

**Vaccinating pregnant women: Exploring midwife's
perspectives regarding vaccination in pregnancy in the
Waterloo-Wellington Region.**

by

Michelle Simeoni

A thesis

presented to the University of Waterloo

in fulfillment of the

thesis requirement for the degree of

Master of Science

in

Public Health and Health Systems

Waterloo, Ontario, Canada, 2018

Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Background: Within the Canadian context midwives play a crucial role in providing prenatal care for pregnant women and this encompasses vaccine recommendations. Although administration of vaccines is outside midwives' scope of practice, they are considered important in discussing and recommending vaccines, as their medical advice is highly trusted and valued by patients. Vaccination of pregnant women is critical because risk of influenza related morbidity and mortality increases during pregnancy. Despite strong recommendations by medical and public health bodies such as NACI since 2007, influenza vaccine uptake amongst pregnant women remains sub-optimal and well below the recommended target of 80 percent. Prior to the H1N1 pandemic it was estimated that approximately 15% of pregnant women were vaccinated annually against seasonal influenza in Canada. Rates have remained similar in subsequent years despite the significant risks posed for mother and fetus. Despite this knowledge, few studies have been conducted in the Canadian context to specifically investigate the factors that influence the knowledge, attitudes, beliefs and behaviours (KABB) of midwives regarding vaccination in pregnancy. Therefore, the unique focus of my project is to specifically investigate the KABB of midwives in the Waterloo-Wellington, Ontario region regarding vaccination during pregnancy.

Research Aim and Objectives: To gain a better understanding of the KABB of midwives regarding vaccination during pregnancy. My project will offer data from a region where I hypothesize that midwifery practice is shaped by the preferences of a diverse subset of the population identified as Mennonite.

Methods: A qualitative approach was taken using semi-structured in-depth interviews. This study used a qualitative, constructivist design in gathering experiences and stories from midwives to determine their KABB regarding vaccination within their field using semi-structured interviews. The Theoretical Domains Framework was consulted for the formulation of the interview guide as well as for the coding and analysis of data collected. Both deductive and inductive approaches were used to code the data in order to ensure that themes that lie outside the framework will also emerge. The findings from this study will be incorporated into similar and more comprehensive research projects conducted by the Canadian Immunization Research Network (CIRN) focusing on KABB regarding

immunization and maternal care providers. Findings from this research will also shed light on the fragmentation and gaps within the field of midwifery and the guidelines and regulations that shape midwifery practice in Canada.

Results: The research project explored the KABB of midwives in the Waterloo-Wellington Region and their perceived role in the discussion and recommendation of the influenza vaccination while also capturing general vaccine perceptions. Participants shed light on the personal and systemic barriers that are currently limiting midwives from incorporating vaccine discussion and recommendation into their routine practice and provided potential recommendations on addressing these barriers in practice. More specifically, this project investigated the impact of the Mennonite community's engagement with health services, such as vaccination and birthing programs through semi-structured interviewing of midwives who provide care to this population. It should be noted however that no such research had investigated this aspect of the Midwifery or Mennonite population previously and these findings are novel.

Conclusions: This study has only begun to address the gap in quality qualitative research exploring the KABB of midwives in the Canadian context regarding vaccine discussion and recommendation practices. The research project provides further information and recommendations regarding barriers to the promotion, discussion and recommendation of immunization in midwifery practice in the Waterloo-Wellington Region. Findings may also contribute to developing public health and vaccination promotion services to reach pregnant women in the Waterloo-Wellington Region that share demographic and contextual characteristics as participants in the study. Participants provided suggestions to how vaccine discussion and recommendation can be more effectively incorporated into routine midwifery practice based on their experiences in the current maternal health care system. Implementation of these strategies, however, relies on developing more comprehensive clinical guidelines in midwifery care, therefore it is essential to further assess vaccination in pregnancy from the health care provider perspective and the barriers that are currently preventing promotion of vaccines.

Acknowledgements

I would like to thank my supervisor Dr. Samantha Meyer for her wisdom and guidance during my time at the University of Waterloo.

Thank you to my committee members Dr. Samantha Meyer, Dr. Elena Neiterman and Dr. Heather MacDougall for providing insights and recommendations throughout the project to make my vision a reality.

I would also like to thank the Canadian Immunization Research Network and Eve Dube for sharing their research, knowledge and ideas with me and inspiring this project.

Most importantly I would like to thank my personal editing team and unconditionally supportive friends and family.

Dedication

I would like to dedicate this thesis to the Waterloo-Wellington midwives that so generously shared their time, knowledge and experiences with me to further the health of Canadian women.

Table of Contents

<i>Vaccinating pregnant women: Exploring midwife's perspectives regarding vaccination in pregnancy in the Waterloo-Wellington Region</i>	1
Author's Declaration	ii
Abstract	iii
Acknowledgements	v
Dedication.....	vi
List of Abbreviations.....	viii
Introduction.....	1
<i>Vaccine Hesitancy in HCP</i>	3
Influenza: Key Information on the Influenza Vaccine in Canada.....	4
KABB (Knowledge, Attitudes, Beliefs, Behaviour)	7
Background.....	9
Midwives in Canada	9
Key Information on Influenza Vaccine and Vaccination in Canada	15
Study Rationale and Objectives.....	30
Methods.....	33
Sampling and Recruitment.....	36
Data Collection.....	39
Data Collection Tools and Methods	39
Coding Process	44
Ensuring Quality of Research.....	54
Results and Analysis	63
Theme 1: KABB of Midwives Regarding Vaccination	64
Theme 2: Exploring the Factors that Shape Vaccine Hesitancy of Midwives in Ontario, Both Related to and Separate from Pregnancy	76
Theme 3: Actual and Perceived Barriers that Influence Midwives Vaccine Discussion and Recommendation Practices	80
Theme 4: Contextual and experiential factors, context and practice.	87
Discussion.....	95
<i>Conclusions</i>	120
<i>References</i>	121
<i>Referencing the Appendix</i>	127

List of Abbreviations

AEFI: Adverse Events Following Immunization
AMO: Association of Midwives Ontario
CAM: Canadian Association of Midwives
CIC: Canadian Immunization Conference
CCHS: Canadian Community Health Survey
CIHI: Canadian Institute of Health Informatics
CIRN: Canadian Immunization Research Network
CMO: College of Midwives Ontario
GBS: Guillain-Barre Syndrome
GP: General Practitioner
HA: Haemagglutinin
Hep B: Hepatitis B
iPHIS: Integrated Public Health Information System
KABB: Knowledge, Attitudes, Beliefs, Behaviours
LHIN: Local Health Integration Network
LAIV: Live Attenuated Influenza Vaccine
MCC: Mennonite Central Committee
NA: Neuraminidase
NACI: National Advisory Committee on Immunization
OB/GYN: Obstetrician/Gynecologist
PHAC: Public Health Agency of Canada
PHU: Public Health Unit
QIV: Quadrivalent Inactivated Vaccine
SAGE: Strategic Advisory Group of Experts
SOGC: Society of Obstetrics and Gynecology
SPHHS: School of Public Health and Health Systems
Tdap: tetanus, diphtheria, acellular pertussis
TIV: Trivalent Influenza Vaccine
UIIP: Universal Influenza Immunization Program
VH: Vaccine Hesitancy
VAMPSS: Vaccines and Medications in Pregnancy Surveillance System
WHO: World Health Organization

Introduction

Within the Canadian context, midwives play a critical role in providing an alternative prenatal care option for pregnant women, which arguably encompasses vaccine discussion and recommendation.(1-4) Although administration of vaccines is currently outside a midwife's scope of practice, midwives are considered trusted figures of authority and knowledge regarding health topics and their professional opinion is often valued by patients.(1-4) Contributing factors to low vaccine uptake by pregnant women in Canadian society specifically include maternal care providers' hesitancy to vaccinate due to safety concerns over a vaccine's efficacy or concerns over medical liability.(5-9) Low uptake by pregnant women can be explained by lack of acceptance of vaccine(s), barriers to access and lack of recommendation by health providers.(5, 6) Research also suggests that there is confusion in the maternity field over whose responsibility it is to inform patients about vaccinations, and barriers in the system to accessing and administering vaccines.(7, 9, 10) It is suggested that up to 70% of obstetricians believe that it is the family physician's responsibility to recommend and administer influenza vaccinations.(11) Despite this knowledge, there has been little research conducted in the Canadian context to specifically investigate the factors that influence maternity care providers' perspectives regarding vaccination in pregnancy, and more specifically, the perspective of midwives. Therefore, conducting qualitative research regarding the perceptions of midwives surrounding vaccination during pregnancy is imperative for recommending and in turn improving uptake amongst pregnant patients.

The history of midwifery is important for understanding how the historical perception of midwives interferes with their experiences as midwives.(12) Contemporary midwifery in Canada has been influenced by the challenges faced by midwives throughout history, by the relationship between traditional forms of midwifery and dominant discourse surrounding biomedicine.(12) In

addition, the absence of midwifery in the Canadian health system as a profession through the 20th century and the often-hostile relationship between midwives and other care providers demonstrate a time for reinvention of the midwifery profession.(12) The historical context of the midwifery profession highlights the convergence of social, cultural political and economic factors leading to the decline of female midwifery and the emergence of male medical control over obstetrics.(12, 13) Biggs (2004) argues that the decline of midwifery in Ontario from 1975 to 1990 was tied to biomedicine gaining monopoly over health care resulting in female midwives being viewed as competition. As a result, regulation and restriction imposed on midwives by their governing bodies has impacted the privileges they are granted and the involvement midwives are able to have when it comes to biomedical interventions such as vaccination and prescribing rights.

The aim of this research is to investigate the knowledge, attitudes, beliefs and behaviours (KABB) of midwives regarding vaccination during pregnancy in the Waterloo-Wellington region. This region brings unique features to the study due to its geographic and demographic characteristics. The area of study was determined based on the designated communities identified within the Waterloo-Wellington Local Health Integration Network (LHIN) outlined by the Ministry of Health and Long Term Care. The Waterloo-Wellington Region consists of five separate areas as categorized by the LHIN and are responsible for planning and funding local healthcare.(14) These areas include: Waterloo Region, Wellington County, City of Cambridge, City of Guelph, and Southern Grey County all spanning approximately 4,800 square km [See Appendix A].(14) The demographic makeup of the Waterloo-Wellington region, which had yet to be studied in current literature, allowed me to consider the perceptions and practices regarding vaccination among a culturally diverse subset of the population identified as Mennonite. Taking consideration of the Mennonite population and their possible influence on vaccination discussion and recommendation in the area provides rich and contextually relevant data on vaccine perceptions and uptake practices. Given that vaccine recommendation and uptake practices can be influenced by contextual and experiential circumstances, as well as, cultural and religious beliefs.

Research among a population that can speak to the beliefs and practices of Mennonites provides a unique opportunity to examine how midwives navigate these challenges in their practice.

Vaccine Hesitancy in HCP

Failure to recommend or administer vaccines to a pregnant patient is often the result of vaccine hesitancy on the part of maternal care providers and patients themselves.(15) Vaccine hesitancy refers to people with varying degrees of motives ranging from support to opposition to vaccines.(15) Vaccine hesitancy is defined as a set of beliefs, attitudes and behaviours, or some combination of these factors exhibited by lay persons concerning their own or their children's immunization.(15) Vaccine hesitancy may also be present in maternal health care providers, the population that is of primary focus in this research project. Maternal health providers may demonstrate vaccine hesitancy by discouraging pregnant women from getting vaccines altogether or by not recommending or discussing vaccines during visits.(15) Vaccine hesitancy is an important area of research because of the impact it has on patient behaviour and action regarding immunization. Hesitancy on the part of the health care provider can directly translate into hesitancy and lower uptake among patients.(15) Individuals who are hesitant may display their hesitancy through their behaviours which can include a delay taking action in receiving a vaccine or declining vaccination altogether.(15) If patients experience hesitancy from their health care provider, they may be less inclined to trust the vaccine, especially during a time of vulnerability such as pregnancy.(15) Vaccine hesitancy within the practice of midwifery is a topic not yet given adequate attention in research or policy. Data and findings from this project can be used to initiate a conversation around vaccine recommendation practices in midwifery, inform future research, and inform policy recommendations and practices within the maternity care field.

Influenza: Key Information on the Influenza Vaccine in Canada

Influenza, or as it is more commonly referred, the flu, is an acute viral infection of the respiratory system that causes annual epidemics.(1) Peak period occurs from November through to March in countries located in the Northern Hemisphere such as Canada.(16, 17) Individuals infected with seasonal influenza can experience a range of symptoms, from less severe, such as fatigue, sore throat and sudden onset of fever to more severe, such as pneumonia and the worsening of underlying medical conditions.(16-18) Severe health complications as a result of the flu can lead to an increase in physician office visits, emergency department visits, hospitalizations and, in some cases, death.(17)

In most jurisdictions across Canada the influenza vaccine is currently recommended for the entire population but especially for people at high risk of complications, those capable of transmitting influenza to individuals at high risk and those who are providing essential community services.(17) Vaccination against influenza has also specifically been recommended during flu season for pregnant women in Canada since 2007.(19) Influenza vaccination for pregnant women is critical because the risk of infection related morbidity and mortality increases during pregnancy for both mother and fetus.(19-22) Influenza is one of six vaccines (including Hepatitis B, Tdap, polio, meningococcal, pneumococcal and certain travel vaccines) recommended for pregnant women by the National Advisory Committee on Immunization (NACI).(19) NACI makes recommendations for the use of vaccines currently or newly approved for use by humans in Canada, including the identification of groups at risk for vaccine-preventable diseases that vaccination should be targeted towards.(23) Despite these strong recommendations by the North American medical and public health bodies since 2007, influenza vaccine uptake among pregnant women remains well below the targeted 80%.(5, 24, 25) Contributing factors to low uptake are well cited in literature and explored further within this study but include logistical issues, trust in vaccine efficacy and evidence, patient and provider

hesitancy, limited scope of practice and unclear guidelines for which midwives base their care practices.

In the province of Ontario, where the data for this project was collected, the provincial government has been offering the influenza vaccine on an annual basis, free of charge, to all Ontarians who wish to be vaccinated since 2000-2001 under the UIIP (Universal Influenza Immunization Program).(17, 26) Despite governments' attempts to increase uptake by making influenza vaccination more available and accessible, it is estimated that only 15% of pregnant women are vaccinated annually against seasonal influenza in Canada.(25) Vaccination rates of pregnant women have remained relatively unchanged in the years following the H1N1 pandemic and reaching a low of 10%.(27) The emergence of the H1N1 flu virus pandemic in 2009 is significant to note because of the increased risk it posed to the public, leading to more than 18,000 deaths worldwide.(28) By April 2010, during the "post-pandemic period" as classified by the WHO (World Health Organization), an estimated 41% of Canadians 12 years and older had received the H1N1 flu shot, exceeding the percentage that get vaccinated annually (32% in 2007-08).(28)

Vaccination uptake is critical for the establishment of herd immunity, a concept that supports the idea that immunization within a population offers indirect protection to members of the population, including those that cannot be vaccinated such as fetus and newborn babies.(29) To be successful in reducing the prevalence and incidence of vaccine preventable diseases, vaccination programs rely on high annual vaccine uptake.(30) Because influenza is a vaccine preventable disease and puts the fetus and expectant mother at increased risk for influenza related morbidity and mortality, it is important to give special attention to this group of at risk individuals.(5, 31) Low vaccination rates suggest that there are barriers to maternal vaccination. As of 2008, 40% of Canadian maternity providers were not aware that pregnant women were at an increased risk of influenza related complications and only 65% of care providers were aware of the NACI recommendation.(11) Although midwives only attend 5% of Canadian births, they

play a critical role in caring for the maternal population including health care decisions during pregnancy.

KABB (Knowledge, Attitudes, Beliefs, Behaviour)

In considering vaccine uptake and the factors that influence it, it is important to consider an individual's personal perceptions or KABB.

Knowledge

Knowledge is defined as the fact or state of knowing; the perception of fact or truth; clear and certain mental apprehension.(32) Lack of accurate information or misinformation is a barrier to immunization for seasonal influenza.(33) Lack of knowledge can influence perceptions of safety of the vaccine, efficacy in preventing infection, as well as an individuals' susceptibility to contracting an infection.(33) All of these factors influence an individual's decision making in receiving a vaccine. Baseline research done by Cairns et al (2012) found that even health care providers underestimated the importance of safety, efficacy and susceptibility and that increased knowledge has the potential to increase uptake.(33)

Attitudes

Attitude(s) is defined as a manner, disposition, feeling, or position with regard to a person or thing.(32) Attitudes towards vaccines can be influenced by outside factors such as religion, personal experience, and knowledge. Attitudes can generally be categorized as positive, neutral or negative towards vaccination.(34) These attitudes are often based on knowledge and it appears that the attitude people hold about vaccine safety and efficacy along with self-perceived knowledge are generally associated with each other.(34)

Beliefs

A belief is defined as an opinion or conviction.(32) Belief systems of a society, group or individual is a leading factor in vaccine uptake and hesitancy.(33) Belief systems theories demonstrate the potential relevance of beliefs on the design, positioning and development of pro-immunization messages.(33) Currently, however, in anti-vaccine discourse, beliefs and worldviews have been identified as a factor impacting vaccine hesitancy.(33)

Behaviours

Behaviours refer to the actions carried out by the lay public, as well as health care providers in regards to vaccination and how these behaviours are influenced by the knowledge, attitudes and beliefs an individual holds. Knowledge, attitudes, perceptions and behaviours are all useful indicators of effectiveness of an intervention.(33) Evaluation of a program should consider all these elements in determining success of a program such as influenza vaccine uptake.(33)

The KAB (knowledge, attitudes and beliefs) of a population, such as that of midwives or that of a cultural population such as Mennonite necessitates a better understanding of the behaviours of the population, can be explored through research.

Background Midwives in Canada

A Brief History of Midwives in Canada: Lay Midwives in Canada

Prior to 1800 midwifery services were offered by women in the community without any formal training.(4) Midwifery is a tradition passed down from women, through generations and was considered a female domain.(12) The traditional midwife in Canadian history represents a natural and essential part of the community, often known as lay midwives. (12) These “lay” midwives often relied upon methods such as first-hand experience with patients, self-directed reading of health care literature, watching laboring women, speaking with practicing midwives and apprenticeships with more experienced midwives when learning how to provide care to birthing women.(4) Most lay midwives have existed for generations in First Nation and other cultural communities and gained their knowledge and skills from community midwifery traditions, and only more recently from formal education programs.(13) Majority of pioneer women were tended to in childbirth by women recognized in their communities for their expertise and specialized knowledge in pregnancy and child birthing.(12) It is argued that despite this recognition within their communities, traditional midwifery and birthing was and is still not viewed as a ‘highly specialized knowledge’ within the medical profession.(6)

The practice of midwifery evolved during the early 1800’s with the advancements in biomedicine. This created a divide between physicians and midwives, which ultimately led to reform of the practice and the requirement for midwives to be formally trained and regulated.(13) Prior to this time, traditional midwifery in Canada was not regarded as a ‘profession’ because women were not only care providers but also took part in raising children and doing farm work in addition to assisting women in childbirth.(12) Midwifery was thereby mostly provided by medical and nurse attendants as the midwifery field was not formally or legally recognized in the province of Ontario.(1, 4)

The practice of midwifery underwent serious decline and devaluation and remained without social, legal or medical status in Canada for more than a century.(12) While obstetric care and practice was established in urban cities in the 1940s, lay midwives remained only in some Mennonite, Hutterite and First Nations communities as well as isolated and rural areas of Canada.(12, 13) In the late 1970's and 80s community midwives emerged as a social movement with the aim of exploring and promoting low-risk, low-tech, woman centered alternatives to standard obstetric care.(13) The goal was to restore the reputation of childbirth as natural and to bring birthing back into the home.(12) This movement led to the legal and professional recognition of midwifery in Ontario under the Regulated Health Professionals Act in 1994 and was legalized in several additional Canadian provinces after over 100 years of 'official abuse'.(1, 2, 12, 13) Formal regulation of the midwifery profession and integration into the Ontario health care system, along with other provinces across the country, was a significant accomplishment for birthing care in Canada.(12)

Regulation of the practice has created an accessibility barrier for rural and lay midwives in that they are not granted privileges in hospitals and professional care settings.(35) Division in practice between lay and formally trained midwives occurred when debate began around whether or not formal education or traditional forms of training should be the standard for midwifery practice.(1, 4, 36) In 1993, a midwifery education program was proposed in order to "legitimize" midwifery within the health care system and to create a sense of professionalism around the practice.(12, 13) Midwives were faced with the challenge of limited ability to provide continuity of care for their patients who gave birth in hospitals due to their lack of recognition as formal providers within the professional community.(1, 4) This led to the goal of expanding the scope of practice in hospitals to allow for a more involved role for midwives within a professional setting.(4) However, legitimizing the practice of midwifery came with challenges, as it requires that midwives adhere to rules, regulations and constraints placed on them by the hospitals in which they are practicing.(4) The rules and regulations that govern the midwifery practice are

specific to the countries and regions in which they practice and provide various opportunities and barriers that shape the midwifery practice we see today [See Appendix N].(37)

Research, and feminist scholars have since aimed to address the invisibility of women as birth attendants in history.(12) Traditional forms of midwifery were disrupted by social, cultural and economic changes during the modernization of society.(12) The most influential being the expansion of biomedicine and the increase in medical specialization.(12) Physicians that felt their career was being challenged by the midwifery profession and went as far as to engaged in a campaign to discredit midwives as incompetent and outdated.(12) A critical element that contributed to the displacement of midwives includes the redefining of childbirth as a dangerous medical event requiring the intervention of recognized medical professions, specifically obstetricians (12) In addition , the gender ideals at this time in history contributed to the idea that women were dependent on others and therefore incapable of performing such tasks or giving birth without a male expert to provide specialized care.(12) All of which, contributed to the acceptance of medicalization and the preference for physician attended childbirth, essentially leading to a rejection of midwifery as a female profession.

Midwifery in Ontario

Midwifery is a self-regulating profession in Ontario that requires midwives to obtain a BHSc from a Midwifery degree program to become registered in the province.(38-40) Alternatively, in Ontario, international applicants have the option to complete the International Midwifery Pre-Registration Program.(41) For midwives, as a condition of registration, the Midwifery Act of 1991 requires that they provide proof of professional liability protection to the College of Midwives of Ontario in order to practice.(42) Each province within Canada outlines specific requirements for registration and practice [See Appendix N].

There are currently 711 regulated midwives in Ontario and approximately 1,173 in Canada that assist with an estimated 10% of births nationally as of 2013.(43) Deliveries by

midwives increased fourfold between 1995 and 2004, from 1,800 to 8,600, while deliveries by general practitioners have declined by more than half.(32) Additionally, within Canada there are still a body of lay midwives who practice with the distinction that they have not received formal training and are registered with the government under alternative requirements.(1, 2, 4, 41)

Registered midwives are well integrated into the Ontario health care system. They are granted admission and discharge privileges at local hospitals and access to other health care providers for consultation and transfer of care if necessary.(44) Midwives care for their patients through the entire labor process, and after the birth make home visits to help families adjust to nursing and life with an infant.(38) Midwives however are not equipped to take on complicated or high-risk pregnancies or deliveries; therefore, midwives take on the role of risk evaluators, and are thus responsible for determining what is safe for their patients.(35) Ontario midwives are compensated on a course of care model.(2, 38) A billable course of care is payable when midwifery services are provided for a period of 12 or more weeks during pregnancy, labor, birth, and up to six weeks post-partum.(38) Another core component of midwifery is to provide information, which woman can then use to make informed choices regarding their care.(1, 2, 4) This requires that midwives be knowledgeable and informed about current recommendations and guidelines within the health care field on a variety of topics including vaccines.

Benefits of Midwifery in Maternal Care and Their Role in the Promotion of the Influenza Vaccine

According to the Canadian Institute of Health Information (CIHI), those who use midwives are less likely to be hospitalized prenatally, to undergo a caesarean, to give birth prematurely, to have labor induced and to have an episiotomy.(2, 4, 45) Research has demonstrated that planned home births attended by a registered midwife are associated with lower or comparable rates of prenatal death and reduced rates of obstetrician intervention and other adverse outcomes compared to planned hospital births attended by a midwife or physician.(45) It can be presumed that the reason there are fewer complications arising during

midwife attended home births is due to the requirement that these pregnancies be less complicated and fall within guidelines to ensure safety for mother and fetus. Some guidelines include absence of pre-existing disease such as diabetes, hypertension or heart disease, absence of disease arising during pregnancy including pregnancy induced hypertension, gestational diabetes, hemorrhaging, or placental abruption; singleton fetus, gestational age between 34 and 41 weeks, mother has had no more than one previous caesarean section and labor is spontaneous or induced on an outpatient basis.(45) Similarly, women who choose home or midwife attended birth are more likely to have had a history of uncomplicated first birthing experience.(44) It is also suggested that women who plan a home birth are more motivated to avoid interventions such as epidurals, which reduces the potential for other interventions.(44) The ability to keep a portion of pregnancy care and deliveries out of hospitals and distribute the demand on physicians and OB/GYNs removes a large burden and cost from this area of the maternal health care system.(44) This demonstrates the critical role midwives have in both reducing cost and freeing up resources in our health care system. Along with these benefits, utilization of midwives has proven to result in better health outcomes for both mother and fetus not only during but also after pregnancy.

According to the Society of Obstetricians and Gynecologists of Canada, there are currently only 1,650 OB/GYNs practicing in Canada.(2) In addition to OB/GYNs practicing in Ontario, there are an additional 31,017 family medicine providers, 15, 417 physicians and 711 midwives providing health care to pregnant women and their families.(37) It is estimated that midwives only attend 5-10% of births in Canada with midwifery care access being distributed unevenly throughout the provinces.(2) The proportion of midwives providing care in each province ranges from 1-6 (per 100,000 population) with provinces having as few as 10 midwives (Nova Scotia) providing care to as many as 711 midwives (Ontario).(37) The provinces with the largest profession of midwives include Ontario (711), British Columbia (273), Quebec (211) and Alberta (111) as 2016 [See Appendix N].(37) It is not indicated whether or not the midwives included in CIHI research are registered or lay care providers however it can be hypothesized

based on the data that the provinces with the highest number of practicing midwives include the provinces with larger populations as well as distinct cultural groups (such as Mennonite and Aboriginal populations). The data above provides context on the number of midwives providing care to pregnant women specified by province and demonstrates the limited number of midwives that are providing care compared to the larger proportion of providers that identify as physicians, OB/GYNs, and family medicine providers. This also provides explanation for the small sample size of midwives included in this study with less than 800 providing care in the province of Ontario and an even smaller proportion of these providing care to Mennonite populations in the Waterloo-Wellington Region.

