they are not clean... Perhaps, they [instruments] have been there for a long time and bacteria are there; then without knowing all that, a person is circumcised using those instruments” [[124], p7].
- Future harm
 - Physical
 - Decreased penile sensitivity “Additional barriers to male circumcision mentioned by a few participants included some loss of penile sensitivity..” [[117], p31].
 - Decreased sexual desire “Additional barriers to male circumcision mentioned by a few participants included some loss of ... and sexual desire...” [[117], p31].
 - Behavioural
 - Increased sexual desire “Additional barriers to male circumcision mentioned by a few participants included ...excessive sexual desire and a tendency to womanize” [[117], p31].
 - Risk compensation “...FGDs also raised a number of concerns and challenges to MC promotion. These included concerns ...that it would encourage their children to engage in risky sexual activity” [[119], p1582].

- Social
 - Ostracisation “Some of these individuals were concerned that boys who were circumcised might be ostracized from their church communities” [[122], p382].
 - Derision “Many said that Luo boys and men would want to avoid being called *rayuom*, a derisive DhoLuo term for the circumcised and for those born with reduced foreskin” [[117], p30].
 - Rejection “A few suggested that Luo women might reject a Luo man as potential sex or marriage partner if he is circumcised” [[117], p30].
 - Religious connotations “Among those from non-circumcising tribes, several participants described circumcision as cultural practice associated with Muslims...” [[126], p16].

Culture/traditional beliefs

- Maintaining tradition “Infants would need to be nursed by their mothers [after circumcision]. We don’t want mothers to know what we do” [[15], p3].
- Non-MC a distinguishing feature “Until recently, extraction of the lower middle six teeth was an identifying feature for Luo as they passed into adulthood, but now that tooth extraction has been largely abandoned, participants see lack of male circumcision as the most significant component of Luo identity aside from language. A few were concerned that, if Luo started circumcising, little would be left to distinguish them from others” [[117], p30].
- Witchcraft “I wanted to have my son circumcised, but my husband refused. He said it was a practice connected to witchcraft” [[126], p17].

Concerns about cost

“Cost of the procedure was expressed by many groups as a significant barrier to circumcision for themselves or their sons” [[117], p31].

Respect for child autonomy

“In the past elders were doing tattoos (Ndembo) on our bodies, and now I understand that these were not good, which is why I wouldn’t want to decide on circumcision for someone else. We may think we are doing the right thing when in fact our children may disagree when they grow up” [126], p17].

3.7.3 Stage three: generating analytical themes

Stage three involved condensing the descriptive themes into analytical ones [106]. Reviewers analysed the barriers to infant male circumcision suggested by the descriptive themes, sub-themes, sub sub-themes, condensed these, and then considered their implications for possible interventions. Each reviewer first did this independently and then together. This process resulted in two main analytical themes (poor knowledge and social constructs) and several recommendations for possible interventions. Conceptually, analytical themes are similar to the eventual product of meta-ethnography: third order interpretations [109], since both enable reviewers to 'go beyond the content of the original studies' [106].

3.8 Results and discussion of the thematic synthesis

Poor knowledge of infant male circumcision and its potential benefits is a significant barrier to intervention uptake. Parents neither understand the rationale behind infant male circumcision nor what the procedure involves. Some doubt (infant) male circumcision's effectiveness in protecting males against HIV. Campaigns designed to promote infant MC should therefore provide parents with information on male circumcision's efficacy in preventing HIV (as well as its other health benefits). I focus on this issue in detail the Discussion chapter.

Concerns around the possibility that infant male circumcision may itself be a source of HIV infection need to be addressed by focusing on how reusable instruments such as the Mogen clamp are sterilised in-between use and the fact that some devices such as AccuCirc can only be used once, which eliminates chances of HIV transmission. Finally, concerns around cost need to be addressed by explaining that male circumcision for HIV prevention is subsidised and clients therefore do not need to pay for the service.

Social constructs –taken here to mean ideas created and sustained by an individual or group - are a source of barriers to infant male circumcision. These include societal myths and misconceptions. Some of the myths act as barriers to MC for HIV prevention because they are associated with threats to a specific social construct – masculinity (e.g. MC decreases sexual desire or pleasure) [127]. In addition to tackling issues around masculinity, interventions to promote infant male circumcision for HIV prevention need to dispel MC-related myths and misconceptions. Fear of various forms of social maltreatment, including ostracisation by church members also came up. Initiatives to promote infant male circumcision for HIV prevention could be incorporated into faith-based HIV prevention interventions; these have been successfully used in sub-Saharan Africa [128,129].

Non-circumcising communities view male circumcision in general and infant MC, specifically, as a form of conversion to the 'other' and a loss of cultural identity. Where circumcision is seen as a "backward" practice, it is likely that communities will resist the intervention. Conversely, traditionally circumcising communities that perceive infant male circumcision, which allows women (mothers) to see and nurse the circumcision wound as taboo [15], regard the intervention as a serious culturally invasion. Country programmes therefore need to recognise and understand cultural and religious beliefs attached to male circumcision in general and EIMC in particular, among certain groups [88]. Furthermore, if targets for infant male circumcision are to be reached, EIMC demand creation initiatives need to change community norms related to infant male circumcision.

3.9 Strengths and limitations of the study

A major strength of this study is that it is the first thematic synthesis to explore parental reasons for non-adoption of infant male circumcision for HIV prevention in sub-Saharan Africa. Given that infant male circumcision has been identified as a key HIV prevention intervention in most of sub-Saharan Africa, reported findings are likely to have broader programmatic implications. Additionally, this study fulfils most of the steps for reporting synthesis of qualitative as research recommended by the ENTREQ statement, a valuable and practical resource and reference tool.

It is perhaps worthwhile to comment on the process of assessing quality of selected studies. As stated earlier, this aspect is not only challenging but also contentious. Although selected studies were assessed using an adaptation of previously derived quality criteria for assessing validity of qualitative research, the process was still challenging and time-consuming. One of the factors that make the exercise a lengthy process is poor reporting of a study's methods; inevitably a lot of time is spent trying to piece together, from inadequate descriptions, what methods and procedures were used and why [109]. Indeed, one of the welcome by-products of undertaking qualitative research syntheses may be an improvement in the quality of the reporting of qualitative research [109].

A potential limitation of this study is that I assessed the quality of my own paper and rated it as "good". In this particular instance, the quality rating could be seen to be biased. However, as has already been stated, assessment of quality of papers was not done by the candidate alone; it involved a second researcher. Additionally, this exercise was first done individually and then jointly using standard criteria; this greatly minimised any potential bias. Moreover, there was generally a high degree of consistency on what the two researchers perceived as

“fair” and “good”, suggesting that on the whole, quality assessment was rigorously performed.

Also, I did not consider frequency counts to determine the weight of the 24 issues (codes) that were identified through line-by-line coding with regards to influencing non-adoption of EIMC. One could argue that a code’s significance is to some extent, determined by the number of times it features in research papers. Whilst this could be true to a lesser extent, reliance on frequency counts to determine the significance of qualitative findings has some shortcomings. The frequency with which an issue is mentioned by research participants may not necessarily be a reflection of its significance but rather, the ease with which it can be mentioned. Also, it could be a result of participants’ conscious efforts to downplay certain issues whilst overstating others. Moreover, during write-up of qualitative findings, authors may choose to present only interesting or rare findings as opposed to commonly-occurring ones. Nonetheless, determination of the relative weight of the identified issues based on researcher’s own perceptions could still be seen to be subjective. However, as previously stated, this exercise was conducted by two researchers to minimise any potential bias.

3.10 Conclusion

In conclusion, using thematic synthesis, this study identified five key barriers to infant male circumcision uptake (lack of information, fear of harm, cultural/traditional beliefs, concerns about cost and need to respect a child’s autonomy) which were later condensed into just two (poor knowledge and social constructs). Resultant recommendations for intervention development will be used to guide the design of a series of approaches for overcoming these barriers. The approaches will subsequently be tested for impact on infant male circumcision uptake.

CHAPTER 4: METHODS

4.1 Overview

This chapter describes the methods I used to undertake the research described in this thesis. It presents the overall study design and goes on to discuss the sampling strategy, data collection methods and analytical approaches for the EIMC hypothetical and actual feasibility and acceptability studies.

4.2 Design of the studies

The research was in two phases (see Figure 4.1). In the first phase I undertook a systematic review and thematic synthesis to explore parental reasons for non-adoption of infant male circumcision for HIV prevention in sub-Saharan Africa. Additionally, I explored the hypothetical acceptability of early infant male circumcision (EIMC) among parents and wider family through focus group discussions (FGDs) and in-depth interviews (IDIs). Previous studies on hypothetical acceptability of infant male circumcision [80,130,131] tended to focus only on the demand side (i.e. exploring views of potential clients). In a bid to be comprehensive, I additionally explored hypothetical acceptability and feasibility of early infant male circumcision among potential providers (supply side) through in-depth interviews. Findings from the first phase informed the design of a study to pilot early infant male circumcision roll out, within which the second phase of the PhD was nested (see Figure 4.1).

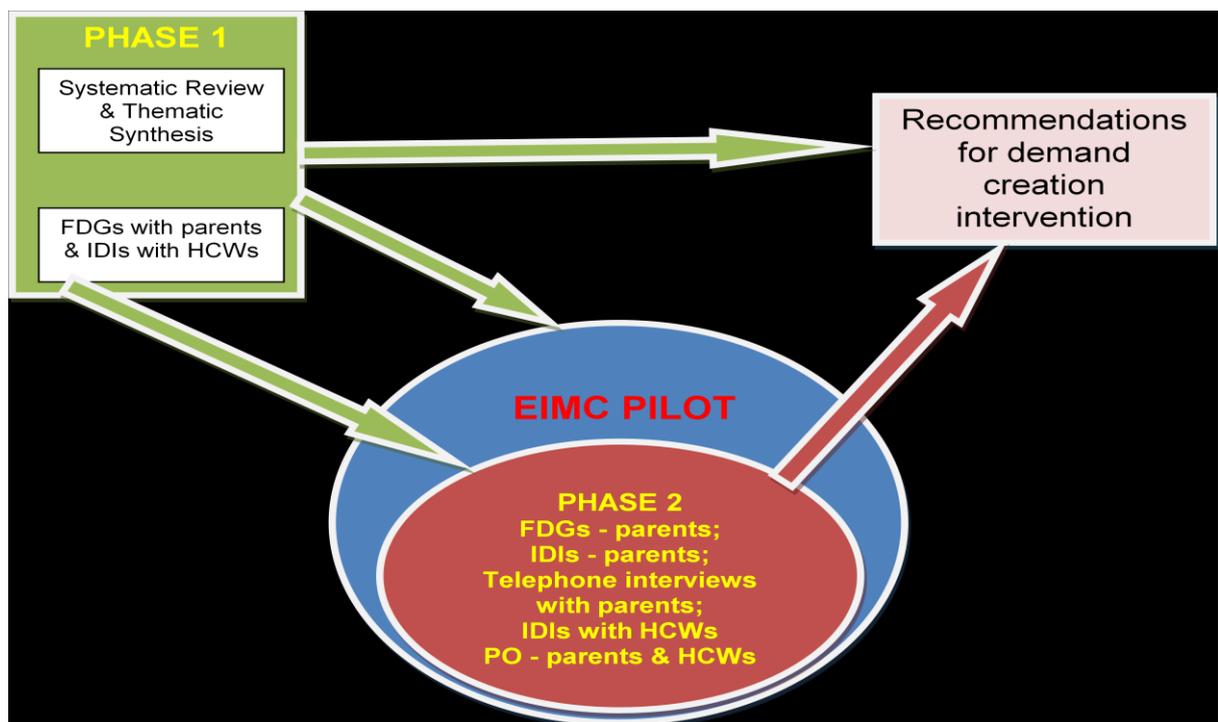


Figure 4.1: Diagrammatic illustration of overall study design

The second phase qualitatively explored actual acceptability of early infant male circumcision among parents who had either opted or declined to have their newborn son circumcised as well as actual acceptability and feasibility of early infant male circumcision among health-care workers. This study of actual acceptability was nested within a randomised comparative trial of doctor-led EIMC which in turn, was part of a larger study to pilot roll out of early infant male circumcision using devices in Zimbabwe.

Ethics approval for the studies described here was obtained from several committees including: University of Zimbabwe College of Health Sciences Ethics Committee, the National Ethics Committee (Medical Research Council of Zimbabwe), the University College London Ethics Committee, and the London School of Hygiene and Tropical Medicine observational/Interventions Research Ethics Committee. Written informed consent was obtained on the day of the interview/discussion.

4.3 Data collection methods

4.3.1 Phase I data collection

Two teams of researchers (1 Shona; 1 Ndebele - each comprising 2 males and 2 females) were trained around qualitative data collection and analysis. Between June and October 2010, the four teams conducted a qualitative study with rural and urban participants in five of Zimbabwe's 10 provinces: Bulawayo, Harare, Mashonaland West, Masvingo and Matebeleland North. Twenty-four gender-specific focus group discussions (FGDs) were held with expectant mothers (n=6 groups), expectant fathers (n=5 groups), grandfathers/fathers-in-law (n=7 groups), grandmothers/mothers-in-law (n=6 groups). Participants (total n=40) were drawn from seven ethnicities: Shona, Ndebele, Shangani, Chewa, Xhosa 'Fengu', Venda and Remba. Purposive and snowball sampling were employed to ensure that the seven ethnicities were fairly represented in the focus group discussions. Of these ethnic groups, only the Shona and Ndebele are traditionally non-circumcising.

Twenty-three in-depth interviews were also held with health-care workers either involved in the adult voluntary medical male circumcision (VMMC) programme or not. These were purposively sampled to include a mix of individuals with various professional roles (doctors, nurse counsellors and midwives). The sample also included paediatricians who offer infant male circumcision privately. Moreover, in-depth interview participants included health-care workers with administrative and policymaking roles. An additional in-depth interview was held with a traditional leader from the dominant traditionally circumcising ethnic group – the Shangani.

All focus group discussions were conducted in either Shona or Ndebele, Zimbabwe's dominant indigenous languages, also spoken and understood by smaller ethnic groups. In-depth interviews were conducted in English, Ndebele and Shona, depending on the participant's preference. Prior to group discussions, facilitators defined early infant male circumcision and presented basic information about the procedure. Discussions then focused on issues such as perceptions of early infant male circumcision, willingness to have son undergo circumcision if it prevented HIV, barriers and motivating factors to early infant male circumcision and perceived acceptability of the intervention (see topic guide in Appendix B).

As data collection progressed, regular meetings were held with researchers to review the data collection process and findings, in addition to providing them with guidance and insights on improving data quality. The data collection process was therefore iterative and it involved data collection, on-going analysis and topic guide revision to test for theme saturation - a situation where qualitative data collection reaches a point where no new constructs emerge [132,133,134]. When theme saturation was reached, data collection was subsequently stopped. All focus group discussions and in-depth interviews were audio-recorded; hand-written notes were taken down as back-up.

4.3.2 Phase 2 data collection

As already mentioned, phase 2 of the study was nested within a comparative trial that was part of a larger study to pilot roll out of early infant male circumcision in Zimbabwe. The pilot study is a collaborative initiative involving the Ministry of Health and Child Care, Population Services International, Centre for Sexual Health and HIV/AIDS Research, University College London, University of Zimbabwe, London School of Hygiene and Tropical Medicine, United Nations Children's Fund–Zimbabwe and the University of North Carolina.

4.3.2.1 Overview and rationale of the EIMC pilot study

Aims of the EIMC pilot study

The early infant male circumcision pilot study has two overarching aims: i) to assess acceptability and feasibility of introducing early infant male circumcision in Zimbabwe delivered using nurse-midwives as part of Zimbabwe's National Circumcision Strategy, and; ii) to conduct studies to inform the prequalification of the Atraumatic Circumcision (AccuCirc) device as a device for early infant male circumcision in sub-Saharan Africa by WHO. The study is in two parts: a comparative trial of two early infant male circumcision devices, AccuCirc and Mogen clamp, to determine AccuCirc's relative safety, acceptability and costs

when used by doctors, and an introductory field implementation study of nurse-midwife delivered early infant male circumcision using AccuCirc, in order to assess intended use during programmatic implementation.

A brief description of the comparative trial devices

The Mogen clamp (Figure 4.2) is one of the commonly-used infant male circumcision devices. It is a reusable stainless steel device that requires a new, sterile scalpel blade for each infant male circumcision [83]. Studies conducted in Southern Africa [69,83] compared the Mogen clamp with the Gomco clamp and Plastibell, two other widely-used infant male circumcision devices. Although rates of adverse events were not significantly different among the three infant male circumcision devices, the Mogen clamp was generally favoured by providers who felt that it was more user-friendly [69,83].

However, since the Mogen clamp does not use a protective shield to safeguard the penile glans, there is a risk that the glans can be pulled into the slit (see Figure 4.3) and crushed or partially severed [19]. In addition, when using the Mogen clamp, operator alignment is critical and if poorly done, results in too much or too little foreskin removal (in which case the remaining foreskin remains vulnerable to infection with HIV). Moreover, because the Mogen clamp is reusable, careful precautions have to be taken to ensure that the device is properly cleaned and sterilized between procedures [19].

The Atraumatic Circumcision (AccuCirc) device (Figure 4.2) is another infant male circumcision device. The AccuCirc is an instrument, largely made of plastic, which utilizes a flexible foreskin probe and shielding ring plus a single-action clamp. Although less widely used in the United States and Europe, AccuCirc has several key features that make it potentially the most suitable device for wide-scale roll out of early infant male circumcision in Southern Africa in general and Zimbabwe, in particular. The device is disposable and comes pre-packaged, negating the need for sterilization. Sterilization of surgical equipment is a major challenge in most health-care facilities due to the unavailability of both electrification and autoclaving equipment. In addition, AccuCirc can be safely applied by non-surgically trained staff such as midwives or nursing cadres as it has a shielding ring, which provides protection of the penile glans during activation of the clamp (see Figure 4.4). The fact that AccuCirc can be applied by non-surgically trained health-care workers not only enables EIMC to be offered on a wide-scale but also in remote health-care facilities, served only by midwives and nurses.

Bronstein Style (Mogen®) Clamp



Figure 4.2: Mogen clamp (left) and AccuCirc (right)

Context of the comparative trial: WHO MC device prequalification process

Before WHO is able to prequalify the AccuCirc device for roll out of early infant male circumcision in Southern Africa, pilot work needs to be conducted in countries of intended use. Just like with any other “new” male circumcision device, the WHO prequalification process involves at least three successive studies that are conducted in countries of intended use: case series, comparative trial and field study [135]. In brief, the case series constitute a non-comparative study conducted with about 50 participants. The study involves close follow-up; primary endpoints are clinical adverse events and device-related incidents.

After the case series, a comparative study (involving at least 100 patients) that compares performance of the “new” device with a standard surgical procedure in a randomized controlled trial is conducted. The third study is a non-comparative field trial of the “new” device in settings of intended use, with procedures performed by trained mid-level providers (non-doctors). A cohort study of at least 500 clients is enrolled and followed-up during the field trial. Primary endpoints for the comparative and field studies are safety, acceptability, feasibility and cost [135]. Below, I describe the comparative trial of the Mogen clamp and AccuCirc devices we conducted as part of the WHO prequalification process for the AccuCirc device. I also occasionally refer to a follow-up field study which is currently underway.

4.3.2.2 A brief description of the comparative trial

Between November and December 2012, four junior doctors (n=3 female; n=1 male) were trained in the use of the AccuCirc and Mogen clamp devices by experts who had already field-tested the devices in Botswana and Nigeria. During the training, 39 infant circumcisions were conducted (n=17 Mogen clamp; n=22 AccuCirc). The training highlighted several issues relating to early infant male circumcision attitudes, decision-making and acceptability, some of which were addressed prior to commencement of the comparative trial.

The comparative trial was conducted between January and June 2013 at Edith Opperman, Mbare, a Harare polyclinic with the greatest number of deliveries (400 deliveries per month [136]). Mbare is one of Zimbabwe's oldest and poorest suburbs; it is characterised by densely packed housing and high levels of unemployment plus crime. As illustrated in chapter 7, the fact that the EIMC clinic was situated in a poor, old suburb sometimes enkindled scepticism about the quality of the EIMC procedure. During the comparative trial, the four doctors performed EIMC on a rotational basis. They were assisted by three female nurse-midwives. Three outreach workers (n=2 female; 1 male) sensitised parents and the wider family around EIMC, in addition to recruiting babies for the comparative trial. The male outreach worker's principal task was to contact fathers of male infants born at the study clinic and subsequently sensitise them around EIMC. The three outreach workers were supported by a female interpersonal communicator with previous experience of mobilising for the adult VMMC programme.

Sensitisation around infant male circumcision and participant recruitment took place during ANC or at delivery. Demand generation materials and activities included posters, pamphlets, road shows, dramas, group talks, interpersonal communication and use of satisfied clients. Mothers who subsequently delivered a male infant and were interested in being enrolled in the study were asked to: i) provide locator information and consent for an outreach worker to physically verify this; ii) respond to a one-time questionnaire and; iii) further discuss the procedure with their male partner (if relevant) before attending for early infant male circumcision.

Locator data were physically verified on all participants between recruitment and enrolment. Following informed parental consent and study eligibility screening, baseline data were collected from all participants (including on the HIV status of the mother) then participants who met the trial inclusion criteria were randomised to infant male circumcision by either the AccuCirc device or the Mogen clamp in a ratio of two AccuCirc to one Mogen clamp (total sample size 100 AccuCirc and 50 Mogen clamp). Initially, only infants aged 6-10 days were eligible for inclusion. After recruiting 108 babies, eligibility was extended to include babies aged 6-60 days old in line with World Health Organisation guidance [19].

All infants received vitamin K to minimise bleeding and 1 gram topical EMLA cream (eutectic mixture of local anaesthetics containing 2.5% lidocaine and 2.5% prilocaine) for anaesthesia about 45 minutes to one hour prior to the procedure. When EMLA cream had achieved anaesthetic effect (45 minutes to one hour post application), the surgical area was cleaned with a scrub solution. The circumcision site (around the corona) was then marked using a

surgical pen mark. The surgical pen mark served to minimise either excessive or insufficient skin removal. The foreskin was subsequently pulled and adhesions were released. Device – specific procedures were employed to free the foreskin from the penile glans (see Figures 4.3 and 4.4). During the procedure, oral glucose was given using a gloved finger.

After the procedure, parents were given detailed post-procedure care instructions (how to deal with dressing, bleeding, cleaning, and signs of infection), emergency contact information and a container of petroleum jelly to be used for wound care. Mothers were encouraged to attend the clinic in the event of any worries or unanticipated events that occurred between scheduled visits. Follow-up appointments at the clinic took place at days 2, 7 and 14 post-circumcision.

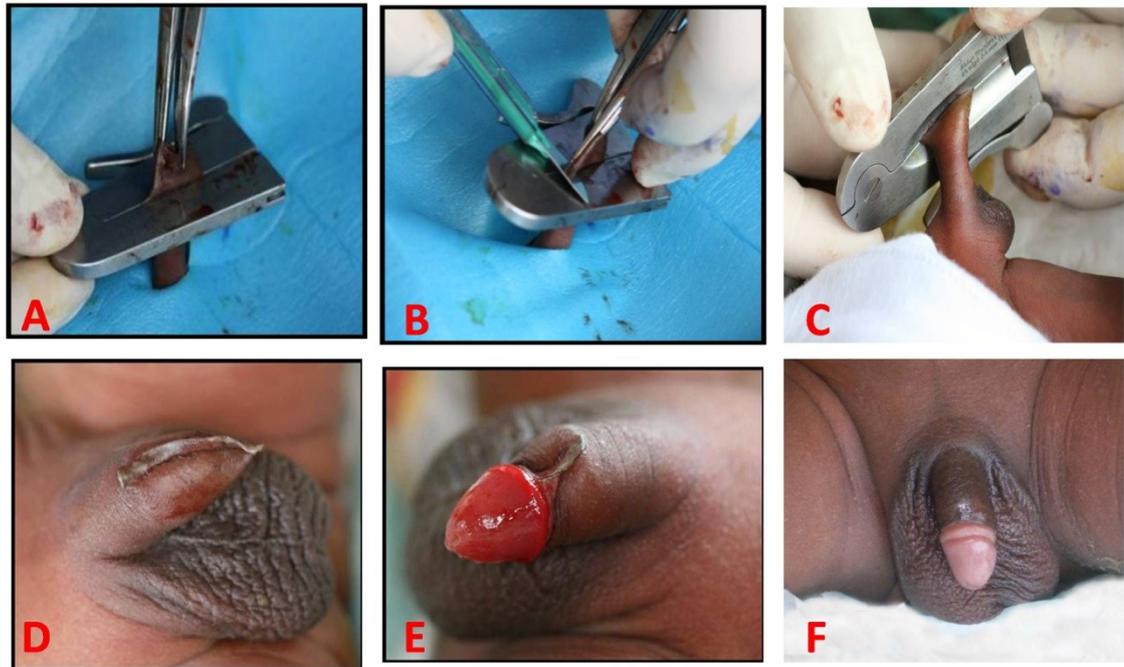


Figure 4.3: Infant MC using Mogen clamp

A Clamp applied; **B** Foreskin removed with scalpel blade; **C** Clamp in place; **D** Removal of clamp; **E** Delivery of glans; **F** Day 14 outcome

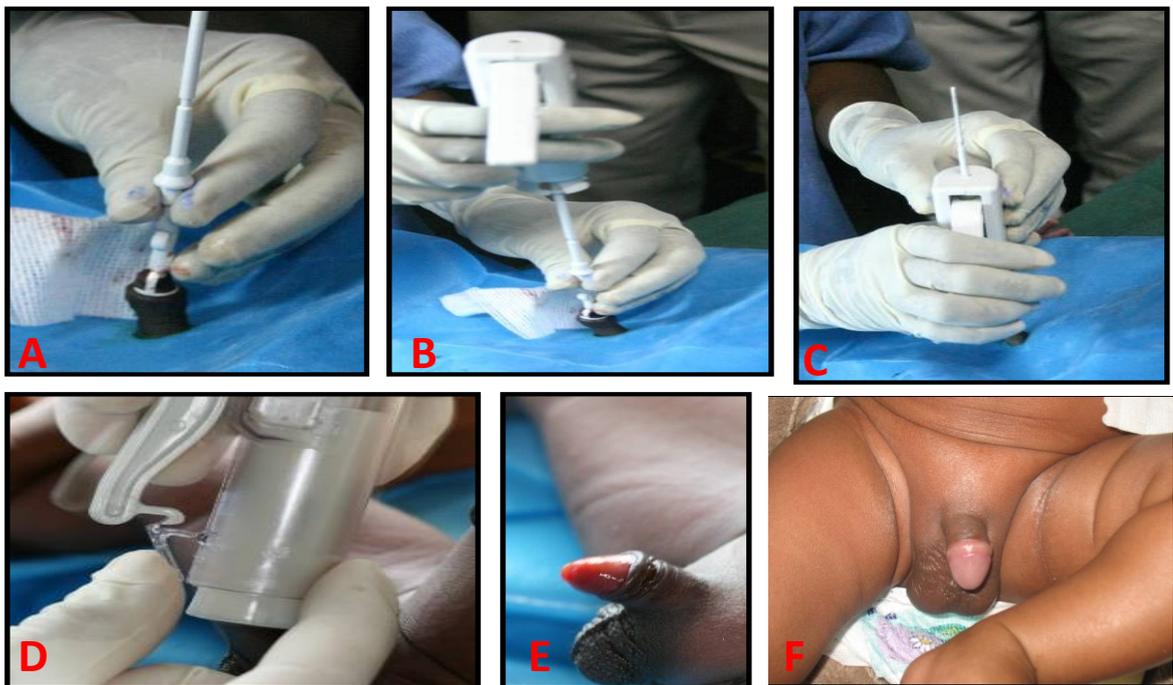


Fig 4.4: Infant MC using AccuCirc

A Shielding ring inserted; **B** Clamp applied; **C** Clamp activated; **D** Removal of clamp; **E** Immediate outcome; **F** Day 14 outcome

Primary endpoints for the comparative trial were: i) safety - number of adverse events (AEs) (minor, moderate and severe) related to each EIMC technique; ii) acceptability - the proportion of parents who reported being satisfied with the procedure by EIMC technique and; iii) cost - monetary cost of equipment usage for each technique plus training costs and labour cost associated with infant male circumcision under each technique and the cost of AE under each technique.

4.3.2.3 Nesting a qualitative study within the comparative trial

Two teams of researchers (including candidate) were trained around qualitative data collection and analysis by an expert on qualitative methodology from London School of Hygiene and Tropical Medicine. Between January and May 2013, we held a predetermined number of in-depth interviews (IDIs) and focus group discussions (FGDs) with parents, based on resource limitations. A total of twelve in-depth interviews and four focus group discussions were held with parents who had either adopted early infant male circumcision for HIV prevention (n=3 IDIs and 1 FGD with mothers; n=3 IDIs and 1 FGD with fathers) or had declined to circumcise their newborn sons (n=3 IDIs and 1 FGDs with mothers; n=3 IDIs and 1 FGD with fathers) (See Figure 4.5 for qualitative sampling).

Among parents who accepted early infant male circumcision, discussions explored reasons for adopting the procedure, the decision-making process, perceptions around safety plus ultimate appearance, as well as whether they would recommend early infant male circumcision to other parents. Among parents who declined early infant male circumcision, discussions explored reasons for not taking up the procedure, their fears and/or concerns as well as what would need to change for them to opt for early infant male circumcision (see IDI topic guide in Appendix B).

Furthermore, short telephone interviews (n=95) were conducted with additional parents who had arranged to bring their sons for early infant male circumcision but then defaulted. This was in order to determine their reasons for not bringing the infant for the procedure. The number of telephone interviews was predetermined, and was based on resource plus time constraints (the same researchers who conducted the interviews were also required to conduct several other study-related tasks). In these telephone interviews, we included 15 parents (88%) who had gone through all study screening procedures (including providing locator information, comprehension of screening eligibility criteria and responding to a one-time questionnaire) but did not eventually enrol. Of these 15, ten were mothers; five were fathers (Figure 4.5).

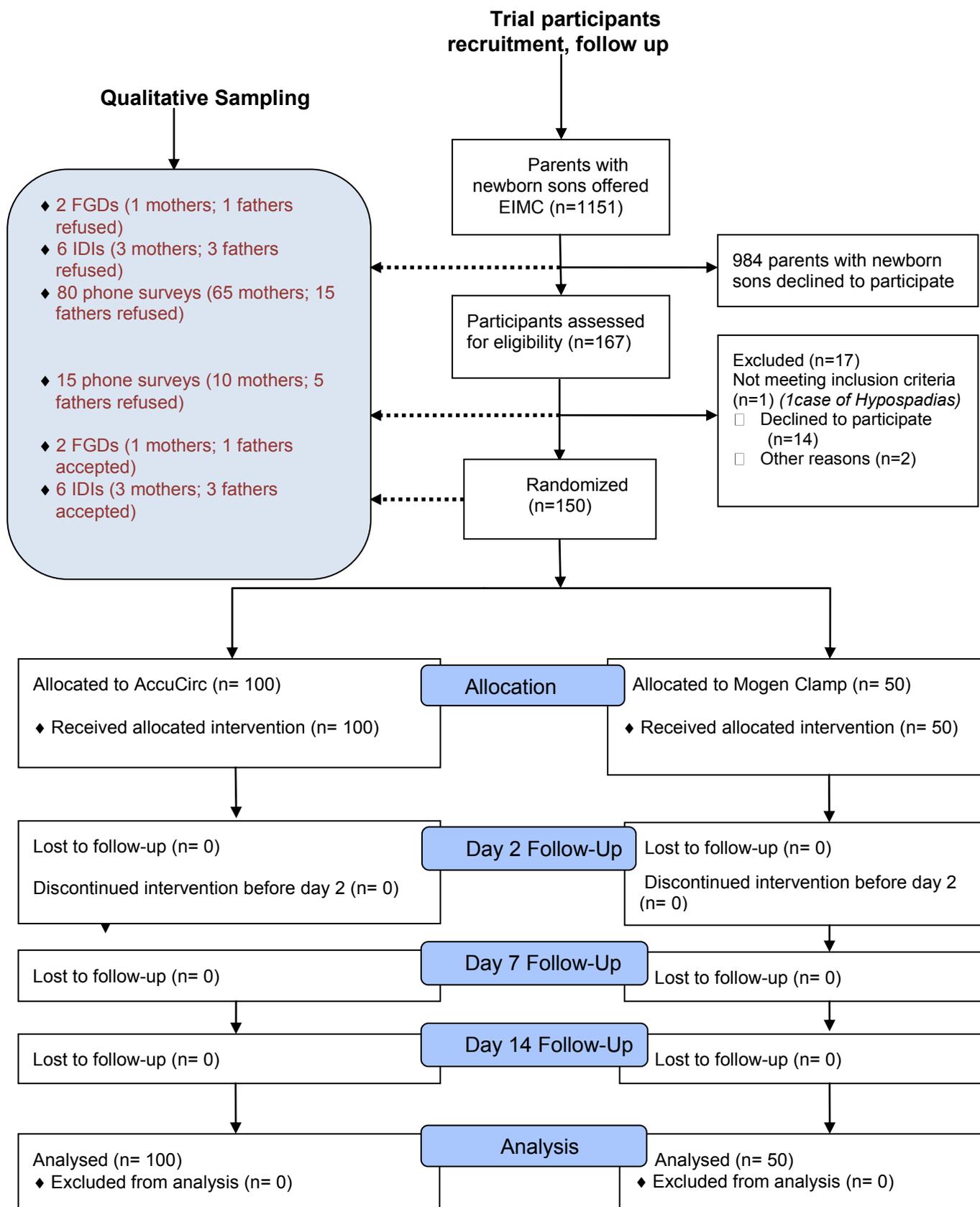


Figure 4.5: Trial participants recruitment and qualitative sampling

The other 80 telephone interview participants were selected as follows: 65 females (10%) were randomly selected from a list of 650 mothers who had arranged to bring their sons for EIMC but then defaulted. An additional 15 males (10%) were randomly selected from a list of 150 fathers who had participated in weekend group meetings and promised to bring their sons for early infant male circumcision but then defaulted. Telephone interview participants were contacted when their sons were no longer eligible for EIMC (initially from day 11 after birth and later from day 61). Short statements were handwritten at the time of the call and later coded.

