An exploration of midwives' role in the promotion and provision of antenatal influenza immunization: A Mixed Methods Inquiry.

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DECLARATION

I certify that this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person accept where reference is made in text.

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ABSTRACT

Influenza acquired in pregnancy can have serious sequalae for both mother and foetus. Recent studies have demonstrated that influenza vaccine in pregnancy is both safe and effective. Despite this, evidence suggests that vaccine uptake in pregnancy is suboptimal. Research suggests that between 43% and 76% of pregnant women receive the vaccine. The role of midwives in the promotion and provision of this vaccine is unknown. The purpose of this study was to investigate the role of midwives in the promotion and provision of antenatal influenza vaccine and, to provide a statistical and thematic description of the barriers and enablers midwives encounter in its promotion and provision. This mixed method study incorporated a cross sectional on-line survey and in-depth interviews conducted with midwives, employed in urban and regional South Australia. This study utilised convenience sampling and the qualitative phase supported and enhanced the results obtained in the quantitative phase. Inferences were drawn from both results. Quantitative data were available for 137 midwives and 10 midwives participated in the interviews. Whilst all midwives indicated that education and vaccine promotion were part of their role, only those employed in a Primary Health setting were actively providing the vaccine. Quantitative data suggests that less than 43% of midwives felt prepared to provide the vaccine. Midwives who had received formal immunization training were more likely to recommend the vaccine (93.7%) (p=0.001) when compared to those who had not received training. Qualitative data identified immunization education as an enabler to practise. Midwives identified an immunization knowledge deficit. Those midwives who had received immunization education were more likely to actively promote and provide the vaccine to pregnant women. These findings indicate the need for more immunization education of midwives in both university and practise settings. This is the first Australian study to investigate the role of midwives in antenatal influenza immunization, hence, the results are relevant to education, practise and policy.

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STATEMENT OF ORGANIZATION OF THESIS

This thesis aims to investigate the role of midwives in the promotion and provision of antenatal influenza immunization and is presented in the following format:

Chapter 1

Introduction and Literature Review including Literature Search Strategy.

Chapter 2

A discussion of the research methods used and the research paradigm.

Chapter 3

A discussion of the research design including data collection methods, data analysis and data management.

Chapter 4

This chapter presents the findings of the Quantitative aspect of this study and includes analysis of the results.

Chapter 5

Chapter five presents the results of the quantitative aspect of the study.

Chapter 6

Chapter six is the discussion section and includes limitations of the study.

Chapter 7

This chapter discusses recommendation and where to from here.

Chapter 8

Contains the references.

Chapter 9

Appendices are attached in chapter 9.

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CHAPTER 1- BACKGROUND

1.1 Introduction

The Australian Department of Health has described immunization as "the most significant public health initiative in the last 200 years (Australian Government Department of Health, 2019; Polit, 2016). The origins date back to the 17th century China when snake venom was ingested to provide immunity to snake bite. Edward Jenner, a physician, was the first European to employ a process of immunizing against small pox, a disease which was subsequently eradicated worldwide in 1980 (The Immunisation Advisory Centre, 2017). Since then many advances have occurred in the safety and efficacy of vaccines. Recent studies report that inactivated influenza vaccine is both safe and effective for pregnant women (de Martino 2016; McMillan, Porritt, Kralik, Costi, & Marshall, 2015; Zaman et al., 2008). Despite this, and evidence of health gains from immunization, a Western Australian study revealed that resistance to vaccination persists (White, Petersen, & Quinlivan, 2010). Whilst it is not clear what triggers this resistance, evidence suggests that in pregnancy, a mothers' greatest concern is for the welfare of their baby (Maher et al., 2014). Concern for their infants' welfare as well as vaccine safety concerns may contribute to vaccine resistance (White et al., 2010).

Nurses and midwives account for around 50% of the health workforce nationally and have played an important role in health promotion since Florence Nightingale used epidemiology to demonstrate the need for change in both nursing practice and hospital design (Nightingale, 1863). Nightingale's strong foundations, along with strong nurse leadership, have been credited with the critical role nurses play in health promotion, disease prevention and delivering both primary and community healthcare (Novak, 1988; WHO, 2018b). For example, the role of community nurses

in Australia has been described as both holistic and family centred with a strong focus on illness prevention (Madsen, 2013).

Nightingale referred to “inoculation” as early as 1857 in papers read before the National Association for the Promotion of Social Science at Liverpool as part of a Royal Commission on the State of the British Army (Nightingale, 1863). Nightingale is quoted as saying “The only way to make life more real is to relieve human suffering” (Nightingale, 1863). It could be argued that prevention of suffering is equally as valuable as is relief, and immunization is the optimal way to prevent suffering. Nurses have played an important role in health promotion, including immunization and antenatal care for many years. Midwives also play an important role in the provision of antenatal care in the public sector and in South Australia this includes the promotion and provision of antenatal immunization (Nursing and Midwifery Board of Australia, 2019a). However, their role as promoters and providers of antenatal immunization has never been fully investigated in Australia.

Influenza is a highly contagious disease which if acquired in pregnancy can result in significant morbidity and mortality of both pregnant women and their foetus. Morbidity includes severe respiratory infection, congenital abnormalities, spontaneous abortion, premature birth, low birth weight and death in both mother and foetus (Yuen & Tarrant, 2014). Historically, morbidity and mortality of pregnant women from influenza has been high in pandemics. This has been evident in all pandemics, with evidence suggesting that up to 50% of women of childbearing age who have died in pandemics were pregnant (McHugh et al., 2017). Additionally, deaths of pregnant women in both Chicago and Minnesota in 1918 and 1957 respectively, were between 20-27% of the affected population (Rasmussen, Jamieson, & Bresee, 2008). More recently, during the 2009 H1N1 pandemic in New South Wales, 28% of patients admitted to Intensive Care Units were pregnant or immediately post-partum (Carlson, Dalton, Durrheim, & Fejsa, 2010).

The United States of America on the other hand, reported 4,693 pregnancy related deaths between 1998 – 2005. Of these, 78 women died from influenza or pneumonia. (Callaghan, Chu & Jamieson, 2010).

Pregnancy and early infancy are a time of relative immune depression. This is thought to be due to changes in cell mediated immunity combined with physiological changes required to maintain the pregnancy (Adegbola, Nesin, & Wairagkar, 2012; Yuen & Tarrant, 2014; Zaman et al., 2008). Infants are also greatly at risk due to their immature immune system (Marshall, McMillan, Andrews, Macartney, & Edwards, 2016).

Influenza is considered a priority disease by the World Health Organization (WHO, 2018a). In 2012 the World Health Organization released a position statement stating that pregnant women should have the highest priority for seasonal influenza vaccination (WHO, 2012). Maternal immunization in pregnancy can provide dual benefits, by reducing the disease burden for both mother and baby. With a single immunization, two high priority groups (pregnant women and newborns) can be protected from the disease for the influenza season and up to 6 months after birth for the baby (WHO, 2019). A study conducted in Bangladesh showed that a single dose of vaccine provided a two for one benefit for mothers and babies. Influenza vaccination has been shown to be both safe and effective to give at any stage of pregnancy (Adegbola et al., 2012; Zaman et al., 2008). A systematic review of the literature revealed that the vaccine is safe when administered in the second or third trimester and may be justified to administer in the first trimester during a pandemic. There was some evidence to suggest that there are also protective factors against prematurity and stillbirth (McMillan et al., 2015).

Despite this, immunization rates in pregnancy remain low in Australia. Western Australian research has reported statistics as low as 40% (Mak, Regan, Joyce, Gibbs, & Effler, 2015). A more recent Victorian study reports 39% of pregnant women were vaccinated between July 2015 – June 2017 (Rowe, 2019). This poor uptake of the inactivated influenza vaccine is thought to be caused by several factors, ranging from: inaccurate perception of infection severity; low knowledge and the need for further education amongst health professionals; as well as women's lack of knowledge in this area (King, Chow, Leask, & Wiley, 2019; Mak et al., 2015; Rowe et al., 2019).

There is currently no reliable and accurate method of ascertaining the exact numbers of pregnant women who receive influenza immunization. This is despite the introduction of the Australian Immunization Register (AIR) in 2016 (Australian Government Department of Human Services, 2019). The AIR is a lifelong register which has the capacity to provide valuable data. However, the website currently has no ability to record pregnancy state as a reason for immunization. Additionally, there is no legal requirement or obligation for providers to record all immunization encounters. Additionally, whilst some states are collecting antenatal immunization data, this has yet to be included in the Australian pregnancy outcomes databases hence, the data that is available is not yet complete or reliable.

Studies have shown that maternal knowledge of the risks associated with contracting influenza in pregnancy is low. Few women are aware of the dangers of acquiring the disease and, they are unaware of the danger to their unborn child (Wiley, Cooper, Wood & Leask, 2013). Research has demonstrated that a health professionals' recommendation is the single most important influence on the decision to accept or reject an immunization (Wiley et al., 2015). The recommendation of a health professional has been described as fundamentally important and can overcome a mothers concerns about the safety of a vaccine

(Moniz & Beigi, 2014; Wiley et al., 2013). One Australian study which included a small number of midwives (n=6) as well as obstetricians and general practitioners, stated that barriers to immunization uptake can, in some cases, be attributed to the lack of a healthcare providers recommendation (Webb, Street, & Marshall, 2014). To date no Australian studies have fully investigated the role that midwives play in the promotion or provision of influenza immunization in the antenatal period.

1.2 Literature Review

The World Health Organisation Global Advisory Committee into the Safety of Immunization recognises the importance of influenza immunization in pregnancy (WHO, 2017). Additionally, public health guidelines in Australia, Canada, United Kingdom, and the United States promotes influenza vaccination in pregnancy. Despite this and the known safety and efficacy of the vaccine, evidence suggests that the numbers of pregnant women receiving the vaccine in Australia is low with recent statistics reported as low as 39% (Adegbola et al., 2012; Regan et al., 2016; Rowe et al., 2019). The vaccine is provided free for pregnant women and is safe to give at any stage of pregnancy. In Australia, midwives play an important role in antenatal care provision in the public sector, however, there is little documented evidence of the role they play in the promotion and provision of the vaccine. Statistics indicate that there were 2466 practising midwives working in South Australia where the births in 2017 were 19,072 (Australian Bureau of Statistics, 2017; Nursing and Midwifery Board of Australia, 2019b).

The purpose of this chapter is to review the current literature with a focus on the role of midwives in antenatal provision and promotion of the influenza vaccine as well as analyse the enablers and barriers which contribute to vaccine uptake.

The research questions are:

What are the barriers and enablers to midwives promoting and providing antenatal influenza immunization?

What do midwives identify as barriers and enablers to providing antenatal influenza immunization?

How do the qualitative results enhance and explain the quantitative results?

1.3 Article Search and Selection Method

To gain a thorough understanding of the research topic, including the existing literature, a systematic on-line search was conducted. This search focussed on articles published between 2000 and 2018. Additional inclusion criteria were articles published in English, as this researcher speaks only English. There were subsequently no articles found in languages other than English. Initially, the only exclusion criteria applied were studies dated prior to 2000 and articles which were not peer reviewed. Key words for the initial search were *immunization, *midwives and *antenatal and included all variations thereof in the Boolean phrases. Data bases searched were CINAHL, SCOPUS, MEDLINE (via OVID), and Johanna Briggs. Combining the initial key words resulted in multiple hits, many of which were for vaccines other than influenza. The terms “healthcare provider” or “healthcare professional” featured often, however these studies rarely included midwives in the study. A further refinement of adding the key word *influenza, with the other search terms narrowed and focussed the search, resulting in a much more manageable and appropriate result. The articles located included both primary and secondary source articles and represented most of the search criteria, however, few

articles included midwives. Over the course of two years the search was updated on six occasions. The search strategy is represented below in Table 1.

TABLE 1 – LITERATURE SEARCH STATEGY

CRITERION	**DETAIL**
Search Terms	Immunization AND Antenatal AND Midwives AND Influenza
Language	English only
Timeframe	2000 – October 2019
Databases	SCOPUS, CINAHL, OVID and Johanna Briggs.
Inclusion Criteria	Primary source articles

The search for articles with a focus on the role of midwives proved to be challenging with few useful primary or secondary source articles located. A further manual search of reference lists was also conducted which resulted in several related articles. Of the 88 articles discovered, only 15 have been included in this review and these are summarised at Appendix 3, the PRISMA diagram is attached at Appendix 1 and the Inclusion/exclusion chart is attached at Appendix 2. Exclusion criteria for these articles included the purpose of the study, for example if the study was a literature review it was excluded from the study, however the reference list was thoroughly searched for additional primary source articles. Some of the articles excluded, focussed on childhood immunization rather than antenatal immunization, or the safety and efficacy of the vaccine. Some studies focussed on birth outcomes of mother infant pairs, but few addressed the role of midwives. Ten articles were excluded for this reason. Of the articles selected, only two directly included midwives in their study. Two focussed on General Practitioners and Obstetricians, three studied healthcare workers in general and seven articles involved research

from pregnant or postpartum women's perspective. These articles were included as they addressed at least one or more of the study objectives, were recent publications and provided insight into the background research (See Appendix 4). One recent article included a midwife led immunization program in an Adelaide hospital and was included for this reason.

1.4 Analysis of the studies

The 15 articles included in the review are all primary source articles and encompass twelve quantitative, three qualitative and one mixed methods study. One study used a combination of in-depth interviews and telephone survey however was multi-method rather than mixed methods and only the qualitative aspects were fully discussed in the article (n=815 and n=20) (Wiley et al., 2015). Most of the quantitative studies were surveys however, one was an intervention study (McCarthy, Pollock, Nolan, Hay & McDonald, 2012). One of the qualitative studies used grounded theory to underpin it, whereas the others were qualitative descriptive studies (Wiley et al., 2015). The mixed methods study (n=53 and n=7)) used a combination of cross-sectional survey and yarning circles (focus groups) as well as supplementing additional data from the Australian FluMum study (O'Grady et al., 2014). The aim of this study was to systematically monitor the uptake of influenza vaccine in Australia. The qualitative aspect of this study had a focus on the Aboriginal community in Queensland. These results were supported by quantitative data obtained from a five years prospective cohort of 10,106 mother infant pairs across six sites in Australia. The most recent study was conducted at a local South Australian Hospital and utilised a midwife delivered immunization program to estimate maternal vaccine uptake (n=180) (Mohammed, Clarke, Koehler, Watson & Marshall, 2018). This study was able to increase influenza uptake to 76% by educating and using midwife immunizers, however the aim of this study was purely to estimate vaccine uptake and not to investigate midwife roles.

All studies were critically appraised using the appraisal tool relevant to their methodology. The qualitative and quantitative articles were appraised using the Critical Appraisal Skills Programme (CASP) tools (CASP, 2002) (see Appendix 2).The mixed methods study was appraised using guidelines by Creswell (Creswell, 2015) (See Appendix 5) as well as the tool developed by University of Salford (Long, 2005) (see Appendix 6). Identified weaknesses of the articles included small sample size, selection and recall bias. One study included non-medical staff in the sample whilst providing no rationale for doing so, thereby misrepresenting the sample size (n=423) (Tuckerman, Collins, & Marshall, 2015). Another study was unable to calculate response rate. This was because dissemination of the survey was via social media; hence response rate could not be determined (n=266) (Ishola, Permalloo, Cordery & Anderson, 2013). Additionally, some ethical weakness was apparent in this study due to one of the methods used. The survey was disseminated to the midwives by senior staff members. This may have been a conflict of interest and resulted in undue pressure on staff to complete the survey, however the article was included in this study as it is one of only two articles found with a midwifery focus. Several articles included no discussion of ethics approval (Ishola et al., 2013; Maher et al., 2014). Additionally, issues of consent, confidentiality and researcher bias were under addressed in general. Despite these issues all fifteen studies were included in this review because they addressed key issues which are pertinent to the current literature and provided direction for the development of the methodology for this study.

1.5 Presentation of the Findings

To sort the literature and gain a broader understanding of the topic, a key word thematic analysis of the articles was conducted. This was done by reading and re-reading transcripts, seeking common themes and breaking them down into sub levels (Appendix 16). According to Thorne (2016) both the use of manual methods of data management as well as the use of software, are equally acceptable. In this

case the amount of data was manageable and a manual approach to conducting a thematic analysis was adopted. Four major themes were revealed which included: 1.5. i. Healthcare providers knowledge and the need for education; 1.5. ii. Women's knowledge of the risks associated with influenza; 1.5. iii. Personal immunization amongst healthcare workers and its impact on immunization practise and 1.5. iv. The importance of healthcare providers recommendation. (see Appendix 5).

1.5.i. Knowledge and the need for further education

Many of the studies explored the knowledge, attitudes, beliefs, and practices of healthcare professionals in relation to both promotion and provision of influenza immunization in pregnancy (Maertens, Braeckman, Top, Van Damme & Leuridan et al, 2016; Tong, Biringer, Ofner-Agostini, Upshur, & McGeer, 2008; Vishram et al., 2018). Most of these studies have revealed that healthcare professionals have a poor understanding of the risks of influenza to pregnant women. In addition, studies have revealed a poor knowledge of immunization requirements and have demonstrated an elevated anxiety about the risks of giving the vaccine in pregnancy. A multicentre study in Belgium (n=823) discovered that only 23% of midwives recommended the influenza vaccine (Maertens et al., 2016). However, low knowledge is not confined to midwives. Broughton, Beigi, Switzer, Raker & Anderson (2009) (n=267) described the knowledge of healthcare professionals in the United States as misinformed or inadequate. This study describes a direct correlation between provider knowledge and their ability to discuss or appropriately recommend vaccinations (Broughton et al., 2009). These results are supported by an Australian study of general practitioners in Central and South Western Sydney. Maher et al. (2014) (n=17), described the general practitioners as having poor understanding of the risk perception of influenza infection in pregnancy. This study also states that antenatal care providers are more likely to recommend the influenza vaccine if they have a thorough understanding of the risks of influenza in pregnancy and the benefits of the vaccine to mother and baby. The

poor results of this study came after strategies were put in place to improve general practitioner awareness of the requirement to vaccinate all pregnant women for influenza. The strategies were ineffective; however, the article was included as it is an Australian study and demonstrates the lack of immunization knowledge of the health professionals involved. (Maher et al., 2014). These results were supported by the 2008 Canadian study which surveyed maternity care providers knowledge attitudes and behaviours towards antenatal Influenza vaccination (Tong et al., 2008) (n= 671). Those surveyed included obstetricians and family physicians; however, midwives were not included in this study. The rationale for this was that midwives attend less than 5% of births in Canada (Tong et al., 2008). Results indicated serious knowledge deficits (Tong et al., 2008). However, a Brisbane based study (McCarthy et al., 2012), which utilised an education intervention, was able to demonstrate that knowledge of healthcare professionals and hence, immunization rates, can be improved by education. This study (n=199) reported that midwife recommendations increased significantly after education (McCarthy et al., 2012). A more recent study which utilised a midwifery led immunization program (n=205) has demonstrated that antenatal influenza uptake can be increased to 76% by educating midwives (Mohammed et al., 2018).

One study recommended educating midwives on vaccine provision regardless of their role and stressed the need for consistent messages from healthcare workers to further improve immunization rates (Maertens et al., 2016). These studies and others that included healthcare professionals as the focus, found knowledge deficits and the need for education to be an issue. Additionally, the mixed methods study of Aboriginal and Torrens Strait Islander women reported that there is a need for accurate and timely information from health practitioners (O'Grady et al., 2015). This theme is consistent across all included studies, but most significant amongst Aboriginal and Torres Strait Islander communities, who have higher rates of morbidity and the least healthcare support (O'Grady et al., 2015). A South Australian study (Tuckerman et. al., 2015) (n=423) conducted in a large tertiary level

birthing hospital in Adelaide, revealed that healthcare professionals in general have poor knowledge of vaccination requirements. Of those surveyed, only 9.8% could identify the recommended vaccines for healthcare workers. The aim of the study was to assess factors that influence personal immunization uptake amongst healthcare workers. However, the researcher argued that the lack of knowledge and poor uptake of personal immunizations could demonstrate poor knowledge and practice across all areas of immunization. It has become clear from evaluating the literature that healthcare professionals in general, and potentially midwives specifically, have poor knowledge of immunization requirements both for pregnant women and for themselves and the importance of education is in this area is clear.

1.5. ii. Women's Understanding of the risks associated with influenza

It is well accepted that influenza acquired in pregnancy can have serious effects on both mother and baby (Adegbola et.al., 2012; O'Grady et al., 2014). A South Australian study (Collins et al., 2014) reported that most women surveyed were unaware of the risks associated with acquiring influenza in pregnancy. Collins et al. (2014) used the health belief model to gain an in-depth understanding of the decision-making processes in relation to accepting immunizations in pregnancy. This study reported that pregnant women rely on their healthcare professionals' recommendations regarding immunization (Collins et al., 2014). The results from this study were supported by another Australian study which found that pregnant women were concerned about the risks of accepting immunization in pregnancy but would follow their healthcare professional's recommendation (Wiley et al., 2013) (n=815). A qualitative study (Wiley et.al., 2015) used the reproductive citizenship model to explore women's perceptions of influenza immunization in pregnancy. This model was first used by Lupton (Lupton, 2012) and Salmon (Salmon, 2011) and provided a framework for including immunization in the lived pregnancy experience. This study reported that women are largely unaware of the risks to themselves or their baby associated with influenza. It stressed the importance of further educating women about the risks of the disease and the benefits of the

vaccine. Additionally, this study also stressed the importance of consistent advice amongst healthcare professionals (Wiley et al., 2015). A study of Aboriginal and Torrens Strait Islander women (O'Grady et al., 2015) (n=53) found that less than 47% of the study population had been offered the vaccine in pregnancy. This study revealed that inadequate information about the benefits of the vaccine was provided and stressed the need for accurate and timely information from healthcare professionals to allow women to make an educated decision about the vaccine (O'Grady et al., 2015). This was supported by a Western Australian study of pregnant women (n=1238) which stressed the importance of timely recommendations to women as well as the need to provide the vaccine at the time of recommendation, which is an enabler to the provision of the vaccine (Mak et al., 2015).

1.5. iii. Personal immunization status and its effect on immunization practise.

Three studies addressed the level of personal immunization knowledge amongst healthcare professionals with one study recognising its influence on the ability to recommend and provide immunization. The study by Ishola et. al. (2013) (n=266) focussed on English midwives' personal immunization uptake and their views on the policy of providing influenza vaccination to all pregnant women. This study described the need for further information and training of midwives. It revealed that significantly more midwives were prepared to recommend the vaccination (76%) than provide it (33%). Ishola et.al. (2013) found that whilst only 43% received the influenza vaccination, 76% of midwives agreed with the recommendations. Moreover, only 25% of midwives surveyed felt adequately prepared to recommend the influenza vaccination. This researcher indicates that English midwives would benefit from immunization education, however, did not find a clear link between personal immunization status and professional practice (Ishola et al., 2013). However, a more recent English study (Vishram et.al., 2017) (n=2393) which included midwives, practise nurses and health visitors found that workers who

received influenza vaccines were more likely to recommend the vaccine. This study also found that those who received training in immunization had greater confidence in recommending vaccines. Whilst this study reported that 63% of overall respondents had received the seasonal influenza vaccine, midwives demonstrated the lowest uptake at 58%. This study also revealed that 62% of midwives had not received training on vaccinations in pregnancy (Vishram et al. 2018). A local South Australian study by Tuckerman et. al., (2015) (n=423) demonstrated that healthcare workers in Adelaide have poor knowledge of vaccination requirements, with only 16% of healthcare workers surveyed being fully immunized. This study also reported that healthcare workers continued to work despite having flu-like symptoms. Whilst this study demonstrates low knowledge amongst the study population, it does not draw a link between personal immunization status and practise recommendations or describe its impact on vaccine uptake. This is arguably an area which needs further investigation.