Of the approximately 1,650 OB/GYNs currently practicing in Canada, an estimated 500 of them have shifted their practices away from deliveries, choosing instead to focus on gynecology, fertility and family planning.(2) Along with this roughly 34% of the OB/GYNs now working are set to retire in the next 5 years.(2) It is estimated that once this happens up to 10,000 women in Ontario alone will not have access to a maternity care provider of any kind.(2) Therefore, midwives are becoming increasingly more important in birthing and prenatal care for pregnant women and are an important research and target group for public health in terms of determining their viewpoints in regards to health issues such as vaccine hesitancy. However, liability issues, guidelines that regulate the care midwives can provide and differing philosophies of care require resolution before Canada can move toward an inter-professional model of maternal and newborn care that include sharing patients between physicians and midwives.(2)

Key Information on Influenza Vaccine and Vaccination in Canada

Influenza Impact

Influenza is prevalent globally with rates estimated at 5%-10% in adults and 20%-30% in children.(46) Annual epidemics of influenza worldwide result in approximately one billion cases, 3 to 5 million cases of severe illness and 250,000 to 500,000 deaths.(46) In Canada, influenza is ranked among the top 10 leading causes of death(46) resulting in approximately 12,200 hospitalizations and 3,500 deaths annually.(47) There are two primary types of influenza viruses known to cause widespread human disease: Types A and B. With constant antigenic shift and change, completely eradicating the circulating influenza virus is not likely. Therefore, the primary focus of public health agencies is, and should be, on reducing the effects of the circulating strains by preventing infection and widespread transmission through the use of immunization.

The seasonal influenza vaccine is the most effective prevention and protection method of avoiding influenza and its related complications. There are currently multiple influenza vaccines authorized for use in Canada for individuals aged six months and older.(47) Specific products include inactivated trivalent and quadrivalent vaccines (including adjuvanted and high-dose formulations) and live attenuated trivalent and quadrivalent vaccines with varying indications based on age and immune status.(47) Vaccine uptake has consistently been below target levels and therefore influenza immunization programs have been developed to address low uptake. Originally these programs only targeted high-risk populations such as seniors, those with chronic conditions and health care workers to receive annual flu shots.(48) In 2004 the NACI modified these recommendations to include all adults and children.(48) Since these programs have been put in place, extensive vaccine uptake monitoring has taken place, which have uncovered trends in vaccine uptake among the Canadian population.

Due to coverage and regulation differences between provinces immunization uptake to some extent, reflects the public funding of immunization. At 35% in 2000/01, Ontario's proportion of the population immunized was significantly above the national figure as a result of

the flu vaccine being available to all residents at no charge.(48) Despite widespread promotion and publicity surrounding the influenza vaccine and the importance of annual vaccination, there has been no significant increase in uptake since 2000/01.(48) Some common reasons expressed for not being immunized included individuals thought it was unnecessary (66%), did not get around to it (11%), and fear of immunization (6%).(48)

Government Intervention: Universal Influenza Immunization Program [UIIP]

Ontario has had a publicly-funded Universal Influenza Immunization Program (UIIP) in place since 2000 whereby all Ontarians, six months of age and older who live, work or go to school in the province are eligible for the yearly influenza vaccine free of personal charge.(47) Ontario's UIIP program was Canada's first ever-universal program for the influenza vaccine. The cost of Ontario's UIIP is approximately double the previous implemented programs (\$40 million versus the previous \$20 million) however UIIP was estimated to prevent 786 hospitalizations, 7,745 influenza related emergency department visits and 30,306 physician office visits each flu season.(17) In Ontario it is estimated that 22,457 cases of influenza are observed on average each season since the introduction of UIIP.(17) Prior to the introduction of the UIIP cases per season were estimated closer to 56,998 therefore it is claimed that the universal program has prevented approximately 61% (34,541 cases) per season.(17) In addition there has also been a 28% reduction in influenza related deaths observed since the introduction of the universal program.(17) The UIIP is a costly intervention with a net cost of 12.2 million, or \$2.60 per person to vaccinate.(16) Cost-analysis of the UIIP program determined that it is an economically beneficial for the province of Ontario in that it has increased uptake of the influenza vaccine and reduced the overall financial burden related to influenza related health care expenses by preventing influenza cases effectively reducing influenza-related health care costs by 52%, saving the health care system approximately \$7.8 million per flu season.(17)

Effectiveness of Flu Vaccine During Pregnancy

NACI recommends the inclusion of all pregnant women, at any stage of pregnancy among its specifically recommended recipient groups for the inactivated influenza vaccine due to the risk of influenza related morbidity and mortality in this population.(19) There is ample evidence to suggest that adverse neonatal outcomes and maternal respiratory hospitalizations are associated with influenza during pregnancy.(30) Evidence suggests that infants born to vaccinated women during influenza season are less likely to be premature, small for gestational age and have low birth weight.(46) Studies of influenza vaccination during pregnancy have not shown evidence of harm to the mother or fetus associated with influenza immunization with the inactivated vaccine.(46) Although the cumulative sample size of active studies in pregnant women is relatively small, particularly in the first trimester, passive surveillance has not raised any safety concerns despite widespread use of the inactivated influenza vaccine during pregnancy over a number of decades.(46) Several studies have investigated the ability of maternally derived influenza-specific antibodies to protect infants from influenza virus infection and/or to reduce severity of illness demonstrating the importance of maternal immunization during pregnancy for protection of both mother and fetus.

Most health care providers administer influenza vaccines during the second and third trimesters; however, the influenza vaccine is also administered during the first trimester, especially for women with an underlying high-risk medical condition, such as asthma.(27) Pregnant women should be immunized with the inactivated influenza vaccine as the live attenuated intranasal vaccine is not recommended during pregnancy.(27) If proper recommendations are followed, vaccination during pregnancy has not been associated with foetal malformations, cognitive or neurological disabilities or childhood cancers.(27) No studies have reported any significant vaccine reactions and no association between vaccination and delivery complications or poor foetal outcomes.(27) However, lack of knowledge and unfounded safety

concerns are important barriers to recommending vaccination to pregnant women for health care providers.(7-10, 49)

Influenza Vaccine Safety and Adverse Events

Data from post-market surveillance of influenza vaccines in Canada has shown seasonal influenza vaccines to be safe. Outcomes are stored and monitored on the Adverse Events Following Immunization (AEFI) profile. Influenza vaccines are generally safe and well tolerated with the most common side effects being pain at the injection site which effects between 40% and 60% of healthy adults.(47) The occurrence of serious adverse events is extremely rare but may include anaphylaxis and Guillain-Barré syndrome (GBS).(47) Therefore post marketing surveillance of influenza vaccines is an essential element in continuing to demonstrate vaccine safety over time, to inform evaluation methods and build public confidence in immunization programs.(47) Information from public health surveillance of adverse events following immunization provides relevant and timely information to address concerns about vaccine safety, which is known to be a key barrier in vaccine acceptance among the general population as well as among health care workers.(47) Monitoring systems like the AEFI's are important for demonstrating the safety and efficacy of vaccines to providers and the general public. They also demonstrate a level of institutional transparency that is instrumental for establishing trust in the health system and the information it puts out along with the products it recommends for the population.

Vaccine Hesitancy in Health Care

Vaccination successfully prevents an estimated 2-3 million deaths each year; however, vaccine refusal has been associated with disease outbreaks across the globe.(50) Despite Canada's relatively high childhood vaccine coverage, there are reasons to be concerned that vaccine programs might be losing public confidence.(30) Recent outbreaks of vaccine

preventable diseases in North America and Europe have been linked to under vaccinated communities, demonstrating the dramatic consequences of a decline in vaccine coverage.(30)

Simple classifications such as ‘pro-vaccine’ or ‘anti-vaccine’ fail to appreciate the spectrum of opinions that exist about vaccination and the distinct responses required from physicians and other care providers. Vaccine hesitancy is a continuum of beliefs and associated behaviours ranging from complete refusal of all vaccines to complete vaccine acceptance.(30) Vaccine hesitancy is complex, fluid and multidimensional with possible demographic, and social-psychological root causes, which change with context, over time and is vaccine specific.(30, 50, 51) Vaccine hesitancy is distinct from vaccine refusal and Caplan (2011) suggests that strategies should be taken in all cases to understand the scope of any concerns, their source and the response warranted.(29) Vaccine refusal is often a result of vaccine hesitancy but they are not symbiotic.(29) People generally fall along a spectrum of vaccine acceptance with the majority accepting vaccinations (70-75%).(50) There is a smaller percentage (25-30%) that are vaccine hesitant meaning they may be selective or delay vaccination or question the importance and safety of vaccines but still vaccinate.(50) About 2% of the population are considered vaccine refusers who completely reject the notion of vaccination.(50)

The World Health Organization (WHO) Strategic Advisory Group of Experts (SAGE) on Immunization created a model of determinants of vaccine hesitancy.(30, 52) The model is organized around three domains contextual influences including influential leaders and individuals, individual/social group influences including personal experience with trust in the health system and provider and the third domain, vaccine and vaccine-specific issues which includes the role of health care professionals.(52) Given the known importance of health care providers on the decision making of their patients it is important to consider these domains on the part of both the general public and providers.

Currently there is no silver bullet or proven strategies to address vaccine hesitancy. Facts and education alone are not enough to change beliefs and behaviours among the public and a

recommendation from a health care provider is considered to be a major driver of vaccination uptake.(50) Previous research in Canada found that providers who were aware of NACI recommendations and guidelines were more likely to discuss or recommend vaccinations than those who were unaware.(53) Beyond evidence and facts, attitudes about vaccines are influenced by risk perceptions, trust, emotions, values, worldviews and critical events such as outbreaks.(50) Health care providers may share the same questions and concerns as the general public such as distrust in health authorities or safety of vaccines.(50) A Canadian study found that most vaccine-providers who participated felt uncomfortable dealing with vaccine hesitant patients and inadequately prepared to counsel them.(30) This is concerning, as health care providers are a trusted source of information but they often underestimate their influence.(50) In addition to this, they often do not allocate time to discuss vaccination or use inappropriate communication approaches to address vaccine hesitancy.(50) Lastly, a health care provider can be hesitant themselves and therefore they are unlikely to address their patients' vaccine hesitancy.(50)

In a French study amongst general practitioners' (GP's), 14% expressed that they are moderately to highly vaccine hesitant. (54) These providers indicated that they were less likely to be vaccinated themselves for flu, HepB and the Tdap booster.(54) Most concerning, was not just vaccine hesitant providers that expressed concerns about vaccines, but there was still a small percentage of non-hesitant GPs that associate vaccines with the possibility of risk or negative outcomes such as Alzheimer's or long-term complications.(54) These findings are concerning as health care providers are the cornerstones of public acceptance of vaccination. Health care providers need to be better equipped to help patients make healthy vaccine decisions and know how their biases and perceptions can influence uptake.

Perceptions of Vaccination During Pregnancy

Research in the United States focusing specifically on pregnant women and their perceptions of vaccines during pregnancy sheds light on some of the concerns and hesitations

faced within this population regarding the influenza vaccine. Forty-four percent of women interviewed during the post partum period said they believed that all vaccines should be avoided during pregnancy.(27) Women who were vaccinated were more likely to do so if they either had experienced influenza or been vaccinated in the past.(27) Vaccinated women were also more likely to believe that influenza infection during pregnancy presented a higher risk of complications than infection during non-pregnant periods.(27) Of the women post partum, 56% said that they would have accepted the influenza vaccine during pregnancy if their physician had recommended it to them.(27) This demonstrates a lack of information among the general public as well as the importance of creating a consistent recommendation program for maternity care providers to follow to increase uptake during pregnancy.

Within the Canadian context, a recent study among health care providers in Quebec hospitals indicated that a substantial proportion of the 540 surveyed providers had concerns about vaccinations.(55) Of those interviewed, 34% felt that children are receiving too many vaccines, 31% had some level of concern and fear about vaccinations and 42% said that a good lifestyle can eliminate the need for vaccination.(55) Providers doubts regarding vaccine safety is growing as demonstrated in a 2016 survey looking at trust in vaccine research, public health authorities and vaccine safety.(56) Most concerning is the low uptake of seasonal influenza vaccine among health care providers themselves. Survey research from Quebec indicated that since the H1N1 outbreak year where uptake was at an all-time high of around 85%, levels have dropped to an estimated 44% in the 2015-2016 flu seasons.(56) This sub-optimal uptake indicates hesitancy among providers and is an indicator of trust and recommendation practices in Canada among patients and providers alike.

A cross sectional study of maternity care providers and women's KABB towards influenza vaccine during pregnancy completed at Mount Sinai Hospital found that 40% of providers were not aware that pregnant women were at risk of influenza-related complications and only 65% knew of the NACI recommendations.(11, 53) The majority of maternity care

providers (70%) also believed that it was not their responsibility to offer the influenza vaccination and that it was the role of the family physician or public health to vaccinate pregnant women.(11) These findings demonstrate a clear lack of education and a gap in our health system that provides the opportunity for pregnant women to slip through the cracks.

During the 2002-2003 influenza season we begin to see a shift in the importance of influenza vaccine recommendation among providers.(11) At that time, 63.4% of maternity care providers recommended the influenza vaccine to pregnant women who were at risk of influenza-related complications.(11) In the three years following the survey over half of providers indicated that their recommendation practices had changed, indicating a potentially changing climate in vaccine recommendations.(11) Consistent with other research in the field, it was determined that the most important factor in women accepting vaccination during pregnancy was recommendation from a provider. Research uncovered another barrier in that providers were uncertain about who is responsible for discussing, recommending and administering the influenza vaccine.(11) The research above neglected to capture the perspective of an important segment of the Canadian maternal care field identified as midwives, which I address in my study. Midwives were not included in the survey as they only attend 5% of Canadian births however they play a critical role in caring for the maternal population including health care decisions during pregnancy and therefore should be considered in research along with other care providers in regards to vaccination and fetal health.(13)

A survey was created and sent to midwives across Ontario in February 2002 to explore their KABB regarding the influenza vaccine.(26) Overall respondents agreed that they are in favor of vaccination in general, and 53% said that the risk of adverse reaction is outweighed by the protection vaccines offer the general public.(26) However only 34% of midwives thought vaccination was important to protect their clients and 24% agreed they would recommend vaccines to their clients.(26) Even more troubling only 8.5% followed through with a recommendation of the influenza vaccine to their pregnant patients and only two reported

spending more than one hour discussing immunization.(26) An interesting finding of the research is the significant differences in KABB between midwives who graduated in 1998 and prior compared to those who graduated after or were still in school.(26) Data suggested that recent graduates or midwives who are still in training are far less likely to view immunization as an important public health measure compared to older graduates.(26) Even midwives who stated that they knew about immunization recommendation and practices reported that they received insufficient, if any, education about immunization during their midwifery program.(26) As a result, most midwives reported that the discussion of immunization was outside their scope of practice and the responsibilities of immunization belonged to the family physician.(26) Slightly contradictory to this, midwives reported that it is their role to support informed choices of their patients but discussion of vaccines would need to take place for this informed choice to happen and in many cases it is being omitted.(26) Overall the survey found that immunization status is strongly associated with immunization beliefs and practices. Consistent with all other research, the recommendation of a trusted health provider can have a strong influence on patient immunization; consequently the behaviours of midwives with regards to immunization may impact uptake of their patients as a result of their KABB.

Importance of Provider Discussion or Recommendation

Health care providers are one of the strongest influences in vaccination decisions. In a study of six European countries, the general practitioner (GP), pharmacy and local hospital were listed as being the most trustworthy sources of health alerts or information about medicines.(52) However there are some providers who feel ill equipped to answer questions or engage in discussion with vaccine hesitant parents as seen in France where 43% of GPs were not recommending some vaccines to their patients.(52) Interviews with health care providers in Europe showed that, although providers were aware of the benefits of vaccination they were highly concerned about the risks of vaccines, which impacted their recommendation

practices.(52) The findings mentioned above demonstrate a widespread lack of confidence in vaccines (or certain vaccines) and inconsistency amongst providers that is directly translated into practice and uptake outcomes globally.

Health care providers may not encourage discussion or recommendation of vaccination with their patients during pregnancy for a number of reasons. By avoiding the conversation or choosing not to bring up the topic of vaccination first, lack of discussion can be enough to convince a vaccine hesitant patient not to vaccinate.(50) Lack of discussion around vaccination can also be linked to time constraints on the part of the health care provider.(50) This can however be perceived as the health care provider not being supportive of vaccinations.(50) Health care providers may also not take the proper approaches in dealing with vaccine hesitant, misinformed or resistant pregnant women and use inappropriate communication methods.(50) Most importantly, if health care providers are vaccine hesitant themselves or hesitant to recommend to a specific population, such as pregnant women, then this could directly translate into their recommendation practices.(50) Considering the often long term and trusted relationship between maternal health care providers and patients, it is critical that these relationships be utilized to their full potential and the topic of vaccination be addressed in an unbiased manner.

Health care providers are more likely to recommend vaccines if they are vaccinated themselves.(52) A Canadian study found that midwives who reported being immunized were more likely to trust in the safety and efficacy of influenza vaccine, and subsequently recommend the vaccine to patients.(52) However, recent surveys have shown that many maternal health care providers are hesitant to recommend and administer vaccines to their pregnant patients.(7, 57) This is especially the case amongst midwives who although they do not have the authority to vaccinate, often prefer alternative approaches to medicine and are therefore more likely to recommend these alternatives to their patient or avoid discussing vaccination altogether.(53) Midwives may also not see discussion of vaccine as part of their role or routine practice and therefore do not engage in such discussion with patients.(5, 9, 27, 49) Current barriers in scope of

practice, and historical barriers in accessibility and authority have shaped midwifery practice.

With the added complexity of vaccine hesitancy and decision-making during pregnancy this has created a complex role for midwives to navigate.

Rural Practices Regarding Vaccine Recommendations, Discussions and Uptake

The following section focuses on a specific target region in this research. It is important that I provide an overview of the unique population, identified as Mennonite, served in the region to provide context for practice. The presence of this diverse subset of the rural population may have an influence on the behaviours of midwives. Research considering the trends, opportunities and barriers to vaccine uptake and use of health care in rural areas of Canada is critical to understand how care can be improved in remote communities. Research based in rural areas of United States investigated vaccination in rural areas and found that among providers surveyed, 68% of obstetricians had specific influenza guidelines in place in their practices.(58) In addition, 73% of obstetricians administered the influenza vaccine in their practice and 15% referred patients elsewhere to receive the vaccine.(58) Among the obstetricians who administered the vaccine in their practices responses indicated that they recommended vaccination to 95% of their patients.(58) In contrast a study looking at vaccination practices in a suburban community in the United States found that both family physicians and obstetricians reported administering the influenza vaccine to less than 40% of their pregnant patients, significantly lower than the study previously mentioned. Interestingly, this study determined that although family physicians in the community are more likely than obstetricians to recommend the influenza vaccine there is no statistical difference in the frequency of vaccine administration during pregnancy. These studies do not however, provide a comparison group such as an urban community to determine if these recommendation or uptake practices are above or below average. This research also did not include the practices of nurses, family physicians or midwives and therefore the recommendation practices are not representative of all health and maternal care providers.

Mennonite population in the Waterloo-Wellington Region

Mennonites are a religious cultural-group established in the 16th century during the protestant reformation when some Christians separated from the Roman Catholic Church.(59) The first Mennonites arrived in Canada in the late 18th century, settling initially in southern Ontario.(59) Ontario Mennonites are far from a homogenous sect with over 20 different groups affiliated to the Mennonite Central Committee (MCC).(60) As of 2013, the number of Mennonite communities in Canada was estimated between 10 to 20, or roughly 2% of the total Mennonite population.(59, 61) Today almost 200,000 Mennonites call Canada home with more than half living in cities.(59) Mennonites first began arriving in Upper Canada around 1776. Since Mennonites originated in German-speaking countries, the German language has been one of their defining characteristics and is still prevalent in the Waterloo-Wellington region.(59) The first migration to Canada brought approximately 2,000 Swiss Mennonites from Pennsylvania to Upper Canada, during and after the American Revolution.(59) They acquired land from private owners in the Niagara Peninsula and in York and Waterloo counties.(59) This group was followed by Amish Mennonites (named after Bishop Jacob Ammon, a conservative leader of the late 17th century).(59) From 1825 to the mid-1870s, approximately 750 settled on crown land in Waterloo County and the surrounding area where they continue to reside in large communities.(59)

There are roughly 175,000 Mennonites in Canada and an estimated 59,000 residing in Ontario based on self-identified NHS 2011 data.(62) These Mennonite communities can be found across Canada with over half of the population residing in Kitchener-Waterloo, Vancouver and Winnipeg.(62) Ontario arguably presents the greatest diversity of Mennonites in the world with approximately 20 different groups in the province ranging from small congregations with less than 100 members to organized conferences with thousands of members.(62) The Mennonite population in Ontario is concentrated in the Southwestern region of the province, in the municipality of Leamington and eastward to include the city of London; in the Niagara Peninsula;

in south-central Ontario surrounding the Region of Waterloo, northward as far as the Bruce Peninsula; and in the Greater Toronto Area. Mennonite communities and congregations can also be found in urban areas like Ottawa and Sudbury as well as in scattered rural areas in northern and central Ontario near Lindsay, Cochrane, and Red Lake.(62)

Data extracted from the Statistics Canada 2001 census indicated the total number of individuals (16,660) who identified as Mennonite in the Waterloo-Wellington Region(63-65) This indication is based on religion in Waterloo Region Health Unit, which includes Waterloo, Kitchener, Cambridge, Wellesley, Woolwich, North Dumfries and Wilmot.(63-65) The entire population reported in the 2001 Census for Waterloo Region was 433,870 [See Appendix C].(63-65) In addition, a total of 4,615 individuals reported Mennonite as their religion in Wellington Dufferin Guelph Region, which includes Minto, Wellington North, Mapleton, Centre Wellington, Guelph/Eramosa, Erin, Guelph, Puslinch, East Luther Grand Valley, East Garafraxa, Amaranth, Mono, Mulmur, Shelburne, Orangeville and Melancthon. The entire population reported in the 2001 Census for Wellington Dufferin Guelph Health Unit was 235,210 [See Appendix C].(63-65) The use of secondary data has limitations, as it is not a perfect fit for the geographic locations used for the recruitment of qualitative interview participants for this study. The data provided by Statistics Canada, however, provides context to the size and location of the Mennonite population in the general Waterloo-Wellington Region.

Mennonites differ from the general population in terms of their views regarding innovation in religion and cultural life.(59) Mennonites have a historical custom to resist acculturation and militarism. The Old Order Amish and Old Order Mennonites, sometimes called "horse and buggy" Mennonites, is a generic term used for Swiss-Pennsylvania Mennonite groups who dress plainly and reject the use of modern technology such as electricity and motorized transportation, and have succeeded in continuing a traditional farming style.(61) Old order Mennonites also reject the use of health care or education paid for by the government.(59) Others use modern machinery and electronics and integrate into mainstream Canadian life.(59)

Mennonites have been identified as preferring rural isolation, strong kinship relationships, a desire for separation from non-Mennonite services and institutions, and a preference for health care providers that share their language, religion and cultural views. It should be noted, however, that Mennonite populations are far from homogenous. At one end of the spectrum are the majority of Mennonites who visibly blend into the society in which they live.(62) At the other end are groups such as the Old Order Mennonites and Amish who are distinct in appearance and lifestyle. Most of the differences among the groups rest in geographic origin and historical experiences as well as how they have responded to the pressures of cultural change.(62) Of the estimated 59,000 Mennonites in Ontario, only about 20% are members of the conservative groups such as the Old Order Mennonites, Old Order Amish or Old Colony Mennonites.(62) Collecting qualitative research allows researchers to explore the unique and nuanced aspects, such as vaccination, amongst these diverse populations. In addition to this, we know little about how health care providers interact with and communicate health messages to their Mennonite patients.(36, 60-62, 66)

Midwives in Mennonite Communities

Beginning in the nineteenth century, midwives that tended to pregnant and child-bearing women in these communities undertook formal training and were considered to be assisting women in a role that came naturally to them.(36) Midwife-assisted child births were, and continue to be more common among Mennonite communities than in the general population mostly due to rural isolation, strong kin relationships and the desire to separate from non-Mennonite institutions leading to the preference to use health care providers that shared similar cultural views.(36) This was seen to contribute to ethnic cohesion within the religious community and maintain identity boundaries between Mennonites and outside populations.(36) The findings of this project suggest that Mennonite communities are shifting away from the use of lay

midwives and are utilizing formal health care providers and clinics in urban centers such as Cambridge, Kitchener, Waterloo and Guelph.

Study Rationale and Objectives

Research Gap

There is research related to the topic of vaccine hesitancy and vaccine recommendation on the part of health care providers, but most studies have been conducted among physicians and there is little data on obstetrical care providers' knowledge, attitudes, behaviours and beliefs (KABB) regarding immunization during pregnancy.(67) In addition, few studies have been conducted in the Canadian context or among Canadian health care providers. Data collected at Laval University in 2015 as part of the larger Canadian Immunization Research Network (CIRN) study was the first of its kind to consider qualitative data from maternity care providers across Canada regarding vaccination and pregnant women. The perspectives of some of the alternative health care providers are not captured throughout literature including certified midwives, certified nurse midwives and pharmacists.(67) The specific study population of midwives was chosen for this research project because it is currently underrepresented in health literature.

Even more rare in the academic field is research considering vaccine practices and midwives' involvement in vaccine recommendation among cultural and ethnic minority groups. This research differs from previous research in that it considers the specific contextual and demographic make-up of the Waterloo-Wellington region and the Mennonite communities that reside there. The Waterloo-Wellington Region provides a research opportunity to see the collaboration of medicalization and traditional medical practices within maternity care. This research presented the opportunity to explore the perceptions and practices of midwives in both urban and rural settings. This opportunity is made possible due to the close proximity of the Mennonite communities of this region and the urban city centers of Waterloo, Kitchener, and Guelph [See Appendix A].(60)

Lastly, qualitative research is needed to determine KABB of a particular study population. In order to explore aspects such as levels of knowledge, personal attitudes, beliefs and

behaviours about any given topic, a qualitative approach must be taken. This research is needed specifically within the Ontario health care system as the social, cultural and historical context has influenced vaccine recommendation practices among midwives and in turn maternal vaccination uptake. Therefore, it is critical that this research be established for public health and educational purposes to gain a more comprehensive understanding of the barriers faced by midwives both personally and systemically so they can be addressed and improved upon.

This research provides insight on how and why midwives' scope of practice and the fragmented health system in which they are employed impacts their ability to incorporate discussion of vaccination into their routine practices and therefore impacts vaccine uptake during pregnancy.(1, 4, 35). It has been acknowledged throughout the research project by midwives and health professionals, including policy makers, that this is a critical issue in public health and there is a gap in policy, guidelines and regulations for midwives which is creating fragmentation and confusion in care leading to a direct impact on uptake of the flu vaccine during pregnancy which needs to be addressed.

Research Questions, Aims and Objectives

The aim of this research is to address gaps in literature such as providing data in the Canadian context regarding an under researched population and regarding an under represented profession in the maternity care field. More precisely, the objectives of this project are:

Research Question 1: What are midwives' KABB regarding vaccines in general, as well as towards vaccinating women during pregnancy?

Aim 1: To explore KABB regarding vaccination among midwives in general and in relation to pregnancy.

