ACCESS TO ANTENATAL CARE IN EAST AFRICA: AN EXAMINATION OF FACTORS INFLUENCING ANTENATAL CARE ATTENDANCE IN KANUNGU DISTRICT, UGANDA

By

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A Thesis
Presented to

The University of Guelph

In partial fulfilment of requirements for the degree of

Master of Science in

Population Medicine

Guelph, Ontario, Canada

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ABSTRACT

ACCESS TO ANTENATAL CARE IN EAST AFRICA: AN EXAMINATION OF FACTORS INFLUENCING ATTENDANCE IN KANUNGU DISTRICT, UGANDA

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Advisor: Dr. Sherilee L. Harper

Despite its potential to reduce maternal mortality globally, antenatal care (ANC) remains difficult to access for many women. This thesis examined ANC attendance in East Africa. First, a scoping review explored ANC research in East Africa. A total of 211 articles were analysed. Interrelated physical and social factors influenced seeking, reaching, and receiving ANC. Second, a mixed-methods study examined ANC attendance among Indigenous and non-Indigenous women in Uganda. Data included local hospital records (n=2,299 records), and interviews and focus group discussions with Indigenous (n=60) and non-Indigenous (n=20) women, and healthcare workers (n=10). Only 7.4% of patients attended the recommended minimum four visits, and distance to the hospital significantly lowered the odds of attending all four visits. Qualitative results indicated that long distances to health centres, high costs of ANC, lack of power in household decision-making, and poor interactions with healthcare providers influenced ANC attendance for both Indigenous and non-Indigenous women.
ACKNOWLEDGEMENTS

This thesis was inspired by the many individuals who generously shared their experiences, knowledge, and time with me: the researchers and participants involved in this study, my supervisor and committee members, my Harper lab mates, professors and students from the Population Medicine Department, and my friends and family. You have provided me with purpose and perspective, both for this thesis and for my future endeavours – thank you!

Thank you, Sheri, for the wonderful opportunity to learn from you – your remarkable dedication, drive, and commitment to each of your students inspires us all. I am confident that the tools and skills you’ve helped me develop will serve me well beyond this thesis.

I am thankful for the opportunity to work with my advisory committee, Dr. Lea Berrang-Ford, Dr. Manisha Kulkarni, and Kate Patterson, as part of a larger team of talented researchers and collaborators, and for the opportunity to travel to Uganda and various conferences and courses in North America with their support. Kate Patterson, thank you for the expertise, guidance, and encouragement you have provided me, both with this thesis and with many other aspects of my life. I love that our first meeting at a bus stop in Montreal has evolved into a friendship I value enormously.

Sarah MacVicar, thank you for being a great travel companion and friend. Your flawless mispronunciations, commitment to morning runs in Buhoma, and unwavering fascination (obsession?) with pigs were main highlights of this experience for me. Kate Bishop-Williams, my sincere thank you for wholeheartedly welcoming me to Guelph, for guiding me to develop
research skills, for providing edits and data analysis help, and especially, for being a kind and supportive friend.

To each of the wonderful members of the Harper lab, thank you for tirelessly sharing resources, words of encouragement, and laughter with me as we navigated through our various research projects together. For me, our lab served not only as a comfortable space to discuss, reflect, and learn together, but also as the starting point of cherished friendships. Cheers to my fellow officemates, Carl, Steph, Jacquie, and Anna, for keeping me company, at the Bowling Alley, the Grad Lounge, and the many other memorable spots in Guelph.

I am grateful for friends who have kept me motivated. Thank you especially to Natalie, Mara, Kirsten, Andrea, and Léa-Rose for all you have done for me these past years – encouraging me, welcoming me in your homes, joining me on hikes, climbs, music festivals, sports teams, and sunset-viewings, and being there for me always.

I feel very fortunate to have such a large and geographically expansive, yet tight-knit and supportive family. Thank you to my parents, siblings, aunts, uncles, cousins, and grandparents for cheering me on. To Al, Ev, and Audrey, thank you for repeatedly listening, motivating, and inspiring me to achieve this step. Thank you to our grandparents for supporting the academic pursuits from which we have learned so much. Special thanks to Auntie Astrid for working through my writing with me and breaks by the lake, and to Buddy Sue for providing me with a second home and delicious baked goods.

Mum and Dad, thank you for your trust and enthusiasm in my every step. I am deeply grateful to you for giving me the opportunity to transition between cities and schools and jobs in pursuit of education, all while living a balanced, healthy, and family-filled life.
STATEMENT OF WORK

The scoping review protocol (i.e. research question, search string, screening questions, and data extraction questions) was developed in collaboration with my advisory committee (Sherilee Harper, Lea Berrang-Ford, Manisha Kulkarni, and Kaitlin Patterson). I conducted a database search and imported citations into Mendeley© reference manager and DistillerSR© systematic review software. In the primary screening level, I reviewed titles and abstracts of all articles with Kaitlin Patterson. I downloaded all articles for the secondary screening level, which I reviewed with Kaitlin Patterson. I conducted data extraction with Chloe Zivot. I cleaned the data using Microsoft® Excel and conducted analysis using STATA® 13.1 with the assistance of Dr. Sherilee Harper and Carlee J. Wright. I wrote the manuscript under the supervision of Dr. Sherilee Harper and Kaitlin Patterson. The draft was edited by my advisory committee (Sherilee Harper, Lea Berrang-Ford, Manisha Kulkarni, and Kaitlin Patterson).

The second study was developed from a larger, collaborative research project, the Indigenous Health Adaptation to Climate Change (IHACC) project. The project was based on pre-existing collaborations with academic researchers, healthcare workers, government stakeholders, local NGOs, and community members. The initial research question and study design was identified by Bwindi Community Hospital (BCH) and were further developed in collaboration with my advisory committee, Sherilee Harper, Lea Berrang-Ford, Manisha Kulkarni, and Kaitlin Patterson. Investigators from the IHACC project, Shuaib Lwasa and Didacus Bambaiha Namanya, provided input on the study’s main goals. With support and input from my advisory committee and researcher Sarah MacVicar, I designed focus group and
interview guides. I travelled to Uganda with Kate Bishop-Williams to collect initial quantitative data. I returned to Uganda to collect qualitative and quantitative data with Sarah MacVicar. Dr. Birungi Mutahunga from BCH provided input on the quantitative data collection plan. Sarah and I met with Dr. Birungi Mutahunga from BCH to receive input and approval on the quantitative portion of our study design. Sarah and I conducted focus group discussions (FGDs) and key informant interviews (KIs) with Batwa and Bakiga women. Sabastian Twesigomwe communicated with community leaders to arrange interviews and focus group discussions. Sabastian Twesigomwe and Grace Asaasira translated questions for FGDs and KIs. Sarah, Grace, and I listened to transcripts and Grace confirmed the translations. I transcribed all KI and FGDs, imported them in NVivo© and conducted thematic analysis with the assistance of Dr. Sherilee Harper and Kaitlin Patterson. Sarah MacVicar and I entered data from BCH health records and presented preliminary results to healthcare staff at BCH. I cleaned and conducted analysis of the quantitative data in STATA® with the assistance of Dr. Sherilee Harper and Kaitlin Patterson. I shared the research results at three conferences. Kate Bishop Williams facilitated the sharing and validation of preliminary results with Ugandan partners and community members. Sarah Gibbons and Rachael Vriezen provided editing contributions.

Given the collaborative nature of this work, the manuscripts comprising Chapters Two and Three of this thesis will be submitted for publication with co-authors.

**Chapter Two: Antenatal care research in East Africa since the Millennium Development Goals: A scoping review**

Authors, in order of listing: Vivienne Steele, Kaitlin Patterson, Manisha Kulkarni, Lea Berrang-Ford, Shuaib Lwasa, Didacus B. Namanya, IHACC Research Team, Sherilee L. Harper
Chapter Three: Factors influencing antenatal care attendance for Indigenous and non-Indigenous women in Bwindi, Southwestern Uganda: a mixed methods approach

Authors, in order of listing: Vivienne Steele, Kaitlin Patterson, Manisha Kulkarni, Lea Berrang-Ford, Sebastian Twesigomwe, Sarah MacVicar, Shuaib Lwasa, Didacus B. Namanya, BCH, IHACC Research Team, Sherilee L. Harper
POSITIONALITY STATEMENT

I am fortunate to have the opportunity to present my interpretation of the generously shared personal experiences of the participating Ugandan women. I have a responsibility to present the women’s stories as accurately as possible. To do so, I have remained cognizant of my position as a researcher and its impact on the interpretation of participants’ stories.

As a qualitative researcher, I have a responsibility to consider and acknowledge the impact of my personal biases, beliefs, and experiences and how it shapes each step of the research process (Berger, 2015). My position as a white researcher, from a high-income country, privileged to access post-secondary education, and to pursue this thesis research, is not unlike many who have conducted a study as foreigners in low- and middle-income countries. Unfortunately, many previous researchers have conducted research in unethical, inconsiderate ways, leaving a negative research legacy in which the needs of local participating communities were not prioritized. I was fortunate to be part of a larger, collaborative research project which employs a community-based, participatory approach and has built and maintained positive relationships with local research partners. I was cognizant of my responsibility to uphold the values of this project, by reflecting on my positionality in the context of this research and by using strategies that maintain trust with research partners and participants alike.

I used various qualitative validity strategies, including member checking, peer debriefing, memo-ing and collaboration (Creswell & Miller, 2000) to minimize negative effects of my positionality. The research questions were identified by local partners. A fellow researcher and I
regularly discussed our preliminary interpretation of results with a local research partner, soliciting and incorporating feedback. To establish sincere relationships with participants, we employed strategies like sharing personal pictures and reminding participants they could leave as needed. During the thematic analysis process, I listened to each interview several times over, reflecting and recording my thoughts, sharing and discussing my thoughts with others, and presenting these thoughts in various formats. The preliminary results were shared with and validated by several Ugandan partners and community members.

Throughout this research process – gathering, examining, reflecting upon, and finally, presenting the stories of participants – I have reflected on the impact of my personal position of privilege. To the Batwa and Bakiga women who participated in discussions, I was an outsider from a privileged background who would stay briefly without guarantee of returning. Although unable to fully understand how community members viewed and perceived my presence in the community, I was aware of my position and was cautious of my actions, behaviours, and mannerisms. Prior to my MSc, I lived and worked with Beninese women in a rural, West African community. While there, I interacted with foreign researchers and gained perspective on how the community perceives their presence in the community. I kept my insights from this experience in mind while I undertook this research process. I hope that my interpretation of these stories will accurately reflect the experiences and needs of the women who generously shared them with me.

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CHAPTER ONE
INTRODUCTION, RATIONALE, AND THESIS STUDY OBJECTIVES

Introduction

The number of maternal deaths occurring globally is high; worldwide, approximately 830 women die daily from pregnancy-related complications, the majority of which are preventable (Every Woman Every Child, 2015; Kassebaum et al., 2016; World Health Organization, 2017). Nearly all these maternal deaths (99%) occur in low and middle income countries (LMICs) (World Health Organization, 2016), and more than half occur in sub-Saharan African countries.

High maternal death rates in LMICs are recognized as a global health issue with important policy, program, and practice implications (Say et al., 2014; World Health Organization, 2005). The Millennium Development Goals (MDGs) were established under the United Nations Millennium Declaration, following the Millennium Summit of Nations in 2000 (Figure 1.1) (Fehling et al., 2013). Presented by the United Nations, the MDGs were a list of global development goals centered on addressing socio-economic and health-related inequities (including poverty, gender equality, and maternal health) to be achieved by the global community by 2015 (United Nations, 2000; United Nations, 2015). Among several health-focused goals, MDG 5 sought to achieve universal access to crucial reproductive health services (i.e. family planning, contraceptive use, antenatal care, and skilled birth attendant assistance in delivery) by 2015 (World Health Organization, 2015). Increasing health personnel training, improving resource allocation (i.e. medical supplies), removing user charges for basic health services, and supporting health education programs were among several strategies to achieve universal access (UNICEF, 2016). The MDGs also aimed to reduce the maternal mortality ratio
(the number of deaths of a woman during pregnancy or within 42 days of termination, per 100,000 births) by three quarters between 1990 and 2015 (World Health Organization, 2015). Since the launch of the MDGs, progress towards reducing global maternal mortality has been made: the global maternal mortality ratio has been reduced by nearly half and the number of births attended by a skilled personnel worldwide has increased by 15% (Lane & Garrod, 2016; UNICEF, 2016). Many countries have made substantial progress towards the MDGs, but globally the rate of declines in maternal mortality were less than half of the MDG target and further progress is needed to improve maternal health globally (Fehling et al., 2013).

Building from the successes, lessons learned, and momentum gained from the MDGs, the Sustainable Development Goals (SDGs) were established in 2015 (Figure 1.2). Guided by the underlying concept of ‘leave no one behind,’ the SDGs focus on vulnerable populations and aim to address inequalities by empowering the poorest subgroups (Razum et al., 2018; United Nations, 2015). SDG 3 pledged to substantially reduce the global maternal mortality ratio by 2030 and effectively end preventable maternal mortality (Alkema et al., 2016). Considered more ambitious and regionally-targeted than the MDGs, the SDGs aim to double the reductions in maternal mortality achieved during the MDG period (World Health Organization, 2015). SDGs targets are especially ambitious for countries with the highest maternal mortality, many of whom fell short of the MDG goals (Alkema et al., 2016). The SDGs include increasing the availability of high-quality, timely, and reliable data relevant to each country (i.e. national demographic information) to enable and inform context-specific development and improvements (United Nations, 2015).
Role of Antenatal Care in Maternal Health

Maternal healthcare services, namely antenatal care (ANC), delivery care, emergency obstetric care, and postnatal care, are essential to preventing maternal deaths and maintaining a woman’s health in pregnancy, childbirth, and in the postpartum period (Chi et al., 2015; World Health Organization, 2018). Effective maternal health services prevent, monitor, and treat pregnancy-related complications for both the pregnant woman and her fetus and/or child, as well as promote future health service use (Chi et al., 2015; World Health Organization, 2018). Lack of healthcare services increases the risk of complication-related maternal deaths which are preventable and/or treatable under stable conditions (Wirth et al., 2008). Maternal mortality rates are particularly high in countries designated as fragile states (conflict or post-conflict states), where a variety of conditions limit the quality, availability, and accessibility of maternal healthcare services (Wirth et al., 2008; World Health Organization, 2015); for instance, Sierra Leone, Central African Republic, Chad, Nigeria, and South Sudan report the highest maternal mortality rates globally (World Health Organization, 2015). Furthermore, in Northern Uganda, armed conflict has negatively impacted maternal healthcare service provision and uptake, resulting in lower numbers of health centre deliveries and reduced contraceptive use (Namasivayam et al., 2017).

Despite global efforts to reduce maternal mortality, pregnancy complications continue to be a main cause of maternal death, particularly in LMICs (World Health Organization, 2018). Antenatal care provides essential prevention, detection, treatment, and management of pregnancy-related complications (Requejo et al., 2015; Moller et al., 2017; World Health Organization, 2016). For instance, in sub-Saharan Africa, ANC provides preventative services...
against malaria (e.g. intermittent preventative treatment of malaria), tetanus (i.e. tetanus toxoid vaccine), and malnutrition (e.g. iron and folic acid supplementation) (Kinzie & Gomez, 2004; Mbuagbaw et al., 2015; World Health Organization, 2016) and also provides early detection and treatment of diseases (e.g. syphilis, HIV, and STIs) and complications of pregnancy (e.g. pre-eclampsia, eclampsia, infection, and vaginal bleeding) (Mbuagbaw et al., 2015; World Health Organization, 2016). Further, ANC is an opportunity to educate women about their health in pregnancy, counsel women on upcoming pregnancy decisions, and develop a plan for maternal health services use, such as timing of next ANC visit, choice of delivery location and birth attendant, support of a caregiver for her children at home, complication readiness, planning and budgeting transport to hospital for delivery, and actions in case of emergency (Mbuagbaw et al., 2015; World Health Organization, 2016).

