

PRENATAL INTERVENTIONS THAT IMPROVE NATIVE AMERICAN
PREGNANCY OUTCOMES AND REDUCE INFANT MORTALITY:
AN INTEGRATIVE REVIEW

by

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Jeanne Kathryn Bloom

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DEDICATION

To the Native women and infants of the United States and Canada. This research may not eliminate the health disparities you face, but I hope it will raise awareness and offer ideas for bettering pregnancy outcomes and decreasing infant mortality.

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ABSTRACT

Native mothers are at increased risk for negative pregnancy outcomes and within the first year of life, Native babies have substantially higher infant mortality rates than their White counterparts. The primary aim of this study was to identify a broad range of interventions/perspectives that positively affect pregnancy outcomes and reduce infant mortality in Indigenous communities. An integrative review using four databases was conducted. Thirty-four articles met the inclusion/exclusion criteria. The findings and recommendations of each article were documented in a chart (Appendix C) that gave rise to the development of a socioecological framework for pregnancy outcomes in Native women (Appendix D). Individual factors that influence pregnancy outcomes included behaviors/lifestyles, mental health, tobacco use, educational attainment, maternal age, prenatal care, breastfeeding, immunizations, family planning, and socioeconomics/WIC enrollment. Interpersonal factors included significant other, family support, peer support, and traditional beliefs. Community factors included: community health clinics, prenatal services, SIDS education, infant care education, home visits, smoking cessation & prevention programs, injury rates/environmental safety, tribal commitment to mothers and infants, and integration of traditional and western medicine. Public policy factors included WIC, safe water and sanitation, IHS funding, and systems to monitor Native health. In total, the synthesis of the findings from the literature appears to influence pregnancy outcomes. For Native American pregnancy outcomes to improve and infant mortality rates decline, interventions will need to target all levels of the socioecological framework: individual, interpersonal, community, and public policy. In addition, Maslow's Hierarchy of Needs must be considered.

CHAPTER ONE

INTRODUCTION TO THE STUDY

Introduction

Health disparities abound for Native Americans (NA), and these disparities are seen from an individual's earliest moments. Within the first year of life, American Indian babies are 1.5 times more likely to die than non-Hispanic Whites (Centers for Disease Control and Prevention [CDC], 2010). This rate of death within the first year is known as the infant mortality rate (IMR). Often it is the tool used to measure a population's health. "Infant mortality is not a comprehensive measure of a population's health status but it does measure a society's ability and willingness to care for its most dependent members" (Nakamura, King, Kimball, Oye, and Helgersen, 1991, p. 2248). In a recent study ranking countries from lowest IMR to highest, the United States (U.S.) ranked a dismal forty-first of 193 countries. The ranking placed the U.S. behind countries like Lithuania, Poland, Cuba and Malaysia. Canada ranked only marginally better at thirty-ninth (Oestergarrd, et al., 2011).

The Native people of Canada, First Nations, also struggle with disparities similar to the NA in the U.S. Indigenous babies have substantially higher IMRs than those of other infants born in Canada (Luo et al., 2004). Like American Indians, Canadian Native women are noted to have higher rates of stillbirth, low-birth-weight-infants and prematurity (Wenman et al., 2004).

One has only to look at historical conditions to see that improvement is possible. In 1955, IMRs for NA were 62.7 deaths for every 1000 live births (Baldwin et al., 2009). The

Indian Health Services (IHS) was created in 1955, and by 1993 the IMR had dropped to 8.7 per 1000 live births (Baldwin et al., 2002). Since then, improvement has stagnated. Recent data from the CDC document NA IMR at 9.22 per 1000 while the non-Hispanic White rate is 5.63 per 1000 (CDC, 2011).

The U.S. government is trying to address the disparities with their Healthy People goals and agenda to better the health of the entire country. For Healthy People 2020 the government set the IMR for all races at 6.0 infant deaths per 1000 live births (U.S. Department of Health and Human Services, 2010).

Background of the Study

Disparities

Disparities are symptoms of complex systemic problems. “Health disparities are rooted in poverty, lower socioeconomic status, and less educational attainment, all which are prevalent throughout Native communities” (Palacios & Portillos, 2009, p. 15). A new survey shows that Native Americans have “larger families, less health insurance (the number of AI/ANs [American Indians/Alaska Natives] without health insurance is over double that for U.S. all races), and a poverty level nearly twice that of the rest of the population” (Indian Health Services, 2011). These factors have a compounding effect. “Low income levels, low educational attainment, and membership in a marginalized group are all factors that place Native American women at risk for ECB [early childbearing—age 18 or younger]” (Palacios & Kennedy, 2010, p. 425). Additionally, Native American women tend to not seek early and ongoing prenatal care. Compared to non-Hispanic Whites, NA women are 3.5 times more likely to begin prenatal care in the 3rd trimester or not at all (CDC, 2010).

The literature is filled with articles describing the many barriers that minority women face in order to receive prenatal care. In an article reviewing 36 different publications on women's experience with prenatal care, researchers found minority and low income women tend to experience long wait times for care, discrimination because of race and/or lack of insurance and inadequate dispensation of prenatal information (Novick, 2009).

As a result, women may decide that the benefits of receiving [prenatal care] PNC do not outweigh the expenditure of time and resources required to obtain care. These women, who may sometimes be viewed within the health care system as noncompliant or passive nonusers of care, may in fact be making rational choices (Novick, 2009, p. 233).

Costs Related to Disparities

Costs that result because of infant health disparities are exorbitant. The Indigenous people of the U.S. and Canada tend to have more preterm birth compared to non-Hispanic Whites (Luo et al., 2004; Sparks, 2009); the March of Dimes Foundation calculated \$51,600 was spent for every preterm infant born (March of Dimes, 2009). A recent study estimated the average cost per year of premature children from birth to age four. The researchers found full term babies cost \$1736/yr where as the preterm children cost on average \$28,290/yr. The average cost of premature children ranged from \$17,381/yr to \$79,856/yr with the expenses increasing with decreasing gestational age (Korvenranta et al., 2010). These figures are only the monetary damage associated with infant health disparities; the cost of losing a child does not address the emotional toll and grief that can be associated with negative pregnancy outcomes and infant mortality.

Perinatal bereavement impacts the parents and family who were involved in the pregnancy. Perinatal loss is associated with anxiety, depression, obsessive-compulsive

disorder, marital conflict, post-traumatic stress disorder, and suicide (Hutti, 2005). Perinatal death is typically associated with intense grief; however, society often ignores or minimizes the grief that in itself can be the most painful part of the experience (Capitulo, 2005). The affects of perinatal loss can be devastating; therefore, determining the factors that contribute to positive pregnancy outcomes is of vital importance.

Disparities Prevalence

The number of individuals affected by health disparities is staggering. The CDC estimates 1 in 8 babies are born prematurely in the US which means over half a million babies each year are premature (CDC, 2009). In one rural western state 11.9% of all live births were premature compared to 15.8% of Native American births (March of Dimes, 2010).

Uniqueness of Tribal People

Native people live in unique circumstances. In the United States, each Tribal Nation is sovereign and as such has the authority to develop laws and government on behalf of the people (American Indian Policy Center, 2002). “Tribes were sovereign nations long before the formation of the United States and continue to remain sovereign today” (American Indian Policy Center, 2000, p. 22). Reservations have a nation-to-nation relationship with the United States government; however Congress does have the ability to override Indian affairs (American Indian Policy Center, 2002). Interestingly, in Canada, Indian Reserves are units of land that are held in trust by the British Crown. The tribe has the right to sell the land but only if the Crown is involved to oversee the deal (First Nations Studies Program,

2009). Some First Nations peoples view their relationship with the Crown as nation-to-nation; however that line has never fully been determined. Canada has been hesitant to officially declare First Nations independent for fear of the effect on Canada. So while historically different, both American's Indian Reservation and Canada's Indian Reserves do function independently from the country's government.

Statement of the Problem

Pregnancy outcomes for Native people are worse than their White counterparts. Native Americans have 1.5 times the IMR as non-Hispanic Whites, Native American babies are 30% more likely to die from complication of low birth weight and 20% more likely to die from congenital malformations compared to non-Hispanic White babies (CDC, 2010). Although researchers have documented the existence of the disparity in the Indigenous population, little consensus is available related to holistic solutions.

Purpose of the Study

The primary aim of this study was to conduct an integrative literature review to identify a broad range of interventions/perspectives that positively affect pregnancy outcomes and reduce infant mortality in Indigenous communities. This study will contribute towards a better understanding of the circumstances that positively impact pregnancy outcomes and infant mortality. After examining and synthesizing the literature, a model was developed based on the socioecological framework.

Cochrane Reviews

Much research has been conducted to identify interventions and conditions that contribute to healthy pregnancy outcomes. The Cochrane Collaboration is an independent non-profit group that conducts extensive reviews to determine best practice based on their analysis of primary published research. The Cochrane Reviews are considered the gold standard due to the fact that studies included typically have big sample sizes, robust rules on data to include in the review and stringent inclusion/exclusion criteria. The recommendations that are produced from the reviews are considered to be the most accurate information because of their rigor. Many times, medical protocol and practice are changed based on the conclusions of their reviews (Cochrane Collaboration, 2011).

There are many Cochrane reviews on pregnancy and the issues surrounding pregnancy. Sometimes after analyzing all primary published studies on a topic the group can definitively answer the question they asked. For example, from their analysis Lumley et al. (2009) found that providing smoking cessation interventions were effective in helping pregnant women to quit smoking. Another review found that zinc supplementation improves pregnancy and infant outcomes (Mahomed, Bhutta, & Middleton, 2007). However, often the results of systematic reviews are inconclusive.

When the Cochrane reviews cannot reach a conclusion on a topic, this finding highlights how much we have yet to learn. The group tried to determine dietary advice in pregnancy for preventing gestational diabetes, and after looking at all the research, they determined they didn't have enough data (Tieu, Crowther, & Middleton, 2008). Another group from the Cochrane Collaboration reviewed the literature to see if pre-pregnancy

health promotion improved pregnancy outcomes; again, there was insufficient evidence to say if health promotion activities affected pregnancy outcomes (Whitworth & Dowswell, 2009). Do home visits during pregnancy and after birth help women with an alcohol or drug problem? Again the Cochrane Collaboration found there was not enough data to say (Doggett, Burrett, & Osborn, 2005). These studies change practice but they also help guide research by identifying the gaps in our knowledge.

The growing body of research adds to society and our comprehension of the unknown. Today we are unsure why Native people have such high IMRs and poor pregnancy outcomes. This study will add one more piece to help solve the puzzle.

Theoretical Basis of the Study

Socioecological Framework

A socioecological framework was used and adapted for this study. A socioecological perspective “views human environments as complex systems in which local settings and organizations are nested within more complex and remote regions” (Stokols, 2000, p. 30).

The theory:

. . . emphasizes the need to examine multiple levels of influence on behavior and recognizes that decisions and behavior are the result of a synergy among these levels and cannot be well understood without viewing the context in which decisions and behaviors occur (Bull & Shlay, 2005, p.73).

When it comes to recommending interventions to improve health outcomes, “Rather than exclusively targeting individual health behaviors or health care system barriers, it is essential

to address the spectrum of individual, community, and environmental factors, which precipitate health disparities” (English et al., 2008, p. 408).

The framework has previously been used effectively when studying health disparities in tribal communities (English et al., 2008; Fahrenwald & Stabnow, 2005; Oetzel & Duran, 2004). One study used the framework to improve mammography rates in a tribal community. The researchers found that the framework was able to encompass the, “Constellation of individual, community, and environmental factors that accounted for low mammography rates among community women” (English et al., 2008, p. 406). The researchers concluded that their study, “Effectively highlighted the benefits of using a socioecological framework to address a complex health disparity within a tribal community” (English et al., 2008, p. 408). Another study used the framework to look at organ and tissue donation among Lakota Sioux (Fahrenwald & Stabnow, 2005). The researchers found that the framework lent itself well to their qualitative ethnographic study (Fahrenwald & Stabnow, 2005). The framework was also used to study intimate partner violence (IPV) among American Indians and Alaska Natives (AI/AN); the researchers found:

“In order to adequately assess this health disparity [IPV], it will be necessary to utilize culturally appropriate multi-level interventions that adequately address determinants that occur at individual, interpersonal, organization, community, and policy levels. While the social ecological framework makes intuitive sense, there are few multi-level interventions to address IPV and none in AI/AN communities” (Oetzel & Duran, 2004, p. 63).

The social ecological framework is able to account for all the different levels of influence (such as individual, interpersonal, community and policy levels) that go into creating and eliminating health disparities.

For this study the social ecological framework will focus on several different levels affecting health outcomes. The levels include: individual, the interpersonal, community, and policy systems level (TulaneMCH, 2011). The individual level constitutes the realm in which the pregnant Native woman makes choices that impact pregnancy outcomes. The interpersonal level represents the relationships she has or does not have such as family and peer support. The community level is the environment in which the Indigenous woman inhabits, and the public policy level represents the legislation and public health programs that impact pregnant Native women. These different spheres impact each other and together in concert produce certain health outcomes. Each plays a role in the production and elimination of health disparities.

Maslow's Hierarchy of Needs

In addition to the socioecological framework, another theory, Maslow's Hierarchy of Needs, guides the investigation into health disparities and potential solutions. Abraham Maslow, a American 20th Century psychologist, theorized that there is a continuum of needs that have to be met in order to move to a higher levels of health/psychological well being. The model is often depicted as a triangle with the most basic level on the bottom peaking at the most complex level (See figure 1).

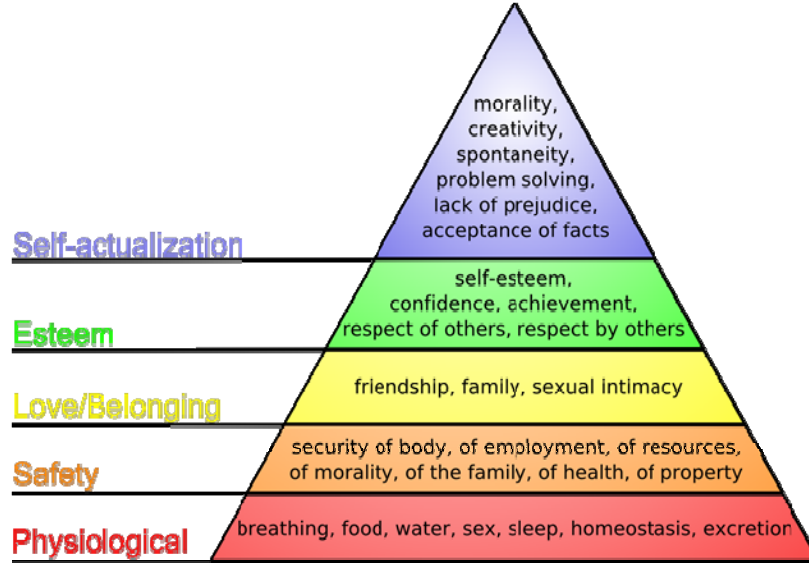


Figure 1: Maslow's Hierarchy of Needs (Retrieved from: <http://nursingcrib.com/nursing-notes-reviewer/abraham-maslows-hierarchy-of-needs/>).

The most basic needs composed of the physiological needs such as food, water, and sleep.

“If all the needs are unsatisfied, and the organism is then dominated by the physiological needs, all other needs may become simply non-existent or be pushed into the background”

(Maslow, 1943, p. 373). Once the physiological needs are met, the next need is safety.

Once a person is safe, the next priority is love needs—friendship, family, and belonging

(Maslow, 1943). Maslow states:

He [She] will hunger for affectionate relations with people in general, namely, for a place in his group, and he [she] will strive with great intensity to achieve this goal. He [She] will want to attain such a place more than anything else in the world and may even forget that once, when he [she] was hungry, he [she] sneered at love. (1943, p. 381).

The next level is esteem—does the person have confidence, respect, and achievement. “All people in our society (with a few pathological exceptions) have a need or desire for a stable, firmly based, (usually) high evaluation of themselves, for self-respect, or self-esteem, and

for the esteem of others” (Maslow, 1943, p. 381). And the final level is self-actualization where the person/family can be their true self. “A musician must make music, an artist must paint, a poet must write, if he is to be ultimately happy. What a man [woman] *can* be, he [she] *must* be” (Maslow, 1943, p. 382). With this model, at least, a pregnant woman has to have her physiological and safety needs met in order even be able to start thinking about proactively working to achieve a healthy pregnancy.

Research Question

What interventions positively affect Native American pregnancy outcomes and reduce infant mortality?

Significance of the Study

Native Americans and First Nations have significant health disparities that need to be eliminated. Through the Healthy People 2020 Objectives, the U.S. is working to reduce health disparities. Similarly, Canada struggles to end the disparities of their First Nation people as well.

This study offers a unique perspective by analyzing the current research through an integrative review and attempts to determine what interventions contribute to better pregnancy outcomes in Native Americans and the First Nations of Canada. The research highlights what is working and what is not. One of the strengths of the integrative review is it examines a wide range of both quantitative and qualitative literature. The review includes studies for analysis based on specific inclusion/exclusion criteria. Additionally, the

socioecological framework was the foundation to build a model to better understand the IMR/pregnancy outcomes disparity.

Operational Definition of Terms

Native Americans/American Indians: Descendents of the indigenous people who resided in the area that we now call the United States (Merriam-Webster, 2011).

American Indians and Alaska Natives (AI/ANs): Descendents of the indigenous people who resided in the area that we now call the United States (Merriam-Webster, 2011).

First Nations: Descendents of the indigenous people who resided in the area we now call the US or Canada (Department of Justice Canada, 2011).

Native people/Indigenous people: For this paper these terms will refer collectively to the native populations of the US and Canada.