In-depth interviews were also held with the four doctors that were performing early infant male circumcision (EIMC) during the comparative trial. Additional in-depth interviews were held with the three EIMC study nurse-midwives. Furthermore, in-depth interviews were held with nurses who worked at the study clinic but were not involved in the EIMC study (n=5). The five nurses were purposively sampled to include a sister-in-charge; two nurse-midwives based in the maternity unit and two registered general nurses based in the family health services clinic (unit where babies and children are seen for immunizations and growth monitoring). Discussions assessed actual acceptability of the procedure, in addition to obtaining views on the feasibility of offering wide-scale early infant male circumcision using either the AccuCirc or Mogen clamp. Discussions with EIMC study clinicians also elicited perceptions around safety of the procedure when conducted through either device.

Focus group discussions lasted 2-2.5 hours whilst in-depth interviews lasted 45 minutes to one hour. All focus group discussions were conducted in Shona, the participants' language. In-depth interviews were conducted in either English or Shona, depending on the participant's preference. All focus group discussions and in-depth interviews were audio-recorded; hand-written notes were taken as back-up.

In addition to the in-depth interviews, focus group discussions and short telephone interviews, I used observation. Observation is particularly useful when an understanding of non-verbal communication is likely to be important; the technique offers the opportunity to record and analyse behaviour and interactions as they occur [132]. As stated earlier, the comparative trial within which the second phase of the PhD research was nested was conducted at a Harare clinic over six months (January to June 2013). Since I was the Research Coordinator for the trial, I would visit the clinic at least three times a week; each visit lasted two hours on average. During the visits, I discussed study-related issues with the clinic coordinator, EIMC doctors and other study staff.

I took advantage of my presence at the study clinic to observe parental and EIMC doctors' non-verbal behaviour before, during and after infant circumcisions. For example, I would observe the composition of family members who accompanied the male infant to the clinic. As illustrated later, the family composition was likely to mirror the key players who had been involved in the EIMC decision-making process. Also, I observed EIMC doctors during and after the procedure; in this instance, their non-verbal behaviour served to validate their assertions about relative ease with EIMC devices. I always had a pen and small notebook in my car, which would be parked outside the clinic. Whenever I observed something that I perceived to be important, I would go to my car and write down some notes. I would also note analytical reflections next to the notes (e.g. 'anxiety about the EIMC procedure').

4.4 Data analysis

4.4.1 Theoretical approaches to qualitative data analysis

There are three common theoretical approaches to qualitative data analysis: *grounded theory*, *framework analysis* and *thematic content analysis* [132,133]. While there may be slight differences in these theoretical approaches, there is a core set of techniques common to them. Overall, all aim to identify main codes from qualitative data and then group these into themes and sub-themes. In brief, grounded theory is often utilised when the purpose of the research is to explore a topic about which little has been written before or when issues being explored may be specific to the study population. Grounded theory involves a cyclical process of data collection, analysis, development of provisional coding scheme, and further data collection until theme saturation.

The framework approach has been specifically developed for applied or policy relevant qualitative research in which the objectives of the investigation are typically set in advance and shaped by the information requirements of a funding body (e.g. a health authority) [132,133,137]. Therefore, although the framework analysis reflects the original accounts and observations of the people studied (i.e. is "grounded" and inductive), it starts *deductively* from pre-set aims and objectives [137]. The difference between framework analysis and grounded theory is that the former is more targeted; it seeks to identify themes relating to a specific topic. The latter identifies themes to come up with a 'story'.

The third approach to qualitative data analysis - thematic content analysis, utilises pre-existing ideas generated before a study to inform key themes of the study (known as 'working down') [132,133]. However, the approach also involves refining those themes on the basis of what is found in collected data (known as 'working up') [132,133]. The difference

between the framework approach and thematic content analysis is that the latter is more inductive (i.e. it mostly draws conclusions from the data) [137]. Additionally, thematic content analysis is less structured than the framework approach.

At the time I conducted phase 1 of the PhD research (i.e. 2010), male circumcision (MC) was new to most Zimbabweans. The Ministry of Health in collaboration with technical agencies had just begun scaling up voluntary medical male circumcision (VMMC) and only about 5,000 adolescent and adult men had been circumcised [62]. Early infant male circumcision was generally unheard of. Grounded theory therefore seemed the appropriate theoretical approach for qualitative data collection and analysis as the intention was to discover issues 'from the ground'. When we conducted the second phase, we were aware of issues relating to early infant male circumcision hypothetical acceptability and feasibility. The intention then was to see whether identified issues also related to actual acceptability and feasibility, especially since we were aware of data from other settings on the poor concordance between early infant male circumcision hypothetical acceptability and actual uptake [83,100]. We therefore used thematic content analysis to analyse phase 2 data.

4.4.2 Qualitative data analysis for the PhD research

All audio-recorded data were transcribed and translated verbatim into English (where necessary). All translations were checked by the candidate (a professional translator) for accuracy. During data analysis for the first phase, which was informed using grounded theory principles, the first five transcripts were coded line by line; emerging themes were used to come up with a provisional coding framework. Additional data were collected; meetings with research teams were held to review additional emerging themes; these were incorporated into the coding framework. Data collection continued until no new constructs emerged. Names and other personal identifiers were removed from transcripts before they were entered into NVivo 8 (QSR International, Melbourne, Australia), a qualitative data management and retrieval program. Two researchers independently coded data using the enhanced coding framework. If there were disagreements over the interpretation of some codes, the candidate met with the two researchers. The three of us would examine the codes and collectively agree on the standard forms to use for coding; the coding framework was subsequently revised in line with any agreed changes. The candidate also independently coded all transcripts. During write-up, themes and sub-themes were illustrated with verbatim quotes.

During data analysis for the second phase, which was informed by thematic content analysis, after translation, interview summaries were written for each in-depth interview and

focus group discussion. The interview summary was both a descriptive and analytic synopsis of the in-depth interview or focus group discussion (see sample in Appendix C). Interview summaries were used to come up with a provisional coding framework. Five in-depth interviews and all focus group discussions were then coded line by line on paper by four researchers using the coding framework.

The four researchers conducted this exercise independently. If there were disagreements over the interpretation of some codes, the candidate met with the four researchers. The five of us would examine the codes and collectively agree on the standard forms to use for coding. Additional codes identified through line by line coding were added to the coding framework. Names and other personal identifiers were removed from transcripts before they were entered into NVivo 10 (QSR International, Melbourne, Australia). Transcripts were then coded using the modified coding framework; care was taken to identify any additionally emerging codes. The candidate also independently coded all transcripts. Analytic memos were written for each theme (see sample in Appendix D). During write-up, themes and sub-themes were illustrated with verbatim quotes.

Handwritten statements obtained from the telephone interviews were typed and entered into an excel document. Two researchers read the statements and assigned each statement a code based on its key words. Codes were grouped into categories and emerging themes and sub-themes were identified following the general principles of thematic content analysis [132,133]. Participant observation notes were entered into a word document together with information that identified the context they described; they were subsequently coded and used to augment themes and sub-themes during write-up.

CHAPTER 5: RESULTS - HYPOTHETICAL ACCEPTABILITY OF EARLY INFANT MALE CIRCUMCISION FOR HIV PREVENTION - PARENTS AND WIDER FAMILY

5.1 Chapter overview

In this chapter I present findings of the research I conducted to determine hypothetical acceptability of early infant male circumcision (EIMC) for HIV prevention among parents and wider family. The methods I used to explore this issue are described in detail in the previous chapter. In brief, between June and October 2010, twenty-four gender-specific focus group discussions (FGDs) were held with expectant parents and the wider family. In addition, an in-depth interview (IDI) was held with a traditional leader from the dominant traditionally circumcising ethnic group, the Shangani. Focus group discussion participants were drawn from seven ethnicities using purposive and snowball sampling. Discussions were transcribed, translated into English, coded using NVivo 8 and analysed using grounded theory principles (see section 4.4.2 for a detailed description of data analysis procedures). Some of the findings presented in this chapter have been previously published [15] (see full paper in Appendix E).

5.2. Description of focus group discussion participants

A total of 240 participants aged 18-80 years took part in the 24 focus group discussions. Of the 240 participants 130 (54%) were female (Table 5.1).

Table 5.1: Characteristics of focus group discussion participants

Category	Subcategory	n	%
Sex	Female	130	(54)
	Male	110	(46)
	Total	240	(100)
Title	Expectant mother	60	(25)
	Expectant father	50	(21)
	Grandmother/mother-in-law	60	(25)
	Grandfather/father-in-law	70	(29)
	Total	240	(100)
Ethnicity	Shona	141	(59)
	Ndebele	71	(30)
	Other	28	(11)
	Total	240	(100)

The distribution of focus group discussions was as follows: expectant mothers (n = 6 FGDs); expectant fathers (n= 5 FGDs); grandmothers/mothers-in-law (n= 6 FGDs); grandfathers/fathers-in-law (n= 7 FGDs). Fourteen focus group discussions were held in urban areas and 10 in rural areas. Distribution of focus group discussion participants

according to ethnicity was as follows: Shona (n= 141); Ndebele (n= 71); other (Shangani, Chewa, Xhosa 'Fengu', Venda, Remba n=28) (Table 5.1). As stated previously, the Shona and the Ndebele are the predominant ethnic groups; they constitute about 70% and 16 % of the Zimbabwean population, respectively [78]. The other ethnicities constitute <2% each [78].

5.3 Overview of focus group discussion findings

On the whole, EIMC knowledge was poor. Despite low knowledge, EIMC acceptability was high among participants from most ethnic groups. Older men from one traditionally circumcising population, who circumcise during adolescence, were strongly opposed to EIMC. Paediatricians reported a recent increase in parents requesting EIMC. Participants raised several concerns that have implications for circumcision roll out.

5.3.1 Early infant male circumcision knowledge

Knowledge of male circumcision in general and of early infant male circumcision, in particular, was poor among most focus group discussion participants and especially among traditionally non-circumcising groups. A majority of participants, particularly (and understandably) females, did not know what circumcision is; neither were they aware of the indigenous terms for the procedure. Knowledge was extremely poor among expectant mothers and in order to initiate discussions with them, female researchers had to first present pictures depicting a circumcised penis. A few female participants mistook circumcision for the common practice of retracting a newborn's foreskin during bath time. An expectant mother had to correct another FGD participant.

What you are referring to is not circumcision. It's what you do when you bath a baby boy. You push the foreskin backwards; it will be uncut... This circumcision that we are talking about is the actual removal of the foreskin (expectant mother, fgd15).

Some female participants mistakenly drew parallels between male circumcision and castration. *'I am seeing that the Shona knew about this [MC]; they used to do it on bulls so that they could be yoked. So this means it [MC] has always been there'* (mother-in-law, fgd23).

Discussions suggested that most female participants did not know how much skin is removed as well as precisely where it is removed from. *'I don't really know which skin it is but it's the one on top'* (expectant mother, fgd3). Additionally, participants from traditionally non-circumcising populations were unaware of male circumcision's benefits. *'We hear that it*

[male circumcision] is done among the Shangani and other people of foreign origin such as the Chewa [from Malawi] but we don't know why they do it' (grandfather, fgd7).

Perceptions around timing of early infant male circumcision also revealed poor knowledge of the procedure. When asked to give their opinions on timing of the procedure, participants generally felt that it should be done not before three to six months after birth. *'It [MC] should be done when they [babies] are about six months old. You can't do it earlier as the organ [penis] will still be too tender'* (expectant father, fgd1). Participants generally felt that fragility of the infant penis in the immediate post-partum period would result in unacceptable risk of surgical error. *'One can easily cut off the head [penile] as well'* (father-in-law, fgd19). An expectant father also remarked, *'At birth it's impossible to hold you see, you will cut the head [penile] as well, that's why I said the infant should be circumcised when it is about to get weaned'* (expectant father, fgd1). Traditionally, babies are expected to be breastfed for up to 18-24 months.

To a lesser extent, views around timing of early infant male circumcision were influenced by experiences with norms and practices around adolescent and adult traditional male circumcision.

We might end up hurting them [infants]...When we are looking at our neighbours, those who actually do this practice, they don't do it when the child is still young. They do it when they are big boys. It means that when the child is young it [MC] cannot be done... (grandfather, fgd6).

Overall, the feeling that it is less-risky to circumcise toddlers, as opposed to infants, was quite pervasive.

5.3.2 General acceptability of early infant male circumcision

Despite low levels of infant male circumcision knowledge, discussions suggested high willingness to have sons circumcised in most ethnic groups. A few participants stated that infant male circumcision was especially a good practice because it was written in the Bible. *'It's a good thing; even the Bible says Jesus himself was circumcised'* (grandmother, fgd9). Interestingly, these participants did not realise that the circumcision referred to in the Bible is early infant male circumcision as opposed to circumcision performed later in life. Overall, participants mentioned that they were even more willing to circumcise their grandsons/sons if male circumcision was an effective HIV prevention method. *'Even now as I speak, if I hear that they are now circumcising children at our hospital, I will quickly take my grandchild along. I am currently faced with the burden of looking after AIDS orphans'* (grandmother,

fgd9). Several participants felt that if circumcision protects one from HIV, infant and adolescent circumcision should be compulsorily offered as part of national HIV prevention efforts. *'The government should "force" parents to circumcise their sons in the same way it "forces" them to immunise children against measles'* (grandfather, fgd20). On the whole, participants felt that the impact of HIV on the younger generation is enormous, and were excited to hear that male circumcision is at least partially protective.

Discussions with older men who were collecting their antiretrovirals at one rural hospital corroborated those from a quantitative survey we conducted in 2009 [13] – that HIV positive men are particularly keen to have their sons circumcised; *'I would not want my son to also go through what I am going through now. Had circumcision come earlier, I would probably be [HIV] negative'* (father-in-law, fgd7). Furthermore, during discussions participants highlighted the advantages of circumcising a son during infancy as opposed to later in life. *'I think it [EIMC] is a good thing for them to be done when they are still infants so that when they start sleeping around, it will take them time to catch the disease [HIV/AIDS]'* (expectant mother, fgd3). Interestingly, participants' responses suggested feelings around the inevitability of male infants' future multiple sexual partnering and that they would likely become infected with HIV.

Additional advantages of early infant male circumcision over adolescent or adult MC cited by participants included the belief that infants experience less pain and are likely to heal faster. *'...They [infants] do not feel the pain very much; they also heal faster. It's not the same as adults'* (grandmother, fgd9). Participants also felt that early infant male circumcision roll out will likely be more successful than the adult voluntary medical male circumcision programme which requires men to first undergo HIV counselling and testing (HCT) as men are generally afraid of HCT. *'Like now, if you tell a man that at the hospital they said both of us should come for testing [HIV], it's a problem. He refuses'* (expectant mother, fgd14). During discussions, men acknowledged their reluctance to undergo HCT and said this was a potential barrier to voluntary medical male circumcision uptake. Additionally, some male participants felt that early infant male circumcision had an important advantage over adolescent or adult MC in that EIMC clients do not endure the pain associated with erections during the post-circumcision period. *'It would be better to circumcise infants because if adults come in contact with women after circumcision, their thing will be like this (gestures to indicate an erection) [laughter]'* (expectant father, fgd1).

5.3.3 Decision-making around early infant male circumcision

When parents were asked to envisage who would be involved in the process of deciding about early infant male circumcision, younger participants (expectant parents) felt that this would involve a discussion between the infant's parents. *'The decision that matters is that of the father and the mother; they sit down and talk about it'* (expectant mother, fgd16). An expectant father concurred, *'You discuss it together with the mother [infant's] and you reach a consensus'* (expectant father, fgd10). Nonetheless, male and female participants of all age groups highlighted the importance of the father in the decision-making process. *'The man must make that decision because he is the one who knows whether or not that is practised in his clan; a woman cannot know anything about a clan to which she doesn't belong'* (father-in-law, fgd18). The implication here is that if male circumcision is not practised in the father's clan it would not be advisable to circumcise the male infant. A female participant concurred, *'As the mother, I cannot decide whether or not the child should be circumcised. I will need to "sit down" [discuss] with the father and we will have to go by his decision'* (expectant mother, fgd3).

Subsequent probing suggested that mothers-in-law/grandmothers are also likely to have considerable influence. When elderly men were asked what they would do if a daughter-in-law turned down a suggestion to circumcise her son, one of them questioned, *'Where does the [infant's] mother fit in?'* (grandfather, fgd19). He went on to proclaim, *'The mother of the child is also my child'* (grandfather, fgd19). This sentiment was echoed by an older woman. *'The daughter-in-law will not refuse; I have powers over the grandchild...I will take him for circumcision myself'* (mother-in-law, fgd21). Discussions also suggested that the wider family's influence is sometimes covert; an expectant mother described steps she would take if her husband refused to have their son circumcised if that was what she wanted. *'If he [father] refuses, I will talk to his mother and she will then ask his uncles to talk to him'* (expectant mother, fgd14). Early infant male circumcision decision-making is therefore likely to be a process involving the extended family and goes beyond just the child's parents.

5.3.4 Acceptability of EIMC among traditionally circumcising groups

Discussions with four of the five traditionally circumcising groups suggested that these ethnicities are unopposed to early infant male circumcision. However, they felt that they would prefer the procedure to be performed by someone who was themselves circumcised and of the same tribe. Some Muslim participants (mostly the Chewa of Malawian origin) preferred it to be done by someone of the same religion. *'For us to be touched [circumcised] by anyone [non-Muslim]...the truth is we don't want but we will be prepared to take our children to Indian [Muslim] doctors'* (grandfather, fgd20).

However, older men from the dominant traditionally circumcising population in Zimbabwe, the Shangani, were strongly opposed to early infant male circumcision for three reasons. Firstly, they mentioned that circumcision is just one part of a comprehensive 'rites of passage' ritual and should therefore not be undertaken separately. *'We don't just circumcise. There are "lectures" that we teach those that undergo circumcision. How will we be able to teach infants?'* (grandfather, fgd6). Secondly, they noted that if infants were circumcised, their mothers would need to be involved in the process as they would nurse the wound. *'Infants would need to be nursed by their mothers [after circumcision]. We don't want mothers to know what we do'* (traditional leader, IDI24). Among the Shangani, allowing women to see (and nurse) the male circumcision wound is considered taboo. Lastly, older Shangani men stated that they do not recognise male circumcision performed in a clinical setting.

There are some men who run away from our tradition and get circumcised in hospitals. Despite being circumcised that way, they still haven't 'qualified' [to be accepted as men]. We don't consider the fact that they have been circumcised at the hospital (grandfather, fgd6).

Further probing revealed that this was because medical male circumcision is less painful (as anaesthesia is used). As stated earlier, experiencing and enduring pain is a key part of the traditional procedure.

5.3.5 Participants' concerns

Despite high levels of acceptability, community members raised several key questions about circumcision discussed in detail below.

5.3.5.1 Safety of the procedure

Community members questioned the safety of early infant male circumcision. As previously stated, safety-related concerns were based on the assumption that the newborn's penis is too fragile to be circumcised, leading participants to feel that, to maximise safety, the procedure should only be performed by highly-trained doctors. *'This thing should be done by doctors who really know how to do it and no one else'* (mother-in-law, fgd23). An expectant father described what might happen if early infant male circumcision is conducted by inadequately-trained health-care cadre. *'...When they try to pull that foreskin, they might not pull it enough and when they try to cut, they might cut that head [penile] as well'* (expectant father, fgd1). Still on the issue of providers, participants who favoured early infant male circumcision for HIV prevention strongly recommended that it should only be done within a clinic setting; they expressed strong reservations with home-based circumcisers. *'They will*

end up using the same razor blade on several infants thereby spreading what we are just trying to prevent [HIV]' (expectant mother, fgd14).

Participants were also concerned about the possibility of excessive bleeding, which they felt could lead to death. *'As has been said, they might make a mistake when cutting. The child might die if he bleeds too much'* (expectant mother, fgd13). A few participants were worried about undesirable outcomes such as possible impotence and keloid scarring. An expectant mother articulated her concern, *'I want to know if there won't be any interference with his manhood during circumcision such that he will face problems when he eventually marries'* (expectant mother, fgd13). A male participant also questioned, *'What if my child gets swollen like those people who have a large growth from ear piercing...?'* (expectant father, fgd11). They felt that such permanent negative outcomes could result in a son's later regrets.

5.3.5.2 Handling and disposal of removed foreskin

Customarily, Zimbabweans are worried about disposal of body fluids/tissues as they fear that these may be used by 'witches' to cause subsequent harm. For example, people burn shaved hair and nail clippings in case these end up in the wrong hands. With infants, disposal of the umbilical stump is a culturally-sensitive issue which involves mothers-in-law/grandmothers. Unilateral disposal of the umbilical stump by a young couple/mother can have serious implications. The umbilical stump is considered a significant part of the human body that connects an individual not only to their mother (in the womb) but also to their ancestors after life [138]. The umbilical stump is therefore often obtained from health-care workers and subsequently buried next to stumps of older siblings (often in the rural areas). When one dies, they are expected to be buried at their rural place (i.e. where their umbilical stump lies). The belief is that the deceased's spirit will then be able to connect with those of their ancestors and cease to be a lost, wandering spirit, something undesirable to the majority of African in general and Zimbabweans, specifically [138].

Just as with the umbilical stump, community members were anxious about the fate of the amputated foreskin: *'What will happen to the piece [foreskin] that gets removed?'* (grandfather, fgd5). Another participant stated, *'They (HCWs) should ensure that pieces that get removed are carefully disposed of so that they do not end up in the hands of those who could use them as "muti" [traditional charm]'* (mother-in-law, fgd21). Some participants felt that parents should be given the foreskin to dispose of it themselves, drawing parallels with the common practice of obtaining the infant umbilical stump from health-care workers. *'The foreskin [infant] is just the same as the umbilical cord [stump]; both should be given back to the child's parents'* (father-in-law, fgd19). Mothers-in-law/grandmothers strongly articulated

that should young couples decide to circumcise infants on their own, *at a minimum* elders need to be involved in foreskin disposal. *'As is the case with the umbilical cord [stump], I should be the one who decides where and how to dispose the piece that gets removed'* (mother-in-law, fgd23). Overall, older male and female participants alike felt that the infant's removed foreskin should be given to the child's relations.

5.3.5.3 Impact of EIMC on future sexual behaviour

Participants raised concerns around the possible impact of early infant male circumcision on male infants' future sexual behaviour. Male participants were worried that the procedure could potentially result in decreased sexual desire or sub optimal sexual performance. *'Is it not possible that he may end up with "no fire" [sexual prowess] such that the woman he marries will end up saying, "My friend you are just too weak"?' (expectant father, fgd2)*. Other participants were concerned that the procedure may result in excessive sexual desire, a concern likely due to myths about the sexual behaviour of traditionally circumcised men. *'I don't know, maybe I might insult Gogo [referring to an elderly woman married to a Chewa man]. I once heard that the Chewa men like women a lot so I think it's because of this circumcision'* (mother-in-law, fgd23).

Discussions with male participants from traditionally non-circumcising ethnicities also suggested myths around male circumcision and sexual performance. For example, these male participants expressed the belief that circumcision results in longer sex duration, something culturally desirable for men.

They say that that head [penile] is the one that is "sensitive". The one who is not circumcised will have it opening and closing during sex so he will ejaculate "chop chop" [very early]. Now, if that skin is no longer there, the period that you take to get to "generate sperms" will be very long (expectant father, fgd12).

Some male participants noted that they had heard that circumcised men have the potential to ejaculate multiple times during a single sexual act, something also culturally desirable for men and closely linked to masculinity.

Yet other participants were concerned that early infant male circumcision could possibly result in future risk compensation or behavioural disinhibition. An expectant mother questioned, *'This circumcision thing, won't it give men the urge to be more promiscuous because they will be saying "I got circumcised so I am protected..."?' (expectant mother, fgd15)*. This concern was echoed by an older man.

The bad thing that I think might result because of circumcision... when we are looking at the issue of HIV/AIDS, I think it can result in some recklessness of some sort, that if this is not accompanied by some education... You see when I have a belief that because I have been cut the virus won't attack, it can result in me not using that plastic, the condom (father-in-law, fgd6).

Overall, participants recommended robust educational programmes to deal with possible male circumcision-related risk compensation or behavioural disinhibition.

5.3.5.4 Stigma associated with 'looking different'

Since male circumcision was until recently, a source of stigma among some Zimbabwean populations, some participants were not surprisingly, concerned that early infant male circumcision would likely result in the child's later regrets due to stigma associated with 'looking different'. *'Perhaps when he grows up he will not like it and he will start to hate you for what you would have done'* (expectant father, fgd11). Another male participant remarked, *'The thing is an infant would not have made his own decision. When he grows up, he will probably ask, "Why did you do that to me?"'* (expectant father, fgd1).

Participants believed that the MC-related stigmatisation leads to aggressive behaviour in both circumcised adolescents and adult men. The aggression is probably a result of the fact that in the past, circumcised men were teased and the circumcised penis was called by several scornful names whose connotations were addressed earlier. When these names were mentioned during focus group discussions, participants spontaneously broke into laughter. *'In Shona, a circumcised penis is called **shondo**'* (laughter) (grandfather, fgd10). As mentioned previously, the term *shondo* literally means 'something which sticks out its head whilst the whole body is inside'. When used to refer to a circumcised penis, the term contains overtones of scorn hence the spontaneous laughter. Some female participants claimed that ladies from traditionally non-circumcising cultures dread circumcised men for their aggression. *'We say he has a **shondo**; he is violent such that even if a lady wanted to marry him, she would dread the idea of being beaten up continuously'* (expectant mother, fgd3).

However, the majority of participants generally felt that the stigma associated with male circumcision due to 'looking different', will fall away when a lot of males are circumcised. In fact, some male participants stated that if they did not circumcise their sons during infancy, later in life these children could possibly ask them why they didn't do so. *'Your son may actually ask you "Why didn't you protect me when I was still young?"'* (expectant father, fgd12). One old man also envisaged,

*I don't see them blaming anyone in future because they will be actually be mocked by others if they are not circumcised. Boys bath together and scrutinise each other's organ. The uncircumcised guy will be labelled **yinkwenkwe** [good-for-nothing person]. He will then come to me and say, 'Why did you not circumcise me when I was young?' (grandfather, fgd5).*

These men felt that at some point in the future, non-male circumcision will actually be a source of ridicule.

5.3.5.5 Suspicion with circumcision being offered freely

A few participants questioned why male circumcision in general and early infant male circumcision specifically, is being or will be provided free of charge. *'Why is this thing done for free yet operation [caesarean section] on a pregnant woman is costly?' (father-in-law, fgd17).* These participants felt that caution should be exercised when accepting this service since it is donor-driven and the motive of the countries paying for it are unclear.

5.4 Conclusion

One of the major criticisms of qualitative research centres on representativeness of findings; critics maintain that with qualitative findings, at times one does not get a sense of the extent to which data are representative of the general population [132,133,139]. For this qualitative piece, I attempted to address this potential limitation in three ways. Firstly, I conducted research with participants representing the majority of Zimbabwe's ethnic groups. Secondly, the sample size (241 participants) was fairly large for a qualitative study. Furthermore, the sample was purposively selected to ensure a wide range of views were heard from a diverse population. Lastly, I achieved theme saturation, suggesting that I captured most of the issues concerning the subject of investigation. However, I explored early infant male circumcision acceptability in the absence of widely-available services or any communication campaign that specifically provides information about infant circumcision. Hypothetical acceptability may be quite different from actual acceptance when early infant male circumcision is eventually rolled-out [83,100]. It will therefore be crucial to assess early infant male circumcision acceptability within the context of actual roll out.

In conclusion, this study found that early infant male circumcision is a potentially acceptable HIV prevention intervention in Zimbabwe and provided a framework for addressing likely barriers to uptake. It appears that awareness campaigns that increase knowledge will be crucial to translating hypothetical acceptability into actual uptake. Implications of these findings are discussed in chapter 6 and in the Discussion chapter.

CHAPTER 6: RESULTS – HYPOTHETICAL FEASIBILITY AND ACCEPTABILITY OF EIMC FOR HIV PREVENTION – HEALTH-CARE WORKERS

6.1 Chapter overview

In this chapter I present findings of the research I conducted to determine hypothetical acceptability and feasibility of early infant male circumcision among health-care workers (HCWs). The methods I used to investigate this issue are described in detail in Chapter 4. In brief, between June and October 2010, twenty-three in-depth interviews (IDIs) were held with health-care-workers either involved in the adult voluntary medical male circumcision (VMMC) programme or not. These were purposively sampled to include individuals with various professional roles. The sample also included paediatricians who offer infant male circumcision privately. Moreover, IDI participants included health-care workers with administrative and policymaking roles. Discussions were audio-recorded, transcribed, translated into English (where necessary), coded using NVivo 8 and analysed using grounded theory principles (see section 4.4.2 for a detailed description of data analysis procedures).

6.2. Description of in-depth interview participants

A total of 23 health-care workers (n=13 male; n=10 female) took part in the in-depth interviews (Table 6.1). In-depth interview participants included doctors, nurse counsellors, midwives and paediatricians. Moreover, in-depth interviews participants included health-care workers with administrative and policymaking roles (Provincial Medical Director, Health Services Assistant Director, MC Trainer and Site Coordinator). Health-care workers' ages ranged from 29 to 59. At the time of the in-depth interviews, fourteen HCWs were providing MC (n=12 VMMC; n=2 EIMC).

Table 6.1: Characteristics of interviewed participants

IDI No.	Respondent's Title	Age (years)	Sex	MC Provider
1.	Midwife	29	F	No
2.	Midwife	57	F	No
3.	Nurse	49	M	No
4.	Senior nurse	42	F	No
5.	Doctor	40	M	Yes – adult VMMC
6.	Midwife	51	M	No
7.	Nurse	51	M	Yes – adult VMMC
8.	Provincial Medical Director (PMD)	55	M	Yes – adult VMMC, policymaker
9.	VMMC Site Coordinator	36	M	Yes – adult VMMC, administrator
10.	Health Services Assistant Director	57	F	Yes – adult VMMC, policymaker
11.	Midwife	58	F	Yes – adult VMMC
12.	Nurse Counsellor	38	F	Yes – adult VMMC
13.	Nurse Counsellor	35	F	Yes – adult VMMC
14.	Sister-in-charge	56	F	No
15.	MC Trainer	57	M	Yes – adult VMMC, policymaker
16.	Doctor	58	M	Yes – adult VMMC
17.	Doctor	51	M	Yes – adult VMMC
18.	Nurse	42	M	Yes – adult VMMC
19.	Nurse	30	M	No
20.	Paediatrician	51	M	Yes – EIMC
21.	Paediatrician	52	M	Yes – EIMC
22.	Matron	59	F	No
23.	Midwife	58	F	No

6.3 Overview of in-depth interview findings

Just as with the general population, early infant male circumcision knowledge was generally poor among health-care workers. Despite poor knowledge, acceptability of early infant male circumcision for HIV prevention was high among most health-care workers. Most health-care workers also felt it was feasible to offer wide-scale early infant male circumcision for HIV prevention. However, despite wide acceptance of early infant male circumcision for HIV prevention and general optimism around the intervention, health-care workers raised a number of concerns.