Objective 1: Assess midwives' KABB regarding vaccination in general and during pregnancy through interview questions targeting midwives' perceptions of vaccination and their knowledge of vaccination practices.

Research Question 2: What are the factors that shape vaccine hesitancy among midwives, and specifically vaccination in pregnancy?

Aim 2: To explore vaccine hesitancy among midwives in relation to pregnancy.

Objective 2: Determine the factors that shape midwives' opinions and practices regarding vaccine related discussions and recommendations to their patients during pregnancy based on general vaccine hesitancy questions in semi-structured interviews.

Research Question 3: What do midwives perceive as barriers to recommending vaccines for pregnant women?

Aim 3: To investigate barriers midwives face in accepting, discussing and recommending vaccines to pregnant patients.

Objective 3: Identify midwives' perceptions of the barriers to maternal vaccination by addressing the following topics:

- a. Psychosocial: attitudes and perceptions of midwives for themselves and their opinion regarding the acceptability of vaccines by and for their pregnant patients; and
- b. Systemic/logistical: knowledge/awareness about immunization recommendations, limitations of scope of practice, feasibility of incorporating vaccine discussion into their existing routine.

Research Question 4: How are the KABB of midwives surrounding vaccination influenced by the experiences and context in which they practice and by their clients?

Aim 4: To explore the influence of demographic, experiential and cultural context on KABB as it relates to the vaccination of pregnant women.

Objective 4: Analyze the levels of midwives' acceptance of vaccination and recommendation practices while considering cultural and demographic context during analysis of interviews.

Methods

Research Paradigm

A constructivist ontological perspective or social constructivism informs this research. Constructivists believe that individuals seek to understand the world in which they live and work.(68) In relation to my research focusing on vaccination and health decision making, ‘views of what constitutes ‘health’ are part of a broad spectrum of individual and group perspectives and are based on the different ways in which people make meaning’.(69) Individuals develop subjective meaning to their experiences and these meanings can vary.(68) The goal of research when following this perspective is to rely on participant views of the situation being studied as much as possible.(68) To achieve this a qualitative approach was taken to understand the way individuals construct their knowledge and the meaning behind, their interactions with each other, media and the social world in which they live.(69) This is done by using broad questions, so the participant can construct their own individual meaning in the situation, and convey those to the researcher.(68, 70) Often these subjective meanings are formed through interaction with others and through historical and cultural norms that operate within each individual’s life.(68) Therefore it is important to focus on the context in which people live and work in order to understand the historical and cultural setting of the participants.(68) The researcher’s purpose is to make sense of or interpret the meanings others have about the world. Rather than starting with a theory, researchers generate or inductively develop a theory or pattern of meaning based on their findings.(68)

This approach was considered in shaping the problem, research questions, analysis of data and other aspects of the design process. Semi-structured interview questions were informed by the constructivist perspective and utilized to gain insight into midwives’ perspectives and practices regarding vaccination for pregnant women. Constructivism allows the individuals to convey their own personal and subjective perspective on the topics of interest and thus the

approach of semi-structured interviews was chosen since this perspective gives credit to the subjective meanings and contexts in which individuals operate. It also considers the historical and cultural influences, and systemic barriers facing midwives and uses this in forming the research questions and interview guide.

Constructivism was used to shape the analysis of data in this study but the researcher did not approach the data with any theoretical (a priori) assumptions with which to influence the purity of the themes that should emerge.(71) Therefore the researcher viewed the data with flexibility and openness and engaged in open coding in the initial stages of analysis.(71) The content was then approached with the underlying theoretical assumptions and ideas of the Theoretical Domains Framework (TDF) in the later stages of coding as a means of giving focus to data collection and analysis.(71) Utilizing both an inductive and deductive approach to analysis allowed for the data to accurately represent the subjective meanings and content which the participants shared without being overshadowed by a theoretical interpretation by the researcher.

The researcher also engaged in theoretical sampling. In addition, the number of people interviewed and how they were chosen was ongoing and flexible throughout the research process and based on the research itself.(71) According to Glaser and Strauss (1976), theoretical sampling is most often used in qualitative data and theory development, therefore researcher should not pre-determine the sample in advance of the research.(71) What is meant by this is that the number of people, the events or activities that are examined cannot be determined prior to the research.(71) In other words, the researcher lets the participants and research content guide the process rather than the other way around. Because theory development was not the aim of this research project the sample selected for data collection was not expected to impact the findings of or final conclusions of this project. Additionally, the theoretical sample approach influenced where and how recruitment was conducted but did not have an impact on the final participants accepted for the study due to minimal criteria for participations.

Study Design Overview

This exploratory investigation of midwives' KABB regarding vaccination during pregnancy was conducted using a constructivist approach and semi-structured interviews. Data gathered through semi-structured interviews was analyzed using open-coding followed by thematic analysis.(68, 72) Following data collection, themes were developed from interview content on both an inductive and deductive basis.(68, 72) Emergent design tactics were utilized as the initial plan for research was not tightly prescribed and some or all phases of the project were subject to change throughout or following the data collection process based on findings that emerged.(68, 70)

A semi-structured interviewing technique was chosen as a data collection method to elicit views and opinions from participants.(68) This is a useful alternative to direct observation of practicing midwives since the interaction between midwives and their patients was not the target of research design. It also allowed the researcher to control the line of questioning and directly inquire about the information relevant to the research more efficiently.(68) The drawbacks/limitations of this approach to data collection include the potential for data to be misinterpreted by the researcher and open to bias.(74) Interviews are also not representative of a natural field setting and therefore there is potential for the interaction to not be considered genuine.(68) The researcher tried to make the interaction as natural as possible by keeping a natural flow to the conversation, was approachable (using facial and body language when in person), friendly and easy going both in person/phone and email exchanges.

Sampling and Recruitment

Sampling and Inclusion Criteria

A purposive sampling technique is often used in qualitative research to select participants who have particular characteristics that are of importance in fulfilling research objectives.(72) Participants of this study were purposively sampled to fulfill eligibility criteria.

Eligible participants were registered midwives in the Waterloo-Wellington Region who volunteered to participate in the 45 minute to one-hour semi-structured interview. No limitations were imposed in terms of whether or not midwives were part-time or full-time. There were also no restrictions on where they were trained or how long they had been practicing. Participants were from a range of clinics in the Waterloo-Wellington area with five servicing more rural clientele and two practicing in centrally located clinics in city centers such as Kitchener or Cambridge. The remaining participant is no longer practicing but is working in midwifery care in an urban city center. It should be noted that the small sample size of this study is not surprising and is representative of the fairly small number of midwives in Ontario (711 as of 2016) and even fewer in the Waterloo-Wellington region providing services to rural and Mennonite clientele.(37)

A total of eight midwives completed interviews including one member from the College of Midwives who agreed to do an unofficial interview and did not answer interview questions but agreed to speak on record about information related to the College and about guidelines and regulations. Data transcription, coding and analysis occurred on an ongoing basis throughout the recruitment and interviewing process to ensure that the interview guide stayed relevant and up to date. The researcher struggled with recruitment due to the small population being studied (midwives in the Waterloo-Wellington Region) and the requirements asked of participants (45 minutes to one hour of interviewing). Although the original proposal indicated the aim of the study was to achieve theoretical saturation, during the interview process it became evident that

recruitment would be more challenging than originally anticipated due to the small population sample size. Expectations and goals were adjusted accordingly and the study aim was modified to become an exploratory study rather than achieving theoretical saturation. With a larger population size saturation could be achieved but this was not a reasonable expectation with the population being studied (Waterloo-Wellington Region) and limited resources. Recruitment was paused after interview seven for a period of six months and initiated again in January 2018 with the hopes of recruiting additional participants. The additional round of recruitment was also unsuccessful in increasing the number of interviews significantly and resulted in one additional participant. Supervisor Dr. Samantha Meyer and Researcher Michelle Simeoni felt that they had exhausted all possible recruitment options for this project and concluded recruitment efforts in April 2018 with eight interviews. The study did yield meaningful, relevant and compelling findings that will be presented in the analysis section of this paper.

Recruitment Procedure

Potential participants were recruited using two techniques; active recruitment through contacting Midwifery clinics in the Waterloo-Wellington Region and passive recruitment through the use of posters and flyers [circulated and posted at these clinics]. The use of a combination of active and passive techniques has been found to improve recruitment of participants for qualitative research in previous studies.⁽⁷³⁾ The researcher engaged in discussion with clinic employees with the objective of increasing the chances that study recruitment would be improved. The flyers acted as a reminder for those who were interested to contact the researcher for more information on the study. Following up with telephone calls to clinics allowed the researcher to ensure that the study was raised at the weekly midwifery meetings hosted at each clinic and that potential participants were hearing about the study through their place of employment.

The general purpose of the study was conveyed in a short information letter that was emailed to clinics [See Appendix H] along with a recruitment flyer [See Appendix H]. If participants emailed or called the researcher expressing interest in the project the researcher then forwarded them a longer information letter [See Appendix H], which outlined the study in more detail. If the participant was still interested, an interview date and time was arranged. The researcher sent the participant a copy of the consent form, demographic questionnaire, permission to re-contact form and a copy of the interview guide prior to the scheduled interview [See Appendix H]. Participants could choose to either sign the forms and send them back via email, bring them to the in-person interview or provide verbal consent over the phone after reviewing the documents with the researcher.

Flyers are a common tool used to recruit participants in qualitative studies and are frequently used in qualitative public health research.(73, 74) Flyers with a description of the study were sent to clinics with the request that they be posted in a central location within the clinic to aid in the recruitment process. Recruitment of participants began following approval from an Office of Research Ethics in the spring of 2017 and continued until Spring 2018.

Data Collection

Data Collection Procedures

On the agreed upon date and time, the researcher and participant met by phone call or in person. The researcher greeted the participant, went over the consent form and demographic questionnaire, which were provided beforehand to the participant via email [See Appendix H]. Once the participant signed the form or verbally consented the researcher clearly stated she was moving on to the interview guide and the interview would be starting now. The interview guide was also provided to participants prior to the scheduled interview to allow participants to review the questions and reflect on responses. The researcher followed the script for the semi-structured interview, remained attentive to each participant response and adjusted follow-up and probing questions accordingly. The interview was recorded using a hand-held recording device with a back-up device on hand in case of technological failure. Recordings were immediately downloaded onto the researcher's secure laptop. Following completion of the interview questions the interviewer asked all participants if they had anything they would like to add and then proceeded to thank the participant for their time and concluded the interview. Some participants requested to receive a copy of the final thesis upon completion of the research. The researcher made note of this and verified that they would be able to receive a final copy of the research following defense scheduled for April 2018.

Data Collection Tools and Methods

Semi-Structured Interview

The sole method of data collection for this research was semi-structured, responsive interviews. Semi-structured interviews are used in qualitative research to gain insight into the experiences of participants and are intended to be flexible to allow participants the freedom to elaborate on their experiences through a set of informal questions.(72, 73) Questions in the semi-structured interview guide designed for this specific study were focused on the main objectives of the research but were designed to free flow of the information provided by participants.(74) The

interview guide itself was informed by Theoretical Domains Framework and by related research conducted by the CIRN group. The interview guide was intended to pull out rich information from participants and to adequately address the research aims and objectives.

The semi-structured interviewing began with small talk and ice-breaker questions then lead into the demographic questionnaire (if not previously filled out by hand).(75) The remainder of the interview consisted of primary and follow-up questions that addressed each of the objectives. The interview guide also contained probes, which were used to gather additional details and keep participants on track with their responses.(75)

Prior to data collection, interviewing was piloted with one peer at the University of Waterloo with little to no prior knowledge of the research or the midwifery field. This was done to gather objective feedback regarding the structure and clarity of the questions.(68, 72) The interview guide was then piloted again with a practicing midwife who the researcher was put in contact with through committee member Dr. Elena Neiterman. The pilot participant put forth some recommendations for revisions, which were made prior to the commencement of recruitment and interviewing. Revision recommendations included removing the word hesitancy from the title of the study due to the lack of understanding of the word and negative connotation attached within the midwife community that potentially deterred participants and hindered recruitment. The pilot participant also questioned the use of the identifiable demographic information. To address this in future interviews the researcher made it clear to participants prior to asking for demographic information that this portion of the data would not be included in published information and would only be used to consider ranges and trends in participants. All recommendations from the pilot process were used to revise the final interview guide.

Responsive Interviewing

The researcher conducted the semi-structured interviews using a responsive interviewing technique. Interviews are used in qualitative research for the purpose of gaining insight into

participant experiences.(73, 76) The goal of qualitative research is to “see through the eyes of others, bring out a sense of process and have a flexible and unstructured method of inquiry”.(73) The technique fits well with the constructivist ontological approach chosen by the researcher because it emphasizes the relationship between the researcher and participant. This relationship aims at depth of comprehension and flexibility of the interview design. To achieve this objective the researcher must take the *responsive interviewing approach* where the researcher responds to and then asks further questions based on participant responses rather than relying on a fixed and unchanging set of questions.(75) Responsive interviewing emphasizes working with participants rather than seeing them as simply objects of research.(75) To achieve responsive interviewing the researcher followed the formula; main questions, probes and follow up questions. The main questions address the main problem and maintain the structure of the interview.(75) Probes assist in managing the conversation and eliciting detail from participants.(75) Follow-up questions explore ideas that emerge during the interview and are a direct response to what the participant has said.(75) The goal of using responsive interviewing is to enhance the richness of the data being collected and present a narrative of the experiences of midwives in the Waterloo-Wellington Region.(75)

Although the researcher was not a neutral subject in the exchange, she strived to be aware of her own beliefs, reactions and biases during the interview.(75) The researcher framed the questions in an open-ended manner to achieve depth within the interviews and to allow the participant the freedom to answer openly with their own personal beliefs, perceptions and experiences.(75) The responses of the participant guided subsequent questions during the interview making each interview unique and tailored to the participant.(75) Questions were added or removed based on responses throughout the interview which was determined by the researcher’s unbiased and educated judgment.(75)

The researcher shared several early interview transcripts with qualitative researcher and Supervisor Dr. Samantha Meyer during the data collection process. Supervisor Dr. Samantha

Meyer provided feedback on interview style and probing and the researcher adjusted her interview technique accordingly. For example it was suggested that some additional probing questions be asked as follow up to some interview guide questions based on responses and the researcher agreed. Moving forward these adjustments were made.

Short Demographic Questionnaire

Each participant was asked to fill out a short demographic questionnaire prior to the scheduled interview (See Appendix K). The demographic questionnaire was sent to participants prior to the interview along with the consent form and the interview guide (See Appendices H and L respectively). Participants could complete the form prior to interviewing and send it to the researcher via email or complete the questions during the scheduled interview time. The data collected included basic information such as location and years of training, education, age, current employment and past employment. Participant responses were used to inform probing questions throughout the interview, as well as, to determine if any trends could be established.

During the pilot interview (Interview ID_001, Emily) it was pointed out that these demographic questions are identifiable and that the respondent was not comfortable answering them due to the small community of midwives in the area. The researcher advised the participant that the responses would not be included in the published research and it was simply for personal records and analysis purposes. The participant agreed and proceeded with the interview. To prevent this from becoming an issue in future interviews the researcher included a disclosure statement in future correspondence that assured participants that the demographic information would not to be published and all information included would be de-identified.

Data Analysis

Interviewing, transcribing and coding took place simultaneously. Semi-structured interviews were audio-recorded, transcribed, and imported to NVivo for qualitative analysis and open-coding. Analysis of interview data was undertaken using techniques from thematic analysis

and Theoretical Domains Framework (TDF).(68, 77-80) Main themes and categories were identified through a combination of deductive and inductive analysis using provisional coding and satellite coding and a constant comparative process.(68) All interview recordings were transferred onto a password safe computer, saved into a designated password secured folder on an encrypted USB and transcribed into a Microsoft Word document. Analysis of interview transcripts took place using NVivo qualitative data analysis software.

Audio Recordings and Transcription

All interviews were recorded on a handheld device. This device was then used to play back and transcribe interviews word for word for further analysis. Original audio recordings were stored in a file on the researchers computer and labeled with an identifiable title (e.g. recording_001, recording_002). A separate file stored the transcribed interviews as Microsoft Word Documents with corresponding labels (e.g transcription_001, transcription_002). These files were uploaded to NVivo for further analysis.

NVivo

This research utilized NVivo qualitative analysis software to assist with efficient retrieval, storage and coding of data.(73) Components of NVivo, such as mind map and organizational charts, were also used for sorting and organizing codes.

Coding Process

First Read Through of Transcript and Provisional Coding

During the first read through of each interview transcript, the researcher used open-coding along with Layder's (1998) provisional coding technique.(71) The first set of coded data is based on open-coding followed by provisional coding. Open-coding is often used in grounded theory as a preliminary way of analyzing the data. This approach was selected as a first approach to allow the researcher to assess the data with no preconceived perceptions or biases about the data or potential findings and to also help determine the discovery of new codes or themes that could potentially lie outside the framework once further analysis and thematic sorting took place.(71)

Provisional coding is used to label segments of text that the researcher considered particularly interesting or triggered some association with particular concepts, categories or ideas, in this case as they related to TDF.(71) While traditional open-coding is characterized by coding data with no orientation to theoretical concepts, provisional coding differs by acknowledging existing theory and concepts while tagging and labeling sections of text.(71) Provisional coding differs from grounded theory approaches in that it is less restrictive than alternative coding methods (e.g. axial coding) as data analysis progresses.(71) Layder (1998) suggests that each transcript should be provisionally coded while remaining completely open to new concepts, even as existing categories are being confirmed with new data.(71) This method was used as a preliminary reminder to classify the data in a particular way so that it could be revised or confirmed at a later date when more detailed coding took place.(71) The researcher referred to the TDF during provisional coding but remained open to new ideas or concepts outside of this framework and coded entire segments of data (back and forth conversation or entire paragraphs) to stay true to the meaning of what participants were saying and to ensure words were not taken out of context. This step ensured that emerging themes were an accurate representation of participants as well as of the current literature in the field.(71)

Satellite Coding and the Comparative Process

Satellite coding took place throughout the data collection and analysis process. The researcher used this process to “indicate significances in the data by applying particular labels and names to classify sections of text” (71), because the satellite coding process allowed the researcher to identify the common or main themes that required further development or exploration through the interview process.(71) As codes were accumulated throughout the analysis process, they were sorted into main themes as indicated by the TDF. The researcher revisited each transcript and re-examined initial codes, collapsed provisional codes into broader analytic categories and began to draw relationships between these categories and create coding hierarchies.(71) The researcher regularly revisited and reviewed the raw data, provisional codes, code categories and the broader themes.

The constant comparison process and use of mind-map and organizational charts within NVivo allowed for comparison of KABB between midwives and the comparison of experiences with regard to vaccine discussions, recommendation, practices and hesitancy within the midwifery profession in the Waterloo-Wellington Region. A mind-map was created with the 14 TDF categories (Knowledge, Skills, Social/Professional Role and Identify, Beliefs about Capabilities, Optimism, Beliefs about Consequences, Reinforcement, Intentions, Goals, Memory, Attention and Decision Process, Environmental Context and Resources, Social Influences, Emotion, Behavioural Regulation).(77, 79, 80) Codes were sorted accordingly into relevant categories and could be placed into multiple or none of the categories outlined by TDF. If codes did not fit into these categories they were left out to determine gaps in the theory in its application to the research topic. The process of collapsing categories together to observe broader themes did not take place until the majority of the interviews had been conducted (following interview 7) to ensure the researcher had a good grasp on the interview content prior to satellite coding.

Sorting Codes Using TDF and Use of a Second Coder

Codes created in the pre-coding and provisional coding stage were sorted using a mind-map on NVivo into categories outlined from the Theoretical Domains Framework.(15, 77, 79, 80) Codes were either organized into the relevant categories as determined by the primary researcher or left un-coded if they did not “fit” into a pre-determined TDF category. Following the researcher’s completion of satellite coding two transcripts were sent to *Eric Filice*, an MSc student of Supervisor Dr. Samantha Meyer who took on the role of second coder. Eric Filice was approach by Supervisor Dr. Samantha Meyer and asked to take on the role of second coder due to his interest in qualitative research. Following agreement to join the project, Eric was put in contact with the primary researcher via email (they were previously acquainted through working together at the University of Waterloo). Eric was debriefed on the overall project and the specific approach that was being used to coding. The researcher sent all relevant background literature including the TDF resources to Eric. Following his review of the literature Eric indicated that he was comfortable moving forward with coding the data and the researcher sent two de-identified transcripts for coding. The coded data was returned to the researcher within a week. Codes were reviewed for inconsistencies by both the researcher and Supervisor Dr. Samantha Meyer. All questions were discussed until all parties reached a mutual agreement.

Known and New Themes

All themes were sorted into a chart categorized by “known” and “new” themes. These themes were organized following the completion of data collection and following extensive literature review. These themes were based on the researcher’s knowledge of known themes in the field, which are found in the literature. Codes were sorted based on uniqueness of the code or aspect of the code being applied in a unique way in which it addresses a gap in current literature or knowledge. New themes that emerge were explored more in depth and became the focus of the

research findings and known themes were used to reinforce knowledge in the research field and validate the findings of the study.

Unclear and Irrelevant codes

Any data that had an unclear meaning or the meaning was determined to be irrelevant during the sorting or satellite-coding process were tagged and revisited towards the end of the analysis process. Beginning with open or provisional coding resulted in many codes ultimately becoming irrelevant in addressing the research questions or objectives. These codes were set aside in a separate category and were reviewed to ensure no meaning could be elicited.

Modifying the Interview Guide and Interview Process

The interview guide was extensively discussed with three thesis committee members (Elena Neiterman, Heather MacDougall and Samantha Meyer), a second coder (Eric Filice) and the project was piloted with an objective outsider. However, the process of interviewing was an active learning process. The researcher scheduled formal weekly updated reports with Supervisor Dr. Samantha Meyer following the pilot interview, interview #3 and interview #6.

Following the pilot the researcher and Supervisor Dr. Samantha Meyer discussed suggestions that were made by the interviewee about the title of the project and some of the questions being asked. After reviewing the transcripts together it was agreed that the first interview went well but could be improved upon for future and Supervisor Dr. Samantha Meyer made suggestions, which the researcher made note of and incorporated in the following interviews (See Interview Notes in Audit Trail, Appendix G). The researcher also took steps to address the concerns of the pilot participant by submitting an ethics application to change the project title, as well, as adding disclosure informing for participants about the use of the demographic questionnaire. With supervisor approval interviewing proceeded.

Following interview #3 Supervisor Dr. Samantha Meyer requested an informal power point presentation be prepared during the next scheduled check in. This presentation included the

transcription, coding, initial sorting and analysis of codes from interviews 001, 002 and 003. Following the presentation of preliminary findings Supervisor Dr. Samantha Meyer and the researcher discussed thoughts, concerns, and next steps regarding recruitment, interviewing, and analysis. Supervisor Dr. Samantha Meyer made some suggestions for adjusting the interview guide for future interviews and how to improve probing and follow-up but was overall pleased at the researchers interviewing strength. Supervisor Dr. Samantha Meyer also pointed out her thoughts on some novel findings and interesting sections of text within the data. Both parties agreed on areas of literature that should be explored further based on these findings such as surveillance during pregnancy, ethics in researching vaccination of pregnant women, personal narrative and stories (anecdotal evidence). These suggestions were incorporated into upcoming interviews. Following the meeting the researcher updated the committee on the progress of the project and expected timeline for completion via email.

Following interview #6 the researcher and Supervisor Dr. Samantha Meyer again discussed progress in the research. At this stage the researcher had completed interviewing, transcription, provisional coding, and satellite coding of all six interviews and had interview #7 scheduled for the upcoming week. The researcher discussed her concerns regarding recruitment, as the researcher was not fielding any inquiries and had no participants lined up for interviews. Supervisor Dr. Samantha Meyer provided some suggestions for recruitment including; emailing clinics located in urban areas, emailing past participants for referral, and repeat discussion with recruitment gatekeepers Dr. Elena Neiterman and Dr. Phil Deacon.

Researcher Michelle Simeoni took the steps suggested by Supervisor Dr. Samantha Meyer to aid in recruitment including; informing her Committee (Elena Neiterman and Heather MacDougall) about her struggles with recruiting, emailing all the clinics located in the Waterloo-Wellington Region not limited to urban location, sending out a second recruitment email to clinics that had already participated and asked Supervisor Dr. Samantha Meyer to discuss this matter again with advocate Dr. Phil Deacon. On June 7th, 2017 the researcher conducted an in-

person interview with participant #7. After several weeks of without any interest in the study from potential participants, and with the deadline approaching, Supervisor Dr. Samantha Meyer granted the researcher permission to expand the study to all of Ontario despite lack of background literature and slight change in research focus. Researcher Michelle expressed concern with the drastic change in focus of the study so close to the scheduled defense date. Supervisor Dr. Samantha Meyer and the Researcher discussed options for relevancy and justification of study expansion and agreed that the best option in order to meet the deadline with enough data collection was to expand the study. On July 7th after not receiving any inquiries or interview opportunities, the researcher was granted permission by a University of Waterloo Office of Research Ethics to modify the study allowing the expansion of recruitment to include all Midwives practicing in Ontario where a Mennonite population is present. Dr. Meyer indicated a strategy for recruitment and suggested contacting clinics located in or close to Mennonite populations similar to Waterloo-Wellington. This strategy did not yield additional participants therefore recruitment was expended to all of South Western Ontario. As of July 22nd, 2017, no further inquiries were made and no interviews have been scheduled or completed. The researcher completed a draft of the thesis paper based on the data that has been collected to date and sent it to Supervisor Dr. Samantha Meyer for revisions (Part 1 sent on June 26, 2017; Part 2 sent on July 13, 2017). Supervisor Dr. Samantha Meyer and the researcher discussed next steps based on the current situation and Dr. Meyer determined she would have to evaluate next steps based on Part 2 of the thesis. In the interim, the researcher focused on recruitment of additional participants to be added to the study prior to the final submission scheduled for August 3rd, 2017.

It was decided on August 3rd, 2017 that the project was to be halted during the Fall Term due to extenuating circumstances on part of the supervisor and researcher. Committee members were informed and approved the researcher's request to postpone the defense of the project until early 2018. Upon further revision, the final thesis was completed and submitted for defense scheduled for April 23, 2018 with no additional participants.

Demographic Questionnaire

Data from the demographic questionnaire developed by the researcher was compiled into an Excel spreadsheet (See Appendix I). The questionnaire requested information such as age, training, education and place of employment (current and previous). Due to the small community of midwives in the Waterloo-Wellington Region and small class sizes for education in obtaining credentials in midwifery the information gathered must remain confidential and unidentifiable. The findings from this questionnaire are not meant to be generalizable but to provide context and background information on participants that may assist in determining trends and patterns in the analysis process.