1.5. iv. Importance of Healthcare provider recommendation

All studies included in this review have recognised the importance of healthcare professionals' recommendation for the uptake of antenatal influenza vaccine. International studies by Broughton et. al., (2009) (n=267) and Tong et. al., (2008) (n=671), as well as Australian studies have demonstrated the importance of timely and consistent recommendations by healthcare professionals (Mak et al., 2015; McCarthy et al., 2012; Mohammed et al., 2018). Because women have been shown to have little knowledge of the risks of influenza acquired in pregnancy, a recommendation by a healthcare professional is vital in the decision-making process (Wiley et al., 2015). A recent study conducted in Western Australia by Regan et.al. (2016) (n=1148) revealed that only 35.5% of pregnant women surveyed had received the seasonal influenza vaccination. This study stated that women receiving care in a public hospital or General Practice setting were least likely to receive the vaccine. It stressed the need for additional immunization education as well as the

importance of timely recommendation being vital to the uptake of vaccination (Regan et al., 2016). Vaccinated women reported that their main reasons for being vaccinated were wanting to protect their baby from infection (Mak et al., 2015). Hence, a timely and professional recommendation combined ideally, with the provision of the vaccine at the time of the recommendation is optimal. This study also found that to optimise maternal and infant health outcomes the recommendation and delivery of influenza vaccine must be incorporated into routine care. This recommendation has now been accepted and Influenza immunization, along with other antenatal immunizations, has been included in the South Australian Pregnancy Record (see Appendix 17). The study by Mohammed et al. (2018) demonstrated a significant increase in influenza and pertussis uptake in one large public sector hospital in South Australia when utilising a midwife delivered immunization program. However, it is yet to be determined if the numbers of women receiving the influenza vaccine has increased overall.

1.6 Discussion

Whilst the role of midwives in the provision of antenatal care in the public sector in Australia is significant, the findings suggest that there is a clear lack of evidence in the literature describing midwives' contribution to antenatal influenza promotion and provision. Their role is under researched and to this researchers' knowledge, contemporary Australian studies have failed to fully address this. Education of healthcare professionals has been shown to improve the promotion of vaccination and subsequently the uptake of immunization (McCarthy et al., 2012; Mohammed et al., 2018). International studies which included or focussed on midwives have demonstrated a lack of knowledge and this impacts on their ability to recommend influenza immunization (Ishola et al., 2013). These findings are consistent globally and midwives were reported as feeling unprepared for the role of immunization education and demonstrated resistance to take on the role of immunisation

provision. However, many of the midwives surveyed agreed that the vaccine should be recommended (Vishram et al., 2017). A search of the literature has clearly demonstrated a need for immunization education for all health professionals, including midwives. Additionally, the personal immunization status of healthcare professionals has been demonstrated to correlate with the recommendations they give (Vishram et al., 2017). The literature describes poor knowledge amongst healthcare professionals in general which has the potential to seriously impact on practise. There is also evidence to suggest that pregnant women have little knowledge of the risk of influenza acquired in pregnancy to both themselves and their baby and midwives are well placed to provide this education (Collins et al., 2014). It is also clear that immunization is more readily accepted when offered at the time of recommendation (Mak et al., 2015). Additionally, the literature clearly demonstrates that the single most important factor in the uptake of influenza immunization by pregnant women is a recommendation by their healthcare professional and in the Australian public sector, this is likely to be a midwife (Broughton et al., 2009).

1.7 Limitations

There are several limitations to this review of the literature. This includes the paucity of literature which addressed the role of midwives in the promotion and provision of antenatal influenza immunization. For this reason, the researcher was required to take a broader view on the subject. This included the effect of personal immunization status on the promotion of influenza immunization and the importance of a healthcare providers recommendation. Additionally, the availability of published literature and accessibility to unpublished research has been a limitation. No Australian studies with a focus on midwives were found and only two international studies which focussed on midwives were located.

1.8 Conclusion

The role of midwives in the promotion and provision of antenatal influenza immunization is an under researched topic. This is an important area of antenatal care and there is a need for quality research on the role of midwives and the area. What is clear from the literature is that healthcare professional's recommendation, including midwives', have been shown to be a predictor in the uptake of the vaccine. Additionally, personal immunization status has been shown to impact on a healthcare professionals' decision to recommend appropriate immunizations. Many studies recognized the need for further education of healthcare professionals. With the lack of knowledge amongst pregnant women of the risks of influenza acquired in pregnancy, this education seems vital. Midwives are well placed in the public sector to provide that education. Given the importance of immunization as a public health initiative, and the paucity of research in the literature addressing the role of midwives, it is evident that more research on the role of midwives in the promotion and provision of antenatal influenza immunization is required.

CHAPTER 2: RESEARCH PARADIGM

2.1 Research Paradigm

The purpose of this chapter is to introduce the research paradigm that will underpin this study. This will include the epistemological underpinnings, as well as the methodological process. A mixed methods approach was undertaken for this study, with both quantitative and qualitative data being included. Mixed methods research is an emerging methodology that challenges the concept that research should remain within one of the two primary paradigms; qualitative or quantitative. Quantitative research has traditionally been thought of as a study which utilises precise measurement and quantification of the results, whereas qualitative research is thought to focus on experiences, attitudes and beliefs in a social context (Polit, 2016; Waller, 2016). Up until recently there has been a tendency to focus on the differences rather than the similarities (Onwuegbuzie & Leech, 2005). However, many similarities also exist and some mixed methods proponents go as far as claiming that mono method research is a major threat to the advancement of the social sciences (Onwuegbuzie, 2014; Onwuegbuzie & Leech, 2005).

This use of mixed methods is an approach which is a growing trend in both behavioural and social sciences and is thought to provide a better understanding of the research problem than if either of the major paradigms were employed independently (Tashakkori & Teddlie, 2010). Mixed methods research has been described as the third methodological movement (Johnson & Onwuegbuzie, 2016). Onwuegbuzie (2012, p.194) advocates that mixed methods researchers “move towards the radical middle”, in order to construct the third space in which qualitative and quantitative research traditions intersect (Gutierrez, Baquedano-Lopez, & Turner, 1997). The third space referred to by Onwuegbuzie (2012) is a virtual intersection of both major paradigms wherein multiple methodologies can

coexist to achieve good and rigorous research from either major paradigm. A mixed methods approach, which uses a combination of both worldviews, incorporating statistical trends with thematic analysis, is thought to result in a collective strength of understanding (Creswell, 2015b). Mixed methods research takes neither a constructivist nor a post-positivist world view independently but adopts an epistemology which works and fully investigates meaning. The ontology that drives this form of research is a belief that reality is constantly renegotiated (Teddlie, 2009).

This study took a pragmatic approach and used a convergent parallel design (Schneider 2013). This design collects both qualitative and quantitative data simultaneously and analyses the results independently. The results are then merged to produce inferences and as such a form of triangulation of results occurs. These inferences are presented in the discussion (Creswell, 2015a). The underlying assumption of this design is that both data collection methods produce different types of data but once combined the overall results confirm and complement the overall results (Creswell, 2014).

2.2 Study Design

The aim of this study was to provide a statistical and thematic description of the barriers and enablers to midwives promoting and providing antenatal influenza immunisation. By taking a pragmatic approach and adopting a mixed methods design, this study obtained two different perspectives, one drawn from cross sectional closed ended survey response data and one from open ended semi-structured interviews, thereby providing methodological triangulation and a broader understanding of the topic (Onwuegbuzie & Leech, 2005; Schneider, 2013). The results of these separate data sources are presented separately in Chapters 4

and Chapter 5. These results are combined and discussed, and inferences drawn and presented in the Chapter 6.

2.3 Limitations

Limitations of the mixed method approach include its time consuming and complex nature (Schneider, 2013). Additionally, a further limitation to mixed method design is the way the research community perceives it. Mixed methods inquiry is a relatively new approach which has been described as having an evolving place in the research community (Schneider, 2013). This limitation was addressed by using multiple sampling approaches. However, this can be viewed by some researchers as a further limitation. Some researchers argue that one paradigm may interfere with the design of the other, thereby affecting overall rigor (Schneider, 2013). However, in this study both qualitative and quantitative aspects were designed and conducted separately, with the final mixed methods inferences taking place after all data analysis were conducted. Convenience sampling is known to produce biased data however, due to the limited population of midwives employed in South Australia, is considered an acceptable risk. Data obtained in surveys can also lack depth however, the qualitative data provided a balanced view (Schneider, 2013).

2.4 Research Questions

The research questions are listed in Chapter 1 but include the following mixed methods question:

"How do the qualitative results confirm and enhance the quantitative results?"

The research objectives were:

To explore the enablers and barriers midwives encounter in the provision of Antenatal Influenza Vaccine.

To explore the role that midwives play in the provision of Antenatal Influenza Vaccine.

To explore the attitudes, behaviours, and practises of midwives in the promotion and provision of Antenatal Influenza Vaccine.

To explore whether midwives' personal immunization values influence their practises.

To explore if midwives feel adequately informed to discuss immunization issues.

2.5 Methodology

This study took the form of a mixed methods design incorporating both Quantitative and Qualitative approach (Creswell 2015). This incorporated an online survey via qualtrics[XM] and in-depth, semi structured face to face interviews

(Qualtrics, 2019). The quantitative study took the form of an observational descriptive cross-sectional design utilising convenience sampling to measure the attitudes, knowledge and practises of midwives working predominantly in South Australia (Polit, 2016; Waller, 2016). The qualitative study took the form of an interpretive descriptive design drawing on the nursing disciplinary framework to underpin it (Thorne, 2016). This methodology has been described as the methodology of choice when straight description is required and grew from a need to generate applied qualitative research, to gain an understanding that would be useful to the practice of nursing. Its' focus is on description, which is the aim of this study. It also draws on and values a nursing framework other than one derived from philosophy or sociology which appeals to this nurse researcher (Thorne, 2016). The interpretive descriptive approach has been described as unfettered by theoretical baggage, unlike other more prescriptive approaches. Thorne (2016) describes this approach as pragmatic and an appropriate philosophical partner in a mixed methods approach.

This study is the first Australian study to evaluate the role and contribution of midwives in the promotion and provision of antenatal influenza immunization. For this reason, mixed methods research was considered the most appropriate approach to take. The basic assumption of this research method is that both quantitative and qualitative data produce different types of information and by merging the two data sets, inferences can be drawn to better explain the research problem (Creswell, 2014) (See Appendix 10).

There are clear advantages and limitations to both major paradigms. The quantitative paradigm, or postpositivist worldview is often referred to as the scientific approach however, cross sectional studies are not seen as a true experimental research. This approach provides objective data which can be expressed in numbers and can produce statistical significance. However, it will not

provide a full understanding of the context or why these numbers are what they are (Creswell, 2014). It does not provide a natural setting and requires large numbers for significance (Polit, 2016). A further limitation of cross-sectional studies is that it can only provide weak evidence of causality due to the limited time frame in which an investigation takes place.

The qualitative paradigm or constructivist worldview aims to explore and understand the meaning individuals or groups find in human problems. This paradigm will produce insight and understanding of the problem but is subjective and cannot be generalized (Polit, 2016). A limitation of the qualitative component of the study is that interpretive descriptive methodology is perceived by some researchers as a lower level form of inquiry (Sandelowski, 2000). This could be because interpretive description seeks knowledge about human subjective experience within the context of applied disciplinary knowledge, in this case nursing and midwifery, and without the constraints of more theoretical approaches which have been grounded in the social sciences (Thorne, 2016). This study has instead used a combination of both worldviews, incorporating statistical trends with thematic analysis which may result in a collective strength of understanding (Creswell, 2015). Additionally, by using this approach an opportunity for data triangulation exists, thereby enhancing overall study rigor (Teddlie, 2009).

CHAPTER 3: RESEARCH DESIGN

3.1 Setting

The purpose of this chapter is to describe the setting, sample, survey design and interview techniques used as a bases for the qualitative phase. This chapter will highlight inclusion and exclusion criteria. It will also discuss rigour and trustworthiness of the data as well as data management methods and ethical considerations.

Four sites were chosen as the setting for this study. Two major birthing hospitals in the metropolitan area of Adelaide and two smaller hospitals from suburban and regional areas were selected to ensure geographical and socio-economic diversity. The sites chosen were Flinders Medical Centre in the south and the Lyell McEwan Hospital in the north of Adelaide metropolitan area. Additionally, Mount Barker District Soldiers Memorial Hospital, located in the Adelaide Hills and Murray Bridge Soldiers Memorial Hospital, located in the Murray Mallee Region east of Adelaide were selected. These hospitals are birthing hospitals and were selected to provide diversity of hospital size, population, and geographical diversity. The annual births from the sampled hospitals combined was 8000 in 2018 which made up approximately 40% of South Australian annual birth rate which was 19,765 in 2017 (ABS, 2017). The survey was also made available to midwives via paid advertisements in the Australian Council of Midwives Newsletter. Additionally, it was promoted through the South Australian Child and Family Health Nurses (SACAFNA) website. A paid advertisement on social media (Facebook) was also used to enhance the population surveyed and provide further diversity of midwives (see Appendix 13). As there could be no control over the employment location of midwives completing the survey accessed via the social media post, further diversity of sample was achieved.

3.2 Sample

This study utilised convenience sampling to obtain midwives who were predominantly employed in the target hospitals in the public sector. This sampling method may compromise external validity; however, this effect was moderated by using multiple sources and using triangulation of method to enhance credibility. The numbers surveyed via the selected hospitals were then supplemented by advertisements and online through social media. These sampling methods are useful because they provide access to participants with desirable attributes, i.e. midwives with experience in all areas of midwifery (Waller, 2016). However, whilst this method is known to produce a biased sample in a quantitative study as those participating may be atypical of the population, in this case, there were few options for accessing large numbers of midwives. The population of midwives working in in South Australia is small (n=2411), and by using multiple sampling method, midwives were recruited across demographic locations and with different interests, specialities and skills, professionally and personally (AHPRA, 2018).

The primary sampling method used for this study was via email to midwives working in the selected hospitals. Emails were sent to midwives with a link to the survey which was disseminated via Qualtrics (See Appendix 8). Completion of the survey was entirely voluntary, and confidentiality and anonymity were assured. No identifying features were included in the survey. Secondary sampling was obtained via advertisements in both the South Australian Child and Family Health Nurses Association (SACAFNA) newsletter, and via social media. This proved to be the most successful sampling method and resulted in a significant increase in surveys completed. Additionally, this method of dissemination also produced several volunteers for participation in the qualitative aspect of the study. Posters advertising the study and with a link to survey were placed in all included venues and in the Flinders University teaching area throughout the data collection phase (See Appendix 14).

The final sampling method was via the final question on the survey. Midwives who were interested in participating in the Qualitative study were requested to provide their first name and a contact phone number to enable contact. These midwives were contacted, and a time and place of their choosing was arranged via SMS (short message system) to conduct the face to face interviews. Data saturation was employed, and no further interviews were conducted at the point. Data saturation was reached when no new data was obtained in subsequent interviews. This component of the study utilised semi-structured interviews and aimed to interview subjects who were articulate and information rich (Polit, 2016).

3.3 Survey

The survey included 30 questions, the first five questions were demographical in nature and included area of employment and years of experience. The remaining 25 were multi-choice based on a five-point Likert scale (Polit, 2016). The survey design was modelled on questions used previously by international researchers in similar studies and were modified for inclusion in an Australian study and to incorporate recent changes to immunization provision (Tong et al., 2008; Ishola et al., 2013; Maertens et al., 2016). Closed ended questions were used which focused on professional practise, knowledge of immunization, personal immunization choices and attitudes to immunization with a midwifery focus. Questions were expressed in a clear and concise manner and the survey was evaluated by peers prior to submission for ethics approval. This evaluation was done by disseminating the survey to six midwife peers who were not included in the study and took place between February to March 2018. These midwives were employed across a range of hospital, tertiary and community health settings. Their feedback was sought regarding readability, clarity and simplicity. No difficulties were reported, and any feedback received was incorporated into the final instrument prior to dissemination.

3.4 Ethics

Ethics approval was obtained through the Women's and Children's Health Network Human Research Ethics Committee. (See Appendix 11). This study was deemed low or negligible risk and was approved on the 23rd July 2018. Site specific approval was sought, and approval received from all three Regional Research Governance offices and survey dissemination commenced at Mount Barker Soldiers Memorial Hospital and Murray Bridge Hospital on 22nd August 2018. Lyell McEwin Hospital followed shortly after and Flinders medical centre commenced dissemination the 25th January 2019.

Signed informed consent forms were obtained from those volunteers participating in the qualitative aspect of the study. The Information Sheet and Consent form is attached. (See Appendix 10). As the Quantitative aspect of this study was a survey, participation was entirely voluntary and considered minimal risk. As such no consent form was required as completion of the survey was considered implied consent.

3.5 Survey Validation

Once ethics approval was obtained the survey was validated on 12 midwives. The survey was presented to these midwives on two separate occasions. This test-retest process was utilised to ensure reliability of the survey. Responders reported no issues with comprehension of the survey. Whilst the second responses varied in some cases from the first, this was thought to be for several reasons. In some cases, completion of the survey may have elicited a desire for more knowledge. In other cases, responders may change their opinions as a result of completing the survey, or

they may become tired or bored on the second occasion, resulting in more haphazard responses. All these things contribute to a slight variation in responses. On completion of the test-retest process, Cohens' Kappa coefficient was calculated. Cohens Kappa is a statistical test which assesses consistency of survey results. By comparing both the test and the retest results interrater reliability can be calculated. In this case a score of K=0.804 was obtained which is considered an excellent result, and denotes an acceptable level of agreement, thereby confirming the reliability of the survey (Polit, 2016).

3.6 Inclusion/Exclusion Criteria

Inclusion criteria required that the participants be midwives registered with the Australian Health Practitioners Regulation Agency (AHPRA, 2018). No specific exclusion criteria were applied; however, the first question of the survey was to determine whether the participant was a Registered Midwife. If the respondent answered "no" that survey was excluded from analysis. The decision to include midwives working in all areas in the study was taken for two reasons. Firstly, to ensure justice by not limiting access to the study. Secondly, because midwives working in all fields of midwifery practise have the ability to influence the choices of their clients, friends and family, additionally, their opinions were valued and hence, no exclusion criteria were applied.

3.7 Analysis – Quantitative

An acceptable level of response to an internal survey is around 30% and to an external survey between 10-15% (Polit, 2016). In this case the survey response rate could not be calculated as the number of midwives receiving the survey or having access to it via traditional and social media was unknown. Despite this, the total

number of surveys completed represented 5.5% of the midwifery population in South Australia. This combined with the diversity of the sample suggests that the survey achieved an appropriate response from midwives.

3.8 Statistical Analysis

Statistical analysis of the survey data was performed using SPSS (Statistical Package for the Social Science) V25. Pearson's Chi squared tests (χ^2) were used to determine categorical variables of interest. In order to run Pearson's Chi Squared (χ^2), all assumptions were checked for frequency. Results were considered significant if a two-tailed *p* value was less than p=0.05. Chi squared (χ^2) was performed on the following independent variables of interest:

- A comparison of knowledge between Registered Midwives and Registered Nurse/Midwives;
- A comparison of formal immunization training and immunization knowledge;
- A comparison of demonstrated knowledge between experienced and inexperienced practitioners;
- A comparison of midwives with less than 5 years' experience and knowledge; and
- A comparison of personal immunization status and its effect on immunization knowledge and practise.

3.9 Qualitative Data

Open ended questions presented in semi structured interviews defined the broad areas to be explored but allowed flexibility for participants to elaborate on aspects important to them and provide a deeper understanding of the phenomena. The interviews were 30 minutes in duration and were digitally recorded by the researcher and transcribed verbatim. Data was then sorted into codes and

categories and analysed to identify themes. This was an iterative process and took place simultaneously with data collection. Saturation was employed to ensure that sampling ceased at the point when no new information was obtained. Ten midwives in total volunteered to be interviewed and at completion of the study, transcripts were returned to the participants for member checking and to confirm accuracy of the data. Whilst no written feedback was received from the midwives, a follow up text message was sent to all participants. None of the midwives indicated any inaccuracies in the transcription.

3.10 Rigor and Trustworthiness

There are many approaches to ensuring rigor or trustworthiness in a study. Qualitative researchers utilise frameworks to achieve this. This study has employed the framework of Thorne (Thorne, Stephens & Truent, 2016), which includes triangulation, a careful audit trail, concurrent collection, coding, and analysis of data. Additionally, by employing data saturation, credibility and trustworthiness can be enhanced (Polit, 2016). There are many considerations to ensuring rigor in a quantitative study. Despite the potential bias associated with convenience sampling, an adequate sample size from a variety of sources, optimized the reliability of the data. By achieving a representative sample, the results could be replicated and therefore external validity achieved. The survey instrument has face validity and has been validated prior to the commencement of data collection achieving K = 0.804. Additionally, the use of Pearson's Chi squared (χ^2) to examine associations between categorical variables of interest adds statistical conclusion validity (Polit, 2016).

The integrative framework for inference quality and inference transferability, proposed by Teddlie (2009) was applied to guide this mixed methods study.

Inference quality and inference transferability are terms used to describe internal validity, statistical conclusion validity, credibility, external validity, and transferability. This can be supported by using a survey instrument which rules out any other alternative plausible explanation (Teddlie, 2009). Additionally, inference transferability can be achieved by obtaining a representative sample. The methodological triangulation obtained using the mixed methods design also supports rigor. Onwuegbuzie and Corrigan (2014) itemise a twelve-point framework for rigor in mixed methods studies which was used to guide this research.

3.11 Data Management

Survey data received was stored under password protection on the Flinders University supported Qualtrics website (Qualtrics, 2019). Only the Principal Investigator had access to this password. Qualitative data in the form of interview transcriptions and voice recordings were stored securely in a locked filing cabinet in a locked room. This data will be stored for 15 years at Flinders University as required by research document storage guidelines. All identifying information was removed soon after the interview and pseudonyms were applied to ensure privacy and anonymity of those midwives participating. Subsequently, transcriptions were secured under password protection (Flinders University, 2019).

CHAPTER 4 – RESULTS - QUANTITATIVE

4.1 Introduction

A convergent parallel design was used in this study, hence the qualitative results are to be used to support and enhance interpretation of the quantitative results (Creswell, 2015b). For this reason, the qualitative and quantitative results will be displayed separately but merged in the discussion.

A total of 137 midwives took part in the anonymous cross-sectional survey. The survey evaluated midwives' attitudes and knowledge of influenza immunization and the disease acquired in pregnancy. Additionally, the impact of both the vaccine and the disease when acquired in pregnancy were assessed. The survey (see Appendix 7) also investigated the midwife's personal immunization status and their opinions about workplace immunizations. Most significantly the survey explored midwives understanding of their role in the promotion and provision of antenatal influenza immunization. Signed consent was not required as completion of the survey was voluntary and by completing the survey, implied consent was achieved. Completed surveys were stored on Qualtrics under password protection. Included in the survey were: five demographic questions; 12 questions assessing immunization knowledge; and 13 questions assessing behaviour and professional practise.

4.2 Survey Results

The demographic questions included variables such as whether the Registered Midwife was also a Registered Nurse, years of clinical practise, whether they were

employed in the public or private sector, their current workplace and whether they had received any formal immunization training. The knowledge questions evaluated: understanding of the safety and efficacy of the influenza vaccine; the effects of influenza when acquired in pregnancy to both mother and foetus; and knowledge of healthcare worker immunization requirements. The behaviour and professional practise questions evaluated: whether midwives had any concerns about the influenza vaccine; what they considered to be their role in the promotion and/or provision of the vaccine; whether they believed midwives were sufficiently trained to provide the vaccine. They were also asked about their understanding of what workplace immunizations were required and whether they were fully immunized in accordance with those requirements.

