

EFFECTS OF ACCULTURATION ON SOMALI WOMEN'S BIRTH OUTCOMES:  
IMPLICATIONS FOR HEALTHCARE POLICY

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A dissertation submitted to the faculty of the University of North Carolina  
at Chapel Hill in partial fulfillment of the requirements for the degree of  
Doctor of Public Health in the School of Public Health  
(Health Policy and Administration)

Chapel Hill  
2008

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## ABSTRACT

PRISCILLA MOEN FLYNN: Effects of Acculturation on Somali Women's Birth Outcomes: Implications for Health Care Policy

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Foreign birth is largely protective against infant preterm birth as noted by the “Latina paradox”. As women acculturate to American lifestyles, this protective effect dissipates. This study investigated the effect of acculturation on Somali refugee women's birth outcomes. Results indicated that while individual factors identified to reflect acculturation changed significantly over time, changes in birth outcomes in Somali women were not attributable to these factors.

Methods: Data were extracted from medical records of 584 Somali women delivering infants at a Minnesota hospital between 1993 and 2006. Independent variables included maternal factors, fertility history, pregnancy complications, health behaviors, prenatal care history and acculturation. Dependent variables were infant birthweight and gestational age. Chi-square tests, t-tests and ANOVA determined changes in like variables between two time periods (1993-1999 and 2000-2006). Bivariate analyses measured relationships between independent and dependent variables for the total sample and each time period. Structural equation modeling (SEM) then determined the fit between factors hypothesized to reflect acculturation (structural model) and the data (measurement model).

Results. Significant increases noted over time include substance use/exposure (chi-square = 4.83,  $p = .0280$ ), body mass index (chi-square = 4.19,  $p = .0406$ ), hemoglobin levels

( $t = 6.96$ ,  $p = .0086$ ), gestational diabetes (chi-square = 6.0,  $p = .0140$ ) and preterm birth (chi-square = 3.87,  $p = .0491$ ). A significant reduction in interpreter use was noted between groups with time (chi-square = 9.47,  $p = .0021$ ). Bivariate analyses showed significance between increased adequacy of prenatal care utilization and reductions in both preterm birth and gestational age. SEM results indicated a poor fit between the hypothesized model and existing data. A post hoc model limited to variables with significant bivariate analysis results indicated a moderate to good fit between the new model and available data (CFI = .985, NFI = .979, RMSEA = .067). A comparison between time periods using the post hoc model showed no differences in the cumulative factors reflecting acculturation (CFI = .996, NFI = .909, RMSEA = .016).

**Conclusion.** Individual factors shown to reflect acculturation in foreign-born women have increased significantly in Somali women over time. While preterm births among Somali women were shown to increase significantly, the factors identified to reflect acculturation in this study were not significantly related to this change. However, the increase in maternal obesity, gestational diabetes and preterm birth are of concern among this population.

**Recommendations.** Clinicians should prospectively collect data hypothesized to reflect acculturation associated with preterm birth and low birthweight to identify foreign-born women at increased risk of poor birth outcomes. Policy makers should support and clinicians should implement programs to provide prenatal education for Somali women aimed at reducing risk factors shown to compromise birth outcomes.

## ACKNOWLEDGEMENTS

Completing a doctoral degree while juggling a full-time career, husband and family could not possibly be accomplished without the support of many caring and understanding individuals. This dissertation is dedicated to the following people who facilitated and supported my work:

To my husband, Mike, who spent many evenings with the television volume down and never complained about the lack of regular meals over the past three years;

To my children, Christopher and Elizabeth, who did most of the grocery shopping and observed the house rule of “no whining”;

To the wonderful group in the first DrPH cohort whose level of competence, passion, caring and collegiality is unsurpassed - Justine, Joe, Sarah, Nicole, Mike, Debbie, Corinne, and Lynn;

To Virginia Miller and Lynne Shuster without whose understanding and support I could not have balanced work and school;

To Ned Brooks and Sue Havala Hobbs whose vision, compassion, support and faith provided the opportunity to participate in the first and best distance DrPH program in the universe;

To Brian Brost for his patience and support of a non-clinician delving into the world of clinical obstetrical care;

To Tanya Hoskin, Mike Foster and Sharon Christ for their continual tutoring of a struggling biostatistician;

To Lynn Knauff for her passion, kindness, and direction; and

To Abdullah Hared and Amina Arte whose patient explanations of Somali customs and  
shepherding through the Somali community have opened my eyes and expanded my world.