The importance of ANC is reflected in the World Health Organization’s (WHO) recent recommendations for a positive pregnancy experience (World Health Organization, 2016). According to these recommendations, women are encouraged to attend a minimum of eight ANC visits: one in the first trimester, two in the second trimester, and five in the third trimester (World Health Organization, 2016), doubling the WHO’s previously recommended four visit minimum. These recommendations may not be relevant or reasonable for all countries; the four ANC visit minimum is not met in most countries (World Health Organization, 2016), because of the many barriers women face in accessing ANC services (Hanson et al., 2015; Koblinsky et al., 2014; Tann et al., 2007). Recent global estimates indicate that only 52% of women of reproductive age (15-49 years) in sub-Saharan Africa attended the recommended number of four ANC visits between 2011 and 2016 (UNICEF, 2016). For example, in Uganda, only 60% of women attended
four or more ANC visits in 2016 (Ugandan Bureau of Statistics, 2016). Early ANC visit attendance is also low; in low income countries in 2013, the estimated coverage of early antenatal care visits was 24% as compared to 81% in high income countries (Moller et al., 2017). To address this, the recent WHO recommendations also promote early ANC attendance (i.e. prior to 12 weeks gestation), to detect pre-existing conditions and complications best treated in the initial stages of pregnancy (Moller et al., 2017; World Health Organization, 2016). For example, gestational age assessment at ANC can facilitate treatment of preterm labour and screening of genetic and/or congenital disorders (Moller et al., 2017). Further, the WHO recommendations also emphasize the establishment of an active and individualized connection between healthcare provider and patient (World Health Organization, 2016). Ideal ANC services are respectful and inclusive, providing a safe and private environment in which the patient feels valued and respected, has the time to ask questions, and trusts and understands the information provided (Mannava et al., 2015; World Health Organization, 2016). Positive patient experiences lead to future healthcare service use, ameliorated perceptions of ANC, and increased attendance among other women (Moller et al., 2017; Paudel et al., 2015; Srivastava et al., 2015; World Health Organization, 2016). To ensure progress is made towards both the SDGs and the new WHO recommendations, research is required to examine and understand the barriers women are facing in ANC access.

**Barriers to Antenatal Care**

Substantial research has focused on exploring barriers to ANC accessibility and attendance (Hanson et al., 2015; Koblinsky et al., 2016; Tann et al., 2007). Identifying ANC barriers is key to understanding inequities in access to ANC and maternal health services generally. In the ANC
literature, accessibility is defined as “the degree to which individuals are inhibited or facilitated in their ability to gain entry to and receive care from a healthcare system,” which is affected by factors generally known to include geographic, financial, and social conditions (Kiwanuka et al., 2008). The term “attendance” refers to the actual uptake of health services (Kiwanuka et al., 2008). Several conceptual models and frameworks have been proposed to describe access to maternal health services. For instance, the Three Delays Model (Thaddeus & Maine, 1994) identified three temporal delays in seeking maternal healthcare: delay in deciding to seek care; delay in identifying and reaching a health facility; and delay in receiving appropriate care at a health facility (Figure 1.3) (Thaddeus & Maine, 1994). This model has continued to guide maternal healthcare research in various contexts (Gabrysch & Campbell, 2009; Knight et al., 2013; Mbaruku et al., 2009; Morrison et al., 2014), confirming that a multitude of temporally-related factors influence healthcare access (i.e. financial limitations, distance to healthcare centre, previous interactions with healthcare provider) (Gabrysch & Campbell, 2009).

Understanding existing barriers to ANC attendance and access in sub-Saharan Africa is an important goal of global health research (Kyei-Nimakoh et al., 2017). In sub-Saharan Africa, cost is often considered a main barrier to ANC (Kyei-Nimakoh et al., 2017), as both direct (e.g. hospital fees) and indirect costs (e.g. transport, provision of food for family while at health centre, employment lost) prohibit care-seeking for women, particularly those from income-insecure groups (Anastasi et al., 2015a; Gross et al., 2013). A lack of financial and physical support from a spouse, paired with a lack of inclusion in ANC decision-making also limits attendance (Munguambe et al., 2016; Påfs et al., 2015). Several socio-cultural factors may dissuade ANC attendance for pregnant women in LMICs, including input from members of her
social circle (i.e. mother, mother-in-law, Elders, healthcare providers), gender norms, and cultural beliefs (Downe et al., 2016; Gabrysch & Campbell, 2009; Glei et al., 2003; Munguambe et al., 2016). Previous contact with the healthcare system is another factor shaping perception of the value of ANC, which impacts future attendance for women in sub-Saharan Africa (Bbaale, 2011; Gabrysch & Campbell, 2009). Some elements of a previous ANC visit which can deter attendance include poor healthcare provider interactions, unjustified service costs, unachievable attendance timelines, expensive food purchases, and obligate maternal supply provision (i.e. clean clothing for self and baby) (Bbaale, 2011; Gabrysch & Campbell, 2009; Kyei-Nimakoh et al., 2017; Simkhada et al., 2008).

Persistent disparities in ANC attendance reveal underlying inequities in maternal healthcare service accessibilities (Godefay et al., 2015; Tessema et al., 2017; UNICEF, 2016; Wirth et al., 2008). Generally, challenges in accessing maternal healthcare are more pronounced in some populations, where situations of poverty exacerbate barriers to healthcare (Graham et al., 2004). In low income settings, key maternal health services are often of lower quality and are more difficult to access than those in higher-income settings (Graham et al., 2004; Wirth et al., 2008). Further, within a population, women in the richest quintile are more likely to attend ANC than those in the poorest quintile (Every Woman Every Child, 2015; UNICEF, 2016). Distance to the hospital is also a marked barrier to ANC in rural regions, amplified by expensive and inconsistent transportation options, poor road infrastructure, and weather conditions (i.e. heavy rain causing road flooding) (Amooti-Kaguna & Nuwaha, 2000; Kawungezi et al., 2015; Kiguli et al., 2009; Odaga et al., 2004). Urban women are often more likely to attend ANC than rural women (Every Woman Every Child, 2015; UNICEF, 2016). For instance, in sub-Saharan Africa,
barriers to ANC are more pronounced in rural regions than in urban areas (World Health Organization, 2016), in part due to the lack of essential resources (i.e. medication, healthcare providers, medical equipment) (Kongnyuy et al., 2009).

**Indigenous Women and Maternal Health**

Women from Indigenous communities in LMICs have poorer health outcomes than non-Indigenous women, yet limited knowledge of the ANC experiences of Indigenous women exists (King & Gracey, 2009; Ohenjo et al., 2006; Stephens et al., 2006). An inadequate amount of research focuses on the maternal health status and ability to access healthcare of global Indigenous populations (Ohenjo et al., 2006; Stephens et al., 2006). Indigenous women in sub-Saharan Africa have higher than average poor maternal health outcomes and maternal mortality (King & Gracey, 2009; Shah et al., 2011), and routine pregnancy healthcare services are less accessible for Indigenous women than non-Indigenous women (King & Gracey, 2009; Lewis, 2000; Ohenjo et al., 2006; Shah et al., 2011; UOBDU et al., 2015). Further, the health of Indigenous women is often poorly prioritized in national healthcare planning (Stephens et al., 2006). When health services are accessible, they are often of lower quality than that available to non-Indigenous populations, in part because they do not consistently and appropriately incorporate patient needs (Stephens et al., 2006; United Nations, 2009) and may directly discriminate against them (Ohenjo et al., 2006). While Indigenous women face the same obstacles to care identified in the general population (e.g. geographical distance, seasonal

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1 As defined by the United Nations’ State of the World’s Indigenous Peoples Report, Indigenous peoples are “those who have a historical continuity with pre-colonial societies that develop on their territories and who consider themselves distinct from other sectors of the societies now prevailing on those territories” (United Nations, 2009).
isolation, out-of-pocket costs of transport, food, accommodation, family support, and medication), the magnitude and distribution of these barriers are often higher for Indigenous women (Omobuwajo et al., 2008; United Nations, 2009).

For Indigenous Batwa populations in Kanungu District, Uganda, historical and ongoing oppression has led to differences in social status between the Batwa and the Bakiga non-Indigenous groups (Berrang-Ford et al., 2012; MacVicar et al., 2017). For instance, Batwa experience limited access to food, shelter, water, and sanitation infrastructure and experience lower life expectancies, higher child mortality rates, a higher prevalence of malaria, a higher prevalence of acute gastrointestinal illness, and face greater food insecurity compared to neighbouring Bakiga and the national Ugandan average (Berrang-Ford et al., 2012; Clark et al., 2016; Patterson et al., 2017). These challenges may also reflect maternal health indicators; initial research has demonstrated that Batwa pregnancy experiences are affected by socio-economic disadvantage, income insecurity, and limited access to ANC during pregnancy (MacVicar et al., 2017).

**Study Rationale and Thesis Research Goals**

The research presented in this thesis identifies and examines factors impacting accessibility of quality ANC in East Africa and in southwestern Uganda. In Chapter One, the nature, extent, and range of published peer-reviewed literature on ANC attendance in East African populations is examined. Specifically, the factors that influence barriers to ANC access in East Africa are identified, described, and discussed. The results aimed to guide critical reflection and discussion of context-specific findings, as well as identify critical research gaps that are important to
address to support global development goals (i.e. the MDGs and SDGs). Chapter Two contributed to gaps in maternal health research that are impacting the delivery of healthcare services in Kanungu District, Uganda. This research focused on two objectives. First, characterizing patients’ ANC attendance patterns at a local hospital and second, exploring the factors influencing attendance among Indigenous Batwa and non-Indigenous Bakiga women in communities in Kanungu District. While this research focused on a single case study in southwestern Uganda, the insights gathered from this process can contribute to the collective and expanding body of knowledge on ANC attendance in East Africa.

References


Figures

**Millennium Developmental Goals**
- Global targets committed to by United Nations Member states in 1999.
- Eight goals with specific targets and indicators to achieve by 2015, including:
  - Reduce the global maternal mortality ratio by three quarters;
  - Achieve universal access to reproductive health.

Figure 1.1 Summary of the Millennium Development Goals and the specific targets relevant to maternal health (United Nations, 2000).
Figure 1.2 Summary of the Sustainable Development Goals and the specific targets relevant to maternal healthcare (United Nations, 2015).

- Global targets established in 2015 as an extension of the MDGs.
- 17 goals with specific targets to be achieved by 2030, including:
  - Reduce the global maternal mortality ratio to less than 70 per 100,000 live births;
  - Achieve universal access to quality essential healthcare services.
Figure 1.3  A schematic of the Three Delays model, which highlights factors influencing three stages of accessing antenatal care services: delay in deciding to seek care, delay in reaching care, and delay in receiving adequate care (Thaddeus & Maine, 1994).
CHAPTER TWO

ANTENATAL CARE RESEARCH IN EAST AFRICA SINCE THE MILLENNIUM DEVELOPMENT GOALS: A SCOPING REVIEW

Abstract

The global burden of maternal mortality is high and unequally distributed. Launched in 2000, Millennium Development Goal (MDG) 5 aimed to improve maternal health by 2015, citing antenatal care as critical to preventing maternal mortality. To facilitate critical reflection on the research conducted during the MDG period, a scoping review was conducted to summarize trends, identify gaps, and critically explore research about antenatal care attendance for East African women. Using scoping review methodology, aggregator databases (PubMed®, Scopus®, Web of Science™, and African Journals Online) were systematically searched for antenatal care articles published between 2000 and 2016. Articles were screened by independent reviewers using a priori inclusion and exclusion criteria. Eligible articles were retained for data charting and analysis. Of the 9,646 citations returned in the search, 211 articles were relevant and analysed. The number of published articles increased over time; included research conducted in nearly all East African countries; utilized primarily quantitative methods; included a variety of participants (i.e. antenatal care patients, healthcare providers, and/or spouses); and involved authors with affiliations from various African countries. Many interrelated physical, social, and cultural factors were identified in the literature, and influenced seeking, reaching, and receiving adequate quality antenatal care. The extent and scope of studies identified suggest that antenatal care is a priority research area, yet key gaps in the literature exist. Limited qualitative research, as well as few articles examining antenatal care experiences of women from vulnerable groups (e.g. adolescent, disabled, and Indigenous groups) were identified. This focused synthesis of
research in East Africa during the MDG initiative can inform and frame the development and implementation of future research aiming to improve equitable access to antenatal care services. These context-specific findings are important considering the Sustainable Development Goals (SDGs), which aim to nearly triple the maternal mortality reductions by 2030.

**Keywords:** antenatal care, health service utilization, accessibility of services, maternal health, scoping review, East Africa, MDGs, SDGs
**Introduction**

Reducing maternal mortality has long been identified as a global health priority (Koblinsky et al., 2016; Moller et al., 2017; World Health Organization, 2015). In 2000, the United Nations launched the Millennium Development Goals (MDGs), one of which focused on reducing maternal mortality by 2015. While a substantial reduction in maternal mortality was documented during this initiative (United Nations, 2015), the distribution of maternal mortality remains unequal, with 99% of deaths occurring in low income countries (World Health Organization, 2016). Building on the MDGs, the newly established Sustainable Development Goals (SDGs) are considerably more ambitious and regionally targeted, aiming to nearly triple the maternal mortality reductions that were achieved during the MDG period by 2030 (World Health Organization, 2015).

Improving maternal healthcare provision contributes substantially to the management and prevention of the causes of maternal mortality (Moller et al., 2017; World Health Organization, 2016). An important component of maternal healthcare is antenatal care (ANC), which includes the services provided to a woman during pregnancy prior to delivery (World Health Organization, 2016). For example, ANC often offers health education, provides preventative services (i.e. iron and folic acid supplementation, intermittent preventative treatment of malaria, tetanus toxoid vaccines), promotes further use of health services, and detects and treats pregnancy-related complications (Carroli et al., 2001; Kabakyenga et al., 2012; World Health Organization, 2016). Globally, ANC attendance is generally low: between 2007-2014, only 64% of women worldwide attended the minimum World Health Organization (WHO) recommended number of ANC visits (n=4 visits) (World Health Organization, 2016). Recently, the WHO
increased their recommended number of visits to eight, likely increasing the percentage of women who will not meet the minimum recommended number of visits.

Globally, many women face challenges in accessing maternal healthcare services during pregnancy (Koblinsky et al., 2016). While there have been reviews that examined maternal healthcare-seeking behavior among women globally (Banke-Thomas et al., 2017; Downe et al., 2016; Finlayson & Downe, 2013; Gabrysch & Campbell, 2009; Knight et al., 2013; Moller et al., 2017; Say & Raine, 2007; Srivastava et al., 2015; Thaddeus & Maine, 1994), fewer reviews have conducted regional examinations, especially in Africa. Regional reviews and analyses, however, are important, as large disparities in healthcare access persist across and within continents, countries, and urban and rural populations (Bbaale, 2011a; Finlayson, 2013; Ronsmans & Graham, 2006; Simkhada et al., 2008). Given these disparities in maternal access to care, as well as the more regionally targeted Sustainable Development Goals, focused synthesis of ANC research in specific regions is important in identifying relevant interventions, policy recommendations, and knowledge gaps. As such, in this paper, the nature, extent, and range of published peer-reviewed literature on ANC attendance in East African populations was examined. Specifically, the factors that influence barriers to ANC access in East Africa were identified, described, and discussed within the following categories: barriers to deciding to seek care; barriers to reaching an appropriately-equipped healthcare centre; and barriers to receiving adequate healthcare at health centres. Finally, this paper presents a critical reflection and discussion of context-specific findings, and well as research gaps that are important to address to support the more regionally targeted and more ambitious SDGs.
Methods

This scoping review followed five steps: a) identifying the research question and developing the search query; b) obtaining identified articles; c) selecting relevant articles; d) charting the data; and e) collating, summarizing, and reporting the results (Arksey & Malley, 2005; Levac et al., 2010).

Search strategy

The search was conducted in four electronic databases: PubMed®, Scopus®, Web of Science™, and African Journals Online. These databases were selected based on their collectively extensive coverage of peer-reviewed health and social science journals. A search string included terms for the population (geographic region) and outcome of interest (Table 2.1). The search was conducted on December 16, 2016 in all four databases.

Citation management

Retrieved citations were exported from each database into a format supported by Mendeley© referencing software (v1.17.1, Mendeley Ltd. 2016), which served to store, organize, and manage citations. The de-duplication function in Mendeley© was used to eliminate duplicate citations. Citations were then exported from Mendeley© and imported into a web-based systematic review software, DistillerSR© (Evidence Partners Incorporated, 2018). In DistillerSR®, the de-duplication function was used to confirm that all duplicates were identified and eliminated.
**Inclusion criteria and relevance screening**

Studies were included in the review if they were primary research studies involving humans and published in English or French (Table 2.2). Studies with data collected between 2000 and 2016 were included, reflecting the establishment of MDGs in the year 2000 and the subsequent investment in improving maternal health (United Nations, 2015). Only studies conducted in East Africa (as defined by United Nations Statistics Division, 2014) (Table 2.2) with ANC as the outcome of interest (as defined by Downe et al., 2016; Finlayson et al., 2013) were included in the review.