4.2 Demographic results

Of the 137 participants surveys included in data analysis, 64.71% were Registered Nurse/Midwives and 35.29% were Registered Midwives only. Of these midwives, 71.85% were employed within the South Australian public sector with 28.15% employed in the private sector. Most of midwives (n=60) completing the survey had over fifteen years' experience in the role of a midwife (45.45%). Those having worked under five years were the next most prevalent group (n=39) 29.55%, with 15.15% midwives working between 5-9 years (n=20) and 9.85% between 10-14 years (n=13). Five midwives did not answer this question.

The primary areas of practise ranged from general midwifery across all areas in a hospital setting, to community and tertiary settings (see Figure 1). Some midwives worked across more than one area in a hospital setting, whilst others were employed in more than one workplace, hence this data represents greater than 100%.

Figure 1 is a visual representation of the primary practise areas of the midwives that completed the survey.

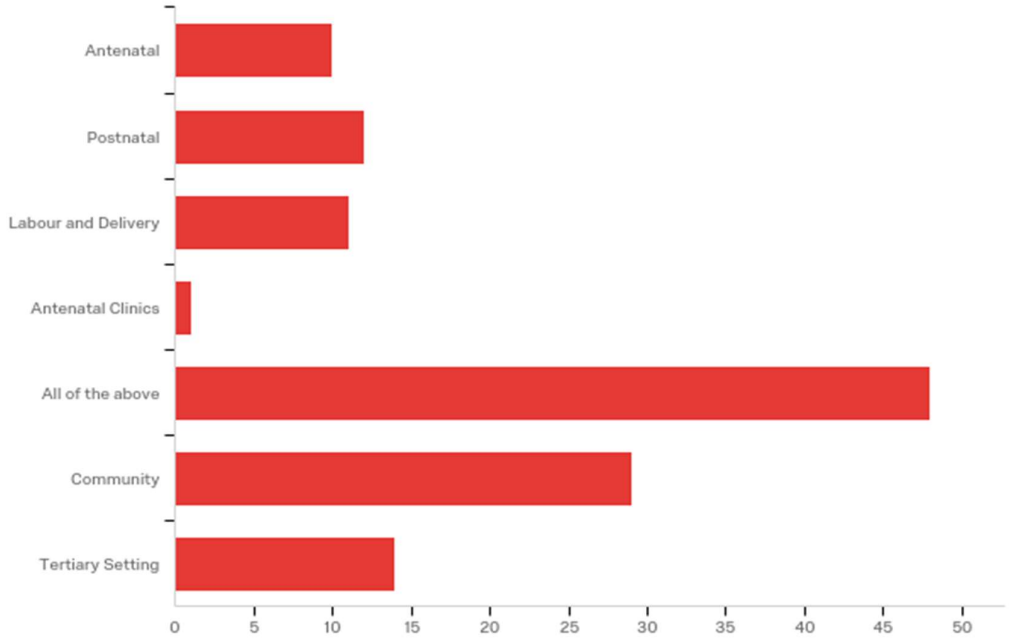

FIGURE 1. AREAS OF PRACTICE (x axis=n)

Most midwives in the acute setting worked across several areas, whilst others worked predominantly in one area. Figure 1 provides a visual indication of the numbers involved which ranged from 14 in the tertiary sector to 48 midwives who worked across various settings.

4.3 Personal immunization status and training

Most midwives surveyed (85.40%) (117/137) had received all recommended workplace vaccines with 14.60% (20/137) stating they had not received or were unsure if they had received all required vaccines. Formal immunization training was confirmed in 36.03% of the midwives surveyed (n=49).

4.4 Immunization knowledge results

Table 2 and Figure 2 show the responses of midwives to the statement that the "influenza vaccine is effective in preventing illness". This is displayed in both number and percentage form.

TABLE 2 INFLUENZA VACCINE IS EFFECTIVE IN PREVENTING ILLNESS.

#	Answer	Percentage
1	Strongly disagree	8.03%
2	Disagree	2.92%
3	Unsure	8.03%
4	Agree	39.42%
5	Strongly Agree	41.60%
	Total	100%

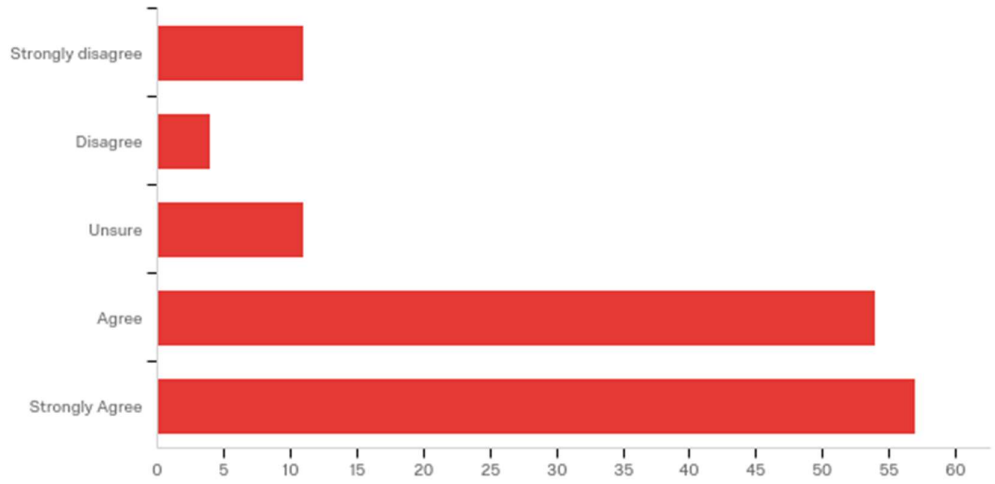

FIGURE 2. INFLUENZA VACCINE IS EFFECTIVE IN PREVENTING ILLNESS (x axis=n)

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Whilst 81.02% (110/137) of midwives agreed that the vaccine is effective, 18.98% were either unsure of disagreed that the vaccine was effective in preventing illness. The Table and Figure above illustrate confidence in the vaccine.

Table 3 and Figure 3 show the responses to the statement that “women are more vulnerable to adverse effects from vaccines in pregnancy”, in both number and percentage form.

TABLE 3. WOMEN ARE MORE VULNERABLE TO ADVERSE EFFECTS FROM VACCINATIONS IN PREGNANCY.

	Answer	Percentage
1	Strongly disagree	21.17%
2	Disagree	37.96%
3	Unsure	21.17%
4	Agree	11.68%
5	Strongly agree	8.02%
	Total	100%

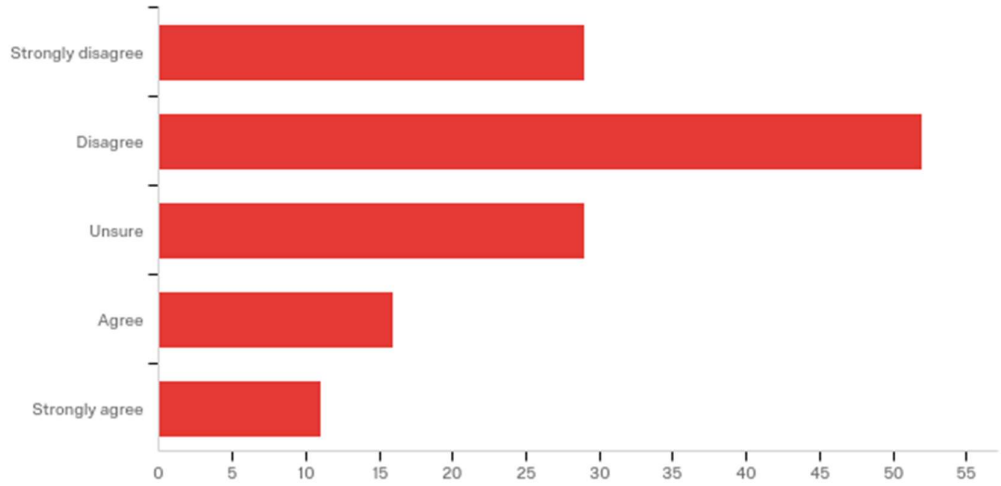

FIGURE 3. PREGNANT WOMEN ARE MORE VULNERABLE TO ADVERSE EFFECTS FROM VACCINATIONS IN PREGNANCY (x axis=n)

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Whilst 59.13% (80/137) of midwives disagreed with this incorrect statement, 40.87% were either unsure or agreed with this incorrect statement. The Table/Figure above illustrate that midwives’ knowledge of immunization varies significantly and some midwives lack knowledge in the area of vaccines and immunology in general.

Table 4 and Figure 4 show the responses of midwives to the statement “it is possible to contract influenza from receiving the vaccine”, in both number and percentage form.

TABLE 4. INFLUENZA VACCINE CAN SUBSEQUENTLY CAUSE A PERSON TO BE SICK WITH INFLUENZA.

#	Answer	Percentage
1	Strongly disagree	56.20%
2	Disagree	31.39%
3	Unsure	8.03%
4	Agree	2.92%
5	Strongly Agree	1.46%
	Total	100%

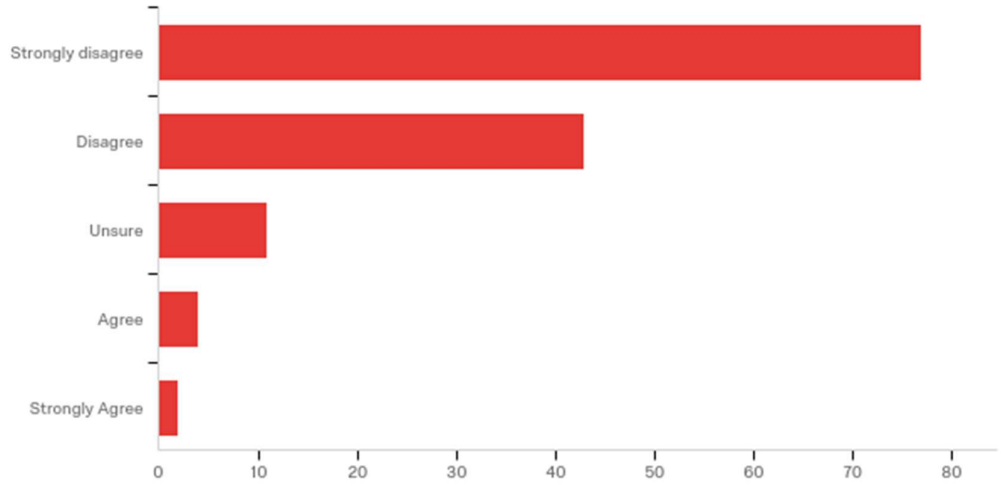

FIGURE 4. INFLUENZA VACCINE CAN SUBSEQUENTLY CAUSE A PERSON TO BE SICK WITH INFLUENZA (x axis =n).

Whilst 87.59% (120/137) of midwives did not believe that the influenza vaccine could cause influenza, 12.41% were either unsure or agreed with this incorrect statement. The Table/Figure above illustrates that most midwives understand that the influenza vaccine does not cause the disease, whilst some are still unsure or agree with the statement, demonstrating a need for further education.

Table 5 and Figure 5 show the responses of midwives who responded to the statement that the “influenza vaccine may induce premature contractions”.

TABLE 5. INFLUENZA VACCINE MAY INDUCE PRETERM CONTRACTIONS.

#	Answer	Percentage
1	Strongly disagree	44.20%
2	Disagree	37.68%
3	Unsure	15.94%
4	Agree	1.45%
5	Strongly agree	0.73%
	Total	100%

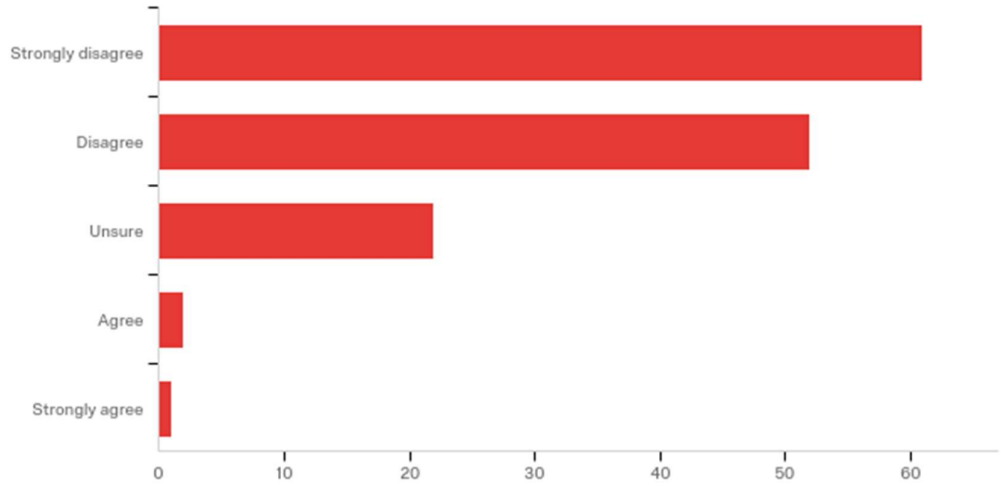

FIGURE 5. INFLUENZA VACCINE MAY INDUCE PRETERM CONTRACTIONS (x axis=n)

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The percentage of midwives that correctly identified that the influenza vaccine did not induce premature contractions was 81.88%. However, 18.12% (20/137) of midwives were either unsure or agreed with this incorrect statement. The Table/Figure above demonstrates that most midwives have confidence in the safety of the influenza vaccine in pregnancy, whilst some lack knowledge in this area.

Table 6 and Figure 6 show the responses of midwives to the statement that "influenza causes more illness in pregnant women". This is represented in both number and percentage form.

TABLE 6. INFLUENZA DISEASE CAUSES SIGNIFICANTLY MORE ILLNESS IN PREGNANT WOMEN THAN NON-PREGNANT WOMEN.

#	Answer	Percentage
1	Strongly disagree	8.03%
2	Disagree	13.87%
3	Unsure	20.44%
4	Agree	29.20%
5	Strongly agree	28.46%
	Total	100%

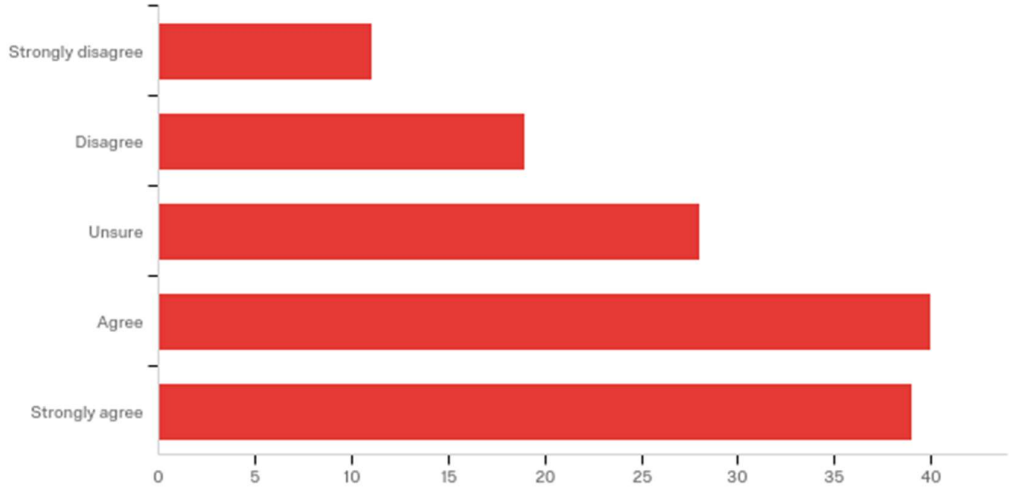

FIGURE 6. INFLUENZA DISEASE CAUSES SIGNIFICANTLY MORE ILLNESS IN PREGNANT WOMEN THAN NON-PREGNANT WOMEN (x axis=n)

The results of this question demonstrated that 57.66% (78/137) agreed that influenza causes more illness in pregnancy, whilst 42.34% of midwives were either unsure or disagreed with this correct statement. The Table/Figure above illustrates that most midwives are aware of the dangers of influenza to the pregnant woman whilst a significant number lack knowledge in this area.

Table 7 and Figure 7 show the responses to the statement that “pregnant women are more likely to be hospitalized for influenza than non-pregnant women”. This is represented in both number and percentage form.

TABLE 7. PREGNANT WOMEN ARE MORE LIKELY TO BE HOSPITALIZED FOR INFLUENZA THAN NON-PREGNANT WOMEN.

#	Answer	Percentage
1	Strongly disagree	2.19%
2	Disagree	5.11%
3	Unsure	17.52%
4	Agree	37.96%
5	Strongly agree	37.22%
	Total	100%

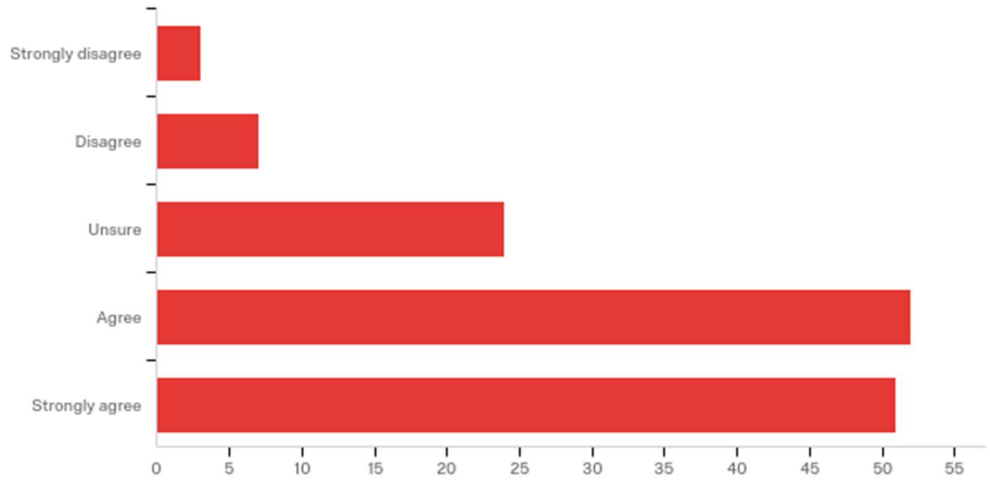

FIGURE 7. PREGNANT WOMEN ARE MORE LIKELY TO BE HOSPITALIZED FOR INFLUENZA THAN NON-PREGNANT WOMEN.

Whilst 75.18% (100/137) of midwives surveyed agreed with this correct statement, 24.82% were unsure or disagreed. The Table/Figure above demonstrates that the majority of midwives understand the side effects of influenza in pregnancy.

Table 8 and Figure 8 show the responses of midwives to the statement “the foetus may benefit form maternal influenza immunization”. This is represented in both number and percentage form.

TABLE 8. THE FOETUS MAY BENEFIT FROM MATERNAL INFLUENZA VACCINATION WHILST IN-UTERO.

#	Answer	Percentage
1	Strongly disagree	2.19%
2	Disagree	5.11%
3	Unsure	21.90%
4	Agree	42.34%
5	Strongly agree	28.46%
	Total	100%

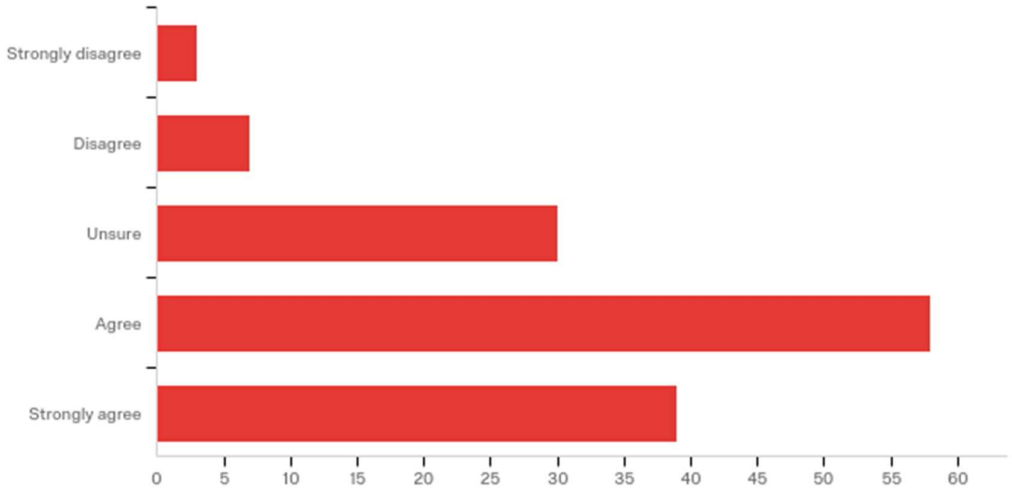

FIGURE 8. THE FOETUS MAY BENEFIT FROM MATERNAL INFLUENZA VACCINATION WHILST IN-UTERO (x axis=n)

Whilst 70.80% of midwives agreed that the foetus may benefit from influenza immunization whilst in utero, 29.20% (40/137) were unsure or disagreed. The Table/Figure above illustrates that some midwives have poor understanding of the benefits of influenza immunization in pregnancy.

Table 9 and Figure 9 show the responses of midwives to the statement that "influenza immunization in pregnancy can have a protective effect on the infant in the first year of life". This is represented in both number and percentage form.

TABLE 9. INFLUENZA IMMUNIZATION IN PREGNANCY CAN HAVE A PROTECTIVE EFFECT ON THE INFANT DURING THE FIRST YEAR OF ITS' LIFE.

#	Answer	Percentage
1	Strongly disagree	2.92%
2	Disagree	3.65%
3	Unsure	33.57%
4	Agree	38.69%
5	Strongly agree	21.17%
	Total	100%

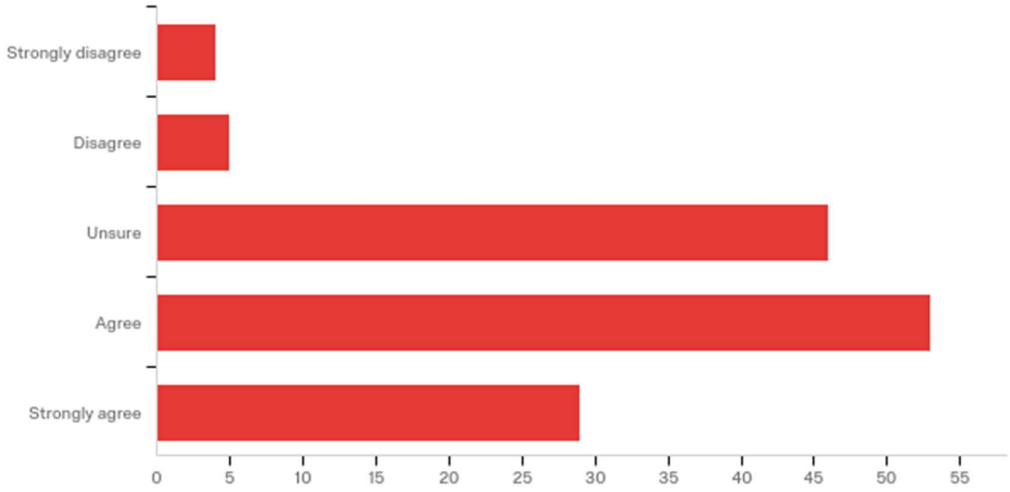

FIGURE 9. INFLUENZA IMMUNIZATION IN PREGNANCY CAN HAVE A PROTECTIVE EFFECT ON THE INFANT DURING THE FIRST YEAR OF ITS' LIFE (x axis=n).

The percentage of midwives that agreed that immunization in pregnancy protected the infant in its first year of life was 59.86%, whilst 40.14% (50/137) were unsure or disagreed. The Table/Figure above illustrates that many midwives have poor knowledge of the benefits of the influenza vaccine.