6.3.1 EIMC knowledge among health-care workers

Early infant male circumcision knowledge was generally poor among health-care workers regardless of their gender or familiarity with and/or involvement in the adult voluntary medical male circumcision programme. A majority of health-care workers acknowledged that they had neither heard of nor witnessed early infant male circumcision. *'I can't say anything about infant circumcision, I will end up lying... but there are some gadgets [EIMC] that were shown to us at some point'* (MC female HCW, IDI10). Some wondered whether it was

possible at all to circumcise infants. ‘...*But is it really possible to circumcise infants just after birth?*’ (non-MC female HCW, IDI23). One health-care worker even wondered whether it was necessary at all to circumcise infants given the fact that the removed foreskin still “regenerates”.

*...I am not sure because the infant is still growing and the penis is still growing so maybe later, the cut foreskin will regenerate and cover **ikhanda lelokuzeni** (the head of the penis) again. Maybe that’s why it [MC] is done in grownups...* (non-MC male HCW, IDI6).

The same health-care worker felt that it would be better to wait until the child became an adolescent rather than circumcising him during infancy as the procedure would need to be repeated later in life.

Overall, most health-care workers felt that male babies should be circumcised later in life (i.e. when 6-12 months old) to avoid the risks they perceived to be associated with circumcision during the immediate post-partum period. ‘*Well with infants that tissue has not yet developed fully so that you can properly hold it and remove the foreskin...chances that you might harm him are high*’. (MC male HCW, IDI5). Others felt that early infant male circumcision should be offered later in life because newborn babies are unable to withstand general anaesthesia. ‘*I think they should be circumcised when they are one year [old]. When they are younger than one year, they can’t withstand anaesthesia [general]*’ (non-MC female HCW, IDI1).

When asked to give their opinions on the devices and/or methods that should be used for early infant male circumcision, most providers’ responses revealed yet again, poor knowledge of the procedure. One provider responded as follows, ‘*They could use a razor blade, perhaps scissors, whatever is surgically clean*’ (non-MC male HCW, IDI19). Several adult voluntary medical male circumcision providers suggested the dorsal slit method. The dorsal slit method is not typically used for infant male circumcision; it is more appropriate for older children and adults [19].

On babies we will have to use the dorsal slit method. Babies’ penises are small and delicate. Circumcisers will need to ensure that there is no vessel that is left untied so as to prevent post circumcision bleeding. A baby does not communicate and so care must be exercised in order to do it well. (MC female HCW, IDI11).

Another provider maintained ‘...*The children need other methods that are not provided here...I have forgotten them but they are not the forceps one... In Zimbabwe we adopted the*

forceps guided method but that one is not ideal for infants' (MC female HCW, IDI12). Yet another provider elaborated on why she felt the dorsal slit method was "appropriate" for early infant male circumcision, *'...Because of the nature of the foreskin to be removed; it is quite tender and so with dorsal slit [method] you cut the exact amount of skin that you want to remove'* (MC female HCW, IDI13).

A few health-care workers who professed knowledge of early infant male circumcision stated that they had either learnt of the procedure whilst outside Zimbabwe or from other nationals living in Zimbabwe. A male doctor stated, *'I witnessed it [EIMC] being done on infants when I was in West Africa'* (MC male HCW, IDI16). Yet another male doctor maintained, *'I have got friends from places like DRC [Democratic Republic of Congo] who say they circumcise their children [male] at birth...'* (MC male HCW, IDI15).

6.3.2 Hypothetical acceptability of EIMC among health-care workers

As with the general population, despite sub-optimal EIMC knowledge among health-care workers, discussions suggested high acceptance of MC in general and EIMC, specifically, as an HIV prevention intervention. Some providers felt that early infant male circumcision was a welcome HIV prevention intervention and drew parallels between the procedure and other childhood vaccines for disease prevention. *'It [EIMC] is good because the child will grow up already protected. It's just like what we do when we inject them with these vaccines to protect them from measles...'* (MC male HCW, IDI17). Overall, providers felt that both adult VMMC and EIMC had the potential to reduce the HIV burden currently being felt by health-care staff and institutions *'It [EIMC] will help because right now we are fire-fighting; we have HIV patients whom we are failing to give treatment'* (MC female HCW, IDI2).

Health-care workers involved in the adult voluntary medical male circumcision programme highlighted two major advantages of EIMC over adult VMMC. Firstly, they mentioned that unlike VMMC, EIMC uptake will not be hindered by the requirement to undergo HIV testing prior to the procedure. *'Infants will not need to be first tested [for HIV]...Most men who come here wanting to be circumcised walk away when we tell them that they need to first undergo testing [for HIV]'* (MC female HCW, IDI13). Secondly, they mentioned that early resumption of sex post circumcision, a major concern related to VMMC, will not be an issue with EIMC.

We tell men that they should abstain [from sex] for six weeks but most of them do not abstain. We have had a few cases of men who have come back for re-suturing because they have had sex three or four days after circumcision...this will not happen with infants (MC female HCW, IDI12).

The same provider went on to highlight the danger associated with early resumption of sex post circumcision. *'The man will be having a fresh wound inside even though the outside may appear to have healed. Now, if he has sex with someone who is positive [HIV], he can easily get the virus [HIV]'* (MC female HCW, IDI12). Overall, health-care workers involved in adult VMMC felt that EIMC would be able to do away with some of the challenges experienced in the adult programme.

Besides issues around HIV testing and early resumption of sex, these providers articulated additional advantages of early infant male circumcision over MC conducted later in life. *'It [EIMC] is very important because he [infant] will be circumcised before he is able to feel pain. At the same time, when he grows up, he will already be circumcised'* (MC male HCW, IDI16). Paediatricians who offer early infant male circumcision privately maintained that EIMC is easier to perform than circumcision later in life. One of them described the challenges around circumcising toddlers.

As babies grow bigger they become more difficult to sedate because I do it under simple sedation...I know a lot of people want to do it under spinal anaesthesia but that is unduly traumatic to both the family and the baby (Male Paediatrician, IDI20).

The other one weighed in *'...Also it [infant] is easier to control because if you have a two year old you are trying to circumcise under local anaesthetic he is obviously going to be climbing up the wall so it makes it more difficult'* (Male Paediatrician, IDI21). These providers felt that the fact that early infant male circumcision does not face these challenges makes it a safer procedure.

Although discussions with the majority of health-care workers suggested acceptance of early infant male circumcision as an HIV prevention intervention, discussions with a few suggested otherwise. One of them remarked,

...With infants, I think that [EIMC] will result in trauma. Maybe they should be circumcised when they reach a certain age; when they are now sexually active and when they are at a risk of getting HIV through sexual intercourse... When you look at infants, the principal way of getting infection is through mother to child transmission or maybe sexual abuse... I think we should circumcise those that are about to enter adolescence because they are now about to become sexually active... (non-MC male HCW, IDI6).

The other one concurred, *'I wouldn't recommend that infants be circumcised because they will experience a lot of pain. We may need to circumcise them when they are about 10 years old, just before they start having sex'* (non-MC male HCW, IDI18). Whilst these two providers felt that there was need to wait until the boys were older, the majority of health-care workers felt that it was best to circumcise them in infancy because one can never tell the age at which they start having sex.

6.3.3 Health-care workers' perceptions around feasibility of EIMC

Health-care workers felt that it is feasible to offer wide-scale early infant male circumcision for HIV prevention in Zimbabwe, and that the intervention can easily be offered routinely. A male provider who is also a policymaker remarked, *'You see you reach your critical mass of adults then you focus on infants so that at the end of the day it just becomes like a routine, just like we do with BCG and all these other child vaccines'* (MC male HCW, IDI8). A Paediatrician also expressed his optimism with early infant male circumcision.

Whilst I have been sceptical about the acceptability and "scalability" of adult circumcision, I think infant circumcision is a win-win situation. I think it's a long term project from which you will realise HIV benefits in 20 years. If you can inculcate a culture of getting your child circumcised as part of the sort of infant thing, then it's a good investment... (Male Paediatrician, IDI21).

Health-care workers also felt that early infant male circumcision has the added advantage that it can be easily integrated into existing child health programmes, something which they said could be achieved through training midwives around the procedure. *'...If you are using an infant circumcision tool, you could simply train midwives to do it before the infant has been discharged from the ward [after birth]. That's what they do in West Africa'* (MC male HCW, IDI16). A Paediatrician concurred that use of a device would enable a wide range of health-care cadre to safely perform early infant male circumcision.

I think if they go for the Gomco clamp or the bell... there is a bell which you can tie on which anyone can be trained to use, then ordinary nurses in the postnatal ward could be trained to do that [EIMC]. As long as you are using a technique which doesn't involve surgical knives and so forth, ordinary nurses should be able to perform the procedure... (Male Paediatrician, IDI21).

A female provider who is also a policymaker suggested that early infant male circumcision could even be incorporated into the midwifery curriculum. *'If it [EIMC] is an uncomplicated procedure as I understand, it should be part of midwifery training because the midwife is the*

one who delivers babies and if it [EIMC] is done at birth, I understand pain and other things are reduced' (MC female HCW, IDI10).

When asked to give opinions on the facilities that should offer early infant male circumcision, a health-care worker responded, *'Well I think any hospital should be able to do so. I think if we are going to have a national programme, I think every district hospital and every provincial hospital should be able to carry out infant circumcision on request'* (Male Paediatrician, IDI21). He however, went on to give further recommendations,

One thing we should be doing I think, middle class don't want to go to government hospitals so there should be a private sector facility where they can go and pay or use their medical aid. I think to bring the medical aid societies on board is a huge thing. If they can claim from their medical aid then they can go to the private facility and have it done (Male Paediatrician, IDI21).

Overall, health-care workers and especially those familiar with early infant male circumcision, felt that it is feasible to offer wide-scale EIMC for HIV prevention since the procedure is simpler and less-demanding than adult VMMC.

6.3.4 Health-care workers' concerns

Although discussions with health-care workers suggested high acceptance of early infant male circumcision for HIV prevention, in addition to eliciting perceptions around feasibility of offering the intervention on a wide-scale, the conversations also brought out several HCWs' concerns which are discussed in detail below.

6.3.4.1 Increased workload

A majority of health-care workers were concerned that provision of wide-scale male circumcision in general and early infant male circumcision in particular, would likely increase the workload of already overburdened health-care workers working at understaffed facilities. As one health-care worker put it,

Already we are overburdened and if we are required to offer [infant] male circumcision that will worsen the situation. We don't have enough staff so with more and more programmes coming, it means even more shortages. Some programmes will end up being affected (non-MC female HCW, IDI1).

This sentiment was echoed by another health-care worker, *'Hospitals are already overloaded with these new HIV programmes coming on board like PMTCT and I think this intervention is going to be time-consuming'* (Male Paediatrician, IDI21).

A provider based at a facility which offers adult VMMC alongside family planning services described how they were already finding it difficult to cope with increased workload. *'Although we have continued with service provision, there has been an increased burden on the service providers and we have resorted to recruiting relief nurses to assist us'* (MC female HCW, IDI10). Overall, health-care workers recommended that the introduction of wide-scale early infant male circumcision should be accompanied by recruitment of additional health-care staff.

However, a few providers had other views. A VMMC site coordinator felt that health-care workers who were complaining about staff shortages and increased workload were being unappreciative of the fact that the situation had significantly improved from what it was two to three years earlier. He questioned, *'What can be worse than 2007 or 2008? We have seen the worst in Zimbabwe. What can be worse than two, zero, zero, seven and two, zero, zero, eight? Nothing, we have seen the worst'* (MC male HCW, IDI9). A male circumcision trainer even suggested that the so-called 'shortage of doctors' was in fact an under-utilisation of the ones that were available.

...So you may think we have a shortage of doctors but even those that we have are under-utilised... The reality is that the unavailability of doctors in our hospitals is not a reflection of the lack of doctors in the country but a lack of paying doctors to do the work we want them to do (MC male HCW, IDI5).

Of course, these sentiments came from individuals with policymaking and supervisory roles; they therefore do not necessarily mirror views of those actually 'on the ground'.

6.3.4.2 Assignment of EIMC duties, incentive provision and possible animosity

A few health-care workers were concerned that since early infant male circumcision roll out is likely to be donor-funded, and therefore likely to come with some monetary incentives, some will be assigned EIMC tasks (and therefore earn extra income), whilst others will continue with their traditional, non-incentivised duties. They said this has the potential to affect other health services as most health-care workers will likely opt to provide early infant male circumcision in order to access accompanying monetary incentives. One health-care worker noted that this issue has been problematic for other health-care interventions.

We have a problem with “Global Fund sites” where staff in certain hospitals is paid by the Global Fund. We have had staff leaving other hospitals to come and join the hospitals funded by the Global Fund because they will get more money, which is a disastrous thing (Male Paediatrician, IDI21).

Other providers felt that selective provision of incentives had the potential to affect working relations. One provider described a situation where this had happened before.

...There will obviously be that sort of tension. I remember it was a bit of a problem at XXX hospital. As MC providers, we were served lunch and the other hospital staff was not served anything. Some nurses at the hospital ended up refusing to perform certain tasks as they said, ‘They are for those who are benefitting’ (MC male HCW, IDI9).

These health-care workers recommended that there is need to offer wide-scale early infant male circumcision and associated benefits in a manner that does not affect other health services either directly or indirectly.

However, basing their assumptions on experience, some health-care workers felt that the issue of incentive provision was unlikely to affect the delivery of other health services.

...I think that won’t be a problem. It happened within the City [Harare] Council during the “cholera days”. Those nurses who were doing cholera outreach were paid by UNICEF whilst those who were based at the clinics were not. I think people will understand that not everyone benefits from everything that happens (MC female HCW, IDI11).

Of note however, is that some nurses turned down the cholera outreach work even though they could earn extra income because of the contagious nature of the epidemic. Since early infant male circumcision work may not necessarily be similarly risky, the scenario could be different.

Whilst acknowledging the fact that selective provision of incentives is a potential source of animosity among staff, other health-care workers still felt that efforts to roll out health interventions should not be held back by this common work-related issue.

...People [HCWs] will get to a point where they appreciate that all of us cannot be involved in certain programmes. There are already programmes that come with incentives like the national immunization campaigns. Some take part in these

campaigns whilst others remain behind to do other tasks yet we work for the same ministry. People end up accepting that we can't all be part of such programmes (non-MC female HCW, IDI14)

A provider who works at a facility which offers adult voluntary medical male circumcision alongside family planning services also weighed in,

...It happened here. The other lady and I are directly involved in MC and we have always been paid extra money. Others initially complained but it didn't mean that family planning services stopped; they had complaints but services continued. It's normal that when some get extra money, others complain but that will not stop the programme. So I think people must just move on, implement their program, remunerate people who are directly involved and not worry much about what others say because if we do that, no programme will ever take off (MC female HCW, IDI13).

This sentiment was of course expressed by a provider who was benefiting from incentive provision.

6.3.4.3 Sub-optimal supervision

Overall, health-care workers felt that large-scale early infant male circumcision provision should be complemented by adequate supervision to ensure high standards. A male circumcision trainer outlined the ideal scenario in relation to health services supervision.

...And the principle of service delivery in the public sector and particularly those facilities run by the government itself, including the mission hospitals, is that they supervise the guys; nobody works without supervision. ...The District Nursing Officer [DNO] gets data from that clinic and checks to make sure that the right things are being done at the right time. A supervisory visit is paid by the DNO once every month and the DMO [District Medical Officer] once every three months, at a minimum. This is called a supervisory visit; it's not a visit where the DMO goes to see patients. The purpose of that visit is for the DMO to see the practitioner and find out how well the practitioner is doing - what constraints they are having, what they are doing well, what they shouldn't be doing and what they could do better. That has always been our principle (MC male HCW, IDI15).

However, despite the well laid-out guidelines for health services monitoring, health-care workers felt that supervision is generally sub-optimal. A doctor described how their seniors always visit for the sole purpose of adding to their work.

Right now to say that there are support visits I will be lying ... They [supervisors] don't come here simply to see if the hospital is okay. They come here because in two weeks time, there is going to be a programme... and so they only come to tell people what should be done. I wouldn't consider those as support visits (MC male HCW, IDI5).

A nurse who assists with adult male circumcision also felt that doctors' supervision needs to be strengthened. *'They [doctors] need somebody who is at the top to tell them what to do. Sometimes they come late and we also finish late...'* (MC male HCW, IDI5).

However, despite concerns around supervision of the VMMC programme, VMMC providers felt that performance of the procedure continued to be done in an extremely safe manner. A male circumcision trainer proclaimed,

Considering all the thirteen countries that are offering VMMC as part of an HIV prevention strategy, the Zimbabwean programme remains the safest on the continent. So far, we have managed to maintain our AE rate well below one percent. Also, we have not experienced any severe AEs and we are confident that we will be able to maintain this high degree of safety (MC male HCW, IDI15).

He went on to explain why he was so confident, *'Our doctors are highly trained and efficient; we just don't appreciate them but other countries do appreciate them'* (MC male HCW, IDI15). He also highlighted the role of additional training and refresher courses.

During training [to standardise VMMC provision] and refresher courses, we emphasise the need to conduct male circumcision in a safe manner. We constantly remind VMMC providers that men who opt for circumcision are healthy, HIV negative individuals. They choose to undergo male circumcision to prevent something [HIV] which they may never get in the first place. They should therefore not end up getting a complication from us [providers] (MC male HCW, IDI15).

Indeed, when the Zimbabwean VMMC programme was judged by external assessors, it was deemed to be the safest on the continent (personal communication Ministry of Health and Child Care). However, at the time of the assessment, the programme was only concentrated in a few, urban districts (although rural ones were sometimes covered via outreach services). Now that the VMMC programme has expanded across the whole country, it remains unclear whether or not that excellent safety record will be maintained in the absence of optimal supervision.

6.3.4.4 Inadequate space

A few health-care workers were concerned that wide-scale early infant male circumcision might worsen space challenges at their facilities. *'We don't have enough space. Now that we are rolling out the ART programme, we are dealing with high volume of clients, there is just no space'* (non-MC male HCW, IDI6). Another provider expressed her concerns, *'I am mostly worried about space. We house family planning services, adult MC plus a research organisation. I just don't see how we can also house infant circumcision'* (MC female HCW, IDI10). Whilst some of the concerns around space were genuine, others were linked to lack of knowledge of the EIMC procedure. For example, some HCWs thought early infant male circumcision can only be conducted in large, well-resourced operating theatres.

You see, we only have two theatres and they are used on Mondays, Wednesdays and Fridays. If male circumcision [infant] is introduced, we will have to circumcise those infants on Tuesdays and Thursdays. If we are to offer male circumcision on a daily basis, we definitely need more theatres (non-MC female HCW, IDI23).

Overall, health-care workers were hopeful that in addition to other material benefits such as ambulances and bicycles for village workers, early infant male circumcision roll out would result in construction of additional buildings or upgrading of existing ones at most health-care facilities.

6.4 Conclusion

A major strength of this qualitative piece is that data were collected from a mix of health-care workers with various professional roles and experiences of male circumcision; this ensured that a wide range of views were heard from a diverse group of participants. Moreover, whilst one-on-one research methods such as in-depth interviews are often prone to social desirability bias - the tendency to provide responses thought to be more favourable or acceptable as opposed to being reflective of true thoughts or feelings [140], it appeared that participants articulated their real thoughts even if these appeared to be critical of the status quo (e.g. when talking about selective provision of incentives and sub-optimal supervision).

However, I explored acceptability and feasibility of early infant male circumcision for HIV prevention in the absence of widely-available EIMC or any communication campaign that specifically provides information about the procedure. Additionally, most of the interviewed health-care workers were unaware of the procedure itself, how it is performed and its associated benefits; this may have influenced their perceptions around the feasibility of early

infant male circumcision for HIV prevention. These views may be different when explored within the context of actual roll out.

6.5 Brief discussion of phase 1 findings

During focus group discussions, the majority of parents reported favourable attitudes towards early infant male circumcision. Data from this research therefore corroborate some of the quantitative findings from our population-based survey [13], namely that early infant male circumcision was seen as widely acceptable as a method for HIV prevention. However, given the very low levels of knowledge or experience of early infant male circumcision, it is unclear whether or not this hypothetical acceptability will translate into actual uptake once early infant male circumcision roll out begins.

Phase 1 findings support the now well-recognised notion that cultural beliefs are integral to successful male circumcision provision [32,61,80,88]. Thematic synthesis plus focus group discussion findings suggested that several ethnic groups had concerns around handling and disposal of the removed foreskin. Secondly, some focus group discussion participants preferred circumcision to be performed by individuals of either the same tribe or religion. Thirdly, during focus group discussions older Shangani men strongly opposed early infant male circumcision as they felt that it undermines their tradition by separating circumcision from adolescent initiation, in addition to allowing women (mothers) to nurse the wound, considered taboo.

These findings have several implications for rolling out circumcision, in general and early infant male circumcision, specifically. As already stated in Chapter 3, implementers will need to recognise and understand cultural and religious beliefs attached to (early infant) male circumcision among certain groups [88]. It will be important to engage key traditional and religious leaders in efforts to mobilise a wider understanding and acceptance of circumcision for HIV prevention. Secondly, early infant male circumcision providers may need to be drawn from diverse ethnic/religious circles. Thirdly, interventions to promote male circumcision (both VMMC and EIMC) need to tackle certain beliefs, attitudes and practices that relate to masculinity. Lastly, male circumcision communication materials/models should specifically address concerns around safety, timing and tissue disposal.

Health-care workers were worried that wide-scale early infant male circumcision provision will further increase their workload. Furthermore, they were concerned that EIMC-linked incentive provision may lead to animosity among health-care workers. Finally, they were worried that current supervision of health services is sub-optimal. During early infant male

circumcision roll out, it will be important to ensure that health-care workers' workload is manageable. Also, assignment of early infant male circumcision duties plus incentive provision need to be carefully planned and monitored to avert possible animosity among health-care workers. Furthermore, early infant male circumcision supervisory mechanisms need to be established and continuously monitored. These implications are discussed in more detail in the Discussion chapter.

6.6 How phase 1 findings informed the EIMC pilot study

Phase 1 findings were used to design the communication materials and implementation of the early infant male circumcision pilot study, specifically by ensuring that adequate information was given, issues related to timing of circumcision were appropriately addressed as were concerns about the safety of the procedure. Additionally, the possibility of early infant male circumcision was raised as early as possible in the pregnancy to give time for fathers and wider family to be consulted.

CHAPTER 7: RESULTS – ACTUAL ACCEPTABILITY OF EARLY INFANT MALE CIRCUMCISION FOR HIV PREVENTION AMONG PARENTS AND WIDER FAMILY

7.1 Chapter overview

In this chapter I present findings of the research I conducted to determine actual acceptability of early infant male circumcision for HIV prevention among parents and wider family. The methods that I used to explore this issue are described in detail in chapter 4. In brief, this qualitative research was nested within a trial to assess the feasibility, safety, acceptability and cost of rolling out early infant male circumcision using devices in Zimbabwe. Between January and May 2013, twelve in-depth interviews (IDIs) and four focus group discussions (FGDs) were held with parents who had either adopted EIMC for HIV prevention (n=3 IDIs and 1 FGD with mothers; n=3 IDIs and 1 FGD with fathers) or had declined to circumcise their newborn sons (n=3 IDIs and 1 FGD with mothers; n=3 IDIs and 1 FGD with fathers).

Furthermore, short telephone interviews (n=95) were conducted with additional parents who had arranged to bring their sons for early infant male circumcision but then defaulted. This was in order to determine their reasons for not bringing the infant for the procedure. In chapter 4, I described how telephone interview participants were selected (see section 4.3.2.3). In brief, telephone interview participants included 15 parents (n=10 mothers; n=5 fathers) who had completed screening but did not eventually enrol. The other 80 participants included 65 mothers (10%) who were randomly selected from a list of 650 mothers who had arranged to bring their sons for EIMC but then defaulted. An additional 15 males (10%) were randomly selected from a list of 150 fathers who had participated in weekend group meetings and promised to bring their sons for early infant male circumcision but then defaulted. Telephone interview participants were contacted when their sons were no longer eligible for early infant male circumcision. Short statements were handwritten at the time of the call and later coded.

In addition to the in-depth interviews, focus group discussions and short telephone interviews, I also observed parental and EIMC providers' non-verbal behaviour before, during and after infant circumcisions. During observation, I took field notes which were coded subsequently. All data were transcribed, translated into English and coded using NVivo 10. Codes were grouped into themes and sub-themes using thematic content analysis (see section 4.4.2 for a detailed description of data analysis procedures).

7.2. A brief discussion of EIMC uptake during the comparative trial

Despite intensive communication about early infant male circumcision among parents attending antenatal clinics and in the post natal period, only 13% of all eligible male infants whose parents were offered EIMC at these times (N=1,151) enrolled in the comparative trial. I stated in chapter 4 that after 108 babies were recruited, the age range for early infant male circumcision was extended to 60 days to allow parents who missed the 6-10 day window to have their babies circumcised later in the post partum period.

One hundred and fifty male infants aged 6-60 days were circumcised between 9 January and 19 June 2013. There were two moderate adverse events (AEs) in the AccuCirc arm (2%) (n=1 excessive skin removal; n=1 insufficient skin removal) and none in the Mogen clamp arm. Both AEs (although classified as moderate for trial purposes) were relatively minor and quickly resolved. Nearly all mothers (99.5%) reported great satisfaction with the outcome. Again, findings were similar by study arm. All mothers, regardless of arm said they would recommend EIMC to other parents, and would circumcise their next newborn son. It took 23 weeks to recruit the 150 babies; we had hoped to reach that target within three months.

7.3 A brief description of qualitative study participants

Thirty-seven parents of newborn male infants (n=20 mothers; n=17 fathers) took part in the four focus group discussions. Also, 12 in-depth interviews were held with parents of newborn male infants (n=6 mothers; n=6 fathers). An additional 95 parents took part in short telephone interviews (n=75 mothers; n=20 fathers). Mothers who took part in the focus group discussions and in-depth interviews were aged 19-34 years. Fathers' ages ranged from 22 to 38 years. All participants resided in Harare, the city where the EIMC clinic was based.

7.4 An overview of qualitative findings

Qualitative data suggested that the main parental motivator for adopting early infant male circumcision was the desire to protect son from future sexually acquired HIV infection. Additionally, data suggested that the decision-making process around adoption of early infant male circumcision often involved the mother-in-law. Parents who had adopted early infant male circumcision spoke about their initial anxieties around the procedure. Additionally, they commented on both the procedure and outcome. Parental reasons for non-adoption of early infant male circumcision included fear of harm, specifically infant's death, penile injury and excessive pain. Myths about male circumcision in general and early infant male circumcision specifically, were a significant barrier to early infant male circumcision. Moreover, data suggested strong concerns around the discarded foreskin with some parents

fearing that it would be used for Satanic purposes. Parental reasons for defaulting on early infant male circumcision did not differ by whether or not they had completed screening procedures. These findings are described in detail below.

7.5 Parental motivators for adopting early infant male circumcision

Parents who had adopted early infant male circumcision stated that they had mostly been motivated by the following factors:

7.5.1 Desire to protect son from sexually acquired HIV infection

Most parents stated that the main reason for choosing early infant male circumcision was so that they would protect their sons from future sexually acquired HIV infection. As with phase 1 focus group discussion participants, parents expressed inevitability of male infants' future multiple sexual partnering. Additionally, a general concern expressed by most parents was that nowadays, children are becoming sexually active at a younger age, hence the need to protect them from HIV when they are still young. As one parent put it,

...Just the ways things are moving, you find that some of these kids are engaging in sex quite early, at about 10 or 12. You never know when your child is going to start having sex. So it's better for you to prepare him when he is still young so that when he eventually engages in sex, he will already be protected from this disease that is wiping a lot of people [AIDS] (father, IDI1).

During discussions, parents expressed the concern that deferring male circumcision until the son became an adolescent or adult had the danger that by the time the individual eventually underwent male circumcision, he could already be infected. *'It's better to circumcise infants than to circumcise someone of my age because I may be having the virus [HIV] already. I might still go for circumcision but it's really not going to help'* (father, IDI2).

A few parents disclosed that they were HIV positive and stated that this had strongly influenced their decision to adopt early infant male circumcision. *'Even though I was afraid, I just gathered courage...I was mostly pushed by my status [HIV]. I don't want my child to be in a similar situation'* (mother, IDI6). Moreover, some fathers who brought over their sons for EIMC reported that they had themselves accessed the voluntary medical male circumcision (VMMC) services currently being offered as part of a comprehensive HIV prevention intervention.

7.5.2 Appreciating advantages of EIMC over MC later in life

Consistent with quantitative survey findings which suggested an association between knowledge of male circumcision and willingness for son to undergo early infant male

circumcision [13], it appears that parents who had adopted EIMC were aware of the advantages of EIMC compared to MC later in life. They mentioned for example, that an infant experiences less pain during the procedure. *'...The pain is minimal because they [infants] would not have gotten to the point where they know and sense what pain is like'* (father, IDI10). A female participant mentioned that post-EIMC wound care was unlike wound care in adults which is characterised by pain. *'The other thing is when he is still an infant he won't feel much pain as compared to an adult who spends three months with the pain. An adult will have to wash the wound with salty water... the process is not very painful for the infant...'* (mother, IDI6)

Related to the issue of pain was the perception that an infant heals faster than an older person. *'For an adult, it takes up to six weeks to heal yet it takes only seven to fourteen days for a baby to heal. So I think it's a good thing'* (mother, IDI3). A male participant explained why an infant heals faster.

The infant might heal faster because if we look at the issue of healing of the wound, it mostly depends on your body's immunity. So I think if we go back to what I was saying before, at my age there is a lot that I have done [sexually] which an infant has not yet done...(father, IDI2).

Overall, parents who had opted to have their baby circumcised appreciated the faster healing in infants and professed amazement at the fact that post-EIMC wound care simply required use of 'Vaseline' [petroleum jelly].

7.6 Parental initial anxieties

Discussions suggested that parents who had adopted early infant male circumcision initially had some anxieties; these were mostly triggered by the consenting process. During the consenting process, parents got to know in greater depth than usual the possible adverse consequences. A male participant narrated how he had silently posed several rhetorical questions during the consent process:

I kept asking myself, 'Isn't it going to cause some deformities on the thing [penis]?' and 'What happens if it [penis] starts decaying?' 'What have been the results with regards to this exercise since they are saying it is research?' You know research, normally is research (father, IDI1).

Despite assurances that the rate of EIMC-related adverse events is very low and also that if an adverse event occurs, it is usually minor and easily resolved, parents remained agitated during EIMC. *'I was so uncomfortable during the time I was sitting here [clinic boardroom] as*

I had been told that my child could possibly get injured during the process' (mother, fgd3). A male participant described how his anxiety had persisted several days post-circumcision. *'For me it was days later ... on day seven when they said, "The wound has healed" That's when I really settled. Otherwise, I checked from time to time to see if everything was okay'* (father, fgd1).

Anxiety about the procedure, sometimes unrelated to the consenting process, was observed during and post-EIMC. The extract below describes one of the anxious moments:

I entered the clinic boardroom where an infant's relations waited as he underwent EIMC in a separate location. There were three family members: the mother, the father and the infant's paternal grandmother. They were not talking to each other. Each of them appeared drowned in deep thoughts. They did not even notice me when I entered the room. 'Are you worried?', I asked. None of them produced any words but just some mumbling. 'Don't worry, the procedure is almost over and very soon you will be called to witness the outcome', I tried to reassure them. (participant observation).

After the procedure, parents sometimes called study staff whose mobile numbers were on the contact card (including at night) to report what to the nurses seemed like trivial issues (e.g. that the baby had soaked the bandage with urine).

7.7 Perceptions of procedure, outcome and providers

Parents who had adopted early infant male circumcision and who were interviewed after the infant had completely healed thought the procedure was very safe. A female participant remarked,

Ha-a it's safe, hundred percent; it's hundred percent safe. My son healed well, I didn't have a problem with it. In terms of bleeding he didn't bleed that much it was just some minimal bleeding and that was it. Also, I simply applied Vaseline and he healed quickly. I can say it's hundred percent safe (mother, ID15).

Another female participant expressed similar sentiments. *'It's safe; the baby did not bleed, he was not sutured and I did not have to immerse the wound in salt [salty water]'* (mother, ID16).

However, one male participant's response suggested some uncertainty.

Yaa, it's safe but you always wonder if everything is okay because you don't know and there is no way to know, you understand what I am saying?...You say to yourself, 'Let's hope I don't end up regretting'. You always have that fear... and you say, 'What if something didn't go well?'...Like I am saying right now, there is no way one can tell whether or not everything was done successfully (father, ID11).

Despite assurances from study nurses and doctors that the procedure had gone well, this participant still had fears that some reproductive organ had probably been tampered with during EIMC, and was therefore anxious about son's later fertility or sexual functioning. He also felt that he would only be able to tell once his son had grown up. This shows the extent to which some parents view early infant male circumcision as a procedure that involves more than just foreskin removal.