A three-step screening process was used to select relevant studies. First, the African Journals Online search tool was unable to include a population term, resulting in large numbers of studies conducted outside of East Africa; therefore, for these citations, articles whose titles indicated that the study was not conducted in East Africa were eliminated. Second, a title and abstract relevance screening tool (Table 2.3) was developed and applied to all citations using DistillerSR© based on the eligibility criteria. Citations deemed ineligible by two independent reviewers were eliminated. The remaining citations proceeded to the third stage, where the full text of each article was screened. A full text relevance screening tool was developed in DistillerSR© (Table 2.3) and two independent reviewers applied the screening tool to the full text of each article. Any conflicts were discussed among the reviewers and resolved by a third reviewer as needed.
Data charting

A data charting tool was developed and applied in DistillerSR© (Appendix A). A primary reviewer applied the charting tool to each article, and a second reviewer verified the extracted data for accuracy. The following study characteristics were extracted from each article: publication year, continent of author, institution of author, country of study, study approach, participant type, data collection method, and barriers/factors influencing ANC. In addition, a framework to classify barriers women face in accessing ANC was developed based on the Three Delays Framework originally outlined by Thaddeus & Maine (1994) and adapted by others (Gabrysch & Campbell, 2009; Knight et al., 2013; Morrison et al., 2014). This framework focuses on maternal healthcare (primarily obstetric and delivery care access) and barriers that delay timing of care. Therefore, the adapted framework used the broad types of delays, but re-framed them as barriers to utilizing ANC: factors that influence (1) decisions to seek ANC; (2) reaching a health centre that provides ANC, and (3) receiving adequate ANC (Table 2.4). This framework using qualitative thematic analysis methods (Braun & Clarke, 2006), deductively coding (Zhang & Wildemuth, 2005) each article to facilitate additional data charting.

Results

Summary of article attributes

A total of 211 articles met the inclusion criteria (Figure 2.1). There was a significant increase in the number of publications over time ($\beta=2.42$; 95%; CI=1.77, 3.07; p<0.001). No articles were published in the year 2000, and 2015 and 2016 had highest number of publications (n=40). The most common study locations were Ethiopia (23.7%), Uganda (23.2%), Tanzania (20.4%), and Kenya (19.4%) (Figure 2.2). None of the articles examined ANC in Djibouti,
Mauritius, Mayotte, Réunion, Seychelles, or Somalia. Most of the articles described research conducted in rural locations (48.8%), and other articles described research in urban (15.6%), semi-urban (2.4%), and/or post-conflict locations (1.4%).

Most authors listed affiliations with academic institutions (98.6%), followed by non-governmental organizations (15.2%), healthcare institutions (12.8%), and government organizations (10.9%). Authors listing affiliations with institutions located in African countries was identified in 59.7% of articles, and this increased over time. Eighty-nine percent of articles had at least one author affiliated with an African institution; 29.4% were published by authors listing only affiliations with African institutions. Affiliations of other authors in descending order were North America (66.8%), Europe (45.5%), Asia (6.6%), and Oceania (1.4%).

Data collection and analysis reported in articles were categorized as quantitative (62.6%), qualitative (22.3%), or mixed methods (15.2%). The most common sources of quantitative data described in the articles included, but were not limited to, questionnaires (i.e. Demographic Health Surveys) (70.1%), and hospital records (11.8%). Qualitative data primarily came from interviews (42.7%) and focus group discussions (23.7%).

Study participants included ANC patients (35.5%), community members (21.3%), and community leaders (21.3%). Socio-demographic factors frequently reported in articles included age, parity, marital status, religion, ethnicity, location, and household characteristics. While women were the population of primary interest in articles, spouses (29.9%), healthcare workers (26.1%), and traditional birth attendants (4.3%) were also included as research participants. Indigenous women participated in research in 0 articles, and 1 (0.5%) of articles included women
with disabilities. Women of child-bearing age (between 15 and 49 year of age) were research participants in 60.7% of articles, and approximately 8% of articles focused specifically on adolescents (females between 15 and 19 years of age). Articles reported that age was associated with quality of ANC services and ANC attendance among adolescents in Uganda (e.g. Reynolds et al., 2006), Malawi (Rai et al., 2013), and sub-Saharan Africa in general (e.g. Magadi et al., 2007).

**Barriers in deciding to seek care**

*Previous experiences impact decisions about seeking ANC*

Previous experiences of ANC were reported to influence care-seeking behaviour in subsequent pregnancies in several articles (e.g. Atekyereza & Mubiru, 2014; Belayneh et al., 2014; Gebremeskel et al., 2015; Gudayu et al., 2015; Tariku et al., 2010; Tekelab & Berhanu, 2014; Turyasiima et al., 2014; Worku et al., 2013; Zegeye et al., 2013). Reports of poor ANC experiences included impersonal care (e.g. Roberts et al., 2016); reprimand for arriving without identification (e.g. Munguambe et al., 2016; Pell et al., 2013); mistreatment by staff (e.g. Chi et al., 2015a; Mseu et al., 2014); lack of privacy during care (e.g. Villadsen et al., 2015); unwanted prescriptions (e.g. Chi et al., 2015b; Mkandawire et al., 2015); and unaddressed fears of routine investigations (e.g. Chaibva et al., 2009; Chi et al., 2015a; Kawungezi et al., 2015; Mseu et al., 2014). Some articles reported that women who previously experienced healthy pregnancies without attending ANC often did not view ANC as important or necessary (e.g. Mathole et al., 2004; Bbaale, 2011); however, women who experienced pregnancy complications in the past were more motivated to seek ANC in subsequent pregnancies (e.g. Chi et al., 2015a; Fekede & Mariam, 2007; Mathole et al., 2004).
Sociocultural factors impact seeking ANC

Some articles reported that women trusted ANC knowledge provided by traditional birth attendants more than the information provided by ANC providers at clinics (e.g. Ayiasi et al., 2013; Rassi et al., 2016), and preferred visiting traditional birth attendants to ANC clinic attendance for a variety reasons, including its lower cost (e.g. Banda et al., 2007; Nyirenda & Maliwichi, 2016). Cultural beliefs were reported to impact ANC attendance in many articles: the value of producing a healthy child was reported to motivate attendance (e.g. Atekyereza & Mubiru, 2014), but wanting to conceal pregnancy until visible deterred ANC attendance (e.g. Biza et al., 2015; Chi et al., 2015a; Roberts et al., 2016). One article reported that women perceived those who attended ANC regularly during pregnancy as “weak” and unable to endure pregnancy without assistance (Chi et al., 2015a). Other articles reported that conflicting recommendations on herb use in pregnancy was common; for example, Elders advised pregnant women to use traditional medicines for positive pregnancy outcomes (e.g. Atekyereza & Mubiru, 2014; Atuyambe et al., 2009; Mathole et al., 2004; Munguambe et al., 2016; Sileo et al., 2016), but healthcare providers did not condone their use (e.g. Allen et al., 2014; Roberts et al., 2016).

Some articles explored how the status of women could affect ANC attendance (e.g. Adjiwanou & LeGrand, 2014; Atekyereza & Mubiru, 2014; Atuyambe et al., 2009; Mbonye et al., 2007; Singh et al., 2014). For instance, one article documented a link between ANC attendance and sociocultural practices of women not being allowed to manage their own affairs without the direction of men (Audet et al., 2016). Other articles reported beliefs that a woman’s responsibility to complete household chores and care for family members was a priority over ANC (e.g. Mseu et al., 2014; Munguambe et al., 2016). As such, pregnant women who did seek
ANC were required to arrange for relatives to supervise children and complete household chores in their absence (e.g. Mseu et al., 2014; Munguambe et al., 2016). Additionally, adolescents and women with disabilities reported low ANC attendance due to barriers in addition to those faced by other women (e.g. the need for specialized health services, negative stigma, poor treatment from staff) (e.g. Chaibva et al., 2009; Pell et al., 2013; Smith et al., 2004).

Financial costs of care impacts seeking ANC

Inability to afford the costs associated with seeking healthcare was a commonly reported barrier to ANC attendance (e.g. Chaibva et al., 2009; Fekede et al., 2007; Smith et al., 2004; Tawiah, 2011). Articles reported that households were often unable to afford the financial costs associated with ANC, including the costs of community health insurance (Hagey et al., 2014); purchasing food for women attending ANC (Pell et al., 2013); and additional fees of health services (e.g. Aarnio et al., 2013; Munguambe et al., 2016; Saad-Haddad et al., 2016; Smith et al., 2004). Even when ANC services were offered free of charge by health centres, these additional costs of ANC negatively influenced ANC attendance (e.g. Onarheim et al., 2015; Sialubanje et al., 2014; TARIku et al., 2010). Many articles reported that men often controlled financial resource allocation in the home and made the health decisions on the woman’s behalf (e.g. Atekyereza & Mubiru, 2014; Atuyambe et al., 2009; Singh et al., 2014). Some articles described the burden of funding ANC expenses to be a “woman’s responsibility” (Stephenson & Elfstrom, 2012); as such, many women conducted additional work during pregnancy to pay for the associated costs of ANC (Beckham et al., 2015; Munguambe et al., 2016). Indeed, some articles reported that women from wealthier households used ANC more frequently than those from lower-income households (e.g. Alemayehu, et al., 2010; Bbaale, 2011a; Tarekegn et al.,
and women relying on their spouse for finances (e.g. Munguambe et al., 2016) often attended ANC late or not at all (e.g. Munguambe et al., 2016; Påfs et al., 2015). Shared healthcare spending decision-making between a woman and her spouse increased ANC attendance (e.g. Tarekegn et al., 2014; Woldemicael, 2010), as well as spousal accompaniment to ANC visits (Jennings et al., 2014).

**Lack of spousal support impacts a woman’s ability to attend ANC**

One article reported that men most often viewed their role in pregnancy as financial providers only (Påfs et al., 2016a); although in one article, men who were knowledgeable of the importance of ANC services were more likely to accompany their wives to ANC visits (Tweheyo et al., 2010) and another article reported that some men attended ANC visits out of a “sense of obligation” (Påfs et al., 2016a). Other articles reported that men felt they were perceived as “weak” when providing ANC-related physical or emotional support to their pregnant spouses (Audet et al., 2016). Finally, some articles reported that pregnant women faced spousal violence, which negatively impacted their ANC attendance (e.g. Aarnio et al., 2013; Påfs et al., 2015).

**Barriers in reaching ANC centres**

**Distance to ANC clinics impacts a woman’s ability to reach a healthcare centre**

Long distances were frequently reported as a barrier to reaching a centre offering ANC services (e.g. Biza et al., 2015; Mbonye et al., 2016; Mubyazi et al., 2010; Roberts et al., 2015; Smith et al., 2004; Tawiah, 2011; Tsegay et al., 2013; Vermeulen et al., 2016), as well as a common reason for delaying the first ANC visit (Mathole et al., 2004). Articles describing research examining distance to clinics found that women living close to health centres had higher ANC attendance, often explained by improved access to health centres and transport (e.g. Aarnio
et al., 2013; Mrisho et al., 2009); whereas, lack of available, predictable, and affordable transport to a health centre was widely reported as a barrier to reaching ANC service providers (e.g. Biza et al., 2015; Mathole et al., 2004; Munguambe et al., 2016; Pell et al., 2013; Roberts et al., 2015; Sialubanje et al., 2014; Smith et al., 2004; Tawiah, 2011; Vermeulen et al., 2016). Some options, although reported to be more affordable (e.g. traveling to clinics by public transit, bicycles, walking), were reported to be slow and uncomfortable, which often delayed or discouraged ANC attendance (e.g. Atekyereza & Mubiru, 2014; Atuyambe et al., 2008; Atuyambe et al., 2009).

Regional differences in reaching ANC centres

Articles showed that the timing and frequency of ANC attendance was often linked to regional differences in the availability and accessibility of healthcare services (e.g. Bbaale et al., 2011b; Fotso et al., 2008; Owili et al., 2016). For instance, women in rural regions faced greater difficulties accessing transport to reach health centres than those in urban areas (Atekyereza & Mubiru, 2014; Mubyazi et al., 2011). Poor road conditions that made travel to health centres challenging were reported to deter ANC access, such as hilly terrain (Atuyambe et al., 2009); insufficient and poor road networks (Sialubanje et al., 2014); unpredictable weather conditions (Munguambe et al., 2016); and flooded roadways in rainy seasons (Mathole et al., 2004).

Barriers in receiving adequate ANC at the health centre

Limited resources challenge adequate care at ANC health centres

Articles described several challenges in providing ANC services in health centres in rural East Africa, including shortages and/or unequal distribution of healthcare staff and healthcare equipment (Kongnyuy et al., 2009). Health centres in urban environments were mainly staffed by physicians, while those in rural environments were more often staffed by clinical officers, nurses,
and midwives (Bbaale, 2011b). From an ANC provider perspective, staff shortages and limited training were reported to lead to incomplete ANC services; for instance, articles reported inconsistent recordings of patient history, not checking vital signs, incomplete physical exams, limited counseling for risk factors and good hygiene practices, and limited identification and management of chronic conditions (e.g. Atuyambe et al., 2009; Desalegn et al., 2016; Wagenaar et al., 2016). An absence or shortage of equipment (e.g. ultrasound machines), electric power, and/or laboratory supplies, were reported to limit a health centre’s ability to effectively deliver the full range of ANC services (Desalegn et al., 2016). One article found that women were more likely to go to a well-equipped health centre for ANC, and found that the installation of an ultrasound machine at a health centre increased ANC attendance (Kawooya et al., 2015). Articles reported that while healthcare providers at less equipped health centres were able to refer patients to better equipped health centres, the additional travel costs and healthcare fees often prevented women from accessing this care (e.g. Biza et al., 2015; Mubyazi et al., 2010; Pembe et al., 2010; Smith et al., 2004).

**Satisfaction with ANC services at health centres**

Articles reported that women were often dissatisfied with the ANC services that they received, including dissatisfaction with the lack of healthcare provider availability, long wait times, and poor treatment from healthcare providers (e.g. Chemir et al., 2014; Gebremeskel et al., 2015; Mathole et al., 2004). In several articles, the lack of female healthcare providers at ANC visits was identified as a barrier to ANC attendance (e.g. Kawungezi et al., 2015; Påfs et al., 2016b; Tawiah, 2011; Villadsen et al., 2014). Many articles reported that interactions with healthcare staff were generally described as negative, with some women reporting healthcare
providers to be “rude,” “uncaring,” and “verbally abusive” towards patients (e.g. Allen et al., 2014; Atuyambe et al., 2009; Chi et al., 2015a; Mseu et al., 2014; Roberts et al., 2016).

Articles reported several components of high quality and positive ANC experiences that were identified by women, and included personal introductions to healthcare providers; explanation of exams and tests; discussion of birth plans and estimated delivery date; counselling on HIV/AIDS; and the opportunity to ask questions (Duysburgh et al., 2013; Fekadu et al., 2014; Kambala et al., 2015; Magoma et al., 2011; Stekelenburg et al., 2004; Villadsen et al., 2015). Many articles, however, reported that wait times were too long and consultation times were too short for ANC healthcare providers to provide all these components. One article that focused on quality of service found that lower quality services prompted women to stop ANC, and higher quality of care and range of services increased ANC attendance (Adjiwanou et al., 2013).

**Discussion**

Various barriers that continue to present challenges for ANC attendance in East Africa were identified, which reflects previous research in other regions, such as socio-cultural conditions and inequitable status of women (Deo et al., 2015); poor previous experience of healthcare (Sibiya et al., 2018); financial and transport challenges (Fagbamigbe & Idemudia, 2015; Saad-Haddad et al., 2016; Yatsuoka et al., 2018); and limited healthcare infrastructure and resources (Atuoye et al., 2015; De Jongh et al., 2016; Koster et al., 2016; Muhammed et al., 2013). These barriers persist in low and middle income countries (LMICs) (Banke-Thomas et al., 2017), despite the initiatives prompted by the MDGs that aimed to achieve universal access to reproductive health services (United Nations, 2015). These findings support the SDG’s
continued focus on achieving universal access to healthcare, which aims to reduce these barriers to ANC attendance and contribute to improved maternal health.