4.5 Professional Practise Results

Table 10 and Figure 10 show midwives' responses to the statement "I am concerned about the side effects of the influenza vaccine". This is represented in both number and percentage form.

TABLE 10. I AM CONCERNED ABOUT THE SIDE EFFECTS FROM INFLUENZA VACCINE.

#	Answer	Percentage
1	Strongly disagree	32.84%
2	Disagree	47.45%
3	Unsure	7.30%
4	Agree	9.49%
5	Strongly agree	2.92%
	Total	100%

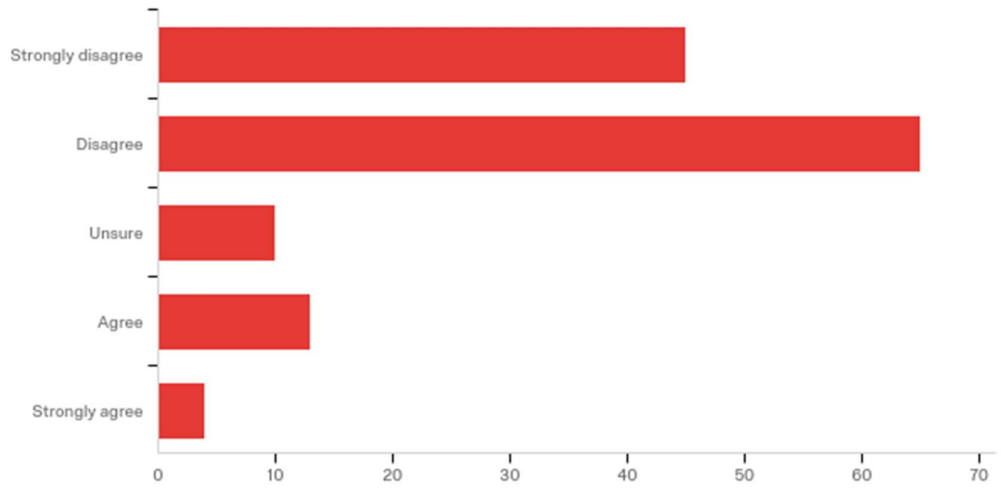

FIGURE 10. I AM CONCERNED ABOUT THE SIDE EFFECTS FROM INFLUENZA VACCINE (x axis=n)

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Whilst 80.29% (112/137) of midwives did not have concerns about the side effects of the influenza vaccine, 19.71% expressed that they were either unsure or had concerns. The Table/Figure above illustrates that some midwives do not fully understand the safety of the influenza vaccine.

Table 11 and Figure 11 show midwives' responses to the statement, "healthcare workers should be immunised against influenza". This is represented in both number and percentage form.

TABLE 11. HEALTHCARE WORKERS SHOULD BE IMMUNIZED AGAINST INFLUENZA.

#	Answer	Percentage
1	Strongly disagree	2.21%
2	Disagree	5.88%
3	Unsure	5.88%
4	Agree	30.88%
5	Strongly agree	55.15%
	Total	100%

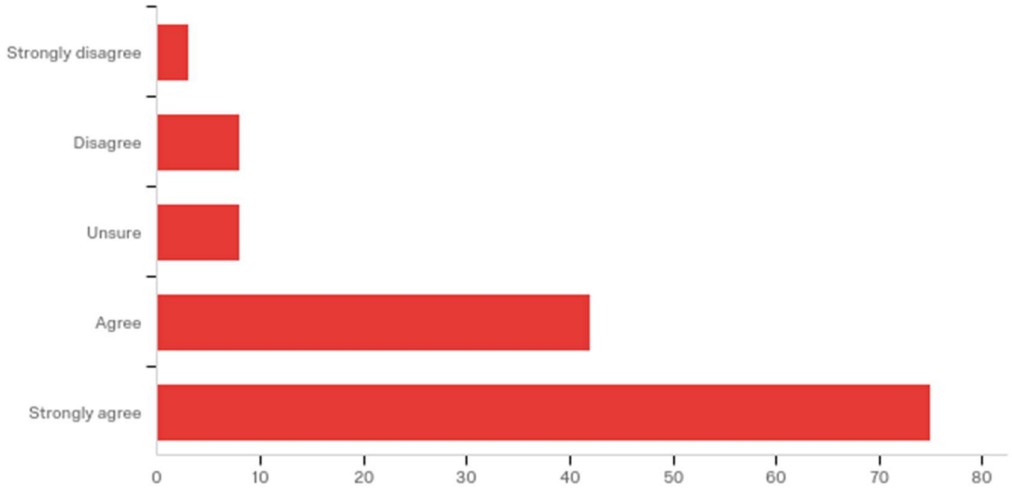

FIGURE 11. HEALTHCARE WORKERS SHOULD BE IMMUNIZED AGAINST INFLUENZA (x axis=n)

Whilst 86.03% (117/137) of midwives surveyed agreed that healthcare workers should be immunized, 13.97% were unsure or disagreed. The Table/Figure above illustrates that some midwives believe that healthcare worker immunization should be optional, suggesting that some midwives do not fully understand the consequences of this for themselves or their patients.

Table 12 and Figure 12 show responses to the statement that “all vaccines should be avoided in pregnancy”. This is represented in both number and percentage form.

TABLE 12. ALL VACCINES SHOULD BE AVOIDED IN PREGNANCY.

#	Answer	Percentage
1	Strongly disagree	47.45%
2	Disagree	44.52%
3	Unsure	4.38%
4	Agree	0.73%
5	Strongly agree	2.92%
	Total	100%

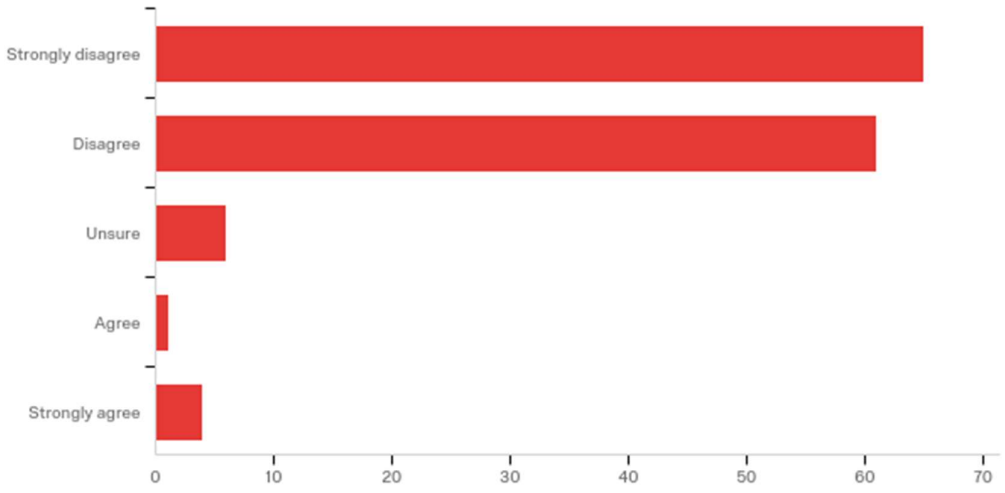

FIGURE 12. ALL VACCINES SHOULD BE AVOIDED IN PREGNANCY (x axis=n).

Whilst 91.97% of midwives surveyed disagreed that “all vaccines should be avoided in pregnancy”, 8.03% (10/137) were unsure or agreed. The Table/Figure above demonstrates that most of the midwives surveyed understood the importance of antenatal immunizations to pregnancy outcomes.

Table 13 and Figure 13 show responses to the statement “influenza vaccines should be avoided in pregnancy”. This is represented in both number and percentage form.

TABLE 13. INFLUENZA VACCINES SHOULD BE AVOIDED IN PREGNANCY.

#	Answer	Percentage
1	Strongly disagree	51.09%
2	Disagree	37.96%
3	Unsure	8.03%
4	Agree	0.73%
5	Strongly agree	2.19%
	Total	100%

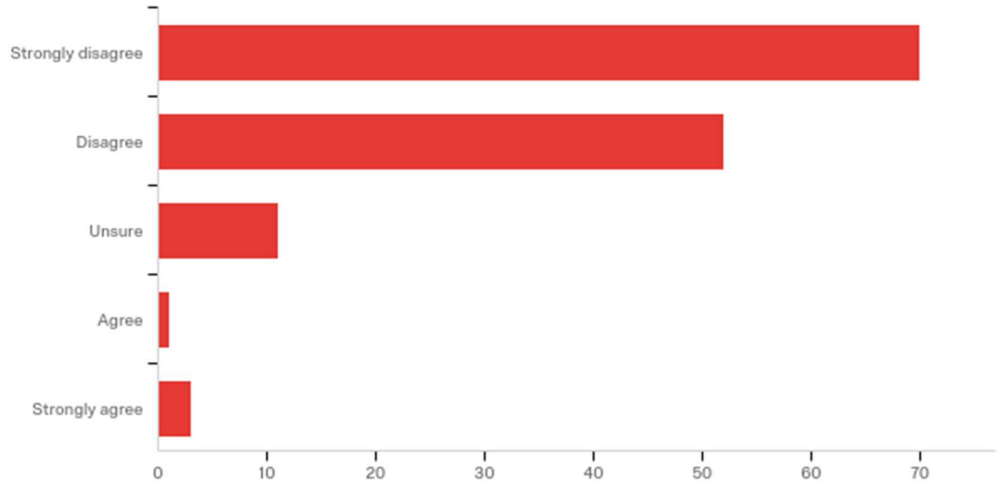

FIGURE 13. INFLUENZA VACCINES SHOULD BE AVOIDED IN PREGNANCY (x axis=n).

Whilst 89.05% of midwives disagreed with this incorrect statement, 10.95% (19/137) were unsure or agreed. The Table/Figure above illustrates that most midwives understand the value of influenza immunisation in pregnancy whilst some still need to be educated in this area.

Table 14 and Figure 14 show responses to the statement “It is my responsibility to discuss influenza vaccination with my clients”. This is represented in both number and percentage form.

TABLE 14. IT IS MY RESPONSIBILITY TO DISCUSS INFLUENZA VACCINATION WITH MY CLIENTS.

#	Answer	Percentage
1	Strongly disagree	0.74%
2	Disagree	3.68%
3	Unsure	4.41%
4	Agree	43.38%
5	Strongly agree	47.79%
	Total	100%

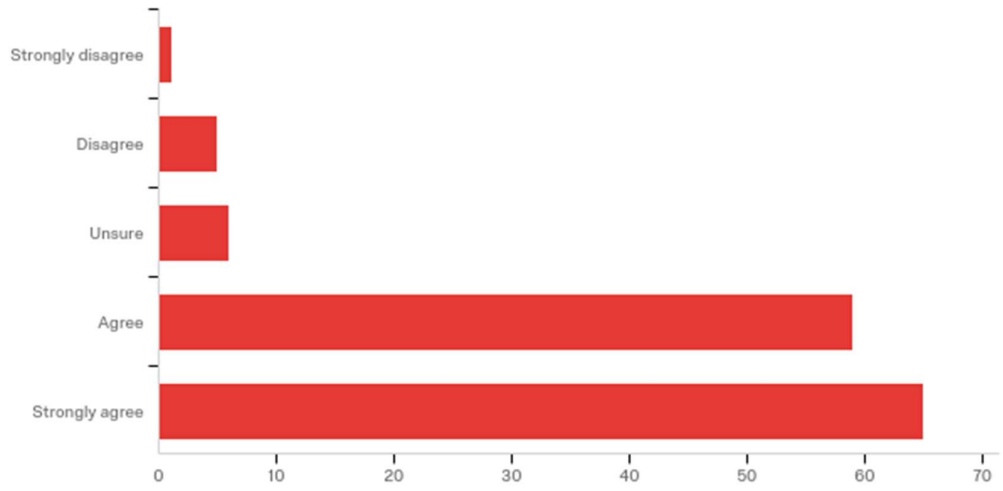

FIGURE 14. IT IS MY RESPONSIBILITY TO DISCUSS INFLUENZA VACCINATION WITH MY CLIENTS (x axis=n).

Whilst 91.17% of midwives agreed with this statement, 8.83% (15/137) were unsure or disagreed. These results demonstrated that most midwives were aware of their responsibilities whilst some were still unsure of their role in educating patients on the dangers of influenza in pregnancy.

Table 15 and Figure 15 show responses to the statement that “Influenza vaccine protects against influenza infection”. These results are represented in both number and percentage form.

TABLE 15. INFLUENZA VACCINE IS BENEFICIAL IN PROTECTING AGAINST INFLUENZA INFECTION.

#	Answer	Percentage
1	Strongly disagree	0.73%
2	Disagree	2.92%
3	Unsure	6.56%
4	Agree	45.99%
5	Strongly agree	43.80%
	Total	100%

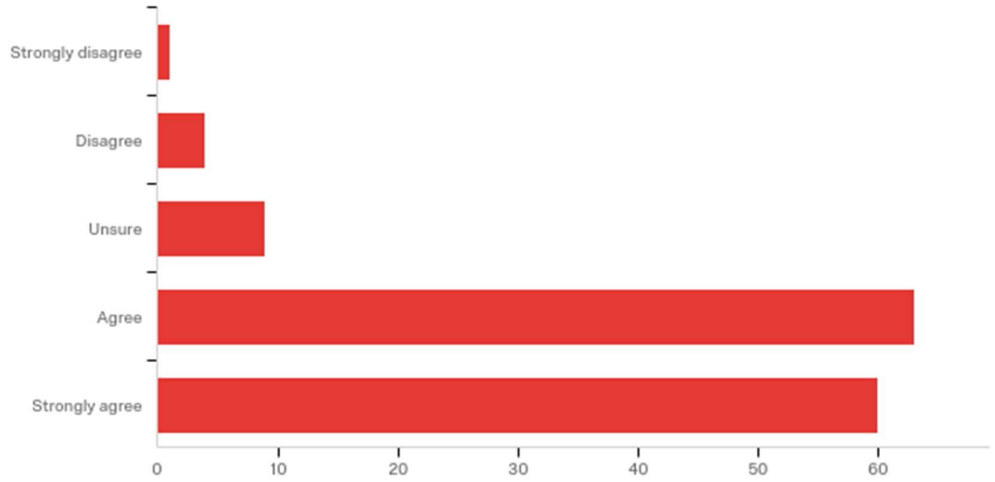

FIGURE 15. INFLUENZA VACCINE IS BENEFICIAL IN PROTECTING AGAINST INFLUENZA INFECTION (x axis=n).

The percentage of midwives that agreed influenza vaccine provided protection against influenza was 89.79%. Fewer than 20 of the 137 midwives surveyed were either unsure or disagreed with this statement. The Table/Figure above illustrates that most midwives have faith in the effectiveness of the influenza vaccine. However, there is a need to educate some midwives in this area.

Table 16 and Figure 16 show responses to the statement “Influenza vaccine is safe to give in pregnancy”. These results are represented in both number and percentage form.

TABLE 16. THE INFLUENZA VACCINE IS SAFE IF GIVEN IN PREGNANCY.

#	Answer	Percentage
1	Strongly disagree	2.18%
2	Disagree	0.00%
3	Unsure	9.49%
4	Agree	49.64%
5	Strongly Agree	38.69%
	Total	100%

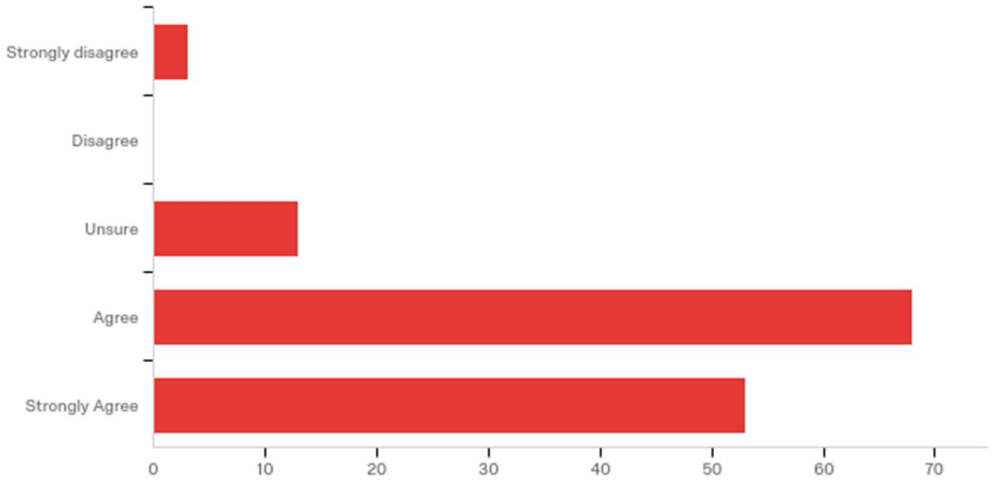

FIGURE 16. THE INFLUENZA VACCINE IS SAFE IF GIVEN IN PREGNANCY (x axis=n).

Whilst 88.33% of midwives surveyed agreed with this statement, 11.67% (11/137) were either unsure or disagreed with this statement. The Table/Figure above demonstrates that most midwives surveyed have confidence in the benefits of the influenza vaccine.

Both Table 17 and Figure 17 show responses to the statement “I always recommend influenza vaccine in pregnancy”. These results are represented in both number and percentage form.

TABLE 17. I ALWAYS RECOMMEND THE INFLUENZA VACCINE IN PREGNANCY.

#	Answer	Percentage
1	Strongly disagree	1.47%
2	Disagree	2.94%
3	Unsure	14.71%
4	Agree	45.59%
5	Strongly agree	35.29%
	Total	100%

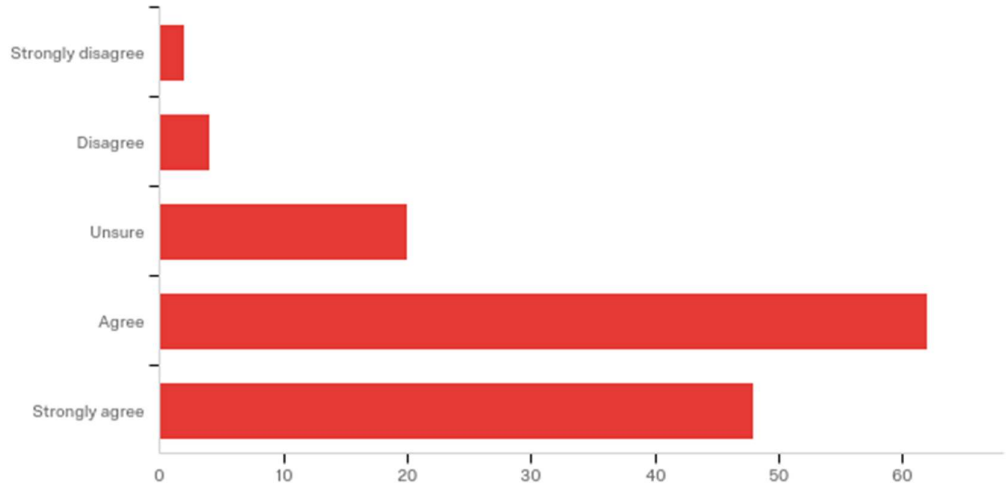

FIGURE 17. I ALWAYS RECOMMEND THE INFLUENZA VACCINE IN PREGNANCY (x axis=n).

Whilst 80.88% of midwives surveyed agreed with this statement, 19.12% were either unsure or disagreed. Thus 26/137 midwives were unsure of their role. The Table/Figure above demonstrates that whilst most midwives are aware of the importance of their role as immunization advocate, some midwives either lack the knowledge or confidence to take on this role. This demonstrates a need for further education of midwives.

Both Table 18 and Figure 18 show responses to the statement “It is not my responsibility to offer Influenza vaccine”. These results are represented in both number and percentage form.

TABLE 18. IT IS NOT MY RESPONSIBILITY TO OFFER THE INFLUENZA VACCINE.

#	Answer	Percentage
1	Strongly Disagree	38.24%
2	Disagree	37.50%
3	Unsure	8.82%
4	Agree	12.50%
5	Strongly Agree	2.94%
	Total	100%

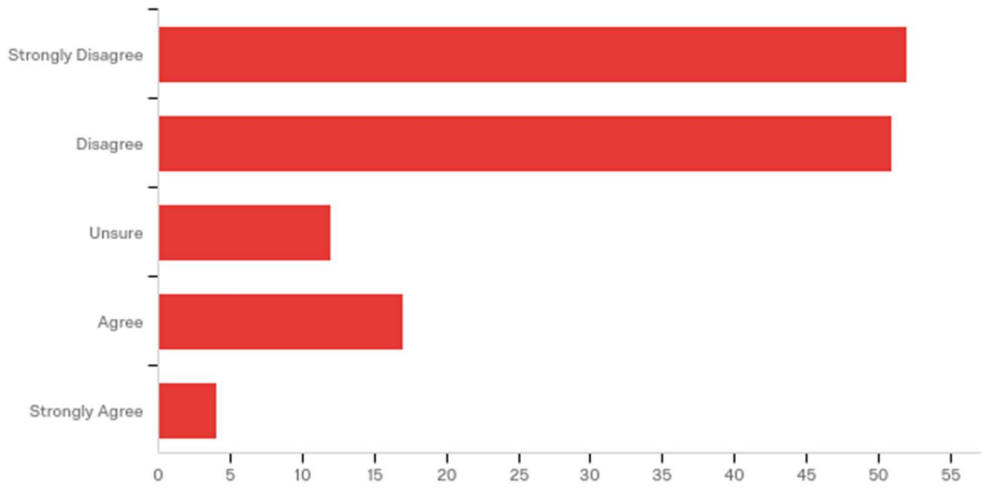

FIGURE 18. IT IS NOT MY RESPONSIBILITY TO OFFER THE INFLUENZA VACCINE (x axis=n).

Whilst 75.74% of midwives surveyed agreed with this statement, 24.26% (34/137) were unsure or disagreed with this statement. A proportion of midwives surveyed did not agree that providing immunization was part of their role. The Table/Figure above confirms the results of Table/Figure 17 and supports the need for further education in the role of immunization provision and advocate.

Both Table 19 and Figure 19 show responses to the statement “Offering influenza immunization to pregnant women is not a midwifery role”. These results are represented in both number and percentage form.

TABLE 19. OFFERING THE INFLUENZA VACCINE TO PREGNANT WOMEN IS NOT A MIDWIFERY ROLE.

#	Answer	Percentage
1	Strongly disagree	44.53%
2	Disagree	37.96%
3	Unsure	8.75%
4	Agree	7.30%
5	Strongly agree	1.46%
	Total	100%

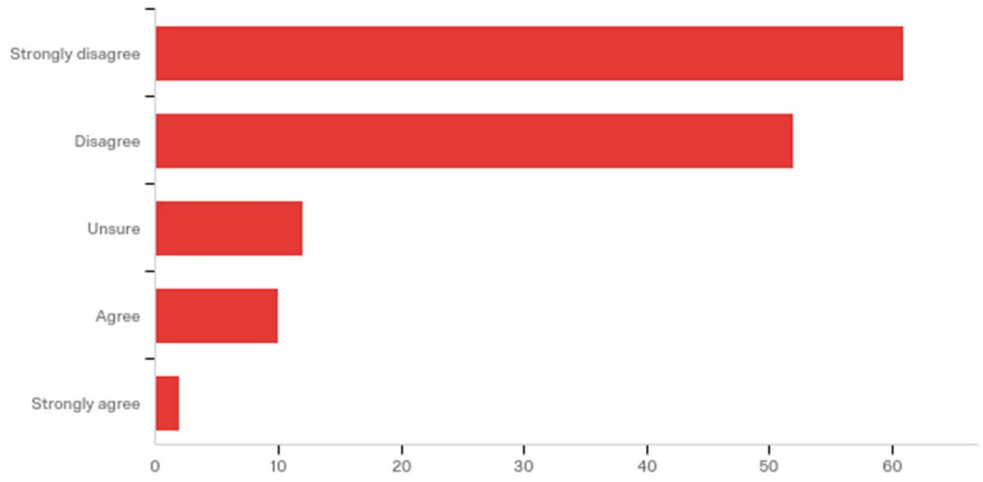

FIGURE 19. OFFERING THE INFLUENZA VACCINE TO PREGNANT WOMEN IS NOT A MIDWIFERY ROLE (x axis =n).