Aboriginal people: includes the original peoples of North America and their descendants. There are 3 groups of aboriginal people, the Indians (First Nations), Métis and Inuit. (Aboriginal Affairs and Northern Development Canada, 2010).

Health Disparities: Differences in health between groups of people. “These differences can affect how frequently a disease affects a group, how many people get sick, or how often the disease causes death” (National Institutes of Health, 2011).

Positive Effects: Interventions that may improve pregnancy outcomes.

Interventions: Inclusion of a program, action, protocol, perspective, or belief (quantitative or qualitative) that contributes to improved pregnancy outcomes.

Pregnancy Outcomes: a general term used to describe the results of conception and ensuing pregnancy including: birth weight, spontaneous abortion, congenital malformations, lower birth weight, preterm delivery or stillbirth.

Infant Mortality: Number of infants that die within the first year of life. The number is often used as an indicator of a population's health (Central Intelligence Agency, 2011).

Low Birth Weight Babies: are considered any babies born weighing less than 5 pounds, 8 ounces (2,500 grams) (March of Dimes, 2008).

Premature birth: While most pregnancies last 40 weeks, those births that take place more than 3 weeks before the due date are considered premature (Mayo Clinic, 2009).

Assumptions and Limitations

In order to conduct this research there are some assumptions that are presumed to be true. We believe:

1. Native health disparities (excess IMR related to poor pregnancy outcomes) can be eliminated.
2. Native pregnancy outcomes should be equal to other groups including non-Hispanic Whites.
3. Native women are in situations and/or environments during their pregnancy that cause pregnancy outcomes that are poorer than those of non-Hispanic Whites.
4. There are interventions that could positively affect pregnancy outcomes.

The main limitation to this study will be time. Since there are only two years to identify a research question, conduct the research, and then write, present, and defend a

thesis, the timeline inhibits the depth of the research. To control that limitation as much as possible, a research question was identified within the first week of the two-year graduate program. Additionally, in that same week, a thesis advisor was identified. Since then the advisor has been regularly consulted to ensure that the work for the thesis is progressing as expected.

Another limitation was the exclusion criteria for the integrative review. Native infant morbidity was not addressed in this study. That means topics like Fetal Alcohol Syndrome were not included since this condition does not necessarily result in increased mortality rates. Excluding the many infant morbidity topics focused this study and created a manageable amount of literature for review. Infant morbidity is however an area worth covering and should be a topic of future research.

Organization of the Remainder of the Study

Chapter two includes selections from the literature using specific search terms to identify studies specific to this population related to interventions that positively affect pregnancy outcomes. Inclusion and exclusion criteria as well as an account of how each article was identified are established. Chapter three describes the methods by which the data was extracted and analyzed. In chapter four the data is presented, and themes and patterns are identified; the chapter will also include the adaptation of the socioecological model. The summary and conclusions will be given in chapter five along with recommendations developed from the data as well as suggestions for future research.

CHAPTER TWO

LITERATURE SEARCH METHODS

Introduction

The purpose of this chapter is to examine the search methods utilized to identify pertinent literature related to interventions that positively affect pregnancy outcomes and reduce infant mortality in Native American populations. The Montana State University librarian, Richard Wojtowicz, confirmed that PubMed and Cumulative Index of Nursing and Allied Health Literature (CINAHL) were the two databases most likely to yield results for this focused search (personal communication, June 16, 2011). PubMed covers multiple disciplines including nursing, medicine, public health, and health care (PubMed, 2010). Its breadth is wide, and the depth of this search engine is extensive with 20 million citations for biomedical literature (PubMed, 2010). CINAHL focuses predominantly on nursing as well as other allied health fields. However, since it was difficult finding studies that focused on interventions that took place during the pregnancy of Native women, two more databases were searched: PsycINFO (psychology on-line) and the Bibliography of Native North Americans. Since computerized databases typically yield only 50% of eligible studies due to indexing problems and inconsistent search terminology (Whittemore & Knafl, 2005), the references or relevant articles were also hand searched to find pertinent literature from Native American journals.

Inclusion/Exclusion Criteria

Inclusion and exclusion criteria were established to help guide the search. The importance of defining these criteria is not to be underestimated:

Any sampling decision must be justified and made explicit. Therefore, the literature search process of an integrative review should be clearly documented in the method section including the search terms, the databases used, additional search strategies, and the inclusion and exclusion criteria for determining relevant primary sources (Whittemore & Knafl, 2005, p.549).

The first criteria was that the article had to focus on Natives either indigenous to the United States or Canada. Because the populations of native people from both countries struggle with such similar issues both groups were considered in this review (Luo et al., 2004; Shah et al., 2011; Sokoloski, 1995; Thomson, 1990). The second criterion established was the dates of inclusion. Because the research topic is a more long-standing issue that is not affected by quick technological or scientific advances, a broader scope is more appropriate. For this reason studies published in the last 25 years were included (1986-2011). Only peer-reviewed articles were accepted since the review process ensures that experts in the field support the publication and believe, “That the work is original, valid, and significant (American Psychological Association, 2010, p. 225). Only articles written in English were used. Additionally, the articles must present some sort of intervention related to pregnancy/infant mortality or insight into circumstances surrounding pregnancy/infant mortality.

There were exclusion criteria as well. Articles were excluded if the focus was on: children’s health, diabetes, women’s health, infant morbidity, violence, and other topics that

were not specific to infant mortality. For example, articles on fetal alcohol syndrome (FAS) were excluded since that typically is a morbid condition and not a fatal one.

	Inclusion	Exclusion
Language:	English	Non-English
Journal Type:	Peer-reviewed	Not peer-reviewed
Dates:	1986-2011	Anything before 1986 or after 2011
Target Population:	Natives from US or Canada	Natives from other countries
Main Topic:	Interventions/Perspectives related to pregnancy/infant mortality	Interventions/Perspectives related to topics other than pregnancy/infant mortality

A clear research question and inclusion/exclusion criteria, is the first step in conducting a research review. “Having a well-specified review purpose and variable of interest will facilitate all other stages of the review, particularly the ability to differentiate between pertinent and extraneous information in the data extraction stage” (Whittemore & Knafl, 2005, p. 548). With the research question and inclusion/exclusion criteria firmly established, the search began.

Search Methods

A description of databases, search terms, and supplemental search methods are highlighted. First, an electronic search was completed using the following databases: PubMed, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PsycINFO (psychology on-line), and the Bibliography of Native North Americans. Second, the search terms used to describe Indigenous people of the US/Canada varied for each search engine. Other search terms included *pregnancy*, *prenatal*, *intervention*, *pregnancy*

outcomes, and infant mortality. Finally, the bibliographies of selected articles were hand searched to supplement established search methods. One peer-reviewed publication from Indian Health Services (IHS), *The IHS Primary Care Provider*, was searched as a means of looking for trends in care of Native American women and infants.

Search Results

PubMed

A search in PubMed utilizing the term “*Indians, North American*”[Mesh] yielded 7471 results with the limits of English and the date range: 1986-2011. To focus the search the term *pregnancy* was added returning 372 results. Narrowing the search more, *intervention* was added thus yielding 17 results.

Of the 17 articles, eight were excluded—four focused on diabetes, two on FAS, and two on infant morbidity. Another four could be used for background but did not explicitly address interventions/perspectives surrounding pregnancy/infant mortality. The final five met inclusion and exclusion criteria (Barlow et al., 2006; Bulterys, Morgenstern, Weltry, & Kraus, 1990; Duffy, Bonino, Gallup, & Pontseele, 1994; Sokoloski, 1995; Walkup et al., 2009).

To be sure all possible studies meeting inclusion and exclusion were captured several more PubMed searches were conducted. “*Indians, North American*”[Mesh] AND “*pregnancy outcomes*” with the limits of English and dates 1986-2011 yielded 12 hits. Of those, four met inclusion and exclusion criteria (Khoshnood, Lee, Wall, Hsieh, & Mittendorf, 1998; Luo et al., 2004; Shah, Zao, Al-Wassia, & Shah, 2011; Wenman, Joffres,

Tataryn, and the Edmonton Perinatal Infections Group, 2004). Of the remaining eight, three provided good background on health disparities (one of the three was captured by the previous search), and five were excluded because they did not specifically focus on infant mortality.

“*Indians, North American*”[Mesh] AND *prenatal AND intervention* were also tried with the same limits; seven articles were obtained. Of this group, three applicable articles were found but they had been captured by the first search (Barlow et al., 2006; Sokoloski, 1995; Walkup et al, 2009). Additionally, “*Indians, North American*”[Mesh] AND *prenatal AND prevention* were also searched, but no new studies that met inclusion and exclusion criteria were found. Finally, “*Indians, North American*”[Mesh] AND *pregnancy AND “infant mortality”* yielded 27 hits. Five new studies met inclusion and exclusion criteria (Baldwin et al., 2002; Bulterys, 1990; Grossman et al., 2002; McCusker, Clifton, & Miller-Korth, 2000; Thomson, 1990). Another six were previously found in the other searches, nine were strictly epidemiological studies that could be used for background, and the remaining either didn’t focus on native people or did not discuss an intervention.

After eliminating duplicates from these search combinations, PubMed yielded a total of 14 studies (see Table 1).

Table 1. PubMed Studies Meeting Inclusion Criteria

Author/ Country	Design	Purpose	Sample	Intervention	Results/Implications / Suggested for Future Interventions
Baldwin et al. (2002) USA	Cross-sectional study of all singleton AI/AN births	National profile of AI/AN maternal and infant health	N=148482 AI/AN singleton births between January 1, 1989 and December 31, 1991	None	High rates of inadequate prenatal care. High rates of variation of maternal/child programs across IHS. Need community-driven programs.
Barlow et al. (2006). USA	Randomized Controlled Trial (RCT)	Assess impact of home-visiting intervention for AI adolescents	Intervention group: n=28 Control: n=25	Home visiting program	Increased mother's child care knowledge and involvement.
Bulterys, M. (1990) USA	Epidemiologic study	Identify factors that could account for high rates of SIDS	Indians: n=32,347 Whites: N=537,077	None	High rates of smoking among Northern Indians and Alaska Natives may account for high rates of SIDS;
Bulterys et al. (1990) USA	Epidemiologic estimation	Quantify the expected impact of a smoking cessation program on AI infant mortality	Indians: n=32325 Whites: N=306,00	Theoretical Smoking cessation program	60% efficacy in preventing infant deaths attributed to smoking.
Duffy & Gallup. (1994) USA	Pre and post test quasi-experimental	Determine if a community baby shower is an effective means of providing health education	N=10	Community baby shower as a transcultural nursing intervention	Pretest questions ranged from 0-70%. Posttest questions were 100% for all 10 participants.
Grossman et al. (2002). USA	Retrospective cohort study	Examine AI/AN births for metropolitan areas	N=72,730 singleton births to AI/AN mothers and/or fathers residing in urban areas	None	Marked disparities between pregnancies to AI/AN and White women. 49% of all AI/AN births are happening in urban areas. Need to expand/improve urban health programs and increase funding.
Khoshnood et al. (1998).	Epidemiologic. Retrospective.	Determine if the interval	Native Americans	None	Short intervals between pregnancies

Table 1 Continued

Author/ Country	Design	Purpose	Sample	Intervention	Results/Implications / Suggested for Future Interventions
USA		between pregnancies impacts birth outcomes	n=30898 Non-Hispanic Whites: N=3,643,947		are associated with increased risk of low birth weight and preterm delivery. 30% of NA has ≤ 12 months between pregnancies. Future intervention: programs controlling fertility.
Luo et al. (2004). Canada	Epidemiologic. Retrospective.	Determine pregnancy outcomes among aboriginal women	N=1,125,462 singleton births from 1985-97	None	High risk of neonate mortality among native children. Prevention of SIDS and infection-related deaths would reduce infant mortality.
McCusker et al. (2000). USA	Case-level, community-based infant mortality review retrospective	Identify local underlying factors that contribute to Native American infant mortality	N=92 Native American infant deaths	None	Disparities between prenatal care and maternal smoking during pregnancy. Need to increase outreach and get NA women early prenatal care and need smoking cessation programs.
Shah et al. (2011). Canada	Systematic review and meta-analysis	Determine risk of adverse pregnancy outcomes in Aboriginal women	N= 38 studies were included in the review	None	Aboriginal women at increased risk for adverse pregnancy outcomes. Providers must increase surveillance, research needs to address potential causes, and need to get aboriginals involved in community representation.
Sokoloski, E.H. (1995). Canada	Qualitative, interviews	Establish Canadian First Nations Women's beliefs about Pregnancy and prenatal care.	N=7	Interviews	First Nations women believe pregnancy is a natural process that requires no intervention like prenatal care. When they did see prenatal care, providers were often unfriendly and authoritarian.

Table 1 Continued

Author/ Country	Design	Purpose	Sample	Intervention	Results/Implications / Suggested for Future Interventions
Thomson, M. (1990). Canada	Epidemiologic Retrospective	Determine the relationship between birthweight and infant mortality	N=1000 Natives N=206,782 non-natives	None	Heavy birthweight 50% more common among Natives and Infant mortality was 40% more frequent in Natives. Hypothesize that high glucose causes increased infant mortality.
Walkup et al. (2009). USA	RCT	Determine if home visiting increases AI parenting knowledge, involvement, maternal & infant outcomes	N=167	Home visiting intervention	Home visits increased mothers' parenting knowledge and showed better infant behavior outcomes.
Wenman et al. (2004). Canada	Prospective cohort study	Determine pregnancy risk factors and birth outcomes in Aboriginal women.	N=2047 enrolled; n=1811 completed the study	Questionnaire s on sociodemogra phic and clinical data	No statistically significant relation between Aboriginal status and birth outcomes.

CINAHL

A search in CINAHL was conducted as well to ensure that as many relevant articles could be identified from the health related journals. The terms (*MH "Native Americans"*) *AND pregnancy* were searched with the limits of English articles, peer reviewed between 1986-2011. The search yielded 190 results. The term *intervention* was added, and 11 articles were found. Of these 11, PubMed previously uncovered seven. Of the remaining four, two did not meet inclusion/exclusion criteria, but the remaining two did (Prater & Davis, 2002; Tran, Rosenberg, & Carlson, 2010). The next CINAHL search with the same limits, (*MH "Native Americans"*) *AND pregnancy AND infant mortality*, produced 17 results. Of those four met inclusion and exclusion criteria (Blabey & Gessner, 2009; Davis

& Prater, 2001; El-Bastawissi, Peters, Sasseen, Bell, & Manolopoulos, 2007; Gaudino, 2008). Five of the remaining studies were previously discovered through PubMed, one by the previous search, and the others were epidemiological studies that could be used for background.

In total CINAHL yielded a total of six additional studies (see Table 2).

Table 2. CINAHL Studies Meeting Inclusion Criteria

Author/ Country	Design	Purpose	Sample	Intervention	Results/Implications / Suggested for Future Interventions
Blabey & Gessner (2009). USA	Epidemiologic Retrospective	Identify variables that account for elevated postneonatal mortality in Alaska Natives	=10,300 (births/yr) N=27 (infant deaths/yr)	None	3 maternal risk factors are associated with elevated risk of postneonatal morbidity among Native Alaskans: 1. Tobacco and alcohol exposure, women who did not complete high school, not reporting a father's name on the birth certificate.
Davis & Prater (2001). USA	Case Study	Design, implementation, and outcomes of a perinatal program for urban American Indians	N=43	Creation of a community health center offering a perinatal intervention program	AI women started prenatal care sooner; they changed smoking and drinking habits, modified diet. No infant deaths occurred.
El- Bastawis si et al. (2007). USA	Record- linkage retrospective cohort design	Determine the effects of the Washington State Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) on adverse pregnancy outcomes.	n=42,495 enrolled in WIC Control: n=30,751 WIC- eligible but not on WIC	WIC program	WIC was protective for adverse pregnancy outcomes especially in high risk women.

Table 2 Continued

Gaudino, J.A. (2008) USA	Epidemiologic Retrospective Birth and death cohorts	Examine infant mortality among AI/ANs in the Pacific NW	N=2100-2800 AI/AN births/yr from 1984-1997	None	IMR among AI/AN in Pacific NW nearing White rates. No specific cause identified but suspect multi-factorial improvements. Champion further surveillance and interventions before conception through postpartum to continue trend.
Prater, S.L. (2002) USA	Case Study	Reduce Native American IMRs in Milwaukee, WI through the creation of a community health agency and a perinatal outreach program.	N=334	perinatal intervention program	American Indian women started prenatal care earlier. No preterm births. Fewer complication during pregnancies. No infant deaths. No low birth-weight babies born. No FAS.
Tran et al. (2010). USA	Population-based survey of postpartum women	Explore the disparities in the receipt of smoking cessation counseling during prenatal care.	N=3895	Survey	American Indian women at greatest risk for not receiving smoking cessation counseling.