Overall, parents who had adopted early infant male circumcision expressed satisfaction with the outcome. A mother remarked, *'First of all it's smart. Secondly, it [penis] now has a better "shape"... I think that's why they have the slogan "PINDA MUSMART" [local slogan that promotes VMMC as hygienic]. It's just a good thing'* (mother, ID16). A young mother also stated,

When you first hear that the circumcisions are being conducted at Edith Opperman, you say to yourself 'What good thing will come out of that old clinic situated in Mbare?' When the nurses [study] describe how the circumcision is conducted, you appreciate that the procedure is going to be conducted according to high standards. When the wound has completely healed and the organ [penis] is looking nice, you further appreciate that the procedure was performed expertly (mother, fgd3).

During informal discussions with parents who adopted EIMC, several of them mentioned that they had initially been sceptical about the fact that EIMC was being offered at Edith Opperman, a clinic situated in one of Harare's oldest and poorest suburbs.

On the whole, parents who had adopted EIMC said they would circumcise their next newborn son. Furthermore, they stated that they would recommend early infant male circumcision to other parents. Some mentioned that they had already started doing so.

There is this other woman who told me that when she went for a scan, she was informed that she was carrying a baby boy. I have been encouraging her to circumcise the boy immediately after delivery. I told her that she could simply call study staff or if she preferred, I could even call them on her behalf. I also told her that she could be picked up from home and taken back afterwards... (mother, ID15).

During the comparative trial, some mothers who brought their sons for early infant male circumcision indeed mentioned that they had received encouragement from other parents who had adopted the procedure.

Parents who had adopted early infant male circumcision stated that they had felt comfortable consenting to the procedure especially because they had been informed that it was going to be performed by doctors. Some parents expressed their reservations with non-doctors. *'So our fear is that they [nurse-midwives] might end up cutting the wrong skin but the doctor is qualified; he can actually check if he is not making a mistake when cutting..., If they [nurse-midwives] cut the wrong skin, they destroy the child's life for good'* (father, fgd2). A female participant also commented, *'I don't really know whether or not they [nurse-midwives] have the adequate knowledge to perform such procedures because from what I heard, circumcision is a risky procedure and so it needs to be performed by highly-skilled doctors...'* (mother, IDI7). These findings are consistent with those from phase 1 where focus group discussion participants also recommended highly-trained doctors.

7.8 Early infant male circumcision decision-making

An exploration of the decision-making process leading to early infant male circumcision adoption corroborated the findings from phase 1 concerning the father's key decision-making role as illustrated by the following excerpt:

JT: The father has to decide ... You have to go by what he says, otherwise nothing will work out.

SF: What happens if he refuses?

JT: There is nothing you can do if he is not interested; if you go against his wishes, there won't be peace in the home (mother, fgd3).

This sentiment was echoed by one father, *'The decision to circumcise my son rests with me. I'm the one who tells the wife what to do'* (father, IDI4).

However, discussions with other participants suggested that the decision-making process had involved a discussion between the infant's parents. A mother described events leading to their son's circumcision.

...I listened to a lady who talked about EIMC when I was still pregnant. I took a pamphlet she had given me home, gave it to my husband and we discussed the issue. My husband said that it was a good thing. He said if I gave birth to a baby boy,

we were supposed to take him for circumcision immediately after birth. When I gave birth to a baby boy, I simply went ahead ... (mother, ID15).

Some male participants also stated that the EIMC decision-making process had involved some discussion. *'In my case we discussed the issue since we had never heard of it [EIMC]. We agreed that our son might benefit... it was an "experiment" ...'* (father, fgd1). Another male participant described the danger associated with making a unilateral decision in respect of newly-introduced initiatives. *'...Especially for something that is new, if you want to exercise your powers on something you don't know, you will end up shouldering the blame'* (father, fgd1). It appears that as early infant male circumcision was a new initiative, men did not feel confident about overriding their wife's decision in the way that they might for other decisions.

Discussions suggested that mothers of newborn babies took advantage of men's anxiety about the decision to influence the outcome. As one mother described,

If you were not interested [in EIMC] you could lie to him [baby's father] that a neighbour had her son circumcised and something undesirable happened. If you were interested, you could also lie to him that several neighbours had their sons circumcised and everything went on well (mother, fgd3).

Another mother described how she had successfully threatened her husband. *'I told him that I would go to the rural areas and leave him with the child if he went ahead with the circumcision and he backtracked'* [laughter] (mother, fgd4).

Discussions also corroborated phase 1 findings with regards to the role of the wider family in the decision-making process. Participants stated that they had consulted other family members prior to adopting early infant male circumcision. Barring the decision by one or both parents, the mother-in-law's perspective was instrumental in adoption or non-adoption of EIMC. A mother who did not adopt early infant male circumcision described how her husband's mother had shot down her proposal to adopt EIMC. *'She said, "I have never heard of it. All of my sons are uncircumcised and even my husband wasn't circumcised"'* (mother, ID18). Mothers-in-law were however, not always successful in blocking early infant male circumcision. A male participant narrated how he had disregarded his mother's views.

In my case when my wife came and informed me about this issue [EIMC], the two of us agreed to go ahead. When I later informed my mother about what we had decided to do, she disagreed with us. I then told myself that I should go ahead with the

decision to circumcise my child and inform her afterwards; I simply did that (father, fgd1).

Responses to short telephone interviews corroborated focus group discussion and in-depth interview findings with regards to the mother-in-law's centrality in the early infant male circumcision decision-making process. Of the 18 instances where telephone interview respondents mentioned the actual person who had said the male infant should not be circumcised, in 50% of the cases it was the infant's father, followed by the infant's mother (28%) and the mother-in-law (22%) (see Table 7.1). Moreover, when male infants were brought to the clinic for early infant male circumcision, the baby's mother was often accompanied by the mother-in-law (participant observation). Perhaps surprisingly, 43 babies (29%) were also accompanied to the EIMC clinic by their fathers (data not shown).

Discussions suggested that mothers-in-law were sometimes quite supportive. A male participant described how his mother had supported early infant male circumcision.

...She really welcomed the idea because she has got nursing friends so she knows that HIV is resulting in this and that. So she was quite supportive; she even asked what I was thinking about our first child. He is three years old now and she said, 'What are you going to do with this one?' So she had no problems with us circumcising the newborn (father, fgd1).

It appears that if the mother-in-law had some MC and HIV knowledge, she was likely to encourage her son and daughter-in-law to adopt early infant male circumcision.

Observation of family members as they accompanied the infant to the EIMC clinic suggested that the infant's parents had indeed informed a wide range of family members about the procedure, a common practice among Zimbabweans.

In one instance, there were six accompanying family members as follows: baby's mother and father, maternal grandmother, paternal grandmother, paternal grandfather and mother's elder sister (participant observation).

These data suggest that by accompanying the male infant to the EIMC clinic, family members were taking joint responsibility for his circumcision.

7.9 Parental reasons for non-adoption of EIMC

An exploration of parental reasons for non-adoption of early infant male circumcision suggested the following factors:

7.9.1 Fear of harm

Fear of immediate harm emerged as one of the major reasons parents did not adopt early infant male circumcision. A few parents expressed concerns that the procedure and its associated complications (e.g. excessive bleeding) could possibly lead to an infant's death. A male participant maintained,

Ya-a something might be said to be safe but at the same time, everything has loopholes ...somehow it might not succeed, you understand? It's just a simple operation you know. An operation on the appendix is supposed to be safe. A lot of people have undergone that kind of operation and some have died. There are things that we presume to be safe but are not necessarily safe. Travelling by road seems safe; we go to town everyday but one of these days someone does not make it (father, IDI2).

Such a concern as this one was based on the assumption that the infant's penis was not only tiny but also 'too' fragile for the procedure. A male participant even asked, *'How do you really know that the child's foreskin starts here and ends there? What if they overdo it and end up cutting some veins...?'* (father, fgd1).

Due to fear of possible harm, some parents adopted a wait-and-see approach. *'My friend said she first wanted to see if my son healed well... People first want to see if it really works'* (mother, IDI12). Considering that complete wound healing post-EIMC takes 7-10 days, those mothers who otherwise favoured EIMC but adopted the wait-and-see approach when the upper age limit was still 10 days from the date of birth, subsequently missed out on the opportunity to have their son circumcised.

Some parents were concerned that early infant male circumcision is a very painful procedure. Some men who had experienced excessive pain when they had gone for adult voluntary medical male circumcision said they had shunned EIMC because they did not want to subject their newborn sons to similar painful experiences. *'What you as an adult goes through... You imagine the pain and your son undergoing such pain at that age...'* (father, fgd2). Another male participant noted that, *'...It [pain] was something that I still remembered very well... I thought of the pain that I had gone through and I refused...'* (father, fgd2). During telephone interviews, parents also mentioned fear of pain as one of the reasons for defaulting on EIMC (Table 7.1).

7.9.2 Cultural/traditional considerations

Data obtained from parents who did not adopt early infant male circumcision suggested that cultural/traditional considerations contributed to non-adoption of the procedure. For example, some parents noted that male circumcision in general and early infant male circumcision specifically, had never been practised in their clan and therefore it was not supposed to start with their newborn babies. During telephone interviews, some respondents gave this as their reason for not circumcising their sons (Table 7.1). Moreover, a few fathers said that they had not adopted early infant male circumcision because they were not even circumcised themselves (Table 7.1). During discussions, some female participants highlighted the challenge of convincing uncircumcised fathers to adopt EIMC. *‘He asked me, “I am not even circumcised myself. If the child is mine, why do you want him circumcised when I am not?”’* (mother, ID18). During telephone interviews, some female respondents also stated that they had shunned early infant male circumcision because they did not want their newborn sons to be any different from their fathers and/or their older brothers who were uncircumcised (Table 7.1).

7.9.3 Myths and misconceptions

Discussions suggested that myths and misconceptions were a significant barrier to early infant male circumcision. For example, participants suspected that the EIMC research was being conducted by Satanists. A mother professed her initial fears. *‘I don’t want to lie; I suspected that you were Satanists and that you may take the foreskin... I really don’t know the process but I was just scared because I don’t want to lie, Satanists are present but we don’t know the organizations they work for...’* (mother, ID19). Another female participant who had adopted EIMC described how someone had scared her after the procedure.

I met a certain woman who asked me if I had seen where the foreskin had gone. When I told her that I had not seen it but I had only been told that it would be incinerated, she said it was a real shame that I had chosen to sacrifice my child to Satanism. She insisted that I was supposed to have requested the foreskin and disposed of it myself (mother, ID13)

Participants who took part in a group discussion of men who did not adopt EIMC stated that they would only circumcise their sons on condition that they would be allowed to take the discarded foreskin with them. Concerning this issue, the facilitator noted in his field notes, *‘It was unclear whether this proclamation was genuine or was just an unrealistic condition to evade EIMC as they knew that this was unlikely to happen’* (field notes, facilitator1). However, I stated in chapter 5 that parents are sometimes able to obtain the infant’s umbilical stump from health-care workers.

Discussions also suggested that an additional myth that resulted in non-adoption of early infant male circumcision was one linked to procreation. A few participants mentioned that they had not adopted early infant male circumcision for fear that their sons would not be able to have children later in life. *'I once heard that if a child gets circumcised he might end up infertile'* (mother, fgd4). Still on child-bearing, some male participants stated what they had heard.

Some are saying that it's the government's ploy to reduce the population since the birth rate is too high. So the government can't tell people that it wants to control the birth rate but will just "catch them that way". At one point the government was even thinking of coming up with a policy to ensure that every boy child is circumcised as soon as he is born (father, fgd2).

Discussions also suggested that some individuals were spreading falsehoods about early infant male circumcision. A father who did not eventually adopt early infant male circumcision narrated what he had heard from a certain lady. *'... She said that this thing [EIMC] is resulting in so many problems. She said that the wounds are not healing and mothers are also struggling with adhesions [post-EIMC]'* (father, ID111). In reality this is not the case.

7.9.4 Other reasons

Additional reasons for non-adoption of early infant male circumcision that came up during discussions included advice from someone considered an 'expert'. During telephone interviews, one respondent said, *'My doctor said I should not do it'* (Table 7.1). Another one maintained, *'My aunt who is a nurse said we should not just accept new things'* (Table 7.1). Health-care workers therefore played a role in discouraging parents from adopting early infant male circumcision.

During telephone interviews, a few mothers who had delivered through caesarean section mentioned that they were still preoccupied with nursing their own wound and would therefore not be able to nurse an additional wound from early infant male circumcision (Table 7.1). Group discussions suggested that this consideration possibly contributed to non-adoption of early infant male circumcision. *'The mother will still be in pain so some mothers do not want a situation where they are in pain and the baby is also in pain...'* (father, ID13).

A few participants felt that the son should decide for himself when older. A father who did not adopt early infant male circumcision stressed, *'As long as he has not yet become sexually*

active, you wait until a time when he can say he now wants to get circumcised, maybe when he is 12 years old' (father, ID13). Worryingly, a few telephone interview respondents mentioned that they had not adopted medical EIMC because their son was going to be circumcised at home. During group discussions, a female participant who had adopted medical EIMC also mentioned that her mother-in-law had initially offered to perform the procedure at home. It was unclear whether these female participants really meant circumcision or were referring to some other practice.

Table 7.1: Telephone interview responses – parental reasons for defaulting on EIMC

Theme	Sub-theme	No. of responses
Someone else refused	Baby's father refused	9
	<ul style="list-style-type: none"> <i>The father refused (8 responses)</i> <i>I really want but my husband does not want to hear anything about it</i> 	
	Baby's mother refused	5
	<ul style="list-style-type: none"> <i>His mother refused (4 responses)</i> <i>My wife is refusing to bring him to the clinic</i> 	
	Wider family refused	4
	<ul style="list-style-type: none"> <i>My mother-in-law refused (2 responses)</i> <i>My in-laws are against the idea (2 responses)</i> 	
		sub-total n=18
Son still too young	Too young to undergo procedure	12
	<ul style="list-style-type: none"> <i>He is still too young (9 responses)</i> <i>It is still too early to circumcise him (2 responses)</i> <i>It is too early; he is only 6 days old</i> 	
	Too young to be taken out in public	4
	<ul style="list-style-type: none"> <i>My baby is too young to be moved around (2 responses)</i> <i>My baby is too young to mingle with the public (2 responses)</i> 	
		sub-total n=16
Fear of harm	Fear of immediate harm	11
	<ul style="list-style-type: none"> <i>It is too painful (4 responses)</i> <i>The mother is afraid it may not go well</i> <i>It's my first child, what if it doesn't go well?</i> <i>I do not want any sleepless nights</i> <i>My wife fears that the wound will take long to heal</i> <i>I am worried about what will happen to the removed foreskin</i> <i>The time for him to get circumcised has already passed</i> <i>It will ruin my marriage</i> 	
	Fear of future harm	3

	<ul style="list-style-type: none"> • <i>His peers will laugh at him when he is grown up (2 responses)</i> • <i>It might create problems for him in future</i> 	
		sub-total n=14
Son to be circumcised later	Near future	8
	<ul style="list-style-type: none"> • <i>I will come after his umbilical stump has fallen off (3 responses)</i> • <i>I will bring him after 6 weeks (2 responses)</i> • <i>I will come later; I first need to heal myself (2 responses)</i> • <i>I will come after the pain from injections subsides</i> 	
	Later	3
	<ul style="list-style-type: none"> • <i>Will come when the baby is older (2 responses)</i> • <i>We will consider it when he turns five</i> 	
		sub-total n=11
Held up by decision-making	Decision-making in progress	5
	<ul style="list-style-type: none"> • <i>We need more time to think about it (2 responses)</i> • <i>I am still thinking about it</i> • <i>My wife and I have not thought about it</i> • <i>I am still trying to convince my husband</i> 	
	Still awaiting someone's approval	5
	<ul style="list-style-type: none"> • <i>The father is not around so I cannot decide</i> • <i>As a mother, I cannot decide</i> • <i>I am still waiting for the father to give the go-ahead</i> • <i>I am still waiting for his grandmother's approval</i> • <i>I still need to hear from my in-laws</i> 	
		sub-total n=10
MC not part of family tradition	MC not practised in clan	4
	<ul style="list-style-type: none"> • <i>No one has ever done that in our tribe (2 responses)</i> • <i>It is not part of my culture (2 responses)</i> 	
	Father not circumcised	3
	<ul style="list-style-type: none"> • <i>I am not circumcised myself (2 responses)</i> • <i>He has to be like his father who is not circumcised</i> 	
	Older brothers not circumcised	3
	<ul style="list-style-type: none"> • <i>His brothers are not circumcised (3 responses)</i> 	
	sub-total n=10	
Son to decide for himself	Do not want to decide for him	6
	<ul style="list-style-type: none"> • <i>He will decide for himself when he grows up (6 responses)</i> 	
		sub-total n=6
External influence	Wider family's influence	2
	<ul style="list-style-type: none"> • <i>My older sister advised me not to</i> • <i>My mother-in-law discouraged me from doing so</i> 	
	Health-care workers' influence	2
	<ul style="list-style-type: none"> • <i>My doctor said I should not do it</i> 	

	<ul style="list-style-type: none"> • <i>My aunt who is a nurse said we should not just accept new things</i> 	
		sub-total n=4
Son to be circumcised at home	Grandmother to perform procedure	3
	<ul style="list-style-type: none"> • <i>His grandmother will circumcise him (3 responses)</i> 	
		sub-total n=3
Theme	Sub-theme	No. of responses
Other	Various other reasons	3
	<ul style="list-style-type: none"> • <i>Baby died</i> • <i>We are no longer in Harare</i> • <i>I will only do it if it is for medical reasons</i> 	
		sub-total n=3
		Grand Total N=95

7.10 Parental views on possible strategies to increase EIMC uptake

Focus group discussion and in-depth interview participants were asked to suggest possible strategies to increase early infant male circumcision uptake. In light of the father's important role in the EIMC decision-making process, both male and female participants emphasised the need to raise EIMC awareness among men. *'I think if you could embark on some campaigns like visiting beer halls during the weekends... that is where you can find men...'* (mother, IDI5). Discussions with fathers suggested that they preferred to be provided with information directly and not through their wives. *'You should educate men yourselves instead of asking their wives to educate them. Most men do not want some of these things to come through the wife'* (father, fgd1).

Participants also recommended advertising the early infant male circumcision programme on both radio and television, in addition to holding TV talk-shows. *'...You could also discuss this programme live on TV and have even older people talking about it so that those that are planning to have a child are enlightened on the benefits well before they have the child'* (father, fgd2). Some participants recommended the use of satisfied clients.

If it is possible, when you conduct your outreach activities you could ask those people who had their newborn sons circumcised, the "pioneers" who have the time to

move around with you so that it doesn't look like you are preaching non-existent things (father, fgd1).

Another participant concurred, *'I think people believe what they see rather than what they hear and so if you could ask one of the parents to show others the circumcised baby... If people can actually see that the baby is still okay and healthy, they will be convinced'* (father, fgd1). A father who did not adopt early infant male circumcision also weighed in. *'...So we need to be shown the infant at different stages – at time of circumcision, after 3 months, after 6 months. We will then believe that the procedure is okay and babies heal well and so on'* (father, IDI11).

7.11 A brief discussion of findings

This qualitative piece identified motivators and barriers to early infant male circumcision uptake. The desire to protect a son from possible future sexually acquired HIV infection emerged as the main reason for adoption of early infant male circumcision. Consistent with quantitative survey and phase 1 findings, data on actual EIMC acceptability suggested that HIV positive parents are likely to quickly accept early infant male circumcision. Furthermore, data on actual acceptability suggested that parents with male circumcision knowledge in general and early infant male circumcision knowledge specifically, were some of the early EIMC adopters. These findings highlight once again, the need to increase knowledge among parents of newborn babies and the wider family.

Data suggest that adult voluntary medical male circumcision (VMMC) either facilitates or hinders EIMC. It appears that fathers who underwent VMMC and were satisfied with both the procedure and outcome were likely to adopt early infant male circumcision. Conversely, those that experienced “excessive pain” were unlikely to adopt the procedure for fear that their newborn son would be unable to bear such pain. These findings have at least three implications for VMMC roll out in general and early infant male circumcision promotion, in particular. Firstly, adult VMMC programmes need to adequately manage clients' pain. Secondly, VMMC clients need to be empowered so that during the procedure, they are able to alert providers whenever anaesthesia does not achieve optimum effect. Lastly, early infant male circumcision awareness campaigns need to explain the differences between VMMC and EIMC – especially the fact that the latter does not involve an anaesthetic injection, something which most VMMC clients say is very painful.

Discussions also suggested that there might be some early infant male circumcision procedures that are performed in non-clinical settings. As discussed in chapter 5, it is possible that participants were referring to practices other than circumcision (e.g. the

common practice of retracting a newborn's foreskin during bath time). Nonetheless, if it is indeed true that some early infant male circumcision is being performed traditionally, interventions to stop this practice need to be put in place. I highlighted the risks associated with male circumcision being performed traditionally in chapter 2.

Finally, men are notoriously hard to reach via health services. Even when they are ill, men are often reluctant to visit the clinic until symptoms become extremely severe [141,142,143]. Additionally, men in general and Zimbabwean men specifically, rarely accompany their wives to the clinic for antenatal or baby care. However, in the case of EIMC a substantial proportion of fathers accompanied their sons to the EIMC clinic, most likely because they were concerned that this was done properly and they also wanted the best service for their male infant. Additionally, visiting the clinic to watch EIMC neither posed any threats to men's masculinity nor inferred their own vulnerability. Early infant male circumcision therefore provides the unique opportunity to reach fathers via health-care facilities; it may therefore be possible to use EIMC as a platform to promote other health-related interventions (e.g. PPTCT, VMMC) among men.

7.12 Conclusion

The major strength of this qualitative work is that it employs the use of various data collection methods (focus group discussions, in-depth interviews, short telephone interviews and participant observation) - to explore *actual* as opposed to *hypothetical* acceptability of early infant male circumcision for HIV prevention among parents and wider family. As illustrated in more detail in the Discussion chapter, the use of two or more data collection methods facilitates data validation.

It is however, possible that some participants used the in-depth interviews and short telephone interviews as an opportunity to portray an image of themselves that is different from what they are in reality. For example, some parents who were too scared to adopt early infant male circumcision despite being aware of its benefits may have felt that they were being seen as non-caring individuals. This may have prompted them to blame something else for non-adoption (e.g. cultural beliefs). Moreover, some participants may have found it easier to blame someone else for refusing to adopt early infant male circumcision (i.e. spouse, mother-in-law) when they were in fact, the ones who had refused.

In conclusion, this qualitative piece unravelled key motivators and barriers to early infant male circumcision uptake. These barriers need to be addressed if uptake of early infant male

circumcision for HIV prevention is to be widely adopted. The implications of these findings are discussed in detail in the Discussion chapter.

CHAPTER 8: RESULTS – ACTUAL FEASIBILITY AND ACCEPTABILITY OF EARLY INFANT MALE CIRCUMCISION FOR HIV PREVENTION – HEALTH-CARE WORKERS

8.1 Chapter overview

In this chapter I present findings of the research I conducted to determine actual acceptability and feasibility of early infant male circumcision among health-care workers (HCWs). The methods that I used to investigate this issue are described in detail in chapter 4. In brief, between January and May 2013, in-depth interviews were held with the four doctors who performed early infant male circumcision (EIMC) during the comparative trial. Additional in-depth interviews were held with the three EIMC study nurse-midwives. Furthermore, in-depth interviews were held with five female nurses who worked at the study clinic but were not directly involved with performing procedures or recruiting parents/babies for the EIMC trial. The five nurses were purposively sampled to include a sister-in-charge; two nurse-midwives based in the maternity unit and two registered general nurses based in the family health services clinic (unit where babies and children are seen for immunizations and growth monitoring). In addition to the in-depth interviews, I also observed EIMC doctors' non-verbal behaviour before, during and after infant circumcisions. During observation, I took field notes which were coded subsequently. All data were transcribed, translated into English (where necessary), coded using NVivo 10. Codes were grouped into themes and sub-themes using thematic content analysis (see section 4.4.2 for a detailed description of data analysis procedures).

8.2 An overview of findings

Actual acceptability of early infant male circumcision as an HIV prevention intervention seemed to be generally high among both EIMC and non-EIMC study clinicians. Nonetheless, a few non-EIMC study nurses expressed their reservations with EIMC. On the whole, health-care workers thought that EIMC was a safe procedure, and the outcome was aesthetically pleasing. Nearly all EIMC study doctors and nurses expressed preference of the AccuCirc device over the Mogen clamp. All health-care workers felt that it was feasible to offer wide-scale EIMC for HIV prevention and they recommended possible strategies to increase EIMC uptake, in addition to highlighting a few issues that warrant consideration.

8.3 Actual EIMC acceptability among health-care workers

8.3.1 EIMC acceptability among study clinicians

Perhaps not surprisingly, discussions with study doctors and nurse-midwives suggested high acceptance of early infant male circumcision as an HIV prevention intervention. These

health-care workers stated that their job satisfaction was in part, due to the awareness that they were working on a study to inform a worthwhile initiative. A study doctor maintained, *'I have a passion for the work that I do because I am always conscious of the fact that I am doing something that will contribute to a reduction of HIV rates in Zimbabwe'* (EIMC HCW, IDI3). A study nurse-midwife also weighed in

Every day, I make sure that I am at the clinic's maternity department by 6:30am to sensitize mothers around EIMC before nurses commence their educational sessions. I am not even an outreach worker and I could simply choose to get to the clinic at 8am. I have this genuine desire to see that this pilot study is a success and also that EIMC is eventually rolled out as an HIV prevention strategy. I strongly feel that EIMC is the way to go... (EIMC HCW, IDI6).

During the EIMC comparative trial, this same nurse-midwife recruited the highest number of trial participants (50/150) despite the fact that she was not specifically required to mobilise study participants.

Study doctors recognised that early infant male circumcision had several advantages over adolescent and adult male circumcision, one of them being the ease of conducting the procedure in newborns. *'Performing MC on adults is a bit of a procedure; you need to suture and you also need to achieve that penile block but EIMC does not require much'* (EIMC HCW, IDI1). Additionally, the doctors thought that EIMC is less painful. *'The only thing that appears to be painful is the removal of adhesions. After that, the infants calm down. Sometimes they fall asleep during the procedure and when you give them back to their parents, they will still be asleep'* (EIMC HCW, IDI4).

As with parents who adopted EIMC, study doctors professed amazement at infants' speedy healing.

An adult has to immerse the circumcision wound in salty water at least twice a day for about 20 to 30 minutes. An infant does not require anything else except Vaseline. However, an infant is completely healed by day 7 or day 14 post circumcision but for an adult it takes much longer; this really amazes me (EIMC HCW, IDI2).

As illustrated by this quote, the doctors were not only surprised by the fact that healing in infants occurs more quickly; they were also fascinated by the fact that an infant heals with just the application of petroleum jelly.

8.3.2 EIMC acceptability among non-EIMC clinic staff

Discussions with clinic staff not involved in the EIMC study suggested that EIMC was acceptable to some and not to others. *'Some say this is a good programme; others think that it is not okay to circumcise a son when he is still that young'* (non-EIMC HCW, IDI9). Further probing suggested that some nurses were even sceptical about male circumcision's HIV prevention benefits.

Since male circumcision is a new thing, people [nurses] still question whether it really reduces HIV. I think it would be better for some circumcised adult men to visit the clinic and give some testimonies. Some sexually active men who were circumcised say "five years ago" could come and actually say, 'I am still negative although I have been having unprotected sex' you know – so that they convince us that it [MC] protects against HIV for sure (EIMC HCW, IDI12).

The same nurse further proclaimed that, *'I think it's important to hear from these men because generally, nurses fear that they may subject infants to unnecessary pain by recommending something [EIMC] that does not reduce HIV'* (EIMC HCW, IDI12).

Discussions also suggested that despite several EIMC sensitisation meetings with non-EIMC clinic staff, including an initial stakeholder meeting convened by the Ministry of Health, misconceptions remained a significant barrier to EIMC acceptability among these health-care workers. *'We "understand" that the babies are circumcised "just like that", under no anaesthesia. Most nurses therefore think that this programme is cruel'* (non-EIMC HCW, IDI11). As illustrated by this quote, perceptions such as these were a result of poor knowledge of the EIMC procedure.

Misconceptions were also prevalent among ancillary staff, including lay community health workers. Study clinic lay community health workers are mostly hand-picked elderly women often with some basic education. A nurse said about them, *'They [lay community health workers] think the infant has to be anaesthetised first [general anaesthesia] so they assume that if infants are anaesthetised, they will "never wake up" [implying dying]. Some have heard of people who have died after being anaesthetised'* (non-EIMC HCW, IDI9). The same nurse went on to state that these community workers often passed on myths and misconception to the communities with which they worked. Given their misconceptions with EIMC, it is perhaps not surprising that the 50 lay community health workers based at the study clinic did not refer even a single infant for EIMC during the comparative trial, despite initial assurances that they would actively support the study.

When asked to articulate their personal feelings around early infant male circumcision, one of the health-care workers maintained. *'I strongly feel that circumcising babies during infancy is a good idea as this ensures that you protect them from HIV well in advance'* (non-EIMC HCW, IDI9). Just as with hypothetical acceptability participants, HCWs who took part in phase 2 of the PhD research felt that early prevention of HIV had the important advantage of minimising the number of individuals who end up needing ART. They too stated that they were struggling to cope with the number of patients needing HIV care. *'We limit the number of HIV patients we see per month to 4,000 because we have a shortage of both medication and staff. We end up referring some patients to Harare hospital because they can accommodate larger numbers'* (non-EIMC HCW, IDI8).

Two non-EIMC study nurses stated however, that although they promoted early infant male circumcision among women attending antenatal and postnatal clinics, they themselves felt that boys should undergo circumcision later in life. *'I think he should be circumcised when he is old enough to decide for himself. Then, he will be able to manage the pain since he would have made his own choice'* (non-EIMC HCW, IDI10). The other nurse stated that she personally would not adopt EIMC as she was mostly concerned about son's later regrets. *'...I have already stated that he [son] may be affected in future when he realises that he is different from others who are uncircumcised'* (non-EIMC HCW, IDI11).

When asked if it was practical to promote a programme she did not necessarily endorse, one of the nurses responded, *'...It's a good thing [EIMC] but I just have my own personal feelings. It's just the same with HIV testing; we encourage clients to get tested for HIV yet we don't want to do so'* (non-EIMC HCW, IDI10). It could not be established whether or not this nurse really promoted EIMC among young mothers. All the same, study staff often heard non-EIMC study nurses ridiculing early infant male circumcision whilst purporting to be promoting the procedure.

After telling young women the advantages of circumcising a son during infancy, a nurse concluded, 'You thought this practice was just for the Chewa? You are now going to be like them' (participant observation).

As noted earlier, the Chewa are originally from Malawi and they circumcise infants; they are often mocked for being aliens (and therefore inferior).

During interviews, non-EIMC study nurses acknowledged that some of their peers gave mothers ambivalent or contradictory advice regarding EIMC. *'You hear them saying, "Ya-a it's a good thing to have him [son] circumcised but if it was my son, I would not have him*

circumcised” (non-EIMC HCW, IDI8). In chapter 6 I described how “advice” from a health-care worker can negatively influence parents who are trying to decide whether or not to have their son circumcised.

8.4 Clinicians’ perceptions: EIMC procedure, devices and outcome

During discussions, study clinicians reported their initial anxieties with EIMC. A study doctor described her initial feelings. *‘Before I underwent training, I thought EIMC was such a difficult thing. I couldn’t imagine infants being circumcised; I had never seen such a thing... And then during the lectures when I was taught the various techniques and their complications, it was a bit scary’* (EIMC HCW, IDI4). Another doctor described the EIMC experience as “mind-opening”. He went on to elaborate, *‘I had a preconception that the neonatal stage was the child’s most delicate period and that EIMC could predispose them to infections, would result in delayed wound healing or anything like that. I never thought circumcision could be that safe and easy’* (EIMC HCW, IDI2).

Despite acknowledging initial anxieties, study doctors stated that with more exposure and practice, they eventually became confident in EIMC and subsequently began to feel that the procedure was both uncomplicated and safe. *‘Now I am very comfortable; I now feel that EIMC is a procedure that you can even do with your eyes closed’* (EIMC HCW, IDI1). Another doctor maintained, *‘I think it’s a procedure that can safely be done not only by doctors but by any adequately trained health-care provider’* (EIMC HCW, IDI3). A non-study nurse also felt that EIMC was a very safe procedure. *‘Judging from the babies I have seen, I think it [EIMC] is very safe. I haven’t witnessed any infections or penile amputations and so I think it’s safe’* (non-EIMC HCW, IDI8). Study nurse-midwives also stated that after assisting doctors with EIMC procedures, they now felt they could safely perform the procedure. *‘From what I have observed, I am very confident that I can also perform the procedure’* (EIMC HCW, IDI7). When asked if she thought nurses other than those involved in the EIMC study could also perform the procedure, a study nurse-midwife responded, *‘They [nurses] can. They are doing episiotomy; episiotomy is cutting a part that is even unmarked, a section you think the unborn baby might come through’* (EIMC HCW, IDI6).