Whilst 82.49% (111/137) of midwives surveyed disagreed with this statement, 17.51% were unsure or agreed with this statement. Some midwives surveyed did not believe immunizing pregnant women was their role. These results demonstrate the need for further education in immunization.

Both Table 20 and Figure 20 show responses to the statement “I feel equipped to educate pregnant women on influenza immunization”. These results are represented in both number and percentage form.

TABLE 20. I FEEL EQUIPPED TO EDUCATE PREGNANT WOMEN ON INFLUENZA IMMUNIZATION.

#	Answer	Percentage
1	Strongly disagree	0.73%
2	Disagree	21.90%
3	Unsure	9.48%
4	Agree	43.80%
5	Strongly agree	24.09%
	Total	100%

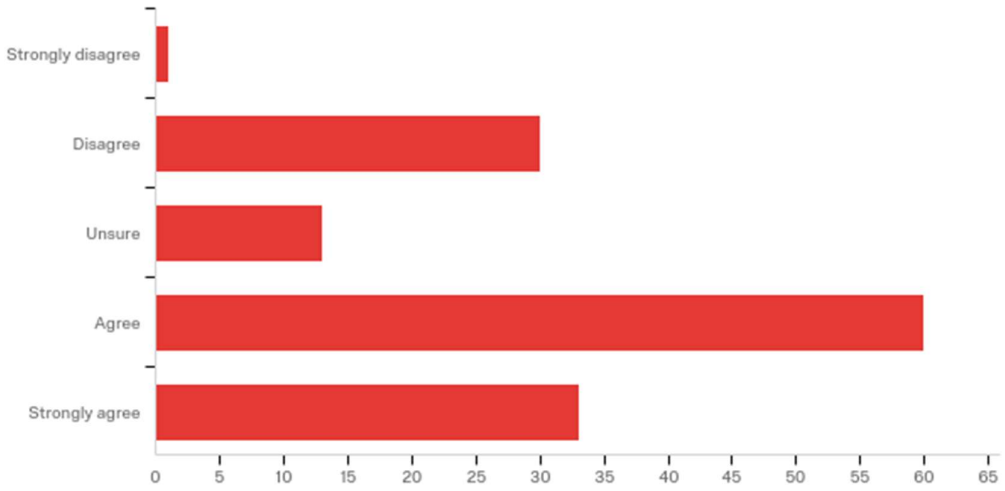

FIGURE 20. I FEEL EQUIPPED TO EDUCATE PREGNANT WOMEN ON INFLUENZA IMMUNIZATION (x axis=n).

Whilst 67.89% of midwives surveyed agreed with this statement, 32.11% were unsure or did not feel equipped to educate pregnant women on influenza immunization. The Table/Figure above illustrate that over 30/137 midwives felt ill equipped to educate women on the importance of influenza immunization.

Table 21 and Figure 21 show responses to the statement “Midwives are sufficiently trained to provide immunization”. These results are represented in both number and percentage form.

TABLE 21. MIDWIVES ARE SUFFICIENTLY TRAINED TO PROVIDE IMMUNIZATION.

#	Answer	Percentage
1	Strongly disagree	7.30%
2	Disagree	33.57%
3	Unsure	15.33%
4	Agree	29.93%
5	Strongly agree	13.87%
	Total	100%

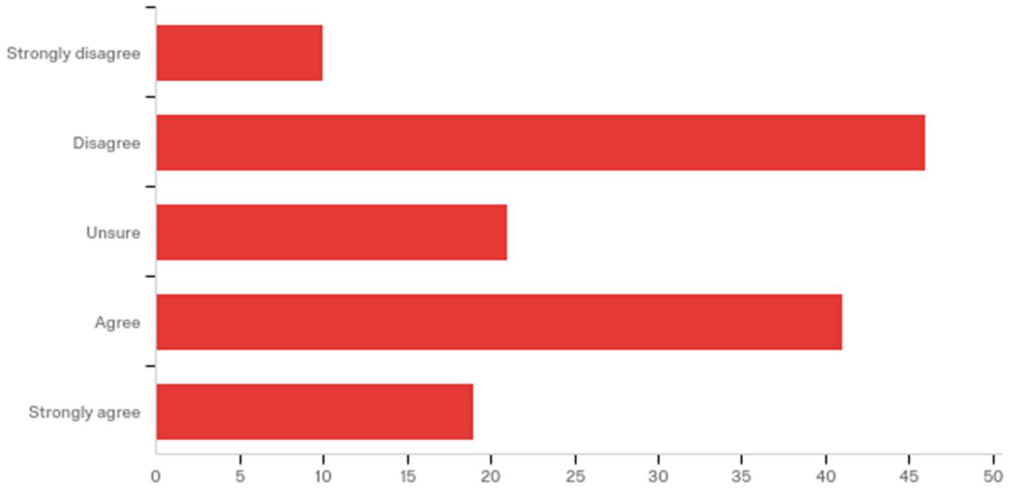

FIGURE 21. MIDWIVES ARE SUFFICIENTLY TRAINED TO PROVIDE IMMUNIZATION (x axis=n).

Whilst 43.80% of midwives surveyed agreed that midwives are sufficiently trained to provide immunization, 56.20% (80/137) were either unsure or disagreed. The Table/Figure above suggests that midwives recognize a need for further education on immunization and immunology.

Both Table 22 and Figure 22 show responses to the statement “All pregnant women should receive the influenza vaccine”. These results are represented in both number and percentage form.

TABLE 22. ALL PREGNANT WOMEN SHOULD RECEIVE THE INFLUENZA VACCINE.

#	Answer	Percentage
1	Strongly disagree	2.91%
2	Disagree	12.41%
3	Unsure	18.25%
4	Agree	32.12%
5	Strongly agree	34.31%
	Total	100%

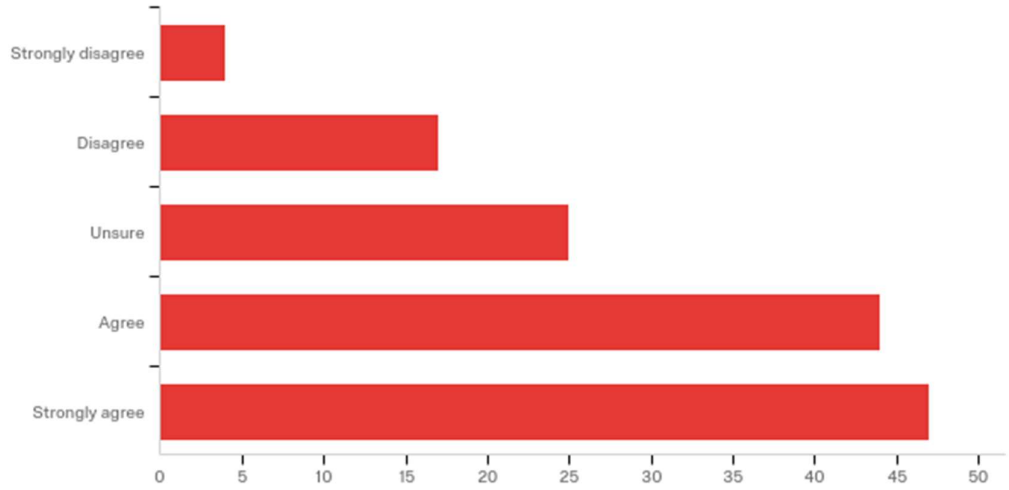

FIGURE 22. ALL PREGNANT WOMEN SHOULD RECEIVE THE INFLUENZA VACCINE (x axis=n).

Whilst 66.43% on midwives surveyed agreed that all pregnant women should be immunized against influenza, 33.57% (90/137) were unsure or disagreed. The Table/Figure above illustrates a diversity of knowledge on influenza immunization and confirms the need for further education of midwives.

Both Table 23 and Figure 23 show responses to the statement “I have given the influenza vaccine in the 2018 influenza season”. These results are represented in both number and percentage form.

TABLE 23. I HAVE GIVEN THE INFLUENZA VACCINE TO PREGNANT WOMEN IN THE 2018 INFLUENZA SEASON.

#	Answer	Percentage
1	Strongly disagree	34.81%
2	Disagree	25.18%
3	Unsure	8.15%
4	Agree	15.56%
5	Strongly agree	16.30%
	Total	100%

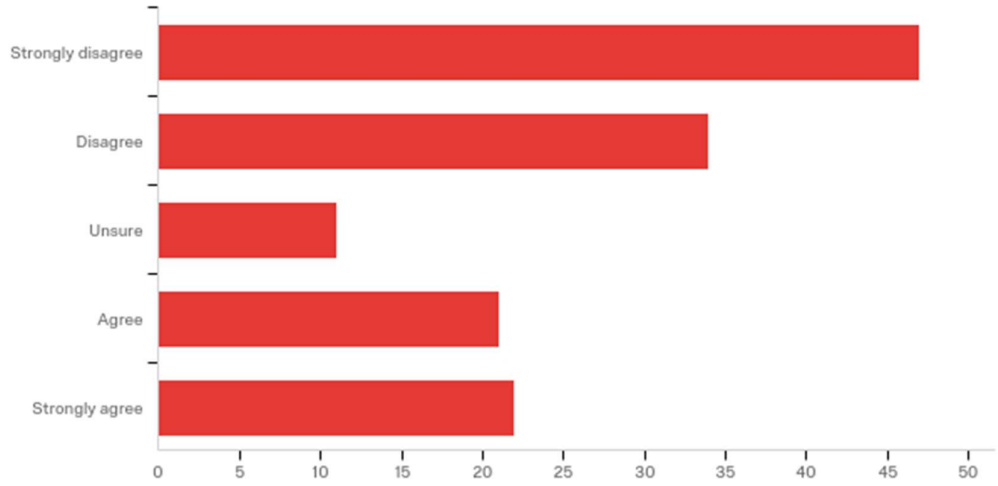

FIGURE 23. I HAVE GIVEN THE INFLUENZA VACCINE TO PREGNANT WOMEN IN THE 2018 INFLUENZA SEASON (x axis=n).

Whilst 31.86% of midwives surveyed were actively immunizing against influenza in 2018, 68.14% (90/137) of midwives were unsure or disagreed. The Table/Figure above illustrates that very few midwives are actively providing immunization. Midwives have an important role to play in both educating and proving antenatal immunization.

4.6 Comparative Statistics

Table 24 below shows a comparison of the knowledge results of both RM/RN and RM alone. Results that are significant are annotated with an #.

TABLE 24 – COMPARISON OF KNOWLEDGE BETWEEN RM/RN AND RM.

	RN/RM % correct	RM % correct	*p*
The vaccine benefits the foetus.	80.00	48.90	**0.001**
The vaccine benefits the infant to 6 months of age.	67.50	44.70	**0.015**
The vaccine can cause the influenza disease.	93.80	78.70	**0.020**
The vaccine may induce preterm contractions.	81.88	17.85	0.062

Legend: % percentage **statistically significant (bold)**

The table above illustrates that there is considerable knowledge difference between RM/RN and RM alone. This demonstrates a need for immunization education to be included in under-graduate direct entry courses as well as additional education to be included in the workplace.

TABLE 25: COMPARISON BETWEEN FORMAL IMMUNISATION TRAINING AND IMMUNIZATION KNOWLEDGE

Table 25 shows a knowledge comparison between midwives who had received formal immunization training and those who had not.

Selected variables	Training received % correct	Training not received % correct	*p*
Influenza results in increased illness in pregnant women.	76.20	50.00	**0.007**
Influenza results in increased hospitalization of pregnant women.	88.10	70.20	**0.044**
The vaccine provides benefits to the foetus.	88.10	59.50	**0.002**
The vaccine protects the infant until 6 months of age.	73.80	52.40	**0.034**
Midwives who were trained more likely to recommend the vaccine.	93.70	74.50	**0.001**
Midwives who were trained were more likely to be fully immunized.	92.90	83.30	0.074

Legend: *%* percentage **statistically significant = bold**

The Table above demonstrates the significant knowledge benefits to those midwives who had received formal immunization training. They were more likely to promote the vaccine and tended to be fully immunized themselves.

TABLE 26 – A COMPARISON OF KNOWLEDGE BETWEEN PRACTITIONERS WITH OVER FIVE YEARS CLINICAL PRACTICE AND LESS THAN FIVE YEARS CLINICAL PRACTICE

Table 26 shows a comparison in clinical practise between midwives with over five years' experience and those under five years' experience.

	Experienced % correct	Inexperienced % correct	*p*
The influenza vaccine induces premature contractions.	87.80	69.40	**0.020**
It is possible to catch influenza from the influenza vaccine.	92.20	77.80	**0.033**
The foetus can benefit from the vaccine in utero.	78.90	41.70	**<0.001**
The infant benefits from the antenatal vaccine in the first year.	64.40	44.40	**0.047**

Legend: *%* percentage **statistically significant = bold**

The Table above illustrates that midwives with greater experience demonstrate greater immunization knowledge, suggesting that a degree of knowledge is acquired in the workplace rather than in undergraduate studies.

Table 27 shows a comparison of knowledge between midwives employed in both the public and private sector.

TABLE 27 – KNOWLEDGE COMPARED WITH EMPLOYED IN A PUBLIC IN PRIVATE SECTOR

	Public % correct	Private % correct	*p*
General knowledge: Influenza vaccine is effective	83.90	72.70	0.198

Legend: *%* percentage **statistically significant = bold**

The Table above demonstrates that knowledge does not vary according to workplace with both public and private midwives demonstrating similar knowledge levels.

4.7 Summary

A difference in immunization knowledge was demonstrated between RN/RM and RM (see Table 24). Registered nurse/midwives surveyed had significantly more knowledge than their RM (direct entry) counterparts. Also, midwives who had received formal immunization training demonstrated considerably greater knowledge and a greater likelihood of recommending the vaccine (*p*=0.006) than

those who were not trained (see Table 25). Additionally, midwives who were more experienced demonstrated more knowledge than midwives with less than five years' experience (see Table 26). However, no apparent difference in knowledge or practise was demonstrated between midwives employed in the public or private setting (p=0.198). Midwives who were fully immunized were much more likely to recommend the vaccine to patients/clients than their unimmunised or under-immunized peers. There was also a trend for midwives who had received immunisation training to be fully immunized (p=0.074).

CHAPTER 5 - RESULTS - QUALITATIVE

5.1 Study Design

Recruitment for this aspect of the study took place via the final question in the survey. This question invited midwives to participate in the qualitative phase of the study. Ten midwives indicated that they would be interested in participating in the interview phase and provided a first name and phone number. These midwives were subsequently sent a text message to confirm their interest in participating in this aspect of the study and once confirmation was received a time was arranged to meet to complete the interview. Interviewees were to nominate a place they felt most comfortable. Five midwives indicated that their preference was for telephone interviews and in these cases a time was arranged to conduct them which best suited the participants. The remaining interviewees nominated a place and time convenient and comfortable for them. These sites included coffee shops, a library and parks.

This study used the interpretive descriptive framework as described by Thorne (Thorne et al., 2016) to underpin the qualitative data collection and analysis. This is not a prescriptive approach, but is described as an operating logic within which high quality qualitative studies can be designed and enacted in applied disciplines (Thorne, 2016). Ten interviews were conducted. The aims of these interviews were to investigate the knowledge, attitudes and practices of midwives and to gain a more in depth understanding of the midwifery role. The interviews incorporated a "so what" approach as described by Thorne (2016). Five interviews were conducted via telephone and five were conducted face to face in sites selected by each interviewee. Interviews were recorded and transcribed verbatim. Participants assumed a pseudonym which was used throughout the interview. From this point onwards the interviewee used this chosen pseudonym and no identifying features

were attached to the recordings or the subsequent transcripts. The interviewees name was only used in mailing of transcripts for member checking. Transcription and coding were conducted by the principal investigator simultaneously around the time of the interview. Investigator triangulation took place between the principal investigator and both academic supervisors. Recruitment ceased when data saturation was reached (Polit, 2016). Data saturation was considered achieved when similar responses to all questions occurred over multiple interviews and no new data was recorded. For example, the similarity of the responses to the question "What do you think is the role of midwives in antenatal influenza immunization?", did not vary significantly over the course of the interviews, with responses ranging from "education" to "provide information" and "promotion". Once all questions were achieving no new data, saturation was considered reached and no further interviews were conducted. The questions used in this aspect of the study are attached at Appendix 9.

Once the transcriptions were completed and initial themes identified, member checking was sought. This was done by forwarding a copy of the transcript to the participants by mail. As no responses were received, the participants were texted to assess whether any inaccuracies were identified. No inaccuracies were identified, and all participants expressed satisfaction with the accuracy of the transcripts. No further member checking was sought in keeping with the principles of Thorne and Darbyshire (2005, p.1110) who see this process as an "epistemological pat on the back". Thorne (2016) describes conventional member checks as having limited utility, however, suggests that returning to the source of the data, either systematically or selectively, can contribute to the transformation of data into findings. Investigator triangulation was used, and coding was checked and compared to coding by both research supervisors to reduce bias and to check for agreement and consensus. Consensus was achieved on all occasions after discussion and a majority decision was agreed as final. In keeping with the principles of Thorne (2015) the audit trail is accessible and is attached at Appendices 8 and 14.

5.2 Data Analysis

Data management in qualitative studies is usually reductionist in nature due to the large quantity of data and the need to convert it into manageable pieces (Polit, 2016). Data analysis can also be deductive or inductive in nature, depending upon the aim of the study. In this study the data analysis took an inductive approach as the study was not aiming to test a theory, but to build new knowledge (Polit, 2016).

Themes were sought from the transcripts using an iterative approach (Schneider, 2013). Initial thematic analysis was performed by the principal investigator. Themes were then member checked and investigator triangulation was sought from both academic supervisors. Thematic analysis treats the data set as a mass of information and the analysis which takes place breaks the data down into small but significant pieces. In this study, due to the small number of participants, a hands-on approach was adopted in order to gain a thorough understanding of the topic. Once familiar with the data, the principal investigator compiled a list of final themes and these were discussed at length. The final themes can be found at Appendix 14. Finally, both the quantitative and the qualitative results were merged to ascertain how the qualitative findings confirmed and enhanced the quantitative findings. Inferences were then drawn, and these can be found in the discussion.

5.3 Researcher Bias

The principal investigator is a Registered Nurse and Registered Midwife with over twenty years' experience as a midwife immunizer. To avoid bias several processes have been put in place including member checking and investigator triangulation (Schneider, 2013). Additionally, the decision was taken to report data in its original

state to avoid the possibility of incorrectly assuming meaning. Therefore, the data has been reported as recorded, including reference to first person, ums and other grammatical anomalies.

5.4 Findings

The midwives that volunteered for the semi structured interviews were employed across a variety of work sites ranging from birth and assessment to antenatal, post-natal, Child and Family Health Service (CAFHS) and General Practice (GP) settings. They were asked about their understanding of their role in antenatal immunization, their thoughts on the risk of influenza acquired in pregnancy and how they felt about midwives providing immunizations. They were also invited to comment about the requirement to receive workplace immunization and their understanding of the risks associated with giving influenza vaccines to pregnant women. Finally, their opinions were sought as to the barriers and enablers to immunization provision by midwives. A list of these questions can be found at Appendix 8. The results of this study are presented below under the following categories; the role of midwives; immunization provision; the risks of influenza in pregnancy; attitudes behaviours and practices and the enablers and barriers midwives encounter in antenatal immunization provision and promotion.

5.4.1 Role of Midwives

All midwives interviewed were aware of the importance of offering influenza immunization to pregnant women. They considered educating women in the benefits of receiving antenatal influenza immunization a midwifery role. This was described as “an important role” along with the role of “health education”. The phrases: “advise women; educate women; promote the vaccine; talk through

concerns and encourage, were used often. Several midwives also identified the role of provision of influenza vaccine as important.

> *So, I think its um education side of it, promoting the benefits of it. But then also probably going in open dialogue with them if they don't want to have it, just exploring why. (Giselle, GP)*

> *Our role is to provide information on what's recommended…when its suitable to have immunizations um, and also what is not mandatory… (Sarah, Antenatal)*

> *Talk to them about why it is important to have it in pregnancy, how it can protect themselves and their baby and the implications for their pregnancy and their baby can be quite dangerous. (Marley, Antenatal)*

> *Um, I believe our role is health education so informing women about the importance of getting the influenza vaccine in pregnancy and um yeah, I hope that in the future we would be able to administer it ourselves because I think it should be within our scope of practise. I am very pro being as autonomous as possible in maternity care. (Jane, Birth Centre)*

> *To give them options and to give them all the tools to make a clear choice… (Michelle, Labour and Delivery)*

Those interviewed were all aware of the significance of the vaccine to both mother and baby, but some adopted a more balanced approach to women who were resistant to receiving the vaccine. Additionally, some midwives explained why they believed the vaccine should not be mandatory.

> *… everyone should be able to decide what to put in their bodies… (Sarah, Antenatal)*

I believe that it is everyone's prerogative to choose if they want to vaccinate themselves. I believe that it is important to get herd immunity for the community. (Jane, Birth Centre)

Overall, the midwives considered their role to be one of education, this is despite several actively providing the vaccine in a general practice setting. They were all aware of the importance of the vaccine to both mother and foetus, but several adopted a balanced approach to whether the vaccine should be compulsory in a health setting.

5.4.2 Immunization Provision

Whilst few of the midwives regularly immunized pregnant women, either because of their area of employment or because they considered it to be a GP or Obstetrician role, all felt capable of doing so. Most midwives interviewed felt that they were well equipped to deliver the antenatal influenza vaccine, despite few having received any formal immunization education. Those who were unsure of the guidelines for immunization knew where that information could be found. One midwife working in the antenatal ward stated that she understood that women were being immunized in the antenatal clinics, however she was not certain. A variety of responses were received when the midwives were asked how they would feel if asked to immunize.

Oh, I have no problem, like I am a Registered Nurse as well so… for me I am very comfortable in administering it. (Giselle - GP)

I think so, I'd have a quick squiz[sic] on Healthware [A virtual patient management system] and work out what it is and why… (Michelle - Labour and Delivery)

I would hope that in the future we would be able to administer it ourselves because I think that should be within our scope of practise" (Jane - Birth Centre).

…. for me I am very comfortable in administering it. (Giselle- GP)

Um I am ok with that; we administer um immunizations to babies. (Sarah - Antenatal)

Oh, they can give a needle, they can give an injection. (Tess - GP)

We give the flu vaccine if it's ordered, but in general most of the patients that we have on the ward are going to get it through the clinic or have had it, so we don't seem to give it that often. (Marley - Antenatal)

Overall, most of the midwives felt capable of delivering antenatal influenza immunization. Some midwives had completed immunization training, whilst others knew where to access information needed to successfully administer the vaccine. Overall, no anxiety was expressed regarding immunization provision.

5.4.3 Risks of Influenza to Pregnant Women

All midwives interviewed demonstrated good knowledge of the risks of contracting influenza in pregnancy. Most demonstrated a knowledge of the impact of the disease on both mother and foetus. They used phrases such as: mum at high risk; worse increased risk of prematurity, risk to the foetus.