Consideration of Theory

Establishing links between observation and theory improves the prospect of achieving the goals of sociological research.(81) This research takes a theory driven approach as opposed to a grounded theory approach. The significance of this is that theory is used as a priori.(81) This means that the responses and experiences of the participants are filtered through a theoretical lens.(77) The goal of this research was to explore the social problem of low vaccine uptake amongst pregnant women by looking at recommendation and discussion practices among midwives in a particular region and focus less on theory development. Integrating theory was achieved through developing research questions that emphasized a theoretical influence in the research process. However the limitation of theory driven research is the constraint it places on the data collection and analysis process in regards to the findings that can be observed.(81) What is meant by this, is often times in a theory driven approach data is made to fit the theory. To address this my research took an approach that is both structured and framed by theory but also open to new concepts, themes and ideas so that the findings are not limited. This form of coding allows data within as well as outside the theoretical framework to emerge.(81) Considering that the aim of this paper along with majority of other health research, is not only to expand theory but

also to build upon existing knowledge in the field and influence policy and practices in the real world, this combination of a deductive and inductive approach is considered the most appropriate.

Theoretical Domains Framework (TDF)

The Theoretical Domains Framework (TDF) was consulted in this research project in the creation of the interview guide and analysis of data. TDF is an integrative framework that summarizes the dominant constructs from predominant theories that aim to explain behavioural change in health care professionals.(77, 79, 80) TDF comprehensively addresses a broad range of themes and topics therefore allowing the researcher to identify possible explanations for midwives' KABB regarding vaccine in pregnancy while providing theoretical justification for these explanations [See Appendix E]. These themes and topics are captured within 14 categories for which data can be sorted accordingly; Knowledge, Skills, Social/Professional Role and Identify, Beliefs about Capabilities, Optimism, Beliefs about Consequences, Reinforcement, Intentions, Goals, Memory, Attention and Decision Process, Environmental Context and Resources, Social Influences, Emotion, Behavioural Regulation.(77, 79, 80) Interview questions and items were designed to explore the specific content of the domains in relation to implementation problems.(77) For example certain questions were specifically designed to elicit responses that would fit into one or more of the designated TDF categories specific to the content being studied [See Appendix E, F & G].

The TDF framework was also used as a coding framework for analysis.(77) Following open-coding and responsive coding where the researcher was able to create 128 baseline codes, codes were sorted further into categories based on the TDF framework. Codes could fit into one or more of the categories outlined by the framework. Codes that were left outside or seemed to not fit within the framework demonstrated a possible anomaly, new findings or a gap in the framework and were looked at more closely.

A social science, as well as, qualitative lens is critical in understanding the health-related decision making of consumers and providers of health care services. Studies have shown that risk and trust issues are not only relevant for examining lay people's vaccine decision-making, but also apply to health care providers in the decision to recommend or administer vaccines. Our society has seen a shift to shared decision-making between health care provider and consumer, changing the interaction and approach required in vaccine education and recommendation practices. More importantly behaviour change is key to increasing the uptake of vaccines into health care practices.(77, 80) A qualitative approach allows the researcher to capture this interaction of how knowledge, attitudes and perceptions influence behaviour and practice within the clinical setting.(79)

Limitations of Using TDF

A limitation of using the TDF approach is that it is too focused in scope and may constrain responses and/or analysis of data. The researcher took steps to eliminate this bias in both the interview guide development and analysis stages. While creating the interview guide, although the framework was consulted and considered, it was not the only informing source of literature and not all interview questions served a purpose related to the TDF framework. In other words, not all interview questions were meant to fit into or address a component of the TDF framework. Similarly, not all codes during the analysis stage were required to fit into the 14 domains and only after open coding took place were codes then reviewed for their relevance to the TDF framework. Codes that fell outside the TDF framework were reviewed as separate. Another limitation of the TDF framework is its reliance on interpretation and subjective categorization of content into TDF domains. Sorting was based on definitions provided by the TDF framework however content is still based on subjective interpretation of interview responses. The researcher tried to focus on key words and phrases to determine sorting and use of

a second coder to eliminate bias in this stage of the analysis. These theoretical approaches and dominant themes helped inform data codification in the analysis phase [See Appendix E and G].

Ensuring Quality of Research

A variety of techniques recommended by Silverman (2013) and Bryman & Bell (2004) were used to ensure that the data gathered through this study are valid and reliable from a qualitative standpoint.(72, 73) The researcher utilized techniques to ensure credibility, consistency, applicability through transferability and neutrality in the study with the aim of producing sound and trustworthy qualitative research findings.(76, 82)

Reliability

Reliability is concerned with the consistency of measures. External reliability, or the degree to which a study can be replicated, is more challenging in qualitative versus quantitative research.(73) As LeCompte and Goetz explain, “it is impossible to freeze the social setting and circumstances of an initial study to make it replicable in the usual sense of the term”.(68,p.168) The research methods and procedures are outlined in detail and therefore if followed step by step can be replicated by the researcher or an outside party. The researcher has documented and can provide background literature, a detailed study proposal, a research guide, a theoretical framework from which to base coding and analysis, as well as, all supporting documents that were used to inform the research included in the references appendices. Despite this, however, due to the nature of qualitative research, the results of a ‘replicate’ study may vary depending on the population being studied.

Use of a second observer or reviewer is important to ensure that members of the research team agree on what they see and hear.(73) Internal reliability has been achieved by introducing a second reviewer (Supervisor Dr. Samantha Meyer), who reviewed transcripts throughout the interview process to ensure proper interviewing techniques were followed. Additionally a second coder, Eric Filice from the School of Public Health and Health Systems (SPHHS), was introduced at the mid-way point of the project to review the coding of two randomly selected de-identified interviews allowing for inter-coder consistency. Eric was provided with the framework and

concepts outlined by TDF, but not the open codes, to allow for an objective and unbiased review of the raw data.(73) The reviewed transcripts were sent back to the researcher who reviewed them against her codes to ensure no critical themes or information were missed and that all coded themes were in the correct categories. All discrepancies were discussed with Supervisor Dr. Samantha Meyer and second coder Eric Filice until agreement was reached. Readers can be confident that findings being presented are reliable and true to the data collected.(73)

Validity

Validity refers to the researcher's criteria that determines the integrity of the conclusions generated by the study being conducted.(73) Internal validity was established by ensuring a match between the researcher's observations and the theoretical ideas that have been developed.(73) The research was peer reviewed using a second coder to ensure sufficient and unbiased codes and concept development prior to the scheduled defense date. Overall project validity was achieved through review of data and final research conclusions by a panel of experts in the field; Dr. Samantha Meyer, Dr. Elena Neiterman and Dr. Heather MacDougall at a scheduled thesis defense.

Credibility

Credibility refers to whether the research can be trusted or believed. When it comes to research, this can be a challenge as every individual can have different accounts of an aspect of reality.(73) To target this the researcher must ensure that the interpretation presented in the study is a true representation of the people being studied.(73, 76) One step to ensuring credibility is following proper research procedures to limit the potential for subjective bias or influence. The researcher has taken the necessary steps to ensure that the research project is not leading or biased in any way. This project was conducted under the supervision of a qualified researcher Dr. Samantha Meyer, and all methods have been approved and overseen by the research committee consisting of Supervisor Dr. Samantha Meyer, Dr. Elena Neiterman and Dr. Heather

MacDougall. This project also received ethical clearances from a University of Waterloo Research Ethics Board prior to data collection. The researcher regularly met with and reviewed progress with Supervisor Dr. Samantha Meyer and provided updates to committee members to ensure data collection followed proper procedures and the researcher remained accountable.

Another method of ensuring credibility is by having a peer reviewer to assist in the analysis or coding stage of the study through regular debriefing.(73) It is suggested that someone, not part of the research committee review the data in order to obtain an objective view of the data. (73) Supervisor Dr. Samantha Meyer recruited fellow SPHHS graduate student Eric Filice to review and code two de-identified transcripts using only TDF literature. It was requested that Eric not have access to the already developed codes to remove any influence or bias. This allowed for codes and themes to be either confirmed or challenged as the researcher worked with the peer reviewer to ensure all codes were agreed upon. (73)

Throughout the data collection process a reflexive journal was kept [See Appendix J]. A reflexive journal not only contributes to the credibility but also the transferability and dependability of the data.(73, 76) A reflexive journal is a method for the researcher to record their thoughts and observations throughout the interview and analytic process. This also allows for justification of methodological changes that may occur.(76) It also contributes to the flexibility of the interview guide and creates justification for changes in either the structure or wording of questions based on participant responses.(76)

Transferability

Transferability is the ability for study findings to be applied to other times, places and people.(73) Due to the nature of qualitative interviews and the specificity of their design related to each research project, it is suggested that rather than aiming for the findings to be transferable, qualitative researchers are encouraged to produce “thick description” or rich and detailed accounts of a groups’ culture or experiences.(73) Purposive sampling techniques were used to

gather participants, as this is the most effective method for collecting individuals that can provide insight on a particular topic of study.(82) The aim was to gather participants that could provide generalizable insight on midwives' practices regarding vaccine discussion and recommendation as well as, midwives' experiences within the health care system surrounding scope of practice and vaccination. Purposive sampling was used to recruit midwives in the Waterloo-Wellington Region that were able to speak to the discussion and recommendation practices related to influenza vaccines as well as vaccines in general.

Dependability

Similar to reliability in quantitative research, dependability refers to the ability to ensure the study's interpretations and theoretical influences are justified.(73) The dependability of the data collected was established using inter-coder agreement, complete transcription of all interviews conducted and note taking during the interview process.(73) In addition the researcher engaged in the use of an audit trail including all phases of the research process such as; problem formulation, selection of research participants, field notes, interview transcripts, data analysis memos and all other relevant records which are included in this final thesis document are available upon request.

Reflexive Journaling

A reflexive journal allows the researcher to record their thoughts and track the reasoning behind changes made during data the collection and analysis stages.(76) A reflexive journal therefore contributes to the credibility, transferability and dependability of a research project.(76) The researcher wrote journal entries throughout the course of the project [See Appendix J] most often following weekly meetings with Supervisor Dr. Samantha Meyer and following transcription of interviews. The journal entries documented suggested changes to the interview guide, ethics modifications, challenges with recruitment, questions and challenges with the coding and analysis process. This process helps to remind the researcher to discuss questions and

concerns that arise during interviewing, coding and analysis and also allows for the researcher to keep track of the responses and how to address and changes being made. Keeping detailed and consistent notes of thought processes and project development is important for review in final analysis stages, for the final thesis composition and to provide clarity and transparency with the research committee. Most importantly reflexive journaling will provide justification for any methodological changes that have occurred throughout the research process.(76)

Memoing

During the data analysis and coding process the researcher participated in memoing. Memoing provides the researcher with a large number of ideas, themes and potential relationships.(83) A technique commonly used in grounded theory, researchers use memos to elaborate on the codes during the assessment of data and provide definitions and descriptions of these codes.(83) Memo notes also summarize potential emerging or discovered relationships among codes as well as any content relevant to the study such as methodological concerns, ideas for further study and so on.(83) Memoing is progressive and originates with terms used by the researcher, then moves from general identification to clarification of concepts and their definitions to the articulation of relationships between concepts.(83) The purpose of memoing is to achieve a higher level of abstraction and generalization.(83)

This research utilizes theoretical notes, elemental memoing, sorting memoing and integrating memoing. Theoretical notes elaborate on conceptual meanings, connections and relationships among the concepts and outline the theoretical foundation of the codes using the TDF.

Elemental memoing is detailed and relatively specific.(83) At this stage all potential themes, concepts and ideas are coded and reflected upon as the development of the main themes and variables have not yet emerged from the data. A total of 128 open codes were created in this original stage of coding and memoing referred to as purposive coding.

Sorted memoing is written at the stage when elemental memos are reviewed and key issues and core variables are identified. It is at this stage that the organization and summary of the data takes form. This was completed by the researcher during the satellite coding stage.

Integrated memoing makes use of the sorted memos and elaborates on the codes to articulate the relationships and connections among key concepts noted in the sorting memos. In this research the TDF is used as a concept map and sorted memos are organized into broader themes and concepts outlined by the framework.

By making notes and writing down her thoughts throughout the coding process the researcher was able to develop common themes, draw relationships between categories and make sense of codes within them.

Note Taking

The researcher took notes during and following each interview. This process allowed the researcher to keep track of thoughts, ideas, and aspects of the interview that could not be captured on the recording device or in transcripts. Some examples include; hesitation in voice, use of humor, use of judgment/tone/attitude or body language. Notes can be found in Appendix J.

Audit Trail

Keeping an audit trail is recommended to improve the reliability of data.(76) The purpose of an audit trail is to provide a systematic and detailed history of the research study and the steps that were required to reach final results and conclusions. (76, 83) The audit trail for this project can be found in Appendices G & J and includes reflexive journaling, memos, meeting and debriefing notes and all other relevant notes and documentation.

Ethical Considerations of this Research Project

The research proposal of this project was submitted to a University of Waterloo Research Ethics Board in March 2017 and received approval in April 2017. This project did not include any treatment or unpleasant procedures for participants. Participation in qualitative interviewing

was on a voluntary basis and without any negative consequences for refusal or withdrawal from the study. Written or verbal consent was obtained prior to the initiation of semi-structured interviewing and participants were free to refuse to answer or withdraw at any point.

Some ethical issues that were considered prior to initiation of the study included; the discussion of a sensitive topic between the researcher and participating midwives, consideration that administration of vaccines is outside midwives scope of practice and therefore some questions may be unexpected or unwelcome, the potential for midwives to be asked to recall traumatic experiences or memories, and the potential for anonymity and confidentiality breaches due to the small community of midwives practicing in Ontario (711 according to 2016 CIHI data), and even fewer in the Waterloo-Wellington Region. The researcher attempted to address these by sending the interview guide prior to scheduled interviews, allowing participants to prepare answers and back out of interviews if the questions made them uncomfortable. The researcher also assured all participants that despite the small midwife community the information provided would remain anonymous and confidential through de-identification of data and use of ID reference numbers and pseudonyms in place of names prior to publication.

Peer Debriefing and Use of a Second Coder

Creswell (2014) recommends the use of peer debriefing to enhance accuracy. This means involving an outside researcher or colleague in the project to allow for an objective view of the research.(68, 76) The role of this peer reviewer or second coder is to review and ask questions about the qualitative research.(68) The researcher enlisted the assistance of fellow graduate student Eric Filice who reviewed two transcripts and objectively coded the transcripts using the TDF provided by the researcher. Eric Filice, Supervisor Dr. Samantha Meyer and the researcher reviewed and compared the coded data and discussed challenges and successes. Eric provided advice and suggestions for coding as well as reinforcing codes already established by the

researcher. The researcher included notes in the reflexive journal following these debriefing discussions. This process adds validity to the research project.(68)

Inter-Coder Agreement

Inter-coder agreement is important for eliminating bias an individual researcher can potentially bring to the analysis of data.(68, 84) Following the completion of interview 7, two transcribed interviews were selected at random and de-identified before being sent to second-coder, Eric Filice. Eric independently coded two transcripts after reviewing the literature for TDF and the original thesis proposal but without seeing the provisional codes already developed by the researcher. The researcher reviewed the transcripts coded by Eric thoroughly and found little to no discrepancy. The researcher and Supervisor Dr. Samantha Meyer discussed the similarity in the coding completed by Eric Filice and agreed it was sufficient for the researcher to proceed and no further peer coding was needed.

The second coder, Eric, followed subjective assessment of the codes and did not use statistical methods or a computer program when coding, which avoids the challenges of incompatibility of using different methods or programs in coding pieces of transcript.(84, 85) It can be arbitrary where a code starts or finishes and what is more important is the concept, theme or idea that lies behind the code. The focus of a second coder, therefore, is to determine if similar concepts within a text are verified in the coding process.(84) Subjective coding also allowed for discussion about the codes that correspond to certain sections of text and interpretation of said text to eliminate bias.(84)

Overall, the researcher and the peer coder had similar coding structures and agreed on virtually all codes. The peer coder had less detailed codes as he worked from the TDF framework whereas the researcher began from an open-coding perspective. However, in the end, the majority of themes aligned following the completion of satellite coding. The second coder made no

suggestions, and it was then determined by the researcher in conjunction with Supervisor Dr. Samantha Meyer that no further clarification and coding was needed to proceed.

Confidentiality and Anonymity

All participant data and transcripts were de-identified prior to being shared with any members of the research team or publication/presentation of data. All participants were given reference numbers and pseudonyms, which were then used to identify recordings, transcripts and direct quotes during coding and analysis. Direct quotes included in the research are linked to pseudonyms to protect the speaker's anonymity and confidentiality. Identifiable data included in the interview transcripts (including but not limited to personal stories, locations, dates and names) was either altered or not included in the final paper to avoid breaching confidentiality and anonymity of participants. The demographic information included in the interviews was not included in the final project and is only accessible by the researcher. All electronic information related to data collection or containing raw data or identifiers will be stored on a encrypted USB for seven years and will be in possession of either the primary researcher, Michelle Simeoni, or supervising researcher Dr. Samantha Meyer. All paper documents related to the research or data collection will be kept in a locked cabinet in the home of Michelle Simeoni or office of Dr. Samantha Meyer at the University of Waterloo campus.

Results and Analysis

All the participants were female and registered midwives currently practicing in the Waterloo-Wellington Region of Ontario except for one participant who was an employee of a health office in Ontario [See Appendix I]. Participants ranged from 27- 47 years of age and were at various stages of their careers at the time of the interview with only one being a “new registrant midwife”, meaning she has been practicing as a registered midwife for less than a year. The participants were from five clinics in the Waterloo-Wellington Region and one clinic in the London Region. All but one trained in Ontario in the McMaster Midwifery Education Program.

One midwife worked part time with a case-load of 25 billable patients per year while the other five practicing midwives worked full time with a total case-load of approximately 40 billable patients per year. Five of the midwives serve more rural areas and patients and spoke to their service of rural and Mennonite patients while two participants were from city center clinics in Kitchener and Cambridge. Of the eight midwives that participated in interviews, only two considered vaccine discussion and recommendation as part of their routine practice.

Data is organized according to the four identified themes based on previously developed research questions: KABB of midwives related to the flu vaccine, the factors that shape vaccine hesitancy amongst midwives, the actual and perceived barriers to recommending vaccination for pregnant women, and how the KABB of midwives is shaped by the historical and cultural context in which they practice. Within these main themes are sub-categories that emerged in the coding and analysis stages of data collection.

Theme 1: KABB of Midwives Regarding Vaccination

This research project explored a number of factors that shape the KABB of midwives practicing in Waterloo-Wellington Region of Ontario. Some of the factors that will be examined more closely include midwives' scope of practice, the role of midwives as distinct from other maternal care providers, and changes in perceptions and behaviours regarding vaccination over time.

When participants were asked to share their level of comfort in recommending the flu vaccine to their patients, Kayla shared the following:

“So I wouldn't say I feel comfortable. My line is that you know when women ask you know 'should I get the flu vaccine' my line is like I follow the SOGC recommendation so yes pregnant women should get the flu vaccine. Umm yeah that's basically what I tell them that 'yup its recommended', I tell them that they are not more likely to get the flu necessarily but if they do get it they are much more likely to have complications from the flu so that's basically the information I give them and I tell them if they want more information they can talk to their family doctor or the provider who is actually going to give you the vaccine. That's basically all I tell them.” (Kayla)

Kayla's response highlights the concern that midwives may feel uncomfortable being responsible for providing vaccine information and recommendations when approached by patients about vaccine discussions due to a lack of knowledge and their beliefs about their role as a midwife. Both of which can contribute to a midwives' level of hesitancy and lack of vaccine recommendation practices. As a result the midwives that were interviewed often had standard responses that provided patients with information regarding vaccination from public health sources such as the Society of Obstetrics and Gynecology (SOGC) or Public Health and directed further questions and concerns to other providers. Participants shared that they are often more comfortable passing on the responsibility of vaccine discussions to a GP or to a health care provider that has the proper knowledge and training in administration of vaccines.

Another participant spoke more specifically about how existing established knowledge, attitudes and beliefs regarding vaccination affect her personal vaccine uptake choices.

“I struggle with recommending it. I find that as somebody who is not likely to vaccinate that there isn’t a whole lot of testing done on pregnant women [haha] that it’s hard to confidently tell somebody that umm you know yes basically take this vaccine that hasn’t been tested or is brand new or doesn’t have much evidence behind it because we are told that we should take it [...] As somebody who has had three children would I get the flu vaccine? Not a chance. [hahahah] umm but when people ask me what I will tell them is public health strongly recommends it. I have left myself out of it because I can’t strongly recommend it and I will just say what the researcher mentioned when I went to that workshop at Mount Sinai and say ‘research shows you know the real effects of the flu are worse than the theoretical of the vaccine’ and then it is up to the person...” (Marie)

It is important to note that not all of the midwives interviewed shared the same level of vaccination support or opposition. Further than this vaccine discussion and recommendation practices were unique to each participant. What is demonstrated above, however, is that the midwives interviewed for the purpose of this research do advise patients based on public health recommendations, even if it contrasts with their personal beliefs.

A number of the participants alluded to the struggle of circumventing and repressing their personal beliefs in order to maintain the integrity afforded to them as professional care providers.

Marie explained her challenge to find a compromise:

“Well certainly everyone has personal bias and beliefs. I try to not let that impact my practice. You know I don’t tell people that I feel like the flu vaccine might not be effective or that you know I have that own personal bias but I try to say you know ‘the recommendation is that women get the flu vaccine during flu season’ so I try to keep it very level in terms of just saying ‘the recommendation is that you get it because blah blah blah blah blah’ but I really try and just leave it at that.” (Marie)

Other participants shared personal experiences and memories related to vaccination, including adverse reactions experienced with vaccinations in their personal life. One participant shared her challenges with having negative experiences related to childhood vaccination with a close relative [that she claims resulted in severe disability] and how this impacted her attitudes, perceptions and behaviours regarding vaccines from that point on, both personally and professionally. The concept of role negotiation within the maternal care system that is undertaken by midwives’ will be explored more in depth in the discussion section of this paper as a unique element of the Canadian health system and midwifery profession deep rooted in the history of the midwifery practice.

When asked to distinguish their role from other maternity care providers all responses remained similar in content with slight variations in wording and detail. Kendall articulated her perception of her role as a midwife nicely; “So as I said you know we really only deal with low risk pregnancies so that would be a difference. And there is a difference in the scope. I have a more limited scope than a physician would. Umm that would probably be the main distinction.” Midwives in the study acknowledge their role as more limited in scope than other maternal care providers but also see this as more comprehensive because of the personal and collaborative relationship that is built with patients and the benefits this affords them.

“ umm the difference...there are a few differences. One is that we get to know our clients. Because we have a lower case load we get to know our clients a little bit more and they have, overall they tend to have a little bit more trust in us because we have that relationship. As well we provide services in the community so we do home visits, which other care providers don’t necessarily do and I guess that’s probably all. Umm we do have a sort of belief in informed choice so really education is quite a large component of midwifery so we try and educate our clients so you know empower them to make the best decision for their family.” (Kayla)

The midwifery scope of practice, outlined by the College of Midwives of Ontario [See Appendix B], influences the active role that midwives take in their everyday practices.

“ummm it differs in part because I specialize only in obstetrics I don’t have um like a nurse practitioner or a family doctor doing deliveries or even an obstetrician, I don’t have the medical knowledge to treat any other disorders so my training is very very specific. Unlike the other maternity care providers I think of myself as having a more narrow knowledge base.”(Marie)

The more personal philosophical approach of maternity care sets them apart from other potential points of contact for vaccine discussions such as a pharmacist, public health official or pediatrician. As one participant explained:

“Yeah. So I mean the nice thing about our care model is that we usually have the opportunity to get to know them a little bit before we have to make too many recommendations, so that probably helps set the stage for how I am going to talk about it. So I don’t have an identical conversation with every patient knowing that the person I’m talking to if they are a physician I’m guessing I’m not going to have to really convince them to have their vaccines. I probably can have a much different conversation with her then somebody who I know from other choices she’s made might be somebody who is not comfortable with vaccines so...”(Kendall)

She went on further to explain how she thinks her role as a midwife gives her a potential advantage in discussing and recommending vaccines:

“Partly because I think a lot of women’s perceptions are that midwives are open to alternative kind of health care so I think we are in a kind of a special spot to give some of that information because they might say ‘oh well I mean sure if my family doctor recommends it well they are going to recommend everything but if my midwife recommends it I might take that a little more seriously’ because I think their perception is that we don’t recommend every possible intervention, we’re a little more selective...so I kind of feel like we’re in a unique position to provide that information. I also think we are in a unique position because we really build like a trusting relationship with our clients and so I think they really feel a different sense of connection and trust with us that might lend itself to them taking our suggestions with a little more weight.” (Kendall)

This personal and trusting relationship allows midwives to have tailored conversations with their patients that are specific to their needs as understood by their midwife. Participant Chleo echoed this perspective and expanded on how this benefits her within practice:

“Umm I would say that I am somebody who is very much in favor of routine vaccinations and I know that the schedule of vaccinations being recommended is being carefully studied to ensure that we are supporting the immune system and making sure these things are available at appropriate ages for these children as well as now looking at the increase in vaccine recommendations in pregnant that just really knowing that things have been well studied and they haven’t been implemented just because you know somebody wants to sell a vaccine to a population. Pregnant people are usually very, um...like they, it’s something where recommendations are usually pretty sparse when it comes to medication, substance exposure, so for us to have such strong recommendations for these things I know that the literature is there to support it.” (Chleo)

In considering that their role regarding vaccines specifically differentiates them from other maternal care providers, a participant shared that;

“umm well because our, because we provide care. Because we provide health care and obviously vaccination is part of health care so our role is to push it in that regard. I don’t see it as my role to do vaccination promotion necessarily umm... you know we provide standard prenatal care and vaccination isn’t necessarily considered part of standard prenatal care so I don’t see my role as promotion necessarily but I do answer questions on it if it is brought up.” (Kayla)

This statement sheds light on the unique and dynamic role of midwives as health and maternal care providers but also the challenges this creates for them in navigating their role in vaccine discussion and recommendation. Vaccination is considered part of standard health but not

standard prenatal care, impacting the KAB (knowledge, attitudes and beliefs) and more importantly recommendation practices, of midwives within the Ontario maternal health system.

Change in Behaviour Over Time Amongst Practicing Midwives

When participants were asked to reflect on whether their views or practices related to vaccines (either in a personal or professional capacity) had evolved over time, responses were divided with some participants remaining consistent in their views with others experiencing a change.

“I would say my perception has definitely changed. I know before I knew a lot about it with some sort of common knowledge people would talk about how ineffective the flu vaccine was but through my own personal research and looking at the information on my own and just getting updates from public health and from our hospital its been something that I think I have gotten a much greater understanding of what the importance of what the flu vaccine can provide in terms of protection for both our pregnant clients and their children and even their families and even using it as a good discussion point for the entire family as how they can protect each other.” (Chleo)

Reasons as to why they experienced a change in their vaccine related KABB with one participant explaining she had multiple influencing factors in making her more vaccine accepting.