Discussions suggested that on the whole, study doctors preferred the AccuCirc device over Mogen clamp. A study doctor maintained, *‘AccuCirc is straight forward and it’s a device that can protect ...we have that thing that protects the glans, so you don’t have to worry about anything...’* (EIMC HCW, IDI1). Another study doctor explained why he preferred the AccuCirc device over Mogen clamp.

I have realised that when using AccuCirc, there is less manipulation of the penis. With Mogen clamp, you manipulate the foreskin so much that the pen mark disappears just before you cut off the foreskin and so you won't have a good approximation of the amount of foreskin that you should remove. As a result, you can either remove too little or too much foreskin (EIMC HCW, IDI2).

The third doctor maintained. *'...If I was asked to do the procedure on my son and I had the opportunity to choose between the two devices, I would choose AccuCirc because of the safety issue'* (EIMC HCW, IDI4). She however, went on to state that, *'If I had not been taught how to use the AccuCirc device, I would still be fine with the Mogen clamp'* (EIMC HCW, IDI4).

The fourth doctor seemed to have some difficulty expressing a preference for one device over the other.

Dr: I will say I prefer the Mogen clamp.

WM: Okay, why?

Dr: Firstly, the initial dorsal crush ensures that you remove the right amount of foreskin. Secondly, the Mogen clamp's immediate outcome looks neater despite it having the dog ear (EIMC HCW, IDI3).

She however, went on to state that, *'On the other hand I have 100% confidence in terms of safety when using AccuCirc but in terms of the immediate outcome [cosmetic], I prefer the Mogen clamp'* (EIMC HCW, IDI3). Participant observation confirmed that this doctor was certainly comfortable using either device.

During discussions, study nurse-midwives mentioned that as they assisted EIMC doctors with the procedure, they noticed that three of them were more confident when using the AccuCirc device. *'Only one doctor is comfortable with Mogen clamp. She says the immediate outcome is smarter with Mogen clamp. The other three doctors are more comfortable with the AccuCirc device'* (EIMC HCW, IDI7). Another study nurse-midwife described how EIMC doctors appeared uneasy as they conducted the procedure using the Mogen clamp.

When they clamp one will say to the other, 'Can you please feel the glans for me? Haven't I clamped the glans?' They will be so uncomfortable; they take turns to feel the glans and before they cut off the skin, they unclamp and double check. You can clearly see that they are really uncomfortable with the whole thing (EIMC HCW, IDI6).

Doctors' uneasiness with the Mogen clamp was also noted during participant observation.

...As she delivered the glans after performing the EIMC procedure using the Mogen clamp, the EIMC doctor was hesitant to look at the immediate outcome. When she eventually looked and realised that the glans was still intact, she jumped up and down in joy (participant observation).

Overall, although some of the study doctors' accounts suggested that they felt confident using either device, study nurse-midwives' descriptions plus participant observation suggested that they were more confident using AccuCirc. Suffice it to note that study doctors' experience with either device was still relatively limited at the time of the interviews (and even by the end of the trial). Later, I dwell on this aspect in more detail.

Even though study clinicians differed in their opinion of which device produced a better cosmetic result immediately post-circumcision, they all felt that by the time healing was complete, the circumcisions performed by either device looked the same. A study doctor maintained, *'Initially I thought Mogen clamp produced a cleaner cut. However, on day 7 I could not tell the difference between procedures performed through either device'* (EIMC HCW, IDI4). Another study doctor concurred, *'Honestly speaking I have noticed it's the same. The [babies] come for the day 7 review and you can't tell which one was circumcised through AccuCirc or Mogen clamp'* (EIMC HCW, IDI1).

Just as with parents who adopted EIMC, study clinicians stated that the outcome of EIMC was aesthetically pleasing. A study nurse-midwife commented *'It's indeed a sweet outcome; you actually feel proud of it'* (EIMC HCW, IDI5). A study doctor felt that compared to adult male circumcision, EIMC produced a better cosmetic result. *'EIMC has amazing results even when compared to adult MC. I most liked the fact that the outcome was not only satisfactory to us as providers but to the parents and guardians of the infants as well'* EIMC HCW, IDI2). A non-study nurse also commented, *'When the wound has healed, the circumcision looks so neat. You can't believe that the procedure was performed in that tiny clinic of yours'* (non-EIMC HCW, IDI8).

8.5 Clinicians' perceptions: feasibility of wide-scale EIMC

Informed by their experience with EIMC within the context of a small research trial, health-care workers felt that it was feasible to roll out wide-scale early infant male circumcision for HIV prevention in Zimbabwe. On the whole, these health-care workers felt that AccuCirc was likely to have several advantages over Mogen clamp when it came to wide-scale

implementation including for example, through rural clinics. *'Even nurses stationed at rural areas will be able to safely perform the procedure through AccuCirc especially because the device is simple to use and the shielding ring makes it impossible to partially amputate the penile glans'* (EIMC HCW, IDI7). Non-study nurses expressed optimism that if adequately trained, they could safely perform EIMC using the AccuCirc device.

The other time one of the study guys had a meeting with us and he clearly demonstrated how that white plastic gadget [AccuCirc] works. If we are trained, we will be able to perform the procedure. Also, we already have knowledge of some of the aspects such as sterile procedures; we can do it (non-EIMC HCW, IDI10).

Nonetheless, despite overwhelmingly recommending that nurses and midwives be trained and delegated to perform EIMC, nurses (both EIMC and non-EIMC) felt that there were likely to be challenges around convincing parents of newborn infants that nurses/midwives could safely circumcise their infants. *'I don't know if it's a "myth" or something else but people have more confidence in doctors than nurses and midwives. I don't know if parents will be convinced that nurses and midwives can perform infant circumcision just as well as doctors'* (non-EIMC HCW, IDI12). A study nurse-midwife recommended, *'Where possible, I think the doctors should perform EIMC alongside nurses and midwives. The doctors have their crucial influence on mothers'* (EIMC HCW, IDI5).

Another study nurse-midwife suggested that even if nurses and midwives were trained and allowed to perform EIMC, these clinicians should be covered by doctors in cases of any major complications. Subsequently, she recommended that wide-scale EIMC be offered at least at the district hospital level.

I think the lowest level that we can go is the district hospital. I say so because there is always a doctor at the district hospital; the doctor will be able to deal with any major complications. Perhaps it also depends on where the EIMC clinic is situated. I once worked in the Dande area for example, Guruve to be specific. There were no vehicles and phones [landlines] were not always working. We used radios whose functionality depended on weather conditions. Now if you experience a complication such as haemophilia, how will you be able to get assistance or rather, how will you be able to transport that infant from point A to point B? That is why I recommend the district hospital (EIMC HCW, IDI6).

This nurse-midwife felt that rather than simply recommending that early infant male circumcision be offered at every health-care facility, there is need to consider the facilities on

a case by case basis. This recommendation may have implications for the device to be used to roll out EIMC. For example, the AccuCirc device is unlikely to result in life-threatening complications (e.g. excessive bleeding) that may require a doctor's immediate attention.

8.6 Possible strategies to increase EIMC uptake: clinicians' views

Just as with parents, health-care workers who took part in phase 2 of the PhD research suggested possible strategies to increase early infant male circumcision uptake during wide-scale implementation. Both EIMC and non-EIMC study clinicians felt that since EIMC knowledge was generally poor among all health-care workers, initiatives to enhance knowledge of the procedure needed to be all-inclusive. *'You need to educate all health professionals at point of care - paediatricians, obstetricians, midwives etc. so that they sensitise mothers around EIMC whenever they get in contact with them'* (EIMC HCW, IDI4).

A doctor explained why it was crucial to reach out to all health professionals.

Health-care workers can be a useful portal for spreading facts about EIMC, including the fact that the procedure is safe. Someone who has neither witnessed nor performed the procedure will find it difficult to convey the message that early infant male circumcision is safe. Myself, despite being a doctor, I was never going to be able to confidently tell anyone that early infant male circumcision is safe (EIMC HCW, IDI2).

When asked to suggest how various health-care workers could be sensitised around EIMC, a study doctor maintained, *'Doctors and nurses could be reached when they attend their various meetings and congresses, including the ZIMA [Zimbabwe Medical Association] congress. Some hold journal club meetings'* (EIMC HCW, IDI4).

Health-care workers also recommended utilisation of the electronic media.

When you try to sensitise parents around EIMC, they tell you that they are only aware of a radio or television advert on adult male circumcision... We probably need to sell our programme much more than what we are currently doing. We need to go on radio and television. Parents always refer to the Mai Chisamba (TV talk-show) that focused on adult male circumcision. We could also have a similar talk-show that specifically focuses on EIMC (EIMC HCW, IDI6).

Another study nurse-midwife also recommended use of satisfied parents.

We also have parents whose babies were circumcised... I don't know the appropriate forum but we could invite these parents to a forum and ask them to talk about their experience with EIMC - their initial fears, safety of the procedure, outcome. Maybe other parents would appreciate EIMC more if they listened to parents who have already adopted the procedure (EIMC HCW, IDI7).

A non-study nurse suggested that satisfied mothers could be asked to give testimonies to mothers attending antenatal clinics. *'You could ask mothers who have already circumcised their sons to share their experiences with pregnant women; they could also allow them to see the infant's circumcised organ [penis] - I don't know'* (non-EIMC HCW, IDI10).

Another non-study nurse recommended the utilisation of already existing health-related initiatives, including those coordinated by churches. *'We sometimes give talks on newly-introduced programmes at Pentecostal churches. These churches have "medical fellowship teams" which invite nurses and other experts to give health-related talks to their respective congregations'* (non-EIMC HCW, IDI10). Certainly, these talks can be used as a platform to sensitise parents and the wider community around EIMC. In fact, I gave a talk on EIMC at one of the fora; three parents subsequently brought their newborn babies for early infant male circumcision.

8.7 Clinicians' concerns

Although discussions with both EIMC study and non-study clinicians suggested high acceptance of early infant male circumcision for HIV prevention, and elicited perceptions around feasibility of offering EIMC on a wide-scale, the conversations also unravelled HCWs' concerns which are discussed in detail below.

8.7.1 EIMC study clinicians' concern: dealing with parental anxieties

As previously mentioned, during the EIMC comparative trial, parents sometimes called study staff whose mobile numbers were on the contact card (including at night) to report issues that the staff thought of as trivial (e.g. that the baby had soaked the bandage with urine). EIMC study clinicians wondered how these understandable parental anxieties would be addressed in the context of roll out. Specifically, they questioned how the public health sector would be able to provide such intensive phone support. *'Will the public clinics and hospitals be able to put in place the necessary supportive mechanisms such as taking night phone calls?'* (EIMC HCW, IDI3).

8.7.2 EIMC study clinicians' concern: wound care management

EIMC study clinicians stated that unlike disposable diapers, cotton nappies (the option used

by most people) often resulted in infants' delayed wound healing. *'...Some delayed wound healing we experienced had to do with the fact that mothers were using nappies [cotton], but once we gave them the pampers, the babies subsequently healed very well'* (EIMC HCW, IDI1). The same doctor went on to question the feasibility of purchasing large volumes of disposable diapers during EIMC roll out. *'Will you be able to purchase pampers for all those babies whose parents cannot afford pampers during the roll out?'* (EIMC HCW, IDI1).

8.7.3 Non-EIMC study clinicians' concerns: staff and space shortages

Just as with health-care workers who participated in phase 1 of the PhD research, non-study nurses were concerned that if EIMC roll out was not accompanied by an increase in number of service providers based at a health facility, the programme was definitely going to increase their already heavy workload. As a result, they had some reservations with the programme.

From what I heard at the launch [sensitisation meeting], nurses were unhappy that this programme is definitely coming with additional work. Some said, 'We are already doing so much and we don't want anything else'. I do not know if some were happy with the programme but I am just reporting what I heard from most nurses (EIMC HCW, IDI10).

An additional concern raised by non-study nurses centred on shortage of space. *'Most clinics have a shortage of space. If the programme is scaled up, where will you find the space to conduct the circumcisions?'* (EIMC HCW, IDI8).

8.8 A brief discussion of findings

This qualitative piece suggested high acceptance of early infant male circumcision as an HIV prevention intervention among health-care workers. Findings also suggested poor knowledge of both EIMC and its HIV benefits among clinicians and non-clinicians alike, and highlighted once again, the need to enhance health-care workers' EIMC knowledge. Encouragingly, all health-care workers stated that they really felt that EIMC was a simple procedure which could be performed by non-doctors. These assertions are especially important as they were articulated by health-care workers with some experience of the procedure. Moreover, basing their assertions on experiences with EIMC, health-care workers felt that it was feasible to offer wide-scale EIMC for HIV prevention. The several recommendations they subsequently made need to be considered when planning EIMC scale-up especially in relation to supportive mechanisms for nurse-midwife providers and the device that should be used during roll out. Furthermore, issues around dealing with parental

anxieties and EIMC wound management need to be carefully considered within the context of a scale-up.

8.9 Conclusion

A major strength of this qualitative piece is once again, the use of more than one data collection method to explore *actual* as opposed to *hypothetical* acceptability of early infant male circumcision for HIV prevention among health-care workers. Participant observation was particularly helpful in either confirming or refuting some of the claims made by health-care workers. For example, although some study doctors wanted to create the impression that they felt confident performing circumcision using the Mogen clamp, participant observation suggested otherwise. Additionally, data were collected from health-care workers either involved or not involved in the EIMC study; this ensured balanced views especially in relation to acceptability of early infant male circumcision as an HIV prevention intervention.

However, I explored acceptability of early infant male circumcision for HIV prevention among health-care workers already involved in the EIMC comparative trial. These health-care workers may have found it difficult to speak against an initiative in which they were already involved. Nonetheless, some of their sentiments appeared to be genuine. For example, one of the nurse-midwives who spoke passionately about the need to ensure a successful study further demonstrated her passion by recruiting slightly over a third of the babies needed for the comparative trial.

Also, I explored device preference among study doctors when their experience with either device was still relatively limited. Even by the end of the trial, the four doctors had each performed about 48 procedures in total (n=10 for training; n=38 for trial) and even fewer circumcisions using the Mogen clamp device (≤ 14). It is possible that study doctors' perceptions of devices were partly influenced by their experience with relatively few procedures; research suggests that to achieve optimal competence in male circumcision, providers need to perform more than 100 procedures [144]. Furthermore, I explored perceptions around the safety of early infant male circumcision before we encountered the two moderate adverse events (AEs). It is possible that I would obtain different perspectives had I explored this issue after occurrence of these AEs. However, both AEs (although classified as moderate for trial purposes) were relatively minor and quickly resolved. It is therefore unlikely that these adverse events would have dramatically altered their perceptions about EIMC's safety.

In conclusion, findings from this qualitative piece suggested high acceptance of early infant male circumcision as an HIV prevention intervention among health-care workers with EIMC experience. In addition, these health-care workers felt that it is feasible to offer wide-scale EIMC for HIV prevention in Zimbabwe. In the next chapter, I discuss the implications of these findings in detail.

9.1 Overview

The research outlined in this PhD thesis assessed the feasibility and acceptability of early infant male circumcision (EIMC) as an HIV prevention intervention in Zimbabwe to guide national roll out. The research was in two phases. The first phase comprised a systematic review and thematic synthesis which I conducted to explore parental reasons for non-adoption of infant male circumcision for HIV prevention in sub-Saharan Africa. Additionally, this phase qualitatively explored hypothetical acceptability of early infant male circumcision among parents and wider family as well as hypothetical feasibility and acceptability of EIMC among health-care workers.

The second phase was nested within a trial that assessed the feasibility, safety, acceptability and cost of rolling out early infant male circumcision using devices in Zimbabwe. It explored actual acceptability of early infant male circumcision among parents and wider family as well as actual feasibility and acceptability of EIMC among health-care workers. Findings informed recommendations for a demand generation intervention for EIMC, which is currently being developed and will subsequently be tested for impact.

9.2 Summary of findings

9.2.1 Systematic review and thematic synthesis findings

A systematic search of qualitative studies reporting on parental reasons for non-adoption of infant male circumcision for HIV prevention in sub-Saharan Africa identified 10 papers from seven countries that met the reviews' eligibility criteria. Thematic synthesis was conducted to collate barriers reported by the 10 studies. Five key barriers to infant MC uptake (lack of information, fear of harm, cultural/traditional beliefs, concern about cost and need to respect a child's autonomy) were identified. These were later condensed into just two (poor knowledge and social constructs). While barriers and motivators are to some degree context specific, the systematic review suggested that there are likely to be common themes that need to be addressed across the region if uptake of infant MC for HIV prevention is to be widely adopted. Findings were used to augment those collected as part of the PhD research.

9.2.2 Hypothetical acceptability and feasibility findings

An exploration of hypothetical acceptability and feasibility of EIMC as an HIV prevention intervention suggested poor EIMC knowledge among parents and health-care workers. Despite the poor knowledge, hypothetical acceptability of EIMC as an HIV prevention

intervention was high among health-care workers and parents from most ethnic groups. Discussions with parents and the wider family suggested that fathers would make the ultimate decision regarding EIMC although mothers and extended family could have (often covert) influence. Parental concerns centred on: safety, motive behind free service provision plus handling and disposal of the discarded foreskin. Older men from the dominant traditionally circumcising population (Shangani) strongly opposed EIMC, arguing that it separates circumcision from adolescent initiation, as well as allowing women (mothers) to nurse the wound, considered taboo. Health-care workers expressed concerns that wide-scale early infant male circumcision provision would further increase their workload. Furthermore, they were concerned that EIMC-linked incentive provision could lead to animosity between health-care workers. Finally, health-care workers were worried that supervision of health services was generally sub-optimal.

9.2.3 Actual acceptability and feasibility findings

An exploration of actual acceptability and feasibility of EIMC as an HIV prevention intervention suggested that the main parental motivator for adopting early infant male circumcision was the desire to protect son from future sexually acquired HIV infection. Findings additionally suggested that although the infant's father generally has the final say over adoption or non-adoption of EIMC, the mother is also able to refuse that the child be circumcised. Furthermore, findings highlighted the centrality of the infant's father's mother (paternal mother-in-law) in the decision-making process, in addition to suggesting that other family members, health-care workers and the wider social support network could influence adoption (or non-adoption of EIMC). Parents who had adopted early infant male circumcision spoke about their initial anxieties around the procedure. Additionally, they commented on both the procedure and outcome. Parental reasons for non-adoption of early infant male circumcision included fear of harm (i.e. infant's death, penile injury and excessive pain). Myths about male circumcision in general and early infant male circumcision specifically, were a significant barrier to early infant male circumcision.

Actual acceptability of early infant male circumcision as an HIV prevention intervention seemed to be generally high among both EIMC and non-EIMC study clinicians. Nonetheless, a few non-EIMC study nurses expressed reservations about EIMC. On the whole, health-care workers thought EIMC was a safe procedure and the outcome was aesthetically pleasing. Nearly all EIMC study doctors and nurses expressed preference for EIMC using the AccuCirc device rather than the Mogen clamp. All health-care workers felt it was feasible

to offer wide-scale EIMC for HIV prevention and they recommended possible strategies to increase EIMC uptake within the context of a roll out, in addition to raising a few concerns.

9.3 Discussion of research findings: EIMC acceptability

An exploration of acceptability of EIMC as an HIV prevention intervention revealed poor concordance between hypothetical acceptability and actual uptake. As stated previously, the quantitative survey on hypothetical acceptability of early infant male circumcision in Zimbabwe, which we conducted in 2009, indicated that 60% of women and 58% of men would be willing to have their newborn son circumcised - if circumcision was an effective HIV prevention strategy [13]. A subsequent qualitative exploration of the hypothetical acceptability of EIMC as an HIV prevention intervention among parents and the wider family also suggested that the procedure was likely to be highly acceptable [15].

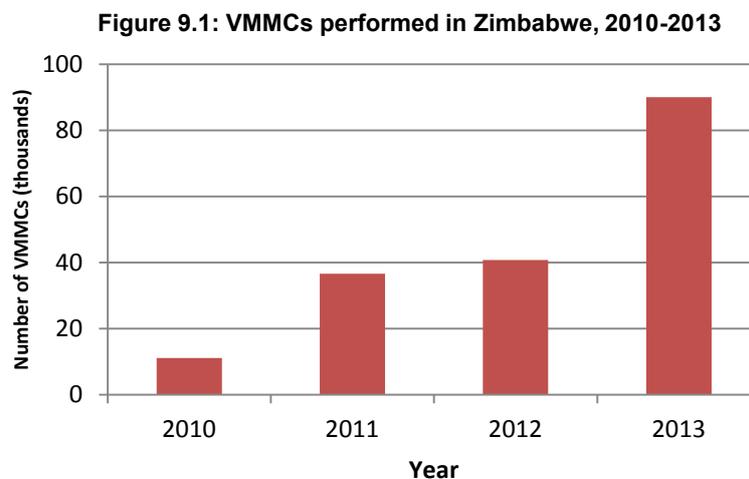
When we actually offered EIMC within a comparative trial, uptake of EIMC was not as high as had been suggested by the hypothetical acceptability studies. As stated previously, we approached 1,151 parents of newborn male infants to enrol 150 babies into the EIMC comparative trial; this translates to 13% EIMC uptake. Our findings on the mismatch between hypothetical and actual EIMC acceptability are consistent with those from across the region. In a study conducted in Zambia, although 97% of mothers who participated in a quantitative survey indicated that they definitely or probably planned to have their newborn son circumcised, only 11% of participants subsequently brought their newborn sons for infant male circumcision [17].

However, in both Zambia and Zimbabwe, EIMC was offered within a research setting. EIMC uptake within a research setting, and in Zimbabwe in the context of a trial, may be different from that as part of a programme. Additionally, Zimbabwean parents were informed that the trial was comparing two EIMC devices. Parents may therefore, have felt this indicated that the devices were 'experimental'; this thought may have exacerbated their fear of harm. Furthermore, the hesitancy of some cultural groups to participate in research has been documented [145,146]. Moreover, Zimbabwe is traditionally a non-circumcising country. It is inevitable that it will take time and the programme will need to earn the trust of parents before EIMC - a novel and invasive procedure - becomes widely accepted. Uptake of 13% may be reasonable this early on in the process of introducing EIMC. Uptake of adult voluntary medical male circumcision (VMMC) scale-up in the 14 priority countries is at an average of about 15%, and considered sub-optimal despite 4-5 years of implementation [147].

9.3.1 Knowledge of EIMC

Triangulating the data from the different studies that inform this PhD thesis, a recurrent theme is that knowledge of early infant male circumcision and its potential benefits is poor. Findings additionally suggest that poor EIMC knowledge is one of the factors responsible for parental non-adoption of the procedure. Conversely, knowledge of both male circumcision and HIV facilitate EIMC uptake. If widespread coverage of EIMC is to be achieved in future, there is need, as a first step, for campaigns to improve knowledge of early infant male circumcision among parents, health-care workers and the wider community. This broad-ranging approach will be essential given that the parents interviewed here conducted extensive consultations among family members, health-care workers and other social support networks prior to adopting (or failing to adopt) EIMC.

EIMC awareness campaigns need to present facts related to the efficacy of male circumcision in preventing sexually acquired HIV (as well as its other health benefits). This is particularly important given that findings suggest some scepticism around the HIV preventative benefits of male circumcision not only within the general population but also among some health-care workers. Such scepticism is likely reinforced by negative media publicity about male circumcision, including reports in local newspapers claiming that findings from the three VMMC randomised controlled trials should not be believed as conduct of the trials was flawed [148]. This negative publicity had a documented effect on the uptake of adult VMMC in Zimbabwe; there was only an 11% increase in the number of voluntary medical male circumcisions performed between 2011 and 2012 compared to 228% and 121% increases in 2010/2011 and 2012/2013, respectively (Figure 9.1) [147].



Data from other settings also suggest that negative publicity can adversely affect interest and uptake of services. For example, an analysis of over one million immunisation records among children born in Scotland between 1987 and 2004 showed that adverse publicity related to the measles, mumps and rubella (MMR) vaccine had a negative impact on uptake, resulting in an increase in measles cases among nursery children (Figure 9.2) [149]. Given the potential effect of negative publicity on acceptability of both adult VMMC and EIMC, the need for initiatives to educate journalists and promote responsible reporting can never be over-emphasised.

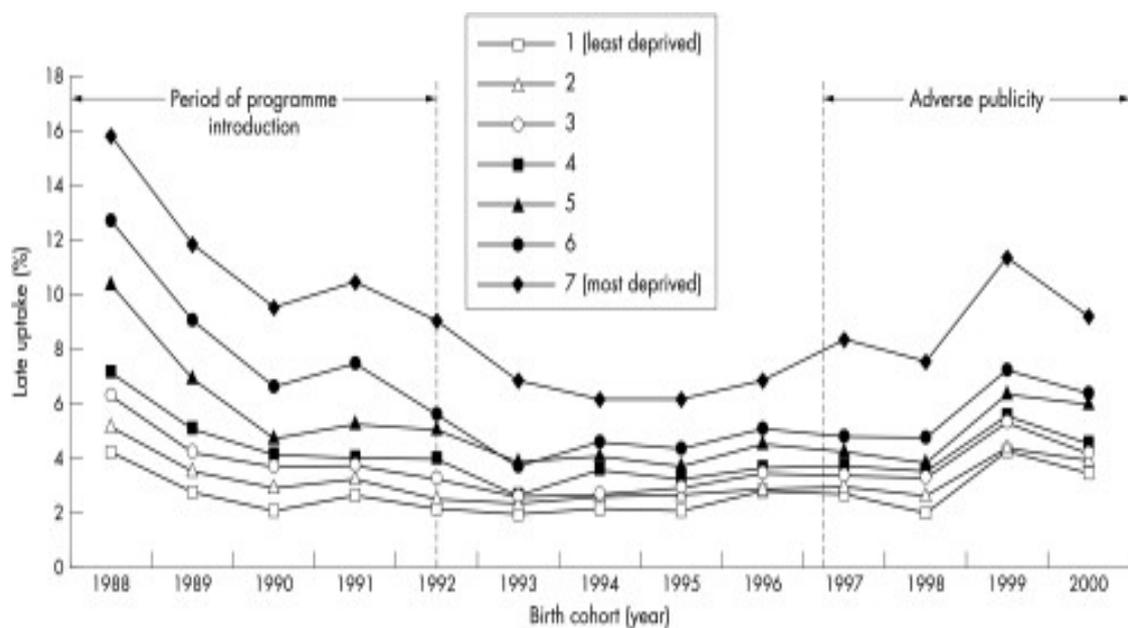


Figure 9.2: Adverse publicity, late MMR uptake by deprivation category & birth cohorts, 1988–2000 [149]

Since research findings suggest that many people including some health-care workers do not understand the rationale behind early infant male circumcision, awareness campaigns need to explain the benefits of EIMC on vulnerability to HIV as well as the non-HIV benefits of EIMC. The benefits of EIMC compared to circumcision conducted later in life also need to be explained. Moreover, since findings suggest a general lack of knowledge of how EIMC is performed, with some thinking that EIMC is a procedure similar to adult VMMC, campaigns need to explain the differences between the two procedures. Specifically addressing the issue of anaesthesia (unlike adult VMMC, device-led EIMC does not require an anaesthetic injection) and explaining that EIMC does not require sutures, is characterised by non life-threatening minimal bleeding, easy wound care and faster healing, will likely allay most of the parental concerns that act as barriers to no-adoption of EIMC.

Of note, some participants expressed strong concerns around the safety of the EIMC procedure. This concern has been observed in other studies across the region [13,80,118,122]. Study participants generally thought a newborn's penis is 'too fragile' to undergo circumcision. Overall, the level of anxiety observed suggested that these concerns need to be addressed head-on to improve early infant male circumcision uptake. As stated earlier, awareness campaigns need to adequately communicate that it is not only possible but also preferable for circumcision to be done soon after birth.

As for other behaviours, provision of EIMC knowledge alone is unlikely to increase EIMC acceptability. It is now well-recognised that even if people have knowledge, they may not necessarily have the incentive or power to change their behaviour [150]. This is especially so given that apart from individual volition, behaviour change is also influenced by several social and contextual factors [150]. I have already mentioned that ideas created and sustained by a particular group can have a bearing on EIMC acceptability. Moreover, we have learnt from implementation of adult VMMC that it is likely to take time and patience to gain trust and enthusiasm for this novel intervention. Efforts to increase uptake of EIMC will therefore need to additionally address negative attitudes and beliefs related to EIMC and seek to change community norms (see section 9.4.3 and 9.4.4).

9.3.2 Decision-making around EIMC

Understanding the EIMC decision-making pathway is crucial for a number of reasons. Firstly, this enables the identification of key players in the decision-making process, who can then be specifically targeted by interventions. Secondly, this allows for the identification of facilitators and barriers associated with each stage of the decision-making process which can then be systematically addressed. Knowing who to target with what information is clearly going to be critical to increasing demand for EIMC.

9.3.2.1 EIMC decision-making: key players

This study highlights the crucial role Zimbabwean fathers play in EIMC decision-making. The findings are not only consistent across the different studies in Zimbabwe but are consistent with those from other settings [126,131,151]. A study conducted in Mysore, India also found that the father has the final say in whether the infant is circumcised or not [131]. Within sub-Saharan Africa, the findings are consistent with those from Western Kenya and Zambia [126,151]. In the Kenyan study, fathers of babies who had undergone EIMC were the primary decision-makers in most instances, according to interviews with mothers and fathers (60% and 72%, respectively) [151]. A qualitative study conducted in Zambia also found that the father had the final say with regards to early infant male circumcision decision-making

[126]. In that study, among women who had accepted early infant male circumcision, most said their husbands had 'authorised' them to take along their sons for the procedure while the majority of women in the groups that decided against early infant male circumcision said it was their husbands who had ultimately refused [126].

However, in a study conducted in Botswana (which neighbours Zimbabwe), the majority of women (63%) identified themselves as primary decision-makers [80], likely explained by the fact that marriage is much less ubiquitous in Botswana than in Zimbabwe and indeed in the Botswana study (which only involved a small sample n=60), only 17% of the participants were married [80] compared to 93% in our comparative trial. Within the sub-Saharan African context, unmarried women have autonomy with regards decision-making than married ones.

On the whole, the findings from the studies presented here, coupled with those from other settings, suggest that since fathers make the ultimate decision as to whether their infant son should be circumcised or not, they need to be provided with information *directly* not just through their wives. Men reported resenting receiving information about ordinary issues in general and EIMC specifically, from the infant's mother. Given that men are notoriously hard to reach via health services [141,142,143], other venues for information sharing need to be considered. Workplaces and beer halls have been successfully used as venues to increase knowledge of health-related matters among men [152,153]. Talking to men about early infant male circumcision at the same time as they come for their own VMMC is also likely to be useful.

The research presented here makes two additional contributions to the issue of key EIMC decision-makers. Firstly, actual acceptability data show that the mother is also able to refuse for the child to be circumcised even if the father is in favour. The mother can do this either covertly (e.g. by not informing father about EIMC / exaggerating procedure's potential harm) or overtly – telephone interview responses suggested that mothers accounted for 28% of parental refusals. Secondly, although data from other settings suggest that other family members can influence non-adoption of EIMC [131,151], Zimbabwean data particularly highlight the importance of the infant's father's mother (paternal mother-in-law) in the early infant male circumcision decision-making process (see figure 9.3). Among Zimbabweans, the paternal mother-in-law is generally revered and has an influence on a couple's (and especially young couple's) decisions [138,154]. For example, paternal mothers-in-law influence infant feeding practices, including the period for which the infant should be breastfed [155]. My findings on who influences decisions regarding EIMC in the Zimbabwean

context highlight the need for EIMC interventions to target fathers, mothers, mothers-in-law – in fact, multiple generations.

9.3.2.2 EIMC decision-making: process

An attempt to map the EIMC decision-making process – especially within the context of a research initiative - is extremely challenging. Despite adult VMMC scale-up in the 14 priority countries over the last 4-5 years, researchers have not yet managed to adequately dissect the adult VMMC decision-making process. Some research groups have attempted to do this and have identified some of the important factors while acknowledging that their understanding of the process is incomplete [156,157]. Those that have attempted to describe the adult VMMC decision-making process using the ‘individual need perception’ model maintain that prior to undergoing the procedure, men weigh their perceived need for, and the benefits of, adult VMMC against other wants and needs, including those related to health [156]. This analysis identified motivators other than those related to risk of HIV including improved hygiene, perceptions of responsible masculine choice, perceptions of sexual partner preferences, and improved health for female sexual partners (e.g. reduced risk of cervical cancer) [156].