Bibliography of Native North Americans

Because it seemed like there were so few studies identified, the database, Bibliography of Native North Americans, was searched. Since the database captures sources dealing with Native people, that search term could be excluded. Limits included: peer reviewed and 1986-2011. In this database the limit of English was not available. The database was searched for “*pregnancy*” (*AB Abstract or Author supplied abstract*) yielding 31 hits. Of those, three were new and met inclusion and exclusion criteria (Dempsey & Gesse, 1995; Iyasu et al., 2002; Long & Curry, 1998). One was in French, three were

previously captured, and the rest were not explicitly about interventions or perspectives on pregnancy/infant mortality. Next *pregnancy AND intervention (AB Abstract or Author supplied abstract)* was searched producing 10 hits. This yielded one new article that met inclusion and exclusion criteria (Patten et al., 2008); of the remaining, four were previously captured and five were excluded because they did not address an intervention or add perspective on pregnancy. Next “*prenatal*” (*AB Abstract or Author supplied abstract*) was entered producing 24 hits. Of these nearly all were previously uncovered; there were no others left that fit the criteria. Just to be sure all bases were covered *prenatal AND intervention (AB Abstract or Author supplied abstract)* were also searched with six hits. While again there were duplicates (Gaudino & James, 2008; Patten et al, 2008; Walkup, 2009), there was one new article that met inclusion and exclusion criteria (Burd et al, 2007). Finally, *infant mortality* was searched producing 23 hits. Of these seven were previously captured, four were not applicable, eight were epidemiological studies that could be used for background information, and four were new and met inclusion and exclusion (Begay, 2004; Johnson, Oakes, & Anderton, 2008; Nakamura et al., 1991; Watson, 2005).

In total Bibliography of Native North Americans yielded a total of nine studies (see Table 3).

Table 3. Bibliography of Native North Americans Studies Meeting Inclusion Criteria

Author/ Country	Design	Purpose	Sample	Intervention	Results/Implications/ Suggested for Future Interventions
Begay, R.C. (2004). USA	Qualitative review	Describe changes in childbirth	N=71 women interviewed about childbirth	None	Author maintains NA need to remember spiritual connection to each other.
Burd et al. (2007). USA	Pre and post test quasi- experimental	Determine if SIDS risk reduction education increased knowledge about SIDS risks factors	N=341	SIDS risk reduction intervention	Program is effective in increasing knowledge about risk factors. The program should be initiated in other settings.
Dempsey & Gesse (1995) USA	Qualitative Exploratory- descriptive	Discover the beliefs, values, and practices of Navajo childbearing women	N=20	54 item structured interview	Great diversity among the Navajo women on the beliefs, values, and practices surrounding pregnancy. Health care providers need to assess each Navajo women's cultural needs individually.
Iyasu et al. (2002). USA	Population based case control study	Determine prenatal and postnatal risk factors for SIDS among Native Americans	N=33 SIDS infants N=66 matched living controls.	None	3 risk factors identified: public health nurse visits, maternal alcohol use, layers of clothing. Need to increased public health nurse visiting program and programs to reduce alcohol consumption.
Johnson et al. (2008). USA	Explicit causal contrast study Retrospective	Explore if neighborhood poverty effects AI infant death.	N=4751	None	Neighborhood poverty has little effect on AI infant mortality.
Long & Curry (1998). USA	Qualitative	Investigate traditional beliefs related to pregnancy and how those ideas affect current use of prenatal care.	N=52	Focus groups	Predominant model of prenatal care is culturally inappropriate of American Indians. Young Natives don't see the value in prenatal care. Need a new version of prenatal care.
Nakamura et al. (1991). USA	Epidemiologic Retrospective	Describe IMR of Warm Springs Reservation	N=3613 (births) N=226 (deaths)	None	IMR would be about the same as US rate if no SIDS deaths.

Table 3 Continued

Patten et al. (2008). USA	Quasi-experimental study as well as qualitative	Evaluate a tobacco educational intervention for pregnant Alaska Natives and determine their health beliefs	N=100	Tobacco cessation educational intervention and open-ended interview questions	Need to augment the educational intervention since only 12% had quit tobacco use at delivery. Only 40% of Natives believed tobacco was harmful to their fetus.
Watson, T. (2006). USA	Epidemiologic Retrospective	Explore infant mortality and the impact of 3700 Federal projects to improve sanitation on reservations.	N=740,470 Indian births N=13,600 Indian infant deaths	Water and sewer projects	Sanitation intervention accounts for 40% convergence in Native and White IMRs in reservations since 1970.

PsycINFO

Finally, PsycINFO was also searched since it covers a slightly different scope than either of the biomedical/health search engines (PubMed and CINAHL) or the Native American database. Employed were the limits of peer reviewed and the dates 1985-2011; in PsycINFO, articles written before 1990, can be searched only in five year intervals: 1985, 1980... In this database, “*American Indians*” and “*First Nations*” are the terms that cover the population of interest. In searching for articles the first attempt was with “*American Indians*” or “*First Nations*” (DE=Descriptors) AND *pregnancy or prenatal* (KW=keyword); this yielded 57 peer reviewed journal articles. To narrow things down the term *intervention** was added producing nine peer reviewed journal articles. Actually *intervention* was tried first but only yielded four articles, when the asterisk was added as suggested by this particular search engine, it opened the field a bit. Of the nine articles, three were previously captured, four did not specifically address pregnancy in relation to infant mortality, but two articles were new and met the inclusion and exclusion criteria

(Mehl-Madrona, 2000; Palacios & Kennedy, 2010). To be sure that the engine was searched thoroughly, “*American Indians*” or “*First Nations*” (*DE=Descriptors*) AND *pregnancy or prenatal* (*KW=keyword*) AND “*infant mortality*” was tried and produced two results both of which had previously been captured. “*American Indians*” or “*First Nations*” (*DE=Descriptors*) AND *pregnancy or prenatal* (*KW=keyword*) AND “*pregnancy outcomes*” was also searched yielding three results which had already been captured.

In total PsycINFO produced two studies (see Table 4).

Table 4. PsycINFO Studies Meeting Inclusion Criteria

Author/ Country	Design	Purpose	Sample	Intervention	Results/Implications/ Suggested for Future Interventions
Mehl- Madrona (2000) USA	Matched comparison group	Compare effectiveness of psychosocial prenatal intervention program to reduce alcohol, smoking and stress and improve birth outcomes	n=320 received the intervention and a matched comparison group developed from prior 5 years.	7 group sessions that addressed: fears, getting support, stress reduction, attachment to the unborn child, preparation for birth I, preparation for birth II, and environmental awareness.	Intervention reduced risks for cesarean birth, improve infant outcome and rates of normal delivery.
Palacios & Kennedy (2010) USA	Qualitative Community- based participatory research	Understand the experience of Native American teen mothers.	n=30 Native American adult women who had early childbearing experiences	Interview with open ended questions.	Two themes identified: stressful childhoods with ensuing chaotic lives and diminished childhoods that require girl to take on extensive responsibility at a young age. These findings may be risk factors for early childbearing.

The IHS Primary Care Provider

Through Montana State University's access through Freely Accessible Science Journals, The *IHS Primary Care Provider* was also searched from 1985-2011. The titles of each article were listed by year. Those were hand searched.

Three articles were found.

Table 5. *IHS Primary Care Provider* Studies Meeting Inclusion Criteria

Author/ Country	Design	Purpose	Sample	Intervention	Results/Implications/ Suggested for Future Interventions
Berger et al. (2007) USA	Epidemiologic Retrospective	Determine the impact of mortality from injuries on overall child mortality rate in Whites and Natives.	N=2482 (native deaths) N=111,917 (White deaths)	None	Overall child mortality rates for AI/AN and Whites would be equal if AI/AN child injury rates were reduced to those of Whites.
Eaglestaff et al. (2007). USA	Epidemiologic Retrospective	Present outcomes from 8 years of infant deaths in Aberdeen Area of IHS from 98-05.	N=233 infant deaths	None	28% of infant deaths due to SIDS. 24% prematurity. 38% of mothers of the infants who died had a previous infant death. Need to enhance prenatal care.
Fleshman (1991). USA	Epidemiologic Retrospective	Review AI/AN infant deaths in 10 states and determine impact of health care, family behaviors, and community life factors related to infant deaths	81 live AI/AN N=505 AI/AN infant deaths	None	42% of infant deaths were neonatal while 58% postneonatal. Of the post neonatal deaths, most were from SIDS. 46% of the "SIDS mothers" had less than 4 prenatal visits and 57% had documented substance abuse, depression, developmental disabilities, or repeated incarcerations. Infant mortality produce of lifestyle quality. It is a public health issue.

To summarize, Whitemore and Knafl's methodology (2005) was used to guide this research. The systematic literature review was conducted by searching four different search engines: PubMed, CINAHL, the Bibliography of Native North Americans, and PsycINFO. The indexes of the *IHS Primary Care Provider* was hand searched for pertinent articles. From these methods, three articles were found that met inclusion and exclusion criteria. The methods used to analyze the articles will be discussed in the next chapter.

CHAPTER THREE

DATA ANALYSIS METHODS

IntroductionProcess of Conducting the Integrative Review

The integrative review has the potential to be a significant force in nursing research (Broome, 2000; Ganong, 1987; Kirkevold, 1997; Russell, 2005; Whittemore, 2005; Whittemore & Knafl, 2005). Unlike other reviews, integrative reviews incorporate both qualitative and quantitative data in an effort to establish a rich, thorough understanding for a specific topic. “While quantitative approaches give a broad, general view of the surface, a qualitative approach gives data that provide a deeper and more multifaceted insight” (Foss & Ellefsen, 2002, p. 245). The clear picture that integrative reviews produce significantly impact nursing. “Well-done integrative reviews present the state of the science, contribute to theory development, and have direct applicability to practice and policy” (Whittemore & Knafl, 2005, p. 546).

The concept of combining qualitative and quantitative data in one study is still a fairly new and young idea (Kirkevold, 1997) and not without controversy. Many have argued that combining qualitative and quantitative data is like combining and comparing apples and oranges (Norwood, 2010). Others debate whether the two types of data can be given equal importance (Foss & Ellefsen, 2002). And what happens if the qualitative and quantitative data oppose each other?

When the conclusion based on data from qualitative and quantitative approaches differ, it could be concluded that the knowledge gained from one of the approaches was unreliable or, alternatively, that they represent two separate perceptions of (different) realities. The finding of two realities is in itself an important outcome (Foss & Ellefsen, 2002, p. 245).

Whittemore & Knafl feel discrepancies between data types are not concerning. Instead, “Conflicting evidence in general demonstrates the need for further research with subsequent research questions and design aimed at resolving the conflict” (2005, p. 551).

The literature warns that the Achilles’ heel of integrative reviews is the lack of a universally accepted methodology which can lead to a lack of rigor and potential for bias (Jackson, 1980; Russell, 2005; Whittemore & Knafl, 2005). There is no gold standard to evaluate studies to determine which studies to keep for the review and which to exclude (Whittemore & Knafl, 2005). Inadequate sampling may also interfere with results (Russell, 2005). “One threat to validity in the data evaluation phase is the tendency to positively evaluate research that is congruent with the reviewer’s own beliefs and negatively evaluate those studies that are not” (Russell, 2005, p.12). The pitfalls are there, but through analytical honesty and transparency throughout the research, a valid study can be produced. And that review can have a big impact, “Rigorously developed integrative reviews allow for various perspectives on a phenomenon to be synthesized into a systematic knowledge base, thus forming the foundation for nursing practice” (Whittemore & Knafl, 2005, p. 552).

Because the topic of interest, interventions that positively affect pregnancy outcomes, is so multifaceted, an integrative review is a fine vehicle by which to study the topic. Qualitative studies to randomized controlled trials can be incorporated and seen as a whole cohesive fabric of the current situation surrounding pregnancy outcomes in Native

people. The integrative review will provide the researcher with the data to compare, analyze, identify gaps in the literature and discover patterns and themes. Ultimately from this process, conclusions will be drawn and recommendations made.

The methodology of the integrative review is still in its infancy. There is no standard process for data evaluation and data analysis. “Strategies for data analysis with integrative reviews are one of the least developed aspects of the process, yet are one of the most difficult aspects and potentially fraught with error” (Whittemore & Knafl, 2005, p 550). A systematic method was developed based on Whittemore & Knafl’s recommendations (2005). The five-step process includes the following:

1. Evaluation of the quality of the data.
2. Data reduction
3. Data display
4. Data comparison
5. Conclusion drawing and verification

Evaluation of the Quality of the Data

Determining the quality of the data is a complex process. “As no gold standard for evaluating and interpreting quality in research reviews exists, how quality is evaluated in an integrative review will vary depending on the sampling frame” (Whittemore & Knafl, 2005, p 449-550). Initially the level and quality of evidence for each article was determined as developed by Stetler et al., 1998.

Table 6: Strength of Journal Articles. (Stetler et al., 1998, p 202).

Level and Quality of Evidence	Source of Evidence
Level I (A-D)	Meta-analysis of multiple controlled studies
Level II (A-D)	Individually experimental study
Level III (A-D)	Quasi-experimental study such as nonrandomized controlled single group pre-post test, time series, or matched case-controlled studies
Level IV (A-D)	Non experimental study, such as correlation descriptive research and qualitative or case studies
Level V (A-D)	Case report or systematically obtained, verifiable quality or program evaluation data
Level VI (A-D)	Opinion of respected authorities (e.g., nationally known) based on their clinical experience or the opinions of an expert committee, including their interpretation of nonresearch-based information. This level also includes regulatory or legal opinions.

Next, each article was compared to the “Research Appraisal Checklist” developed by Duffy (as cited in Fain, 2009) (see Appendix A). The checklist details important elements of research articles, and while scores were not generated, the list did aid in determining the quality of each article.

Data Reduction

In order to facilitate data analysis, each article was condensed to its most pertinent information. Each source was dissected and distilled to determine: study design, sample size, purpose, intervention, major findings, and strengths and limitations (See Appendix B).

Data Display and Data Comparison

A chart was made so that the most important information from each article could quickly be seen and easily understood (see Appendix B). By having the articles in this

concise and uniform format, data can easily be compared. Data comparison is, “An iterative process of examining data displays of primary source data in order to identify patterns, themes, or relationships” (Whittemore & Knafl, 2005, p 551). Through data comparison much can be learned: gaps in the data can be determined, areas of discrepancy, as well as areas of consensus. “Creativity and critical analysis of data and data displays are key elements in data comparison and the identification of important and accurate patterns and themes” (Whittemore & Knafl, 2005, p. 551).

Conclusion Drawing and Verification

From the data comparison, conclusions were drawn. “Analytical honesty is a priority; the data analysis process is made transparent with rival explanations and spurious relationships thoughtfully explored” (Whittemore & Knafl, 2005, p 551). These conclusions and verifications will be detailed in chapter four.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF THE DATA

Introduction

The purpose of this chapter is to present the data extracted from the literature on interventions that positively affect pregnancy outcomes and reduce infant mortality in Native Americans. The data was analyzed through the lens of the socioecological framework. This systems model allowed the examination of health outcomes from a holistic perspective taking into account the idea that many different influences contribute to one's overall health. "The ecological model recognizes that the health of individuals and the community is determined by multiple factors and by their interactions, including biology, the social and physical environment, education, employment, and behavior (e.g., healthy ones [behaviors] such as exercise and unhealthy ones [lifestyles] such as overeating)" (Institute Of Medicine [IOM], 2003b, p. 25). In this study, the framework was used to examine the multifactor impact of the environments surrounding a mother and her fetus/infant.

Socioecological Model for
Pregnancy Outcomes in Native Americans

The socioecological model was adapted to depict the factors found in the literature that demonstrate an impact on pregnancy outcomes and infant mortality in Native people. Each of the factors used in the model comes directly from the peer-reviewed studies that

were used in this integrative review; the findings are documented in a chart (see Appendix C). The chart provided the evidence upon which the model was developed.

The socioecological model for pregnancy outcomes takes into account many different systems and factors [see Appendix D]. In the center of the model is a circle representing the Native mother and her fetus/infant. The encircling ellipses represent the different levels that can impact pregnancy outcomes and infant mortality; these levels are: individual, interpersonal, community, and public policy. The borders between ellipses are dotted indicating that there is interaction between levels. The complexity of interaction and the degree of influence occurring between levels is unknown but believed to exist. The levels, ellipses, are polarized between two extremes: protective factors favoring positive pregnancy outcomes (represented at the top of the chart), and the risk factors for negative pregnancy outcomes placed at the bottom of the chart. Within each level are listed the factors within that level that contribute to either positive pregnancy outcomes (listed in the top half of the ellipse) or risk factors for negative pregnancy outcomes (listed in the bottom half of the ellipse). In the following sections of this chapter each level of impact including individual, interpersonal, community, and public policy will be discussed along with the supporting literature.

Individual

The individual level, depicted as an ellipse, constitutes the factors that can theoretically be controlled by the person. The studies indicate that individual characteristics as well as the choices and decisions individuals make can impact pregnancy outcomes. From the studies there are ten categories under an individual's influence identified as

affecting pregnancy outcomes: behaviors/lifestyles, mental health, tobacco use, educational attainment, maternal age, prenatal care, breastfeeding, immunizations, family planning, and socioeconomics/WIC enrollment.

Behaviors/Lifestyles. Eight of the thirty-four studies found that positive health behaviors and or lifestyles were influential in having a positive pregnancy outcome (Begay, 2004; Davis & Prater, 2001; Dempsey & Gesse 1995; Gaudino, 2008; Long & Curry, 1998; Mehl-Madrona, 2000; Prater, 2000; Sokoloski, 1995). Positive health behaviors cover a wide gamut including avoiding alcohol and drugs. Long & Curry (1998) interviewed NA women who believe, “Exercise, a good diet, a positive mental outlook, and abstinence from drugs and alcohol, remain the most important elements of good prenatal care” (p. 213-214). Davis & Prater (2001) found the most common changed behavior in their study was the mother modifying her eating habits to improve her nutrition. Gaudino (2008) reported lower infant mortality among NA in the Pacific Northwest, and one of his findings indicated a reduction in alcohol use during pregnancy. Mehl-Madrona (2000) focused on an intervention teaching women alternative methods of coping with life’s stressors which resulted in reduced alcohol consumption among the participants as well as better pregnancy outcomes and healthier infants. “Rather than making participants feel criticized for resorting to drinking, smoking or other self-destructive behaviors, the health care professions tried to add to the participant’s resources and skills, so that they could do even better” (p. 274).