Numerous articles reported that financial limitations were barriers to ANC attendance in East Africa, particularly due to women’s inequitable access to resources and sustainable income. For example, similar to other studies in LMICs (Hunter et al., 2017), interventions which aimed to address financial barriers, such as health centre fee coverage and transport vouchers, were found to improve ANC attendance in East Africa. These ANC interventions underscore the role of financial resources in healthcare access (Fryatt & Bhuwanee, 2017; Stenberg et al., 2017; Tangcharoensathien et al., 2015); however, in East Africa the funding for these interventions has not been particularly sustainable over the long-term (Fenny et al., 2018; Okungu et al., 2017). Therefore, prioritizing larger efforts for poverty reduction could result in more sustainable improvements in ANC access.

Some studies identified in this review moved beyond simply identifying barriers, and examined how women’s healthcare experiences impacted their decisions to attend ANC. For example, studies reported women’s dissatisfaction with interactions with healthcare providers and the availability and quality of ANC services. This reflects a recent increasing recognition that improved healthcare interactions will improve the quality of ANC provision (Mannava et al., 2015; World Health Organization, 2016). Recent WHO recommendations focus heavily on improving patient-provider interactions (World Health Organization, 2016) and, similarly, the SDGs highlight the intersection between access and quality of care (World Health Organization, 2015). In the global context, improving quality of care through better patient-provider
interactions can improve both women’s experiences with, and decision to attend, ANC services (Kiguli et al., 2009; Mannava et al., 2015; World Health Organization, 2016).

In many LMICs, gender norms restrict women’s ability to make ANC decisions, a finding which was documented in this review. As such, it is important to consider the multifactorial context and actors which have roles influencing a woman’s autonomy (Mandal et al., 2017; Osamor & Grady, 2016; Pennington et al., 2018). Understanding male perspectives is important to understand barriers to ANC attendance, as they have direct and indirect impacts on the care-seeking decisions of women. This review provides evidence of research efforts to consider men’s perspectives and experiences of ANC in East Africa, which is mirrored in the global literature (Gabrysch & Campbell, 2009). This research is important because when men attend ANC visits, women are often more likely to attend ANC and adhere to recommendations (Banke-Thomas et al., 2017; Ediau et al., 2013). The implications of interventions targeting men in ANC, however, can be complex and create new challenges, and further exacerbate existing inequities for those women without partners at ANC visits (Peneza & Maluka, 2018; Yargawa & Leonardi-Bee, 2015). For example, women who are accompanied by a spouse to ANC are treated first, resulting in longer wait times for unaccompanied women (Pâfs et al., 2015). Therefore, the inclusion of male perspectives in research and interventions should not come at the cost of, or with the exclusion of, women and women-centred care and equity. No research in East Africa that examined the complexities and/or unintended consequences of ANC interventions that promote spousal involvement were identified. Globally, women’s autonomy in healthcare-seeking behaviour is often limited and/or influenced by male involvement, not only for ANC but reproductive health in general (Wado, 2017). Effective implementation of women-centred care
can increase autonomy and agency, and benefit other areas of women’s health (Johnson, 2014; Murray et al., 2014; Pratley, 2016).

A gap in ANC research focusing on vulnerable populations, including women with disabilities, as well as Indigenous and adolescent women was identified in this review. These populations have lower ANC attendance (Atuyambe et al., 2008; Kyei-Nimakoh et al., 2017), and experience different and/or more pronounced social barriers to ANC compared to other women (Atuyambe et al., 2009; King & Gracey, 2009; Mheta & Mashamba-Thompson, 2017; Rai et al., 2013; Reynolds et al., 2006; Shah et al., 2011). For example, women with disabilities are often systematically excluded from mainstream health services due to social, attitudinal, and physical barriers (Mheta & Mashamba-Thompson, 2017; Smith et al., 2004). For adolescent women, pregnancy-related complications are the leading cause of death (World Health Organization, 2018); while progress towards reducing adolescent mortality has been made by the global community since the launch of the MDGs, a lack of understanding in how to reach young women and provide appropriate care remains (Barros et al., 2012; Victora et al., 2005). Despite these challenges and inequities, few studies in this review, and in the global literature, examine ANC attendance for women with disabilities, as well as Indigenous and adolescent women, and, as such, their specific experiences of ANC are not well understood (Banke-Thomas et al., 2017; King & Gracey, 2009; Mheta & Mashamba-Thompson, 2017; Shah et al., 2011). Scholars have noted the “invisibility” or “silencing” of the voices of these populations in research in general (Poudrier & Mac-Lean, 2009), and in maternal health research specifically (Gichane et al., 2017; Tolhurst et al., 2012). This gap is rooted in inequity, discrimination, colonization, and exclusion (Anderson et al., 2016; Ganle, 2016), and goes beyond challenges in “accessing” or “reaching”
these populations (Bonevski et al., 2014; Guillemin et al., 2016; Odierna & Schmidt, 2009; Singh et al., 2012). Despite these populations being identified as a specific priority group in the SDGs, no evidence of increased research efforts to understand how to better serve these women in East Africa was identified. Improved inclusion of the voices of these populations in research, as well as the development and evaluation of global targets, like the MDGs and SDGs, is necessary (Anderson et al., 2016; Bonevski et al., 2014; Lovern, 2017).

In East Africa, most research was found to focus on identifying ANC attendance barriers; however, little research examining how and why these barriers manifest and intersect to impact attendance were identified, reflecting the global literature (Kennedy et al., 2016). Understanding the complexities of ANC barriers remains a challenge for quantitative research approaches. Qualitative research provides methods to examine and characterize these socially complex issues that impact ANC attendance (Finlayson et al., 2013; Ogu et al., 2016). As such, while calls for “big data” research are important and required to answer critical research questions (Huang et al., 2015; Say et al., 2014), they are not sufficient to understand and address these complexities, which are often locally and contextually specific (Bonevski et al., 2014; Langston et al., 2015). For example, vulnerable groups are often less likely to attend ANC, more likely to have worse health outcomes, and/or often have smaller population sizes, all of which can limit statistical approaches available to examine ANC (Fritz & MacKinnon, 2010). As such, qualitative research is especially important for these populations, as they were excluded from the large quantitative research studies identified in this review, despite being priority groups in the MDGs and SDGs (George et al., 2018).
Some review limitations must be considered. This review was restricted to English and French language articles and did not include grey literature, academic theses, unpublished reports, or reviews of primary research. As such, information relevant to ANC research in East Africa may have been missed. These grey sources could have contributed to results and likely enhanced understanding of ANC research conducted in East Africa. Nonetheless, the goal of this review was to use transparent, systematic, and repeatable methods to identify published literature on ANC attendance in East Africa.

**Conclusion**

This review identified, described, and examined key factors that influence barriers to ANC attendance in East Africa. Since the launch of the MDGs in 2000, a significant increase in the number and range of publications on ANC in East Africa was documented. While the barriers to ANC attendance were clearly presented in the literature, several remaining research gaps and areas for improvement were identified. First, more critical examinations of the intersectionality of the barriers that women face is needed; poverty, gender inequity, and patient experiences interact to create unique experiences and challenges for women seeking care. Second, increased efforts are needed to include the voices of women, particularly those that are from vulnerable populations, to ensure ANC is accessible to all women. Finally, a key opportunity to address these gaps through qualitative research methods that are able to examine these complexities and contribute valuable insights and context of ANC experiences was identified. By engaging in research which prioritizes the needs and perspectives of all women, global efforts like the SDGs will be better able to implement relevant, appropriate, and sustainable ANC initiatives.
References


health Sustainable Development Goals: a model for projected resource needs in 67 low-income and middle-income countries. The Lancet Global Health, 5(9), e875–e887.


Table 2.1 Search terms used in four electronic databases (PubMed®, Scopus®, Web of Science™, and African Journals Online) to identify studies related to antenatal healthcare attendance in East Africa from 2000-2016.

<table>
<thead>
<tr>
<th>Database</th>
<th>Geographic focus terms</th>
<th>Health outcome component terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>PubMed®, Scopus®, Web of Science™</td>
<td>(East* AND Africa*) OR Burundi OR Comoros OR Djibouti OR Eritrea OR Ethiopia OR Kenya OR Madagascar OR Malawi OR Mauritius OR Mayotte OR Mozambique OR Reunion OR Rwanda OR Seychelles OR Somalia OR South Sudan OR Uganda OR Tanzania OR Zambia OR Zimbabwe</td>
<td>Antenatal OR prenatal OR perinatal(^2)</td>
</tr>
<tr>
<td>African Journals Online</td>
<td>n/a</td>
<td>Antenatal OR prenatal OR perinatal</td>
</tr>
</tbody>
</table>
Table 2.2 Summary of inclusion and exclusion criteria used for screening the literature on antenatal healthcare attendance in East Africa.

<table>
<thead>
<tr>
<th>Inclusion criteria</th>
<th>Exclusion criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Timeline</strong></td>
<td></td>
</tr>
<tr>
<td>A portion or all data collection occurred between 2000 to 2016</td>
<td>All data collection occurred before 2000 or after 2016</td>
</tr>
<tr>
<td><strong>Population</strong></td>
<td></td>
</tr>
<tr>
<td>Humans</td>
<td>Other non-human animals</td>
</tr>
<tr>
<td><strong>Studies Type</strong></td>
<td></td>
</tr>
<tr>
<td>Original research published in peer-reviewed journal</td>
<td>Thesis or dissertations, secondary research studies (reviews, commentaries, editorials)</td>
</tr>
<tr>
<td><strong>Language</strong></td>
<td></td>
</tr>
<tr>
<td>Studies published in English or French</td>
<td>Studies published in other languages</td>
</tr>
<tr>
<td><strong>Country</strong></td>
<td></td>
</tr>
<tr>
<td>Studies conducted in countries in East Africa²</td>
<td>Studies conducted outside of East Africa</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td></td>
</tr>
<tr>
<td>Studies on antenatal care³</td>
<td>Studies on broader maternal health-related topics which are not specific to antenatal care</td>
</tr>
</tbody>
</table>

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² Geographic region of East Africa (United Nations Statistics Division, 2014), inclusive of the country of Sudan prior to 2011 (Oxfam America, 2018), Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mayotte, Mozambique, Reunion, Rwanda, Seychelles, Somalia, South Sudan, Uganda, Tanzania, Zambia, and Zimbabwe

³ Refers the period between the 28th week of pregnancy and the end of the first week of the newborn’s life (Medical Dictionary for the Health Professions and Nursing, 2012)
Table 2.3  A summary of the primary and secondary relevance screening tools used in a) the title and abstract screening stage and b) the full text screening stage to identify relevant studies on antenatal care attendance in East Africa.

**Title and Abstract Screening Questions and Responses**

Does the study involve and/or address humans?
- Yes or No

Does the article occur in and/or include participants living in East Africa?
- Yes or No

Is the article in English or French and NOT a review, commentary, correspondence, letter, editorial, case report, or reflection?
- Yes or No

Does the article address antenatal/perinatal/prenatal care (ANC) attendance or access?
- Yes- Article reports on any factors, determinants, predictors, indicators, perceptions, experiences, drivers, barriers, or facilitators of ANC access, coverage, attendance, or status;
- No – Article does not report on the above; the above are not key focus of study; addresses the above as a predictor NOT outcome; focuses on delivery care as opposed to antenatal care.

**Full Text Screening Questions and Responses**

Does the study occur in or include participants living in a country in East Africa?
- Yes- Article indicates that the study occurs in or includes participants from a community, university, hospital or other location within the country;
- No – Article does not specifically indicate “East Africa” or an East African country; refers to a country in East Africa in introduction only.

Is the article longer than 500 words, in French or English, include data collected between 2000 now AND published between 2000 & 2016?
- Yes – Article indicates that data collection, in part or in full, occurred between 2000 and 2016;
- No – Article indicates that all data collection occurred before 2000 or after 2016.

Is the article classifiable as primary, peer-reviewed research?
- Yes – Article is considered primary research, which includes observational studies, or secondary analysis of previously evaluated data;
- No - Article is a review, book, editorial, working paper, commentary, conference proceeding, letter, correspondence, case report, thesis chapter, supplementary text, or clinical study which does not address outcomes relevant to the review. Further, article does not address data from an observational study (for example, it is a model-based, theory, policy, health systems studies and studies whose outcomes are based on review of information from unspecified data sources).
Does the article address ANC access, coverage and/or attendance, experience, as an outcome, in depth?

- **Yes** - Article focuses on examining, understanding, and/or quantifying antenatal/perinatal/prenatal care access, coverage, attendance, status, or experience is an outcome of the study;
- **No** – Article does not thoroughly address ANC, or article does not address ANC as a determinant or factor of another outcome not considered ANC; article addresses ANC care in introduction or conclusion only; results of article do not address ANC.

*Responses to screening questions are not mutually exclusive.*
Table 2.4 Adapted framework used to explore factors affecting antenatal care attendance in the scoping review on ANC attendance in East Africa.

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Description</th>
<th>Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Delay the decision to seek care</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous experience of healthcare</td>
<td>Any prior contact with formal (e.g. health centre) or informal (e.g. traditional birth attendant home) healthcare system can impact a woman’s decision to seek care in the future and is reflected in her familiarity with and understanding of ANC. Experience of the gap between formal and informal service provision (e.g. use of traditional medicine) is marked component of a previous healthcare experience.</td>
<td>Gabrysch &amp; Campbell, 2009</td>
</tr>
<tr>
<td>Women’s status in household or society</td>
<td>A woman’s level of autonomy in decision-making on her health seeking behaviour is determined by existent restrictive social norms. Her status in the household may be reflected by limits to decision making, responsibilities as a caregiver, and experiences of domestic violence.</td>
<td>Gabrysch &amp; Campbell, 2009</td>
</tr>
<tr>
<td>Financial implications</td>
<td>The costs of seeking healthcare services accumulate in the decision process. Both actual and perceived costs, combined with a lack of financial/spousal support or resources can delay or deter women from seeking ANC care.</td>
<td>Gabrysch &amp; Campbell, 2009</td>
</tr>
<tr>
<td><strong>Delay arrival at a health centre</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance to health centre</td>
<td>Long distance between a woman’s home and the health centre is a physical accessibility factor known to directly hinder attendance</td>
<td>Thaddeus &amp; Maine, 1994</td>
</tr>
<tr>
<td>Cost and availability of transport</td>
<td>The lack of availability and high cost of a safe transportation from home to the health centre is a prominent challenge to care access.</td>
<td>Gabrysch &amp; Campbell, 2009</td>
</tr>
<tr>
<td>Road conditions</td>
<td>Poor road conditions and terrain, unpredictable weather, impeding geographical features, and poor road networks negatively impact access to care.</td>
<td>Gabrysch &amp; Campbell, 2009</td>
</tr>
<tr>
<td>Distribution of health centres</td>
<td>The uneven distribution of healthcare centres in a region reduces access to healthcare system, particularly for referral or advanced health services.</td>
<td>Thaddeus &amp; Maine, 1994</td>
</tr>
<tr>
<td><strong>Delay the provision of adequate care</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health centres and medical supplies</td>
<td>A shortage of healthcare workers and medical supplies (e.g. shortage of equipment and medication) at health centres limit their ability to meet the healthcare needs of the population.</td>
<td>Mgawadere et al., 2017</td>
</tr>
<tr>
<td>Adequacy and quality of referral systems</td>
<td>Incorrect or unnecessary referrals to maternal health centres can result in poor follow-up for patients due to extra costs and limited physical access to higher level centres.</td>
<td>Knight et al., 2013</td>
</tr>
<tr>
<td>Staff training and motivation</td>
<td>Few options for job training and overworking results in lack of competence, skills, and motivation among available healthcare providers at health centres, which relates to patient distrust and dissatisfaction with care provided.</td>
<td>Mgawadere et al., 2017; Knight et al., 2013</td>
</tr>
</tbody>
</table>
Figure 2.1 A Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram outlining the number of records identified in the search; excluded in preliminary screening; excluded in title and abstract screening; excluded in full text screening; and included for data extraction for the scoping review on antenatal care access in East Africa.
Figure 2.2 A map illustrating the geographical focus of the scoping review on antenatal care access in East Africa for articles published between 2000 and 2016.
CHAPTER THREE

FACTORS INFLUENCING ANTENATAL CARE ATTENDANCE FOR INDIGENOUS AND NON-INDIGENOUS WOMEN IN KANUNGU DISTRICT, SOUTHWESTERN UGANDA: A MIXED METHODS STUDY

Abstract

Despite ongoing global efforts to reduce maternal mortality, the number of maternal deaths remains high in much of sub-Saharan Africa. In response, improved antenatal care (ANC) service provision has been prioritized because it contributes to the treatment, management, and prevention of pregnancy-related complications. Research is limited on the ANC experiences of women from vulnerable groups in sub-Saharan Africa, particularly Indigenous women. This study aimed to characterize ANC attendance patterns at a local hospital, and explore the factors influencing attendance among Indigenous Batwa and non-Indigenous Bakiga women in Kanungu District, Southwestern Uganda.