By better understanding the motivating factors, messages to influence uptake of adult VMMC have been redesigned. For example, VMMC in Zimbabwe has recently been repackaged as a lifestyle choice rather than an HIV prevention method so as to increase acceptance of the service by both men and women, in addition to countering perceptions that the procedure only benefits “promiscuous” men [82]. This has coincided with increased uptake of VMMC across the country. However, as many approaches to increasing demand for VMMC have been introduced simultaneously (e.g. performance-based financing for providers and interpersonal communication), it is not possible to disentangle whether all or only some of the interventions have been responsible for increasing demand - although anecdotal evidence suggests that this repackaging is making VMMC more acceptable to women.

Other scholars have explained the adult VMMC decision-making process using the ‘sequential discrete choice model’ [157]. This model assumes that a sequence of decisions and actions are prerequisites for adult VMMC uptake as follows: awareness (of VMMC), consideration, gathering information, VMMC uptake [157]. To a certain extent, these elements are related to those that make up the ‘stages of change’ model [150]. For example, consideration could be the equivalent of ‘contemplation’, gathering information could be equated to ‘preparing for action’ and uptake could be equivalent of ‘action’. Of note is that a

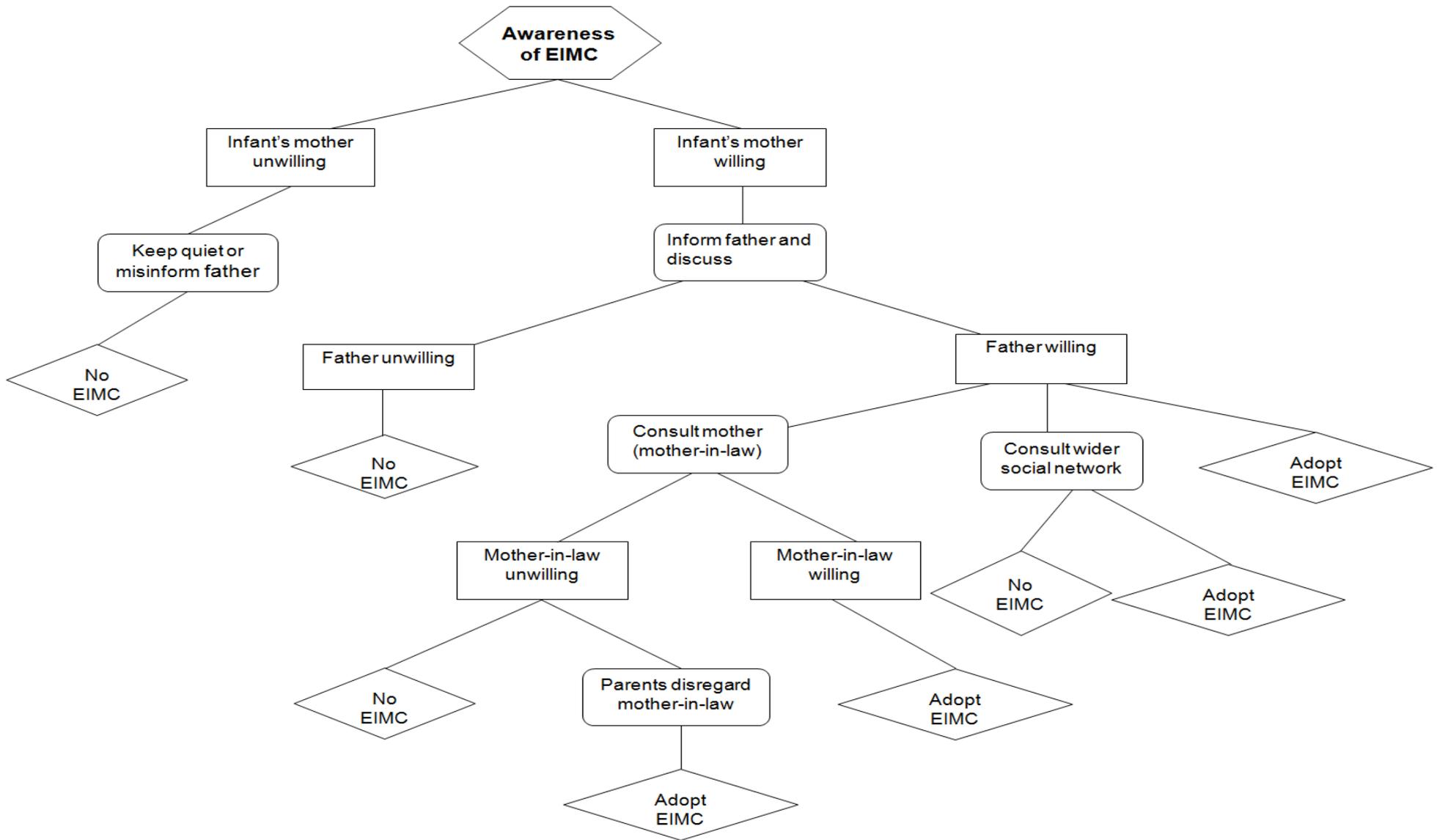
systematic review of randomised controlled trials to explore the effectiveness of interventions that use the stages of change model found that there was limited evidence for the effectiveness of stage-based interventions as a basis for behaviour change or for facilitating stage progression, irrespective of whether those interventions were compared with other types of intervention or with no intervention or usual care controls [158].

Despite the difficulty in unpacking the VMMC decision-making process it is generally accepted that decision-making is characterised by an interplay of various factors at the individual, household and community levels [127]. Additionally, factors that influence or hinder male circumcision uptake in general and EIMC specifically, are to a large extent, context specific [127,156]. It may therefore be difficult to come up with a description of decision-making that can be applied across the region or contexts.

Triangulating findings from the various studies within this thesis, I have drawn an EIMC decision tree (model) [159,160] to illustrate key decision-makers as well as alternative outcomes of their key actions and decisions around EIMC within the Zimbabwean context. Just like the 'sequential discrete choice model' [157], the EIMC decision model also makes the otherwise obvious assumption that a range of decisions and actions are prerequisites for EIMC uptake. Unlike the 'sequential discrete choice model', the Zimbabwe EIMC decision model that I developed assumes that the decisions and actions around EIMC are neither sequential nor predictable. I have used the decision tree to describe the most commonly described decision-making process uncovered during this work.

In summary, based on research findings, I have illustrated that when the mother becomes aware of the possibility of EIMC for her newborn son, she either keeps quiet or misinforms the infant's father about the risks of EIMC if she does not want to have her baby circumcised. On the other hand, if she wants to have her son circumcised, she informs the father about the possibility of EIMC and a discussion of the pros and cons ensues. If the father objects to EIMC, the baby will not be circumcised. However if the father is interested, he will consult his own mother (wife's mother-in-law) and/or wider social support network whose views may or may not influence the ultimate outcome (see Figure 9.3).

Figure 9.3: Zimbabwe EIMC decision tree (model)



9.4 Implications of research findings

The research findings presented here suggest that there are barriers to uptake of EIMC both at the level of the family and of the health-care providers. Encouragingly these barriers are likely to be amenable to change if adequately addressed. Below I focus on several issues that are likely to have a bearing on the scale-up of EIMC including possible providers, device and demand generation initiatives.

9.4.1 Possible EIMC providers for scale-up

Nearly all health-care workers who took part in the hypothetical and actual acceptability studies felt that nurses and midwives could be trained to offer wide-scale EIMC, although they expressed concerns about the resulting additional workload. A systematic review and meta-analysis of studies reporting the safety of tasking medical male circumcision to nurses in Africa found that rates of adverse events were similar for adult VMMC performed by doctors and non-doctors (including nurses) [161]. Moreover, a study we conducted in Zimbabwe found no significant difference in the overall safety and quality of the male circumcisions performed by recently-trained nurses and those performed by experienced doctors [74]. With specific reference to EIMC, studies have shown that nurses and midwives can safely perform the procedure [69,70]. Data on the safety, feasibility and relative cost of nurse-led EIMC in Zimbabwe are being collected as part of the field study that has previously been mentioned.

Despite the evidence from other countries that nurses/midwives can safely offer EIMC and the willingness of Zimbabwean nurses to be trained to do so, I found that parents and grandparents expressed a strong preference for the procedure to be performed by “highly-trained” doctors. EIMC awareness campaigns therefore need to demystify early infant male circumcision and explain that it is an uncomplicated and minor operation [66,75] in order to reassure parents that nurses/midwives can safely provide EIMC. As previously discussed, if early infant male circumcision is provided by nurses/midwives, it will be possible to make it accessible even in remote rural areas.

9.4.2 Possible device for EIMC scale-up

Although two adverse events (95% CI 0.4-7.7%) that were classified as moderate occurred in the AccuCirc arm and none (95% CI 0.0-8.9%) in the Mogen clamp arm during the EIMC comparative trial, these resolved quickly and without any lasting disability or adverse events. A field study of the AccuCirc device is now underway in 500 infants in which the adverse event rate can be more accurately quantified. If the AccuCirc device adverse event rate remains at this very low level, it is likely that EIMC will be scaled up in Zimbabwe using this

device, because of the several advantages compared with Mogen clamp that have already been outlined. Discussions with most study clinicians suggested preference for EIMC using the AccuCirc device rather than the Mogen clamp, largely because they were reassured by the presence of the shielding ring, which makes amputation of the penis 'impossible'.

9.4.3 Possible strategies to increase demand during EIMC scale-up

As discussed earlier, acceptability of early infant male circumcision will have a bearing on procedure uptake, roll out and subsequent effectiveness in preventing HIV [15]. Demand creation will therefore be an important component of EIMC scale-up. Experiences from the adult VMMC programme (plus the Zimbabwean EIMC pilot study) suggest that generating demand for male circumcision represents a social marketing challenge par excellence [72]. It is particularly challenging to market male circumcision in Zimbabwe, a traditionally non-circumcising country, where the connotations of having been circumcised were until recently, largely negative [82]. A wide range of strategies have been used to generate demand for VMMC in Zimbabwe and the region more widely [72]. Some of these have been used to generate demand for EIMC in the comparative trial described here including: posters, pamphlets, road shows, dramas, group talks, interpersonal communication and use of satisfied clients. At this stage, it is difficult to disentangle which of these strategies have been most effective in generating demand for EIMC.

As alluded to previously, it is likely that EIMC awareness campaigns need to reach the extended family and the wider community if the social norms relating to EIMC are going to change. Demand creation initiatives will likely need to include a combination of activities that address the individual, household and community. Furthermore, the use of new technological innovations such as mHealth (SMS messages) and social media to provide information about the availability of EIMC need to be explored; these media have been successfully used to improve post VMMC clinic attendance [162]. The Zimbabwean teledensity of around 90% [9] bodes well for the use of such information dissemination mechanisms. Once appropriate mechanisms for EIMC provision have been worked out, and a significant number of EIMC providers have been trained, it will be necessary to routinely offer EIMC. Data have shown that routine service provision (where patients opt-out rather than opt-in) of HIV testing for example, has resulted in a dramatic uptake of HIV testing in general [163,164] and antenatal HIV testing, in particular [165,166].

The PhD findings described in this thesis were presented to a meeting of stakeholders on 27th March 2014. The stakeholders included Ministry of Health plus Harare City Health officials, PSI representatives, researchers, health-care workers (including Paediatricians),

parents and grandparents. Implications of the PhD findings were discussed in terms of demand creation for actual roll out. This group then came up with the notion that interventions to support EIMC should be focused in the clinic and community, and should involve various components (Figure 9.4). Clinic activities would include health education talks, testimonials and distribution of IEC materials by health care workers, health promoters and parents who had their infant sons circumcised. These activities would take place during ANC, at delivery and at postnatal visits (Figure 9.4).

Since data have shown how important the wider family and community are in the EIMC decision-making process, it will likely be important to support clinic activities with community-based awareness raising. Clearly ensuring that key stakeholders in the community are broadly supportive is key; regular and ongoing stakeholder engagement need to take place (for example through the District AIDS Action Committee (DAAC) and /or Area Health Meetings) (Figure 9.4). Specific community activities could include community awareness raising through community meetings facilitated by behaviour change facilitators (BCFs), health-care workers, health promoters (HPs), parents and key opinion leaders. These activities could be complemented by road shows and workplace campaigns (largely targeting the male workforce). In addition to awareness raising, interpersonal communication (individualised discussions about EIMC) will likely be critical, and could be conducted by health promoters and parents of circumcised sons. Finally, EIMC rollout could be supported by a mass media campaign which would include utilisation of radio, television and bill boards (Figure 9.4).

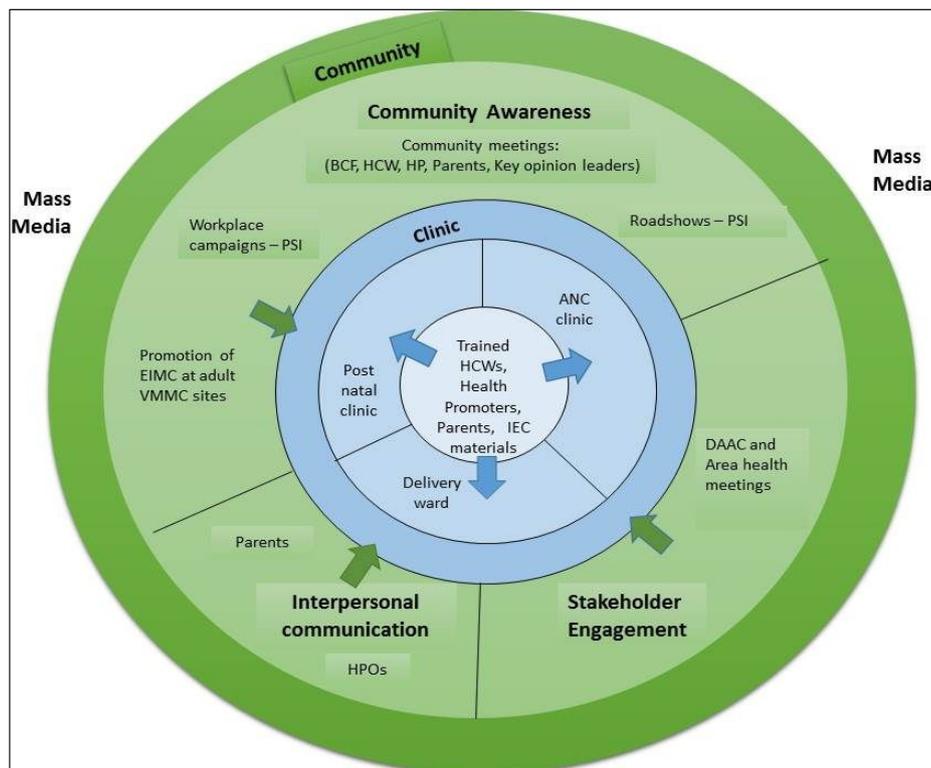


Figure 9.4: Proposed comprehensive intervention to increase demand during EIMC scale-up

The group that met to discuss implications of the PhD findings also developed a ‘Theory of Change’ (a description of a sequence of events that is expected to lead to a particular desired outcome) [167] to guide the development of a framework for evaluating this complex intervention. A protocol is in development for a cluster randomised trial to assess the impact of that approach.

9.4.4 Possible strategies to ensure demand for EIMC is sustained during EIMC scale-up

Perceptions of the safety and aesthetic aspects of EIMC will have a bearing on whether demand for EIMC will be sustained [168]. Encouragingly, during discussions, parents who had chosen to adopt EIMC reported that they felt the procedure was very safe. Additionally, during the EIMC comparative trial nearly all mothers (99.5%) reported high levels of satisfaction with the outcome. Studies from other regional settings have also shown high levels of satisfaction with the EIMC outcome [69,83]. For example, in a study conducted in Botswana, more than 94% of mothers reported high/complete satisfaction with the EIMC outcome [83]. Similarly, in a study conducted in Western Kenya, for the parents who completed a satisfaction survey, mean satisfaction score for mothers and fathers was 96.4

(SD = 7.5) and 95.9 (SD = 8.2), respectively, based on a scale from 0 (very dissatisfied) to 100 (very satisfied) [151].

Furthermore, in our comparative trial, all mothers, regardless of study arm said they would recommend EIMC to other parents, and would circumcise their next newborn son. These findings are also consistent with those from other regional settings. In the Western Kenya study, 98% of mothers and 97% of fathers said they would prefer to have a future son circumcised in infancy [151]. In the Botswana study, at least 97% of mothers reported that they would want EIMC for another infant should they have one [83].

To maintain these high levels of satisfaction within EIMC programmes, provision of early infant male circumcision will need to be carefully supervised and monitored to ensure i) a good cosmetic result and ii) that adverse events are prevented. This is particularly important given that health-care workers felt that in general, supervision of health services in Zimbabwe is currently sub-optimal.

Of note, during the EIMC comparative trial, most of the men who opted to accompany their sons to the EIMC clinic reported having undergone VMMC themselves. A study on actual EIMC acceptability conducted in Western Kenya also found that the circumcision status of the infant's father was associated with increased likelihood of EIMC adoption [151]. These findings and those from the PhD research suggest that as adult VMMC becomes more prevalent, demand for EIMC is likely to increase. Consequently, men who undergo VMMC need to be sensitised on both the availability and comparative advantages of EIMC.

Debunking myths and misconceptions around medical male circumcision in general and EIMC, specifically within awareness campaigns will be another important strategy to allay parental concerns. Given the persistent concern around the discarded foreskin, awareness campaigns need to address this issue. Specifically, the wider community needs to be informed that all removed foreskins will be incinerated as per tissue disposal policies. It will be difficult for parents to obtain the discarded foreskin from EIMC clinics since it is likely that EIMC will be rolled out using the AccuCirc device, which is designed to retain the discarded foreskin. Parents would therefore need to obtain the used AccuCirc device in order to get the foreskin. This will in turn, have implications for waste disposal; AccuCirc is largely made up of hardened plastic and will take years to biodegrade.

EIMC awareness campaigns need to explicitly address the reasons behind the programme. A few participants in the hypothetical acceptability study were suspicious of the fact that the

male circumcision programme was funded by external donor agencies and that it was being done without charge (most health services in Zimbabwe are provided on recovery of a small user fee). Zimbabwe (just like Kenya, Malawi, Rwanda, Swaziland and Tanzania) decided to ensure that the cost of adult VMMC was minimised by providing the procedure and follow up freely to offset at least some of the primary and opportunity costs [127].

The theory behind social marketing maintains that people generally do not value something that they get for free [169]. Moreover, suspicion about the motivation for free HIV prevention interventions is a recurrent theme; participants who took part in earlier studies conducted by our group [170,171] repeatedly questioned how quality condoms can be provided free of charge. Asking (early infant) male circumcision clients to pay a nominal procedure fee might help to increase the value people attach to the procedure. However, the potential advantages of such an approach need to be set against the fact that concern about the cost of the procedure came out strongly as a potential barrier to EIMC in a number of studies described in the systematic review and thematic synthesis (chapter 3), and resulted in low VMMC uptake in Malawi [127].

9.5 Strengths of the research

The research combines data collected using different but complimentary approaches to get a nuanced understanding of the barriers and facilitators for EIMC in Zimbabwe. The fact that many of the findings were elicited using multiple methods gives more confidence in their veracity. The thematic synthesis of parental reasons for non-adoption of infant male circumcision for HIV prevention from across sub-Saharan Africa allows me to set the research conducted in Zimbabwe within the broader context of the region, as well as allowing me to validate the findings from Zimbabwe. Furthermore, the PhD research explores both *hypothetical* and *actual* feasibility and acceptability of early infant male circumcision as an HIV prevention intervention, and subsequently adds to the scant literature on poor concordance between hypothetical and actual EIMC acceptability. Research findings reinforce the need for operational research to inform evidence-based programming for newer HIV interventions (e.g. VMMC and EIMC) – information that will be critical as EIMC is scaled up as part of HIV prevention efforts across the region.

The data collected using various data collection approaches were triangulated to explore *actual* acceptability of early infant male circumcision for HIV prevention among parents, the wider family and health-care workers. With specific reference to qualitative research, triangulation has been widely adopted as a means of investigating the ‘convergence’ of both the data and the conclusions derived from them [132]. Triangulation is often cited as one of

the central ways of 'validating' qualitative research evidence [132,133]. In this case, there was concordance among data obtained through focus group discussions, in-depth interviews and short telephone interviews, highlighting not only the likely validity of the results but also the value of triangulation. At the same time, participant observation allowed me to obtain first-hand accounts of parental and health-care worker behaviour before, during and after EIMC procedures. This enabled cross verification of data obtained through other methods.

9.6 Limitations of the research

Potential limitations of the systematic review and thematic synthesis have already been discussed in chapter 3. A potential limitation of the work is that I explored actual acceptability and feasibility of EIMC within a research setting. It is therefore unclear whether or not the barriers that emerged apply specifically to EIMC or to concerns about experimental research more widely. It is possible that some of the issues that emerged as concerns might not resurface during actual programme roll out. Conversely, health-care workers' enthusiasm with EIMC highlighted by the actual acceptability study could be because the procedure was still novel and not being undertaken in the context of routine work. It is unclear whether or not the enthusiasm for EIMC will be as high in practice. It will be crucial to explore actual acceptability of EIMC among parents and health-care workers during actual programme roll out to establish whether issues unravelled by this research apply just to EIMC offered within a research or to EIMC in general.

Also I only explored actual acceptability of doctor-led EIMC. Since it is likely that EIMC roll out will be through nurses/midwives for the reasons mentioned earlier, it is unclear how this will affect uptake. Encouragingly, parents continue to enrol their sons into our EIMC field study even after learning that the procedure is being performed by nurse-midwives. Nonetheless, future research needs to explore actual acceptability of nurse-led EIMC in order to effectively inform EIMC programming and roll out.

An additional potential limitation of the work described here is that the second phase of the PhD research was nested within a clinical trial. The inherent advantages of conducting qualitative research with or within trials are now well-recognised [172,173]. Qualitative research can be undertaken at the pre-trial stage to explore perceived value and benefits of an intervention [172]. Qualitative research can also be conducted with RCTs to see how interventions are delivered in practice [172]. Thus, qualitative components of trials gather complementary information which helps to answer research questions in depth [172,173]. Additionally, qualitative research undertaken with the main trial also has the potential to impact on the trial, for example, by facilitating interpretation of trial findings. However, the

practice of conducting qualitative research within a clinical trial has potential shortcomings, including the fact that qualitative results are often inconsistent with trial results, or at least need clarification [173]. In this case, qualitative data suggested high acceptance of EIMC but trial data showed that actual acceptance was less favourable.

Moreover, during the second phase of the PhD research, I conducted a predetermined number of in-depth interviews (n=12) and focus group discussions (n=4), based on resource limitations. It could be argued that parents with newborn sons who declined to participate in the trial (n=984) were not adequately represented in this relatively small qualitative piece. Finally, there are some issues that emerged via short telephone interviews that I did not manage to explore in depth through in-depth interviews and focus group discussions. It is therefore possible that I did not fully achieve theme saturation during the second phase of the PhD research.

9.7 Conclusion

Despite relatively low uptake of early infant male circumcision during the EIMC comparative trial, research findings suggest that early infant male circumcision for HIV prevention is potentially, an acceptable intervention among the majority of ethnic groups in Zimbabwe. However, the data suggest that while there are currently barriers to EIMC uptake, these are potentially surmountable given time. Culturally appropriate demand-creation activities to promote EIMC need to be developed, piloted and appropriately evaluated in order to support uptake of EIMC in Zimbabwe. Given that EIMC has been identified as a key HIV prevention intervention for sustaining the prevention gains anticipated through VMMC across sub-Saharan Africa, the findings of this research are likely to have broad implications for HIV prevention across the region.

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APPENDICES

Appendix A: Systematic review search terms (Medline)

Appendix B: FGD and in-depth interview topic guides

Appendix C: Example of interview summary – EIMC actual acceptability

Appendix D: Example of analytic memo – EIMC actual acceptability

Appendix E: Conference abstracts, prizes and publications

Appendix A: Systematic review search terms (Medline)

1. exp Circumcision, Male/
2. (male or infant* or neonat* or newborn* or child* or baby or babies or son or sons) adj2 circumcis*.mp
3. 1 or 2
4. HIV Infections/
5. (HIV adj3 prevent*) or (HIV adj3 intervention*).mp
6. 4 or 5
7. (accept* or belie* or barrier* or attitude* or willing* or inten* or view* or perspective* or perceive* or perception*).mp
8. qualitative research/
9. (focus group* or interview* or qualitative or finding* or theme*).mp
10. 8 or 9
11. 3 and 6 and 7 and 10

Adj2/3 means the two terms are within two or three words of each other, as the case may be
* is a truncation sign

Appendix B: FGD and in-depth interview topic guides

1. FGD topic guide - EIMC hypothetical acceptability

A study to assess the feasibility and acceptability of MC as an HIV prevention intervention in Zimbabwe

Focus group discussion guide – expectant parents, in-laws and grandparents

- Introduce self and explain study
- Obtain consent
- Set ground rules

(Note to interviewer: Questions in italics are meant to be probes. They do not have to be asked as they appear here. Rather, phrase and order questions according to the flow of the discussion).

Assessing attitudes/perceptions around MC in general

Note to interviewer: Ask participants to examine factual materials on MC. After they have looked at the materials ask:

Q No	Question	Probes
1	What do you think about the information in these materials?	
2	Do you understand the information in these materials?	<i>a. Which issues are well described? b. What issues are not clear?</i>
3	What additional information would you like to see in these materials?	
4	What do you understand by male circumcision?	<i>a. What is it? b. What happens during MC? Probe to get a sense of participants' knowledge and/or misconceptions</i>
5	What is MC called in this community?	<i>a. What are the formal indigenous terms? b. What are the informal/slang terms?</i>
6	Is there anyone who performs MC in this community on adult men?	<i>a. If so, who? Where? b. What about on children? c. What are your impressions about this service?</i>

Assessing attitudes/perceptions around early infant MC

Note to interviewer: Explain to participants what early infant MC is as follows: Early infant MC is conducted in the same manner as adult MC but is done to a baby. Then go on to ask:

Q No	Question	Probes
1	What do you think about early infant MC?	
2	Would you ever consider having your baby/infant grandson circumcised?	a. If yes, why? b. If no, why not? What are your concerns/fears?
3	What might influence your decision to have your child/grandson circumcised?	a. What will it take for them to consider EIMC? b. Probes to focus on: costs, accessibility and availability of the service.
4	Whose decision matters most with regards to either circumcising a baby or not?	a. Who is consulted? b. What if the mother refuses?
5	Are there any advantages of circumcising a baby?	a. If so, what are the advantages?
6	Are there any disadvantages of circumcising a baby?	a. If so, what are the disadvantages?
7	At what stage should a child be circumcised?	a. Why should a child be circumcised at this stage? b. What happens if they are circumcised later (at what stage)?
8	Who should circumcise babies?	a. Why? b. How do several service providers compare
9	What are the reasons why parents/grandmothers/mothers-in-law would not want to have their babies/grandsons circumcised?	a. What could be done to encourage them to have them circumcised?
10	If MC was an effective method of HIV prevention would you have your son/grandson circumcised?	a. If so, why? b. If not, why not?
11	How could we help those that are willing to have their babies/grandsons circumcised to eventually get them circumcised?	

2. IDI topic guide - EIMC hypothetical acceptability

A study to assess the feasibility and acceptability of MC as an HIV prevention intervention in Zimbabwe

In-depth interview guide – policy makers and health care workers (HCWs)

- Introduce self and explain study
- Obtain consent

(Note to interviewer: Questions in italics are meant to be probes. They do not have to be asked as they appear here. Rather, phrase and order questions according to the flow of the discussion).

Assessing knowledge/perceptions of MC

Q No	Question	Probes
1	What do you understand by male circumcision?	<i>a. What is it? b. What happens during MC? Probe to get a sense of their knowledge and/or misconceptions</i>
2	Are there any advantages of MC?	<i>a. If so, which ones?</i>
3	Are there any disadvantages of MC?	<i>a. If so, which ones?</i>
4	Do you think MC is an effective method of HIV prevention?	<i>a. If so, why? b. If not, why not?</i>
5	What do you know about the MC pilot that has been completed?	<i>a. Where was it conducted? b. What did it involve?</i>
6	Do you think MC procedures are safe?	<i>a. If so, why? b. If not, why not?</i>
7	Do you think it is important to promote adult MC in Zimbabwe?	<i>a. If so, why? b. If not, why not?</i>
8	Do you think it is important to promote infant MC in Zimbabwe?	<i>a. If so, why? b. If not, why not?</i>
9	In your view, how acceptable is adult MC to Zimbabwean men?	<i>a. Why do you think so? b. What about to women?</i>
10	In your view, how acceptable is infant MC to Zimbabwean men?	<i>a. Do you think fathers are in favour of it? b. What about mothers? c. What about grandmothers/mothers-in-law?</i>
11	Who should provide adult MC in Zimbabwe?	<i>a. Why? b. What about infant MC?</i>
12	When should infant MC offered after birth?	<i>a. Why?</i>
13	What specific information do you think is essential in helping people decide to have their children/grandchildren circumcised?	
14	Which procedure or device would you recommend for adult MC?	<i>a. Why? b. What about for infant MC? Why?</i>
15	What are the major barriers to offering MC on a large scale?	<i>a. How could they be addressed?</i>

Models of care

Interviewer: describe each of the models of care to the key informant and then go on to:

- Ask the key informant to map which services might be directly/indirectly affected by the implementation of the MC programme. *Probe on type and quality of services, staff workload, staff retention.*

Medical officers, nurses and midwives currently implementing MC

Q No	Question	Probes
1	What advantages have the MC programme brought?	<p>a. Probe advantages to health facility.</p> <p>b. Probe advantages to clients (ambulance, surgical services etc.)</p> <p>c. Probe advantages to them personally (training, experience etc.)</p>
2	What are the programme's disadvantages?	<p>a. Probe disadvantages to health facility.</p> <p>b. Probe disadvantages to clients (blood supplies etc.)</p> <p>c. Probe disadvantages to them personally.</p>
3	What challenges have you encountered so far?	<p>a. How have you dealt with them?</p> <p>b. How could these be avoided?</p>
4	Is there anyone locally who practises traditional MC?	<p>a. What do you think about their service?</p> <p>b. Is it considered to be safe?</p> <p>c. Is there any link between your health centre and them?</p>
5	Can you describe to me your experiences of working on the MC programme?	a. Probes to focus on penile blocks and if they are actively practising.
6	Can you describe the process for planning and scheduling of appointments for surgery.	a. How do you plan for surgical procedures including allocation of surgery time?
7	Are there days allocated for specific surgical procedures?	<p>a. If so, which ones?</p> <p>b. Does this affect other services now? What about when MC is scaled up?</p>
8	Is supportive supervision and mentoring regularly provided at this facility?	a. If so, specify programs that are actively providing supervision and mentoring.
9	Are there any space limitations at this health centre?	<p>a. If not, do you anticipate any future space limitations?</p> <p>b. What about when MC is scaled up?</p>
10	On average, how many MC cases do you do per month?	a. What are the age ranges of your MC clients?
11	If adult and infant MC were scaled up across the whole country, do you think the training you received would be sufficient for other health workers?	a. If not, what additional training is needed?

Medical officers, nurses and midwives who will implement MC in future

Q No	Question	Probes
1	What advantages do you think the MC programme will bring?	<p><i>a. Probe advantages to health facility</i></p> <p><i>b. Probe advantages to clients (blood ambulance, surgical services etc.)</i></p> <p><i>c. Probe advantages to them personally (training, experience etc.)</i></p>
2	What in your view will be the programme's disadvantages?	<p><i>a. Probe disadvantages to health facility?</i></p> <p><i>b. Probe disadvantages to clients (blood supplies etc.)</i></p> <p><i>c. Probe disadvantages to them personally.</i></p>
3	What are your anxieties around this programme?	<p><i>a. What challenges do you foresee?</i></p> <p><i>b. How could these be avoided?</i></p>
4	Is there anyone who practises traditional MC?	<p><i>a. What do you think about their service?</i></p> <p><i>b. Is it thought to be safe?</i></p> <p><i>c. Will there be any link between your health centre and them?</i></p>
5	Can you describe the process for planning and scheduling of appointments for surgery?	<i>a. How do you plan for surgical procedures including allocation of surgery time?</i>
6	Are there days allocated for specific surgical procedures?	<p><i>a. If so, which ones?</i></p> <p><i>b. Does this affect other services now? What about when MC is introduced?</i></p>
7	Is supportive supervision and mentoring regularly provided at this facility?	<i>a. If so, specify programs that are actively providing supervision and mentoring.</i>
8	Are there any space limitations at this health centre?	<p><i>a. If not, do you anticipate any future space limitations?</i></p> <p><i>b. What about when MC is scaled up?</i></p>

3. In-depth interview topic guide, parents – EIMC actual acceptability

A study to pilot implementation of early infant male circumcision using devices in Zimbabwe

In-depth interview guide - parents

- Introduce self and explain study
- Obtain consent

(Note to interviewer: Questions in italics are meant to be probes. They do not have to be asked as they appear here. Rather, phrase and order questions according to the flow of the discussion).