Many of the studies directly found that unhealthy behaviors were detrimental to positive pregnancy outcomes (Blabey & Gessner, 2009; Fleshman, 1991; Iyasu et al., 2002; Luo et al., 2004; Nakamura et al., 1991; Palacios & Kennedy, 2010; Thomson, 1990;

Wenman et al, 2004). Fleshman (1991) studied NA infant mortality and concluded, “Infant death is a highly visible product of life-style quality” (p. 154). Maternal alcohol use and binge drinking during the first trimester of pregnancy was one of the three risk factors Iyasu et al. (2002) found for SIDS. In an effort to improve their IMRs, Nakamura et al. (1991) reported that the Oregon Indian Reservation, Warm Springs, was offering drug screening and counseling to their pregnant members; however, no data was available on the program’s outcomes.

There were even a few studies that did not prove that healthy behaviors led to positive outcomes, but the authors recommended the practice none the less (Burd et al., 2004; Eaglestaff et al., 2007; Walkup et al., 2009). Topics frequently mentioned included good nutrition and avoidance of drugs and alcohol.

Mental Health. Three articles found direct evidence that stable mental health worked towards positive pregnancy outcomes (Begay, 2004; Long & Curry, 1998; Mehl-Madrona, 2000). Begay (2004) interviewed Navajo women who believed that a mother should feel harmonious because those feelings are transmitted to the baby, “A proper attitude meant to think that the world is beautiful and that one is happy to be alive” (p. 553). The women interviewed by Long & Curry (1998) also believed in the need for the woman be mentally balanced and at peace with the universe. Mehl-Madrona (2000) maintains that minorities, including NA, typically have higher stress levels than their White peers; stress hormones can decrease uterine blood flow and fetal oxygenation therefore Mehl-Madrona worked on providing study participants with stress coping tools. The study produced improved pregnancy outcomes and better maternal mental and physical health thus leading the author

to conclude that, “Psychiatrists and other mental health care providers should be involved in prenatal care” (Mehl-Madrona, 2000, p. 275-276).

Two studies found direct evidence that disturbed mental health was a risk factor for poor pregnancy outcomes therefore they indirectly showed that good mental health was a positive predictor of healthy moms and babies (Fleshman, 1991; Palacios & Kennedy, 2010). Fleshman (1991) found depression to be a risk factor for having an infant die of SIDS. Palacios & Kennedy (2010) interviewed NA women about their experiences as teen mothers. A recurrent theme was the inability to mentally work through the blows dealt them in childhood (sexual, physical and/or psychological abuse and neglect); the mental distress often caused the young women to cope with alcohol, drugs, and other risk taking behaviors (Palacios & Kennedy, 2010). While Johnson et al. did not have enough evidence to prove one outcome or the other, the trends in data pointed to conclusions made by others that good mental health led to good pregnancies while an unhealthy state of mind lead to negative outcomes, “... Increase(d) maternal exposure to psychological stressors such as crime and violence...may result in psychological responses or detrimental coping mechanisms either of which could lead to an unhealthy in utero environment” (2008, p. 557). Two articles recommended mental health counseling as a step towards achieving healthy pregnancy outcomes (Eaglestaff et al., 2007; Nakamura et al., 1991).

Tobacco Use. Tobacco use came up in eighteen of the thirty-four articles. Most often studies found direct evidence of it being a risk factor for negative pregnancy outcomes (Blabey & Gessner, 2009; Bulterys, 1990; Bulterys et al., 1990; Fleshman, 1991; Luo et al., 2004; McCusker et al., 2000; Nakamura et al., 1991; Patten et al., 2008; Trans et al., 2010;

Wenman, 2004). Higher rates of prenatal tobacco use put Alaska Natives at higher risk for postneonatal mortality (Blabey & Gessner, 2009). Bulterys (1990) found high rates of smoking among Northern NA and Alaska Natives coupled with high SIDS rates while Arizona and New Mexico Indians had a low rate of smoking and low incidence of SIDS. Fleshman (1991) found that 50% of the mothers who had children die of SIDS smoked. In Wisconsin in 1997 44% of NA women smoked during pregnancy compared to 18% of other races; of the NA infants who died, 27.2% succumbed of SIDS compared to 19.5% of other races (McCusker et al., 2000). The adverse events of smoking's impact on infants are well documented (Blabey & Gessner, 2009; Bulterys, 1990; Bulterys et al., 1990; Fleshman, 1991; Luo et al., 2004; McCusker et al., 2000; Nakamura et al., 1991; Patten et al., 2008; Trans et al., 2010; Wenman, 2004).

Four of the articles found direct evidence that no tobacco use was a factor favoring positive pregnancy outcomes for Indigenous women (Davis & Prater, 2001; Gaudino, 2008; Mehl-Madrone, 2000; Prater, 2002). Davis & Prater (2001) described better pregnancy outcomes with tobacco cessation. Gaudino (2008) found that smoking rates decreased among Natives in the Pacific Northwest during a time when there was a decrease in infant mortalities. Mehl-Madrone (2000) initiated a buddy system for women to lean on each other to help reduce cigarette consumption; the intervention led to reduced smoking and better pregnancy outcomes than the control group.

Eaglestaff et al. (2007) and Burd et al. (2007) both recommended avoidance of tobacco though their studies did not research the topic. Johnson et al (2008) and Khoshnood

et al. (1998) did not have enough evidence to prove tobacco's harm but the trends in their data indicated its dangers.

Education. There is some evidence to show that the level of educational attainment is indicative of pregnancy outcomes in Natives. Blabey & Gessner (2009) found direct evidence that a low educational level was a risk factor for poor pregnancy outcomes. Alaska Native mothers who had infants die postneonatally, “. . .were twice as likely as non-Natives to have less than 12 years of education and about one third as likely to have more than 12 years of education” (Blabey & Gessner, 2009, p. 228). Therefore an indirect finding was that a high educational level was a protective factor; the researchers recommended education as a means to achieve positive pregnancy outcomes (Blabey & Gessner, 2009).

Other researchers did not prove that low education attainment was indicative of poor pregnancies but the data trended in that direction leading them to believe it is an important factor (Grossman et al., 2002; Johnson et al., 2008; Shah et al., 2011). Grossman et al. (2002) highlighted low maternal education as one of the risk factors for disparities in infant health. Shah et al. (2011) said poor education was a challenge that could be attributed to the poorer outcomes of Native pregnancies. Though their data didn't reflect the connection, Nakamura et al. (1991) also recommended high educational attainment as a means to improve pregnancy outcomes.

Maternal Age. Maternal age was a topic addressed by several studies. Three studies found that young mothers and their infants were at increased risk for poor outcomes (Eaglestaff et al, 2007; Nakamura et al., 1991; Palacios & Kennedy, 2010). These three

studies produced indirect evidence that a more mature maternal age was beneficial. While the results were not significant, the data from the Johnson et al. article (2008) showed trends that young maternal age was a risk factor while an older age was predictive of better outcomes. Shah et al. (2011) also found within their results, evidence that pointed toward the risks of young maternal age.

Prenatal Care. Another topic of intense investigation was prenatal care. Five articles showed that late or no entry into prenatal care was indicative of poor pregnancy outcomes in NA (Begay, 2004; Eaglestaff et al., 2007; Fleshman, 1991; McCusker et al., 2000; Nakamura et al., 1991). Eaglestaff et al. (2007) found that the NA mothers of infants dying from prematurity or SIDS were more likely to have had fewer prenatal visits than their peers. Fleshman's data (1991) indicated that 46% of the "SIDS mothers" had less than four prenatal visits. McCusker et al. (2000) identified that Native women are three times more likely than all other races to get late or no prenatal care.

Four studies found early entry into prenatal care is good for mothers and infants alike (Davis & Prater, 2001; Gaudino, 2008; Mehl-Madrona, 2000; Prater, 2002). One of the goals of the program described by Davis & Prater (2001) was to get NA women to initiate prenatal care earlier than historical rates; they succeeded and with that program produced healthier mothers and infants. Gaudino (2008) reported improving rates of NA infant mortality in the Northwest, and the researcher found utilization of prenatal care to be increased from years past. The prenatal intervention group detailed by Mehl-Madrona (2000) substantially increased the number of normal deliveries, decreased cesarean sections, fewer infants needed admission to the intensive care unit, and the mothers were more likely

to have reduced drinking and smoking. And while Barlow et al. (2006) didn't have the evidence to prove the benefits of prenatal care, the researchers did recommend its use.

Breastfeeding. Two studies found breastfeeding to be indicative of better pregnancy outcomes (Davis & Prater, 2001; Dempsey & Gesse, 1995). NA women interviewed by Dempsey & Gesse (1995) believed that breastfeeding was important for infant health. The other article by Davis & Prater (2001) evaluated their program that included breastfeeding as an intervention; they had no infant deaths within their cohorts. Although their work did not produce evidence to support their stance, two groups recommended breastfeeding as a means to reduce infant mortality (Barlow et al., 2006; Khoshnood et al., 1998).

Immunizations. One study found evidence to support the importance of immunizations in decreasing infant mortality (Davis & Prater, 2001). But many studies recommended immunizations though their data did not prove immunizations' importance (Baldwin et al., 2002; Barlow et al., 2006; Duffy & Gallup, 1994; Fleshman, 1991; Luo et al., 2004). There was no data indicating negative affects from immunizations on NA infant mortality.

Family Planning. Family planning was a topic that was often addressed. Seven studies recommended family planning as a key factor in reducing infant mortality and increasing positive pregnancy outcomes (Barlow et al., 2006; Eaglestaff et al, 2007; Fleshman, 1991; Gaudino, 2008; Khoshnood et al., 1998; Nakamura et al., 1991; Palacios & Kennedy, 2010). And while Shan et al. (2011) did not explicitly recommend family planning, they inferred its importance when they found increased infant mortality among

Indigenous women with higher fertility rates. Fleshman (1991) found that women who engaged in family planning had fewer infant deaths than those who didn't plan their families; Native mothers who had babies die from SIDS had twice the birth rate of their Native peers. Davis & Prater (2001) described decreased rates of infant mortality when family planning was initiated. Johnson et al. (2008) did not have evidence to prove its importance, but the data indicated that family planning favored positive pregnancy outcomes.

Socioeconomics and Women, Infants and Children (WIC). Financial support is another topic of interest when dealing with pregnancy outcomes. It falls within the individual level since it reflects a woman's ability to generate income or her ability to identify and utilize available resources to enhance her current socioeconomic status. "Lower mortality, morbidity, and disability rates among socioeconomically advantaged people have been observed for hundreds of years" (IOM, 2003a, p. 57). The pattern was reflected in the research articles as well. Fleshman (1991) found that infant demise was associated with poverty. Wenman et al. (2004) saw that family income less than \$12,000/yr was associated with low birthweight and inversely related to macrosomia. El-Bastawissi et al. (2007) studied the effect of WIC on pregnancy outcomes and found that those on WIC were less likely to have preterm delivery, low birthweight, and more likely to receive adequate prenatal care. While the women enrolled in WIC were not of high socioeconomics, WIC gave participants access to the resources needed for health pregnancy outcomes (El-Bastawissi et al., 2007).

Interpersonal

The interpersonal sphere is one in which people interact with each other. The importance of this level is not to be underestimated. The IOM reports a strong connection between health and social connectedness, “The pathways by which social networks might influence health are multiple and include pathways related to health behaviors, health care, access to material resources such as jobs, and direct physiological responses leading to disease development and prognosis” (2003a, p. 64-65). The articles included in this study reflect the impact of belonging on pregnancy outcomes. Included in the interpersonal sphere are: significant other, family support, peer support, and traditional beliefs.

Significant Other. The presence or absence of a significant other impacts the pregnancy outcomes in NA. Two studies generated data proving that a woman without a significant other puts herself and her baby at increased risk for poor pregnancy outcomes (Blabey & Gessner, 2009; Nakamura et al., 1991). Thus their indirect finding was that having a significant other was a protective factor for a mother’s and infant’s health (Blabey & Gessner, 2009; Nakamura et al., 1991). Begay (2004) stressed the importance of having a significant other for support. And while Johnson et al. (2008) did not have statistically significant data to prove the point, the evidence pointed towards the benefit of a significant other and the risk associated with not having such a person.

Family Support. Family’s influence on a pregnant NA is not to be underestimated. Three articles discussed the importance of family support in determining pregnancy outcomes (Begay, 2004; Dempsey & Gesse, 1995; Long & Curry, 1998). Interestingly,

these were all qualitative studies; their interviewees, NA women, stressed the importance of family as a determinant of health (Begay, 2004; Dempsey & Gesse, 1995; Long & Curry, 1998). In the Long & Curry study (1998) participants talked about the strength and importance of the family circle. One young women said, “Just stick with your family, your granny; they’ll stick with you every step of the way” (p. 213). Begay (2004) discusses the important role of family support, “Women nourish the new generation by bringing them into a family that includes many generations of parents to provide comfort, support, knowledge, and respect for all that was experienced and endured to create a single baby to carry us into the future” (p. 565).

Three studies examined the negative impact of family dysfunction on NA women (Fleshman, 1991; Long & Curry, 1998; Palacios & Kennedy, 2010). Palacios & Kennedy note, “Many women in this study lacked support systems and experience psychological, physical, emotional, and sexual assaults that may have set them upon a course destined for ECB [Early Childbearing]” (2010, p. 431). Fleshman (1991) states, “Systematic analysis of postneonatal deaths in the AI/AN population in a ten state area suggests that family behavior and dysfunction (such as alcohol/substance abuse, depression, physical violence, and the effects of abject poverty) were the major factors associated with infant demise” (p. 154).

Peer Support. Peer support influences Native pregnancy outcomes. Four studies found that peer support increases the health of the woman and her fetus/infant (Begay, 2004; Davis & Prater, 2001; Mehl-Madrone, 2000; Sokoloski, 1995). Begay (2004) discussed the importance of peer support during traditional Navajo childbirth. Davis & Prater (2001) observed that when one of their pregnant NA women seemed alone, they tried to connect the

woman with peers in the community, “This return to one’s culture and roots seemed to produce the strength to keep trying to achieve good health habits” (p. 16). In the Mehl-Madrona study (2000) pregnant women joined together for a group prenatal intervention that included a whole segment on developing peer support. Additionally the intervention included a Talking Circle where participants could share what was on their mind. The women involved in the Mehl-Madrona prenatal intervention had greater rates of spontaneous vaginal births, lowered rates of smoking and drinking, and their infants were less likely to be admitted to the neonatal intensive care unit (NICU).

Traditional Beliefs. Within the traditional beliefs of Native people is the idea that a woman needs to take good care of herself to ensure her health along with her baby’s (Begay, 2004; Davis & Prater, 2001; Dempsey & Gesse, 1995; Long & Curry, 1998; Mehl-Madrona, 2000; Sokoloski, 1995). Dempsey & Gesse (1995) discussed Navajo customs that a pregnant woman should exercise, continue with her chores but avoid heavy lifting. Additionally, a well-balance diet along with adequate rest was considered important to prenatal health (Sokoloski, 1995). And while there is a strong belief that a woman has a duty to take care of herself and her baby, western intervention is traditionally seen as unnecessary. “Grandmothers had not gone for prenatal care...grandmothers had delivered large, healthy babies, thus negating the doctor’s or midwife’s instructions to come for regular care” (Davis & Prater, 2001, p. 13).

Traditionally, pregnancy is seen as a time of health and not a time to be seeking a healer (Davis & Prater, 2001; Long & Curry, 1998; Sokoloski, 1995). Thus in this traditional mode of viewing pregnancy, western medicine’s prenatal care is seen as

superfluous. Pregnancy is not a time of sickness, but of health therefore no intervention is needed. Long & Curry (1998) found, “Many of the young Native women in the study told us that they couldn’t see the value of the Western model [prenatal care] despite knowing they should attend” (p. 214). Davis & Prater (2001) rallied to change the traditional views surrounding prenatal care by making home visits to meet with the extended family of pregnant NA and discuss the benefit and need of prenatal care and its positive affect on decreasing infant mortality.

Community

The community greatly impacts the health of a pregnant woman and her fetus/infant.

Neighborhoods, schools, work sites, and even nations—carry with them health risks for the individuals who live in those environments. The health risk conferred by these places is above and beyond the risk that individuals carry with them. Thus, we might view characteristics of physical environments (e.g., parks and buildings) as well as social environments (e.g., levels of inequality and civic trust) as truly properties of places, not individuals (IOM, 2003a, p. 68).

The community’s impact on NA pregnancy outcomes is seen within the literature. The topics addressed by the literature that fall within the community sphere include: community health clinics, prenatal services, SIDS education, infant care education, home visits, smoking cessation & prevention programs, injury rates/environmental safety, tribal commitment to mothers and infants, and integration of traditional and western medicine.

Community Health Clinics. The presence or absence of community health clinics serves as an influence on Native pregnancy outcomes. In Long & Curry (1998) the interviewees often had a hard time accessing the clinic due to long distances, bad weather,

and transportation difficulties. Additionally NA women reported feeling disrespected by the providers who were Caucasian men (Long & Curry, 1998).

Three articles recommended community health clinics as a means to improving pregnancy outcomes (Baldwin et al., 2002; Grossman, 2002; Palacios & Kennedy, 2010). Grossman (2002) discovered considerable disparity among urban health clinics; for example the Los Angeles-Orange metropolitan area of California has the highest number of AI/AN births in the country yet there is only one urban Indian health clinic that does outreach and gives referrals but provides no direct medical or prenatal care. Grossman (2002) believes that more health clinics with better prenatal care will improve pregnancy outcomes. Palacios & Kennedy (2010) point out that clinicians in community health clinics have a unique opportunity to screen young women for risk factors associated with early childbearing and to help the young women develop strategies to delay pregnancy.