A concurrent mixed-methods approach was used for data collection, integration, and interpretation. Quantitative data were collected from a local hospital and qualitative interviews and focus group discussions were conducted with local healthcare providers, as well as Batwa and Bakiga women (April 2013 to March 2014). Quantitative analyses included descriptive statistics and modelling, and thematic analysis was used to examine the qualitative data.

Quantitative results indicated that most ANC patients attended between one and three ANC visits per pregnancy (N=1259; 92.57%), and few attended the recommended four or more visits (N=101; 7.43%). Distance from a woman’s home to the hospital was significantly associated with lower ANC attendance (p<0.05, 95% CI = 0.01—0.96). Qualitative results indicated that many factors influenced ANC attendance for both Batwa and Bakiga women, including: long
distances from the home to a health centre, high direct and indirect costs of ANC for the patient, lack of power in household decision-making, and poor interactions with healthcare providers. For Batwa women, unreliable employment and unfamiliarity with the formal healthcare system were additional barriers to ANC access. Lastly, we found that adolescents experienced additional barriers to ANC, exacerbated by perceived stigma from peers, family members, and ANC service providers.

These findings indicated that marginalized populations, such as the Batwa and adolescents, continue to face unique and/or more pronounced barriers to accessing ANC in Kanungu District, Uganda. Ensuring access to ANC for these populations requires an in-depth understanding of their experiences. Future research should focus on reducing inequities among highly vulnerable populations, by adequately understanding, effectively addressing, and appropriately prioritizing factors influencing ANC attendance.

**Keywords:** antenatal care, health service utilization, healthcare-seeking behaviour, maternal health, East Africa, SDGs, mixed methods, prenatal care
Introduction

Maternal mortality is disproportionately high in low-income countries, where almost all (99%) of the global pregnancy and childbirth-related deaths occur (World Health Organization, 2017; Girum et al., 2017; Say et al., 2014). Every day approximately 830 women die from preventable causes related to pregnancy and childbirth (World Health Organization, 2017), and more than half of these deaths are attributed to complications which could have been addressed by effective antenatal care (ANC) (Every Woman Every Child, 2015; World Health Organization, 2017). For this reason, ANC is considered an essential component of a healthy pregnancy and is critical for reducing maternal mortality (Moller et al., 2017; World Health Organization, 2016).

Effective ANC provides essential prevention, detection, treatment, and management of pregnancy-related complications (Requejo et al., 2015; Moller et al., 2017; World Health Organization, 2016), as well as health education to ultimately promote future antenatal, delivery, and postpartum healthcare service use (Guillermo et al., 2001; Hanson et al., 2015; Kabakyenga et al., 2012; World Health Organization, 2016). Recent ANC recommendations encourage women to attend a minimum of eight visits per pregnancy (previously the recommendation was four) (World Health Organization, 2016); however, many low- and middle-income countries struggled to meet the global target of four visits (UNICEF, 2016). For instance, only 52% of women in sub-Saharan Africa attended the recommended four ANC visits between 2011 and 2016 (UNICEF, 2016). Furthermore, within countries there are disparities in ANC attendance across social and geographical gradients: for instance, women in the richest income quintile are
more likely to attend ANC than those in the poorest quintile, and urban women are more likely to attend ANC than rural women (Every Woman Every Child, 2015; UNICEF, 2016).

In response, research has focused on reducing disparities in ANC access and attendance, particularly in sub-Saharan Africa (Hanson et al., 2015; Koblinsky et al., 2016; Tann et al., 2007) (Chapter 2). Recent reviews identified several barriers influencing ANC attendance for women in sub-Saharan Africa, including health service fees, transport cost and availability, spousal support, distance from home to health centre, previous experience with healthcare, cultural beliefs, input from members of a pregnant woman’s social circle, and gender norms (Downe et al., 2016; Gabrysch & Campbell, 2009; Glei et al., 2003; Kyei-Nimakoh et al., 2017). Research is limited on the ANC experiences of women from vulnerable groups in East Africa, particularly Indigenous women (Banke-Thomas et al., 2017; Stephens et al., 2006). This is an important research gap, as Indigenous women experience higher maternal mortality and poorer maternal health outcomes globally, coupled with substantial disparities in healthcare access (Ohenjo et al., 2006) and lower maternal health services use compared to non-Indigenous women (King & Gracey, 2009; Lewis, 2000; Ohenjo et al., 2006; Shah et al., 2011; UOBDU et al., 2015).

Given the disparities in ANC globally, and the complex yet poorly understood factors that impact ANC attendance patterns among Indigenous communities in East Africa, the goals of this study were to: 1) characterize ANC attendance patterns at a local hospital and 2) explore the factors influencing attendance among Indigenous Batwa and non-Indigenous Bakiga women in communities in Kanungu District, Southwestern Uganda.
Methods

Study location

The study was conducted in Kanungu District in southwestern Uganda, an area bordered by Rwanda and the Democratic Republic of the Congo (Figure 3.1). The population of Kanungu District is approximately 250,000 individuals (Uganda Bureau of Statistics, 2014); 800 Indigenous Batwa live in the District, forming less than one percent of the population (Berrang-Ford et al., 2012). The creation of the Bwindi Impenetrable National Park in 1991 led to the forced and uncompensated eviction and relocation of the Batwa population in Uganda (Lewis, 2000). As a result, the Batwa were forced to transition from their traditional hunter-gatherer livelihood to a settled agrarian-based livelihood (Berrang-Ford et al., 2012; Donnelly et al., 2016; Patterson et al., 2017). Compared to the national Ugandan average, the Batwa have lower life expectancies, and higher prevalences of child mortality, malaria, acute gastrointestinal illness, and food insecurity (Berrang-Ford et al., 2012; Clark et al., 2016; Donnelly et al., 2016; Patterson et al., 2017). Relative to the non-Indigenous Bakiga in Kanungu District, the Batwa have poorer access to food, employment, shelter, safe water, and sanitation infrastructure (Berrang-Ford et al., 2012; Clark et al., 2016; Donnelly et al., 2016; Patterson et al., 2017).

In 2003, American philanthropists founded the Bwindi Community Hospital (BCH) to address some of the health disparities in the region by providing health services to the Batwa. Currently BCH provides comprehensive primary healthcare services to a catchment area of 100,000 individuals, both Indigenous (i.e. Batwa) and non-Indigenous (e.g. Bakiga) populations. The Maternity and Family Planning department at BCH serves over 250 patients monthly, providing ANC, health education, complication screening for high risk patients, delivery
services, and a Waiting Mother’s Hostel (WMH) (providing in-hospital accommodation for women awaiting delivery) (BCH, 2014). BCH aims to provide affordable and accessible healthcare; through its community health insurance program, eQuality (introduced in 2010), non-Indigenous patients pay 10,200 UGX (approximately $2.70 USD (2018)) and Batwa patients pay 3,000UGX (approximately $0.80 USD (2018)) per year for healthcare services (Haven et al., 2018).

Between 2012 and 2017, 3,197 women delivered at BCH, averaging 24.66 years of age and 2.72 previous pregnancies (MacVicar et al., 2017). A small portion of women delivering at BCH between 2012 and 2017 were Batwa (1%) (MacVicar et al., 2017). Batwa womens’ pregnancy experiences were affected by their socio-economic disadvantage; income insecure Batwa women had little flexibility in pregnancy, were unable to stop work, and lacked assets to sell to support ANC attendance (MacVicar et al., 2017). Maternal height and birth weight, in combination with adequate nutritional uptake, (MacVicar et al., 2017), were important determinants of birthweight; the small stature characteristic of Batwa was linked to differences in birthweight observed between Batwa and Bakiga infants (MacVicar et al., 2017). Batwa women were also especially vulnerable to the adverse and unpredictable effects of seasonal variation on their pregnancy and newborn health (MacVicar et al., 2017).

Research approach

This research was guided by a collaborative, community-based approach (Blumenthal, 2011) built from existing partnerships. An EcoHealth approach, which integrates principles of participation, gender and social equity, and transdisciplinarity, guided this research (Charron, 2018).
2012). The involved research partners were BCH, the Batwa Development Programme (BDP), Makerere University, the Ugandan Ministry of Health, local researchers, and Batwa and Bakiga communities, who contributed to developing the research questions, study design, data collection, and results interpretation (Webb et al., 2010; Waltner-Toews & Kay, 2005). This approach served to produce knowledge intended to positively impact research communities involved in the project (Blumenthal, 2011).

**Data collection and analysis**

This research used a mixed-methods study design, in which quantitative and qualitative data were concurrently collected and jointly interpreted (Creswell & Clark, 2007). Quantitative hospital record data and qualitative interview and focus group discussion data were collected from June-August 2015 in Kanungu District, Uganda.

**Quantitative data collection**

One year of ANC records (April 2013-March 2014) were obtained from BCH’s maternal health department and entered in Microsoft® Excel v.1709 (Microsoft, 2016). From April 2013 to March 2014, 1,360 patients attended ANC visits at BCH for a total of 2,299 ANC visits. Data from ANC heath records included information on patient age, subcounty of residence, visit date, gravidity (the number of previous pregnancies), parity (number births to a fetus with a gestational age of 24 weeks or more), estimated delivery date, and gestational age.

**Quantitative data analysis**

Data from health records were imported into STATA® v15 (STATA Corps, USA) for analysis. The outcome variable of interest was ANC attendance, specifically whether a woman
attended four or more ANC visits, which reflects the World Health Organization’s global recommendation for ANC attendance at the time of the study (World Health Organization, 2016). A multivariable logistic regression model was built to identify how demographic factors and maternal health history were associated with attending four or more ANC visits for patients at Bwindi Community Hospital. Despite this study’s focus on Indigenous gradients in health and healthcare, quantitative results could not be stratified by ethnicity. First, univariable logistic analyses were performed to examine the unconditional association of each independent variable with the outcome; independent variables with a $p < 0.2$ were considered for inclusion in the multivariable model. The assumption of linearity was visually assessed by plotting continuous variables against the log-odds of the outcome using locally weighted scatterplot smoothing. Independent variables that did not have a linear relationship with the outcome were categorized based on biological plausibility according to evidence in the literature. Subcounties were geolocated from the Human Rights Focus database (Human Rights Focus, 2013) and cross-referenced with the national map data (Uganda Bureau of Statistics, 2012). Based on the subcounty of residence, patients were classified as living close, medium, or far from BCH. Collinearity was evaluated using Spearman’s Rank correlation, with a cutoff of $\rho = |0.80|$ (Dohoo et al., 2009). The multivariable logistic regression model was built using a manual backward elimination process. Confounding was assessed theoretically and at each step of the model-building process by determining whether the removal of a variable resulted in a 30% or greater change in the remaining regression model coefficients. In addition, a likelihood ratio test was performed to assess whether the full and reduced models were
significantly different. The final model was evaluated for fit using Pearson’s chi-squared goodness of fit test, and residuals were visually assessed (Dohoo et al., 2009).

**Qualitative data collection**

**Focus group discussions:** Qualitative data were collected using focus group discussions (FDGs) with women from Batwa and Bakiga communities, and patients at the Waiting Mother’s Hostel at BCH (Table 3.1). Self-identified women who were or had been pregnant living in Batwa and Bakiga communities were invited to participate in FGDs. Using a semi-structured discussion guide (Appendix B), we asked FGD participants to share their perspectives on ANC attendance in the region. Each FGD was conducted in Rukiga (local language) and translated into English by two local researchers who had pre-established connections with the community, alongside one Canadian-based researcher. Each FGD was audio recorded, with permission, and transcribed.

**Key informant interviews:** Key informant interviews (KIs) were conducted with healthcare providers (Table 3.1). Using a semi-structured interview guide (Appendix B), healthcare providers were asked to share their views on ANC services in the region. Interviews were conducted in the language preferred by the participant: either in English or in the Rukiga. Each KI was audio recorded, with permission, and transcribed.

A total of 16 focus group discussions (FGDs) were conducted in Batwa and Bakiga communities and at the Waiting Mother’s Hostel (16 FGDs, total n=80 individuals), and eight key informant interviews (KIs) with community members and hospital employees (8 KIs, total
n=10 individuals) (Table 3.1). The FGDs lasted a total of 661 minutes and averaged 41 minutes, and the KIs lasted a total of 344 minutes and averaged 34 minutes.

**Qualitative data analysis**

A phenomenological approach guided the qualitative data analysis, in which the researchers focused on the individual experiences of women to provide an in-depth and contextual picture of ANC experiences in Kanungu District (Green & Thorogood, 2014; Merriam, 2002). Thematic analysis using a constant comparative method was conducted to identify key themes related to ANC access (Boeije, 2002; Braun & Clarke, 2006; Guba & Lincoln, 1994). This process involved writing detailed memos during and following each FGD and KI (Birks et al., 2008), as well as research team meetings following each FGD and KI to facilitate preliminary analyses by discussing and critically reflecting on participant responses to interview questions (Creswell & Miller, 2000). All audio-recordings, transcripts, and memos were imported into NVivo© 11 to facilitate coding and theme development (Charmaz, 2006). A constant comparative method was used to identify and explore codes and themes from each interview in relation to other aspects of the interview and other interviews (Green & Thorogood, 2014). Through this process, themes and codes were expanded, collapsed, refined, adapted, and defined to depict, summarize, and contextualize participants’ ANC perspectives and experiences (Braun & Clarke, 2006; Dierckx de Casterlé et al., 2012), and a codebook was created to establish conceptual definitions for key themes (Green & Thorogood, 2014). To ensure the authenticity of the results, researchers conducted team debriefs, detailed data audit trails, ground truthing, and triangulation throughout the analysis (Creswell & Miller, 2000).
Research Ethics

McGill University and the University of Guelph Research Ethics Boards granted ethics approval for the project (REB File #461–0414). Permission to access and export health records data was approved by BCH with strict controls and protocols to maintain confidentiality of patient information. Permission to conduct FGDs and KIs was obtained from community chair person and BCH management, respectively. All participants provided informed consent to participate and audio-record the interviews or FDGs. Each FGD and KI participant was provided with a token of thanks to compensate them for their time.

Results

ANC attendance is low

Most FGD and KI participants acknowledged the importance of attending ANC. As one Batwa participant described, “it’s good to go to the hospital so you will know how the baby is”. However, many participants felt that attending the four ANC visits recommended by World Health Organization was unreasonable and/or challenging. A Bakiga woman explained, “they [healthcare providers] usually tell us to go for antenatal care, like, four times, and we find it’s too much.”

The hospital data reflected the sentiments expressed by women in the FGD s and KIs. Most patients attended between one and three ANC visits (N=1259; 92.57%), few participated in four or more visits (N=101; 7.43%) (Table 3.2). Patients’ ages ranged from 15 to 45 years, with an observed mean of 24.98 (SD: 5.89) years of age (Figure 3.2). The number of previous
pregnancies ranged from one to 17, with an observed mean of 2.95 (SD: 1.96). Patient data could not be stratified by ethnicity and was not included in the results.

**Distance to hospital is significantly associated with ANC attendance**

Each community who participated in FGDs was situated at various distances from BCH (Figure 3.3). Overall, most patients attending ANC lived relatively close to BCH (N=822; 64.98%), some lived at a medium distance (N=368; 29.09%), and few lived far (N=75; 5.92%). Participants from most communities described distance to the health centre as a major determinant of ANC attendance, which was also reflected in the quantitative results (Table 3.3). As a health care provider explained, “those who are near the catchment area – they come [for more than one antenatal visit]; people who are coming from very far, they just come to have one antenatal visit.” For example, it was difficult for Batwa participants from Kihembe (a community located far from BCH) to reach BCH, for a variety of reasons, including physical distance and the increased costs of traveling long distances. As Batwa participants from Kihembe described, “the Bwindi community hospital is very far, and sometimes we can’t afford [...] to go to BCH when we are pregnant because we can’t walk there.” In the unconditional univariable logistic regression analyses, patient’s age, number of previous pregnancies, and distance from patient’s home were significantly associated with attending four or more ANC visits. The final multivariable logistic model indicated that distance to the hospital was significantly associated with ANC attendance. Specifically, the odds of attending ANC four times or more during a pregnancy for a patient who lives at a close distance to the hospital was 7.58 times that of a patient who lives far from the hospital; the odds of attending ANC four times or more for a patient who lives at a medium distance from the hospital is 4.14 times that of a patient who lives
far from the hospital (Table 3.3). After adjusting for the effect of distance to BCH, the patient’s age and number of previous pregnancies were not significantly associated with ANC attendance. Assumptions of independence and linearity in the final model were met. Results of the Pearson $\chi^2$ goodness-of-fit test, visual assessment of predicted values, residuals, and outliers demonstrated that the model was a good fit for the data.