I am aware that the woman is more susceptible… (Sarah, Antenatal)

It's a big worry for us as care providers of managing women who are really sick with it, um and obviously pregnancy you are already in a compromised state, so you don't want women to get the flu… (Michelle, Labour and Delivery)

… risks to the foetus as far as um prematurity. (Fiona, CAFHS)

… women are more likely to be admitted to ICU … have worse outcomes. (Jane, Birth Centre)

Most midwives were also able to correctly identify the side effects of the influenza vaccine when given in pregnancy.

I guess it's like anything, you can have a localised reaction to it. You know some people say it gives you the flu. I definitely do not believe that um, so you are going to get a bit of a sore arm but … (Marley, Antenatal)

It doesn't give you the flu so it's not the flu you are going to get from it, but it can be localised swelling, anaphylaxis [allergic reaction] or anything in between … (Sarah, Antenatal)

There are those risks of anaphylaxis, 1 in 100,00 vaccines you give so that's minor, but it can happen. (Tess, GP)

… pain around the site. Possibly just getting some sort of reaction just immune system reacting to getting a vaccine so you don't get the flu, so I know that's not the case, so feeling run down while your immune system is taking over and forming antibodies. (Jane, Birth Centre)

Um I think it would be low risk as far as my research is showing. (Fiona, CAFHS)

Those who were unsure correctly identified that the risks for pregnant women were no different to the rest of the community.

… I would assume that the risks would be as any other person… (Michelle, Labour and Delivery)

In summary, most midwives interviewed had a good knowledge of immunization and the risks of acquiring influenza in pregnancy. They had a good knowledge of the side effects of the vaccine and expressed no concerns about administering the vaccine in pregnancy.

5.4.4 Attitudes, Behaviours and Practices

Midwives expressed that they were happy to receive workplace immunizations although most were aware that some health professionals refused the vaccine. Several midwives, whilst in favour of receiving the vaccine personally, did not believe that it should be compulsory whereas others felt that all healthcare workers should be immunized.

Oh absolutely. They are necessary, very necessary. (Tess, GP)

… you have to have a pretty good reason for not having it. (Marley, Antenatal)

… it is protecting the women I am caring for …. I have got some protection. (Michelle, Labour and Delivery)

… I have no problem with it personally I think we work in a high-risk zone and we come into contact with people who are vulnerable um I mean this is the whole point of immunization is that whole herd immunity in the community… (Giselle, GP)

… whilst I understand that from a community health standpoint staff should have some vaccinations um to protect those who are more susceptible, I don't think it should be mandatory… (Sarah, Antenatal)

Um, I think it is essential if you are working in heath or many fields with pregnant women and babies, families, then workplace immunization is essential. (Fiona, CAFHS)

Whilst, all midwives interviewed were personally happy to receive prescribed workplace immunizations, most stated that they did not think the vaccines should be compulsory.

5.4.5 Enablers and Barriers

Most midwives interviewed expressed a desire for more education in immunization and identified lack of knowledge as a barrier to providing immunization. One midwife working in the community expressed the need for accreditation of midwives as a prerequisite for immunization provision. None of the midwives were able to recall any education in either of the Bachelor of Nursing of Midwifery courses. Several midwives had subsequently completed the SA Health online Immunization course and identified that as an enabler to immunization promotion and provision (SA Health, 2019c). Only one midwife could recall any training prior to registration and that midwife was hospital trained.

> *… just knowing the risks and benefits and how to give it correctly ... and cold chain management* [the manipulation of temperatures to ensure vaccines remain stored at an appropriate temperature] *was beneficial. (Marley, Antenatal)*
>
> *Part of my role has been to do the immunization course …. having a general understanding and knowledge of vaccination immunology purely in my role working in general practise has been helpful. It really helped me to understand exactly what I was doing and why. (Giselle, GP)*
>
> *… it would start with more education so whether it was the SA Health online course or just another module… before I did that course…I didn't know the sort of things I should have been telling them, what to look out for so it's been helpful having that background. (Michelle, Labour and Delivery)*

All midwives interviewed identified the need for further education, or in services. They expressed the desire to know the risks and benefits and how to administer the vaccines correctly.

> *I think probably um better education towards midwives towards immunization. So, for me it wasn't until I got into general practise that I realised the importance of it, what is actually happening in the body, but you know just the science behind vaccination immunology that sort of stuff…starting at university even incorporating that midwives course* [SA Health On-Line Immunization Course for Midwives] *into part of their Graduate Training… (Giselle, GP)*

Whilst most midwives identified lack of knowledge and opportunity as barriers to the provision of antenatal influenza immunization all midwives interviewed felt

capable of administering a vaccine. Those midwives who regularly immunized pregnant women were mostly employed in a general practise setting, although most midwives working in a post-natal setting reported regularly immunizing babies as part of their everyday tasks. Those interviewed who worked in a hospital setting generally saw it as a GP or Obstetrician role and some confusion existed as to whether immunization should take place on antenatal ward or in antenatal clinics. However, despite the accepted role of GP provision, some midwives were questioning the limitations of the role of midwives. One midwife stated:

*I don't know why the girls (*midwives) *in the antenatal clinic don't give it. (Tess, GP)*

And another stated,

I am very pro [sic] *being as autonomous as possible in maternity care. (Jane, Birth Centre)*

In summary, most midwives felt that midwives should be more proactive in immunization. Jane felt that there should be a push from the Australian College of Midwives (ACM) to promote midwifery skills and that medical staff needed to be more aware of midwives' potential for delivering vaccines independently.

5.5 Summary

The common thread among the midwives interviewed who worked across a variety of work sites ranging from birth and assessment to antenatal ward, post-natal ward, CAFHS and GP Practices, was a belief in the importance of immunization in pregnancy. Whilst their personal knowledge of immunization varied, they all

demonstrated good basic knowledge of the risks of the disease and the side effects of the vaccine. None of the midwives revealed any concerns in having routine staff immunizations, however it could be argued that it would be unlikely that they would reveal any extreme beliefs in an immunization focussed research setting. Some midwives were also outspoken about the issue of mandatory immunization in the workplace. This issue may be a consideration for further research as it is not fully understood why a healthcare professional would consider workplace immunizations voluntary.

The midwives could not recall any immunization training in university and only those employed in a primary health care settings such as CAFHS or GP practises had undergone any subsequent training in immunization. All of those who had completed further training identified the SA Health immunization course as very useful and an enabler to practise. Most importantly, all midwives expressed a need for better immunization education of student midwives and one midwife working in CAFHS identified that midwives should be accredited to perform immunization. This is of significance to university education and should form the basis of an evaluation of existing teaching. It has become clear that current immunization and pathophysiology education at an undergraduate midwifery level is not meeting the needs of midwives in South Australia. This issue will be discussed further in Chapter 6.

CHAPTER 6: DISCUSSION

The role of midwives in the promotion and provision of antenatal influenza immunization is an under researched issue. This is an important area of antenatal care and has the potential to impact the outcomes of both mothers and babies. There is a clear need for quality research on the role of midwives in this area. Previous research has demonstrated that the influenza vaccine, when given in pregnancy, is both safe and effective (Adegbola et al., 2012; Zaman et al., 2008). A review of the evidence by the WHO global advisory committee into safety of immunization in pregnancy has confirmed the benefits outweigh the risks and recommend the vaccine as a high priority (WHO, 2012). Additionally, the uptake of the vaccine has been consistently reported in Australian literature to be between 40%-75% in Australia, as low as 17% in Aboriginal and Torres Strait Islander communities (n=53) (O'Grady et al., 2015). Literature, both Australian and International, has also confirmed that healthcare practitioner recommendations is a predicter in the uptake of influenza immunization in pregnancy(n=267; n=; n=671) (Broughton et al., 2009; Mak et al., 2015; Tong et al., 2008). Pregnant women's understanding of the risks associated with acquiring influenza in pregnancy has also been shown to be low thereby placing an increased need for midwives and other healthcare practitioners to provide timely recommendations (Healy, Rench, Montesinos, Ng, & Swaim, 2015; Leask et al., 2012). Additionally, personal immunization status has been shown to impact a healthcare practitioners' decision to recommend vaccines (Vishram et al., 2018).

Midwives are well placed to provide immunization education and provision and this study investigated: midwives understanding of their role in antenatal influenza immunization promotion and provision; midwives existing knowledge and education; their personal immunization status and the impacts these issues have on

professional practise; as well as the enablers and barriers that exist to midwives providing and promoting antenatal influenza immunization.

6.1 Role

Up until now the role of midwives has not been fully investigated, with no known previous Australian study taking place. The midwives in this study all described their role in immunization as one of education and information sharing. However, despite several midwives actively immunizing in a general practise setting and having completed the SA Health course, few of the midwives saw their role as immunization provision and they were unlikely to initiate it (SA Health, 2019c). This is a concern given that immunization is an important midwifery role (ACM, 2019). Some midwives, working predominantly in a primary practice setting that regularly immunized thought they should be more autonomous in this practise and not reliant upon GP orders. This could be achieved by standing drug orders or by accrediting suitably trained midwives to operate independently. The Australian midwives surveyed were significantly more likely to recommend the vaccine (80.88%) than midwives surveyed in Belgium, which found that only 23.00% recommended the influenza vaccine in pregnancy (n=271) (Maertens et al., 2016). Whilst most of the midwives interviewed were confident in providing the influenza vaccine, of those surveyed only 31.86% had given the vaccine in the last year.

6.2 Knowledge and education

As midwife's knowledge and practise have not previously been studied in an Australian setting, this research has addressed this knowledge deficit. This study demonstrated that midwives who have had immunization education, had

significantly greater immunization knowledge (p=<0.001). Most of the midwives surveyed displayed basic immunization knowledge, with over 81% demonstrating faith in the influenza vaccine in pregnancy. However, 42.34% were unsure or did not agree that influenza could cause significantly more illness in pregnant women. Antenatal influenza immunization is recommended to protect both mother and baby, however, 29.25% of midwives surveyed were unsure or did not agree that the influenza vaccine was protective for the foetus in utero and 33.57% of midwives were unsure or did not agree that all women should receive the influenza vaccine in pregnancy. This demonstrates a significant knowledge deficit in the midwives surveyed. This study has also shown that only 67.89% of midwives surveyed felt adequately prepared to educate pregnant women on the importance of antenatal immunization, representing a higher result than their English counterparts(n=266) (25%) (Ishola et al., 2013). Only one of the midwives interviewed who was hospital trained could recall any immunization training in their under-graduate education. This suggests a significant shortfall in university education across South Australia. Those midwives who had completed the online immunization training through SA Health demonstrated greater knowledge and confidence in both educating women and administrating the vaccine. They also reported immunization as an enabler to practise (93.70%).

Knowledge of immunization requirements and understanding of the risks associated with acquiring influenza has been shown by previous studies to be poor in pregnant women(n=267; n=17; n=199) (Broughton et al., 2009; Maher et al., 2014; McCarthy et al., 2012). This lack of knowledge of the risks associated with acquiring influenza in pregnancy places greater importance on the timely education of women. Midwives are well placed to provide this education. However, this study has shown that 67.50% of Registered Nurse/Midwives and only 44.70% of Registered midwives recognised the benefits provided by the influenza vaccine to the newborn. This is a clear knowledge deficit and one with the potential to place mothers and babies at risk.

6.3 Personal immunization and practise

The personal immunization knowledge and practice of healthcare practitioners has been the subject of minimal research. Previous studies (n=199) have demonstrated that healthcare practitioner knowledge of personal immunization requirements is poor (McCarthy et al., 2012). They have demonstrated that healthcare practitioners in general have, not only a low personal immunization status, but also a poor knowledge of workplace immunization requirements. One South Australian study (n=423) revealed that only 16% of healthcare workers in one large Adelaide public hospital were fully immunized (Tuckerman et al., 2015). This study however has demonstrated that 85.40% of midwives are fully immunized with only 14.60% reporting they were not fully immunized or were uncertain about the immunization requirements.

An English study (n=2393) found that healthcare practitioners who received influenza immunization, were more likely to recommend them (Vishram et al., 2018). This study has confirmed those results and demonstrated a strong link between personal immunization status and professional recommendation of the influenza vaccine (p=0.006). Additionally, midwives expressed that they were happy to receive workplace immunizations although most were aware that some health professionals refused the vaccine. Several midwives interviewed, whilst in favour of receiving the vaccine personally, did not believe that it should be compulsory whereas others felt that all healthcare workers should be immunized. Several midwives were aware of the importance of herd immunity and most reported the importance of protecting themselves and their vulnerable patients.

6.4 Enablers

One Brisbane based education intervention (n=199) demonstrated that both knowledge and professional practise can improve through education (McCarthy et al., 2012). Additionally, a recent South Australian study (n=180) has demonstrated that with immunization training and a midwifery led immunization program, influenza immunization rates can be increased to 76% (Mohammed et al., 2018)(n=180). This study has confirmed the work of McCarthy et. al., (2012) and Mohammed et al., (2018) and demonstrated that midwives who had previously completed immunization training displayed both higher levels of knowledge (p=0.007) and enhanced professional practice (p=0.006). However, this study only surveyed pregnant women and did not survey midwives regarding their opinions or practices (Mohammed et al.,2018). This is supported by the qualitative results wherein midwives stated that immunization education was an enabler to practise. Additionally, there is an indication that there is increased uptake of personal immunization in those who had received immunization education (p=0.074). When asked what would assist midwives to take a more active role in immunization, those interviewed routinely expressed a need for more education, with few midwives recalling any immunization training in their undergraduate education.

A further enabler for increasing influenza uptake amongst pregnant women is the incorporation of immunization into routine health checks. This was a recommendation of Webb et al., (2014) (n= 15) and has been achieved to an extent. The 2019 production of the South Australian pregnancy record and guidelines claims that it is both an inclusive and comprehensive medical record and includes a prompt to remind women to receive an influenza immunization (SA Health, 2019b). However, any handheld record is only as reliable as its user and with pregnant women often seeking antenatal care across several providers, and their proven lack of knowledge regarding the risks of acquiring influenza in pregnancy, it is arguably

subject to human error on the part of the healthcare provider and the pregnant woman (Broughton et al., 2009) (n=267).

6.5 Barriers to immunization provision and promotion

The lack of immunization knowledge and education has been a consistent theme throughout this study. Several of the midwives interviewed had completed the SA Health course (36%) (SA Health, 2019d) and considered it to be an enabler to practise. With women's knowledge of the risks associated with influenza demonstrated to be poor, there is an increased need for midwives to be confident and competent in recommending the influenza vaccine (Wiley et al., 2015) (n=815). This study was able to demonstrate that there is a significant deviation in knowledge surrounding the benefits of the influenza vaccine to the foetus and newborn, with more Registered Nurses/ Midwives than Registered Midwives alone agreeing (p=>0.001). This apparent lack of knowledge of immunology suggests that a barrier to immunization provision and promotion is being a Registered Midwife only. As the direct entry midwifery course was only introduced in 2000, it could be suggested that some modification to pathophysiology/immunology is required. One midwife stated that the Australian College of Midwives (ACM) should promote midwifery skills. This suggests a lack of confidence amongst the midwives to promote their own skills and knowledge. Additionally, another midwife/immunizer believed that midwives who had received formal education and routinely immunized, should be accredited to act independently, thereby improving the efficiency of the process. All midwife/ immunizers expressed a desire for more autonomy of practise.

A further barrier to midwives' knowledge could be attributed to the lack of content in midwifery textbooks. An assessment of midwifery textbooks has revealed that they contain very little information on immunology and vaccinology. For example,

there was three paragraphs in a textbook published in 1985, however immunology is not mentioned in a recent text book currently used at Flinders University (Bennett, & Brown, 1985; Myles,Bennett & Brown, 1999; Pairman, 2019a, 2019b). Other textbooks assessed also had little to no immunization content (Blackburn, 2013; Glover et al., 2018; Hoover, 2004).

6.7 Limitations

A limitation of this study is the absence of credible data. This can be attributed to both the absence of an accurate data identification method by the Australian Immunization Register (Australian Government Department of Human Services, 2019) and to the absence of immunization data recorded in the Perinatal Outcomes Information (South Australia) (SA Health, 2016). For this reason the numbers of pregnant women receiving the influenza immunization is currently unknown despite estimates of around 40% (O'Grady et al., 2015; White et al., 2010). One recent publication (n=180) was able to lift that number to 76% with the aid of a midwifery led immunization program (Mohammed et al., 2018). Whilst the Immunization Register has the capacity to record all vaccines given over the course of an individual's life, it is currently unable to provide data to support this study. Two reasons exist for this. The register is unable to record a reason for receiving an immunization and, whilst recording data into the register is required of the provider, the quality of the data may be dependent upon the input of a practitioner (AIR, 2019). Additionally, antenatal immunization is not recorded in perinatal outcomes data in South Australia (SA Health, 2016). The data that is recorded is based on midwife notifications of South Australian births. This data has been recorded since 1981 and includes demographic details, pre-pregnancy, birth and post-natal details, however, what is not recorded is maternal immunization status.

A further limitation of this study can to attributed to its' design. Mixed methods research, whilst providing data and methodological triangulation, can be attributed to the way the research community perceives it. This approach is a growing trend in both the behavioural and social sciences and has been described as the third methodological movement, however, is still the subject of suspicion in some areas. Surveys, whilst subject to bias, are commonly used when researching midwives and, in this study, a small but representative sample was achieved (n=137) (Ishola et al., 2013). This is a limitation but is considered an acceptable one due to the limited population of midwives employed in South Australia (n=2411). This has also been mitigated by using a variety of sample sources. Data obtained in surveys can also lack depth however, the qualitative data provides a balanced view as well as data and method triangulation (Schneider et al., 2013). Additionally, the survey instrument has face validity and was validated prior to data collection using a test-retest process, resulting in a Cohens' Kappa coefficient of K=0.804.

Finally, a limitation to the qualitative study can be attributed to the researcher's background. The principal investigator is a Registered Nurse/midwife with over twenty years' experience as an immunizer. Hence, a degree of bias in relation to anti-immunization sentiments may be present throughout this analysis. Any unforeseen bias has been mitigated by using member checking and investigator triangulation. Additionally, data has been left in the original state including any reference to first person and slang, such as "I, we and ums and ahs" to ensure accuracy of reporting.

6.8 Summary

In summary, this study has achieved its aim of providing a statistical and thematic description of the barriers and enablers to midwives promoting and providing

antenatal influenza immunisation. As this is the first Australian study to address the role of midwives in relation to antenatal influenza immunization, the results of this study are significant. Key findings of this study are:

- Midwives perception of their role in antenatal immunization - they saw their role as educating but not providing the vaccine;
- A description of the enablers and barriers that midwives encounter in promoting and providing antenatal immunization - identifying immunization education as an enabler to practice but no barriers were presented;
- The impact of personal immunization status on the promotion and provision of antenatal immunization, with results demonstrating that being fully immunized was an enabler to professional practise, as well as;
- The current level of immunization knowledge amongst Registered Nurse/midwives and Registered Midwives demonstrating the need for further education.

Whilst there is a need for further education of midwives, both in the tertiary education environment and in practise settings, this study has also demonstrated the need for policy change in relation to data recording. The Perinatal Outcomes Statistics published in South Australia does not record immunization status (SA Health, 2016). Similarly, the Australian Immunization Register does not have the capacity to record the reason for immunization, e.g. pregnancy (AIR, 2019). The quality of research is arguable, only as good as the quality of the available data, and all research on antenatal immunization uptake to this point has been based on estimates alone. Some of these studies have also been small and relied upon regionally acquired data (Maher et al., 2013; Mohammed et al., 2018; O'Grady et al., 2015; Wiley et al., 2013). If more accurate data were available in either of these sources, a greater understanding of the vaccine coverage amongst pregnant women would be achieved and more targeted interventions could be devised.

CHAPTER 7: RECOMMENDATIONS

7.1 Education

Consistently throughout this study it has been demonstrated that midwives practise would benefit from additional education. There is little evidence to suggest that midwives received or benefitted from, any immunological or vaccination related education provided in the undergraduate setting. Additionally, those midwives who had received training via the SA Health Immunization course stated that they benefitted from it in terms of both education, confidence and vaccine provision. An additional course is also available which has been tailored to the specific needs of midwives (SA Health, 2019d). This may be a valuable option for closing the knowledge gap for midwives and if it were made available free of cost, would be a financially sound method of educating midwives in the public sector.

The knowledge deficit in midwives could be, in part, attributed to the nature of undergraduate education across South Australia. Preliminary discussions with course coordinators at Australian Universities that offer Bachelor of Midwifery Programs indicated that immunization courses are offered more frequently as an elective topic as opposed to core subjects. Additionally, an assessment of midwifery textbooks over the years has revealed that they contain very little information on immunology and vaccinology. For example, there was three paragraphs in an old textbook published in 1985, however immunology is not mentioned in a recent text book currently used at Flinders University (Bennett, & Brown, 1985; Myles, Bennett & Brown,1999; Pairman, 2019a, 2019b). Other textbooks assessed also had little to no immunization content (Blackburn, 2013; Glover et al., 2018; Hoover, 2004). With immunization playing a significant part in both antenatal and postnatal care, and

the low knowledge levels that exist amongst surveyed midwives there is a clear need for change in this area.

7.2 Statistical records of Influenza uptake in pregnant women

The lack of accurate antenatal immunization data has been discussed previously. With a clear need for more accurate data, it is recommended that the Perinatal Outcomes Statistics include antenatal immunization status for all births. This will ensure that all research, education, policy and procedures are based on accurate up to date data.

7.3 Pregnancy record (SA Health, 2019a)

The South Australian pregnancy record, whilst a good aid to health care provision, is only as efficient and as effective as its user and the healthcare provider accessing it. Whilst there is a recent addition to this record providing the capacity to record antenatal immunization, there is always the potential for loss of these records as it is made up of loose leaves within a plastic folder. Whilst pregnant women can access multiple levels of antenatal care, there is the potential for care to be delivered across multiple sites. If the folder is lost or forgotten, there is a potential for over or under servicing. Additionally, whilst the data is recorded on databases such as Healthware, the data input is dependent upon the accuracy of data recorded in the pregnancy record (see Appendix 17).

7.4 Nurses and midwife's role

It has been stated by the International Council for nurses that Nurses play a crucial role in both supporting, administering and integrating vaccination in health services (ACM, 2019; Department of Health, 2013). However, this statement is arguably, unsupported in practise. Nursing management are well placed to support and promote midwifery skills and whilst their role is recognised in theory, arguably there is a long way to go at practise level (ACM, 2019). Increased education and support with a view to moving towards immunization autonomy is a recommendation of this study given that the Australian College of Midwives states that midwives must meet regulatory requirements to support the National Immunisation Program (ACM, 2019).

7.5 Future Research

There is a need for further research into the role of midwives and the effect of education on knowledge and practise. As this is the first study in Australia to focus on the role, barriers and enablers of midwives in the promotion and provision of antenatal influenza immunization, there is a clear need for further study to confirm the results. This would ideally take the form of translational research incorporating a pre-test – post-test educational intervention of midwives to fully evaluate the effect of education on practise. Translational research aims to "translate" research findings into practice and has a strong history of producing meaningful health outcomes (Christian, 2018; Curtis, Fry, Shaban & Considine, 2017).