Prenatal Services. The availability of prenatal services plays a critical role in pregnancy outcomes for Indigenous women. Two articles found evidence in their data of prenatal care's importance (Mehl-Madrona, 2000; Prater, 2002). The prenatal interventions used in Mehl-Madrona (2000) improved incidence of normal delivery, reduced the number of Cesarean deliveries, and improved infant outcomes. The prenatal intervention included both a Talking Circle and group session covering: fears, getting support, stress reduction, attachment to the unborn child, preparation for birth, and environmental awareness. The prenatal program described by Prater (2002) increased the number of NA receiving prenatal care, increased earlier initiation of that care, and resulted in no infant deaths, no preterm

births, no low birth-weight babies, no fetal alcohol syndrome and the average birth weight was 7 lbs 5 oz.

On the opposite end of the spectrum two studies found the detrimental effects of no or unequal access to prenatal care (Baldwin et al. 2002, Grossman et al., 2002). Baldwin et al. (2002) found that NA women were two to three times more likely to receive inadequate prenatal care compared to Whites and they were more likely to have low-birthweight infants. Grossman et al. (2002) studied urban NA and found 14.4% received inadequate prenatal care resulting in higher than White rates of infant mortality.

SIDS Education. A recurrent theme throughout the literature was the high rates of SIDS death among Native people and the need to combat the problem through education (Baldwin et al., 2002; Burd et al., 2007; Gaudino, 2008; Iyasu et al., 2002; Luo et al., 2004). Between 1996-1998 the SIDS rate for all races in the US was 10.7 per 1000 live births where as the IHS rate was 18.1 per 1000 (Burd et al., 2007). Nakamura et al. (1991) who investigated infant mortality on the Warm Springs Indian Reservation in Oregon said, “The infant mortality rate at Warm Springs since 1980 would be about the same as the US rate if there were no excess SIDS deaths” (p. 2247). Burd et al. (2007) determined through a pretest that both NA and Caucasians know very little about the risk factors for SIDS, but after a 20 minute teaching program, 80% of participants had improved their scores on a posttest. Additionally participants were given a baby blanket that had graphics of the nine risk factors for SIDS as a reminder to take proper precautions when preparing an infant for sleep (Burd et al., 2007).

Iyasu et al. (2002) found three risk factors associated with SIDS. They found that infants were one-fifth less likely to die from SIDS if public health nurses had visited the house before or after the infant's birth. If there was periconceptional maternal alcohol use and first trimester binge drinking, the infant was also at increased risk for SIDS. This is the first study to identify this link. The authors also found a six-fold increase in risk for SIDS when a diapered infant wore two or more layers of clothing at night (Iyasu et al., 2002). Researchers champion education as a means to reduce infant mortality related to SIDS (Baldwin et al., 2002; Burd et al., 2007; Gaudino, 2008; Iyasu et al., 2002; Luo et al., 2004).

Infant Care Education. Five studies produced data indicating the importance of infant care education (Barlow et al., 2006; Davis & Prater, 2001; Duffy & Gallup, 1994; Long & Curry, 1998; Walkup et al., 2009). Davis & Prater (2001) conducted postnatal home visits and observed mothers lacked nurturing skills, "Mothers expected babies to be happy in their beds or infant seats, to watch TV, or to play with what was provided. Interaction was sorely missing" (p. 17). Based on client interest, a nurturing program was established (Davis & Prater, 2001). Among the interviews Long & Curry (1998) conducted, "All of the elders expressed concern about how today's young women were caring for their babies. One described it as "Throwing their babies away." (p. 211). One remarked, "A major teaching that no one does anymore and no one talks about is that when a child is born, you take real good care of this child, because how you take care of the child is how the child would be for the rest of its life" (Long & Curry, 1998, p. 211). The elders felt there was a breakdown in infant care that needed to be addressed. Walkup et al. (2009) and Barlow et al. (2006) conducted randomized controlled trials on a home-visiting interventions among

young NA. The intervention group in Walkup et al. (2009) had an increased maternal knowledge and bettered infant behavior, and the study subjects in Barlow et al (2006) had improvement in child care knowledge and involvement. And while Baldwin et al. (2002) did not examine childcare classes, they recommended the intervention due to the high postneonatal death rates that they claim are from preventable causes.

Home Visits. Three studies found direct evidence to support the benefit of home visits on pregnancy outcomes (Barlow et al., 2006; Iyasu et al., 2002; Walkup et al., 2009). As stated in the previous section both Barlow et al. (2006) and Walkup et al. (2009) found home visits to be effective in increasing childcare knowledge which Baldwin et al. (2002) believes decreases infant mortality. Home visits also decreased infants' risk of SIDS by one fifth according to Iyasu et al. (2002).

Many researchers recommended home visits as a means of bettering pregnancy outcomes (Davis & Prater, 2001; Eaglestaff et al., 2007; Nakamura et al., 1991; Prater, 2002). Davis & Prater (2001) state:

A home visit by the nurse often revealed why a family may not make a prenatal office appointment a first priority. Food, shelter, and safety had to be considered first. The nurse perceived a tangible new level of acceptance by patients following a visit to their homes. (p.14).

Eaglestaff et al. (2007) concluded that increasing home visiting rates would help decrease infant mortality. Nakamura et al. (1991) stated that the Warm Springs Reservation in Oregon was conducting home visits after every birth in hopes of decreasing infant mortality. The importance of a home visit is substantial according to the data (Barlow et al., 2006;

Davis & Prater, 2001; Eaglestaff et al., 2007; Iyasu et al., 2002; Nakamura et al, 1991; Prater, 2002; Walkup et al., 2009).

Smoking Cessation & Prevention Programs. Smoking cessation

& prevention programs are another way pregnancy outcomes are improved (Mehl-Madrona, 2000; Patten et al., 2008; Trans et al., 2010). In the Mehl-Madrona (2000) intervention, many participants identified smoking as a stress coping devise so women were paired to help each other reduce smoking. The program worked. Initially among the intervention group, 32.5% of the women smoked versus the comparison group of 28.4%. Among the intervention group 30.8% quit and 77.9% reduced their smoking compared to the control group where only 11% stopped smoking and only 45.1% reduced smoking. The author believes that the smoking intervention was a key component in the positive pregnancy outcomes and decreased IMR associated with the study (Mehl-Madrona, 2000).

Patten et al. (2008) piloted a study on the tobacco use of pregnant Alaska Native women and initiated an education intervention on tobacco cessation. Of the one hundred pregnant women studied, only 40% believed tobacco was harmful to the fetus. The educational intervention was a 20 minute session with a nicotine dependent counselor who assessed tobacco use and administered the clinical gold standard intervention for smoking cessation called the Five A's (Ask, Advise, Assess, Assist, Arrange). At the last prenatal visit 11% of the women had stopped smoking and at delivery 12% quit. Patten et al. (2008) concluded that the need for a cessation program is there, but that their intervention needed augmenting since a more robust cessation rate was expected.

Trans et al. (2010) explored receipt of smoking cessation counseling during prenatal care offered in Oregon. A stratified random sample found that even though NA women were more likely to smoke than any other race/ethnicity, they were less likely than any other group to receive the most fundamental of smoking cessation steps: first three of the Five A's (Ask, Advise, Assist).

While El-Bastawissi et al. (2007) did not have direct evidence on smoking's effect on infant mortality, they did believe WIC's referrals to smoking cessation may be a reason for WIC recipients' better birth outcomes. The need to address smoking cessation is a crucial portion in the quest for better outcomes among Indigenous women.

Many other studies recommend smoking cessation as a means to decreasing infant mortality and bettering pregnancy outcomes in Native people (Blabey & Gessner, 2009; Bulterys, 1990; Bulterys et al., 1990; Eaglestaff et al., 2007; Fleshman, 1991, Patten et al., 2008). Blabey & Gessner (2009) found that maternal tobacco or alcohol use increased postneonatal mortality therefore they recommended treatment programs. Bulterys (1990) found that maternal cigarette smoking might account for the high incidence of SIDS among NA therefore he concluded, "From a public health perspective, this report points to the need to develop effective smoking cessation methods for Native Americans, targeting in particular women of reproductive age" (p. 193). In examining smoking's role in infant mortality, Eaglestaff et al. (2007) said, "Smoking reduction programs urgently need improvement" (p. 178). Patten et al. (2008) added, "The development, implementation and evaluation of the feasibility and efficacy of culturally relevant interventions are needed to enhance the tobacco abstinence rate" (p. 47).

Injury Rates/Environmental Safety. Researchers found that injury rates and environmental safety may be causes for high infant mortality (Baldwin et al., 2002; Berger et al., 2007, Duffy & Gallup, 1994). “AI/ANs have substantially higher rates of postneonatal death rates from a number of preventable causes: SIDS, infectious diseases, and unintentional injuries” (Baldwin et al., 2002, p. 1495). Baldwin et al. (2002) champion the idea of injury prevention programs. Berger et al. (2007) found that child mortality rates (ages 0-19) would be equivalent with Whites if NA child injury rates were reduced to those of Whites; however, NA IMRs would still remain high. The challenges to determining the cause of infant death is complicated:

Differentiating among unintentional suffocation, SIDS, and child abuse, for example, often requires a postmortem examination, death scene investigation, and detailed review of case records. Particularly in AI/AN communities, geographic isolation, lack of resources, an absence of tribe-specific child mortality review teams, and cultural practices can be barriers to fulfilling these requirements (Berger et al., 2007, p. 206).

Despite the complication of determining cause of infant death, Berger et al. believed that a safe environment would be beneficial, “Many injury prevention strategies are effective, but too few are fully implemented in AI/AN communities” (Berger et al., 2007, p. 207).

Many studies recommended a safe environment as a means to better pregnancy outcomes among Native women (Barlow et al., 2006; Berger et al., 2007; Fleshman, 1991; Luo et al., 2004; Nakamura et al., 1991). “By highlighting the dramatic impact of child injury rates on overall child mortality, we hope injury prevention programs will be continued and expanded at the local, state, and national levels” (Berger et al., 2007, p. 207). Nakamura et al. looked at infant mortality for the Warm Springs Indian Reservation in Oregon and found that because the rates of infant mortality were so high, “A health

promotion office has been established, recognizing that much excess infant mortality may be due to dangerous home environments rather than lack of access to medical care” (Nakamura et al., 1991, p. 2248). Additionally home visits were conducted to determine environmental safety (Nakamura et al., 1991). Even after controlling for maternal education, age, marital status, parity, infant sex, community size, and community-level random effects, Luo et al. found that infant mortality remained high suggesting, “That these disparities are at least partly related to their [First Nation women’s] particular socio-cultural environments or other unknown factors related to aboriginal women and their communities” (2004, p. 49).

Tribal Commitment to Mothers & Infants. Pregnancy outcomes also are affected by a tribe’s commitment to its infants and mothers (Begay, 2004; Dempsey & Gesse, 1995; Patten et al., 2008; Sokoloski, 1995). Begay (2004) interviewed Navajo women about their pregnancies, and interviewees talked about the important role of the community during pregnancy. Community support was essential to a pregnant woman for tribal members were needed to conduct a Blessingway ceremony, a ceremony to enhance positive thoughts and ensure healthy pregnancy outcomes for mother and infant (Begay, 2004). In Sokoloski’s (1995) interviews with First Nation women, they looked to the female community for support during childbirth.

Integration of Tradition & Western Medicine. A common theme throughout the literature is the idea that there needs to be an integration of traditional and western medicine offered to pregnant Native women (Barlow et al., 2006; Begay, 2004; Davis & Prater, 2001; Dempsey & Gesse, 1995; Duffy & Gallup, 1994; Long & Curry, 1998; Mehl-Madrona,

2000; Palacios & Kennedy, 2010; Patten et al, 2008; Shah et al, 2011; Sokoloski, 1995; Tran et al, 2010; Walkup et al, 2009). In the program described by Davis & Prater (2001), a medicine woman who was an elder in the community helped with the Lamaze classes.

Dempsey & Gesse (1995) concluded from their interview of Navajo women that:

“To ensure successful integration of traditional Navajo beliefs with modern childbearing health practices, health care personnel need to support those individual beliefs, values, and practices that are either beneficial or harmless and modify those that are harmful to provide nursing care that is truly sensitive to the cultural needs of each Navajo childbearing client (p. 603)

Long & Curry (1998) concluded that NA live in two different worlds that of their native culture and that of the dominate national culture, “Thus we recommend that contemporary prenatal care be reconceptualized to strengthen partnerships between the Native American community and the Western health care providers to reintegrate traditional cultural wisdom” (p. 214). Long & Curry (1998) suggest that elders, Native natural healers, grandmothers, and aunts take up a role in providing prenatal education and collaborate with licensed providers to provide culturally appropriate prenatal care. From her interviews with Canadian First Nations women, Sokoloski concluded “Perhaps health-care providers need to place more emphasis on promoting healthy traditional practices and reducing poverty in order to enhance pregnancy outcomes” (1995, p. 98). According to the research the need to integrate traditional and Western medicine is an appropriate and needed step (Barlow et al., 2006; Begay, 2004; Davis & Prater, 2001; Dempsey & Gesse, 1995; Duffy & Gallup, 1994; Long & Curry, 1998; Mehl-Madrone, 2000; Palacios & Kennedy, 2010; Patten et al, 2008; Shah et al, 2011; Sokoloski, 1995; Tran et al, 2010; Walkup et al, 2009).

Public Policy.

Public policy is another sphere of influence on NA mothers and infants. “Macro-level or upstream determinants (such as policies and societal norms) and micro-level determinants (such as sex or the virulence of a disease agent) interact along complex and dynamic pathways to produce health at a population level” (IOM, 2003¹, p. 53). The macro-level decisions made by governments and tribes impact mother and infant outcomes. Included among the public policy that affects pregnant Indigenous women and infants are: WIC, safe water & sanitation, IHS funding, and systems to monitor Native health.

WIC Availability. One of the studies researched Special Supplemental Nutrition Program for Women Infants and Children (WIC)’s affect on pregnancy outcomes (El-Bastawissi et al., 2007). The results were stunning. They found WIC to be protective for preterm delivery, abortion, low birth weight, and fetal death (El-Bastawissi et al., 2007). Women were more likely to receive adequate prenatal care. The protective effect of WIC was greatest among higher risk women (El-Bastawissi et al., 2007). The authors concluded that funding for WIC was cheaper than the costs incurred with pregnancy complications, “This evaluation, which adds to the studies showing the benefit of prenatal WIC participation on birth outcomes, is important in these times of skyrocketing health care costs and limited funding for preventive public health programs” (El-Bastawissi et al., 2007, p. 620).

Water & Sanitation. Another article examined the impact of safe water and sanitation on IMRs in NA (Watson, 2006). The article details the impact of the 3700 federal

sanitation projects implemented on reservations between 1960-1998. “Federal sanitation interventions explain almost forty percent of the convergence in Native American and White IMRs in reservation counties since 1970” (Watson, 2006, p.1537). Because of the program’s impact on reducing waterborne gastrointestinal diseases and infections respiratory disease among Native infants thereby leading to a sharp decline in infant mortality, the author concluded, “The public sector has an important role to play in allocating resources to sanitation” (Watson, 2006, p. 1559).

IHS Funding. Another area of public policy influence on NA pregnancy outcomes is IHS funding. Two studies identified inadequate IHS funds as a problematic stressor on healthy pregnancy outcomes (Grossman et al., 2002; Nakamura et al, 1991). Grossman et al. states, “Funding of the IHS has not kept pace with the growth of the population or health care inflation rates, making it difficult, if not impossible, for it to address adequately the needs” of NA (2002, p. 632). Nakamura et al. (1991) concluded, “Programs for maternal and infant health might be underfunded because of decreased priority for infant health issues” (p. 2247).

System to Monitor Native Health. Most of the studies conclude with recommendations for better pregnancy outcomes, and eight of them ended with the proposal of establishing a system to monitor Native health (Baldwin et al., 2002; Eaglestaff et al., 2007; Fleshman, 1991; Gaudino, 2008; Iyasu et al, 2002; McCusker et al., 2000; Palacios & Kennedy, 2010; Shah et al., 2011). Baldwin et al. state:

Development of data systems, such as those provided by the IHS-funded Tribal Epidemiology Centers, that can supply information at the local

level is crucial to effective health and social service program planning by tribes that have assumed responsibility for their members' health care needs, the IHS, and other s involved in providing AI/AN health services (2002, p. 1496).

Fleshman (1991) believed that better systems analyzing infant death need to be established, "Multidisciplinary review, at the local level, close to the time of the death, is the best opportunity for planning intervention strategies to prevent additional deaths, the ultimate objective of the reviews" (p. 155). Gaudino (2008) states, "Only with ongoing surveillance capacity can progress and setbacks be identified early for timely public health action" (p. S22).

Assessing Study Strength

The level and quality of each article was analyzed using the criteria Stetler et al. proposed (1998). (See Table 7). Assessing the strength of each study provided perspective on how to view the entire body of literature. It also helped identify where future research will be needed.

Of the 34 articles that met the study's inclusion and exclusion criteria, only one article was a meta-analysis ranking it at level I (Shah et al., 2011). While a meta-analysis represents the strongest type of research among reports, the information gleaned from the article affirmed what was previously known. It confirmed by studying thirty-eight studies that aboriginal women are at increased risk for adverse pregnancy outcomes. This information provided an important foundation upon which to build.