**Cost and availability of transport and poor road conditions influenced ANC attendance**

Participants from FGDs reported using three modes of transport to reach the health centre for ANC: walking, taking a *boda* (local motorcycle), or hiring a car. Each mode of transportation had its own unique advantages and disadvantages. Walking, for instance, was challenging and time-consuming, as described by a Batwa participant: “if you don’t have pain from pregnancy, it can take like two hours to get to the health centre on foot, and if you have pain and you are weak, you take like three hours.” Although less physically demanding, travelling by motorcycle or car was more expensive than walking; as a Bakiga participant from Kitariro describes, “we don’t have income, so we don’t have money to pay for a boda.” A healthcare provider explained that some communities are inaccessible by motorcycle, limiting ANC attendance: “sometimes there is no vehicle available, or a mother lives in a place where a boda can’t reach, whether they have money for transportation or not.” Poor road conditions (e.g. rough and hilly terrain, flooding in the rainy season) also deterred patients’ ANC attendance. Although the number of recorded visits differed slightly by month, and by season (i.e. during the dry season (N=1102; 48.10%) and the rainy season (N=1189; 51.90%) (Table 3.2), no statistically significant trends were observed.
Poor road conditions, more generally, were also identified as a barrier to ANC attendance. As described by a WMH participant, “most of the roads are not suitable for the boda”. This was re-iterated by a healthcare provider: “for some of us, it is not very far to reach the health centre, but the terrain is difficult.” The challenges posed by difficult terrain were more pronounced in the rainy season, as detailed by a healthcare provider: “it’s more difficult to get to the hospital during the rainy season because of the bad roads. There are a lot of floods and a lot of rocks possible on the roads.”

Financial constraints were an important barrier to ANC attendance

Batwa participants regularly highlighted ANC-related expenses as an important ANC barrier. As one woman explained, “we have challenges accessing the hospital when we’re pregnant because we don’t have money to go to the hospital.” The high cost of transport to get to the hospital, for instance, impacted the decision to seek care. In addition to the cost of transportation, the associated costs of ANC (e.g. accommodation, medication, food for self while at hospital, and maternal supplies) impacted attendance for many Batwa participants. Participants explained, “what can stop me from going to antenatal care, is when I don’t have money to pay,” and “when we go to the hospital, the hospital needs money, yet we don’t have money. We don’t have food to eat at the hospital.... That’s why we decide to stay home.” Lack of maternity supplies required by the hospital (e.g. clean clothing in good condition) also limited women’s ANC attendance. As explained by a healthcare provider, “when they don’t have petticoats [undergarments] or they feel embarrassed when they have old petticoats or when [healthcare providers] examine them without a petticoat […] it stops people from coming in for antenatal care.”
Both Batwa and Bakiga women were impacted by financial constraints, but Batwa women described the cost as a major and prohibitive barrier to care. Batwa women explained, “we are still very poor, and we can’t help ourselves.” Healthcare providers spoke generally of Batwa women’s spending decisions, indicating that money for ANC costs had to be spent elsewhere: “the Batwa don’t usually save. Most of their money is spent on eating food. So it’s bad, although we are trying to help them.”

**Women’s household responsibilities limited ANC attendance**

Participants explained how they were often obliged to complete home responsibilities, including manual labour for food and supervision of children. These tasks often limited ANC attendance; as one Bakiga woman explained, “we have got to look after the young ones at home, so that forces us to not attend antenatal care.” As a healthcare provider explained, “to get anything they have to go and dig. Maybe […] the mother is having her ninth pregnancy, then, she has to work and get food for the other young children.”

**Limited spousal involvement or support during pregnancy was common**

Many Batwa and Bakiga participants described a lack of spousal support during pregnancy. Women explained that “the husband’s role during pregnancy is like almost nothing;” “we have no support of our husbands;” and “our husbands are not taking part in taking care of the pregnancies.” According to several Batwa and Bakiga participants, many of their spouses were absent for most or all of their pregnancy, with some even leaving the house for years at a time: “we would not have any assistance because my husband was somewhere else,” and “sometimes a man leaves you with a pregnancy at one month […] by the time he comes back, the child is
already old. There is nothing he has helped you with.” Healthcare providers reported actively promoting spousal accompaniment to ANC. They reported that they advise the husbands to come to ANC “to health educate them both, let the husband know that the mother has been pregnant, what she’s supposed to do and not do [for a healthy pregnancy].” But healthcare providers reported that spouses generally did not accompany their wives to ANC. As one participant described, “during antenatal care, ... they [women] usually come alone,” and the spouse “just takes the role of impregnating, and does not care for you, does not help you, does not advance you, nor escort you at least one day to the antenatal care.” Some women, however, reported having some spousal support during pregnancy, especially related to childcare during ANC attendance. For instance, some WMH participants had support from their spouse or other women, which allowed them to attend ANC, “[the children] are with their father, but sometimes they have even helpers, to stay with the kids.”

Many women described a lack of autonomy in decision-making about their health; as described by a healthcare provider, “women do not have permission from their husbands [to attend ANC].” Women explained that their spouse often had “final say,” not only in health seeking decisions but in other household decisions as well (i.e. work during pregnancy, supervision of children, food preparation); as one women described, “he’s making decisions about your life, and you are educated and you’re supposed to be the person who is deciding for yourself, but, traditionally, the man is having all of the authority in the home.”

**Interactions with healthcare providers influenced ANC attendance**

Interactions with ANC healthcare providers had an impact on subsequent ANC service use
for participants. Several Batwa and Bakiga participants experienced poor treatment from healthcare providers, who “talk to us badly,” “speak to us rudely,” “are not friendly to pregnant mothers,” and “shout at us.” A Bakiga participant noted that “when we go for antenatal, the nurses abuse us.”

Participants also described how the purpose of ANC services (e.g. routine testing and procedures) were not explained to patients. This reported lack of communication, resulted in lack of understanding of service provision, and also generated fear among Batwa participants. One Batwa mother explained, “a long time ago, we used to fear going to the hospital because we had no understanding of what healthcare providers were doing. We feared to have our stomachs touched, and feared that having stomachs pressed would kill the baby.”

**ANC altered the use of traditional medicine and vice versa**

Many Bakiga and Batwa women relied on consuming and/or applying traditional herbs collected from the forest to ensure a healthy pregnancy, but participants explained that these practices did not conform with standard pregnancy care provided at BCH. For instance, as a Bakiga participant explained, “women fear to take traditional medicine because when you go to the hospital, the midwife and doctors usually know that you have taken traditional medicine and then they shout at you.”

After the eviction of the Batwa from the forest, access to traditional herbs for Batwa has been reduced. According to a Batwa participant, “we no longer get those herbs because they chased us away from the forest.” Batwa participants, thus, expressed a need to adjust their healthcare-seeking behaviour to align with that of Bakiga women: “now we are out of the forest
so we need to do things like the Bakiga are doing, so when they are pregnant it’s wise to go to the hospital." Indeed, attending ANC was described as a relatively new healthcare-seeking practice for Batwa participants:

*Nowadays we are going to the hospital for antenatal clinics, but in the past the services were not there and we were not aware of the importance of antenatal clinics. We would fear going because we thought [...] we would get abortions. But now, we are educated and know the importance of antenatal care. So, when we are pregnant, we go there.*

**Older women influenced younger womens’ ANC-seeking behavior**

Participants reported that older women and/or mothers-in-law influenced the ANC-seeking behaviour of younger women by providing advice on traditional herb use, ANC attendance, and delivery location. According to a healthcare provider: “so now those are the ones considered to be the traditional knowledge bank regarding pregnancy and health.” Younger women referred to the knowledge and advice of other women in their social circle (i.e. mother, mother-in-law, and/or grandmother) prior to, or instead of, relying on information from health centres; as a healthcare provider described, “so, when a younger girl becomes pregnant, uh, the first social reference is not a health worker facility but those women who have done it before.” In many cases, it is expected that younger women follow the advice they receive from their spouse’s mother, for example, to deliver from home instead of at a health centre; as described by a healthcare provider: “so, the mother-in-law is the one you’re staying with, it’s the one who produced your husband and when you tell her you want to go to check up, the first thing she will
Heeding the advice of other women on ANC-seeking behaviour can prevent women from attending multiple visits according to a healthcare provider, “so that [advice] ends up giving them some kind of false confidence that, the person who has been there who knows it all and then the advice they give is you can go there [ANC] once to check if everything is fine, otherwise you don’t need to.”

**Adolescent women experienced ANC differently**

Adolescent women (ages 10-19) were generally unfamiliar with ANC and/or lacked confidence at ANC visits at BCH, according to a healthcare provider: “[adolescent women] try to come, but they, it’s another group which has issues when they come for antenatal and when they come for delivery. Even when you are trying to counsel her she is like: ‘yes, yes’ to anything because she just doesn’t […] have the confidence that develops later in life.” Adolescent women experienced unique challenges in pregnancy evident to healthcare providers at ANC and delivery, primarily relating to social norms around marriage and the ability to provide maternal supplies: “the young girls, when they come to deliver, they have so many social problems, they don’t have things to use, because most of them are not married. The parents are so rough on them, the girls are so stressed.” Healthcare providers expressed concern over the high number of adolescent pregnancies at BCH (reporting that 25% of pregnant women in communities were adolescents), explaining “it’s a big number.” Participants also described adolescent ANC attendance as poor: “[adolescent women] do come to ANC, like twice.” ANC records at BCH indicated that most antenatal patients were 20-24 years of age (n=448; 32.94%), many were adolescents (n=257; 18.90%), and some were 35 years or older (n=119; 8.75%) (Table 3.2).
ANC attendance levels were lower in Kanungu District than the internationally recommended four-visit minimum: only 7.43% of Bwindi Community Hospital patients attended four or more ANC visits, and most FGD and KI participants reported below-minimum attendance. This problem is not unique to Uganda, and is prevalent across sub-Saharan Africa where only 52% of women attended four or more ANC visits (UNICEF, 2016). It was evident from the qualitative results that several barriers influenced ANC access, and socio-economic factors notably modified or exacerbated these barriers. Both Indigenous and non-Indigenous women experienced obstacles to care, but some barriers had different, or more pronounced, effects for Indigenous and adolescent women.

Interrelated barriers influencing access to ANC

Both qualitative and quantitative results revealed that a long distance from a woman’s home to the health centre generally negatively influenced ANC attendance. In rural communities in Uganda, the barrier of distance to facilities is amplified by the time lost from domestic tasks, the physical burden of reaching ANC centres, and the high cost and low availability of transport (Amooti-Kaguna & Nuwaha, 2000; Kawungezi et al., 2015; Kiguli et al., 2009; Odaga et al., 2004). Qualitative results demonstrated that in Kanungu District, no mode of transportation was universally accessible. As is the case in many rural communities in low and middle-income countries (LMICs), women are often unable to afford cars, taxis, buses, and bodas to reach ANC (Simkhada et al., 2008; Finlayson & Downe, 2013). Although travelling to ANC on foot or by bicycle are generally affordable modes of transport, the high time expenditure of both often makes a visit to a clinic for ANC impractical (Atuyambe et al., 2009; Kiguli et al., 2009; Titaley
Further, participants from FGDs were influenced by external factors while travelling to ANC, including unpredictable weather and unreliable transport. Research from LMICs confirmed that challenging topography, poor road conditions, and seasonal changes in weather, particularly in the rainy season, hinder ANC attendance in rural regions (Thaddeus & Maine, 1994; Titaley & Hunter, 2010; Finlayson & Downe, 2013). An attempt by BCH to increase hospital access by implementing a motorcycle-ambulance was unsuccessful due to the difficult terrain and unpredictable weather in the catchment area. Evidence from other rural regions of Uganda suggest that there exist effective interventions for improving transportation and reducing geographic inaccessibility, but these initiatives require substantial resources from the government or other sources (Ekirapa-Kiracho et al., 2016). Qualitative results indicated that participants’ proximity to the facility or access to transport did not guarantee ANC attendance, suggesting that addressing geographic distance as the sole barrier to accessing care may not be sufficient to improve attendance in the presence of additional barriers to access (Finlayson & Downe, 2013; Glei et al., 2003; Pariyo et al., 2011c; Finlayson & Downe, 2013).

Direct (i.e. health centre fees) and indirect costs (e.g. transport costs, clothing, soap, meal purchases, labour lost, and medication) were identified as important barriers to ANC; financial barriers limit attendance for women in other regions of East Africa as well (Anastasi et al., 2015; Gross et al., 2013). Even when maternal health services are provided for free or at a reduced rate, as is the case in many rural health centres in LMICs, ANC attendance levels remain low. This is in part due to the indirect costs and “under the table fees” (i.e. paying to reduce wait times or receive services). Results indicated that women were required to work at paid employment or subsistence activities through their pregnancies in order to afford both the direct and indirect
costs of ANC (Beckham et al., 2015; Munguambe et al., 2016; Stephenson & Elfstrom, 2012). Yet, women from LMICs who work in subsistence farming, like participants in this study, earn little and struggle to accumulate sufficient savings to pay for ANC (Anastasi et al., 2015; Gabrysch & Campbell, 2009; Odaga et al., 2004). Addressing the large gap in ANC attendance between rich and poor is an international priority guiding the development of healthcare initiatives globally (World Health Organization, 2015). Gaps in ANC attendance between poor (Bakiga) and very poor (Batwa) patients were identified in this study, demonstrating that inequity in access to ANC is realized at multiple socio-economic scales. Avenues to address the challenges facing low-income women might start with increasing employment and income-generating opportunities for women (Sigalla & Carney, 2012).

Understanding the complex influences on ANC-seeking behaviour

No significant relationship between the number of previous pregnancies or patient’s age on the number of ANC visits was identified in quantitative results, despite evidence in the literature that a woman’s pregnancy history and age are important factors in maternal healthcare-seeking (Gabrysch & Campbell, 2009; Glei et al., 2003). Qualitative results suggest a complex relationship between these factors. For example, younger and older women reported unique influences, perceptions and pregnancy experiences that impacted the way they perceived the value of ANC. Other studies described similar results across age groups (Bbaale, 2011; Gabrysch & Campbell, 2009; Kyei-Nimakoh et al., 2017). Qualitative evidence from this study and the literature suggest that many older women’s decisions against attendance were founded on beliefs that their accumulated experiences were adequate to ensure a safe and successful pregnancy (Navaneetham et al. 2002; Simkhada et al., 2008). However, older women and those with a high
number of previous pregnancies are at an increased biological risk for complications in pregnancy, also making them more likely to require ANC services (Bbaale, 2011; Gabrysch & Campbell, 2009).