“You know and then when I started my own practice then it was sort of like well I am just going to follow the rules [referring to the standards and guidelines outlining midwifery standards of care, particularly surrounding midwives role in vaccination discussion and recommendation] and the way it’s sort of done and recommended and then seeing the H1N1 scare and having reports in my community of people who have this illness and being very sick certainly that changed my perspective quite a bit but I actually have to say having my own son changed my perspective because I had a chance to dialogue with my family doctor quite a bit about vaccines [...]” (Kayla)

Above, a participant describes her personal change in KAB (knowledge, attitudes and beliefs) surrounding vaccines. Kayla shared that when considering the risk associated with not receiving the flu vaccine, she decided that a more thoughtful and informed consideration was needed. This impacted her personal and professional stance on the flu vaccine and was translated into behaviour change when Kayla engaged in a dialogue with her HCP. In the end, Kayla obtained the information required to have an overall impact on her vaccine perspectives and practices. The shift described provides insight regarding the factors that shape the personal perceptions and

behaviours of health providers and how this may translate into recommendation practices in a professional capacity, as well as personally.

Decision-Making During Pregnancy

A central element to the Model of Care guiding the practice of midwives in supporting their patients in making informed choices. In order for that to happen in practice, informed discussions need to take place between providers and their patients. It was the consensus among all participants that informed choice discussions are a central aspect of their care approach and even if a patient is making a decision that is against the recommendation of their midwife “I whole-heartedly believe that if you know the risks and benefits and you have chosen to decline something that is recommended then that is okay with me...I am okay with that.”(Sarah)

Participants expressed that they need to feel comfortable that their patients are making an educated decision based on all the information that is available. One participant went on to explain the challenges with having informed choice discussions with patients surrounding vaccination during pregnancy:

“umm well [ha] well my challenge as I have alluded to before is that I don’t feel like I have enough education surrounding them to be confident in recommending them and I know that I struggled with you know having done research for vaccines for my children I didn’t do them on time. And I didn’t do all of them. And so it is hard for me to confidently want to tell someone else to go ahead and vaccinate when I am not making that choice. But a midwife I respect someone’s choice, like there is no judgment if somebody you know does them all, that’s the recommendation. But it is hard for me to have a conversation when people, our clients, expect an informed choice discussion and I can’t do an informed choice discussion on vaccines because for me to do an informed choice discussion means that I have all the information necessary to give them all the information they need to make a choice...”(Marie)

The implications of this include midwives not addressing vaccine questions and concerns appropriately, or in a way that does not contribute to hesitancy or fear of vaccination. As a result, pregnant women are likely to leave their midwifery appointment and not seek further information or get vaccinated elsewhere, potentially contributing to the climate of hesitancy and low uptake due to lack of informed choice. Considering informed choice decision-making is a central aspect

of midwifery care it is not surprising that midwives as represented in this study are apprehensive standing behind messaging that they feel uninformed and uneducated about. Midwives in this study alluded to the need to be better equipped with knowledge and information so they are comfortable engaging in discussions about vaccination and vaccine safety during pregnancy. This is a key area that can be addressed to improve midwives' involvement in additional aspects of maternal care including vaccine discussion and promotion.

When asking the provider to explain the importance of vaccination, responses tended to more focus on the health of the mother. Sarah summarized the importance of vaccines during pregnancy as:

“I think of it as protecting the mother. Umm I think for someone like myself or for healthy non-pregnant people to be getting the influenza vaccination I think of that as protecting the community and protecting other people whereas I think of the women having the influenza vaccine as protecting herself because she is a vulnerable population.”(Sarah)

This statement validates the perceived risk associated with vaccine decision-making for women and the challenges associated with vaccine discussions for providers during pregnancy in that there is an increased sense of vulnerability for the pregnant women and a sense of responsibility (towards the child) that is present during pregnancy. In other words, there is a shift that occurs during pregnancy, taking the main focus or concern off the individual women and placing it on the fetus or newborn. As explained by Kendall,

“...I think women in pregnancy and I think this is a bit of a cultural thing. Feel a little bit fragile and so I think that it's a common thing for women in pregnancy to be probably a little more anxious than I think is necessary about what they're exposed to, what they can consume, what foods can they eat, what foods can't they eat. So I think there is this feeling like pregnancy is this super fragile, delicate stage and you need to be you know super protective and aware of what comes near your developing fetus and so I think that then coupled with the general mistrust makes people feel like of well I shouldn't get...I shouldn't take any medication and I shouldn't get any immunization. Even though that's not founded in any research or science I think there is still some notion about that.”
(Kendall)

The last comment speaks to the sense of vulnerability of pregnant women as it relates to broader social perceptions as well as ignorance regarding what is safe for women to be exposed to and consume during pregnancy.

Participants that do engage in vaccine discussions with their patients pointed out the importance of addressing vaccine hesitant patients appropriately, or in a way that does not contribute to a patient's vaccine hesitancy. One participant explained her personal experience with a provider that did not address her hesitancy as a parent in a productive manner: "because that's what my prenatal care was all about umm my main access for health care had been midwifery and she was talking to me about babies in graveyards as her line to get me to want to vaccinate."(Marie) She acknowledged this was not the right approach to encourage vaccination and in extreme cases may discourage future physician and health care visits all together. This example demonstrates the negative impact that an inappropriate approach to vaccine discussions can have on overall vaccine uptake amongst those that already fall on the vaccine hesitancy spectrum.

Some of the participants that had experienced pregnancy, motherhood and vaccine decision-making during pregnancy shared their personal experiences in navigating these roles. This presented a unique finding as it allowed midwives to share their perspectives on the decision-making process of vaccination during pregnancy as both vulnerable and unsure mothers as well as health providers. The following segment captured a conversation with a participant who explained how she made vaccine choices for her son:

"Yeah we didn't actually do a lot of if any study on vaccination in pregnancy when I was training so I would have to say I really didn't do any research on that early on so I really only started looking into it a little bit more when my son was being immunized. It wasn't really on my radar, besides the H1N1."(Kayla)

The last comment speaks to the situation of mothers and midwives not being provided with or seeking vaccine information until it is relevant to their personal or professional life. As a result, midwives are not always comfortable being responsible assuming the risk of recommending

vaccines in a professional capacity as well as personal uptake. The discussion comes as a follow-up to the participant sharing a personal story about making the decision to vaccinate her son with the chicken pox vaccine and the influence of having a discussion with her health provider had on uptake, in this particular case. Kayla indicates her ambivalence regarding newer vaccines but suggests that engaging in dialogue with a provider that is more informed and is able to reassure her of the safety of the vaccine in question is impactful in influencing her overall KABB. The interaction described speaks to the KABB of midwives (in relation to other maternal and health providers) and indicates a connection between their level of knowledge as well as predetermined vaccine attitudes and beliefs that can impact recommendation and uptake practices.

Questions focusing on personal choices as a parent were added to the interview guide following discussion with another participant that sparked thoughts on the importance of decision-making during pregnancy. Marie shared her struggle with making these choices as a mother and how this contrasts her role as a care provider and midwife.

“Marie: Not at all... nope. [hahaha] so... and then it’s very difficult when there is a lot of information in the media around anti-vaxers and you know vaccinations. It’s such a touchy topic. And I would have been labeled one of those anti-vaxers although I have vaccinated some so [haha] it makes it difficult because I can’t be seen...I don’t want to be seen as swaying one way or the other.

Researcher: Right.

Marie: But I feel uncomfortable because I don’t feel like even though I have done all the research I can from my, for myself and for my children it’s my research from a personal perspective. Not from... not the kind of research that I would expect to give somebody an informed discussion on.”

This dialogue suggests that midwives experience an internal conflict between their role as health care provider (a biomedical approach), an alternative care provider (holistic approach) and parent when disseminating health information and making vaccine recommendations. Marie shared her apprehension about having an informed discussion as a professional maternal care provider and how this differed from her vaccine KABB as a parent.

Vaccine Discussions [how, when and why]

One of the participating midwives felt it was her role as a health provider to not only discuss but also challenge her patient's KABB when it came to vaccine uptake. Although administration of vaccines is outside a midwife's scope of practice [As detailed in Appendix N], Emily believed that it was her role as a health provider to be informed about and firmly promote recommended vaccines during pregnancy to patients that expressed hesitancy or disinterest.

Emily explained:

“If someone were to tell me that they think that vaccination causes autism I would say that you know that has been debunked. I would be very frank and open with them. I would also tell them that your choice of not vaccinating your child you are leaving that... you are hoping that everyone else is vaccinating. You know the herd mentality that's, is that the herd is vaccinated that you have protection so are you giving that to someone else to make sure that you child has immunity to a certain disease. I would kind of challenge the client to take some responsibility. It is a midwife's job though to be uhm non... to support peoples choices but I would still say you know your choices could harm and have some consequences.”(Emily)

It should be noted that the strong viewpoint on recommendation and promotion demonstrated by Emily was not shared by other midwives in the study. There was general consensus among the remaining participants that regardless of their personal KABB in vaccination, as long as the patient appeared to be making an educated decision then it was not the responsibility of the midwife to challenge these choices. Overall, participant responses suggest how their attitudes and beliefs about their role as a midwife influence their practice and correlates with vaccination discussions and recommendations. It was evident that among participants, those that were strongly supportive of vaccination in pregnancy took a more active role in the discussion and recommendation of vaccines.

Rather than challenging the perspective of patients when it comes to vaccination and other health decisions during pregnancy, some participants expressed that their approach is more passive when it comes to vaccination discussions. This was evident among midwives that served a large proportion of Mennonite patients, who tend to take a holistic approach to pregnancy and child birthing. The approach taken by Emily (above) was an anomaly among participants and it was more common for a midwife to not challenge the vaccine choices of their patients but rather

just present the option of vaccination and let the patient make a personal choice. As demonstrated by Marie;

“uhhh well [pause]... as midwives we are not trained to provide information regarding vaccination. And that’s in Ontario so we don’t have the training to educate people or to provide informed choice discussions around vaccinations. We do offer... we will tell people about vaccinations and the recommendations from public health if there is a specific recommendation around it then we will let people know because the questions do come up about whether someone should have the flu vaccine when they are pregnant umm... people will ask... or there is some research around having Tdap in the third trimester um so I try to be as unbiased as possible and let people know what the current research tells them without having a stance on it specifically. And when it comes to babies getting vaccinated people also ask us because we do serve a population that by nature will question everything that they are doing.” (Marie)

Similar to Marie, when asked about her approach to a vaccine hesitant patient, Sarah expressed her defence of and personal role in vaccine promotion based on public health recommendations but unwillingness to go above and beyond to encourage vaccination uptake.

“...so if a client has made it clear to me that they have no interest in vaccines and they don’t wish to discuss them then I certainly would not push that further. Ummm if a client says something that’s a little more ambiguous like I am a little unsure about vaccines or I don’t usually get them or I don’t really know what that one is, then absolutely I would talk about it. But I am not going to try and change someone’s mind I suppose.” (Sarah)

The data suggests that there is little emphasis on vaccine promotion and uptake within the practice of the participants because it is not considered a central part of prenatal care nor is it well incorporated into the care model that midwives currently follow.

All participants were asked if and when vaccine discussions typically take place and what is their ‘routine’ vaccine discussion with patient’s sounds like. As noted, all participants except for one expressed the view that vaccine discussion is not part of their routine practice, is not necessarily something discussed with every patient, and that the context and timing often changes or is avoided or skipped over all together. One of two midwives that has effectively incorporated vaccine discussions into her routine practice explained “It’s part of our regular um conversations. It’s part of let’s say at six weeks we would talk about vaccination. You would talk about it in the pregnancy when we do a history we would talk about their vaccination history um, you know as flu season comes around we talk about vaccination again.”(Emily) Other participants indicate that

routine incorporation of vaccine discussion could be improved upon in their personal practice.

Kendall admits that:

“Yeah uhh... so I think in the flu season I am probably fairly consistent at recommending that women uhh have the flu vaccine. Sometimes it comes up a little bit more of an *ad hoc* basis [...] I’m not super consistent with bringing up vaccination. In particular like the pertussis one is sort of the other one that sometimes gets discussed in pregnancy and I’m probably not as consistent as I should be about that one.”(Kendall)

Participants expressed that there is no reason that vaccine discussions are not part of their routine practice as they are fully supportive of recommending vaccines to their patients but have not yet incorporated to make vaccine discussions into their routine practice. When asked about her vaccine recommendation practices Sarah explained: “I do [said with hesitation]. In that if a client said that ‘is it safe for me to take this?’ I know the answer is yes. Like I don’t have to go and look that up. And I know that the answer is more than yes. I know that the answer is actually that it is recommended that you have this vaccination during pregnancy.”(Sarah) When probed about how vaccine discussion may be better incorporated into her practice she stated that:

“Mhmm I think that it would actually be a very simple thing to include and all it would be ummm ...probably when that vaccination is recommended for us to get a little notice in our mailbox that says now is the time for you to recommend this vaccination and maybe a little...and that reminds me at every appointment to talk about the influenza vaccination. Like I don’t think it would be hard at all to implement.”(Sarah)

Sarah’s comment suggests that it is not necessarily a lack of willingness to discuss or even distrust in vaccines in general (or the flu vaccine specifically) that is preventing vaccine discussions from taking place but a variety of other underlying factors that could be addressed through expansion of scope within the field of midwifery to include vaccination recommendation.

Participants were asked if the topic of vaccines was something that came up regularly in their workplace environment (whether related to personal KABB or clinical practices and standards). The aim of these questions was to focus on the culture of the workplace as separate from training and education and to determine the influence it may have on the routine practices of the midwives in the study. A participant explained the typical approach taken by the clinic where she works:

“And if we do have a client that asks about it then it might start a discussion about okay so what it is the general. Because we have at least one new midwife every year so then it starts the discussion so what is the information, what is the current research, what are we recommending, what do we say when somebody asks us about this? [...] because there is[...] of us working in our practice we want to have a consistent message that we are sending.”(Marie)

Again, suggesting that it is often patient questions that spark vaccine discussions between patients and fellow providers rather than midwives taking an active role in addressing vaccination in practice and on a larger scale. Similarly, another participant explained,

“And in terms of my colleagues umm I know that or I think my practice...so just speaking to the [...] midwives that I work with personally in my own practice I think we probably mostly share a similar approach in what we recommend for vaccination but I know we don't all share the same approach for what we personally do for vaccination. We have tried to have a practice policy about whether or not it's recommended that all the midwives at our practice get the flu shot because we work with a vulnerable population and we didn't have total consensus on that.”(Kendall)

Through exploring the culture of vaccination and vaccine discussions in the workplace contrasting perspectives emerged and it was uncovered that some clinics do not address the topic of vaccination practices at all while others make an active effort to keep their midwives informed and consistent regarding vaccine recommendations. Data from this study suggest that there are not consistent uptake practices within clinics (amongst the midwives) or recommendation practices across clinics in the Waterloo-Wellington Region despite the recognition that midwives are providing care to an at risk population.

Theme 2: Exploring the Factors that Shape Vaccine Hesitancy of Midwives in Ontario, Both Related to and Separate from Pregnancy

When asked about KABB towards vaccination, midwives revealed various levels of understanding and approaches to vaccination discussions. The findings demonstrated the complex interaction and relationship between the different aspects of knowledge, attitudes, and beliefs that are important in understanding individual levels of vaccine acceptance and recommendation practices behaviour amongst midwives. This study highlights the fact that a midwife's

incorporation of discussion and recommendation B(behaviour) was not necessarily related to or explained by her K(knowledge), A(attitude), B(belief).

Trust and Vaccine Research

A unique aspect that came to light through the qualitative interviews with midwives is the magnification of the challenges midwives face in having vaccine discussions when they are not confident in the research and information available to them. Midwives in the study suggested that this complication is amplified when their patients also find it difficult to trust the quality of vaccine research available. These challenges have made themselves evident in the everyday practices of midwives, specifically surrounding vaccine discussions with pregnant patients.

“Yeah I still feel like the mistrust that grew out of that [referring to Wakefield article linking MMR vaccine and autism] lingers and so even though it’s not like they cite specific concerns. It’s not that they say I heard it causes this or I’m worried about this connection in particular, they still have a vague feeling of mistrust and coupled with the fact that I think women in pregnancy and I think this is a bit of a cultural thing. Feel a little bit fragile and so I think that it’s a common thing for women in pregnancy to be probably a little more anxious than I think is necessary about what they’re exposed to, what they can consume what foods can they eat what foods can’t they eat. So I think there is this feeling like pregnancy is this super fragile, delicate stage and you need to be you know super protective and aware of what comes near your developing fetus and so I think that coupled with the general mistrust [of vaccines and vaccine research] makes people feel like ‘oh well I shouldn’t get...I shouldn’t take any medication and I shouldn’t get any immunization.’ Even though that’s not founded in any research or science I think there is still some notion about that.” (Kendall)

In terms of personal hesitancy in relation to evidence and quality of vaccine research, Shannon stated, “There is a whole other side of it [to vaccine research]. So that was when I was in practice I was like how do I present this [research] because you know what the guidelines are but at the same time you’re like ‘but there is a systematic review that actually [...] you are like wow this is the recommendation but I gotta tell you there is a whole body of evidence that doesn’t actually support this so it’s like an endless cycle.’”(Shannon) A personal lack of trust in and confusion regarding vaccine research that midwives can access was also cited as leading to an internal struggle with recommendation in practice.

Ambivalence influences their practice by limiting midwives' ability to make confident recommendations supported by sound research. Midwives expressed the concern that something could be recommended and considered safe today but research tomorrow could be contradictory and as a provider you have to make the choice to advocate in practice on behalf of research that is uncertain. Midwives in this research project also expressed scepticism about the authenticity and truth behind the research that is available to the public and questioned the intent behind the sources of information provided to the public. It's important to note that none of the participants refused to discuss or discouraged vaccine uptake in their individual practice, but they did express their concern and discomfort in being the sole provider of vaccine information and recommendation in cases where their patient does not receive care from another provider throughout pregnancy. One participant shared "so now I am glad I am not getting it [the flu shot?] year after year because they are making me think 'oh maybe not...you know.' So again when you have that kind of research coming out being like 'you know you might have been right' it's hard to recommend it to a pregnant person." (Marie), demonstrates the ambivalence that arises amongst providers in disseminating conflicting research and data and how it is reflected in practice.

Aspects of quality of research were considered important to participants and there tended to be a correlation between the quality of research that is available to the public and the level of trust in broader elements such as science, vaccines, vaccine and pharmaceutical companies, health research and the Canadian health system as a whole. Participants were asked to share their go-to sources of information for content regarding any updates, newsletters, guidelines and vaccine information. Common responses included the Association of Ontario Midwives, The Society of Obstetricians and Gynaecology of Canada, The Canadian Paediatric Society, Google, Centre for Disease Control, and World Health Organization. It was however, acknowledged that although trusted sources exist, these sources of information do have flaws. As suggested by Shannon, trusted sources such as the College of Midwives and The Association of Ontario

Midwives are currently lacking the resources and information needed to keep up with the demands of the midwifery field,

“There is a... like we have an annual report, it’s sort of from the college and all colleges see that and then we have newsletters that go out and you can find some of those on the website. Again our website is difficult to negotiate and we’re aware of that and its on the list of things to do...[...] right... it’s just that colleges have come under some criticism from the ministry about this whole transparency initiative that everything needs to be more transparent and all that kind of stuff so colleges are now making things [information] more available but they are still a little bit behind.” (Shannon)

Overall, there is public perception that only limited scientifically sound research exists which focuses on vaccination (more specifically the flu vaccine) within pregnancy, leaving midwives questioning the safety and efficacy of research findings that they are expected to advocate to their patients. Midwives expressed a sense of discomfort or ambivalence about supporting the flu vaccine recommendations given the lack sound and robust scientific research. Findings suggest that there is limited opportunity for informed choice discussions to take place between the medical professional and the patient, as neither party feels adequately informed about vaccine. This highlights how the KAB, specifically the (lack of), the knowledge component may impact the practices and behaviours of midwives.

Flu vaccine perceived as distinct from other vaccines

This research project also aimed to explore if vaccine hesitancy was specifically related to the influenza vaccine or if it was generalizable to all recommended vaccines (MMR, Tdap, Hepatitis C). Interview questions were framed to explore the perceptions of vaccines in general, as well as, further probing participants about the influenza vaccine specifically. It was found that there is a general hesitancy and uneasiness that surrounds the influenza vaccine specifically that is not present to the same extent as with more established vaccines (such as the MMR and Tdap immunizations). Explained by Marie:

“The problem is because the flu vaccine and this is why I don’t do it. But because the flu vaccine isn’t you know one strain where you go ‘okay I am going to be fully protected from that strain’ then it’s a crap shoot you know it’s their best guess which strain is out there. So you could be getting this vaccine and it’s not going to protect you from the one

you are going to be exposed to. Whereas with other vaccines...something like the Tdap and MMR it's one thing...the complications are what the complications are and if you want to avoid them then this is what you do.”(Marie)

The segment of text above in conjunction with other statements made during interviewing suggests that midwives are more comfortable providing recommendations and even administering most established and trusted vaccines such as Hepatitis C and MMR, which have been incorporated into training and practice. The perspectives and experiences shared by participants allude to a broader problem within our health care system in that hesitancy and mistrust of the flu vaccine exists even amongst our providers, whose responsibility it is to promote and recommend it. As midwives in this research project indicated, they do not take an active role in initiating flu vaccine discussions with their clients or incorporating flu vaccine discussions annually to the same extent as they would with some other vaccines that have been more established in midwifery practice. Although apprehension over the efficacy and safety of the flu vaccine expressed by participants are concerning, it only becomes a public health problem when these concerns influence discussion and recommendation practices among providers.

Moreover, the quality and quantity of flu vaccine and health research is a central part of the K (knowledge) aspect of KABB and also influences the ABB (Attitudes, Beliefs and Behaviours) of providers. It should be explored further how closely vaccine hesitancy is related to the flu vaccine specifically, as oppose to the hesitancy towards all vaccines recommended during pregnancy. KABB of providers was found not only to be shaped by the research and information available but also by social, geographical and systemic factors that will be addressed later in this analysis.

Theme 3: Actual and Perceived Barriers that Influence Midwives Vaccine Discussion and Recommendation Practices

A core component of this research project was to focus on the barriers faced by Waterloo-Wellington midwives in discussing and recommending the flu vaccine in their routine practices. Some of the barriers identified were expected based on previously established research

of vaccine hesitancy and uptake but are still important to explore further as they are impactful in influencing the practices of midwives. Participants were able to provide insight as to how and why these factors may translate to barriers to discussion and recommendation of vaccines by midwives.

Expected Barriers Present Across Findings (Training and Education, Information Gaps)

A number of barriers to the incorporation of vaccine recommendation and discussion into the routine practice of Ontario midwives became evident in the findings of this research. The social and historical context of the midwifery profession in Ontario, and more broadly Canada is partly responsible for vaccine topics not being incorporated into midwifery practice. The training and education of midwives, or lack thereof, was explored in an attempt to determine the ways it shapes their routine practices when it came to vaccine recommendation. With all midwives citing a lack of vaccine curriculum and training, consistent findings suggest that midwives in Ontario are not receiving sufficient, if any training, surrounding maternal vaccination promotion and uptake. Data presented in the background of this paper demonstrates that the current training and education of Ontario midwives is reflective of a time when the health system aimed to keep midwives as distinct from other care providers. The research project successfully demonstrates how this can be impactful in shaping KABB of care providers when it comes to incorporating what is considered to be more medicalized interventions such as vaccination into practice.

Accordingly, there is potential to shift these perceptions and practices.

When asked about the scope of practice of midwives, most described it as limited, or at least more limited than other maternity care providers. Some of the main differences in scope of practice between providers included the ability to provide care post-partum (past 6 weeks), ability to administer vaccines and prescribe medications including antibiotics, associated with logistics of expanding the scope of practice to include vaccination. In considering expansion of the scope

of practice for midwives, participants acknowledged the challenges related to the logistics and storage of administering vaccines. One participant recalls

[pause/hesitation] “That’s not the problem. The vaccine chain, the cold chain, that’s the tricky part. So we can give the MMR and the Hep B in the hospital and it’s in the fridge in the hospital. But we couldn’t have it here because then we would have to have a fridge that was regulated by public health and then the vaccines would have to come and then we would have to watch the expiry dates. We just wouldn’t carry the vaccine so then it wouldn’t really matter if we could or couldn’t because we wouldn’t. Who would we vaccinate” (Lisa)

Participants expressed that they find themselves uninformed about important vaccine recommendations and updates and think the general public must also not be receiving this important information. On top of a lack of foundational knowledge as a health provider about vaccination, many participants expressed that there is confusion and inconsistency regarding sources of information for the midwifery community. When asked about sources of information and uptakes Kendall shared that “umm I think this exists somewhere because I am sure that I have seen it before but I don’t know if it’s easy enough for me to just Google it and pull it up but it would be nice to have a chart that lists...I’m sure it exists. But I feel like maybe it would be useful to have that. It’s honestly so rare that I am talking about it that it is not on my radar.”(Kendall) Demonstrating that information available to midwives is often confusing, contradictory or not easily accessible and therefore not utilized to its full potential, if at all, by midwives. As a result, Waterloo midwives are often faced with having to disseminate research on their own and make personal judgments on the validity and quality of the findings and thereby are less likely to initiate vaccine discussions and provide recommendations.

Systemic Barriers (continuity of care, standards and guidelines created by governing bodies, perceived barriers and challenges)

When asked to recall their training and education surrounding vaccines, vaccination practices, vaccine protocol or vaccine discussions few had some recollection of a vaccine discussion or interaction within their training or placement during their first year of practice but none could recall vaccination being incorporated in their education curriculum. One participant in

the study was a new-registrant [less than one year in practice] and had better recall with regard to the training and education she had received. When asked, she was certain that “It did not come up a lot in our training...and I would say it doesn’t. No. I guess the one we would talk about would maybe be the hepatitis vaccine for newborns that would be at risk. Hepatitis B sorry.”(Sarah)

Kayla received her midwifery training outside of Canada and shared that in her experience, vaccine discussions did not come up in her training that she can remember and she even recalls a prevalent culture of mistrust as it relates to vaccines within the system she was trained in. She describes the system as “non-integrated” in terms of working with other care providers and reflects there was “really not a lot of talk about it [vaccines or vaccination]” during her time training to be a midwife (Kayla). Kayla shared that her KABB surrounding vaccination shifted as a result of her training in Canada as a midwife demonstrating that there is potential to make a positive shift surrounding vaccine KABB among providers even once they are integrated into the health and maternal care system. When a participant was asked to recall her training on vaccines the response sparked the following discussion:

Sarah: So my memory...I don’t actually remember it coming up a whole lot in my training which doesn’t mean that it didn’t it just means that I don’t remember it being a big focus. I know that umm I know that a few of the midwives that I was trained by... so not my university education program but the midwives who did sort of my in-person training. So you work within a midwifery practice as a student, kind of like a residency or a...

Interviewer: Okay so kind of like a placement or a residency?

Sarah: Yeah... I know that some of them were probably a little more hesitant about vaccines so I probably picked up a little bit of that as a student but I think pretty quickly as my own practicing midwife I didn’t feel comfortable with that approach so I don’t remember specifically what I was taught as a student but I do know that I think that shifted a bit as I was practicing on my own.