Only two studies were randomized control trials (RCTs) placing them at level II (Barlow et al., 2006; Walkup et al., 2009). Walkup et al. (2009) pointed out that NA tend to

be, “Extremely cautious of research because of a history of abuses” (p. 600). This view of research may explain why there are only two RCTs published on the subject. Additionally, some topics (such as behavioral interventions) may be difficult and/or unethical to randomize. Some even argue, “The greatest weakness of laboratory experiments lies in the artificiality. Social processes that occur in a laboratory setting might not necessarily occur in more natural social settings” (Babbie, 1998, p. 252).

Five studies were quasi-experimental putting them at level III (Baldwin et al., 2002; Burd et al., 2007; Duffy & Gallup, 1994; Mehl-Madrona, L.E., 2000; Patten et al., 2008). These studies either had a control group and intervention or they had a pre- and post- test to determine changes attributed to the intervention.

The majority of the articles, a total of 24, fell into level IV, non-experimental studies (See Table 7). Most were retrospective epidemiological studies while a few were qualitative. While these studies did not produce the strongest evidence, they did provide data that was exceedingly rich. While Shah et al. (2011) confirmed the fact that aboriginals were at increased risk for poor pregnancy outcomes, the non-experimental articles explored why this might be the case.

The remaining two resources were program evaluation studies thereby placing them at level V (Davis & Prater, 2001; Prater, S.L., 2002). While these articles are considered the weakest of the evidence within this integrative review, they were a valuable and candid evaluation of a program the researchers developed to try and put a stop to the health disparities. From the articles one could trace how a program was created, how it was

modified to meet client needs, and how it succeeded in producing better pregnancy outcomes.

Table 7: Distribution of the Articles According to Strength (Stetler et al., 1998, p 202).

Level and Quality of Evidence	Source of Evidence	Research Articles
Level I (A-D)	Meta-analysis of multiple controlled studies	Shah et al. (2011)
Level II (A-D)	Individually experimental study	Barlow et al. (2006) Walkup et al. (2009)
Level III (A-D)	Quasi-experimental study such as nonrandomized controlled single group pre-post test, time series, or matched case-controlled studies	Baldwin et al. (2002) Burd et al. (2007) Duffy & Gallup. (1994) Mehl-Madrona, L.E., (2000) Patten et al. (2008)
Level IV (A-D)	Non experimental study, such as correlation descriptive research and qualitative or case studies	Bengay, R.C. (2004) Berger et al. (2007) Blabey & Gessner (2009) Bulterys, M. (1990) Bulterys et al. (1990) Dempsey & Gesse (1995) Eaglestaff et al. (2007) El-Bastawissi et al. (2007) Fleshman, C.V. (1991) Gaudino, J.A. (2008) Grossman et al. (2002). Iyasu et al. (2002) Johnson et al. (2008) Khoshnood et al. (1998) Long & Curry (1998) Luo et al. (2004) McCusker et al. (2000) Nakamura et al. (1991) Palacios & Kennedy (2010) Sokoloski, E.H. (1995) Thomson, M. (1990) Tran et al. (2010) Watson, T. (2006) Wenman et al. (2004)
Level V (A-D)	Case report or systematically obtained, verifiable quality or program evaluation data	Davis & Prater (2001). Prater, S.L. (2002)
Level VI (A-D)	Opinion of respected authorities	None.

The distribution of the articles showed there is a vast need for higher-level research. However, the review of literature also indicated the value of local evaluation efforts and qualitative studies to provide insight into community processes and potential interventions.

Contradictory Studies

While the majority of the studies confirmed the stance that Native women and infants were at increased likelihood for poor pregnancy outcomes, a few studies produced contradictory evidence. The Johnson et al. (2008) study concluded that neighborhood poverty has little effect on NA infant mortality but looking closely at the data it seemed like this had to be the conclusion because they could not find enough wealthy NA to compare to the poorer ones. Wenman et al. (2004) also found no statistically significant relationship between Aboriginal status and birth outcomes. However, under the study limitations section, the authors note that a small sample size may account for the nonsignificant results. The trends produced by the Wenman et al. (2004) data resembled that of other studies even though the Wenman et al. results did not reach a level of significance.

Gaps in Literature

From assessing study strengths, gaps in the literature were identified. Higher levels of research need to be conducted. The fact that there are only three studies that qualify as either level I or level II shows there is a void that needs to be filled by future study.

There is also a plethora of epidemiological studies identifying health disparities, but very little research studying interventions to eliminate the disparities. For example, in this integrative review of thirty-four studies, only eight studies take steps to try to change

pregnancy outcomes through an experimental action or intervention (Barlow et al., 2006; Burd et al., 2007; Davis & Prater, 2001; Duffy & Gallup, 1994; Mehl-Madrona, 2000; Patten et al., 2008; Prater, 2002; Walkup et al., 2009). As The American Indian Policy Center states, “For researchers, identifying problems is the easy part of improving social service to Indian communities. A more difficult task is how to create systemic change” (2000, p. 14). It is time to move beyond documenting disparities and research ways to resolve them.

Conclusion

The determinants of health for an Indigenous mother and her infant are multifactoral. There are layers upon layers of factors that interact with each other and change each other to produce pregnancy outcomes. These levels include: the individual, the interpersonal, the community, and public policy. Within those levels many different elements affect health. Within the individual level are: behaviors/lifestyles, mental health, tobacco use, educational attainment, maternal age, prenatal care, breastfeeding, immunizations, family planning, and socioeconomics/WIC enrollment. The interpersonal level includes: significant other, family support, peer support, and traditional beliefs. The community level also impacts health by the availability or lack of: community health clinics, prenatal services, SIDS education, infant care education, home visits, smoking cessation & prevention programs, injury rates/environmental safety, tribal commitment to mothers and infants, and integration of traditional and western medicine. Additionally public policy influences pregnancy outcomes through: WIC, safe water & sanitation, IHS funding, and systems to monitor Native health. Together levels and factors spin and configure in a kaleidoscope like manner

to produce the health outcomes of one Native woman and her infant. The implications are huge. The challenge of changing those outcomes is daunting. Only through multilevel changes can Indigenous pregnancy outcomes and IMRs be bettered.

Chapter five will discuss the topic further. It will discuss themes in more detail and address findings that were both intuitive and surprising. It will conclude with recommendations for future studies in the quest to produce positive pregnancy outcomes and reduce infant mortality among Native people.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

Native American infants are 1.5 times more likely to die than non-Hispanic Whites before their first birthday (CDC, 2010). Like their American counterparts, First Nations women are at increased risk for adverse pregnancy outcomes (Luo et al., 2004; Shah et al., 2011). Although the disparities in infant mortality and poor pregnancy outcomes are well documented, little consensus exists for addressing the multiple determinant problems within the population. The purpose of this study was to conduct an integrative literature review to identify a broad range of interventions/perspectives that positively affect pregnancy outcomes and reduce infant mortality in Native American communities.

To address the primary aim of this study, four databases were searched: PubMed, CINAHL, PsycINFO, and Bibliography of Native North Americans. A variety of terms were searched including: *pregnancy, prenatal, intervention, pregnancy outcomes, and infant mortality*. The search terms used to describe Indigenous North Americans varied based on the preferred term for each search engine. Additionally, *The IHS Primary Care Provider*, was hand searched since search engines can miss up to 50% of relevant articles due to indexing problems and inconsistent terminology (Whittemore & Knafl, 2005).

Inclusion and exclusion criteria were established to focus the search and adhere to the methodology required for an integrative review. Articles accepted for the study included the following criteria: written in English, peer-reviewed, published between 1986-2011,

focused on the Indigenous population from the US or Canada, and descriptive of interventions/perspectives related to pregnancy/infant mortality. From this search, 34 articles met the inclusion criteria.

First, each study was analyzed based on criteria established by Stetler et al. (1998) including the level and quality of evidence. Second, findings and recommendations established in each article were documented in a chart (Appendix C). And finally, the findings and recommendations were subdivided based on categories of the socioecological framework: individual, interpersonal, community, and public policy (TulaneMCH, 2011).

“To understand how to improve health, we first must understand the determinants of health and how they interact” (IOM, 2003b, p. 31). The results and recommendations from the articles gave rise to the development of an adaptation of the socioecological framework for pregnancy outcomes in Native American women (Appendix D). At the heart of the model is a circle, representing the mother and fetus/infant. Around that circle is an ellipse representing the individual and the choices a woman can make to influence pregnancy outcomes including: behaviors/lifestyles, mental health, tobacco use, educational attainment, maternal age, prenatal care, breastfeeding, immunizations, family planning, and socioeconomics/WIC enrollment. Next, the interpersonal ellipse includes more factors that impact pregnancy outcomes: significant other, family support, peer support, and traditional beliefs. Surrounding the interpersonal ellipse is the community ellipse, a level that includes: community health clinics, prenatal services, SIDS education, infant care education, home visits, smoking cessation & prevention programs, injury rates/environmental safety, tribal commitment to mothers and infants, and integration of traditional and western medicine.

The outermost ellipse represents the public policy level composed of: WIC, safe water & sanitation, IHS funding, and systems to monitor Native health. In total, the synthesis of the findings from the literature appears to influence pregnancy outcomes. Torraco (2005) described forms of synthesis from an integrative review as follows:

Synthesis integrates existing ideas with new ideas to create a new formulation of the topic or issue. Synthesizing the literature means that the review weaves the streams of research together to focus on core issues rather than merely reporting previous literature. Synthesis is not a data dump. It is a creative activity that produces a new model, conceptual framework, or other unique conception informed by the author's intimate knowledge of the topic (p. 362).

Conclusions

The findings from 34 articles analyzed for the integrative review, indicate that pregnancy outcomes and infant mortality are determined by a number of factors embedded within many different layers including: individual, interpersonal, community, and public policy. The choices made from the individual up through public policy and the interplay of those choices impact pregnancy outcomes. "Understanding and ultimately improving a population's health rest not only on understanding this population perspective but also on understanding the ecology of health and the interconnectedness of the biological, behavioral, physical, and socioenvironmental domains" (IOM, 2003a, p. 51).

Some of the findings were fairly intuitive. A few studies recommended healthy behaviors/lifestyle (Begay, 2004; Davis & Prater, 2001; Dempsey & Gesse 1995; Gaudino, 2008; Long & Curry, 1998; Mehl-Madrona, 2000; Prater, 2000; Sokoloski, 1995). Other studies warned against poor lifestyle choices including drugs and alcohol (Blabey &

Gessner, 2009; Fleshman, 1991; Iyasu et al., 2002; Luo et al., 2004; Nakamura et al., 1991; Palacios & Kennedy, 2010; Thomson, 1990; Wenman et al, 2004). Still other studies found evidence to champion prenatal care (Davis & Prater, 2001; Gaudino, 2008; Mehl-Madrona, 2000; Prater, 2002). Finally, a few studies documented the importance of family support (Begay, 2004; Dempsey & Gesse, 1995; Long & Curry, 1998). Although these findings were fairly predictable, there were also some surprises.

The amount of research on the influence of tobacco on NA pregnancy outcomes was staggering. Twenty-one of the 34 articles touched on tobacco use in some form either as individual use, need for smoking cessation programs, or the need for SIDS education which include tobacco's influence on poor pregnancy outcomes. Most of this literature fell under the individual and community levels but no interventions were found to test the importance of public policy related to smoking.

As sovereign nations, tribes can set their own policy related to environmental tobacco smoke. None of the 34 studies in the integrative review mentioned Environmental Tobacco Smoke (ETS) laws or policies. However, a Google search indicated that it is becoming a topic of conversation and with more and more tribes moving toward limiting public smoking (Americans for Non-Smokers' Rights, 2012). In 2005 the Blackfeet Nation initiated the first codified commercial tobacco ordinance in Indian Country with their Blackfeet Tobacco Free Act (Americans for Non-Smokers' Rights, 2012). Fort Peck has also established the Fort Peck Tribes Ordinance 1906-2007-8, "Ohinni Candi Wakandapi/Chani Wakan K/Nusa" (Keep Tobacco Sacred) Act which created a tobacco free ordinance for all tribal buildings, workplaces, bars/restaurants and casino/gaming

(Americans for Non-Smokers' Rights, 2012). So while tobacco's public policy aspect is not yet in the research literature for pregnancy outcomes, it is taking affect in the public sector.

Another surprise within the tobacco literature was the correlation between SIDS deaths and risk for future SIDS death. Eaglestaff et al. (2007) found, "In the AAIHS [Aberdeen Area of the Indian Health Services], infant mortality is a recurrent event with, 38% of the mothers having had a pervious infant or child death before the death of this current infant" (p.178). While the researchers did not explore the causes of the recurrence, the study did identify previous SIDS death as a major risk factor and recommended additional surveillance and enhanced prenatal care for these women.

Another topic of interest was the power of peer support. Mehl-Madrona (2000) recognized the influential peer support on pregnancy outcomes. In his study women were paired to help each other receive the social support they felt they needed (Mehl-Madrona, 2000). In the same study women were matched to help each other reduce their cigarette and alcohol consumption. The intervention not only significantly decreased smoking and drinking but also produced better pregnancy outcomes (Mehl-Madrona, 2000).

A possible criticism of the study was the compilation of research from many different tribes and cultures. Like the meta-analysis conducted by Shah et al. (2011), "A major criticism of our review is the suitability of the studies for combining their results" (p. 37). Many of the 34 articles combined findings from several different tribes as well. For example, Eaglestaff et al. (2007) studied infant mortality within the Aberdeen Area of the IHS, and they questioned the validity of combining the results from the area because, "The 19 individual tribal nations represent different cultures with widely differing beliefs systems

about infant deaths” (p. 179). But due to the limited research available on this topic, combining data from various tribes seems to be the only option on which to draw any conclusions.

Another limitation was the inclusion and exclusion criteria. The study looked only at Indigenous pregnant woman, but articles on minority women and women at risk would also have contributed to the picture.

Time was another hurdle. There is always more literature to discover, articles that the search engines did not uncover, but at a certain point, a researcher has to take the data she has and move on from there. Additionally, each month more and more studies come out which can change the picture. The review of literature for this study ended in August of 2011.

General Recommendations

The data generated by the integrative review articles indicated that pregnancy outcomes are a result of many factors within different levels of a person’s environment including: individual, interpersonal, community, and public policy. The IOM state, “Addressing public health challenges requires an ecological approach” (2003b, p. 25). The IOM goes on to say, “An ecological *approach* to health is one in which multiple strategies are developed to impact determinants of health relevant to the desired health outcomes” (IOM, 2003b, p. 7). Therefore a multipronged approach for eliminating health care disparities, like NA infant mortality, is essential.

A balanced program would address interventions at the public policy, community, interpersonal, and individual levels. Can one program tackle such a vast project? It seems

unlikely, but through collaboration perhaps it can be achieved. IHS or the local Tribal Health program or a group of interested citizens would need to assess what programs (governmental, non-governmental, and nonprofit) are currently available for their constituents and how these programs could be utilized to their utmost. The leaders of this Indigenous prenatal program would need to identify what programs are working and where gaps exist in the socioecological framework that could yield better pregnancy outcomes. The following example is a suggestion for a start.

An effective Indigenous prenatal program would have to take into account Maslow's hierarchy of needs (Maslow, 1943) in addition to the model developed in this paper, the Socioecological Framework for Pregnancy Outcomes in Native Women (Appendix E). It seems as though the public policy and community levels in the socioecological framework may combine to meet the physiologic and safety needs of Maslow's model. Maslow's level of belonging is echoed in the interpersonal level of the socioecological framework. The esteem needs of Maslow are acted out within the individual sphere of the socioecological framework. The end product of Maslow's needs is self-actualization and the end products of the socioecological model are pregnancy outcomes; they both are the summation of all the choices and support or lack thereof from public policy, community, interpersonal, and individual.

Public Policy

While it is farthest removed from mothers and infants, changes in public policy can make some of the greatest changes to create a climate conducive to healthy pregnancy outcomes. The most important place to start would be to find out what Indigenous people

feel they need. “Unless service professional, policy makers, and researchers begin to understand and seek knowledge about Indian culture and history, today’s policies and programs will be no better for American Indian people than failed assimilation attempts of boarding schools” (American Indian Policy Center, 2000, p. 8).

According to Maslow, a focus should be on developing programs targeting physiological and safety issues. This idea is seen within the articles analyzed for this study as well. The El-Bastawissi et al. (2007) article proved that WIC, which provides women with food and other health resources, can produce healthier pregnancy outcomes in NA women. It is imperative that women who are eligible for WIC seize that aid. Additionally, continuation of safe water and sanitation are key to positive pregnancy outcomes (Watson, 2006).

Many of the studies called for increased IHS funding. More money for IHS would allow for development of more programs to improve Native pregnancy outcomes and infant mortality. Additionally, some of the IHS funding can go into creating systems to monitor Native health, an idea that appeared again and again in the literature (Baldwin et al., 2002; Eaglestaff et al., 2007; Fleshman, 1991; Gaudino, 2008; Iyasu et al., 2002; McCusker et al., 2000; Palacios & Kennedy, 2010; Shah et al., 2011).

Community

Community health clinics are the keys to improving pregnancy outcomes among Native women (Baldwin et al., 2002; Grossman, 2002; Palacios & Kennedy, 2010). Having the physical structure of the clinic is important but even more important is having providers who are knowledgeable about Native traditional beliefs, “Cultural competency should be

supported as an essential element in teaching, research, and practice” (IOM, 2003b, p. 84). The women interviewed by Long & Curry (1998) said they knew they should be attending prenatal care but found the providers, “Insensitive and disrespectful” (p. 212). Palacios & Kennedy (2010) felt that healthcare providers are in a unique position to be able to identify women who are at increased risk for early child bearing and have a prime opportunity to help the women:

Along with directly asking young women if they have been sexually assaulted, clinicians may also ask, “What are the greatest challenges you have faced and how did you meet them?” Discerning these risks while educating about contraception and referring for resources (e.g., counseling), may postpone childbearing by drawing on women’s perceived strengths” (p. 432).