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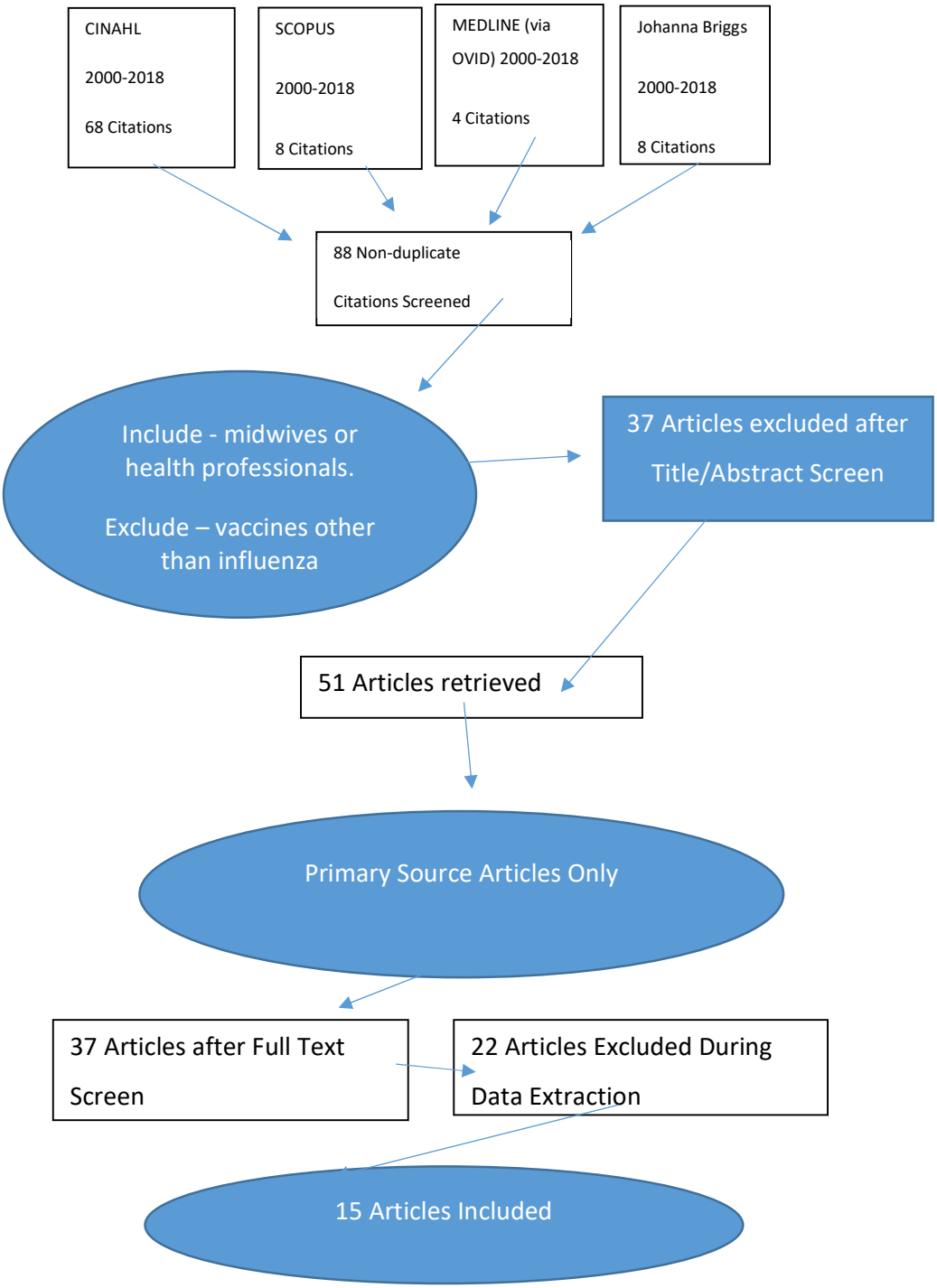
CHAPTER 9: APPENDICES

Appendix 1 - PRISMA Diagram



Appendix 2 - Inclusion/ Exclusion Table

Inclusion Criteria	
Types of studies	Publication date 2000 (inclusive) – present.
	Studies from any geographical location
	Written in English.
	Including key words *immunization, *midwives, *antenatal and *influenza.
	Qualitative, quantitative, and mixed methods studies.
	Study including midwives or healthcare professionals.

Exclusion Criteria	
Types of studies	Non—English language.
	Published pre-2000.
	Grey Literature and secondary source literature.
	Vaccines other than influenza.
	Studies other than with an Antenatal focus.
	Studies focussing on safety/efficacy or the influenza vaccine.

Appendix 3 - Articles chosen to Review

Author and date citation	Aim/Objective	Sample/ setting	Methods and Methodology	Major Findings	Limitations/ Rigour and Validity	Significance of the issue
(Broughton et al., 2009)	The aim of this study was to explore obstetric healthcare workers attitudes and beliefs regarding influenza vaccination in pregnancy.	Healthcare workers at two large hospitals in Providence and Pittsburgh USA were surveyed n=267. This paper failed to include	A cross sectional, quantitative survey of nurses medical and allied health staff was conducted via a written survey made	Poor knowledge of immunization requirements risks and benefits in pregnancy.	The sample in this study included educated and non-educated staff including receptionists and medical assistants, thus providing a	A lack of knowledge and confidence in influenza vaccination in pregnancy. A direct correlation between provider knowledge and recommendation.

		sampling method	up of 16 multiple choice questions.		misrepresented sample size.	
(Collins J, 2014)	The aim of the study was to gain an in-depth understanding of pregnant women's decision-making process in deciding to receive antenatal immunizations	Pregnant women n=17 were purposively recruited to the study from a public and private antenatal clinic located in a large tertiary hospital in Adelaide.	A qualitative descriptive study was conducted using semi-structured interviews using open-ended questions. The study used the Health Belief	Most women were not aware of the risks of acquiring influenza in pregnancy. Health care worker recommendation was vital to women accepting the vaccine.	A limitation of the study is that only one venue was used for the study. Among the participants only three of the seventeen participants had been immunised during their	Lack of knowledge of dangers of Influenza and clear link to importance of HCW recommendation. Uptake in Australia quoted as around 30%.

			Model as a framework for analysis.		current pregnancy, however all expressed a willingness to be immunized.	
(Ishola et al., 2013)	To assess the personal influenza vaccination uptake of midwives and their views on the policy of offering all pregnant women in England	London midwives were surveyed on-line via a semi-structured instrument on survey monkey n=266. Sampling was convenience and surveys	Quantitative study using an on-line survey. Results were presented in percentage form and chi square was used to	Adequate information and training are needed to support midwives to provide antenatal vaccines. 76% agreed that midwives should	Response rate could not be calculated as it could not determine the number of midwives receiving the questionnaire. The survey was sent to	More midwives are prepared to recommend vaccination than to provide the vaccine. The low numbers receiving the influenza vaccine indicates that more education of midwives is required.

	vaccination during pregnancy.	were disseminated by senior midwives.	evaluate the results.	recommend the vaccine but only 25% felt prepared for the role. Only 28% wanted to be immunisers. 43% received the influenza vaccine.	midwives via senior midwives, thereby placing undue pressure on the midwives to complete the survey and raising ethical concerns.	
(Maertens et al., 2016)	The aim was to assess the coverage of influenza and pertussis in pregnancy and	Gynaecologists, GP's midwives and post-partum women (n=823) at ten hospitals in	Quantitative cross-sectional multi-centre study across five provinces	A positive attitude of healthcare providers and overall high vaccination	Limitations of the study include that the study may only be generalisable in Belgium. Only	Belgium has a coverage rate of 45% which is similar to Australian studies. Belgium, midwives who recommend immunization in pregnancy is low. This may be significant for

	to evaluate the cocooning strategy among post-partum women.	Flanders Belgium were Surveyed. (n=261) healthcare workers. Sampling type was not included.	was conducted of GP's Midwives and post-partum women. HCW were invited to complete an encoded questionnaire. Researchers surveyed post-partum women.	coverage was reported. However, only 23% of midwives were reported as recommending pertussis and influenza and only 10% recommended vaccination and cocooning strategies.	hospitals with high delivery rate included in the study. Vaccination numbers were self- reported and subject to bias.	the Australian population. There is a need for education of midwives.
(Maher et al., 2014)	The aim of this study was to investigate the	Purposive sampling of GP's in the	Qualitative descriptive study using	33% of GP did not consider influenza a risk in	The sampling method may have	This study revealed that GP's have a low perception of the risk of influenza in pregnancy.

	knowledge, attitudes, beliefs and practices of GP's in Sydney and SW Sydney.	subject areas manipulated to ensure sex, practise size and local government area were equally represented n=17.	semi-structured interviews and thematic analysis.	pregnancy. Few GP were confident in their knowledge and 50% had concerns for the safety of the vaccination in pregnancy.	introduced selection bias as participants were screened to ensure diversity. A further limitation is the sample size n=17.	There is a need for significant education of GP's, no midwives were included in this study.
(Mak et al., 2015)	The aim of the study was to compare seasonal influenza vaccination uptake among	Women who were pregnant between 2012-2013 in WA were randomly selected to participate.	Quantitative study using telephone interviews of post-partum women. Results were	Vaccination recommendation increased from 37.6% to 62.1% and vaccine uptake increased from 23% to	Study relied on self-report leading to reporting bias. There was no confirmation of	Importance of health care provider recommendation and the need to provide vaccine at time of recommendation to ensure vaccine uptake. Increase from 23% to 36.5%.

	pregnant women in WA and identify factors associated with its uptake.	Study was conducted in 2012 n=407 and 2013 n=831.	analysed using multivariate logistic regression.	36.5%. Antenatal care providers advice was the single most important factor in uptake of the vaccine.	immunization status.	
(McCarthy et al., 2012)	The aim of the study was to conduct an intervention study of maternity staff to improve vaccine uptake in both staff and patient	Postnatal women were interviewed at the Mercy Hospital in Brisbane n=199. Sampling was not mentioned in this paper.	An intervention study of postnatal immunization uptake before and after an education programme.	The study showed an improvement in the vaccination rate post education. Midwife recommendations increased sixfold after education.	Limitations were that the study relied on self-report. This intervention study took place in only one hospital in Brisbane so	The importance of education and accessibility to vaccines and a Healthcare worker recommendation vital to vaccine uptake.

	awareness of the benefits of the vaccine.				may not be generalizable.	
(Mohammed et al., 2018)	The aim of this study was to estimate antenatal vaccine uptake and assess factors associated with it.	Sample included pregnant women (n=180) receiving antenatal care at WCH between Nov. 2014 and July 2016.	A prospective study of pregnant women was conducted using a standardised self-report survey and a follow up phone call at 8-10/52 postpartum.	The study showed a high uptake of immunization (76%) can be achieved with healthcare provider recommendation and a midwife led program.	Limitations included the small sample size and the inclusion of only one site. Also, immunization estimates prior to the study were based on small sample size.	This study demonstrated that high uptake can be achieved with a midwife led program.

(O'Grady et al., 2015)	The aim of the study was evaluating the uptake of antenatal vaccination in Australian Aboriginal and Torres Strait Islander women	Aboriginal and Torres Strait Islander women attending two primary health care settings in Queensland. Sampling was convenience. n=53 for survey and n=7 for yarning circles.	Mixed methods study using results from the FLUMUM study, a cross-sectional survey and yarning circles (focus group).	Less than half the women were offered an influenza vaccine whilst pregnant. The qualitative data revealed that inadequate information about the vaccine and benefits was given.	Small sample size in the yarning circles and convenience sampling as well as self-report of immunization status may have resulted in reporting bias.	Most important was the need for accurate and timely information from health practitioners. 25% of women would have had vaccine if offered. Importance of immediate access to vaccine.
(Regan et al., 2016)	The aim of the study was to evaluate trends and	Post-partum women who delivered in WA between	Quantitative study conducted by telephone	Whilst there was an increase in the number of women receiving	Data was self-reported and subject to recall bias. 15%	Uptake of influenza vaccine low in surveyed area. Additional immunization education is needed.

	determinants in seasonal influenza vaccination among pregnant women in WA.	2012-2014 were randomly selected, 2012 n=566 2013 n=1114 2014 n=1148.	survey. Multivariate logistic regression models were used to estimate immunization status by year.	the vaccine between 2012-2014 the overall number of women receiving the vaccine was 35.5%. Lowest chance of receiving the vaccine was women in public hospital and GP setting.	of vaccinations could not be confirmed.	Healthcare provider recommendation vital to influence uptake of vaccine.
(Tong et al., 2008)	To assess how the knowledge, attitudes and beliefs of	Obstetricians and General practitioners in Toronto were	Quantitative - cross Sectional surveys of	Recommendation of care provider is	Midwives were not included in the study. Only 33%-44%	Revealed serious knowledge deficits among Health Professionals and the vital importance of health care

	maternity care providers influence, their recommendation of influenza vaccine in pregnancy in Canada.	survey by mailed. N=671 care providers. N=185 women. Sampling was convenience.	Healthcare workers and post-partum women. Analysis was performed with SAS 8e. Chi square was used to evaluate associations between knowledge and attitudes.	vital in uptake of vaccine. Maternity care providers had serious knowledge deficits.	response rate. Results may not be generalisable as only surveys conducted in Toronto only.	providers recommendations on the uptake of the vaccine.
(Tuckerman et al., 2015)	The aim of this study was to assess factors	A paper-based questionnaire was distributed	A cross sectional study of	HCW had limited awareness of recommendations	Limitations of the study are the sampling	Health care workers in general have poor knowledge of vaccination requirements. Only

	that influence the uptake of immunisation amongst health care workers	among selected wards in an Adelaide hospital including wards with high and low uptake of vaccines. Sampling was purposive n=423.	healthcare workers was performed across several wards in a large tertiary hospital in Adelaide.	and only a minority were fully immunised.	method which limited participation to selected wards in one hospital. The sampling methods resulted in selection bias. Results cannot be generalised.	16% were fully immunised and only 80% had the annual flu shot. This is significant given that acceptance of self-vaccination influences recommendation of vaccines to patients.
(Vishram et al., 2018)	The aim of this study was to examine the attitudes, knowledge and	Healthcare workers including nurses, midwives and	A link to the quantitative cross-sectional on-line survey	Overall good knowledge of vaccines due in pregnancy. Immunisation	The survey is subject to selection and representation bias due to its	HCW who receive annual influenza vaccines are more likely to recommend vaccine. Those who received training in immunisation result in greater

	role perceptions of midwives, nurses, and health visitors in England.	health visitors working with pregnant women were purposively sampled. Midwives n=2393 Practise Nurses n=751 Health visitors n=297	was sent to nurses, midwives and health visitors via their professional body. Data analysed by STATA. Chi square was used to identify associations.	training is essential to ensure informed, confident and effective vaccine delivery.	methodology. There is also over-representation of white ethnicity and practice nurses.	confidence in recommending vaccines.
(Wiley et al., 2013)	To determine the vaccination coverage among pregnant women	Pregnant women were surveyed at three antenatal	Quantitative self-administered surveys based	Women expressed concerns about the vaccine but	A limitation of the study includes the sample being	Clear evidence of the need for Healthcare worker education in immunisation. Clear benefits in

	in NSW and factors affecting uptake	clinics in NSW. Sampling was non-random stratified sample. N=815	on the Health Belief Model were self-administered by pregnant women.	were more likely to have the vaccine if recommended by a health care worker.	only public patients. The results relied on self-report which can lead to recall bias.	healthcare worker recommendation.
(Wiley et al., 2015)	The aim of the study was to explore women's perceptions of influenza vaccine in pregnancy in Sydney.	To gain an understanding of the risk perception of vaccination by pregnant women, Sampling was made from the quantitative study above	Qualitative study using grounded theory with a focus on the reproductive citizenry model. Conducted by in-depth phone	Women were largely unaware of the risks of acquiring influenza in pregnancy. Consistent recommendations and greater vaccine	Two methods were used, qualitative via in-depth face to face interview and via telephone survey. Limitations of the study include	Importance of education of risks of the disease and benefits of the vaccine. Need for consistency of advice and availability of the vaccine.

		however method is unstated. N=20	interview and face to face interviews using a semi-structured format.	availability were needed.	sampling method was not identified.	

Appendix 4 - _CASP Tool

QUANTITATIVE STUDIES

Author Date	Question focused	Study - Type appropriate	Sample	Instruments	Variables	Results	Results precise	Generalizable	Outcomes important	Implications
Broughton 2009	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Ishola 2013	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Maertens 2018	N	Y	Y	Y	Y	Y	Y	N	Y	Y
Mak 2014	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
McCarthy	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

2012										
Mohammed 2018	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
O'Grady 2015	Y	Y	Y	Y	Y	Y	Y	N	Y	y
Regan 2016	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Tong 2008	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
Tuckerman 2015	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
Vishram 2017	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Wiley 2013	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Appendix 5 - Qualitative Studies

Author Date	Aims clear	Qualitative approach appropriate	Research design appropriate	Recruitment strategy appropriate	Data collection methods appropriate	Researcher bias recognized	Ethical Issues considered	Data analysis rigorous	Findings clearly stated	Research is valuable
Collins 2014	y	Y	Y	Y	Y	Y	N	Y	Y	Y
Maher 2014	Y	Y	Y	N manipulated	Y	N	N	Y	Y	Y
O'Grady 2015	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Wiley 2015	Y	Y	Y	Y	Y	N	N	Y	Y	Y

Appendix 6 - Mixed Method Evaluation

Author	**Qualitative and Quantitative methodology**	**Evidence of integration**	**Mixed methods literature cited**	**Rationale for use of mixed methods**
O'Grady et.al., 2015, pp.1147-1153	Yes. Cross sectional survey and yarning circles included and supplemented by data from a national Australian study (FLUMUM).	Some evidence of integration of results. The qualitative and quantitative results are listed separately, however there was some evidence of integration in the results section.	No evidence of citing recent mixed methods literature.	No rationale was given for the use of a mixed methods approach. Mixed methods were incorporated into the title however there is no evidence of mixed methods questions or joint displays.

Appendix 7 - Mixed Methods Appraisal Tool

Review Area	Key Questions
Bibliographic Overview	O'Grady, KA, Dunbar M, Medlin LG, Hall KK, Toombs M, Meiklejohn J, McHugh L, Massey PD, Creighton A, and Andrews RM, 2015, 'Uptake of influenza vaccination in pregnancy amongst Australian Aboriginal and Torres Strait Islander women: a mixed methods pilot study', BMC Res Notes, Vol.8, Number 1., P.169.
Purpose	The aim of this study was to collect pilot data on vaccine uptake and attitudes towards and perceptions of maternal influenza vaccination in the population to inform a larger study. This study is part of a wider study.
Key Findings	Quantitative data indicated that less than half of the study population received the immunization. Qualitative data revealed that insufficient information was made available to the women to make an informed choice on whether to receive the vaccine.
Evaluative Summary	This is an important pilot study into the uptake of antenatal influenza immunization amongst ATSI women. Whilst the results can't be generalised, they are an indicator of low uptake. This study also revealed that poor information is provided to women which hinders their ability to make informed choices. This study also revealed an appalling lack of immunization knowledge and logistics amongst healthcare professionals. Strengths of this paper are its methodology which by its nature confers data triangulation despite it being only a pilot study. Limitations include small sample size and the reliance on self-report for immunization status. Despite these limiting factors, this study has value and is included in this literature review.

The Study	This was a mixed method study designed to evaluate the uptake of antenatal influenza vaccination in the population described.
Context -Setting	This study was conducted in Queensland in two regional centres because of access to the study population and is appropriate. Quantitative data was obtained from a cross-sectional survey and qualitative data was collected from yarning circles. Sufficient detail is provided about the setting. Rationale for choosing these settings was convenience and access to the population. Study was conducted from January to April 2014.
Context - Sample	• Source population – Aboriginal and Torres Strait Islander (ATSI) women. • Inclusion/exclusion criteria – ATSI women, over 17 years and more than 28/40 pregnant or 16/52 post birth and English speaking. No exclusions applied. • Sample selection – convenience and appropriate. Sample size appropriate for the study. • Key characteristics of sample are ATSI women attending a community health centre.
Outcome	ATSI women's perspectives were addressed in this study. Outcome criteria were the collection of data from ATSI women. This was purely a pilot study so sufficient breadth was present.
Ethics	Ethics was gained from QUT. Informed consent was gained by Aboriginal researchers. Ethical issues of researching ATSI communities was well addressed by using Aboriginal researchers and by using familiar data collection methods such as Yarning circles. This was respectful and appropriate.
Data Collection Methods	This study used data obtained from the FLUMUM study and community based cross-sectional surveys as well as qualitative data obtained from yarning circles. Fieldwork is well described, and all questions asked are listed.

Data Analysis	Qualitative data analysis is well described, as is quantitative data from the survey is also well described, includes raw data extracts. Data triangulation is present due to the nature of the study. Findings were interpreted within the context of the study. Evidence of iteration is present.
Researchers potential bias	Researcher bias is not discussed. Researchers role was also not discussed in this paper. As this is a pilot study it is unlikely to affect the study.
Implications	These study findings are generalisable to the ATSI community in regional areas around Brisbane. This setting is not typical of city settings or of health provision in other states, however it is a pilot study and more data may follow. The conclusion is well positioned and balanced. This pilot study does demonstrate a low uptake of influenza in pregnancy which may be endemic in other areas across the ATSI community.
Other comments	36 references were listed in this study. This is a novel study aimed at gaining previously unavailable data on influenza uptake in pregnancy amongst the ATSI community.

Appendix 8 - Survey Instrument

Thank you for completing this survey. This survey will be used in research approved by the Women's and Children's Health Network Human Research Ethics Committee. You are assured confidentiality and no identifying information is applied to your submission.

This survey should take no more than 2 minutes of your valuable time.

Are you a Registered Midwife? Yes No

How many years have you worked as a midwife?

0-4 5-9 10-14 15 or more.

Where is your primary area of practice?

Do you work in the public sector?

Have you received all your recommended vaccines as a healthcare worker? This includes: Pertussis, Influenza, Measles, Mumps, Rubella, Chickenpox and Hepatitis B.

Yes, No Maybe

Quantitative Survey Questions	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree
Influenza vaccine is effective in preventing illness.					
Pregnant women are more vulnerable to adverse effects from vaccination in pregnancy.					
Influenza vaccine can subsequently cause a person to be sick with influenza.					
Influenza vaccine may induce preterm contractions.					

Influenza disease causes significantly more illness in pregnant women than non-pregnant women.					
Pregnant women are more likely to be hospitalized for influenza than non-pregnant women.					
The foetus may benefit from maternal influenza vaccination while in-utero.					
Influenza immunization in pregnancy can have a protective effect on the infant during the first year of its' life.					
I am concerned about the side-effects from influenza vaccine.					
Healthcare workers should be immunized against influenza.					
All vaccines should be avoided in pregnancy.					

Influenza vaccines should be avoided in pregnancy.					
It is my responsibility to discuss influenza vaccination with my clients.					
The influenza vaccine is beneficial in protecting against influenza infection.					
Influenza vaccination is safe if given in pregnancy.					
I always recommend the influenza vaccine in pregnancy.					
It is not my responsibility to offer the influenza vaccine.					
I do not provide the Influenza vaccine to pregnant women.					

Offering the influenza vaccine is not a midwifery role.					
I feel equipped to educate pregnant women on influenza immunization.					
Midwives are sufficiently trained to provide immunization.					
All pregnant women should receive the influenza vaccine.					
I have given the influenza vaccine to pregnant women in the 2018 influenza season.					

Have you completed formal Immunization training? Yes No

Thank you for taking part in this anonymous survey. Part of this study involves conducting face to face interview of midwives who volunteer for this aspect of the study. You are under no obligation to volunteer; however, your contribution would be welcome. If you are happy to be interviewed, at a time and place of your choosing, please complete the following information.

I would be happy to be interviewed at a time and place of my choosing. This should take no more than thirty minutes. Please enter your first name only and a contact number.

Name……. Phone Number……

Appendix 9 - Qualitative Study Questions

What do you think is the role of midwives in antenatal immunization?

(purpose: to find out what midwives perceive as their role in immunization promotion and/or provision).

What are your thoughts on the risk of influenza acquired in pregnancy?

(purpose: to find out midwives' perceptions of the risk of influenza infection in pregnancy on both mother and baby).

How do you feel about midwives administering immunization?

(purpose: to discover how midwives feel about immunization provision).

What are your feelings about the requirement to receive workplace immunizations?