This discussion is in line with the experiences of Kayla [the participant trained outside of Canada] and illustrates that training and education can be quite impactful in shaping practices and perceptions, but there is potential to shift those perceptions. It also mirrors the literature in demonstrating that this systemic gap in training and education of maternal care providers in the promotion and recommendation of vaccines is present in other systems globally. However,

participants represented in this research are optimistic that their ambivalence and hesitancy to provide confident recommendations and even administer vaccines in the future can be mitigated if proper education and training is established in their practice.

Continuity of Care: Follow Through with Vaccines and Vaccine-Related Care

It is important to consider both the integration and consistency of maternal care with each individual provider as well as between providers. What this means is that the continuum of care should be maintained within midwifery practice internally and externally. In terms of their individual practice, participants spoke about the importance of midwifery as it offers women consistency and continuity throughout the pregnancy or even over time with multiple pregnancies.

“Um one of the big things that we provide is continuity of care. So knowing your care provider is a little bit different when multiple care providers are on call in other fields. Then you may not have somebody that you have met throughout your care or you have only met one person and they happen to be off duty or off call at the time when you deliver [...]” (Chleo)

Chleo was able to share how continuity of care is maintained within her personal practice:

“My partner midwife and I, I would say we have a very similar perspective when it comes to our approach in care so I would feel quite confident that the discussion I have had, she would have had in a very similar manner with clients. Um and then for communication pieces to cover and ensure that the next person knows that we have discussed these things we have kind of a checklist almost. Where we would sign of a particular discussion and what day it occurred. So somebody can reflect back and look at our list of stuff that has happened and say ‘oh okay this has been talked about’. And if they felt like maybe it was a particularly important thing or maybe they had more questions we can also make some notation and say that they had some questions, they want to look into this a little bit more, and it might be something that then I start out a visit with saying ‘oh I see you discussed this at your last appointment, did you have any follow-up from it or what did you think after that discussion’.” (Chleo)

A consistent care provider throughout pregnancy is key for building trust and providing meaningful recommendations, especially when it relates to complex and controversial health decisions such as vaccine uptake. Participating midwives recognize that as maternal care providers, and often the sole providers of care throughout pregnancy, establishing a trusted and

long-term relationship with patients is critical for effective practice and addressing patient concerns.

Additionally, participants were asked about their relationship and level of communication with other maternity care providers that they work with in the community, this included obstetricians, gynaecologist, and family doctors. None spoke to any personal or philosophical issues related to approaches to care of mothers or their babies but what came to light were gaps or areas where communication is lacking between various health care and maternity care providers. Midwives cited the most prominent gap in the continuity of care was related to communicating vaccine uptake and post-partum care information between providers and clinics. This was most relevant when talking about the transfer and communication of patient vaccine records with Ontario midwives. When asked about her knowledge of a patient's vaccine uptake during pregnancy (which she would have received from a public health nurse, pharmacist or GP), a participant explained, "yeah I think so. Umm it's hard to say. They are not forth coming with whether or not they do that or not [get vaccinated]. So because we still give them the immunization schedule at the 6 week visit and tell them to follow up with their family doctor but they don't volunteer whether they are going to do that." (Kayla) this was further reinforced by Sarah who explained "But I do know we don't end up knowing what they end up doing...it's not like the family doctor sends us a note to say that 'yes so and so came to see me and they did get their vaccination'. I mean that would be nice, I would love it but we don't." (Sarah)

A lack of communication between providers demonstrates a gap in the care model for pregnant women. A gap in communication and care leaves opportunity for human error and for individuals to be over-looked, uninformed and unprotected against influenza and other preventable viruses. Midwives explained that if they are provided with consistent and accurate medical information and patient history upon each visit, which should include vaccine uptake, they would be better prepared to address important health topics during visits. In some cases the responsibility is left to the individual (the pregnant women) to know when to ask about

recommended vaccines, ask to receive vaccines and inform all necessary medical personnel (i.e. midwives) that she has received a vaccine. According to midwives in the study, without a proper system in place to address who is accountable for initiating vaccine discussions, recommending, administering and recording vaccine related information, then missed opportunity is likely. These oversights can result in pregnant women and their foetus' being at increased risk of contracting influenza due to lack of protection resulting in complications in pregnancy and delivery as a result of influenza.

Challenges Incorporating Vaccine Discussion into Practice

Speaking about their experiences working within the Ontario maternal care system participants were able to point out additional common missteps and gaps that they experience in practice:

“I have had family doctor’s secretaries make the mistake of booking them before [vaccine appointments]...even if it’s a day or two and they aren’t allowed to get the vaccine unless they are literally two months old. So we just check in at their discharge visit...so their one month or discharge visit to confirm that they have a follow up appointment booked and to confirm that they have discussed the idea of vaccination. So not that we are encouraging them to vaccinate but that you know...we ask them whether they are or are not going to and what they say we actually put that in a letter to the family doctor so that the family doctor knows...” (Marie)

Errors and gaps in communication and care such as these can affect uptake and suggest confusion exists within the system regarding whose responsibility it is to talk to pregnant women about vaccination in pregnancy. Participants also spoke about challenges with language barriers and health literacy among culturally diverse patients and suggest that

“A helpful tool for the future is we are really trying to get people better informed is looking at what support material we can provide. So we as health care providers might have adequate knowledge to discuss these things but when it comes to answering peoples questions or providing them with more information. It would be nice to have some brochures or being able to refer people to a little bit more educational material that would be appropriate in terms of their level of education. So just kind of you, simple, in terms of how it is presented so it doesn’t seem so confusing” (Chleo)

When asked if and how vaccination discussion, recommendation and even administration could be incorporated into midwives’ scope of practice all participants agreed they would be

comfortable with expansion and thought it could easily be achieved. Some recommendations on how this could be accomplished were presented. Lisa shared the following insights:

“If I think of it [recommendation] but yeah it’s because, because it’s, I am more focused on where they are in their pregnancy rather than where we are in the year. I don’t have a check box for the flu vaccine. There is not a check box on the antenatal so it’s not something that the people who have made the antenatal forms thought needed a check box. They have things like exercise and on call providers and prenatal classes and circumcision. So those are check boxes but the flu vaccine isn’t a check box. So we could replace circumcision with flu vaccine, that would be fine.” (Lisa)
[See Appendix J for copy of Antenatal Forms]

This demonstrates an interesting finding in that knowledge (K), attitude (A) or belief (B) does not necessarily relate to or influence behaviour (B). This research has provided us with evidence that an individual’s knowledge base and belief system, in this case surrounding vaccination, is not always translated into their practices as a provider.

Theme 4: Contextual and experiential factors, context and practice.

This research project specifically considered the contextual and experiential aspects of midwives’ practices in the Waterloo-Wellington Region. Cultural elements were considered in the exploration of the Mennonite population in the surrounding area and incorporating interview questions to specifically explore these aspects in relation to pregnancy and vaccination practices through the midwives that provide prenatal care. Consideration of cultural context is important for health communicators as their role entails engaging with social groups, their practices and understanding of health.(69) This understanding of culture is crucial is we are to engage with communities in meaningful ways to negotiate change.(69)

Contextual and Experiential Factors that Shape KABB of Participating Midwives

A number of participants brought up memories and experiences of previous disease outbreaks, pandemics and other persuading factors that demonstrated the importance of encouraging vaccine uptake, especially during pregnancy. More recent events such as the H1N1 pandemic of 2009, which directly impacted pregnant women in Canada, as well as historical

outbreaks such as polio were referenced by participants. A participant recalled her experience of the 2009 outbreak: “[...] when the H1N1 um was out and everyone was getting vaccinated for that I did talk to every one of my clients and encouraged them to get that just because it was such a big thing and there were women...this was back when I worked in [REDACTED]. And there were women in our community who were really ill from it...” (Kayla) This participant demonstrated how seeing the impact of the disease first hand in her community and the risk it posed to her patients (pregnant women) was cause for concern. This experience resulted in her changing her recommendation practices to include ‘encouraging’ uptake among ‘all’ patients.

In considering other preventable diseases and their corresponding vaccines we can draw upon polio as an example. One participant shared her enlightening experience of becoming more aware of the importance of vaccination based on discussion with a midwife who remembers when polio was prevalent. She shares that:

“umm I would say I have stayed relatively consistent [referring to her views on vaccination]...however...[...] and it was very impactful to hear one of the midwives actually who remembered that time and said actually you know they were just desperate to line up for this vaccine if it could mean avoiding that disease because they saw what it looked like [polio]. And for me naively we are in a generation where we don’t see any of these diseases...” (Marie)

When probed further she explains how this discussion caused her to reflect upon the importance of vaccination for other diseases such as measles:

“Researcher: We have never experienced it, we have never seen it.
Marie: that’s right. And to a degree when you read the description of measles all I can think of is ‘well I had a the chicken pox you know it wasn’t so bad’ well what are the risks of complications, well they are this small and then it occurred to me that they have come out with the shingles vaccine. Which obviously doesn’t touch our population but it made me realize ‘well nobody wants to get the shingles...it’s kind of really awful to get’
Researcher: Right, right. And if you can avoid it why wouldn’t you?
Marie: Exactly. So then it changed my frame of mind in that maybe avoiding the actual disease isn’t such a bad idea even if it’s something that...I mean obviously you aren’t expecting to die from it but why would you want to put your child through that week, several days, two weeks, whatever the period of time of suffering if you can avoid it. So that’s where I would say my perceptions of things has changed...”

Participant’s references to historical events (such as the H1N1 and polio outbreaks) indicate the impact of high-risk situations on the current attitudes and beliefs of midwives and the how the

lessons learned from these experiences translate into future personal vaccine discussion practice. Participants that made reference to these events admit that it was not until the occurrence of a personal traumatic experience or large-scale outbreak that a personal KABB shift was initiated. In some, but not all cases, a shift in perspective regarding the topic of vaccination brought on by a meaningful event or interaction was enough to influence a change in either a professional and/or personal viewpoint. This demonstrates the relevance of considering the social and contextual environment in which health providers are practicing when conducting research.

Mennonite Population of Waterloo-Wellington

It should be noted that none of the Midwives interviewed self-identify as Mennonites. Participating midwives did provide prenatal care to pregnant Mennonite women and their families in rural Waterloo-Wellington were asked to share their experience about working with and providing care to this diverse population. Participants were asked about practices and their personal experiences with Mennonite patients in open-ended questions so as not to be led or influenced by the interviewer. All participants that currently, or had previously served Mennonite patients, and could speak to their approach to health care and pregnancy were asked to share their experiences. Of those that serve Mennonite patients, their experiences were similar however specific stories and details were unique.

The Mennonite lifestyle is quite different than that of the urban/mainstream or “English” population that is prominent in the Waterloo-Wellington area. One participant described their lifestyle as follows:

“I think they probably by margin, I think they are a healthier population than the rest of the clients that we serve. You know they have, I think they are just, none of them are in sedentary office jobs. They are all doing physical labour, eating foods they grow in their garden, lots of time outdoors, they just seem to be a really robust and healthy bunch. Not that they aren’t at risk for the flu, by all means they are. But I think they probably a little farther, a little more disconnected from things like influenza that can hospitalize people.”
(Marie)

The Mennonite lifestyle and the influence it has on health choices are reflected in the overall health of the population as indicated by the midwives that provide their care.

Individuals of the Mennonite culture can be described as non-interventionist regarding their approach to personal health care. This approach to personal health care is reflected in responses provided by participants, who observe the habits of their Mennonite patients for the period of time during pregnancy. Often providing care over several years and with multiple pregnancies, midwives expressed they were able to develop an understanding for their non-interventionist approach to care. One midwife shared the following perception based on her individual experience with Mennonite patients:

“Umm I found that if they were old order umm...they were definitely less inclined towards anything really [speaking about vaccination uptake]. They wouldn't necessarily do ultrasounds, they had a firm belief in que sea sera...umm and I can't say that I remember any of them really getting vaccinated. When you think of a lot of them, well they were horse and buggy so we were doing a whole day of home visits to go see them umm...so I don't think so. The people who would often access care were the ones that had children with complications. [...] Otherwise they were pretty non-interventionist in that regard. It was hard enough for some of them, the less options you know, if you see somebody normally sometimes three times by the time they are twenty weeks pregnant you were lucky to see them once.”(Marie)

Another participant shared her observations of the trends in decision-making and care that she experienced in her time as a midwife in rural Waterloo-Wellington, Ontario:

“The Mennonites? Yeah they definitely are much better integrated socially, so they place high importance like on what their mothers and sisters will tell them as well so...and they tend to try and do things more simply and naturally than other people might. Ummm what else should I say? They tend to be quite pragmatic and generally easy to care for in terms of um... you know the time spent with them tends to be productive and yeah, they're pretty easy.”(Kayla)

The approach to health and cultural and historical influence is reflected in health care practices as shared by participants in the study. Midwife Sarah has a significant Mennonite participant base and shared that “yeah... but do clients support vaccinations whole-heartedly? I would say I happen to work in a community that there is a large group of our clients, like maybe 30 or 40% that don't routinely vaccinate their children and don't participate in any routine vaccination practices.” (Sarah) Considering the impact the Mennonite lifestyle has on important

public health topics such as vaccine uptake, there is opportunity to explore the influence of cultural, historical, and community factors on vaccine attitudes, beliefs and decision-making within these communities.

Similar to their approach to general health care, participating midwives explained that the Mennonites in the Waterloo-Wellington Region to which they provide prenatal care, take a more minimalist approach to pregnancy care. One participant explained her interpretation of the Mennonite approach to pregnancy that she typically encounters in the following segment;

“They are probably on the whole sort of more comfortable with lower interventions and part of that is I think they are also...and maybe comfortable isn't the right word but they are more accepting of the fact that there are things beyond our control and I think that comes from a religious or faith based perspective for them. Like they will feel like 'well do I want to do all of these ultrasound if there is nothing we can do to change what the outcome is then that's not necessarily information that is helpful for me and it might just be more stressful' like whereas some other patients would say 'if there is absolutely anything I can do to find out more information and maybe change the outcome then I want to do every single thing'. So they probably take a different approach in that way and I would say they have or what appears to have a more of a sort of confidence in themselves and the process of reproduction where they take just a more laid back confident approach where they are not usually too anxious about labour they aren't usually too anxious about having a new baby and what that looks like they seem to kind of go with the flow quite easily. And I think that comes from a real sense of confidence or ease at knowing like 'yes this is what our bodies are meant to do and this is how this works'. They seem to have a comfort with that.”(Kendall)

The approach taken by Mennonites, as described above, implies that midwives are much less involved in the pregnancies of their Mennonite patients in comparison to their mainstream patients. It also means they are less likely to approach their midwife with questions regarding topics that would be considered medical interventions such as vaccination. One participant did however suggest that a Mennonite patient may be more likely to address sensitive and private topics related to health care with a female care provider affording midwifery professionals the benefit of attracting minority groups seeking more culturally sensitive care. When referencing the specific services and interventions that Mennonite patients utilize another participant explained the following:

“Not often but with the Mennonite ...absolutely [referring to going through pregnancy without accessing certain aspects of care]. If they have done the public health blood work in their first pregnancy they often refused it after that, which made sense because after that they are in a committed, monogamous relationship with the same person you know nothing is going to change why would I do that again. Even if they are getting blood work done it’s not an extra poke or anything but it’s still information they still didn’t feel was necessary. So when we would talk to them I don’t know how many you know necessarily follow through with even having the well-baby check-up the way the population I serve now [...]”(Marie)

She went on further to give an example that “well it was like okay yup I’m pregnant so I’ll see you when I am 20 weeks because what are you going to do right? You sort of already know the information, you’re not going to have an ultrasound, you’re not going to do this or that. You know we have had people who have declined all blood work period.”(Marie)

Participants were asked if they could speak to their experience regarding vaccine discussions with their Mennonite patients during pregnancy. Participants shared similar interactions and experiences with patients when it came to discussions and recommendations of vaccines including MMR, Hep B, and influenza. Some participants that work more closely with Mennonite patients were able to share more in-depth experiences but all participants had worked with Mennonite patients at some point in their career and could share insight on the topic. Sarah, who has a higher proportion of Mennonite patients, shared the following:

“umm I would say umm as a whole they use less vaccination then my English clients. But it’s not to say, I would never say as a group they don’t vaccinate at all because that is certainly not the case. They are getting their children...they are sorry. Some old order Mennonites are getting their children vaccinated, some are not. And I could never look at one or talk with a family and tell you whether or not they are vaccinating their children...it really does seem to be a personal choice in those communities. Umm what elseI don’t think the influenza vaccine is something that they are doing. Like I would say I would say childhood vaccinations they are okay with most often. Lots of women, most women I would say are Rubella immune so most women it would seem are getting vaccinated ummm these is not Hepatitis B there and I don’t think they are getting vaccinations for Hep B. They are also not a part of the public school system to vaccinations that we do in school they maybe are not getting... but I honestly don’t know a whole lot about all those vaccinations and when they happen for children.”(Sarah)

One participant speculated about the reason why vaccine uptake of the influenza vaccine may not be as high among the Mennonite population or why patients that identify as Mennonite may not be asking about the influenza vaccine. She shares that

“Umm in terms of vaccines particularly, I can’t say, I think most of them would do routine vaccinations. Um I haven’t, at least in our, I mean among Mennonite communities there’s a whole bunch of different kinds of Mennonites and so I am just speaking mostly for the ones that we see. I would say most of them do the routine vaccinations for their infants but most of them would not do the influenza vaccine so for whatever reason that’s been, and maybe that’s just a time thing of like you know, we haven’t kind of infiltrated yet in showing them ‘look the influenza vaccine is also beneficial’.”(Kendall)

The comment above speaks to the challenges that may be faced by midwives when working with Mennonite patients (or patients of other cultural minorities) who have limited knowledge outside of their cultural group. Therefore, a midwives’ engagement with Mennonite patients and their approach to important discussions is impacted by the level of cultural and medical literacy held by the patients being served.

It should be made clear that all the information above is based on participant’s personal interpretations and perceptions and no data was collected on uptake or vaccination levels of the Mennonite population. However, these findings still provide valuable insight on the everyday approaches and interactions that take place within the maternal health system in Ontario that affect and explain vaccine uptake among rural and minority cultural and religion groups in Canada.

Rural Clientele and Health Services

Many of the participants interviewed either live, work and/or provide services for patients that live in rural or remote areas of the Waterloo-Wellington Region. This gives them the opportunity to provide insight on some of the unique challenges that are associated with providing midwifery care in a region where the use of health services is greatly impacted by accessibility and convenience factors. In addition, the majority of their patients that reside in these rural areas surrounding Waterloo-Wellington identify as Mennonite and therefore do not have access to transportation. Participants were able to share their perceptions on how this potentially impacts aspects of care and vaccination uptake among the Mennonite population, which they serve. One participant shared her experiences and perceptions of the challenges of the

rural lifestyle and how this impacts health care utilization and access among her Mennonite patients.

“Sarah: yeah so I would say there is a few. So for my old order folks who experience a lot of barriers regarding transportation and even my old colony Mennonite community who maybe don’t drive or they only have one vehicle and they are definitely experiencing poverty...that’s not like... going into town to go to the pharmacy and get a vaccination or make an appointment with the family doctor to get rubella vaccination like boosters and those kinds of things.... that’s not a priority for them. Ummm other things I can think of could include...I think midwives use to do the MMR boosters in the post-partum...like I think we use to keep them in the clinic and be able to give them and now we don’t...well this practice group at least and the one that I was at before but I don’t know about all over Ontario. But because it was too fussy...like in terms of monitoring the fridge temperature and keeping check of everything and making sure that... you know it was just too much.”

Researcher: Right. So it’s a convenience thing.

Sarah: yeah I think that matters a lot. And same with the influenza... like people aren’t going to make extra trips into the community...

Researcher: Right...which is part of the challenges of the more rural lifestyle...it’s more about the convenience and being accessible.

Sarah: Accessibility, right. Yeah.”

Participants shared that if their scope were more comprehensive then accessibility barriers would not be so evident for rural communities. Therefore eliminating or reducing accessibility barriers allows potential for behaviour change, such as increased opportunity for rural patients to attend prenatal visits and to initiate vaccine discussion and uptake.

Health care providers are the cornerstones of public acceptance of vaccination. They need to be equipped to help people make informed decisions regarding their personal health and this includes vaccination choices. There is not currently a one size fits all strategy to address vaccine hesitancy among health and maternity care providers but understanding and targeting some of the root causes is a start. Some of the important findings that can be taken from this project include the need to build trust (in providers and in the health system/health research), support health care providers’ role in vaccination and enhance training and education for future midwives. These actions would result in long-term improvement in uptake to be explored further in the discussion section of this paper.

Discussion

So why is this study important?

The study explored the KABB of midwives to gain a better understanding of their discussion and recommendation practices surrounding vaccination during pregnancy. The study met the aim of providing data from a Canadian context and was able to address gaps within the field of midwifery deep rooted in the history and regulation of midwifery, shaping the midwifery practice in Ontario that we see today. This study builds upon, and contributes to, the existing body of literature within public health surrounding vaccine hesitancy among maternal care providers' discussion and recommendation of vaccines with pregnant patients. This research was informed using The Theoretical Domains Framework and considered well-established concepts such as trust, risk, and vaccine hesitancy in the analysis. This research project was able to successfully explore a diverse set of topics including maternal and midwifery care as they relate to vaccine recommendation and discussion, vaccine hesitancy and uptake among pregnant women in Ontario, and vaccine practices and perceptions of Mennonites in the Waterloo-Wellington Region through well formulated research questions that informed the interview guide and analysis process. This research was novel in that it is the first of its kind to undertake a qualitative approach to specifically explore the KABB of midwives in the Waterloo-Wellington Region surrounding vaccine discussion and practices. An additional element that was underlying the project was the consideration of a culturally diverse subset of the population that identify as Mennonite, a population that has yet to be researched in relation to their vaccination KABB in the Waterloo-Wellington Region.

A variety of factors are associated with vaccine hesitancy but there is no universal algorithm to determine just how much each factor influences the KABB of midwives as their influence is complex and context specific and even varies across time, place and vaccines.(86) It was found that the lack of vaccine recommendation that was observed is not because Ontario midwives' do not support vaccination or are vaccine refusers, but rather because of a mixture of

factors, which is unique to each individual and provide and rooted in the history and reinvention of the midwifery practice. It was found that hesitancy was less prevalent when considering the discussion and recommendation of more established vaccines that are also recommending during pregnancy, indicating that policy and public health intervention should focus their resources on addressing the flu vaccine specifically in pregnancy among providers. Midwives admit that they have more effectively incorporated discussion of vaccines that are included in the midwifery guidelines into their routine practices and that the flu vaccine could be incorporated to the same extent if steps were taken to address the current barriers in place. Data suggests that the lack of vaccine discussion and recommendation is often a result of both individual (personal vaccine hesitancy) and systemic barriers (outside scope of practice, education and training etc.).(12)

Research cites logistical barriers for providers in recommending and discussing vaccines such as inadequate reimbursement, lack of vaccine storage and handling facilities, lack of time during patient visits and liability concerns that are also currently limited by the midwifery scope.(27)

Waterloo-Wellington midwives also cited challenges and barriers in aspects such as vaccine cold-chain and storage logistics, prescribing rights and inconsistency in resources among midwifery clinics. Overall, our study findings suggest that Waterloo-Wellington midwives experience these same systemic barriers when it comes to the discussion and recommendation of vaccines in a professional capacity.

Midwives are an important population of study within the Canadian maternal health system because of their unique role within our system and the advantage this affords them when it comes to providing consistent and trusted health advice to patients during pregnancy.(8, 24, 26, 49) Midwives have considerable influence over patient decisions and therefore they have the opportunity to address public health and individual health topics within their scope.(8, 24, 26, 49)

Additionally, midwives are able to advocate for their patients and improve women's health and patient-centered care, a privilege afforded to them by the profession of midwifery. The general consensus among participants was that Midwifery Care Model philosophy, that guides midwifery

care, is different than the approach to mainstream health care. Yet participants emphasized the value that is placed on recommendations given by midwives and how the relationship between midwife and patient can be used in a productive way when it comes to health interventions such as vaccine uptake and health promotion. (8, 24, 26, 49)

The participants spoke about the opportunity to further the influencing power for midwives that has been neglected thus far in research, educational and practical applications. Participant responses suggest that midwives should be utilized more effectively as maternal advocates and providers in target programs and interventions such as flu vaccine uptake. Allowing midwives to be fully incorporated into all aspects of maternal care in order to move towards an inter-professional model of care is critical, but first we need to explore how the current scope of midwifery is creating a barrier for this through additional qualitative research.

Role of Midwives' Regarding Vaccination as viewed by TDF

The midwife approach to care is outlined by the Standards and Guidelines, put forth by the Association of Ontario Midwives and regulated by the College of Midwives of Ontario. However, the role midwives' take in their daily routine can vary or be influenced numerous organizational and individual factors.(79) According to the TDF, the behaviour of a health worker can be influenced by factors such as the availability of evidence, its relevance to the practice, the dissemination of evidence and guidelines, individual motivation, the ability to keep up with current changes, clarity of roles and practice, and the culture of specific health care practices.(79) Some of the influencing factors that became apparent during interviews with eight practicing midwives included their personal perceptions and bias, the training they received, influences of the clinic in which they practice, and the rights granted to them by the hospital they serve under. A novel finding from this research however, is that although all the factors mentioned above play a role in shaping the KAB of midwives in Ontario, it did not necessarily determine their B(behaviours) or recommendation practices as a provider.

Participants suggest a lack of consistency and official protocol or guidelines available to help midwives navigate the challenging task of vaccine discussions with pregnant patients. NACI and the Public Health Agency of Canada (PHAC) have clear recommendations that include pregnant women as an at-risk group for receiving the flu vaccine, which has been recommended for pregnant women since 2007 (19, 23, 46), yet no training, guidelines, protocols or standards exist for midwives to help them address this in their everyday practices. In reading the current standards of care and the guidelines set out by College of Midwives of Ontario (CMO), Association of Ontario Midwives (AOM) and Canadian Association of Midwives (CAM) which regulate and govern the profession of midwives, the role of discussing, recommending and administering the flu vaccine is not included (See Appendix B).(42, 87) It is important to consider the fall and reinvention of the midwifery profession throughout the 20th century and how this provides some explanation as to why vaccination was left outside a midwife's scope of practice during the formulation of the original guidelines in 1994. I argue that since this time, the role required of midwives in Ontario should have evolved alongside public health interventions and initiatives but rather, lags behind the rest of the health system with out-dated guidelines and privileges that limits the potential of midwifery practice in Ontario. As a result, midwives shared that even as formally trained and regulated midwives, their ability to understand where exactly they "fit in" with regard to vaccine uptake and promotion along with their level of comfort standing behind recommendations is affected. In turn, it was found that there is inconsistency in the perceptions as well as practices of some midwives in the Waterloo-Wellington Region regarding their roles and responsibilities when it comes to the seasonal influenza vaccine. It can be hypothesized that these inconsistencies in perception and practice is not an isolated issue only affecting Waterloo-Wellington midwives but is present among the profession provincially and to an even greater extent, across Canada. The WHO claims that greater health knowledge, having a positive attitude towards and seeing the value of vaccination, and feeling a sense of comfort about getting vaccinated as a promoter were all important aspects in recommending vaccination in

Canada.(86)With that being said, it is important that we recognize the value of midwives as formal care expert care providers that are equally important to family physicians and gynecologist when it comes to advocating for and providing care to Canada's pregnant women, and should be trained as such.