Healthcare providers who understand the unique position and cultural barriers of Indigenous women are imperative.

Providers need to encourage family planning. The data on how short pregnancy intervals increase risks of poor pregnancy outcomes were staggering (Barlow et al., 2006; Eaglestaff et al, 2007; Fleshman, 1991; Gaudino, 2008; Khoshnood et al., 1998; Nakamura et al., 1991; Palacios & Kennedy, 2010). If providers can motivate and empower Native men and women to utilize birth control, IMRs should decrease and the women will have better pregnancy outcomes.

The clinics are also a venue for comprehensive prenatal services. According to the integrative review results found in Chapter 4, these services would need to include: SIDS education, infant care education classes, smoking cessation & prevention programs, family planning, addictions counseling, mental health counseling, nutrition and exercises classes, as well as information on breastfeeding and immunizations. If elders could be incorporated

into teaching and providing prenatal services, this could be a strong means of making prenatal services more culturally appropriate. As the American Indian Policy Center says, “American Indians and non-Indians possess distinct cultures and histories, but we all share responsibility to seek a better future. The fastest way to build a bridge is to begin the process on both ends simultaneously” (2000, p. 9). Elders need to continue passing down their knowledge, and if prenatal care could be incorporated into their teaching, both cultures would benefit. “Indian elders are highly respected, but because they are less called upon in contemporary society, younger generations are losing sight of this valuable resource” (American Indian Policy Center, 2000, p. 34). Prenatal care could be just the right vehicle for refocusing the younger generation’s attention onto the wisdom their elders have to share.

The power of good prenatal care programs is not to be underestimated. One Native woman who’d just found out she was pregnant arrived at the prenatal program described by Prater (2002) and said:

How can I do this? I don’t have my own home or even my own groceries. My mom is an alcoholic and I just stay with my blanket roll wherever she finds to stay. I have nothing to call my own, and I don’t know when or where my next meal will come from. (p. 26).

The woman was given WIC coupons for food, a prenatal appointment, and bus tickets to get her to the appointment. By the end of the program she had her own apartment and concluded, “This program saved my life” (Prater, 2002, p. 27). Another one of the participants in the prenatal program described by Davis & Prater (2001) said, “I did pregnancy right...I am the first one in my family to break the cycle of alcohol in pregnancy” (p. 16). With the right support and resources, a healthy new circle can begin.

Home visiting will be an important element within the prenatal program. The strength of a home visiting intervention on generating positive pregnancy outcome was seen in the literature (Barlow et al., 2006; Iyasu et al., 2002; Walkup et al., 2009). It was recommended as a key component in prenatal care as well (Davis & Prater, 2001; Eaglestaff et al., 2007; Nakamura et al., 1991; Prater, 2002). The synergy of good prenatal care and home visiting could produce healthy Native infants and mothers.

Interpersonal

The importance of family is paramount within Native culture (American Indian Policy Center, 2000). “Child rearing is an important community responsibility and is shared among all family members” (American Indian Policy Center, 2000, p. 39). But if the family circle is broken, child rearing becomes more difficult.

The literature concurs that family support is imperative for positive pregnancy outcomes (Begay, 2004; Dempsey & Gesse, 1995; Long & Curry, 1998), yet family dysfunction is a theme that surfaced often (Fleshman, 1991; Long & Curry, 1998; Palacios & Kennedy, 2010). In Long & Curry (1998) the Native women interviewed discussed how the Federal assimilation programs destroyed Native family life; one elder stated, “Families were breaking up and people were going their own ways. Some children had lived in ten different foster homes...We have lost what we had” (p. 211). Another woman interviewed stressed the devastation the disruption and the difficulty reestablishing a loving and nurturing environment for infants, “It starts in the family circle, and hopefully, it will be carried on. Because once the family circle is broken, it’s hard to repair” (p. 221). Palacios & Kennedy (2010) outline the hardships that complicate Native life, “For Native Americans

historically traumatic events included but are not limited to loss of land, population decimation, prohibition from practicing cultural and religious beliefs, and sterilization campaigns” (p. 432). The impact of these atrocities continues to reverberate within the populations. The family circle must be reestablished.

Efforts need to be made to reestablish strong families. No one person can make a family whole, healthy, and supportive of their pregnant women, but public policy and community programs can help. Public policy should establish community programs to help each family meet Maslow’s hierarchy of needs (Maslow, 1943). Public policy and the community have a duty to help families meet their physiological and safety needs so that families can move to Maslow’s next level of belonging and help the pregnant women through their pregnancy and beyond. Healthy families will give women and infants the support they need. Do the women’s families have shelter, food? If not, systems and programs need to be in place to rectify the deficiencies. If alcoholism is destroying a family, programs need to be in place to get the family help. If sexual abuse is occurring, counseling and resources are needed to intervene and help each individual work through the problems. The family has to have the resources it needs to satisfy its physiological and safety needs in order to establish healthy behaviors and lifestyles supportive for pregnant women.

Within Maslow’s level of belonging, is the importance of peer support in achieving better pregnancy outcomes (Begay, 2004; Davis & Prater, 2001; Mehl-Madrona, 2000; Sokoloski, 1995). Mehl-Madrona (2000) initiated a buddy system for women to lean on each other to help reduce cigarette consumption; the intervention led to reduced smoking and better pregnancy outcomes than the control group. When women feel they belong and

have the resources they need to fulfill their own needs, they can reach out and help each other to live a healthy pregnancy and produce a healthy infant.

Individual

Again, Maslow's hierarchy of needs come into play when addressing issues related to bettering pregnancy outcomes. In order for a woman to make good choices regarding healthy behaviors and lifestyles, her basic physiological and safety needs must be met. Davis & Prater (2001) noticed this, "A [home] visit often revealed why a family may not make a prenatal office appointment a first priority. Food, shelter, and safety had to be considered first" (p. 14). It is imperative that IHS representatives or health care providers or someone assess each woman's status in the hierarchy of needs. For health disparities to be eliminated an agency or group needs to take the initiative to fight for getting women the physiological and safety requirements they need in order that they can work towards focusing on their pregnancy and working to achieve healthy pregnancy outcomes.

Meeting physiological and safety requirements is essential to achieving positive pregnancy outcomes. After these basic needs are met, Native women can strive for healthy behaviors and lifestyles. They can seek mental health care. They can imagine ways to continue their education and enroll in early prenatal care. They can choose to breastfeed and choose to have their infants immunized. And they can choose birth control measures and engage in family planning. But until a woman has food in her belly and a safe place to sleep, she cannot address smoking cessation or prenatal care. Providing the basics through public policy, community collaboration, and through interpersonal connections is essential. "In view of the value of health to employers, business, communities, and society in general,

creating the conditions for people to be healthy should also be a shared social goal” (IOM, 2003a, p. 2). Not only should it be a shared social goal, it will have to be a shared social goal in order for it to work. Only after we have provided physiological and safety measures for women, can we eliminate healthcare disparities. We can do it, but it will take commitment from public policy, the community, the interpersonal sphere surrounding Native women as well as effort from the individual.

Study Limitations and Recommendations for Future Study

Young Native men must be included in the conversation of pregnancy outcomes and infant mortality. All of the articles from the integrative review focused on the mothers; research on paternal influence was sparse. Several studies indicated Native women with significant others achieved better pregnancy outcomes than those that didn’t have that support (Begay, 2004; Blabey & Gessner, 2009; Johnson et al., 2008; Nakamura et al., 1991). Men need to be included in the health disparities conversation. Native men need the same support as Native women. They need to be screened and treated for abuse, alcoholism, addiction, tobacco use, and suicide ideation. They need to be educated on birth control, sexually transmitted infections (STIs) and family planning.

Another topic that should be further explored is mental health’s role in prenatal care. After Mehl-Madrona’s success in reducing alcohol, smoking and stress and improving birth outcomes through his psychosocial prenatal intervention, he concluded, “Psychiatrists and other mental health care providers should be involved in prenatal care” (Mehl-Madrona, 2000, p. 275-276). After looking at the results it is hard to argue otherwise. Study findings

either are non-generalizable or need to be conducted with more power so results of solid studies are acknowledged.

One recommendation would be for Native people to become more involved in research. IOM predicts that communities must become involved to research complex health issues such as infant mortality. IOM states, “Whereas the study of clinical interventions can most usually be achieved by recruitment of consenting patients or subjects, interventions at the community level require an altogether different paradigm in which investigators and community or population to be studied are partners” (IOM, 2003b, p. 12). The most logical way to become partners would be through Community Based Participatory Research (CBPR).

CBPR is a collaboration between researchers and the population being studied. In CBPR, the population being studied should define the question being asked, help pick the method by which to answer the question, and then collaborate in the interpretation of the data (IOM, 2003b).

In short, the underlying rationale for CBPR and practice entails increased sensitivity to a community’s rightful place as a partner in research and practice. Furthermore, practical considerations dictate that community cooperation is predicted on processes that are participatory. Lastly, complex, interventions require communities to work in partnership with researchers and providers. Without comprehensive community approaches, pockets of prevalence many not be addressed effectively (IOM, 2003b, p. 87).

From the 34 articles studied, only one used a CBPR approach. Palacios & Kennedy (2010) used CBPR in an effort, “To equalize power between the researcher and the researched” (p. 427). The authors state, “Each step of the project, from proposal development to dissemination, was shared with the partnering Tribal Nation” (p. 427).

Study participants verified the results of the study. Palacios herself is a Native American and the oldest child of a young mother.

Some studies did work diligently to include Natives in their project development. Davis & Prater (2001) contacted 16 different local American Indian agencies and the reservations of the Wisconsin's six tribes, discussed the program, conducted needs assessments, and asked for support and referrals for the program. They hired an Indian artist to design a logo, and a medicine woman spoke at the Lamaze series. The researchers note, "Holding confidences and expecting to learn from the American Indian culture were both important in building trust and conveying sensitivity" (Davis & Prater, 2001, p. 18). While not specifically a CBPR project, the program worked to include the input from tribal agencies and refine their program based on participants' feedback.

Other studies also incorporate Native people into the development of their research. Long & Curry had community health representatives (CHRs) who recruited participants and provided the researchers ideas on how to arrange focus groups. Mehl-Madrone (2000) used Social Marketing Theory as a means of tailoring his intervention to fit Native needs; in this study, NA women were interviewed about what they needed in a prenatal program and he took their feedback to design such a program. Walkup et al. (2009) asked for local and cross-tribal advisory boards to help design a program that would meet the needs of NA mothers.

Some Natives were the primary investigators in their own research. As stated above, Palacios is a NA woman who used CBPR as her research method (Palacios & Kennedy 2010). Begay is a NA who interviewed fellow NA about their perceptions of childbirth

(2004). The Great Lakes Inter-Tribal Council received funding and analyzed infant deaths and identified factors contributing to those deaths (McCusker et al., 2000).

Some studies included Native women to help conduct the study. Dempsey and Gesse had a Navajo nurse who was both fluent in Navajo and English interview Navajo women about their beliefs, values and practices in childbearing (1995). Patten et al. (2008) recruited female Alaska Native bilingual (English and Yupik) nicotine dependence counselors to conduct their tobacco educational intervention.

The IHS also reviewed some of its own data. For example Eaglestaff et al. (2007) analyzed infant mortality in the Aberdeen Area. Eaglestaff is an RN employed by IHS. In order to understand NA infant mortality, Fleshman (1991) describes a collaboration between IHS and The American Academy of Pediatrics as well as each IHS Area Maternal and Child Health Coordinator, Clinical Directors at the Services Unites, representatives from Tribal Councils and Tribal health administrators.

Community involvement is imperative. In fact, according to CBPR principles, the data generated from research studies, including results from RCTs, are weakened if the community is not involved in the study. The process is more complicated for researchers, but the efforts will produce valid results that will be meaningful to both the researcher and the researched and ultimately be more applicable to eliminating healthcare disparities.

This study examined the following research question: What interventions positively affect Native American pregnancy outcomes and reduce infant mortality? A plethora of research establishes that pregnancy outcomes and infant mortality are worse in Native people, but only eight of the 34 studies analyzed in this thesis took steps to try to change

pregnancy outcomes through an experimental action or intervention (Barlow et al., 2006; Burd et al., 2007; Davis & Prater, 2001; Duffy & Gallup, 1994; Mehl-Madrona, 2000; Patten et al., 2008; Prater, 2002; Walkup et al., 2009).

The first step is to confer with tribal representatives and see what they believe to be the pressing issues. From an academic perspective it seems like the next logical step would be to focus on the socioecological framework to meet Maslow's hierarchy of needs by creating public policy and community programs to ensure individuals' physiological and safety needs are met. Once people have food and safety, the population will move to develop a sense of belonging; the research shows the importance of family and peer support as well as the benefit of a significant other for bettering pregnancy outcomes (Begay, 2004; Blabey & Gessner, 2009; Davis & Prater, 2001; Dempsey & Gesse, 1995; Fleshman, 1991; Johnson et al, 2008; Long & Curry, 1998; Mehl-Madrona, 2000; Nakamura et al., 1991; Palacios & Kennedy, 2010; Sokoloski, 1995). Now with food, shelter, safety, and belonging, pregnant Native women can focus on developing healthy lifestyles, seeking the mental health care she needs, quitting tobacco, entering into prenatal care early, breastfeeding, immunizing her infant, and practicing family planning. There is no easy way to make a socioecological environment conducive to healthy pregnancy outcomes, but interventions at the four levels (public policy, community, interpersonal, and individual) may be a promising start.

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APPENDICES

APPENDIX A:

RESEARCH APPRAISAL CHECKLIST

Title

1. The title is readily understood
2. The title is clear
3. The title is clearly related to content

Abstract

4. The abstract states the problem and, where appropriate, hypotheses clearly and concisely
5. Methodology is identified and described briefly
6. Results are summarized
7. Finding and/or conclusions are stated

Problem Statement

8. The general problem of the study is introduced early in the report
9. Questions to be answered are stated precisely
10. Problem statement is clear
11. Hypothesis to be tested are stated precisely in a form that permits them to be tested
12. Limitations of the study can be identified
13. Assumptions of the study can be identified
14. Pertinent terms are/can be operationally defined
15. Significance of the problem is discussed
16. Research is justified

Review of the Literature

17. Cited literature is pertinent to research problems
18. Cited literature provides rationale for the research
19. Studies are critically examined
20. Relationship of problem to previous research is made clear
21. The conceptual framework/theoretical rationale is clearly stated

22. Review concludes with a brief summary of relevant literature and its implications to the research problem under study

Methodology: Subjects

23. Subject population (sampling frame) is described
24. Sampling method is described
25. Sampling method is justified
26. Sample size is sufficient to reduce type 2 error
27. Standards for protection of subjects are discussed

Methodology: Instruments

28. Relevant reliability data from previous research are present
29. Reliability data pertinent to the present study are reported
30. Relevant previous bullet at the data from previous research are presented
31. Politically data pertinent to present study are reported
32. Methods of data collection are sufficiently described to permit judgment of their appropriate in this to the present study

Design

33. Design is appropriate to study questions and/or hypotheses
34. Proper controls are included where appropriate
35. Confounding/moderating variables are/can be identified
36. Description of design is explicit enough to permit replication

Data Analysis

37. Information presented is sufficient to answer research questions
38. Statistical tests are identified and obtained values are reported
39. Reported statistics are appropriate for hypothesis/research questions
40. Tables and figures are presented in an easy-to-understand, informative way

Discussion

- 41. Conclusions are clearly stated
- 42. Conclusions are substantiated by the evidence presented
- 43. Methodological problems in the study are identified and discussed
- 44. Findings of the study are specifically related
- 45. Implications of the findings are discussed
- 46. Results are generalized only to population on which study is based
- 47. Recommendations are made for further research

Form and Style

- 48. The report is clearly written
- 49. The report is logically organized
- 50. The donor the report displays an unbiased, impartial, scientific attitude

APPENDIX B

STUDY SYNOPSES

Author/ Country	Design	Purpose	Sample	Intervention	Outcome Measures	Results/Implications/ Suggested for Future Interventions
Baldwin et al. (2002) USA	Cross-sectional study comparing singleton AI/AN births to non-AI/AN births from 1989-1991	Determine a national profile of AI/AN maternal and infant health	N=148482 AI/AN singleton births between January 1, 1989 and December 31, 1991	None	Compared: receipt of an inadequate pattern of prenatal care, low birthweight (<2500g), infant mortality, and cause of death for infants.	High rates of inadequate prenatal care for AI/AN. AI/AN postneonatal death rates twice that of Whites. High rates of variation of maternal/child programs across IHS. Need community-driven programs.
Barlow et al. (2006). USA	Randomized Controlled Trial (RCT)	Assess impact of home-visiting intervention for AI adolescents	Intervention group: n=28 Control: n=25	Home visiting program	Child care knowledge, skills and involvement.	Home visits increased mother's child care knowledge and involvement.
Begay, R.C. (2004). USA	Qualitative review	Describe changes in attitudes/knowledge of childbirth among Navajo	N=71 women interviewed about childbirth	None	Knowledge of prenatal support & labor.	Author maintains NA need to remember spiritual connection to each other.
Berger et al. (2007) USA	Epidemiological Retrospective	Determine the impact of mortality from injuries on overall child mortality rate in Whites and Natives.	N=2482 (native deaths) N=111,917 (White deaths)	None	All-cause mortality and age-specific mortality rates for AI/AN and White children age 0-19 using CDC's Web-Based injury Statistics Query and Reporting System (WISQARS).	Overall child mortality rates for AI/AN and Whites would be equal if AI/AN child injury rates were reduced to those of Whites.