(purpose: to ascertain midwives' feelings on workplace immunization, whether they agree or disagree and whether they receive all or some or no vaccines).

What are the risks associated with influenza vaccination in pregnancy?

(purpose: to gain an understanding of what midwives perceive as risks involved with giving or promoting the influenza vaccine in pregnancy).

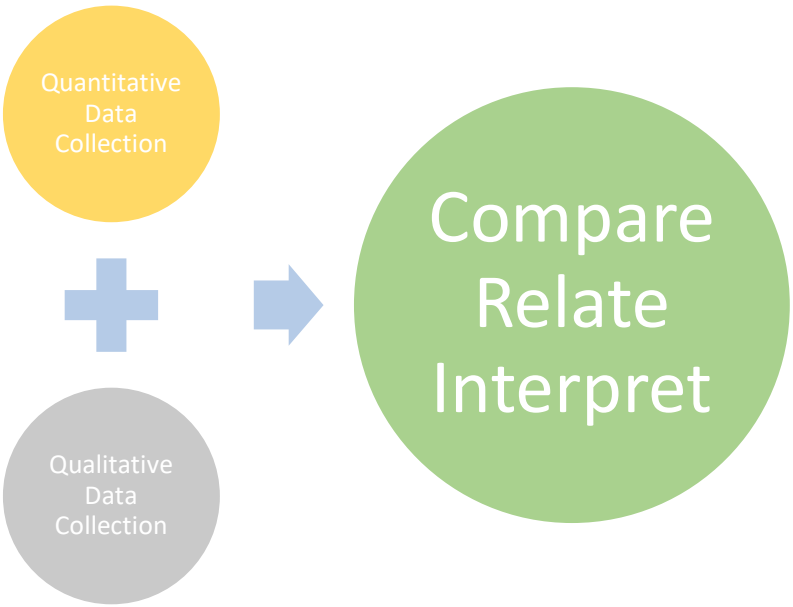
Did you see or hear any information about the influenza vaccine in the 2017 season? What are your thoughts about that?

(purpose: To ascertain whether midwives were influenced by media coverage during the 2017 influenza season).

What do you think would assist midwives to take a more active role in immunization provision?

Purpose: To discover what midwives perceive as barriers and enablers to immunization provision).

Appendix 10 - Mixed Methods Convergent Parallel Design



Appendix 11 - Information and consent form

INFORMATION SHEET

For Midwives

CONSENT FOR PARTICIPATION IN RESEARCH
By interview

Title	South Australian Antenatal Influenza Study
Short Title	Influenza Study
Protocol Number	HREC/18/ECHN/68
Project Sponsor	Flinders University
Coordinating Principal Investigator	Associate Professor Charlene Thornton Susan Smith

1. Introduction

You are invited to take part in this research project which is called South Australian Influenza Study. You have been invited because you are a midwife working in the South Australian public sector and have a wealth of knowledge to share. Your opinion will be appreciated. Your contact details were provided by you and were obtained from the survey you completed online or have shown interest in participating from your workplace.

The Participant Information sheet tells you about the research project. It will explain the processes involved with taking part. Knowing what is involved will help you decide if you want to take part.

Please read this carefully. Ask questions about anything that you don't understand or want to know more about. Before deciding whether or not to take part you might want to talk about it with a relative or friend.

Participation in this research is voluntary. If you don't wish to take part, you don't have to.

If you decide you want to take part in the research project, you will be asked to sign the consent section. By signing it you are telling us that you:

- **Understand what you have read.**
- **Consent to take part in the research project.**
- **Consent to be involved in the research described.**

You will be given a copy of this Participant Information and Consent Form to keep.

2. What is the purpose of this research?

The aim of the project is to find out what midwives perceive as their role in the promotion and provision of influenza immunization and the barriers and enablers to this practice. This will be the first Australian study to fully investigate the role and perceptions of midwives in the promotion and provision of antenatal influenza immunization. This study will provide information which may assist in the development of policies and education practices. There is no existing knowledge on the role of midwives in immunization provision in the antenatal period. The results of this research will be used by the researcher, Susan Smith, to obtain a Masters of Midwifery degree. Susan Smith has initiated this research. The research is unfunded and has received no grants or sponsorship and is being conducted at Flinders Medical Centre, Lyell McEwan Hospital, Mount Barker District Soldiers Memorial Hospital and Murray Bridge soldiers' Memorial hospital.

3. **What does participation in this research involve?**

- Consent form will be signed prior to any study assessments being performed.
- Procedures will include:
  - Face to face interview with the researcher at a time and place of your choosing.
  - This will take no more than thirty minutes of your time.
  - The project will be complete in one year from commencement.
  - Digital audio recording of the interview.
  - Transcription of interview.
  - Access to transcript for authentication if desired.
  - Data will be extracted from the transcript.
  - Data will be presented with no identifying features as to the source of information.
  - Anonymity is assured.

This research project has been designed to ensure that the researchers interpret the results in a fair and appropriate way. There are no costs associated with participating in this research project, nor will you be paid.

4. Other relevant information about the research project.

This study will include up to 10 midwives working in the South Australian public health sector. Four hospitals have been selected for the study. These include Flinders Medical Centre, the Lyell McEwan hospital, Mount Barker District Soldiers' Memorial Hospital and Murray Bridge Soldiers' Memorial Hospital.

5. **Do I have to take part in this project?**

Participation in any research is voluntary. If you do not wish to take part, you do not have to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage.

If you decide to take part, you will be given this Participant Information and Consent Form to sign and you will be given a copy to keep.

Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your relationship with the researcher.

6. **What are the possible benefits of taking part?**

There will be no clear benefits to you from your participation in this research. The sharing of your experiences will provide depth of understanding and will enhance and support the data obtained from the on-line survey. Your experiences will provide a deeper understanding of the research problem.

7. **What are the possible risks and disadvantages of taking part?**

You may feel that some of the questions we ask are stressful or upsetting. If you do not wish to answer a question, you may skip it and go to the next question, or you may stop immediately. If you become upset or distressed as a result of your participation in the research project, the research team will be able to arrange for counselling or other appropriate support. This may include a referral to Lifeline. Any counselling or support will be provided by qualified staff who are not members of the research team. This counselling will be provided free of charge.

8. What if I withdraw from this project?

You may withdraw from this project at any time. If you decide to withdraw from the project, please notify a member of the research team before you withdraw. A member of the research team will inform you if there are any special requirements linked to withdrawing. If you do withdraw, you will be asked to complete and sign a 'Withdrawal of Consent' form; this will be provided to you by the research team.

9. Could this research project be stopped unexpectantly?

This research project may be stopped unexpectantly for a variety of reasons. This could include the researchers' illness, withdrawal from the course or when data saturation is reached.

10. What happens when the research project ends?

It is anticipated that the results of this project will be published and/or presented in a variety of forums. In any publication and/or presentation, information will be provided in such a way that you cannot be identified, except with your express permission. In accordance with relevant Australian or SA privacy and other relevant laws, you have the right to request access to the information about you that is collected and stored by the research team. You also have the right to request that any information with which you disagree be corrected. Please inform the research team member named at the end of this document if you would like to access your information. If requested the participants can be provided with a summary of results of the project. This will happen on completion of the project around December 2019.

11. **What will happen to information about me?**

Data collected will be completely de-identified and will be presented under a pseudonym. The data will be stored at Flinders University in a locked filing cabinet in a locked room. Digital data will be stored on the Flinders University system and be password protected. Only members of the research team listed will have access to the data. Any information obtained for the purposes of this project that can identify you, will be treated as

confidential and securely stored. It will be disclosed only with your permission or as required by law. Data will be stored for fifteen years under legal requirements. Participants are providing consent for this project only. This study does not involve establishment of a data bank. Please note that due to the nature of the internet, it is possible that data transmitted online can sometimes be accessed by unauthorised third parties as with any online information. While every effort is made to minimise this risk, we cannot guarantee that information you provide online will never be compromise. Once data is retrieves from the survey software provider it will be securely stored on password protected computers and password protected electronic files which will be accesses by study researchers.

12. **Complaints and compensation**

Any complaints arising from participation in this research should initially be directed to the Coordinating principal researcher or the associate researcher. If you suffer any distress or psychological injury because of this project, you should contact the research team as soon as possible. You will be assisted with arranging appropriate treatment and support. Complaints may also be presented to the reviewing HREC.

Who is organising and funding the research?

This research project is being conducted by Susan Smith, Masters of Midwifery student enrolled at Flinders University College of nursing and midwifery under the supervision of Associate professor Charlene Thornton. This project is unfunded and unsponsored.

14. **Who has reviewed the research project?**

All research in Australia involving humans is reviewed by an independent group of people called a Human Research Ethics Committee (HREC).

The ethical aspects of this research project have been approved by the Women's and Children's Health Network Human Research Ethics Committee.

This project will be carried out according to the *National Statement on Ethical Conduct in Human Research (2007)*. This statement has been developed to protect the interests of people who agree to participate in human research studies.

15 Further information and who to contact

The person you may need to contact will depend on the nature of your query. If you want any further information concerning this project or if you have any problems which may be related to your involvement in the project, you can contact the researcher on 0407374698.

Research contact person

Name	*Susan Smith*
Position	*Researcher*
Telephone	*0407374698*
Email	*Smit0515@flinders.edu.au*

For matters relating to research at the site at which you are participating, the details of the local site complaints person are:

Complaints contact person

Name	*Associate Professor Charlene Thornton*
Position	*Associate Professor Midwifery, College of Nursing and Health Sciences Flinders University*
Telephone	*+61 8201 3409*
Email	*Charlene.thornton@flinders.edu.au*

If you have any complaints about any aspect of the project, the way it is being conducted or any questions about being a research participant in general, then you may contact Mr Luke Fraser.

Reviewing HREC approving this research and HREC Executive Officer

Reviewing HREC name	*Women's and Children's Health Network Human Research Ethics Committee*
HREC Executive Officer	*Mr Luke Fraser*
Telephone	*8161 6521*
Email	*luke.fraser2@sa.gov.au*

details

Local HREC Office contact

Name	*Women's and Children's Health Network Human Research Ethics Committee*
Position	*Executive officer – Mr. Luke Fraser*
Telephone	*8161 6521*
Email	*luke.fraser@sa.gov.au*

WOMEN'S & CHILDREN'S HEALTH NETWORK (WCHN)

HUMAN RESEARCH ETHICS COMMITTEE (HREC)

Title	South Australian Antenatal Influenza Study
Short Title	Influenza Study
Protocol Number	TBA
Project Sponsor	Flinders University
Coordinating Principal Investigator/ Principal Investigator	Associate Professor Charlene Thornton
Associate Investigator	Susan Smith
Location	FMC, Lyell McEwan, Mt Barker District Hospital and, Murray Bridge Hospital.

I _____

hereby consent to my involvement in the research project entitled:

_____

1. The nature and purpose of the research project described on the attached Information Sheet has been explained to me. I understand it and agree to taking part.

2. I understand that I may not directly benefit by taking part in this study.

3. I acknowledge that the possible risks and/or side effects, discomforts and inconveniences, as outlined in the Information Sheet, have been explained to me.

4. I understand that I can withdraw from the study at any stage and that this will not affect medical care or any other aspects of my relationship with this healthcare service.

5. I understand that there will be no payment to me for taking part in this study.

6. I have had the opportunity to discuss taking part in this research project with a family member or friend, and/or have had the opportunity to have a family member or friend present whilst the research project was being explained by the researcher.

7. I am aware that I should retain a copy of the Consent Form, when completed, and the Information Sheet.

8. I understand that my information will be kept confidential as explained in the information sheet except where there is a requirement by law for it to be divulged to authorised third parties. This requirement is standard and applies to information collected, both in research and non-research situations.

9. I understand that the alternate contacts I have provided may be used to contact me as explained in the information sheet for study related purposes.

Signed: .....

Full name.....

Dated: .....

I certify that I have explained the study to the participant and consider that he/she understands what is involved.

Signed: ..... Title: .....

Dated: .....

Declaration by Participant

I have read the Participant Information Sheet, or someone has read it to me in a language that I understand.

I understand the purposes, procedures and risks of the research described in the project.

I have had an opportunity to ask questions and I am satisfied with the answers I have received.

I freely agree to participate in this research project as described and understand that I am free to withdraw at any time during the project without affecting my future care.

I understand that I will be given a signed copy of this document to keep.

Name of Participant _____

Signature _____ Date _____

Declaration by Researcher†

I have given a verbal explanation of the research project; its procedures and risks and I believe that the participant has understood that explanation.

Name of Researcher† (please print) _____

Signature _____ _____

Form for Withdrawal of Participation - *Adult providing own consent*

Title	South Australian Antenatal Influenza Study
Short Title	Influenza Study
Protocol Number	TBA
Project Sponsor	Flinders University
Coordinating Principal Investigator/	Associate Professor Charlene Thornton
Associate Investigator	Susan Smith
Location research will be conducted	FMC, Lyell McEwan, Mt Barker DSMH, Murray Bridge SMH.

Declaration by Participant

I wish to withdraw from participation in the above research project and understand that such withdrawal will not affect my routine care, or my relationships with the researchers or Flinders University.

Name of Participant (please _____

Signature

_____ Date _____

In the event that the participant's decision to withdraw is communicated verbally, the Senior Researcher must provide a description of the circumstances below.

Declaration by Researcher†

I have given a verbal explanation of the implications of withdrawal from the research project and I believe that the participant has understood that explanation.

Name of Researcher (please print) _____
Signature _____ _____

† An appropriately qualified member of the research team must provide information concerning withdrawal from the research project.

Appendix 12 - Ethics Approval letter

Women's & Children's Hospital

Research Secretariat
Level 2, Samuel Way Building
72 King William Road
North Adelaide SA 5006
Tel 08 8161 6390
Tel 08 8161 6521
www.wch.sa.gov.au

19th July 2018

A/Prof C Thornton
College of Nursing and Health Sciences
Flinders University
Sturt Road
BEDFORD PARK SA 5142

Dear A/Prof Thornton

Re: The South Australian antenatal influenza study. HREC/18/WCHN/68. Ethics expiry date: 31/07/2021.

Lead HREC for the above study for the following institutions/sites:

Flinders Medical Centre
Mount Barker District Soldiers Memorial Hospital
Murray Bridge Soldiers Memorial Hospital
Lyell McEwin Hospital

I refer to your letter dated 22nd June 2018 in which you responded to matters raised by the WCHN Human Research Ethics Committee at its May 2018 meeting. I am pleased to advise that your protocol has been granted full ethics approval and meets the requirements of the *National Statement on Ethical Conduct in Human Research*.

Specifically, the following documents have been noted/approved:

Document	*Version*	*Date*
Patient Information Sheet/Consent Form: Poster	1.1	02 May 2018
Interview Schedules / Topic Guides: Open ended questions for interview phase	1.1	29 April 2018
Questionnaire/s: Survey	1.1	29 April 2018
Research Protocol: Research Protocol	1.1	28 April 2018
Covering Letter: Covering letter	1.1	29 April 2018
Master Participant Information Sheet and Consent Form		14 June 2018
LNR Application: AU/15/8E76311		22 May 2018

This letter constitutes advice on ethical consideration only. You must not commence this research project at a site until you have obtained separate research governance approval from the site concerned. A copy of this letter should be forwarded to all site investigators for submission to the relevant Research Governance Officer.

At the WCHN, or any other SA Health site, separate authorisation from the Chief Executive or delegate of that site must be obtained through a Site Specific Assessment (SSA) request. For information on this process at the WCHN, please contact the WCHN Research Governance Officer, Ms Camilla Liddy (telephone 8161 6688, email camilla.liddy@ sa.gov.au).

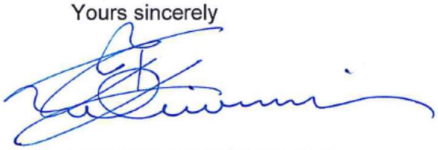
I remind you approval is given subject to:
•immediate notification of any serious or unexpected adverse events to participants;
•immediate notification of any unforeseen events that might affect continued ethical acceptability of the project;

Government of South Australia
SA Health

•submission of any proposed changes to the original protocol. Changes must be approved by the Committee before they are implemented;
•immediate advice, giving reasons, if the protocol is discontinued before its completion;
•submission of an annual report on the progress of the study, and a final report when it is completed to the WCHN Research Governance Officer. It is your responsibility to provide these reports, without reminder. The proforma for the report may be found on the WCHN Research Governance and Ethics website.

Approval is given for three years only. If the study is more prolonged than this, an extension request should be submitted unless there are significant modifications, in which case a new submission may be required. Please note the expiry date in the title above and include it in any future communications.

Yours sincerely



TAMARA ZUTLEVICS (DR)
CHAIR
WCHN HUMAN RESEARCH ETHICS COMMITTEE

Appendix 13 - Survey Reliability Calculation

Appendix 12 - Survey Reliability

Names Q2 to Q29	1		2		3		4		5		6		7	8		9		10		11		12	
	A1	A2	F1	F2	E1	E2	J1	J2	D1	D2	T1	T2	N1	N2	O1	O2	J1	J2	C1	C2	S1	S2	L1	L2
Q2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Q3	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Q4	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y
Q5	15+	15+	15+	15+	15+	15+	10/14	10/14	15+	15+	15+	15+	10/14	10/14	0/4	0/4	15+	15+	15+	15+	15+	15+	15+	15+
Q6	C	C	C	C	C	C	T	T	T	T	N	N	All	All	T	T	C	C	C	C	C	C	All	All
Q7	Y	Y	Y	Y	Y	Y	M	M	Y	Y	N	N	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y
Q8	Y	Y	Y	Y	Y	Y	N	N	Y	N	N	N	Y	Y	N	N	N	N	Y	Y	Y	Y	N	N
Q9	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	A	A	A	A	A	A	SD	SA	S	SA	U	U
Q10	SD	SD	A	A	SD	SD	SD	SD	D	U	D	SD	D	D	U	U	D	D	SD	SD	SD	SD	SD	SD
Q11	SD	D	SD	SD	SD	SD	SD	SD	D	D	D	SD	D	D	D	D	SD	SD	SD	SD	SD	SD	SD	SD
Q12	SD	SD	D	SD	SD	SD	SD	SD	D	D	D	SD	D	D	U	U	SD	SD	D	SD	SD	SD	SD	SD
Q13	SD	SA	D	D	SA	SA	SA	SA	D	U	SA	SD	A	A	U	A	SA	SA	A	SA	SA	SA	SA	A
Q14	A	A	A	A	SA	SA	SA	SA	U	U	SA	U	U	A	A	A	SA	SA	A	SA	SA	SA	SA	SA
Q15	SA	SA	A	A	SA	SA	A	A	A	A	SA	A	A	A	A	U	SA	SA	A	SA	SA	SA	SA	SA
Q16	A	SA	A	A	SA	SA	A	A	A	A	A	SA	U	U	A	A	SA	A	SA	SA	SA	SA	U	U
Q17	SD	SD	D	D	SD	SD	SD	D	D	D	D	SD	SD	D	D	D	D	SD	SD	SD	SD	SD	SD	SD
Q18	SA	SA	A	SA	SA	SA	SA	SA	A	SA	D	A	SA	SA	A	U	SA	SA	SA	SA	SA	SA	SA	SA
Q19	D	D	D	SD	SD	SD	SD	SD	D	D	U	SD	SD	SD	D	D	SD	SD	SD	SD	SD	SD	SD	SD
Q20	SD	SD	D	D	SD	SD	SD	SD	D	D	SD	SD	SD	SD	D	D	SD	SD	SD	SD	SD	SD	SD	SD
Q21	SD	SA	A	SA	SA	SA	SA	SA	A	A	A	A	SA	SA	A	A	A	SA	SA	SA	SA	SA	SA	SA
Q22	SA	SA	A	SA	SA	SA	SA	SA	A	A	SA	SA	SA	A	U	A	A	SA	SA	SA	SA	SA	SA	SA
Q23	SA	SA	U	U	SA	SA	SA	SA	A	A	SA	SA	SA	SA	A	A	A	SA	SA	SA	SA	SA	SA	SA
Q24	SA	SA	U	U	SA	SA	SA	SA	A	A	U	A	SA	SA	U	A	U	SA	A	SA	SA	SA	SA	SA
Q25	U	SD	D	A	A	A	SD	SD	D	D	A	A	SD	SD	U	A	U	SD	A	SD	SD	SD	SD	SD
Q26	U	U	U	A	D	D	SD	SD	D	D	SD	A	SD	SD	A	U	U	SD	SD	SD	SD	SD	SD	SD
Q27	A	U	U	A	SA	SA	SA	A	A	A	SD	SD	SA	SA	A	A	A	A	U	U	SA	SA	SA	SA
Q28	SA	U	D	D	SD	D	SA	A	A	A	A	SA	U	A	D	U	D	SD	D	D	SA	SA	U	U
Q29	SA	SA	U	D	SA	SA	SA	SA	A	U	SA	SA	SA	SA	U	U	A	SA	A	SA	SA	SA	U	U
Q30	U	U	SD	SD	SD	D	SA	SA	D	Nil	SD	SD	SD	U	SD	SD	SD	SD	SD	SD	SA	SA	SD	SD
Dif	7		8		2		2		5		13		5	9		10		5		1		1	
Sim	22		21		27		27		24		16		24	20		19		24		28		28	

Appendix 14 - Facebook Advertisements

Appendix 15 - Poster

Appendix 16 – Themes

1 Role of Midwives

Level 1	Level 2	Level 3
Encouraging	Encourage	Encourage
promoting	Promote	Promote
educating	Educate	Educate
talk through concerns	Administer	Administer
advise not mandatory	Cocoon infant	Protect
administer	Autonomous	
just another tool	Simple and effective	
protect mothers/babies	Protect	Protect
I don't know why they don't give it		
All RN's can give an injection	Capable of providing	Capable of providing
it is one of the easiest things to keep people well		

Give them research findings, refer to more information why it is beneficial		
All the family should have it/cocoon them		
I am pro being as autonomous as possible	autonomous	
Public v private		

2 – Attitudes behaviours and practises

Level 1	Level 2	Level 3
Risk to foetus and mum	Morbidity and mortality of mum and baby	Increased morbidity and mortality of mum and baby
Prematurity		
Mum high risk		
Mums get it worse		

Get so sick		
Get sick quickly		
Worse outcomes		
Lower immunity		

3 – Side effects of vaccine

Level 1	Level 2	Level 3
Localised reaction	Local reaction	Local with some minor and major reactions
Sore arm	Can't get flu from vaccine	
Can't get flu from vaccine	Possible anaphylaxis	
Pain at site		
anaphylaxis		

4 – 2017 influenza season

Level 1	Level 2	Level 3
Didn't cover all strains	Nil significant	
Ran out of vaccines		
promoted		
Poor timing		

5 – Administer the influenza vaccine

Level 1	Level 2	Level 3
Very comfortable	Comfortable /confident	Comfortable and confident
Well equipped	Course helped	educated

Knowledge helpful		
I am an RN so can do		
Completed the course		

6 – Education

Level 1	Level 2	Level 3
Midwives need education	Need for education	Education, accreditation and more training at university.
Need to educate families	Need for accreditation	
ACM should push midwives	No training at university	
Medical staff should be aware of our skills		
No training at university		
Need for university training		
SA Health course should be incorporated into university training		
Need for accreditation		

7 – Personal immunization status

Level 1	Level 2	Level 3
Own protection	Protect self and family	Responsible to protect those at risk
Protect babies	Herd immunity	Herd immunity
herd immunity	Protect babies	
Own choice, not mandatory	Benefits outweigh risks	
Protect family		
Benefits versus risks		
Annual event?		
Staff should have some vaccines		

Appendix 17 – South Australian Pregnancy Record

South Australian Pregnancy Record (Version 11, January 2019) has been removed from pages 157-164 of this thesis due to copyright restriction.