There was general consensus amongst participants that expanding scope of practice was something that would be beneficial to the midwifery profession provided that training and education was also expanded to include vaccines and, of course, logistical issues would also need to be addressed properly. Assuming that these implementation issues were addressed in policy midwives would be comfortable taking on the responsibility of expanding their scope of practice to include vaccine discussion, recommendation and administration. Although scope of practice for midwives to include vaccination is not expected in the near future as indicated by participants, they are often a trusted point of contact for vaccine discussion among their pregnant patients and therefore should be prepared to discuss and ultimately promote vaccine uptake.

Midwives are an important sector to consider in research of maternity care practices as the role of midwives within the health system is evolving and expanding. More women are turning to midwives as their primary, if not only, care provider during pregnancy. Maternal care providers, including midwives, could play an important role in disseminating vaccine information leading to an increase in awareness and uptake among pregnant women by incorporating vaccine discussion and recommendation into their routine practices. With only 1,650 OB/GYNs in Canada and only an estimated 1,000 focusing on delivery and maternal care and a large portion of practitioners set to retire in the near future, it is essential that midwives are able to be involved in all aspects of maternal care delivery and services including vaccine discussion and recommendation.(22)(88) Not only are midwives critical for replacing the declining OB/GYN workforce to sustain the maternal care system in Canada, but they are also able to keep a portion of deliveries out of hospitals and reach rural communities and cultural groups which may not

otherwise have access to care. This distributes the demand for maternal care from physicians and OB/GYNs to midwives which reduces the burden and cost from the health care system.(22)(88)

Practical and Clinical Relevance: Strategies to Increase Vaccine Uptake

This research presented two distinct yet complementary components that are relevant to my work. Findings suggest there is an element related to the discussion and recommendation of vaccines, which includes the personal level of hesitancy regarding vaccination amongst providers and perceptions of their role regarding vaccination. On the other hand, the practical element encompasses information gaps and challenges communicating with patients. Behaviour change is key in addressing issues in our health care system such as low recommendation rates and discussion trends among health providers in practice.(77) Some of these elements are easier to address, such as providing resources and information or incorporating training and education into midwifery practice. In contrast, changing a belief system or deep-rooted attitudes and beliefs regarding vaccines and vaccination are significantly more challenging to confront. The findings of this study suggest that there is a distinction between simply following recommendations when asked by the patient (doing bare minimum) and providing strong confident recommendations as a maternal provider to all patients on a regular and consistent basis (active recommendation and promotion). Based on the findings of this project including statements made by participating midwives, it can be presumed that currently a proportion of midwives in the Waterloo-Wellington region, and potentially all of Ontario are lacking in their discussion, recommendation and promotion of the flu vaccine openly but are only addressing concerns when asked. Participants in this research project suggest that there is a significant difference between these two approaches of promotion and discussion that directly impacts uptake amongst the at-risk population of pregnant women for which they provide care.

Midwives that participated in the qualitative interviewing for this research project were asked to reflect on their education and training. Responses shed light on a novel finding that none

of the midwives educated or trained (inside and outside of Canada) could recall vaccine information or best practices being incorporated into their curriculum. Currently this is because vaccination is outside the midwife scope of practice and therefore vaccine safety, recommendations, and discussion methods are not currently incorporated into the routine practices or educational foundation of the midwifery practice in Canada.(8, 24, 26, 49) More important than this however, is although vaccine education and training is not incorporated in the midwifery scope of practice, this was not the sole determining factor of midwives' KABB or practices when it came to vaccine discussion and recommendation.

Health care providers are a trusted source of vaccine information and their recommendation is a primary driver of vaccine uptake.(52) Research suggests that one of the key factors influencing a pregnant woman's decision to accept a vaccine is receiving a strong recommendation from her maternity health care provider.(31) Recent surveys, however, have shown that many maternity health care providers are hesitant to recommend and administer vaccines to their pregnant patients.(7, 57) Midwives in this study also indicated that their discomfort in providing recommendations did not lie in simply providing information or recommendations to patients when vaccine questions and concerns were brought up, but rather initiating these discussions and standing behind a strong and confident recommendation, as research suggests is beneficial for impacting uptake. Therefore it is essential to assess barriers to vaccination in pregnancy from the health care provider perspective.(5) Midwives in my study made some suggestions as to how vaccine uptake can be improved among pregnant women and how discussion and recommendation by midwives could be increased based on their experiences as maternal care providers in Ontario. Some of the suggestions included more clear and publicly accessible messaging from Public Health regarding vaccine safety during pregnancy (for both midwives and for the lay-public), reminder systems to keep midwives on top of vaccine schedules, and more communication and integration between care providers to ensure all pregnant women have been recommended the vaccine by at least one care provider. Participants

believe that by implementing these changes, over time vaccine discussion and recommendation could be incorporated into routine midwifery practice. This in turn would lead to an increase in pregnant women's access to and uptake of the flu vaccine.

In considering the media and health messaging, what is 'healthy' or 'unhealthy' is subject to influence by social discussion, stories, images, information and knowledge.(69) In addition to this, social groups vary significantly in the ways in which they understand health and how they engage with and construct meanings around health.(69) Therefore messaging from Public Health and other health authorities plays a vital role in vaccine perceptions and uptake amongst both the general public and providers. Contradictory and/or confusing messaging from these authoritative and trusted figures can have a direct impact on shaping the perceptions and influence uptake among pregnant women. Misinformation related to vaccination during pregnancy was identified by participants as creating additional challenges for midwives when they have to address hesitancy that is often a result of unclear messaging surrounding vaccine efficacy and recommendations. The result is a system that allows vulnerable populations, such as pregnant woman, to slip through the cracks of a health system that is more than capable of supporting their needs.

The current standards, guidelines and regulations that guide midwifery care neglect to mention the role of midwives in vaccine discussions and promotion regarding the influenza vaccine. According to participants it is not incorporated into the curriculum in Ontario's Midwifery training or education programs sending the message that it is not the responsibility of midwives to discuss, promote or recommend vaccines with their patients despite being maternal health care providers. Although the potential reason for this gap in policy can be connected to the historical divide between midwives and other mainstream medical professionals and the effort to keep midwives as separate from biomedical interventions, it is important to consider that health innovations and advancements take place over time therefore health care providers must also evolve their knowledge and techniques to keep up with the needs of the population. In the case of

midwifery, this may look like an expansion of scope to include biomedical interventions and knowledge base so they can participate in all aspects of care that are relevant during a women's pregnancy.

The findings of this project highlight how these systemic gaps are influencing the behaviours of midwives as demonstrated in their discussion and recommendation practices. The lack of guidelines and standards that exists in midwifery has created confusion in the Canadian health system over their involvement in certain aspects of care and treatment. Midwives that participated in this study alluded to some of the gaps they have noticed during their time as maternity care providers. Through interviewing it came to light that flu vaccine discussion reminders, as well as, uptake records are not recorded or tracked on the standard antenatal and intake forms. Participants discussed how vaccination information is currently not captured on these antenatal forms (likely because it is beyond midwives' scope of practice) and therefore there is no consistent method for recording uptake and reminding midwives to have important vaccine discussions. The failure to capture vaccination data demonstrates a gap in policy and practice in the midwifery field. It also provided an opportunity to capture data on how systemic barriers affect the practice of midwifery.

The data in this project suggests that Waterloo-Wellington midwives' experience the same concerns and hesitations as health providers in health literature. The concerns and hesitations are captured in discussion of vaccine KABB of midwives. Hesitancy in providing a recommendation is especially the case amongst Waterloo midwives who, because of the current climate of midwifery care, may also not see discussion of vaccines as part of their routine practice and therefore they do not engage in such discussions with patients at all and rather pass the responsibility onto other providers.(5, 9, 27, 49)

Decision-Making During Pregnancy and Risk Evaluation

Decision-making regarding the use of vaccines is, in part, influenced by how the public or an individual assesses the risks associated with a disease and the vaccine.(89) Focus group participants in a study by Holmes (89) indicate that they would base their vaccine decisions largely on the severity of morbidity if they were to become infected by the disease and compare this to the potential or theoretical risks of the vaccine.(89) Participants in Holmes' study expressed that they were extremely hesitant to be the first users of a product and there was a shared belief that there could be problems with the safety of the vaccine that would only surface after it has been used for a sufficient amount of time for long-term side effects to emerge.(89) Midwives interviewed for this project expressed similar concerns and shared that both personal hesitancy and patient hesitancy stem from the fact that the flu vaccine has only been recommended and administered to pregnant women since 2007 and there is a lack of adequate clinical evidence to ensure the public that the vaccine will not cause harm. Midwives suggest that this has not been long enough for long-term effects to emerge in the children whose mothers were vaccinated who may have been affected thus far by vaccination during pregnancy therefore skepticism still surrounds the long-term effects of flu vaccine specifically. As a result, when it comes to recommendation practices, as well as, personal uptake, midwives were less likely to initiate vaccine discussions, provide information, receive the vaccine themselves or vaccinate their child when it came to the flu vaccine. This hesitancy, although it sometimes correlates to overall distrust in vaccines or hesitancy to vaccinate during pregnancy despite recommendations, does not necessarily reflect an overall distrust in vaccines.(89) Alternatively, midwives expressed that when it came to vaccine discussions and most specifically the flu vaccine, they preferred to refer their patients to another care provider. When it came to their personal uptake or their children, they consulted with their GP because they are able to host informed and informative discussions. Moreover, although levels of hesitancy sometimes correlate with behaviour as a

provider, it is not the only determining factor to vaccine recommendation or personal refusal to vaccinate and there is potential for a shift in KABB among providers if trust and confidence in vaccine evidence is improved.(89)

Trust As It Relates to Vaccine-Decision Making in Pregnancy

Trust is a prominent theme in health care and health behaviour research. The concept of trust in medical and health services is important for understanding the impact of trust on health promotion and illness prevention.(90) Social theories of trust identify and distinguish between, institutional or systems based, and interpersonal trust—both of which are relevant to the findings.(90)

Institutional trust is the trust placed in the system or institution, such as the health care system.(90)The complex history of the midwifery professional can be partly to blame for the current climate of midwifery and their restrictions to provide the same level of care afforded to other maternal and health professionals. We also see institutional trust present itself in segments of dialogue where midwives refer to their (as well as their patients) sources of vaccine information. Participants recognize that they are a part of a larger health system, which is responsible for providing; education and training, maternal care, preventative care, vaccination and health research. Yet they acknowledge that not all aspects of this system can be equally trusted or counted on to have the best interest of the public (or more specifically pregnant women) as the main focus. Midwives acknowledge that they did trust the information provided to them by health authorities but admit that the information relevant to vaccine recommendations and guidelines was minimal. As a result, midwives were required to seek out information on their own when faced with situations that required them to be informed about a particular vaccine (whether for personal or professional reasons). This is when they expressed concerns with seeking out and disseminating accurate and trustworthy sources of information and vaccine clinical research that gives them confidence in providing a strong recommendation to pregnant

patients. In some cases when vaccine hesitancy among participants affected personal vaccine KABB and uptake, midwives chose to turn to other health care providers to have informed vaccine discussions.

Interpersonal trust is negotiated between individuals and is a learned personal trait. It is argued that interpersonal trust in health care is ‘built, sustained, or damaged through face to face encounters with health providers and is more likely to increase with long-term doctor-patient relationships’(90)(p. 178) Participants also spoke to this concept in sharing their experiences as maternal care providers, as well as, in some cases when roles were reversed and they themselves became the patients and were seeking health or vaccine advice from a more knowledgeable source (such as their physician). Midwives shared that when faced with vaccine decisions that carried personal risk and the decision became a personal rather than professional choice, seeking a trusted source of vaccine information was a priority. These midwives chose to turn to a trusted health care provider or their family physician to address these concerns and have informed discussions prior to making a vaccine uptake decision. These shared experiences of positive impacts of knowledge building and attitude change toward vaccination as a result of system interventions are important to capture to demonstrate the potential for positive change and how it can be achieved when it comes to vaccination in maternal care. Participants also shared personal anecdotes expressing how damaging it can be when an effort to seek information and comfort about vaccination is not addressed appropriately. These experiences are also important to explore to ensure incorrect approaches are voided at all cost in order to not contribute to vaccine hesitancy in Canada.

It is theorized that trust in the system is dependent on the trust in those that represent it.(94) Midwives that participated in semi-structured interviewing were aware of the connection between trust and the health system in which they provide care. Participants acknowledged the trust (or lack of) that exists between patients and providers, patients and the health system, patients and research/information, providers and the health system and providers and

research/information. Important to note however, is the value that midwives placed on their role as distinct care providers and the value placed within their profession on maintaining a trusting, personal and collaborative relationship with their patients that may not be established with other health professionals. It is worth exploring further the difference in trust levels and/or encounters between patients and midwives as opposed to other care providers, such as physicians. This project raised the question why it is that midwives and CAM practitioners are seen as having the best interest of clients, more so than physicians in some cases and how does this impact some aspects of their practice, such as providing vaccine and other health related recommendations? Midwives in the study recognize there is not much they can do personally to change the current climate of trust between the public (including health professionals) and the system in which they work but they did place value on maintaining their role as trusted advocates for their patients.

Literature suggests that exposure to news stories about vaccination, negative ones in particular, in mass media, act as a barrier in Canada.(86) The quality and accuracy of the information available to the public varies widely, particularly the information that can be found on the internet.(29) Distinguishing reputable sources can be challenging for members of the general public.(29) Most widely publicized are vaccine safety and controversy stories such as the now discredited link between increases in vaccine rates and increases in autism rates originally claimed and popularized by Andrew Wakefield in 1998.(29) Despite the large body of evidence disputing the claims since the original publication, the hesitancy and distrust amongst the public lingers as evident in the interviews with midwives in this study.

Research suggesting that the cumulative sample size of active studies including pregnant women is relatively small (particularly in the first trimester).(46) Passive surveillance has not yet raised any safety concerns despite widespread use of the inactivated influenza vaccine during pregnancy over a number of decades.(46) Nonetheless, historically the lack of women represented in clinical trials and research has impacted the current climate of trust in clinical evidence and health recommendations.(46) Most specifically, the underrepresentation of pregnant women in

clinical trials is cited in research as having an influence on the quality, efficacy, relevance and trust that women have in the evidence as it relates to their level of safety.

Author Eula Biss speaks to her personal experiences as a mother and the struggle as a parent responsible for making the decision to vaccinate a child in her book *On Immunity*.⁽⁹¹⁾ She cites a number of influences from the historical impact of Wakefield's publication and the evolution and development of vaccines as broader social factors to more personal aspects that impact her decision-making including her personal interactions within her family and community.⁽⁹¹⁾ Eula Biss provides the voice of a mother and offers an understanding of an important experience that is shared by most women.⁽⁹¹⁾ This speaks to the challenges that pregnancy brings outside of the medical topics and issues one would expect. Some of the concepts that Biss acknowledges as being instrumental in vaccine decision-making were also evident in my research such as that special consideration should be given to the fragility and vulnerability that is experienced by pregnant women during this time and how this might affect practice and communication about vaccines on the part of the provider. Therefore, there may be hesitancy on the part of midwives because they themselves are reluctant to recommend something that they fear carries a certain level of risk. As professionals, midwives shared that their hesitancy may not necessarily be from the known but the unknown level of risk due to the perception of uncertainty of the safety and efficacy regarding the flu vaccine. Therefore, lack of recommendation and discussion is a result of distrust stemming from a lack of knowledge rather than distrust stemming from something negative and midwives suggest there is potential for change and improvement.

Possible Risk of Vaccine v. Actual Risk of Disease

Concerns over vaccine safety has been a central focus of immunization research and major determinant of policy within Canada and internationally.⁽⁹²⁾ Risk evaluation is well cited in literature when it comes to health and decision making, especially when it comes to vaccine decisions.⁽⁹²⁻⁹⁵⁾ The challenges of this are only amplified when decision-making is shifted from

the individual to that of the foetus or child. Many individuals or parents struggle with balancing the risks and benefits of each side and it is common that the risks are often exaggerated and the actual risks of the disease are unknown or underestimated by members of the population.

Additionally, with the availability of new vaccines and vaccine recommendations, such as the influenza vaccine, comes the challenges of how to best communicate the risks and benefits appropriately to vaccine hesitant individuals.

Participants in my research understood that although there are risks associated with both vaccination and the potential of contracting the disease that the risk of complications from vaccination was significantly less than the risks associated with contracting the actual disease. The disease being referred to was not necessarily important, but noteworthy was the general understanding that vaccination was the safer option. Some individuals had come to this conclusion through education and training, while some had personal experiences that enlightened them on the importance of vaccination and in some cases, promotion of vaccination. In some cases, this change came later in life, either following the birth of a child or the start of their midwifery career. The development or change of participants' KAB (knowledge, attitudes and beliefs) in relation to vaccination translated into their behaviours in their personal and professional lives.

Public health officials emphasize that ongoing vaccine uptake is critical to maintaining prevention of related diseases.(29) Despite this, the public often questions the number of vaccines recommended, the timing of their administration, or the interactions between them leading to adverse reactions.(86, 94) Participants spoke of experiencing vaccine choices such as this in their professional and personal lives and the challenge of evaluating the risks and benefits of their choices. The internet and popular media appear to validate the concerns of vaccine hesitant individuals and create an environment of doubt and anxiety regarding the value of vaccines.(94) Recent outbreaks of measles and pertussis among unvaccinated populations have made the reality of this more apparent. One participant recalled a particular experience that shifted her perceptions

and made her consider the historical context in which a disease such as measles was not yet controlled by vaccines. It was suggested by participants that informing the public about the real risks of disease should be more of the focus of public health interventions rather than focusing on theoretical risks of vaccination.

Supporting Health Providers

In order for health providers to provide effective care they need to be part of a system that is supportive of their practices. It has come to light through this qualitative research study that amongst midwives in particular, vaccine discussion, recommendation and uptake is not supported well within the Ontario health system. There is zero mention of the influenza vaccination, what is the midwife's role, and what are the recommendations in any midwifery standards of care or clinical practice guidelines despite strong recommendations by NACI and public health authorities. Participants in the study acknowledge that they are ambivalent when approached with influenza vaccine questions in practice. Midwives recognize that their role is reduced as a result of their limited scope despite the fact that they are the ones providing majority (if not the only source) of care at the time when vaccination discussions would be relevant during pregnancy. Participants suggest that it should be included in their scope of practice to educate their patients about vaccinations, but, due to lack of reminder systems and routine currently in place, their role is reduced. The only guidelines provided to midwives related to vaccination include general and unclear documents in the Standards of Care that had statements such as “encourage clients to seek information” and “inform clients that administration of childhood vaccination is outside the scope of midwifery” [See Appendix N].

Participants suggest simple solutions such as email reminder systems and mailbox notices that probe midwives when vaccine information, recommendations and administration become available. In addition, it was pointed out by one participant that there is a lack of recording and monitoring of vaccine uptake on the standard care forms used by midwives (Antenatal 1 and 2

Forms—See Appendix J). The standard practice of midwifery in Ontario is guided by two Antenatal forms that serve to document and guide all prenatal care in the province. The purpose of these forms is to capture relevant patient information and inform midwives what should be discussed during the prenatal appointment. The Antenatal forms capture family history, intake information and ongoing care. It was suggested that the routine practice of midwives surrounding vaccine promotion could be improved if the Antenatal forms were redeveloped to include vaccine reminders to assist midwives establish a habit of vaccine recommendation and discussion. However, for all participants in my research, including vaccine discussion and recommendation as routine is not currently a reality. The lack of initiative on the part of maternal providers, particularly midwives, is reflected in the low uptake among pregnant women which remains at only 15%.(11)

Moreover, participants shared how, based on their experiences as midwives in the Ontario health system their practices are informed and limited by the system in which they provide care. Several strategies to increase vaccine acceptance during pregnancy have been recommended, including patient and provider education, strong provider recommendations, making vaccination part of routine prenatal care and maximizing access to vaccination services for pregnant women.(5, 19-22, 24, 25, 31) As the implementation of these strategies relies on the commitment and willingness of health care providers to drive vaccine promotion, it is essential to assess barriers to vaccination in pregnancy from the health care provider perspective.(5)

Mennonites in the Waterloo-Wellington Region

This paper brings in a unique element that has yet to be researched in Ontario. The research design of this project gives consideration for how the Mennonite lifestyle and approach to health and pregnancy may influence the KABB of both patients and midwives. The project gives consideration to the cultural context that the Mennonite population have on vaccine uptake in the Waterloo-Wellington area due to their settlement in the region. Midwives that provide

prenatal care for some of the Mennonite women in this region shared their experiences with their patients, how these women used and approach maternity services and their experiences of vaccine discussions with Mennonite women.

Participants that work closely with the Mennonite women in Waterloo-Wellington were able to speak to this population's use of health services, ability to adapt and utilize formal midwifery services, their level of inquiry and in some cases uptake of vaccination and most specifically their approach to pregnancy. The use of the Canadian health system by Mennonite women was suggested to be a personal choice, with some patients utilizing more care and services than others. It was not specifically determined what proportion of the patients that utilize midwifery services are registered for OHIP, but it is believed that there are still some families who have not signed up for Ontario health coverage despite it being more of a personal or family choice and not restrictions imposed by the church.(96) Despite this, Mennonite women still seek out care from registered midwives providing care in urban and rural clinics at some point during their pregnancy, according to participating midwives that provide care for this population. Overall, there was a noticeable difference between the approach and services utilized by the Mennonite patients in comparison to the mainstream patients. Midwives suggest that this was most noticeable with services such as ultrasounds, blood work and vaccinations. This is not surprising considering the non-interventionist and traditional approach cited in literature as the standard for Mennonite communities, and potentially explains why Mennonite women prefer to seek care from midwives rather than other health care providers during pregnancy.(59)

There is little to no literature that references the vaccine perspectives of Mennonite populations, or pregnant women in particular. This study was able to explore the practices of vaccination among a small population of Mennonites through the midwives that provide their prenatal care. The participants touched upon important themes also indicated in literature such as the cultural and familial elements to decision-making, and the comfort and trust in the natural process of pregnancy and childbirth. This study provides the opportunity to explore the evolving

(and not evolving) traditions within Mennonite communities within aspects such as health care, birthing and vaccination. All of which are important to view through a more culturally centered health communication perspective as an alternative rather than a barrier to effective health communication. (69)

Moreover, by interviewing midwives that provide care for both Mennonite and mainstream patients we could compare and contrast approaches to health care, vaccination and pregnancy as experienced, interpreted, shared by the midwives that participated in qualitative interviews. This added a unique element to the data that was explored as a cultural and social factor in the KABB of midwives in the Waterloo-Wellington Region. Although this research is a good starting point, there should be more of a focus on exploring the influence of cultural, historical, and community influences on vaccine attitudes, beliefs and decision-making within Mennonite (and other culturally diverse) communities. Considering cultural context in research offers new ways of understanding relationships between media, culture and communication and is helpful to explain the success and failure of communication strategies in addressing complex health issues such as vaccine uptake.(69)

Analysis using Theoretical Domains Framework (TDF)

Coding and analysis of raw data collected through semi-structured interviewing was informed using Theoretical Domains Framework. The TDF framework proved to be an effective application for this research project and assisted in the design of a well-organized interview guide. The framework provided a direction for the interview content and analysis but did not limit it. It was demonstrated that the TDF framework can be applied to and covers a breadth of behaviours, clinical designs, settings and methods.(77) The framework allowed for the researcher to see how more focused elements (individual and specific codes) fit into broader themes and social structures (domains as outlined in TDF). Furthermore, the domains were (and can continue

to be) utilized as an organizational tool when considering and developing targeted behavioural interventions.

The TDF is effective for assisting in exploring implementation challenges and designing implementation interventions and can assist in creating a direction for future research.(77) It also allowed for the researcher to translate theory into practice by taking interview data and content and providing the practical application of behavioural change. Explained further, interview questions directed at exploring KAB (knowledge, attitudes, beliefs) and perceptions provided an understanding and foundation for the research findings. In contrast interviews directed at behaviour and broader themes such as influencing factors (systemic barriers, cultural and historical influences and factors) provide insight on barriers to the individual actions of health and maternal care providers. Together it becomes clear where interventions should be directed to influence behaviour change in practice among the particular population of midwives in Ontario. In some aspects, findings can even be generalized to health providers in Canada.

The TDF was effective for sorting codes in a breadth of codes and categories, but this research was limited due to the small sample size in that the researcher's ability to explore certain themes in depth was limited. Also because the TDF was consulted in the creation of the interview guide, as well as, in the analysis of data it is possible that despite the researcher's best effort to not solely rely on the TDF to inform the project, that bias remained. Themes that fell outside the TDF framework were not discarded but looked at more closely to determine if they could fit within the framework or demonstrated an anomaly in an attempt to remedy this limitation. It was determined that the themes that fell outside the framework were to be considered "New Themes" to be explored for the purpose of this research project.

Directions for Future Research

A minimal amount is known about vaccine hesitancy among providers and even less about vaccine hesitancy among midwives specifically and how this impacts their discussions and

recommendations during prenatal care and how this impacts vaccine uptake. This study explored the KABB of midwives around vaccination during pregnancy; however, additional research is needed to examine how this directly impacts vaccine uptake in Ontario, and more broadly, Canada, amongst pregnant women. Currently there is almost no research focusing on the perspectives and interactions of midwives related to vaccine discussions and recommendations with their pregnant patients and how this is evolving based on vaccine recommendations by NACI and Public Health. This is also the first study of its kind that has given consideration to the experiential and contextual influences of the Mennonite populations that reside in the rural Waterloo-Wellington Region. Research is needed to gain a better understanding of the social and systemic factors that create a gap in research, as well as, care guidelines and standards surrounding influenza vaccination in pregnancy in relevant contexts. Research development in this area is not only important for the academic community but for informing health policy and encouraging system level changes. It is critical to address issues of vaccine uptake before we see another pandemic outbreak such as H1N1 in 2009. Furthermore, qualitative research focusing on KABB of midwives and other maternal health providers, as well as, quantitative research focusing on the correlation between vaccine discussions with midwives and uptake is key to examining the importance of influenza vaccine conversations.

There is also a need for research among minority, remote and rural populations in Canada. This study demonstrated that vaccine KABB of rural populations, such as the Mennonite population considered in this research might potentially have different KABB and utilization of health services than those located in more urban setting who potentially follow more medicalized approaches to care. Overall, there is a lack of data on the Mennonite population and their practices as it relates to their use of health care (specifically midwifery and prenatal care); this is also a difficult population to infiltrate due to their isolation and close-knit communities. Therefore, working with or interviewing individuals (such as midwives) who work closely with

Mennonite and having a thorough respect and understanding for their lifestyle and approach to care is an effective way to evaluate their KABB.