Author/ Country	Design	Purpose	Sample	Intervention	Outcome Measures	Results/Implications/ Suggested for Future Interventions
Blabey & Gessner (2009). USA	Epidemiological Retrospective	Identify variables that account for elevated postneonatal mortality in Alaska Natives	N=10,300 (births/yr) N=27 (infant deaths/yr)	None	Association between race and postneonatal mortality examined using univariate, stratified and regression analyses	3 maternal risk factors are associated with elevated risk of postneonatal morbidity among Native Alaskans: 1. Tobacco and alcohol exposure, women who did not complete high school, not reporting a father's name on the birth certificate.
Bulterys, M. (1990) USA	Epidemiologic study	Identify factors that could account for high rates of SIDS	Indians: n=32,347 Whites: N=537,077	None	Incidence rates of SIDS	High rates of smoking among Northern Indians and Alaska Natives may account for high rates of SIDS;
Bulterys et al. (1990) USA	Epidemiologic estimation	Quantify the expected impact of a smoking cessation program on AI infant mortality	Indians: n=32325 Whites: N=306,00	Theoretical Smoking cessation program	Proportional reduction (impact fraction) and absolute reduction (impact risk) in neonatal and postneonatal mortality	60% efficacy in preventing infant deaths attributed to smoking. Need to develop effective smoking cessation programs for Native Americans.
Burd et al. (2007). USA	Pre and post test quasi- experimental	Determine if SIDS risk reduction education increased knowledge about SIDS risks factors	N=341	SIDS risk reduction intervention	Pre and post testing scores on SIDS risk factors.	Program is effective in increasing knowledge about risk factors. The program should be initiated in other settings.
Davis & Prater (2001).	Case Study	Design, implementation, and outcomes of a	N=43	Creation of a community health center offering a	Change in at-risk health behaviors, start of prenatal	AI women started prenatal care sooner, they changed smoking and drinking habits, modified

Author/ Country	Design	Purpose	Sample	Intervention	Outcome Measures	Results/Implications/ Suggested for Future Interventions
USA		perinatal program for urban American Indians		perinatal intervention program	care, infant deaths.	diet. No infant deaths occurred.
Dempsey & Gesse (1995) USA	Qualitative Exploratory-descriptive	Discover the beliefs, values, and practices of Navajo childbearing women	N=20	Adapted Kay-Galenic cultural assessment framework to develop a 54 item structured interview	Responses to the 54 questions.	Great diversity among the Navajo women on the beliefs, values, and practices surrounding pregnancy. Health care providers need to assess each Navajo women's cultural needs individually.
Duffy & Gallup. (1994) USA	Pre and post test quasi-experimental	Determine if a community baby shower is an effective means of providing health education on newborn care.	N=10	Community baby shower as a transcultural nursing intervention	Pre and post testing scores	Pretest questions ranged from 0-70%. Posttest questions were 100% for all 10 participants. Community baby shower effective mode of providing education on newborn care.
Eaglestaff et al. (2007). USA	Epidemiological Retrospective	Present outcomes from 8 years of infant deaths in Aberdeen Area of IHS from 98-05.	N=233 infant deaths	None	Mortality rates: SIDS, prematurity, other.	28% of infant deaths due to SIDS. 24% prematurity. 38% of mothers of the infants who died had a previous infant death. Need to enhance prenatal care.
El-Bastawissi et al. (2007)	Record-linkage retrospective cohort design	Determine the effects of the Washington State Special	n=42,495 enrolled in WIC	WIC program	Birth/fetal death of women on Washington WIC to those who were	WIC was protective for adverse pregnancy outcomes especially in high risk women. Beneficial prenatal WIC

Author/ Country	Design	Purpose	Sample	Intervention	Outcome Measures	Results/Implications/ Suggested for Future Interventions
USA		Supplemental Nutrition Program for Women, Infants, and Children (WIC) on adverse pregnancy outcomes.	Control: n=30,751 WIC-eligible but not on WIC		eligible for Washington WIC but not enrolled.	participation on birth outcomes. WIC may be a good method to have better birth outcomes and reduce medical expenses.
Fleshman (1991). USA	Epidemiological Retrospective	Review AI/AN infant deaths in 10 states and determine impact of health care, family behaviors, and community life factors related to infant deaths	N=32,481 live AI/AN births N=505 AI/AN infant deaths	None	IMR, maternal lifestyle and baseline health, adequacy of prenatal care.	42% of infant deaths were neonatal while 58% postneonatal. Of the post neonatal deaths, most were from SIDS. 46% of the “SIDS mothers” had less than 4 prenatal visits and 57% had documented substance abuse, depression, developmental disabilities, or repeated incarcerations. Infant mortality produce of lifestyle quality. It is a public health issue.
Gaudino, J.A. (2008) USA	Epidemiologic Retrospective Birth and death cohorts	Examine infant mortality among AI/ANs in the Pacific NW	N=2100-2800 AI/AN births/yr from 1984-1997	None	Population characteristics, IMRs, behavior and prenatal care, infant outcomes, pregnancy outcome and delivery.	IMR among AI/AN in Pacific NW nearing White rates. No specific cause identified but suspect multi-factorial improvements. Champion further surveillance and interventions before conception through postpartum to continue trend.

Author/ Country	Design	Purpose	Sample	Intervention	Outcome Measures	Results/Implications/ Suggested for Future Interventions
Grossman et al. (2002). USA	Retrospective cohort study	Examine AI/AN births for metropolitan areas compared to Whites	N=72,730 singleton births to AI/AN mothers and/or fathers residing in urban areas	None	Adequacy of prenatal care, birth weight, neonatal death rates, and postneonatal death rates.	Marked disparities between pregnancies to AI/AN and White women. 49% of all AI/AN births are happening in urban areas. Need to expand/improve urban health programs and increase funding.
Iyasu et al. (2002). USA	Population based case control study	Determine prenatal and postnatal risk factors for SIDS among Native Americans	N=33 SIDS infants N=66 matched living controls.	None	Association of SIDS with infant care practices, health care utilization, maternal socioeconomics and behavioral factors.	3 risk factors identified: public health nurse visits, maternal alcohol use, layers of clothing. Need to increased public health nurse visiting program and programs to reduce alcohol consumption.
Johnson et al. (2008). USA	Explicit causal contrast study Retrospective	Explore if neighborhood poverty effects AI infant death.	N=4751	None	Infant death classified either as endogenous (internal/biologic in origin) or exogenous (external or socioenvironmental in origin)	Neighborhood poverty has little effect on AI infant mortality.
Khoshnood et al. (1998). USA	Epidemiological. Retrospective.	Determine if the interval between pregnancies impacts birth	Native Americans n=30898 Non-	None	Interpregnancy interval and birth eight and length of gestation.	Short intervals between pregnancies are associated with increased risk of low birth weight and preterm delivery.

Author/ Country	Design	Purpose	Sample	Intervention	Outcome Measures	Results/Implications/ Suggested for Future Interventions
		outcomes	Hispanic Whites: N=3,643,947			30% of NA have ≤ 12 months between pregnancies. Future intervention: programs controlling fertility.
Long & Curry (1998). USA	Qualitative	Investigate traditional beliefs related to pregnancy and how those ideas affect current use of prenatal care.	N=52	Focus groups	Discussions transcribed and coded. Themes identified.	Predominant model of prenatal care is culturally inappropriate of American Indians. Young Natives don't see the value in prenatal care. Need a new version of prenatal care.
Luo et al. (2004). Canada	Epidemiological Retrospective.	Determine pregnancy outcomes among aboriginal women	N=1,125,462 singleton births from 1985-97	None	Pregnancy outcomes: preterm birth, low birthweight, small-for-gestational-age, stillbirth, neonatal and postneonatal death.	High risk of neonate mortality among native children. Prevention of SIDS and infection-related deaths would reduce infant mortality.
McCusker et al. (2000). USA	Case-level, community-based infant mortality review retrospective.	Identify local underlying factors that contribute to Native American infant mortality	N=92 Native American infant deaths	None	Infant mortality, maternal smoking and timing of entry into prenatal care.	Disparities between prenatal care and maternal smoking during pregnancy. Need to increase outreach and get Native Am women early prenatal care and need smoking cessation programs.
Mehl-Madrone (2000)	Matched comparison group	Compare effectiveness of psychosocial	n=320 received the intervention	7 group sessions that addressed: fears, getting	Birth outcomes for women who attended the	Intervention reduced risks for cesarean birth, improve infant outcome and rates of normal

Author/ Country	Design	Purpose	Sample	Intervention	Outcome Measures	Results/Implications/ Suggested for Future Interventions
USA		prenatal intervention program to reduce alcohol, smoking and stress and improve birth outcomes	and a matched comparison group developed from prior 5 years.	support, stress reduction, attachment to the unborn child, preparation for birth I, preparation for birth II, and environmental awareness.	intervention versus comparison group.	delivery.
Nakamura et al. (1991). USA	Epidemiologic Retrospective	Describe IMR or Warm Springs Reservation	N=3613 (births) N=226 (deaths)	None	Cause of infant death & morality rates.	IMR would be about the same as US rate if no SIDS deaths.
Palacios & Kennedy (2010) USA	Qualitative Community-based participatory research	Understand the experience of Native American teen mothers.	n=30 Native American adult women who had early childbearing experiences	Interview with open ended questions.	Interviews transcribed and coded. Themes identified.	Two themes identified: stressful childhoods with ensuing chaotic lives and diminished childhoods that require girl to take on extensive responsibility at a young age. These findings may be risk factors for early childbearing.
Patten et al. (2008). USA	Quasi-experimental study as well as qualitative	Evaluate a tobacco educational intervention for pregnant Alaska Natives and determine their	N=100	Tobacco cessation educational intervention and open-ended interview questions	Self-reported tobacco abstinence rate following intervention and at delivery.	Need to augment the educational intervention since only 12% had quit tobacco use at delivery. Only 40% of Natives believed tobacco was harmful to their fetus.

Author/ Country	Design	Purpose	Sample	Intervention	Outcome Measures	Results/Implications/ Suggested for Future Interventions
		health beliefs				
Prater, S.L. (2002) USA	Case Study	Reduce Native American IMRs in Milwaukee, WI through the creation of a community health agency and a perinatal outreach program.	N=334	perinatal intervention program	Number of clients utilizing the program, timing of entry into prenatal care, health outcomes for mothers and infants, & client interviews.	American Indian women started prenatal care earlier. No preterm births. Fewer complication during pregnancies. No infant deaths. No low birth-weight babies born. No FAS.
Shah et al. (2011). Canada	Systematic review and meta-analysis	Determine risk of adverse pregnancy outcomes in Aboriginal women	N= 38 studies were included in the review	None	Pregnancy outcomes: low birthweight, preterm, small for gestational age, macrosomia, neonatal mortality, prenatal mortality, birthweight, gestational age.	Aboriginal women at increased risk for adverse pregnancy outcomes. Providers must increase surveillance, research needs to address potential causes, and need to get aboriginals involved in community representation.
Sokoloski, E.H. (1995). Canada	Qualitative, interviews	Establish Canadian First Nations Women's beliefs about Pregnancy and prenatal care.	N=7	Interviews	Interviews transcribed and coded. Themes identified.	First Nations women believe pregnancy is a natural process that requires no intervention like prenatal care. When they did see prenatal care, providers were often unfriendly and authoritarian.
Thomson, M. (1990).	Epidemiological Retrospective	Determine the relationship	N=1000 Natives	None	Birthweight and infant mortality.	Heavy birthweight 50% more common among Natives and

Author/ Country	Design	Purpose	Sample	Intervention	Outcome Measures	Results/Implications/ Suggested for Future Interventions
Canada		between birthweight and infant mortality	N=206,782 non-natives			Infant mortality was 40% more frequent in Natives. Hypothesize that high glucose causes increased infant mortality.
Tran et al. (2010). USA	Population-based survey of postpartum women	Explore the disparities in the receipt of smoking cessation counseling during parental care.	N=3895	Survey	Provision of smoking cessation counseling to pregnant women in Oregon.	American Indian women at greatest risk for not receiving smoking cessation counseling.
Walkup et al. (2009). USA	RCT	Determine if home visiting increases AI parenting knowledge, involvement, maternal & infant outcomes	N=167	Home visiting intervention	Parenting knowledge, parent involvement, Home Observation for Measurement of the Environment observational checklist, Infant Toddler Social Emotional Assessment, The Center for Epidemiological Studies—Depression self report, Substance use, Social support, Parenting Stress	Home visits increased mothers' parenting knowledge and showed better infant behavior outcomes.

Author/ Country	Design	Purpose	Sample	Intervention	Outcome Measures	Results/Implications/ Suggested for Future Interventions
					Index.	
Watson, T. (2006). USA	Epidemiologic Retrospective	Explore infant mortality and the impact of 3700 Federal projects to improve sanitation on reservations.	N=740,470 Indian births N=13,600 Indian infant deaths	Water and sewer projects	IMR Amount spent on sanitation.	Sanitation intervention accounts for 40% convergence in Native and White IMRs in reservations since 1970.
Wenman et al. (2004). Canada	Prospective cohort study	Determine pregnancy risk factors and birth outcomes in Aboriginal women.	N=2047 enrolled; n=1811 completed the study	Questionnaires on sociodemographic and clinical data	Prenatal risk factors Birth outcomes	No statistically significant relation between Aboriginal status and birth outcomes.

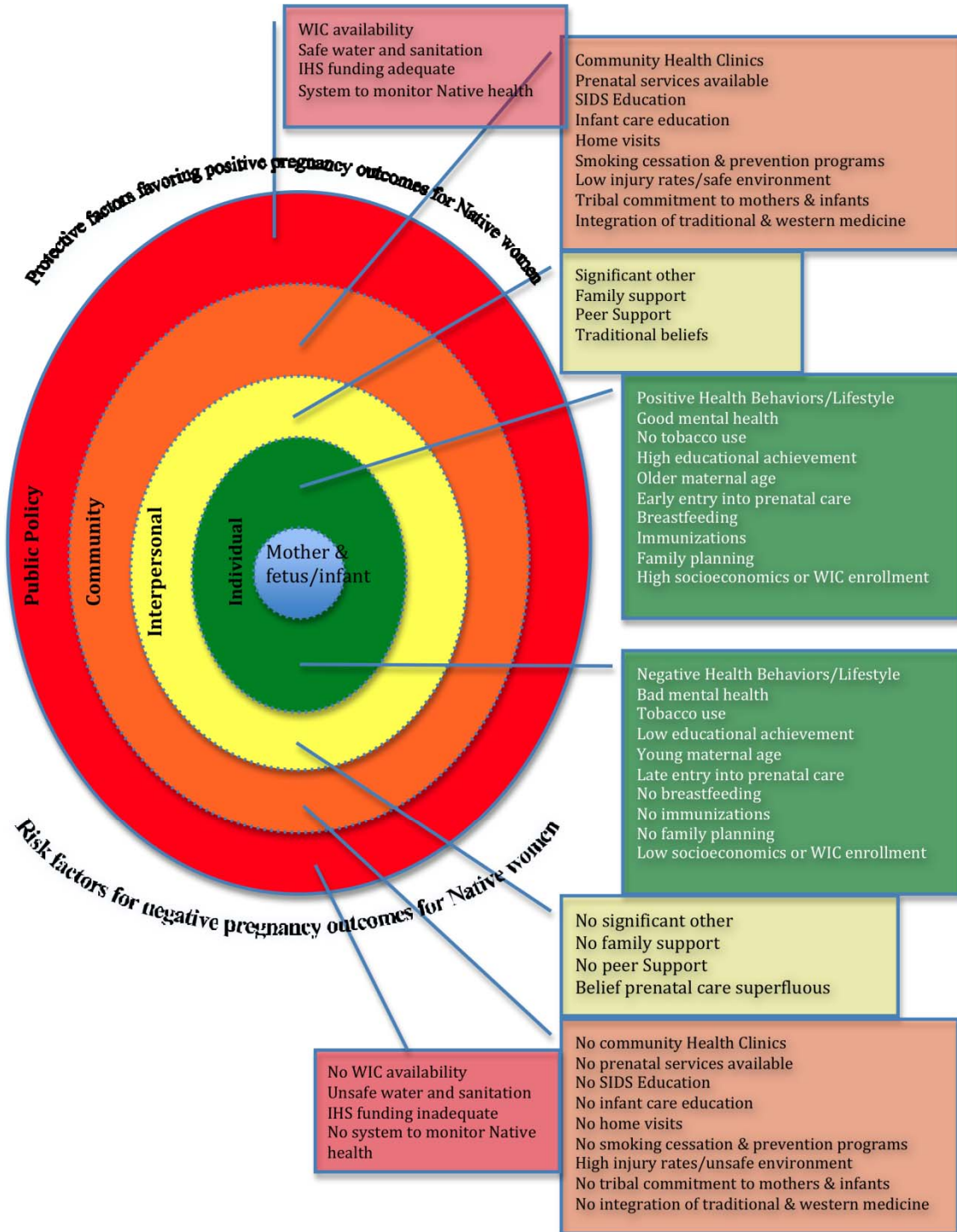
APPENDIX C

STUDY FINDINGS

APPENDIX D

SOCIOECOLOGICAL FRAMEWORK FOR
PREGNANCY OUTCOMES IN NATIVE WOMEN

Socioecological Framework for Pregnancy Outcomes in Native Women



APPENDIX E

THE RELATIONSHIP BETWEEN MASLOW'S HIERARCHY OF NEEDS
AND THE SOCIOECOLOGICAL FRAMEWORK FOR PREGNANCY
OUTCOMES IN NATIVE WOMEN