Batwa FGD participants who were pregnant for the first time reported being more likely to attend ANC, as they reported feeling reassured receiving health advice from a professional healthcare provider. This pattern was not unique to the Batwa; research shows that first time mothers are driven to seek care due to inexperience with pregnancy, familiarity with Western medical care, and health initiatives targeting this group (Gross et al., 2012; Turyasiima et al., 2014). However, unmarried adolescent women in this study were less likely to seek ANC due to unfamiliarity with healthcare services, a lack of understanding of the pregnancy process, and a fear of social stigma. Global research confirms that adolescent women may experience social stigmatization by peers, family members, and healthcare providers when seeking ANC (Atuyambe et al., 2008, 2009; Kyei-Nimakoh et al., 2017; Rai et al., 2013; Reynolds et al. 2006). Indeed, despite being deemed a priority population by international organizations (i.e. World Health Organization), providing appropriate ANC to adolescents remains a crucial international challenge (Banke-Thomas et al., 2017; Barros et al., 2012; Kyei-Nimakoh et al., 2017; Victora et al., 2005; World Health Organization, 2015). Special programming and targeting is likely needed to meet the needs of pregnant adolescents (Callahan et al., 2017; Gross et al., 2012); indeed, targeted programs in LMICs have been successful but large scaling is needed to reach all adolescents, particularly in rural areas (Hainsworth et al., 2014; Salam et al., 2016; World Health Organization, 2015).
Beyond a woman’s individual decision to seek ANC, the realization of her decision can be strongly influenced by her social sphere (mothers-in-law, peers, family members, spouse, and community health providers) (Munguambe et al., 2016; Simkhada et al., 2010); household responsibilities (e.g. childcare, income earning, food provision, chores) (Mseu et al., 2014; Munguambe et al., 2016); and autonomy (ability to make independent health decisions) (Amooti-Kaguna & Nuwaha, 2000; Atuyambe et al., 2009; Gross et al., 2013). ANC programs may be able to leverage existent social networks as a powerful way to disseminate information and awareness of ANC services, and in turn promote future health service use (Deri, 2005). Although spousal support during pregnancy has been encouraged and there is evidence that it improves access to health services and ANC attendance (Mangeni et al., 2012; Sileo et al., 2016), results suggested that spousal involvement in pregnancy was uncommon. Qualitative results indicated that the impact of spousal absence was more pronounced for Batwa women, potentially providing another confounding factor that might contribute to lower ANC attendance rates. Shared household decision-making and increasing women’s autonomy has been shown to positively influence ANC attendance and promote maternal health services use globally (Adjiwanou & LeGrand, 2014; Gabrysch & Campbell, 2009; Tarekegn et al., 2014; Woldemicael, 2010). Evidence from this study and the literature suggest that promotion of shared household responsibilities and decision-making in Kanungu District may be more effective than focusing solely on spousal involvement to ultimately increase ANC attendance.

**Provider impacts on ANC attendance**

Patient-provider interactions lay the foundation for the quality of ANC that women receive, as well as their likelihood of returning for future visits (Amooti-Kaguna & Nuwaha, 2000;
Gabrysch & Campbell, 2009; Kiguli et al., 2009; Mannava et al., 2015). Many participants expressed fear, apprehension, and distrust about attending ANC, which stemmed from poor interactions with healthcare providers at previous ANC visits; these experiences were more pronounced for Indigenous and adolescent participants. Many women in the FGDs also experienced poor patient-provider interactions during ANC visits due to their cultural practices (e.g. use of traditional herbs in pregnancy). Globally, formal healthcare systems have a poor history of incorporating traditional knowledge and practices in ANC care provision (Finlayson & Downe, 2013; Gabrysch & Campbell, 2009). There is a significant need to prioritize cultural safety and respect in healthcare provision, particularly for Indigenous women whose ANC attendance levels are low (Gracey & King, 2009; Shah et al., 2011). Thus it is essential that services provided at ANC appointments are appropriate, respectful, inclusive, and provide a safe, private environment in which the patient feels valued and respected (World Health Organization, 2016). The benefits of improved care provision are far-reaching; evidence from LMICs demonstrated that women are willing to attend perceived high-quality health centres to receive ANC, and that one woman’s positive ANC experience may increase attendance among other women (Paudel et al., 2015; Srivastava et al., 2015). The broader maternal health community has recognized the importance of these dynamics, reflected in recent World Health Organization recommendations intended to improve patient-provider interactions and in turn ameliorate perceptions of ANC services and promote future healthcare use (Mannava et al., 2015; World Health Organization, 2016). However, there is a lack of research on the ANC experiences of Indigenous women in East Africa (Chapter 2). The development of culturally-appropriate
strategies to address health inequities requires increased effort to understand the experiences and perspectives of Indigenous women (Greenwood & De Leeuw, 2012).

**Conclusion**

This study aimed to identify and describe the factors influencing antenatal care attendance for Indigenous Batwa and non-Indigenous Bakiga women in Kanungu District, Uganda. The persistence of low ANC attendance levels indicates that the barriers to ANC access are not yet well understood or are not properly prioritized or addressed, particularly for marginalized women such as the Batwa and adolescents. Continued efforts are needed to increase the autonomy and decision-making power of women to improve access to healthcare generally and to ANC specifically. Participatory programs that actively engage local women and community members in the planning of local ANC services should be promoted in communities such as Kanungu District. This research and further qualitative research focused on marginalized women can inform the efforts of local health centres such as BCH to improve ANC attendance, for example by increasing healthcare staff training and community outreach efforts (BCH, 2015). This research contributes to the collective body of knowledge on ANC access, and can ultimately help to enhance global efforts to achieve equitable, accessible ANC for every woman, everywhere.

**References**

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strategies to increase male involvement in women’s reproductive health services in rural Uganda. Journal of Health Psychology.


### Tables

Table 3.1 Description of participants involved in focus group discussions and key informant interviews conducted during the qualitative data collection period (June-August 2015) in Kanungu District, Uganda.

<table>
<thead>
<tr>
<th>Focus Group Discussion Participants</th>
<th>Batwa (n)</th>
<th>Non-Batwa (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>32</td>
<td>64</td>
</tr>
<tr>
<td>Waiting Mother’s Hostel</td>
<td>1</td>
<td>23</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Informant Interview Participants</th>
<th>Batwa (n)</th>
<th>Non-Batwa (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td>N/A</td>
<td>9</td>
</tr>
<tr>
<td>Community</td>
<td>N/A</td>
<td>1</td>
</tr>
</tbody>
</table>
### Table 3.2  Descriptive summary of quantitative antenatal care data from healthcare records at Bwindi Community Hospital, Uganda (April 2013 to March 2014).

<table>
<thead>
<tr>
<th>Hospital Specific Data</th>
<th>N. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of women&lt;sup&gt;4&lt;/sup&gt; attending antenatal care per month</strong></td>
<td></td>
</tr>
<tr>
<td>January</td>
<td>196 (8.56)</td>
</tr>
<tr>
<td>February</td>
<td>174 (7.59)</td>
</tr>
<tr>
<td>March</td>
<td>213 (9.3)</td>
</tr>
<tr>
<td>April</td>
<td>176 (7.68)</td>
</tr>
<tr>
<td>May</td>
<td>200 (8.73)</td>
</tr>
<tr>
<td>June</td>
<td>154 (6.72)</td>
</tr>
<tr>
<td>July</td>
<td>218 (9.52)</td>
</tr>
<tr>
<td>August</td>
<td>202 (8.82)</td>
</tr>
<tr>
<td>September</td>
<td>189 (8.25)</td>
</tr>
<tr>
<td>October</td>
<td>209 (9.12)</td>
</tr>
<tr>
<td>November</td>
<td>202 (8.82)</td>
</tr>
<tr>
<td>December</td>
<td>158 (6.9)</td>
</tr>
<tr>
<td><strong>Number of women attending antenatal care by season (N=2291)</strong></td>
<td></td>
</tr>
<tr>
<td>Dry (Dec-Feb and Jun-Aug)</td>
<td>1102 (48.1)</td>
</tr>
<tr>
<td>Rainy (Mar-May and Sept-Nov)</td>
<td>1189 (51.9)</td>
</tr>
<tr>
<td><strong>Number of women attending antenatal care at the time intervals of gestational age recommended by the focused antenatal care model guidelines&lt;sup&gt;5&lt;/sup&gt; (N=2208)</strong></td>
<td></td>
</tr>
<tr>
<td>Attended visit 1 on schedule</td>
<td>33 (1.49)</td>
</tr>
<tr>
<td>Attended visit 2 on schedule</td>
<td>690 (31.25)</td>
</tr>
<tr>
<td>Attended visit 3 on schedule</td>
<td>508 (23.01)</td>
</tr>
<tr>
<td>Attended visit 4 or more on schedule</td>
<td>977 (44.25)</td>
</tr>
<tr>
<td><strong>Patient-specific data</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Number of visits attended per pregnant woman (N=1360)</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>832 (61.17)</td>
</tr>
<tr>
<td>2</td>
<td>256 (18.82)</td>
</tr>
<tr>
<td>3</td>
<td>171 (12.57)</td>
</tr>
<tr>
<td>1–3</td>
<td>1259 (92.57)</td>
</tr>
<tr>
<td>≥ 4</td>
<td>101 (7.43)</td>
</tr>
<tr>
<td><strong>Reported age of pregnant woman at visit (N=1314)</strong></td>
<td></td>
</tr>
<tr>
<td>&gt; 20</td>
<td>257 (18.9)</td>
</tr>
<tr>
<td>20-24</td>
<td>448 (32.94)</td>
</tr>
<tr>
<td>25-29</td>
<td>317 (23.31)</td>
</tr>
<tr>
<td>30-34</td>
<td>173 (12.72)</td>
</tr>
<tr>
<td>≥ 35</td>
<td>119 (8.75)</td>
</tr>
<tr>
<td><strong>Reported number of previous pregnancies (including current) per pregnant woman at visit (N=1348)</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>382 (28.34)</td>
</tr>
</tbody>
</table>

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<sup>4</sup> Number of women is a total of Batwa and Bakiga women. Despite its focus on Indigenous gradients in health and healthcare, quantitative results could not be stratified by ethnicity.

<sup>5</sup> The World Health Organization’s recommendations for a healthy pregnancy (World Health Organization, 2016) recommend the following schedule for antenatal care contacts: visit 1 occurs at 8-12 weeks, visit 2 is 24-26 weeks, visit 3 is 32 weeks, and visit 4 is 36-38 weeks.
6 Communities were geolocated from the Human Right Focus database (Humans Rights Focus, 2013) and cross referenced with national map data (Uganda Bureau of Statistics, 2012). These were categorized as close, medium and far.
Table 3.3 Results of the multivariable logistic regression evaluating factors impacting the odds of attending 4 or more ANC visits for patients at Bwindi Community Hospital in Bwindi, southwestern Uganda (April 2013-March 2014).

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Odds Ratio</th>
<th>p-value</th>
<th>95 % Confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maternal age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-24</td>
<td>Ref.</td>
<td>0.840</td>
<td>0.54-2.12</td>
</tr>
<tr>
<td>25-29</td>
<td>1.48</td>
<td>0.308</td>
<td>0.69-3.17</td>
</tr>
<tr>
<td>30-34</td>
<td>1.30</td>
<td>0.594</td>
<td>0.48-3.49</td>
</tr>
<tr>
<td>≥ 35</td>
<td>1.35</td>
<td>0.586</td>
<td>0.45-4.10</td>
</tr>
<tr>
<td><strong>Previous pregnancies, including current</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Ref.</td>
<td>Ref.</td>
<td>Ref.</td>
</tr>
<tr>
<td>2</td>
<td>1.42</td>
<td>0.275</td>
<td>0.75-2.70</td>
</tr>
<tr>
<td>3</td>
<td>1.25</td>
<td>0.538</td>
<td>0.60-2.58</td>
</tr>
<tr>
<td>≥ 4</td>
<td>0.81</td>
<td>0.623</td>
<td>0.36-1.825</td>
</tr>
<tr>
<td><strong>Distance from home to hospital</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Far</td>
<td>Ref.</td>
<td>Ref.</td>
<td>Ref.</td>
</tr>
<tr>
<td>Medium</td>
<td>4.14</td>
<td>0.160</td>
<td>0.54-31.56</td>
</tr>
<tr>
<td>Close</td>
<td>7.58</td>
<td>0.046</td>
<td>1.03-55.65</td>
</tr>
</tbody>
</table>
Figure 3.1 Map of communities in Bwindi Region, Kanungu District, southwestern Uganda.
Figure 3.2  Age of hospital of patients attending Bwindi Community Hospital for 1-3 antenatal care visits or 4 or more antenatal care visits in Uganda (April 2013-March 2014).
Figure 3.3 Distance from hospital of patients attending Bwindi Community Hospital for 1-3 antenatal care visits or 4 or more antenatal care visits in Uganda (April 2013-March 2014).
CHAPTER FOUR

SUMMARY OF RESEARCH FINDINGS, RECOMMENDATIONS, AND CONCLUSION

Summary of Research

This thesis presented an overview of the global antenatal healthcare (ANC) literature (Chapter One), and through two research studies, explored various factors which influence ANC attendance. The first study (Chapter Two) systematically mapped the extent, range, and nature of the literature on ANC in East Africa. The second study (Chapter Three) examined ANC attendance of Indigenous Batwa and non-Indigenous Bakiga women in Kanungu District, southwestern Uganda. Specifically, ANC attendance levels at the local health centre were characterized and influential barriers to attendance were identified.

An overview of the global ANC literature, presented in Chapter One, highlighted the need to improve access to key maternal health services for women worldwide, and particularly those in low and middle income countries, where maternal mortality levels are highest. While the global community has recognized the need to address the current high number of maternal deaths, by historically including ‘improving access to health care’ as a target in large scale development efforts like the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs), further progress is needed to reduce access inequalities faced by many populations. A summary of the main ANC barriers facing women in sub-Saharan Africa was presented, supplemented with evidence that women from vulnerable groups face more pronounced barriers and experience ANC differently. Evidence from the global literature
confirms that a better understanding of the ANC experiences of groups who are at higher risk is needed to address the underlying inequities in access.

An in-depth examination of the ANC literature on barriers facing East African women then presented in Chapter Two. A multi-step scoping review was conducted to summarize trends, identify gaps, and critically explore the ANC attendance literature for East Africa during the MDG period (Chapter Two). A research question and search string were developed, a systematic literature search was conducted, relevant studies were identified, data were charted, and results were collated, summarized and reported.

Since the launch of the MDGs in 2000, a significant increase in the number and range of publications on ANC in East Africa was documented. The identified studies (n=211) spanned nearly all countries of East Africa, utilized a variety of evidence and study methods, included the perspectives of members of different social groups, and presented a range of ANC barriers. The literature documented several intersecting barriers experienced by women in East Africa, including those affecting the decision to seek care, reaching the health centre, and receiving adequate care. Physical barriers limiting the decision to seek care included long distances, high cost and low availability of transport, poor road conditions, and the unequal distribution of facilities, while socio-cultural factors like financial constraints, a woman’s household obligations, previous experience with the healthcare system, and advice from social peers and family members negatively or positively impacted attendance. Future research should consider and account for the intersectionality of attendance barriers, as well as the interacting role of poverty, gender inequity, and patient experiences on ANC seeking behaviour.
Our review identified a gap in global literature focusing on vulnerable groups (i.e. women with disabilities, adolescent women, and Indigenous women), many of whom have lower ANC attendance, and experience different and/or more pronounced social barriers to ANC than the general population. Increased efforts are needed to include the voices of vulnerable populations in research and development of global targets, particularly since these populations are identified as a specific priority group in the SDGs.

Building from the scoping review, we then examined ANC attendance of Indigenous Batwa and non-Indigenous Bakiga women in Kanungu District, southwestern Ugandan in Chapter Three. Quantitative analysis indicated that attendance levels at Bwindi Community Hospital (BCH) were lower than the nationally recommended minimum (only 7.43% of patients attended all four visits), and that increased distance to the hospital was associated with lower odds of attending four visits. Qualitative analysis identified several barriers to ANC attendance affecting women, including long distances, high costs, lack of autonomy in decision-making, and poor interactions with healthcare providers. Adolescent and Indigenous women experienced different or more pronounced barriers to care which were exacerbated by socio-economic factors (i.e. less reliable income source, social stigma).

Many of the ANC barriers identified in this study intersected to influence attendance. For instance, the high costs of attending ANC was not limited to health centre fees; instead, the associated costs of transport, maternal supplies, food, and work time lost also impacted the decision to seek care. Efforts to reduce the cost barrier in low and middle income countries (i.e. by implementing reduced healthcare fees and transport voucher programs) have had some
success, but further efforts are needed. While both Bakiga and Batwa women relied on inconsistent employment opportunities for income, Batwa women’s relatively low socio-economic status and reduced access to stable employment opportunities limited attendance. As such, we suggest that addressing a sole barrier to ANC may not be sufficient to improving attendance in the presence of additional barriers.

Our qualitative research revealed underlying complexities in factors influencing attendance, particularly among vulnerable groups whose personal ANC experiences are not well understood. Social stigmatization from peers, family members, and healthcare providers markedly deterred attendance for adolescent and Indigenous women, pointing to the importance of providing informed and specialized care. Special programming and tailored ANC service provision for vulnerable groups could boost attendance and improve maternal health outcomes. Further, improving patient-provider interactions at ANC visits for all women through appropriate and personalized care remains a priority, as many participants felt that their negative experiences dissuaded future healthcare use.