More in depth research is needed within Ontario and Canada among midwives regarding their role in vaccine discussions and recommendations. In addition, evaluation of the midwifery Standards of Care and scope of practice is needed to clarify what exactly is a midwife's role in vaccine discussion and recommendation and how vaccine hesitancy among patients should be addressed by health and maternal providers. There is the potential that vaccine discussion hasn't yet been incorporated into policy and guidelines in an attempt to continue to keep midwives as separate from biomedical health providers. It is critical that changes are made on a systemic level to inform policy and create more clear and relevant standards and guidelines for midwives regarding their role in vaccine discussion and recommendation. Most critically vaccine education and training needs to be incorporated into the midwifery curriculum and placement programs to prepare midwives' for vaccine discussions that they will face in practice. If public health is going to provide strong recommendations for pregnant women to (such as the influenza vaccine) then midwives need to be educated, informed and comfortable standing behind these recommendations.

Overall, this study was able to shed light on some of the factors that contribute to hesitancy amongst an important subset of the health care system and the impact of this hesitancy on practice. Literature in the field advocates that more qualitative research like this is needed to explore the topic of vaccine hesitancy further within components of our health systems. The goal of this research is to bring focus to the midwives' involvement in vaccine promotion and begin a dialogue among providers and policy makers on potential expansion of practice.

Limitations of this Research

This study has several limitations that should be noted. Recruitment took place utilizing email and telephone contact with Midwifery clinic secretaries who then presented the study

information and flyer at clinic meetings to midwives in the Waterloo-Wellington Region. This leaves the potential for selection and recruitment bias if the recruitment was not presented to all employed midwives in the area (i.e. neglected at meetings or forgotten about and therefore midwives from a particular clinic may not have been informed about the research opportunity). Recruitment took place over several months (April 2017-April 2018) with interviewing taking place between April-August 2017 and January-April 2018, therefore it is not anticipated that recruitment methods limited the opportunity for participants that were currently taking time off for vacation or maternity leave at the time of recruitment and or interviewing. There is, however, is the possibility that recruitment was less successful due to initial recruitment taking place between May and August when midwives are more likely to be taking time off for summer holidays. Another limitation of off-site recruitment is that without personal contact, potential participants may have been less inclined to want to participate in the research project. This project also did not offer any remuneration for participation and required a considerable time commitment from midwives making the study appeal to midwives was a challenge.

Interviews were conducted with a purposive sample of eight participants. Interviewing and recruitment was concluded following interview seven due to the approaching submission deadline. Although theoretical saturation was not achieved as originally anticipated it was determined that the final thesis was to be submitted as an exploratory study and that saturation did not have to be the end goal to achieve impactful results. While the qualitative nature and small sample size of this research limits its generalizability, the results of this study may still be transferable to other Canadian health and maternal care contexts. This research project concluded with a smaller sample size than originally anticipated. With only 711 midwives practicing in all of Ontario(37), and majority of them focusing their care practices in urban settings, the researcher was studying a small population (rural midwives in the Waterloo-Wellington Region) and therefore expected challenges with recruitment due to the nature of the study. The research required forty-five minutes to one hour of time commitment from participants without

remuneration. It is possible that the requirements for participants was too much to ask and deterred volunteers from reaching out or participating in the research. This also means that those that were willing to participate in the research may feel more strongly about the topic and therefore are not necessarily an accurate representation of the majority of the KABB of midwives in the area being researched. As a result of the small sample size it must be acknowledged that some of the themes may be biased in representing the perspectives of one or two participants. The researcher aimed to not make generalizable claims or statements based on the findings of the data or statements made by interview participants as a result of this while still valuing the input of the midwives that participated.

The interview guide included questions about Mennonite lifestyle, approach to health and approach to pregnancy. None of the participants were of Mennonite descent themselves so all responses were based on hearsay or personal experience with individuals of the Mennonite population. Therefore, it is possible that there is misrepresentation, misinterpretation or that the nuances of the Mennonite culture or approaches to care are missed but the general ideas and concepts have been captured in the findings.

The use of the demographic questionnaire could be considered a limitation due to the inconsistency of the data provided (one participant refused to answer some of the questions) and lack of formal use of the data. Due to the data on the demographic questionnaire being identifiable the information was kept confidential but it was useful for the researcher in establishing context and background information about the participant as well as determining trends in the interview responses and how they may (or may not) relate to age, training and experience of participants. The demographic questionnaire was not used for formal or statistical analysis but for consistency and organizational purposes.

Participants were provided the option of participating via telephone or face-to-face interviews. Seven of the eight participants chose phone interviews. One interview took place in the break room of a midwifery clinic. This could be considered a limitation despite all other

information captured in the interview being identical (ie. notes and memos, audio recording and required documentation). All interviews did have a natural and authentic feel but it can be argued that some nuanced and personal aspects of speaking face to face can be lost in telephone interviewing. The interviewer attempted to address this by recording things like hesitation in the voice, pauses and laughing that can be heard on the audio recording. Finally, qualitative research has been criticized for being subject to researcher or experimenter bias.(84) Efforts were made by the researcher to minimize bias through the use of a second coder, inter-coder agreement and regular consultation with her supervisor.(84) Overall, the aim of this research was to better understand and initiate a dialogue for future change in midwifery care. I believe both goals have been achieved despite the limitations present.

Conclusions

This study has started to address a lack of qualitative inquiry and begun to fill the gap in research on vaccine recommendation practices and discussions among midwives in the Waterloo-Wellington Region of Ontario and its implications for vaccine uptake among pregnant women in Canada. This study improved upon prior quantitative and limited qualitative investigations by recruiting midwives in Ontario, which allowed for a more comprehensive understanding of the experiences of midwives as they relate to KABB of vaccination during pregnancy. The data gathered through the short demographic questionnaire and semi-structured qualitative interviews provided greater context for the experiences of vaccine discussions and recommendations among midwives. Specifically, it allowed the researcher to compare elements that emerged in the interview process to findings of research conducted outside the Canadian context. These findings contribute to a better understanding of the perceptions of both midwives that provide care in the Canadian context, as well as, the perceptions of the pregnant women that they are providing care to.

While some elements such as vaccine hesitancy among health care providers have previously been researched both outside and within Canada, a specific focus on the role of midwives, their interaction with the at-risk population of pregnant women and the cultural element of the Mennonite population have not yet previously been considered explicitly in research. The similarities and differences that emerged in interviewing demonstrate the value of using a qualitative approach when exploring experiences and perceptions of complex processes and interactions such as vaccine hesitancy and health care decision-making.

The exploratory findings suggest that lack of vaccine discussion and recommendation in midwifery care in Waterloo-Wellington, especially when considering the influenza vaccine, is a serious issue with critical implications. The findings of this study reinforced well cited literature and further demonstrate that there is an issue with vaccine hesitancy and lack of confidence in

recommendation among health providers within our health system that directly impacts uptake rates as seen amongst our at risk pregnant women who have uptake rates of an estimated 15%. Future strategies must address the root causes of low-uptake among at risk populations in order to create impactful and proactive change.

References

1. Fynes. Integrating lay and nursed midwifery into the U.S and Canadian health care systems *Social Science Medicine*. 1997;44(7).
2. George L. A Midwife crisis: Not enough doctors, not enough midwives; It's a bad time to have a baby in Canada. *MacLeans Magazing*. 2008.
3. Eve Dubé, Maryline Vivion, Chantal Sauvageau, Arnaud Gagneur, Raymonde Gagnon and Maryse Guay. How do Midwives and Physicians Discuss Childhood Vaccination with Parents? *Journal of Clinical Medicine*. 2013;2(4):242-59.
4. Bourgeault IL. Delivering the 'new' Canadian midwifery: the impact on midwifery of integration into the Ontario health care system. *Sociology of Health & Illness*. 2000;22(2):172-96.
5. Moniz M, Beigi RH. Maternal Immunization: Clinical experiences, challenges, and opportunities in vaccine acceptance. *Human Vaccines and Immunotherapeutics*. 2014;10(9):2562-70.
6. Committee. NVA. The National Vaccine Advisory Committee: reducing patient and provider barriers to maternal immunizations: approved by the National Vaccine Advisory Committee on June 11, 2014. *Public Health Report*. 2015;130(1):10-42.
7. Cynthia A Bonvillea, Joseph B Domachowskea & Manika Suryadevara. Vaccine attitudes and practices among obstetric providers in New York State following the recommendation for pertussis vaccination during pregnancy. *Human Vaccines & Immunotherapeutics*. 2015;11(3):713-8.
8. Michael L. Power, Meaghan A. Leddy, Britta L. Anderson, Stanley A. Gall, Bernard Gonik, Jay Schulkin. Obstetrician–Gynecologists' Practices and Perceived Knowledge Regarding Immunization. *American Journal of Preventative Medicine*. 2009;37(3):231-4.
9. C. Eppes, A. Wu, K.A. Cameron, P. Garcia, W. Grobman. Does obstetrician knowledge regarding influenza increase HINI vaccine acceptance among their pregnant patients? *Vaccine*. 2015;30(39):5782-4.
10. Robert F. Arao, Shannon McWeeney, Katrina Hedberg. Influenza Vaccination of Pregnant Women: Attitudes and Behaviors of Oregon Physician Prenatal Care Providers. *Maternal and Child Health Journal*. 2015;19(4):783-9.
11. Agnes Tong M, Anne Biringer, Marianna Ofner-Agostini, Ross Upshur M, Allison McGeer. A Cross-Sectional Study of Maternity Care Providers' and Women's Knowledge, Attitudes, and Behaviours Towards Influenza Vaccination During Pregnancy. *Journal of Obstetrics and Gynaecology Canada*. 2008;30(5):404-10.
12. Biggs L. Tradition as a political symbol in the new Midwifery in Canada. In: Ivy Lynn Bourgeault CB, Robbie Davis-Floyd, editor. *Reconciling Midwifery*.
13. Biggs L. Rethinking the history of midwifery in Canada. In: Ivy Lynn Bourgeault CB, Robbie Davis-Floyd, editor. *Reconciling Midwifery*. McGill: McGill.
14. Ontario Go. Waterloo Wellington LHIN 2016 [Available from: <http://www.waterloowellingtonlhin.on.ca/aboutus.aspx>].
15. Peretti-Watel P, Larson HJ, Ward JK, Schulz WS, Verger P. Vaccine Hesitancy: Clarifying a Theoretical Framework for an Ambiguous Notion. *PLOS current outbreaks*. 2015.
16. Canada S. Flu Vaccination Rates in Canada *Statistics Canada: Statistics Canada*; 2014
17. Beate Sander, Chris T. Bauch, Andreas Maetzl, Allison McGeer, Janet M. Raboud, Murray Krahn. Economic Appraisal of Ontario's Universal Influenza Immunization Program: A Cost-Utility Analysis. *PLOS Medicine*. 2010;7(4).
18. Canada PHAo. Reported influenza hospitalizations and deaths in Canada:2011-12 to 2015-16 (data to August 27, 2016): PHAC; 2016 [
19. (NACI) NACoI. Statement on influenza vaccination for the 2008-2009 season. An Advisory Committee Statement (ACS). *Can Commun Dis Rep* 2008;34(ACS-3):1-46.

20. Dodds L, McNeil SA, Fell DB. Impact of influenza exposure on rates of hospital admissions and physician visits because of respiratory illness among pregnant women. *Canadian Medical Association Journal*. 2007;176:463-8.
21. Legge A, Dodds L, Macdonald NE, Scott J, McNeil S. Rates and determinants of seasonal influenza vaccination in pregnancy and association with neonatal outcomes. *Canadian Medical Association Journal*. 2014;186(4):E157-E64.
22. Denise J Jamieson, Margaret A Honein, Sonja A Rasmussen, Jennifer L Williams, David L Swerdlow, Matthew S Biggerstaff, Stephen Lindstrom, Janice K Louie, Cara M Christ, Susan R Bohm, Vincent P Fonseca, Kathleen A Ritger, Daniel J Kuhles, Paula Eggers, Hollianne Bruce, Heidi A Davidson, Emily Lutterloh, Meghan L Harris, Colleen Burke, Noelle Cocoros, Lyn Finelli. H1N1 2009 influenza virus infection during pregnancy in the USA. *The Lancet*. 2009;374(9688):429-30.
23. Canada PHAo. National Advisory Committee on Immunization (NACI) Public Health Agency of Canada Web page: Public Health Agency of Canada; 2017 [
24. Yudin, Sgro. Acceptability and feasibility of seasonal influenza vaccine administration in an antenatal clinic setting. *Journal of Obstetrics and Gynaecology Canada*. 2010;32(8):745-8.
25. Beth A Halperin, Shelly McNeil, Jennifer Kalil & Scott A Halperin. Maintaining the momentum: Key factors influencing acceptance of influenza vaccination among pregnant women following the H1N1 pandemic. *Human Vaccines & Immunotherapeutics*. 2014;10(12):3629-41.
26. Todd Lee, Margaret McArthur, Allison McGeer. Beliefs and practices of Ontario midwives about influenza immunization. *Vaccine*. 2005;23(13):1574-8.
27. Allison L. Naleway and John P. Mullooly. Delivering Influenza Vaccine to Pregnant Women. *Epidemiologic Reviews*. 2006;28:47-53.
28. Canada S. H1N1 Vaccination: Priority Groups. About Health Analysis Division; Retrieved: 2018. Contract No.: 4.
29. Caplan. Vaccination refusal: Ethics, individual rights, and the common good. Elsevier. 2011.
30. Eve Dubé Dominique, Gagnon, Manale Ouakki, Julie A. Bettinger, Maryse Guay, Scott Halperin KW, Janice Graham, Holly O. Witteman, Shannon MacDonald, William Fisher, Laurence Monnais, Dat Tran, Arnaud Gagneur, Vineet Saini, Jane M. Heffernan, Samantha Meyer, Joshua Greenberg, Heather MacDougall. Understanding Vaccine Hesitancy in Canada: Results of a Consultation Study by the Canadian Immunization Research Network. *PLOS One*
31. Shabir A. Madhi, Clare L. Cutland, Locadiah Kuwanda, Adriana Weinberg, Andrea Hugo, Stephanie Jones, Peter V. Adrian, Nadia van Niekerk, Florette Treurnicht, Justin R. Ortiz, Marietjie Venter, Avy Violari, Kathleen M. Neuzil, Eric A.F. Simões, Keith P. Klugman, and Marta C. Nunes. Influenza Vaccination of Pregnant Women and Protection of Their Infants. *The New England Journal of Medicine*. 2014;371:918-31.
32. Dictionary. Dictionary 2017
33. Georgina Cairns LM, Kathryn Angus, Laura Walker, Theodora Cairns-Haylor and Timothy Bowdler. Systematic literature review of the evidence for effective national immunisation schedule promotional communications: Insight into health communication. Stockholm: Stockholm; 2012.
34. Paul Ritvo, Neil Klar, Kumanan Wilson, Laura Brown, Aline Rinfret, Robert Remis and Murray D Krahn. A Canadian national survey of attitudes and knowledge regarding preventive vaccines. *Journal of Immune Based Therapies and Vaccines* 2003;1(3).
35. PATERSON SL. Ontario Midwives: Reflections on Decade of Regulated Midwifery. *Canadian Womens Studies*. 24(1):153-7.

36. Epp M. Midwife-Healers in Canadian Mennonite Immigrant Communities: Women who “made things right”. *Social History*. 2007;40(80).
37. CIHI. HCP provincial profiles. CIHI: CIHI; 2016.
38. Hanna A. Maternal and Newborn Care in Ontario. *Ontario Medical Review*. 2007:27-39.
39. (CAM) CAoM. Annual Report. CAM. 2014/2015.
40. (CAM) CAoM. CAM. 2016.
41. CMRC. Require for Initial Registration as a Midwife in Canada. CMRC Nunavut. CMRC Nunavut2011.
42. Ontario CoMo. College of Midwives of Ontario College of Midwives of Ontario Web Page: College of Midwives of Ontario; 2015 [updated 2015].
43. Information CIfH. Midwives-CIHI 2013 [Available from: <https://www.cihi.ca/en/spending-and-health-workforce/health-workforce/midwives>].
44. Eileen K, Hutton P, Angela H. Reitsma, and, Karyn Kaufman D. Outcomes Associated with Planned Home and Planned Hospital Births in Low-Risk Women Attended by Midwives in Ontario, Canada, 2003–2006: A Retrospective Cohort Study. *Birth*. 2009;36(3):180.
45. Patricia A. Janssen, Lesley A. Page, Michael C. Klein, Robert M. Liston, Shoo K. Lee. Outcomes of planned home birth with registered midwife versus planned hospital birth with midwife or physician . *CMAJ*. 2009;181(6-7):377-83.
46. (NACI) NACoI. Canadian Immunization Guide Chapter on Influenza and Statement on Seasonal Influenza Vaccine for 2016-2017. PHAC: PHAC; 2016-2017.
47. Assessing vaccine safety within Ontario's Universal Influenza Immunization Program, 2012-2013 to 2014-2015 [Internet]. Public Health Agency of Canada. 2016 [cited September 1, 2016].
48. Helen Johansen. Flu Shots- National and provincial/territorial trends. *Stats Canada, Catalogue 82-003*. 2006;17(2):43.
49. Ehrenthala. Commentary on “Maternal immunization: Clinical experiences, challenges, and opportunities in vaccine acceptance”. *Human Vaccines & Immunotherapeutics*. 2014;10(9):2574-5.
50. Dube E. Vaccine hesitancy among health care professionals and approaches to address it. *Canadian Immunization Conference*; Ottawa: Eve Dube; 2016.
51. Eve Dube DG. Strategies intended to address vaccine hesitancy: Review of published reviews. *Vaccine*. 2015;33:4191-203.
52. Pauline Paterson a FMb, Lawrence R. Stanberry c, Steffen Glismann b, Susan L. Rosenthal c,, Larson HJ. Vaccine hesitancy and healthcare providers. *Vaccine*. 2016;34:6700-7.
53. Tong A , Ofner-Agostini M, Upshur R, McGeer A. A cross-sectional study of maternity care providers' and women's knowledge, attitudes, and behaviours towards influenza vaccination during pregnancy. *Journal of Obstetrics and Gynaecology Canada*. 2008;30(5):404-10.
54. Verger P CF, Fressard L, Bocquier A, Gautier A, Pulcini C, Raude J, Peretti-Watel P. Prevalence and correlates of vaccine hesitancy among general practitioners: a cross-sectional telephone survey in France, April to July 2014. *Euro Surveill*. 2016;21(47):3406.
55. Dubé E , Ouakki M., Guay M., Sauvageau C., Landry M. . Enquête québécoise sur la vaccination contre la grippe saisonnière et le pneumocoque en 2016. Québec: Institut national de santé publique du Québec 2016.

56. Enquête québécoise sur la vaccination contre la grippe saisonnière et le pneumocoque et sur les déterminants de la vaccination. Québec: Institut national de santé publique du Québec. 2017.
57. Carol Yuet Sheung Yuen, Marie Tarrant. Determinants of uptake of influenza vaccination among pregnant women – A systematic review. *Vaccine*. 2014;32(36):4602-13.
58. Pingsheng Wu, Airron Richardson, Steven G. Gabbe, Meredith A. Gambrell, and Tina V. Hartert. Influenza Vaccination During Pregnancy: Opinions and Practices of Obstetricians in an Urban Community. *Southern Medical Journal*. 2006;99(8).
59. Epp. M. Mennonites. *Historica Canada*. 2011.
60. Guides R. *The Mennonites of Kitchener-Waterloo and St. Jacobs*. 2016.
61. Country SJ. *The Mennonite Story*. 2016.
62. Studies IoAa. Who are the Mennonites? Conrad Gabel University College: Conrad Gabel University College; 2017 [
63. Canada S. Census Profile. 2001 Census.: Statistics Canada; 2002. Contract No.: 92-378-2011.
64. Canada S. National Household Survey Profile. Stats Canada Report. Statistics Canada Catalogue.; 2013 Released June 26, 2013. Contract No.: 99-010-X2011032.
65. Team EaHA. Data Request. Data Request. Statistics Canada: Region of Waterloo Public Health; 2017 April 6, 2017.
66. Susan Fish, Marlene Epp, Carol Ann Weaver. *Mennonite Heritage Report*. 2016.
67. Eve Dubé, Julie Bettinger, University of British Columbia, Nicholas Brousseau Indspd, Eliana Castillo, Liz Darling, Michelle Driedger, William Fisher, et al. RESEARCH PROTOCOL: Vaccinating Pregnant Women: Are maternity care providers hesitant? Canadian Immunization Research Network. 2015.
68. Creswell JW. *Reserch Design: Qualitative, Quantitative and Mixed Methods Approaches*. 4th ed. University of Nebraska: SAGE; 2014.
69. Lewis B. *Health Communication: A media and cultural studies approach*: Palgrave; 2015.
70. Jacob SA. Writing Interview Protocold and Conducting Interviews: Tips for Students New to the Fird of Qualitative Research. *The Qualitative Report*. 2012;17(6):1-10.
71. Layder D. *Sociological practice: linking theory and social reserch*. London: SAGE publications; 1998.
72. Silverman D. *Doing Qualitative Research*. 4th ed. London: SAGE; 2013.
73. Bell . *Social Research Methods. Fourth Canadian Edition* ed. Don Mills, Ontario, Canada: Oxford University PRes; 2016 2016.
74. Taylor B FK. *Qualitative Research in the Health Sciences: Methodologies, Methods, and Process*. 1st Ed. . Taylor B FK, editors., editor. New York, NY: Taylor & Francis; 2013.
75. Rubin HJ RI. *Qualitative Interviewing: The Art of Hearing Data*. 2nd ed. ed. Thousand Oaks, California: SAGE Publications Inc.; 2005.
76. Erlandson DA, Skipper BL, Allen SD, Grotevant , Carlson CI. *Doing Naturalistic Inquiry: A Guide to Methods*. MM M, editor. Newbury Park, California: SAGE Publications; 1993.
77. Jill J Francis. Theories of behaviour change synthesised into a set of theoretical groupings: introducing a thematic series on the theoretical domains framework. *Implementation Science*. 2012;7(35).
78. Midwives AoO. *Working with hospitals: scope of practice, collaberation and integration* Association of Ontario Midwives: Association of Ontario Midwives; 2008.
79. James Cane. Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implementation Science*. 2012;7(37).

80. Simon D French, Sally E Green, Denise A O'Connor, Joanne E McKenzie, Jill J Francis³, Susan Michie, Rachele Buchbinder, Peter Schattner, Neil Spike and Jeremy M Grimshaw. Developing theory-informed behaviour change interventions to implement evidence into practice: a systematic approach using the Theoretical Domains Framework. *Implementation Science*. 2012;7(38).
81. Ward S. How to' Use Social Theory Within and Throughout Qualitative Research in Healthcare Contexts. *Sociology Compass*. 2014;8(5):525-39.
82. Erlandson, Skipper BL, Allen SD, Grotevant HD, Carlson CI. . Quality Criteria for a Naturalistic Study. . McCue MM e, editor. Newbury Park, California: SAGE Publications; 1993.
83. Benaquisto. Fundamentals of Social Research. Evelyn Veitch AW, Laura MacLeod, David Tonen, Lesley Mann, Valerie Adams, editor. Toronto, Canada.: Nelson Education LTD.; 2010.
84. Gibbs G. Analyzing Qualitative Data. Corbin J DN, Freebody P, Gergen K, Manson J, Murray M et al., editors. , editor. London, UK: SAGE Publications; 2007.
85. Guest G MK, Namey EE. . Applied Thematic Analysis. Knight V, Habib, L, Viriding A, Rosenstein A, Hutchinson A, editor. Thousand Oaks, California: SAGE Publications 2012.
86. Heidi JL, Caitlin Jarrett, Elisabeth Eckersberger, David M.D. Smith, Pauline Paterson. Understanding vaccine hesitancy around vaccines and vaccination from a global perspective: A systematic review of published literature, 2007–2012. *Vaccine*. 2014;32:2150-9.
87. Midwives AoO. Ontario Midwives Ontario Midwives: Association of Ontario Midwives; 2017 [Available from: <http://www.ontariomidwives.ca/midwife/regulation/association>].
88. Bourgeault IL. Lack of midwives costs Canada's health system. *The Province*. 2014.
89. Holmes NHB. The public's acceptance of novel vaccines during a pandemic: a focus group study and its application to influenza H1N1. *Emerging Health Threats Journal*. 2009;2(e8).
90. Samantha Meyer, John Coveney and Wendy Rogers. Trust in the health system: An analysis and extension of the social theories of Giddens and Luhmann. *Health Sociology in Review*. 2008;17:177-86.
91. Biss E. On Immunity. Minneapolis, Minnesota Greywolf Press; 2014.
92. Leslie K. Ball GE, Ann Bostrom. Risky Business: Challenges in Vaccine Risk Communication. *Pediatrics*. 1998;101(3).
93. Wiley K, Massey, P., Cooper, S., Wood, N., Quinn, H., Leask. Pregnant women's intention to take up a post-partum pertussisvaccine, and their willingness to take up the vaccine while pregnant:A cross sectional surveyK. *Vaccine*. 2013;31:3972-8.
94. Katrina F. Brown, Mary Ramsay, Michael J. Hudson, John Green,, Charles A. Vincent JSK, Graham Fraserf Nick Sevdalisa. UK parents' decision-making about measles–mumps–rubella (MMR) vaccine 10 years after the MMR-autism controversy: A qualitative analysis. *Vaccine*. 2012;30:1855-66.
95. Brownsyne M. Tucker Edmonds JC, Katrina Armstrong, Judy A. Shea. Risk Perceptions, Worry, or Distrust: What Drives Pregnant Women's Decisions to Accept the H1N1 Vaccine? *Maternal and Child Health Journal*. 2011;15:1203-9.
96. Zehr G. Changes I Have Seen In The Amish Community In My Lifetime. *Ontario Mennonite History* [Internet]. 1998; XVI(1192-5515).

Referencing the Appendix

Please see attachment **Michelle_Simeoni_** to reference supplementary thesis documents.

Appendix A: Recruitment Region- Waterloo-Wellington LIHN	(p.2-3)
Appendix B: Ontario Midwifery Documents	(p.4-26)
The Ontario Midwifery Model of Care	
Midwifery Scope of Practice	
Prescribing and Administering Drugs	
Routine Childhood Vaccinations	
Appendix C: Region of Waterloo Public Health-Data Request Results	(p. 27-33)
Appendix D: Not Included in Document	
Appendix E: TDF Framework	(p.34-35)
Appendix F: Interview Guide	(p.36-39)
Appendix G: Audit Trail	(p.40-61)
Appendix H: Recruitment	(p. 62-77)
Appendix I: Not Included	
Appendix J: Not Included	
Appendix K: Not Included	
Appendix L: Findings and Results Supplementary Documents	(p.77-81)
Demographic Questionnaire	
Questionnaire Results	
Antenatal Record 1	
Antenatal Record 2	
Appendix M: Appendix M: Ethics	(p.83-90)
Ethics Review Feedback	
Ethics Review Clearance	
Ethics Review Modifications	
Appendix N: Supplementary Documents	(p.91-96)
Requirements for Initial Registration as a Midwife in Canadian Jurisdictions	
CIHI HCP Provincial Profiles (2016)	