Assessing attitudes/perceptions around MC in general

Q No	Question	Probes
1	What do you understand by male circumcision (MC)?	<i>a. What is it? b. What happens during MC? Probe to get a sense of participants' knowledge and/or misconceptions</i>
2	Why do adult men get circumcised?	<i>a. Have many men been motivated recently in relation to HIV prevention campaigns? b. Is desire to be circumcised driven by service providers? c. Is demand driven by clients?</i>
3	If MC was an effective method of HIV prevention would you be willing to undergo/have your partner undergo MC?	<i>a. If so, why? b. If not, why not?</i>
4	If MC was an effective method of HIV prevention would you be willing to have your son undergo MC?	<i>a. If so, why? b. If not, why not?</i>

Views on Early Infant Male Circumcision (EIMC) in general

Q No	Question	Probes
1	When would be the best time for an infant to be circumcised?	<i>a. Why?</i>
2	What do you think are the advantages of infant circumcision compared to adult one?	<i>a. See whether issues such as less pain, faster healing, lack of shyness etc. come up</i>
3	Who should circumcise infants?	<i>a. Explore preferences b. Explore acceptance of nurses/midwives to perform the procedure</i>
4	What are the possible reasons that some parents refuse to circumcise their infants?	<i>a. Explore knowledge, myths & misconceptions b. Explore cultural issues</i>
5	How likely will infant circumcision be viewed in the community?	<i>a. Positively? b. Negatively? What can be done to change these negative views? c. Mixed?</i>

Perceptions of parents who circumcised their sons (to be asked after day 14 post-EIMC)

Q No	Question	Probes
1	What motivated you to circumcise your son?	a. <i>What did you consider?</i>
2	Who was the primary decision-maker when it came to EIMC?	a. <i>Explore whether partner mattered</i> b. <i>Explore process of reaching consensus with partner</i> c. <i>Explore gender issues</i> d. <i>What was the role of other family members? Did gender matter?</i>
3	What fears or concerns did you have?	a. <i>Were these allayed? At what point (before procedure, during, after)?</i> b. <i>Do you have any regrets?</i>
4	Do you wish you had received additional information on EIMC?	a. <i>If so, which information?</i> b. <i>How would have that helped?</i>
5	If it were a nurse/midwife doing it, would you still circumcise your infant?	a. <i>Why?</i> b. <i>Do you think other parents will agree to have their sons circumcised by nurses/midwives? Why?</i>
6	Would you recommend EIMC to other parents?	a. <i>Why?</i>
7	What do you think about the safety of the procedure?	
8	What do you think about the appearance?	a. <i>Good, not so good?</i> b. <i>What, if anything, could be done better?</i>
9	Do you think EIMC can be safely offered on a wide-scale in Zimbabwe?	a. <i>Why?</i> b. <i>At which facilities? By whom?</i>
10	What could we do to increase EIMC uptake?	a. <i>What recommendations would you have?</i>

Perceptions of parents who did not circumcise their sons

Q No	Question	Probes
1	What stopped you from circumcising your son?	<i>a. What did you consider?</i>
2	Whose decision mattered most?	<i>a. Explore whether partner mattered b. Explore gender issues c. What was the role of other family members?</i>
3	What fears or concerns do you have?	<i>a. How could these be allayed? b. Do you have any regrets?</i>
4	What do you think about the safety of the procedure?	
5	What additional information would you like to have received on EIMC?	<i>a. How would have that helped?</i>
6	What would it take for you to circumcise your infant son?	
7	Would you recommend EIMC to other parents?	<i>a. Why?</i>
8	Do you think EIMC can be safely offered on a wide-scale in Zimbabwe?	<i>a. Why? b. At which facilities? By whom?</i>
9	What could we do to increase EIMC uptake?	<i>a. What recommendations would you have?</i>

4. In-depth interview topic guide, doctors – EIMC actual acceptability

A study to pilot implementation of early infant male circumcision using devices in Zimbabwe

In-depth interview guide – doctors

- Introduce self and explain study
- Obtain consent

(Note to interviewer: Questions in italics are meant to be probes. They do not have to be asked as they appear here. Rather, phrase and order questions according to the flow of the discussion).

Q No	Question	Probes
1	Did the training you receive adequately prepare you to perform EIMC using either device?	<i>a. If not, what aspects of the training were inadequate?</i>
2	Would the training you receive be adequate for other providers?	<i>a. Would it be adequate for doctors? b. Would it be adequate for nurses/midwives? c. If not, how could it be improved?</i>
3	Could you please describe your experience of performing EIMC	<i>a. What was good about it? b. What was not so good?</i>
4	Do you prefer one device over the other?	<i>a. If so, why? b. Which of the two results in better appearance? c. Which one is safer? d. Explore views on nature and severity of AEs</i>
5	What in your view are the advantages of AccuCirc over Mogen Clamp?	<i>a. What about disadvantages?</i>
6	What can you say about acceptability of EIMC (by actual uptake)?	<i>a. Are parents likely to bring their sons? b. What are their concerns?</i>
7	What could be done to improve actual uptake of EIMC?	
8	What do you think about the feasibility of offering EIMC on a wide-scale?	<i>a. Who should offer it, why? b. At which facilities, why? c. Through which device, why?</i>

5. In-depth interview topic guide, nurses – EIMC actual acceptability

A study to pilot implementation of early infant male circumcision using devices in Zimbabwe

In-depth interview guide – non-EIMC nurses

- Introduce self and explain study
- Obtain consent

(Note to interviewer: Questions in italics are meant to be probes. They do not have to be asked as they appear here. Rather, phrase and order questions according to the flow of the discussion).

Q No	Question	Probes
1	What do you think about EIMC?	<i>a. What do other nurses think? What about non-clinical staff e.g. HPOs? Any myths/rumours?</i> <i>b. How do you feel now that the programme is here? What about others?</i> <i>c. Would you have your son circumcised (at our clinic)? Why?</i> <i>d. Would you recommend EIMC/our clinic to parents? Why?</i> <i>e. Explore perceptions of safety</i>
2	What could we do to improve staff buy-in?	
3	What can you say about acceptability of EIMC (by actual uptake)?	<i>a. In your view, is this a generally accepted intervention? Why?</i>
4	What are the reasons some parents are refusing to circumcise their infants?	<i>a. What could be done to improve actual uptake of EIMC?</i> <i>b. By who?</i>
5	How could we effectively reach fathers of babies delivered at this clinic?	
6	What are the possible reasons fathers are accompanying their sons?	<i>a. Is it because of anxiety/fear?</i>
7	What do you think about the feasibility of offering EIMC on a wide-scale?	<i>a. Who should offer it, why?</i> <i>b. At which facilities, why?</i>
8	Do you think nurses/midwives can do it if adequately trained?	<i>a. Why?</i>
9	Would you be willing to be trained on performing EIMC?	<i>a. Why? What about other nurses/midwives?</i>

Appendix C: Example of interview summary – EIMC actual acceptability

Interview summary for IDI held with father of uncircumcised baby (IDI4)

Interview conducted on 14 May 2013

Venue: Southerton Post Office

Participant's background information

ZM is a 32 year-old man married to a 26 year-old lady. They live in Waterfalls, one of Zimbabwe's low income residential suburbs/townships initially established for the urban poor during colonial times and characterised by densely packed housing. They recently had a baby boy (second child). They also have a five year-old daughter. ZM and his wife were offered EIMC but did not bring forward their infant son for EIMC. This interview was conducted to understand reasons for not adopting EIMC for their newborn son.

Interview arrangements and setting

I contacted ZM by phone (using a number that had been obtained from his wife) requesting to have an interview with him on the 12th of May 2013 and he suggested that I meet him at his workplace after hours so that we could discuss. I later met ZM at the agreed time and had in-depth interview with him. ZM preferred the interview to be conducted in Shona.

Southerton is an industrial area to the South of Harare's CBD and is home to one of Harare's largest referral hospitals, Harare Hospital. The industrial area is generally busy and noisy. In order to ensure that the in-depth interview was not affected by the noise, we sat in one of the rooms where staff have their lunch. Since it was after hours, everyone had gone home and so the premises were very quiet, private and conducive for the conduct of the in-depth interview.

Summary of interview

The interview was conducted according to the interview guide. I started by exploring general attitudes/perceptions around male circumcision e.g. What ZM understood by male circumcision and why some adult men get circumcised. I then went on to explore ZM's views on male circumcision in general as well as why some parents may not choose to circumcise their newborn sons before specifically exploring reasons why ZM and his wife did not adopt EIMC for their son.

ZM explained well what circumcision involves. He mentioned for example, that *'Male circumcision is the removal of the male foreskin so that the penile head is left exposed'* (line 10-11).

ZM also felt that EIMC had an advantage over adult VMMC in that an infant heals faster than an adolescent.

'The advantage is that an infant heals faster for example when the infant is still wearing a nappy, it will just dry up in there as compared to when he is older, if he is circumcised when he is older he might want to go and play with a paper ball when playing football. Otherwise it will disturb him when he is walking. So I think there are advantages for short periods when the infants have just been born, yes' (line 69-73).

He however, felt that EIMC was risky as excessive bleeding could lead to infant death. He also thought that the procedure was painful especially since it is conducted at a time when the umbilical stump has not dried off (also considered painful) (line 81-84).

ZM also thought EIMC wound care was the same as that for adult and even involves the use of methylated spirit (line 30-32).

With regards to decision-making, ZM stated that he makes the ultimate decision around most issues, including around EIMC.

ZM: The decision is mine. I'm the one who can just declare to the wife that lets go and have the child circumcised.

CM: Ok

ZM: Yes

CM: What if she says no?

ZM: No; she cannot say no (line 219-224).

Reflections of the method and account

I believe ZM was able to express his honest thoughts around EIMC and decision-making. ZM was also comfortable with being audio-recorded

Reflections on emerging themes

EIMC has advantages over adult VMMC

- Characterised by faster healing

Poor knowledge of EIMC

- EIMC wound care same as adult wound care (methylated spirit is used)

- *Barriers to EIMC*
- Fear of infant death (due to excessive bleeding)
- Fear of excessive pain

Decision-making around EIMC

- Father makes ultimate decision

Appendix D: Example of analytic memo – EIMC actual acceptability

Theme: Fear of harm

Fear of immediate harm appears to be the major reason parents did not adopt early infant male circumcision. Some parents expressed concerns that the procedure and its associated complications (e.g. excessive bleeding) could possibly lead to an infant's death. Assumption was that the infant's penis was not only tiny but also 'too' fragile for the procedure (IDI2, 4, 8, 11 and FGD1, 4).

Ya-a something might be said to be safe but at the same time, everything has loopholes ...somehow it might not succeed, you understand? It's just a simple operation you know. An operation on the appendix is supposed to be safe. A lot of people have undergone that kind of operation and some have died. There are things that we presume to be safe but are not necessarily safe. Travelling by road seems safe; we go to town everyday but one of these days someone does not make it (father, IDI2).

'How do you really know that the child's foreskin starts here and ends there? What if they overdo it and end up cutting some veins...?' (father, fgd1).

Due to fear of possible harm, some parents adopted a wait-and-see approach (IDI12).

'My friend said she first wanted to see if my son healed well... People first want to see if it really works' (mother, IDI12).

Some parents were concerned that early infant male circumcision is a very painful procedure (FGD1, 2, 3) **(Mostly linked to painful experiences during adult VMMC).**

'The reason why we are saying it's the healing it's because we didn't want them to go through that pain because if they felt pain they would cry and if they cried then no more sleeping not what so it's a strain to everybody' (father, fgd1).

'So for you to say again they should be circumcised, to have them go through this other procedure I think it will introduce another dimension, whereby now he has to deal with maybe another pain. It's obvious that they feel it, right, at that moment the, would not have dropped off before the 10 days or 2 weeks, the umbilical cord would not have fallen off' (father, fgd1).

'What you as an adult goes through... You imagine the pain and your son undergoing such pain at that age...' (father, fgd2).

'...It [pain] was something that I still remembered very well... I thought of the pain that I had gone through and I refused...' (father, fgd2).

'Yes, yes so I think and at the same time they are going through the pain inflicted by the wound and then they also get an injection that's a bit tough because they would, isn't the pain too much? I think that will be too much because these days the injections, I think they are giving them twice' (father, fgd2).

'It might be because of the pain, for the mother to be in pain then the baby also in pain and might be crying and since he won't be able to say what's affecting him, though it might be stomach pains, so becomes problematic. This could be one of the reasons behind refusal by some parents' (father, fgd2).

Reflexivity

Could it be that parents who had not adopted felt that they were being seen as uncaring? How genuine were their fears? Experience of pain – just one particular group of men? What are the implications for VMMC in general and EMC, specifically?

Appendix E: Conference abstracts, prizes and publications

Abstract presented at IAS 2010 conference, Vienna (oral) and IAS 2011 conference, Rome (poster)

Acceptability and feasibility of neonatal male circumcision as an HIV prevention intervention: qualitative findings from Zimbabwe

Webster Mavhu^{1,4}, Karin Hatzold², Susan M Laver³, Judith Sherman³, Brenda R Tengende¹, Collin Mangenah¹, Lisa F Langhaug⁴, Frances M Cowan^{1,4}

Background

Neonatal male circumcision (NMC) is simpler, safer and more cost-effective than adult MC. It is therefore important to have an in-depth understanding of NMC acceptability and feasibility. In 2009, a quantitative survey of 2,746 rural Zimbabweans (aged 18-44), indicated NMC willingness among 60% of women and 58% of men. Willingness was associated with HIV and MC knowledge. A follow-up qualitative study which also assessed perceptions of health care workers (HCWs) towards NMC feasibility was conducted with rural and urban participants.

Methods

In 2010, focus group discussions were held with expectant mothers (n=6), expectant fathers (n=5), grandmothers/mothers-in-law (n=6) and grandfathers/fathers-in-law (n=7) from seven ethnic groups. Additionally, key informant interviews were held with HCWs either involved in MC (n=10) or not (n=13). Discussions were audio-recorded, transcribed, translated into English (where necessary), coded using NVivo 8 and analysed using grounded theory principles.

Results

NMC knowledge (procedure, timing, benefits) was poor, particularly among women and HCWs not involved in MC. HCWs, particularly those involved in MC, felt that NMC can be integrated within the current health system. Despite low knowledge, acceptability of NMC was high among parents from most ethnic groups. Discussions suggested that fathers make the ultimate decision regarding NMC although mothers and extended family members can have (often covert) influence. Parents' concerns centred on safety, son's later regrets, motives behind free service and handling of discarded foreskins; HCWs feared a potential increase in workload in the context of a struggling health-care system. One traditionally

circumcising population strongly opposed NMC, arguing that it undermines their tradition by omitting associated adolescent 'lectures', in addition to allowing women (mothers) to nurse the wound, considered taboo.

Conclusions

While participants felt NMC is feasible and acceptable, this study highlighted possible barriers to NMC uptake. These findings will inform demand-creation and implementation of NMC services.

Abstract orally presented at 2013 Zimbabwe Medical Association (ZIMA) conference, Victoria Falls and 2013 University of Zimbabwe College of Health Sciences Annual Medical Research Day, Harare

Title: Parental reasons for non-adoption of early infant male circumcision for HIV prevention: qualitative findings from Harare

Mavhu, W; Ncube, G; Hatzold, K; Samkange, CA; Weiss, HA; Mugurungi, O; Chasokela, C; Nyandoro, M; Mothobi, N; Sherman, J; Cowan, FM; Ticklay, I; Gwinji, G

Introduction

Early infant male circumcision (EIMC) is safer, easier and cheaper than adult MC [1]. Further, EIMC may be more effective at preventing HIV acquisition than adult MC as the procedure is carried out before the individual becomes sexually active, negating the risk associated with acquisition or transmission of HIV during the healing period [2]. However, EIMC acceptability will affect uptake, roll-out and subsequent effectiveness in preventing HIV. It is therefore crucial to identify and address parental concerns that may act as barriers for EIMC for HIV prevention. Addressing the barriers will likely improve uptake and maximize the intervention's benefits.

Objective

This qualitative study explored parental reasons for non-adoption of early infant male circumcision for HIV prevention to inform intervention design.

Materials and methods

Qualitative methods were used to explore barriers to EIMC. Qualitative methods seek to gain a deeper understanding of participants' descriptions, accounts and observations. Between January and May 2013, twelve in-depth interviews (IDIs) and four focus group discussions (FGDs) were held with parents who had either adopted EIMC for HIV prevention or had declined to circumcise their newborn sons. In addition, short telephone surveys were conducted with a random sample of parents who had scheduled to bring their sons for EIMC but defaulted (n=95); short statements were handwritten. IDIs and FGDs were audio recorded. All data were transcribed, translated into English and coded using NVivo 10. Codes were grouped into themes and sub-themes using thematic analysis. Ethics approval was obtained from the Medical Research Council of Zimbabwe, the University College London Ethics Committee and the London School of Hygiene and Tropical Medicine Research Ethics Committee.

Results

During FGDs and IDIs, most parents highlighted the following reasons for non-adoption of EIMC: fear of harm specifically death, excessive bleeding, pain and penile injury; the newborn's penis was deemed 'too' fragile for the procedure. FGDs and IDIs also suggested concerns around the discarded foreskin with some parents fearing that it would be used for satanic rituals. During IDIs and short telephone surveys, a few parents noted that MC in general and EIMC specifically, had never been practised in their clan and it was therefore not supposed to start with their newborn sons.

Conclusions

This qualitative study enabled us to identify key barriers to EIMC uptake. If uptake of EIMC for HIV prevention is to be widely adopted, these barriers need to be specifically tackled by ensuring that adequate information is given, issues related to timing of circumcision are appropriately addressed as are concerns about the safety of the procedure.

References

1. Mavhu et al, PLoS One 2012 7:e32475
2. Plank et al, AIDS Behav 2010 14:1198-1202

Abstract orally presented at 17th ICASA conference, Cape Town, 2013

Parental reasons for non-adoption of early infant male circumcision for HIV prevention: qualitative findings from Harare, Zimbabwe

Fernando Shamiso¹; Mavhu, Webster^{1,2}; Ncube, Getrude³; Hatzold, Karin⁴; Samkange, Christopher⁵; Weiss, Helen⁶; Mugurungi, Owen³; Cowan, Frances^{1,2}; Ticklay, Ismail⁵; Gwinji, Gerald³

Background

Early infant male circumcision (EIMC) is easier, safer and cheaper than adult MC [1]. Further, EIMC may more effectively prevent HIV acquisition as the procedure is carried out before the individual becomes sexually active, negating the risk associated with acquisition or transmission of HIV during the healing period [2]. However, EIMC acceptability will affect uptake, roll-out and subsequent effectiveness in preventing HIV. It is therefore crucial to identify and address parental concerns that may act as barriers for EIMC for HIV prevention. Addressing the barriers will likely improve uptake and maximize the intervention's benefits.

Methods

This qualitative study was ancillary to a trial that assessed the feasibility, safety, acceptability and cost of rolling out EIMC using devices in Zimbabwe. Parents of babies born at a Harare clinic were invited to participate. Between January and May 2013, nine in-depth interviews (IDIs) and four focus group discussions (FGDs) were held with parents who had either adopted EIMC for HIV prevention (n=2 IDIs and 1 FGD with mothers; n=2 IDIs and 1 FGD with fathers) or had declined to circumcise their newborn sons (n=3 IDIs and 1 FGD with mothers; n=2 IDIs and 1 FGD with fathers). In addition, short telephone surveys were conducted with a random sample of parents who had scheduled to bring their sons for EIMC but defaulted (n=95). This was in order to assess reasons for not bringing the infant for EIMC; short statements were handwritten. IDIs and FGDs were audio recorded. All data were transcribed, translated into English and coded using NVivo 10. Codes were grouped into themes and sub-themes using thematic analysis.

Results

Parental reasons for non-adoption of EIMC include fear of harm including death, fear of excessive bleeding, pain and penile injury; the newborn's penis was deemed 'too' fragile for the procedure. There were also strong concerns around the discarded foreskin with some parents fearing that it would be used for harmful traditional or Satanic rituals. Myths about

MC in general (e.g. that it is a ploy to reduce the number of children that a man can procreate) also played a significant role. Some parents noted that MC in general and EIMC specifically, had never been practised in their clan and it was therefore not supposed to start with their newborn sons. A few parents stated that the baby should decide for himself when older. Several mothers who had delivered through caesarean section mentioned that they were still preoccupied with nursing their own wound and would therefore not be able to nurse an additional wound (from EIMC).

Conclusions and Recommendations

The qualitative study enabled us to identify key barriers to EIMC uptake. Findings were used to derive recommendations which will inform the design of a demand-generation intervention for EIMC. Although barriers to EIMC are to some degree context specific, some of those identified in this study may apply in other settings across the region; they need to be addressed if uptake of EIMC for HIV prevention is to be widely adopted.

References

1. Mavhu et al, PLoS One 2012 7:e32475
2. Plank et al, AIDS Behav 2010 14:1198-1202

Prizes won

- Second best monetary prize (US\$200) - young investigator category, 2013 ZIMA congress.
- Trophy and monetary prize (US\$200) - best social science paper - 2013 University of Zimbabwe College of Health Sciences Annual Medical Research Day

Acceptability of Early Infant Male Circumcision as an HIV Prevention Intervention in Zimbabwe: A Qualitative Perspective

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Abstract

Background: Early infant male circumcision (EIMC) is simpler, safer and more cost-effective than adult circumcision. In sub-Saharan Africa, there are concerns about acceptability of EIMC which could affect uptake. In 2009 a quantitative survey of 2,746 rural Zimbabweans (aged 18–44) indicated that 60% of women and 58% of men would be willing to have their newborn son circumcised. Willingness was associated with knowledge of HIV and male circumcision. This qualitative study was conducted to better understand this issue.

Methods: In 2010, 24 group discussions were held across Zimbabwe with participants from seven ethnic groups. Additionally, key informant interviews were held with private paediatricians who offer EIMC (n=2) plus one traditional leader. Discussions were audio-recorded, transcribed, translated into English (where necessary), coded using NVivo 8 and analysed using grounded theory principles.

Results: Knowledge of the procedure was poor. Despite this, acceptability of EIMC was high among parents from most ethnic groups. Discussions suggested that fathers would make the ultimate decision regarding EIMC although mothers and extended family can have (often covert) influence. Participants' concerns centred on: safety, motive behind free service provision plus handling and disposal of the discarded foreskin. Older men from the dominant traditionally circumcising population strongly opposed EIMC, arguing that it separates circumcision from adolescent initiation, as well as allowing women (mothers) to nurse the wound, considered taboo.

Conclusions: EIMC is likely to be an acceptable HIV prevention intervention for most populations in Zimbabwe, if barriers to uptake are appropriately addressed and fathers are specifically targeted by the programme.

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Introduction

Randomised trials suggest that male circumcision (MC) reduces a man's risk of acquiring HIV through heterosexual sex by 51–60% over an 18–24 months period [1,2,3]. Longer-term follow up suggests that this protective effect persists beyond 24 months [4,5]. WHO/UNAIDS has recommended rapid scale-up of MC in high HIV prevalence countries to maximise intervention effectiveness at a population level [6]. In order to ensure that this protective effect is sustained in the longer-term, WHO/UNAIDS and UNICEF also recommend early infant male circumcision (EIMC) be implemented in parallel [6,7].

Although EIMC's effects on HIV will take longer to realize, infant circumcision is likely to ultimately be more effective at preventing HIV acquisition than adult MC as the procedure is carried out long before the individual becomes sexually active,

negating the risk associated with sex during the healing period [8]. Additionally, the procedure is quicker and easier to perform than adult circumcision [9]. Moreover, various surgical devices can be used to perform EIMC more simply, and these can be used by health-care cadres other than doctors, making infant circumcision potentially more accessible than adult MC. Compared to adult MC, EIMC results in fewer surgical adverse events and post-operative complications [10,11,12]. Furthermore, EIMC is much cheaper, with recent studies estimating that it is likely to be a cost-saving HIV prevention intervention [13,14].

Since 2009, Zimbabwe has provided circumcision to adult and adolescent men through a collaborative effort between the government and technical agencies. The programme aims to reach 1.2 million 15–29 year-olds by 2015 [15]. Starting in mid 2012, a pilot roll-out of EIMC will be conducted. Since large-scale EIMC for HIV prevention is not yet widely available in Zimbabwe

or throughout Southern Africa, there are concerns around its acceptability [8]. Clearly, acceptability will have a bearing on uptake, roll-out and subsequent effectiveness in preventing HIV.

In a 2009 representative household survey of 2,746 rural Zimbabweans (aged 18–44), 60% of women and 58% of men reported willingness to have their son circumcised; willingness was associated with increased HIV and MC knowledge [16]. Here we report on a qualitative study designed to explore these issues in more depth. Findings will inform communication strategies to promote EIMC in Zimbabwe, to plan appropriately for service delivery and to provide guidance for EIMC policy development.

Methods

Design and participants

The qualitative study was conducted between June and October 2010 with rural and urban participants in five of Zimbabwe's ten provinces: Bulawayo, Harare, Mashonaland West, Masvingo and Matebeleland North. Twenty-four gender-specific focus group discussions (FGDs) were held with expectant mothers (n=6 groups), expectant fathers (n=5 groups), grandmothers/mothers-in-law (n=6 groups) and grandfathers/fathers-in-law (n=7 groups) from seven ethnicities.

Key informant interviews (KIIs) were held with private paediatricians who offer EIMC (n=2). An additional KII was held with a traditional leader from a traditionally circumcising ethnic group (Shangaan).

FGDs were conducted in either Shona or Ndebele, Zimbabwe's dominant indigenous languages, also spoken and understood by smaller ethnic groups. KIIs were conducted in English and Shona. Prior to group discussions, facilitators defined EIMC and presented basic information about the procedure, including the fact that it is quicker and safer than adult MC. Discussions then focused on issues such as perceptions of EIMC, willingness to have son undergo circumcision if it prevented HIV, barriers and motivating factors to EIMC and perceived acceptability of the intervention. Theme saturation - a situation where qualitative data collection reaches a point where no new issues emerge [17] - was reached after the 24 FGDs. Data collection was subsequently stopped. All discussions were audio-recorded.

Analysis

Audio-recorded data were transcribed and translated verbatim into English (where necessary). Names and other personal identifiers were removed from transcripts before they were entered into NVivo 8 (QSR International, Melbourne, Australia), a qualitative data storage and retrieval program. Two researchers (CM and RBT) coded each transcription separately. Discrepancies were resolved by discussion with the senior social scientist (WM), who also independently coded all transcripts. Codes were grouped into categories and emerging themes were then identified iteratively following the general principles of grounded theory [18]. Themes and sub-themes were illustrated with verbatim quotes.

Ethical considerations

Ethics approval was given by the Medical Research Council of Zimbabwe and the ethics board of University College London. Written informed consent was obtained on the day of the interview/discussion.

Results

A total of 240 participants took part in FGDs; an additional three key informants were interviewed. EIMC knowledge was

generally poor. Despite low knowledge, EIMC acceptability was high among participants from most ethnic groups. Older men from one traditionally circumcising population, who circumcise during adolescence, were strongly opposed to EIMC. Paediatricians reported a recent increase in parents requesting EIMC. Participants raised several concerns that have implications for circumcision roll-out. We present these themes in more depth below.

EIMC knowledge is poor

Male circumcision knowledge in general and EIMC knowledge, in particular, is poor among the general population and especially among traditionally non-circumcising groups. Several participants, particularly (and understandably) females, did not know what the procedure involves save to say, *'It is the removal of the skin on the penis'* (expectant mother, fgd4). When probed, they did not know how much skin is removed as well as precisely where it is removed from. Additionally, participants from traditionally non-circumcising populations were unaware of MC's benefits. *'We hear that it [MC] is done among the Shangaan and other people of foreign origin such as the Chewa [from Malawi] but we don't know why they do it'* (grandfather, fgd7). The same participants maintained that attempts to learn more about traditional MC have been futile since the procedure is highly secretive.

When asked to give their opinions on timing of EIMC, participants generally felt that it should be done three to six months after birth. *'It [MC] should be done when they [babies] are about six months old. You can't do it earlier as the organ [penis] will still be too tender'* (expectant father, fgd1). Participants generally felt that fragility of the infant penis in the immediate post-partum period would result in unacceptable risk of surgical error. *'One can easily cut off the head [penile] as well'* (father-in-law, fgd19). Private paediatricians reported parents requesting infant circumcision often when it is 'too late'. *'Mothers are bringing 12 month-old babies for circumcision (HCW, KII1)*. Another paediatrician described challenges around circumcising toddlers. *'As babies grow bigger they become more difficult to sedate because I do it under simple sedation...I know a lot of people want to do it under spinal anaesthesia but that is unduly traumatic to both the family and the baby'* (HCW, KII2). However, during FGDs, the feeling that it is less-risky to circumcise toddlers, as opposed to infants, was quite pervasive.

Acceptability of EIMC is high

Despite low levels of infant MC knowledge, discussions suggested high willingness to have son circumcised in most ethnic groups – providing MC was an effective HIV prevention method. *'Even now as I speak, if I hear that they are now circumcising children at our hospital, I will quickly take my grandchild along. I am currently faced with the burden of looking after AIDS orphans'* (grandmother, fgd9). Several participants felt that if circumcision protects one from HIV, infant and adolescent circumcision should be compulsorily offered as part of national HIV prevention efforts. *'The government should "force" parents to circumcise their sons in the same way it "forces" them to immunise children against measles'* (grandfather, fgd20). Overall, participants felt that the impact of HIV on the younger generation is enormous, and were excited to hear that MC is partially protective.

Paediatricians reported a recent increase in the number of infant circumcisions being conducted privately as well as the number of Zimbabwean parents requesting EIMC, something previously uncommon. *'It used to be almost entirely Muslim and Jewish parents [requesting infant MC] and then quite a number of North Africans married to Shona women but we are now getting quite a number of Zimbabweans. So the picture is definitely changing...and people often ask me about male circumcision and HIV'* (HCW, KII2). Discussions with

older men who were collecting their antiretrovirals at one rural hospital corroborated quantitative findings – that HIV positive men are particularly keen to have their sons circumcised; *‘I would not want my son to also go through what I am going through now. Had circumcision come earlier, I would probably be [HIV] negative’* (father-in-law, fgd7).

Father has ultimate decision

Study findings highlighted importance of the father in the decision-making process. *‘The man must make that decision because he is the one who knows whether or not that is practised in his clan; a woman cannot know anything about a clan to which she doesn’t belong’* (father-in-law, fgd18). A female participant concurred, *‘As the mother, I cannot decide whether or not the child should be circumcised. I will need to “sit down” [discuss] with the father and we will have to go by his decision’* (expectant mother, fgd3). However, subsequent probing suggested that mothers-in-law/grandmothers are likely to have considerable (often covert) influence. A young woman described steps she would take if her husband refused to have their son circumcised. *‘If he [father] refuses, I will talk to his mother and she will then ask his uncles to talk to him’* (expectant mother, fgd14). EIMC decision-making is therefore likely to involve relations other than the child’s parents.

Traditionally circumcising tribes had mixed feelings

Discussions with traditionally circumcising tribes in Zimbabwe including the Xhosa, Chewa, Venda and Remba suggested that these groups are not opposed to EIMC. However, they felt that they would prefer the procedure to be performed by someone who was themselves circumcised and of the same tribe. Some Muslim participants (mostly the Chewa of Malawian origin) preferred it to be done by someone of the same religion. *‘For us to be touched [circumcised] by anyone [non-Muslim]...the truth is we don’t want but we will be prepared to take our children to Indian [Muslim] doctors’* (grandfather, fgd20).

However, older men from the dominant traditionally circumcising population in Zimbabwe, the Shangaan, were strongly opposed to EIMC for two reasons. Firstly, they mentioned that circumcision is just one part of a comprehensive ‘rites of passage’ ritual and should therefore not be undertaken separately. *‘We don’t just circumcise. There are “lectures” that we teach those that undergo circumcision. How will we be able to teach infants?’* (grandfather, fgd6). Secondly, they noted that if infants were circumcised, their mothers would need to be involved in the process as they would nurse the wound. *‘Infants would need to be nursed by their mothers [after circumcision]. We don’t want mothers to know what we do’* (traditional leader, KI3). Among the Shangaan, allowing women to see (and nurse) the MC wound is considered taboo.

Participants’ concerns

Despite high levels of acceptability, community members raised several key questions discussed below.

Safety of the procedure. Community members questioned the safety of EIMC. As previously stated, safety-related concerns were based on the assumption that the newborn infant’s penis is too fragile to be circumcised, leading participants to feel that, to maximise safety, the procedure should only be performed by highly-trained doctors. *‘This thing should be done by doctors who really know how to do it and no one else’* (mother-in-law, fgd23). Participants were also concerned about the possibility of excessive bleeding and keloid scarring. *‘What if my child gets swollen like those people who have a large growth from ear piercing...?’* (expectant father, fgd11).