Nearly all the barriers identified in this study confirmed and expanded on those examined in the ANC literature and are accordingly prioritized in global development goals like the SDGs. However, achieving universal healthcare access will require increased efforts to understanding the unique and pronounced barriers experienced by adolescent and Indigenous women. Ideally, improved understanding of vulnerable populations will effectively inform healthcare interventions that provide appropriate, contextualized, and well-targeted ANC on a global level.
Recommendations

Based on the scoping review examining the breadth of literature on ANC attendance in East Africa (Chapter Two), and the study of the attendance in southwestern Uganda (Chapter Three), the following recommendations are made:

**Recommendations for health policy makers**

- **Incorporate patient feedback in health service delivery:** Batwa and Bakiga women’s concerns about ANC services were not communicated to local health centres because no communication channel existed. Efforts to establish communication channels (e.g. patient feedback surveys) and develop sustainable communication strategies (e.g. ongoing community sharing sessions) between patients and healthcare providers are necessary to improving ANC service quality and uptake. Central to the SDGs is the concept of ‘inclusion’ of all voices in policy development and implementation (United Nations, 2015b), confirming the importance of incorporating community members’ perspectives in healthcare service provision interventions.

- **Integrate local values in ANC service provision:** The healthcare seeking behaviours of Batwa and Bakiga women were shaped by socio-cultural identities and values (e.g. local traditional views on pregnancy and care) (Chapter Three) borne of a unique history, geography, and culture. Women who were actively engaged in local health program development, through community-mobilization and participatory research projects, can contribute valuable perspectives on ANC seeking behaviours (Ekirapa-Kiracho et al., 2016; Finlayson & Downe, 2013; World Health Organization, 2016). Accounting for the local community context is an key component of health program design and
implementation, as reflected in the SDGs (United Nations, 2015b). As such, efforts to develop and implement culturally-appropriate strategies to improve healthcare access are an important step forward for healthcare provision (Greenwood & De Leeuw, 2012).

- **Implement cost-reduction initiatives**:Mitigating the important financial barriers to ANC that were identified in Chapters Two and Three has the potential to improve ANC attendance in Kanungu District. Cost-mitigating ANC initiatives (e.g. user fee reduction programs, income-generating projects, community saving schemes, travel vouchers, and cash incentives) could be targeted towards low-income women (Ganle, 2016; O’Donnell, 2007; Okal et al., 2013). Women who are most limited by the effects of poverty (e.g. food insecurity and employment insecurity) often tend to be the least healthy, and thus have the most to benefit from effective cost-reduction initiatives (O’Donnell, 2007; Varcoe et al., 2013).

- **Increase healthcare provider training**: Women in Kanungu District preferred interacting with knowledgeable and considerate ANC providers (Chapter Three). Investing in skills training opportunities for healthcare providers (e.g. in-service training, distance learning, career development, and mentorship opportunities) will be an important step forward in addressing women’s pregnancy needs and promoting future service use (World Health Organization, 2016). The quest for universal access to health care, a SDG goal, counts on effective healthcare provision by workers across the health system, meaning that recruitment, development, and training of healthcare workers are needed (Fairall & Bateman, 2017).

**Recommendations for researchers**
• **Improve scope and quality of ANC research:** Inconsistent quality, scope, and accessibility of data contributes to research gaps in East African ANC research (Chapter Two). Research informs health policy development by identifying priority populations, areas for improvement, and future research (Friberg et al., 2010). Improvements to data quality (e.g. collecting relevant healthcare determinants like demographic variables) and subsequent analysis increase research validity and relevance (World Health Organization, 2016). An aim of the SDGs is to increase availability of high-quality, timely, and reliable data relevant to each country (United Nations, 2015) (i.e. by establishing national registration and vital statistics systems), which can inform decision making and accountability (Chou et al., 2015). Ideally, research results founded in high-quality, country-specific, and contextualized data can motivate effective ANC interventions (Friberg et al., 2010).

• **Increase Indigenous representation:** Knowledge of ANC experiences of Indigenous women in East Africa is lacking (Chapter Two); but, the available evidence suggests that these women experience pronounced health inequities (Chapter Three) (Mohindra, 2017). Since the SDGs pledge to identify and address barriers faced by vulnerable groups in access to services and opportunities (Razum et al., 2018; United Nations, 2015), more of the experiences of Indigenous women must be heard and included in research. Collaborating with Indigenous communities and established local agencies (e.g. non-governmental organizations) is critical to appropriately document existent knowledge (Mohindra & Labonté, 2010; Stephens et al., 2006). Collaborative development of health initiatives can generate health interventions which are culturally-
appropriate and relevant to the community (Mohindra, 2017). Ideally, representative research will have positive implications for Indigenous women worldwide.

**Conclusion**

Inclusion of Indigenous voices is essential to achieve the SDGs; addressing inequities in access to high quality healthcare requires a focus on understanding the experiences of these populations. This thesis contributed to the literature on ANC attendance in East Africa, and was the first to explore the experiences of Batwa and Bakiga women in Uganda. Despite a recognition of adolescent and Indigenous women as priority populations, they remain poorly represented in the East African ANC literature. Addressing this gap in knowledge through effective research is crucial, because current evidence shows that these groups experience poorer maternal health outcomes than the general Ugandan population. Long identified barriers, including long distances, high costs, lack of autonomy in decision-making, and poor interactions with healthcare providers, continue to prevent Indigenous Batwa and non-Indigenous Bakiga communities from attending ANC. Further, these barriers were more pronounced among Batwa women, indicating the presence of inequitable access to ANC services in Kanungu District. This important finding is intended to inform the development of relevant and effective ANC initiatives. By engaging in community-based mixed methods research that prioritizes the needs and perspectives of all women, global efforts like the SDGs will be better able to implement meaningful and sustainable ANC health initiatives.


12. Mohindra, K. S., & Labonté, R. (2010). A systematic review of population health interventions and Scheduled Tribes in India. BMC Public Health, 10(Figure 1), 1–10.


Appendix A. The data extraction tool used to extract relevant information from studies on antenatal care access in East Africa.

<table>
<thead>
<tr>
<th>Extraction Question</th>
<th>Data Extraction Responses and Notes*</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the year of publication?</td>
<td>2000 to 2016.</td>
</tr>
<tr>
<td>In what continent are the authors located?</td>
<td>Africa, Asia, Europe, Latin America &amp; Caribbean, North America, Oceania.</td>
</tr>
<tr>
<td>From what institution are each contributing author?</td>
<td>Academia – university, college, research institute, medical department, or nursing school; Government – local, regional, national, or international government organization e.g. Ministry of Health; Health – clinic, hospital, or health centre; Non-governmental organization.</td>
</tr>
<tr>
<td>What language is used?</td>
<td>English or French.</td>
</tr>
<tr>
<td>In which East African country was the study conducted?</td>
<td>Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mayotte, Mozambique, Réunion, Rwanda, Seychelles, Somalia, South Sudan, Tanzania, Uganda, Zambia, and Zimbabwe.</td>
</tr>
<tr>
<td>What is the reported 'study type'?</td>
<td>Qualitative – Uses qualitative methods; conducts interviews and focus groups; Quantitative – Uses quantitative methods; uses hospital records, participant observation, household data, data from a demographic health survey; Mixed methods – uses both quantitative and qualitative methods.</td>
</tr>
<tr>
<td>What is the reported 'study design'?</td>
<td>Case control, cohort, descriptive, longitudinal, intervention, cross-sectional, and quasi-experimental.</td>
</tr>
<tr>
<td>What is the reported 'research approach'?</td>
<td>Community-based, facility-based, population-based, community-based, and participatory.</td>
</tr>
</tbody>
</table>
**In what category were the participants and population identified?**

- Participant - adolescent (less than 18 years of age), baby/child, community leader, community member, elderly, government staff, healthcare leader/supervisor, healthcare worker, health facility, husband, man, non-governmental organization representative, patient, traditional birth attendant or midwife, wife, and woman;

- Population - disabled, vulnerable, at-risk, post-conflict, remote, rural, semi-urban, informal settlement, urban, and other.

**What was the data source used?**

- Data source – community or village, household, focus group, hospital records, interview, participant observation, questionnaire or survey, and other.

**When were the data collected?**

- Start - 1990-2015
- End – 2000-2015

**What word was used to describe healthcare service?**

- Antenatal, birth preparedness, maternal, obstetric, perinatal, pregnancy, prenatal, or other.

**What factors of antenatal healthcare access were addressed in the study?**

- Acceptance of maternal health, adequacy of hospital services, adequacy of referral systems, affordability of health services, antenatal care decision-making, awareness of healthcare services, cost of hospital services, cost of transportation, distance to healthcare centre, domestic abuse, experience at a hospital, facilities and medical supplies, family planning decisions, fear and apprehension, financial implications, HIV testing and awareness, levels of healthcare, malaria testing and awareness, male involvement in pregnancy, media and communication tools, patient registry and records, physical geography, previous experience of healthcare, regional differences, requirement to support children, roads and infrastructure, role of family, role of traditional knowledge and skills, seasonality, services outside hospital, social stigma, socio-economic and demographic characteristics, spousal support, staff training, timing of use of antenatal care, treatment from healthcare worker, trust in healthcare services, type of resident, women’s status, or other.

*Responses to screening questions are not mutually exclusive.*
Appendix B. The semi-structured focus group interview guide used to conduct focus group discussions with participants.

**Opening**

- Introductions of ourselves, family histories, picture sharing
- Reminder introduction of IHACC project
- Brief overview of the current study
- Invitation for questions prior to beginning the interview

<table>
<thead>
<tr>
<th>Topic</th>
<th>Questions</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background</strong></td>
<td>How many children do you have? How many times have you been pregnant?</td>
<td>Do you keep track of length of your pregnancy (e.g., by estimating the date of your last period, counting weeks or months)?</td>
</tr>
<tr>
<td><strong>Pregnancy Experiences</strong></td>
<td>How do you know you are pregnant?</td>
<td>Do you go to the hospital or clinic when you are pregnant?</td>
</tr>
<tr>
<td></td>
<td>Do you go to the hospital or clinic when you are pregnant?</td>
<td>What makes you seek care when you are pregnant?</td>
</tr>
<tr>
<td></td>
<td>How far is it to get to the hospital or clinic? How do you get there?</td>
<td>How far is it to get to the hospital or clinic? How do you get there?</td>
</tr>
<tr>
<td></td>
<td>How do you pay for transport to the hospital?</td>
<td>How do you pay for transport to the hospital?</td>
</tr>
<tr>
<td></td>
<td>Do you attend antenatal care? Where? How many times have you attended?</td>
<td>Do you attend antenatal care? Where? How many times have you attended?</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
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<tr>
<td>What makes it hard to attend antenatal care? Why do you attend or not attend?</td>
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<tr>
<td>What helps you personally to stay healthy when you are pregnant?</td>
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<tr>
<td>During pregnancy, what helps to ensure your baby is healthy when they are born?</td>
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<tr>
<td>How do you know that your pregnancy is going well? That it is not going well?</td>
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<tr>
<td>What do you eat when you are pregnant? Is this different from what you eat when you are not pregnant?</td>
<td>Does this change in rainy season? What about during harvest season?</td>
<td></td>
</tr>
<tr>
<td>What kinds of physical work do you do when you are pregnant? Is this different from what you do when you are not pregnant?</td>
<td>Does this change in rainy season? What about during harvest season?</td>
<td></td>
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<tr>
<td>Does your husband help during pregnancy?</td>
<td></td>
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<tr>
<td>Do you do anything to avoid getting sick while you are pregnant that you don’t normally do? To avoid malaria?</td>
<td>Does this change in rainy season?</td>
<td></td>
</tr>
</tbody>
</table>
Would you want to do anything differently the next time you are pregnant?

Do you consume alcohol? Do you consume alcohol during pregnancy? Is there any difference in babies born when the mother has been drinking alcohol?

Do you smoke? Do you smoke during pregnancy? Is there any difference in babies born when the mother has been drinking alcohol?

<table>
<thead>
<tr>
<th>Childbirth experience</th>
<th>Where did you give birth?</th>
<th>Why did you choose to give birth there? Would you have given birth elsewhere if the weather was different?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Do more people give birth in the hospital now than before? Why?</td>
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<td>Did anyone assist you in giving birth? If so, who? Why did you seek assistance from this person?</td>
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<td>Do women use herbs? Where do they get them?</td>
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<td></td>
<td></td>
<td>How do you know when you’ve been bewitched? Who would bewitch you?</td>
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<td></td>
<td></td>
<td>What advice would you give to a pregnant woman who cannot</td>
</tr>
</tbody>
</table>
get to the hospital for antenatal care? For delivery?

What advice would you give to a PG mother?

**Seasonality**

Are there more babies born at certain times of year? Are babies that are born healthier in certain seasons?

Is it harder to get to the hospital in one season or the other? Why?

---

**Closing**

Invitation for questions or closing comments.

Thank you very much for your time and knowledge, we sincerely appreciate your help.
Appendix C. The key informant semi-structured interview guide used to conduct key informant interviews with participants.

**Opening**
- Reminder introduction of IHACC project
- Brief overview of the current study
- Invitation for questions prior to beginning the interview

<table>
<thead>
<tr>
<th>Topic</th>
<th>Questions</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background and experience</strong></td>
<td>What is your name?</td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td>What is your job?</td>
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<tr>
<td></td>
<td>How many years have you been in this position at BCH?</td>
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<tr>
<td></td>
<td>Do you interact with Batwa in your position?</td>
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<tr>
<td><strong>Maternal and infant health status</strong></td>
<td>What are the primary health concerns for pregnant women in the region during pregnancy? At delivery?</td>
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<td></td>
<td>Who is at the most risk for adverse birth outcomes/SGA births?</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>What is the role of the ANC system at BCH?</td>
<td>Why do mothers attend ANC? What are some reasons that a mother does not attend?</td>
</tr>
<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Pregnancy Experience</strong></td>
<td>Do many women attend antenatal care? Do they attend all of their visits?</td>
<td></td>
</tr>
<tr>
<td>What makes it hard for women to attend antenatal care? How does the hospital address this?</td>
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<tr>
<td>Does antenatal care attendance differ between Batwa and Bakiga? How so?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Why do you think these differences exist?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Delivery location</strong></th>
<th>Who gives birth at the hospital? Who doesn’t?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why would a woman choose to give birth in the hospital instead of at home? Why at home instead of at the hospital?</td>
<td></td>
</tr>
<tr>
<td>What is the community perception of giving birth at the hospital vs. at home?</td>
<td></td>
</tr>
<tr>
<td>Who decides where a woman will give birth (herself, partner, other family member, etc.)?</td>
<td></td>
</tr>
<tr>
<td>Who accompanies women to the hospital to give birth (herself, partner, other family member, etc.)?</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Birth Culture</strong></th>
<th>Do birth practices differ between Batwa and Bakiga? How so?</th>
<th>Do these practices make for safer or less safe births?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why do you think these differences exist?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there traditional birth practices in the region?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do birth practices differ between Batwa and Bakiga? How so?</td>
<td></td>
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</tr>
<tr>
<td>Seasonal and meteorological drivers</td>
<td>How might births in the hospital be affected by climate change (heavier rains, higher temperatures)?</td>
<td>Through what mechanism would it affect them?</td>
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<tr>
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<td>------------------------------------------------------------------------------------------------</td>
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<tr>
<td></td>
<td>How might births at home be affected by climate change (heavier rains, higher temperatures)?</td>
<td>Through what mechanism would it affect them?</td>
</tr>
<tr>
<td></td>
<td>Does the typical diet for a woman change when she is pregnant? How does it change from wet to dry/harvest to hunger season?</td>
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<tr>
<td></td>
<td>What is the typical physical workload like for a pregnant woman? Is this different from when she is not pregnant?</td>
<td></td>
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<tr>
<td></td>
<td>What do women do to avoid getting sick during pregnancy (e.g., malaria prophylaxis, traditional medicines, etc.)?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are there times of year when you notice more adverse birth outcomes? When? Why? Does weather affect birth outcomes (heavy rain, wind, drought, high temperatures, etc.)?</td>
<td>During rainy season? Dry season? Harvest/hunger?</td>
</tr>
<tr>
<td></td>
<td>Do you think birth outcomes are improving over time?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have you noticed any changes in the practices of pregnant women in the last few decades? What do you think is driving these changes?</td>
<td></td>
</tr>
</tbody>
</table>
Validating
LMP (specific to OB nurses/doctors)

How accurate are records of last menstrual period (LMP)? Who determines it/records it?

Closing
Invitation for questions or closing comments.

Thank you very much for your time and knowledge, we sincerely appreciate your help. If you would like we can contact you once the results are complete. Would you like us to follow-up with you?