Handling and disposal of removed foreskin. Customarily, Zimbabweans are worried about disposal of body fluids/tissues as they fear that these may be used by ‘witches’ to cause subsequent

harm. For example, people burn shaved hair and nail clippings in case these end up in the wrong hands. With infants, disposal of the umbilical stump is a culturally-sensitive issue which involves mothers-in-law/grandmothers. Unilateral disposal of the umbilical stump by a young couple/mother can have serious implications. Community members were therefore anxious about the fate of the amputated foreskin: *‘What will happen to the piece [foreskin] that gets removed?’* (grandfather, fgd5). Another participant stated, *‘They (HCWs) should ensure that pieces that get removed are carefully disposed of so that they do not end up in the hands of those who could use them as ‘muti’ [traditional charm]’* (mother-in-law, fgd18).

Some participants felt that parents should be given the foreskins in order that they would be able to dispose of them themselves, drawing parallels with the common practice of obtaining the infant umbilical stump from health-care workers. *‘The foreskin [infant] is just the same as the umbilical cord [stump]; both should be given back to the child’s parents’* (father-in-law, fgd19). Mothers-in-law/grandmothers strongly articulated that should young couples decide to circumcise infants on their own, at a minimum elders need to be involved in foreskin disposal. *‘As is the case with the umbilical cord [stump], I should be the one who decides where and how to dispose the piece that gets removed’* (mother-in-law, fgd13). Overall, older male and female participants alike felt that the infant’s removed foreskin should be given to the child’s relations.

Motivation behind free service provision. A few participants questioned why MC in general and EIMC specifically, is being or will be provided free of charge. *‘Why is this thing done for free yet operation [caesarean section] on a pregnant woman is costly?’* (father-in-law, fgd17). These participants felt that caution should be exercised when accepting this service since it is donor-driven and the motive of the countries paying for it are unclear.

Discussion

Data from this qualitative study corroborate some of the quantitative findings from our population-based survey, namely that EIMC was seen as widely acceptable. However, given the very low levels of knowledge or experience of EIMC, it is not clear whether this hypothetical acceptability will translate into actual acceptability once EIMC roll-out begins. It is clear though that participants were very interested in the intervention as described, that is, one that could protect their sons against future HIV.

This qualitative study additionally identified new issues which have implications for EIMC implementation. Firstly, given the low levels of knowledge about the procedure, it will be important to provide information at a community level to enhance the procedure’s acceptability. These qualitative findings reinforce the need for multi-faceted awareness campaigns (e.g. community mobilisation, road shows) to ensure that everyone in the community is reached and not just those in contact with clinical services [16].

Education needs to include both women and men; it should also target multiple generations. While reinforcing the crucial role fathers play in EIMC decision-making shown elsewhere [19,20], our data suggest that fathers need to be provided with information *directly* not just through their wives. As caretakers of their family’s health, women often receive information from health-care centres during routine visits. Yet men are notoriously hard to reach via health services [21,22,23]. Other venues should therefore be considered. Workplaces and beer halls have been successfully used to increase knowledge of health-related matters [24,25].

Participants raised concerns around the safety of EIMC. Similar concerns have also been observed in other studies across the region [8,16,26,27]. Study participants generally thought a newborn’s

penis is 'too fragile' to undergo circumcision. Overall, the level of anxiety observed suggested that these concerns need to be addressed head-on to improve EIMC uptake. Awareness campaigns need to adequately communicate that it is not only possible but also preferable for circumcision to be done soon after birth. In practice, however, acceptability and uptake will depend on perceptions of procedure's safety [28]. Provision of EIMC will therefore need to be carefully supervised and monitored to ensure i) a good cosmetic result and ii) that adverse effects are prevented.

Participants strongly felt that safe EIMC can only be provided by highly-trained doctors. However, in practice, it is likely that EIMC will largely be performed by midwives/nurses since it is an uncomplicated procedure [8,9]. Communication materials/models should focus on the fact that nurses and midwives have the relevant skill/expertise to perform the procedure and that including them in EIMC delivery will make the procedure accessible through more remote health-care facilities, which are only served by nursing cadres.

Study findings support the now well-recognised notion that cultural beliefs are integral to successful MC provision [6,8,12,29]. In this study, several ethnic groups were concerned about handling and disposal of the removed foreskin. Secondly, some participants preferred circumcision to be performed by individuals of either the same tribe or religion. Thirdly, older Shangaan men strongly opposed EIMC as they felt that it undermines their tradition by separating circumcision from adolescent initiation, in addition to allowing women (mothers) to nurse the wound, considered taboo.

These findings have at least three implications for rolling-out circumcision, in general and EIMC, specifically. Firstly, implementers will need to recognise and understand cultural and religious beliefs attached to MC among certain groups [12]. It will be important to engage key traditional and religious leaders in efforts to mobilise a wider understanding and acceptance of circumcision for HIV prevention. Secondly, MC providers need to be drawn from diverse ethnic/religious circles. Lastly, EIMC communication materials/models should specifically address concerns around safety, timing and tissue disposal.

This study has several strengths. Firstly, this research was conducted with participants representing the majority of ethnic groups, and in half of Zimbabwe's ten provinces. Secondly, our sample size was large for a qualitative study. The sample was

purposely selected to ensure a wide range of views were heard from a diverse population. Thirdly, we managed to achieve theme saturation, an important component of qualitative research.

There were some limitations to this study. Firstly, although EIMC was defined prior to group discussions, some participants still discussed neonatal circumcision and had to be reminded that they needed to focus on infant circumcision. Secondly, we explored EIMC acceptability in the absence of widely-available services or any communication campaign that specifically provides information about infant circumcision. Hypothetical acceptability may be quite different from actual acceptance when EIMC is eventually rolled-out [8]. It will be crucial to assess EIMC acceptability within the context of actual roll-out. Lastly, while religious beliefs might be expected to affect attitudes/beliefs related to EIMC, neither our qualitative nor quantitative data found any indication of this. Nonetheless, it may be worth exploring this issue in more depth with religious groups that are specifically known to resist biomedical interventions and who make up a significant minority of the population in Zimbabwe and sub-Saharan Africa more widely.

In conclusion, this study found that EIMC is a potentially acceptable HIV prevention intervention in Zimbabwe and provided a framework for addressing likely barriers to uptake. Specifically, awareness campaigns that increase knowledge will be crucial to translating hypothetical acceptability into actual uptake. These data suggest that barriers are not insurmountable - which bodes well for achieving high EIMC targets in sub-Saharan Africa, in general and Zimbabwe, specifically.

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Author Contributions

Conceived and designed the experiments: WM KH SML JS BRT CM LFL GH FMC. Performed the experiments: BRT CM WM. Analyzed the data: BRT CM WM. Contributed reagents/materials/analysis tools: WM KH SML JS BRT CM LFL GH FMC. Wrote the paper: WM KH SML JS BRT CM LFL GH FMC.

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Factors Associated with Parental Non-Adoption of Infant Male Circumcision for HIV Prevention in Sub-Saharan Africa: A Systematic Review and Thematic Synthesis

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Abstract Infant male circumcision (IMC) may be more effective at preventing HIV than adult male circumcision as the procedure is carried out before the individual becomes sexually active. Successful scale-up will depend on identifying and overcoming parental concerns that may act as barriers for IMC. We conducted a systematic review to identify qualitative studies reporting on parental reasons for non-adoption of IMC for HIV prevention in sub-Saharan Africa. Thematic synthesis was subsequently conducted. Five descriptive themes were identified; these were later condensed into two main analytical themes: “poor knowledge” and “social constructs”. While barriers and motivators are to some degree context specific, this review suggests that there are common themes that need to be addressed across the region if uptake of IMC for HIV prevention is to be widely adopted. Study findings are therefore likely to have broad implications for IMC roll out.

Resumen Circuncisión infantil (IMC) puede ser más eficaz en la prevención del VIH que MC adultos como el procedimiento se lleva a cabo antes de que el individuo

llega a ser sexualmente activo. Escalado exitosa dependerá de identificar y superar las preocupaciones parentales que pueden actuar como barreras para IMC. Se realizó una revisión sistemática para identificar estudios cualitativos informando sobre las razones de los padres para la no adopción de IMC para la prevención del VIH en África subsahariana. Posteriormente se realizó la síntesis temática. Se identificaron cinco temas descriptivos; Éstos fueron posteriormente condensadas en dos temas principales de análisis: “pobre conocimiento” y “construcciones sociales”. Mientras que las barreras y motivadores son poco grado de contexto específico, esta revisión sugiere que existen temas comunes que deben abordarse en toda la región si la absorción de IMC para la prevención del VIH va a ser ampliamente adoptado. Resultados del estudio por lo tanto, son propensos a tener amplias implicaciones para despliegue IMC.

Keywords Infant male circumcision · Barriers · Qualitative · Interventions · Sub-Saharan Africa

Introduction

By 2007 three randomized controlled trials (RCTs) conducted in sub-Saharan Africa had conclusively demonstrated efficacy of male circumcision (MC) in reducing the risk of HIV infection in heterosexual men by up to 60 % [1–3]. Longer-term follow up suggests that the protective effect of male circumcision persists [4, 5], and recent findings on population-level impact from South Africa confirm those from the RCTs [6]. Based on RCT results, the World Health Organization (WHO) has recommended rapid scale-up of voluntary medical male circumcision (VMMC) in 14 Eastern and Southern African countries

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with high HIV prevalence and low rates of male circumcision [7–9]. These countries are Botswana, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Rwanda, South Africa, Swaziland, Uganda, Tanzania, Zambia and Zimbabwe [7–9].

Modelling studies conducted between 2009 and 2011 estimated that circumcising 80 % of males aged 15–49 in the 14 African countries within 5 years and sustaining this coverage rate thereafter, could avert 3.4 million new HIV infections within 15 years, in addition to yielding savings of US\$16.5 billion in care and treatment costs [10, 11]. Thus, the 14 VMMC priority countries are striving to scale-up VMMC to a level that could impact the transmission of HIV [12]. In order to ensure that benefits of MC are sustained in the longer-term, WHO also recommends that infant MC (IMC) be implemented alongside adult VMMC [7]. Presuming high uptake, it will then be possible to phase out the “catch up” adult VMMC as infants circumcised now come of age. Pilot implementation of early infant male circumcision is already underway in some of the 14 VMMC priority countries including Botswana, Kenya, Lesotho, Swaziland, Zambia, and Zimbabwe [13–18].

Although its effects on HIV will take longer to realize, infant MC is likely to ultimately be more effective at preventing HIV acquisition than adult MC since infant MC is conducted long before the individual becomes sexually active, thereby negating the risk of sexual acquisition of HIV before male circumcision and the risk associated with sex before complete wound healing after the procedure [19]. Resumption of sex before the recommended post-circumcision abstinence period (6 weeks) is a major issue with adult men [1, 20, 21]. Since actual acceptability of IMC will have a bearing on the procedure’s uptake, roll-out and subsequent impact, it is crucial to identify and address parental concerns that may act as barriers for infant MC for HIV prevention. Identifying parental barriers and specifically working to address them will likely improve uptake and maximise the intervention’s benefits.

This study sought to collate qualitative data which explore parental reasons for non-adoption of infant MC for HIV prevention in sub-Saharan Africa. The main question that the study sought to answer is ‘For what reasons might parents choose not to adopt infant MC for HIV prevention in sub-Saharan Africa?’ Findings will be used to inform the development of a package of approaches for overcoming these parental barriers (that could subsequently be tested for impact). The synthesis is described in line with a recently-developed set of guidelines for reporting synthesis of qualitative studies—‘Enhancing transparency in reporting the synthesis of qualitative research (ENTREQ)’ [22]. ENTREQ consists of 21 items grouped into five main domains: introduction, methods and methodology, literature search and selection, appraisal, and synthesis of findings [22].

In addition to being comparatively new (albeit growing), the practice of synthesising qualitative studies is a subject of on-going debate [23, 24]. Some maintain that it is not valid to take qualitative findings from a specific context, time and group and generalise beyond that setting [25, 26]. However, a strong case has been made for qualitative synthesis to be valued as it brings together qualitative evidence from a range of settings for a wider audience, identifies research gaps and provides evidence for health-care and policy [22–24, 26–29]. The described synthesis was conducted in the hope that it would contribute to the design of interventions to tackle parental barriers that need to be addressed in order to facilitate infant male circumcision adoption in sub-Saharan Africa in general and Zimbabwe, specifically.

Methods

Inclusion Criteria

Studies were selected for review if they were published in peer-reviewed journals; reported qualitative data on barriers to infant MC for HIV prevention entirely or in combination with quantitative ones, and were conducted in sub-Saharan Africa. Studies were excluded if they reported only quantitative data, were conducted outside sub-Saharan Africa, and focused only on adult MC. Abstracts for conference proceedings were excluded because abstracts for qualitative studies seldom provide sufficiently detailed methods and results, making it difficult to judge their suitability for synthesis [24].

Search Strategy

To develop the search strategy, we first split the research question into four components: (a) male or infant circumcision, (b) HIV prevention, (c) acceptability, and (d) qualitative research. Synonyms for the four components were identified through reading relevant literature. Additional synonyms were identified through a review of pilot search results. The search was first conducted using Medline Medical Subject Headings (MeSH) terms and text searches. Thereafter, two searches were conducted in Embase and CINAHL Plus using key terms and text words (plus thesaurus) relevant to each database. In addition to allowing for adjacency for words in a phrase, word endings were truncated to ensure inclusiveness of text searches. The Boolean operator “OR” was used to identify all papers related to each component after which search returns of all four components were combined using the operator “AND”. The final search in the three databases was run and closed on 22 January 2013. Identified papers from each

Table 1 Criteria used to assess quality of studies*Items on reporting of study methods*

1. Paper reports findings from qualitative methodology
2. Clear statement on aims/objectives
3. Sampling strategy explained and appropriate
4. Data collection methods mentioned/described and appropriate
5. Mention of ethical considerations
6. Theoretical approach mentioned/described
7. Analysis adequately described
8. Analysis done by more than one person to minimise subjectivity

Items on reporting of study findings

9. Results can be linked back to study objectives
10. Sufficient data presented to support the results (including quotes)

Items on interpretation of study findings

11. Discussion and conclusions adequately supported by the data

of the databases were imported into an Endnote reference management software file (library). Duplicates were identified and removed.

Selection of Eligible Papers

Titles and abstracts were used to screen papers for relevance to the systematic review. If it was clear that a paper was ineligible based on the title and/or abstract review, it was dropped. Where the title and/or abstract were insufficient to make a determination, the full paper was downloaded and read. If the paper was deemed ineligible, it was excluded and reasons for exclusion were documented. Reference lists for all eligible papers were scrutinised for any additional relevant papers.

Quality Assessment

Assessing quality of qualitative research is not only challenging but also contentious [22, 23]. There is little consensus on how quality should be assessed as well as whether it can or should be assessed at all [23, 29]. We assessed selected studies using an adaptation of previously-derived quality criteria for assessing validity of qualitative research [26, 30]. Two experienced qualitative researchers (WM and ZM) first conducted this process independently and then jointly. The adapted criteria covered three main issues: *reporting* of study methods, *reporting* of study findings, and *interpretation* of study findings (Table 1).

Synthesis

Electronic copies of the 10 studies were directly imported into NVivo 10 (QSR International, Melbourne, Australia),

a qualitative data storage and retrieval program. The thematic synthesis of findings was done in three previously-validated and recommended stages: line-by-line coding of study findings, developing descriptive themes and generating analytical themes [23, 28]. *Stage one: line-by-line coding of study findings.* Two researchers independently conducted line-by-line coding of qualitative findings presented in the selected studies. During this stage of the synthesis, the two researchers also examined each other's codes to check consistency of interpretation and to see whether additional levels of coding were needed [23].

Stage two: developing descriptive themes. The two reviewers looked for similarities and differences between the codes in order to group them [23]. New codes were created to capture the meaning of groups of initial codes through an iterative, inductive process. This process resulted in 5 descriptive themes, 15 sub-themes and 8 sub-sub-themes. Due to the overlapping nature of the 3 stages of thematic synthesis, some codes were adopted as themes/sub-themes in their original form.

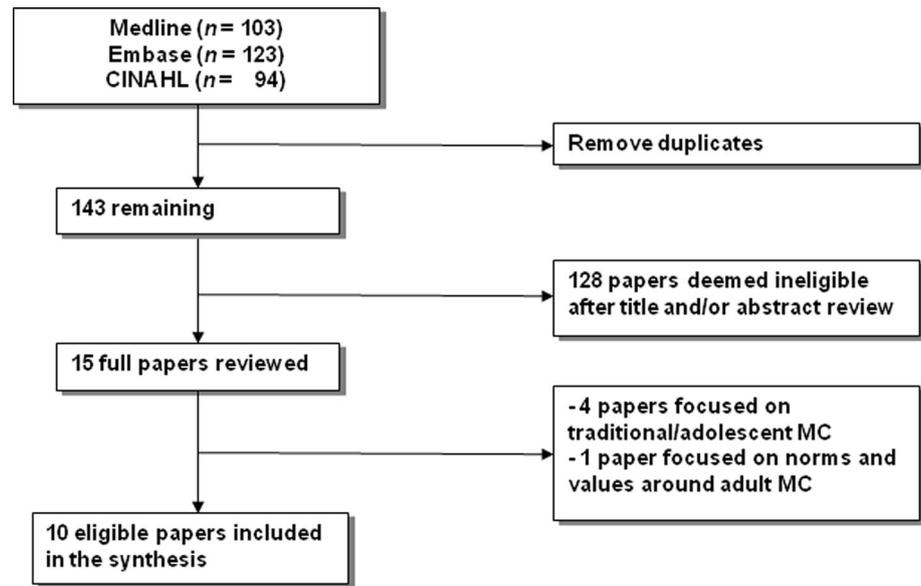
Stage three: generating analytical themes. Stage three involved condensing the descriptive themes into analytical ones [23]. Reviewers analysed the barriers to infant MC suggested by the descriptive themes, sub-themes, sub-sub-themes, condensed these, and then considered their implications for possible interventions. Each reviewer first did this independently and then together. This process resulted in two main analytical themes and several recommendations for possible interventions.

Results

Our search conducted to 22 January 2013 resulted in 320 hits, which included 177 duplicate articles. After removing duplicates, a further 128 were excluded based on the title and/or abstract review (see Fig. 1). Studies were excluded for at least one of the following reasons: [1] they reported only quantitative data, [2] they were conducted outside sub-Saharan Africa, and [3] they focused only on adult MC. The full article was read for the remaining 15 articles. Of these, five papers were excluded from the analysis because they failed to meet the inclusion criteria; four [31–34] because they focused on traditional adolescent MC and one [35] because it reported on norms and values around adult MC (see Fig. 1 for details of the selection process). Ten papers met the inclusion criteria and were assessed for quality and assigned a quality score ranging from poor to fair/good (see Table 2).

Characteristics of Included Studies

The 10 studies [36–45] included in the synthesis were conducted in 7 countries [Kenya, Malawi, South Africa

Fig. 1 Selection of eligible papers**Table 2** Characteristics of included studies

Date	Country	Authors (ref)	Time of study	Study population	Setting	Data collection methods	Quality rating
2002	Kenya	Bailey et al. [37]	1998	16–80 year-old men and women	Rural and urban	Focus groups and interviews	Good
2003	South Africa	Rain-Taljaard et al. [43]	1999–2000	13–59 year-old men and women	Peri-urban	Focus groups and interviews	Fair
2006	Malawi	Ngalande et al. [42]	2003	16–80 year-old men and women	Rural and urban	Focus groups	Good
2007	Zambia	Lukobo and Bailey [38]	2003	18–67 year-old men	Rural and urban	Focus groups	Fair
2011	Tanzania	Mwanga et al. [41]	2008–2009	40–59 year-old men and women	Rural and urban	Interviews	Good
2011	Uganda	Albert et al. [36]	2008	16–80 year-old men and women	Rural and urban	Focus groups	Fair
2012	Tanzania	Tarimo et al. [44]	2009	24 male and 10 female police officers	Urban	Interviews	Good
2012	South Africa	Milford et al. [40]	2008	16 females and 4 males	Rural and urban	Interviews	Good
2012	Zambia	Waters et al. [45]	2009–2010	18–74 year-old men and women	Urban	Focus groups	Good
2012	Zimbabwe	Mavhu et al. [39]	2010	16–80 year-old men and women	Rural and urban	Focus groups and interviews	Good

($\times 2$), Tanzania ($\times 2$), Uganda, Zambia ($\times 2$), and Zimbabwe]. The earliest paper [37] was published in 2002 and the most recent [39] in 2012. Two studies [39, 45] conducted between 2009 and 2010 specifically explored acceptability of infant MC. Seven of the 10 studies (70 %) were perceived to be of good quality and three (30 %) of fair quality (see Table 2). Overall, studies rated as fair either did not report how data analysis was done and/or did not include participants' verbatim quotes to substantiate findings. Two of the three papers rated as fair [36, 43] reported mixed

methods research. In the first case [36], qualitative research was ancillary to household and provider surveys. In the second [43], focus group discussions (FGDs) and in-depth interviews were conducted alongside two cross-sectional studies.

Results of Synthesis: Line-By-Line Coding

Line-by-line coding resulted in 24 codes (Table 3). The codes are listed in order of the two researchers' own

Table 3 Codes identified from the studies

Code	Frequency
1. Fear of death	5
2. Fear of negative outcome	4
3. Fear of HIV infection	1
4. Fear of excessive bleeding	6
5. Fear of excessive pain	5
6. Fear of infection	2
7. Don't understand rationale	1
8. Scepticism about preventative benefits	1
9. Lack of confidence in procedure safety	2
10. Lack of confidence in medical personnel	2
11. Not understanding advantages of infant MC over later in childhood	2
12. Concerns about cost	5
13. Suspicion about/of program	1
14. Unfamiliarity with procedure, father uncircumcised	2
15. Fear of loss of penile sensitivity	2
16. Fear of loss of sexual desire	2
17. Non-MC a major distinguishing feature	1
18. Preserving tradition	4
19. Fear of rejection/derision/ostracism	3
20. Associated religious connotations	2
21. Fear of witchcraft	2
22. Fear of excessive sexual desire (womanizing)	1
23. Fear of risky sexual activity/behaviour later	2
24. Respect for child autonomy	2

perceptions of their relative weight with regards to influencing non-adoption of infant MC (with 1 being perceived as most significant) and not by the number of times each code appears in the studies. Although some of the codes are closely related, they have certain nuances within them and as such, we felt it was justifiable to treat them separately. However, the codes were subsequently grouped into themes, sub-themes and sub sub-themes as illustrated in Table 4.

Results of Synthesis: Descriptive Themes

In summary, barriers to non-adoption of infant male circumcision for HIV prevention in sub-Saharan Africa include a lack of information. An additional recurrent theme is fear of harm—both immediate (infant death, HIV infection, excessive bleeding and pain, infection) and future (decreased penile sensitivity and sexual desire, increased sexual desire, risk compensation, ostracism, derision and rejection). Cultural and traditional beliefs also seem to be significant barriers. Concerns about cost emerged as a significant barrier especially within the context of competing interests. Surprisingly, the need to

respect a child's autonomy featured (albeit in only one setting) as a barrier despite the fact that in most African settings, children seldom feel able to make independent decisions (Table 4). All of these factors act as barriers to adoption of infant MC for HIV prevention by the male infant's parents.

Results of Synthesis: Analytical Themes

Poor knowledge of infant MC and its potential benefits is a barrier to intervention uptake. Parents neither understand the rationale behind infant MC nor what the procedure involves. Some doubt (infant) MC's effectiveness in protecting males against HIV. Social constructs—taken here to mean ideas created and sustained by an individual or group—are a source of barriers to infant MC. These include societal myths and misconceptions. Some of the myths act as barriers to MC for HIV prevention because they are associated with threats to a specific social construct—masculinity (e.g. MC decreases sexual desire or pleasure) [46].

Discussion

This paper presents a thematic analysis of systematically identified qualitative studies from sub-Saharan Africa that reported barriers to infant male circumcision for HIV prevention. Five major themes were identified: lack of information, fear of harm, cultural/traditional beliefs, concerns about cost and need to respect a child's autonomy.

Several studies identified poor knowledge as a barrier to infant MC for HIV prevention, suggesting that campaigns designed to create demand for the intervention need to provide parents with accurate information about the efficacy of MC in preventing HIV (as well as its other health benefits). Misconceptions about how the procedure is conducted and the risks associated with it were commonly cited; information, education, and communication (IEC) materials will need to provide understandable and accurate information to explain the procedure and that when conducted by appropriately trained and experienced personnel, IMC is safe, does not require sutures and is usually characterised by minimal bleeding [15, 18]. Additionally, IEC materials need to also explain issues around pain management and infection control (and that if an infection occurs, it usually involves just the skin and can be easily treated) [15, 18]. Concerns around the possibility that infant MC may itself be a source of HIV infection need to be specifically addressed. IEC materials should also highlight the several advantages of circumcising males during infancy as opposed to later in life.

Table 4 Themes—parental reasons for not adopting infant male circumcision for HIV prevention

Theme	
<i>Lack of information</i>	
Rationale	“Fathers themselves have not gone for circumcision and so they do not believe it is important for their children” ([45], p 17)
Preventative benefits	“I am still not convinced that circumcision reduces the spread of HIV” ([45], p17)
Advantages (over MC later in life)	“It [MC] should be done when they [babies] are about six months old” ([39], p 2)
<i>Fear of harm</i>	
Immediate harm	
Death	“They [providers] might kill my child, like the case in Kafue of the child that died after an MC operation” ([45], p 17)
HIV infection	“The most commonly expressed reasons not to circumcise were fear of infection, including HIV...” ([42], p 381)
Excessive bleeding	“The danger of excessive bleeding is of particular concern for mothers considering circumcision for young children...Some said that infants and small boys <i>simply do not have sufficient blood to spare</i> ” (our emphasis) ([37], p 31)
Excessive pain	“Many were against circumcising babies because of excessive pain during and after the procedure” ([38], p 474)
Infection	“Although you may be told the instruments were boiled [sterilized], you may find out that they are not clean... Perhaps, they [instruments] have been there for a long time and bacteria are there; then without knowing all that, a person is circumcised using those instruments” ([44], p 7)
Future harm	
Physical	
Decreased penile sensitivity	“Additional barriers to male circumcision mentioned by a few participants included some loss of penile sensitivity...” ([37], p 31)
Decreased sexual desire	“Additional barriers to male circumcision mentioned by a few participants included some loss of ... and sexual desire...” ([37], p 31)
Behavioural	
Increased sexual desire	“Additional barriers to male circumcision mentioned by a few participants included ...excessive sexual desire and a tendency to womanize” ([37], p 31)
Risk compensation	“...FGDs also raised a number of concerns and challenges to MC promotion. These included concerns ...that it would encourage their children to engage in risky sexual activity” ([36], p 1582)

Table 4 continued

Theme	
Social	
Ostracism	“Some of these individuals were concerned that boys who were circumcised might be ostracized from their church communities” ([42], p 382)
Derision	“Many said that Luo boys and men would want to avoid being called <i>rayuom</i> , a derisive DhoLuo term for the circumcised and for those born with reduced foreskin” ([37], p 30)
Rejection	“A few suggested that Luo women might reject a Luo man as potential sex or marriage partner if he is circumcised” ([37], p 30)
Religious connotations	“Among those from non circumcising tribes, several participants described circumcision as cultural practice associated with Muslims...” ([45], p 16)
<i>Culture/traditional beliefs</i>	
Maintaining tradition	““Infants would need to be nursed by their mothers [after circumcision) We don’t want mothers to know what we do”” ([39], p 3)
Non-MC a distinguishing feature	“Until recently, extraction of the lower middle six teeth was an identifying feature for Luo as they passed into adulthood, but now that tooth extraction has been largely abandoned, participants see lack of male circumcision as the most significant component of Luo identity aside from language. A few were concerned that, if Luo started circumcising, little would be left to distinguish them from others” ([37], p 30)
Witchcraft	“I wanted to have my son circumcised, but my husband refused. He said it was a practice connected to witchcraft” ([45], p 17)
Concerns about cost	“Cost of the procedure was expressed by many groups as a significant barrier to circumcision for themselves or their sons” ([37], p 31)
Respect for child autonomy	“In the past elders were doing tattoos (Ndembo) on our bodies, and now I understand that these were not good, which is why I wouldn’t want to decide on circumcision for someone else. We may think we are doing the right thing when in fact our children may disagree when they grow up” ([45], p 17)

Concerns around both the monetary and opportunity cost of the procedure were common. Infant MC programmes will need to ensure that the cost of the procedure

is minimised, for example, by providing the procedure and follow up without charge to offset at least some of the primary and opportunity costs. This approach has been adopted by some adult VMMC priority countries (Kenya, Malawi, Rwanda, Swaziland, Tanzania and Zimbabwe) [46]. However, social marketing theory suggests that people generally do not value something that they get for free [47]. Moreover, in one of the studies included in this review, some participants questioned the motive of providing free male circumcision, particularly when funded by foreign donors [39]. In a separate study, participants recommended low priced male circumcision to boost the community's satisfaction with the quality of the procedure [42, 48]. Asking infant MC clients to pay a nominal procedure fee might help to increase the value people attach to IMC.

Social constructs, a potential barrier to infant MC, need to be tackled. In addition to tackling masculinity, interventions to promote infant MC for HIV prevention need to dispel MC-related myths and misconceptions. Since fear of various forms of social maltreatment, including ostracism by church members were reported, initiatives to provide information about infant MC for HIV prevention could be incorporated into faith-based HIV prevention interventions; these have been successfully used in sub-Saharan Africa [49, 50]. Non-circumcising communities view MC in general and infant MC, specifically, as a form of conversion to the 'other' and a loss of cultural identity. Where circumcision is seen as a "backward" practice, it is likely that communities will resist the intervention. Conversely, traditionally circumcising communities that perceive infant MC, which allows women (mothers) to see and nurse the circumcision wound as taboo [39], regard the intervention as a serious cultural invasion.

If targets for infant circumcision are to be reached, demand creation initiatives need to change community norms related to infant MC. Beliefs about circumcision are deeply-entrenched and it is likely that demand creation will be a gradual and ongoing process rather than a once-off event. Specifically, demand creation for infant MC for HIV prevention needs to address the wider community and not just mothers and fathers of infant boys since circumcision may have far-reaching social implications for the child in later life. In addition to targeting multiple generations, campaigns should engage key traditional and religious leaders in efforts to mobilise a wider understanding and acceptance of circumcision for HIV prevention [39].

A major strength of this study is that it is the first systematically conducted thematic synthesis to explore parental reasons for non-adoption of infant MC for HIV prevention in sub-Saharan Africa. Given that IMC has been identified as a key HIV prevention intervention for sustaining the prevention gains anticipated through adult

voluntary medical MC across sub-Saharan Africa, study findings and resultant recommendations are likely to have broad implications for IMC roll out across the region. Additionally, this study fulfils most of the steps for reporting synthesis of qualitative research as recommended by the ENTREQ statement [22], a valuable and practical resource and reference tool.

Assessing quality of selected studies was difficult. Selected studies were assessed using an adaptation of previously derived (and accepted) quality criteria for assessing validity of qualitative research. The process was challenging and time-consuming; largely because study methods were poorly described or unsystematic. Reviewers then had to try and piece together, from inadequate descriptions, what methods and procedures were used and why [26]. Indeed, it has been suggested that one of the possible by-products of undertaking more qualitative research syntheses may be an improvement in the quality of the reporting of qualitative research [26].

A potential limitation of the study is that we used our own perceptions, as opposed to frequency counts, to determine the weight of the 24 issues (codes) that were identified through line-by-line coding. To some extent, a code's significance is determined by the number of times it features in a research paper. However, reliance on frequency counts to determine the significance of qualitative findings has inherent shortcomings; the frequency with which an issue is mentioned by research participants may not necessarily be a reflection of its significance but rather, the ease with which it can be mentioned. Also, it could be a result of participants' conscious efforts to downplay certain issues whilst overstating others. Moreover, presentation of qualitative research is often influenced by the approach taken by authors in conducting and reporting that work; for example authors may sample participants to gain information about specific beliefs or practices or choose to put more emphasis on interesting, novel or unusual findings as opposed to commonly-occurring or previously recognised ones. Additionally, determining the relative weight of the issues identified would always be a subjective exercise and potentially subject to bias (although as stated earlier these biases can be minimised by using at least two experienced researchers to independently code/weight data).

In conclusion, using thematic synthesis, this study identified five key barriers to infant MC uptake (lack of information, fear of harm, cultural/traditional beliefs, concerns about cost and need to respect a child's autonomy) which were later condensed into just two (poor knowledge and social constructs). Barriers such as knowledge will be relatively easy to overcome but more culturally entrenched beliefs will take time and a layered, community-level approach to change.

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Conflict of interest No authors have any competing interests.

Ethical statement An ethics statement was not required for this work.

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