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## CHAPTER I

### THE TOPIC

#### Statement of the Issue

Preterm birth in the United States increased from 9.45% to 12.5% between 1981 and 2004<sup>2,3</sup>. Recent legislation (the PREEMIE Act) provides research funding to reduce the rates of preterm labor and delivery and work toward an “evidence-based standard of care for pregnant women at risk of preterm labor...and for infants born preterm and at a low birth rate”<sup>4</sup>. Significant racial disparities in birth outcomes exist, and non-Hispanic African-American women experience the highest rate of preterm births (17.8% in 2003)<sup>3</sup>. Among the many factors that increase the risk of preterm birth is low socioeconomic status (SES)<sup>3,5</sup>. Yet foreign-born Mexican women and U.S.-born Latinas who retain Mexican familial values and cultural behaviors have preterm birth rates similar to those of non-Hispanic white women despite lower SES<sup>6-8</sup>. This “Latina paradox” diminishes with time of residence in the U.S. and in subsequent generations of U.S.-born Latinas<sup>8-10</sup>. Acculturation is hypothesized to be responsible for this decreasing perinatal advantage as women adopt a more “American” lifestyle. Protective factors retained by less acculturated Mexican women include the maintenance of their traditional dietary practices, a low level of substance use, strong family support networks, positive attitudes towards childbearing and childrearing, and strong religious beliefs and practices<sup>7</sup>.

The focus of this study is the occurrence of a similar phenomenon in Somali refugee women. Despite presenting with numerous physical and socioeconomic risk factors

associated with preterm and low birthweight infants, preliminary data (Table 1) indicate that Somali refugee women had fewer preterm births than all other women delivering infants at Rochester (MN) Methodist Hospital (RMH) between 1997 and 2004 (8.5% vs. 12.3%)<sup>11</sup>. Determining whether Somali refugee women are experiencing a decline in birth outcomes similar to Latinas will improve the understanding of factors that influence preterm birth. Therefore, the aim of this study is to describe psychosocial factors associated with Somali women's birth outcomes and determine if this protective effect has dissipated over time.

### Background

Somali refugees began arriving in Minnesota in 1993 as a result of civil war in their native country. U.S. Census Bureau data indicate that more than 25,000 primary refugees entered Minnesota between 1993 and 2003<sup>12</sup>. However, secondary migration has resulted in 60,000 and 70,000 Somalis in Minnesota today. Minnesota's third largest Somali population resides in the city of Rochester in Olmsted County, including approximately 6,000 individuals, or almost 8% of the city's 85,806 residents. This dramatic change in demographics in slightly over a decade has introduced healthcare providers to differences in culture, language, religion, health beliefs and medical care utilization patterns. In Minnesota, the number of children born to Somali women increased ten fold between 1995 and 2000<sup>13</sup>.

Somali women consider pregnancy a normal process rather than one requiring medical intervention, and they are less likely to seek prenatal care as early or often as U.S.-born women<sup>14-16</sup>. Prenatal care is associated with the prevention of low birthweight infants in the United States. Women with no prenatal care are three times as likely to have low birthweight infants (less than 2,500 grams) than women who receive care initiated in the first trimester of pregnancy, continuing on a regular schedule until delivery<sup>17</sup>. Low birthweight infants are

often born prematurely or are small for gestational age. Prenatal care has shown the greatest benefits when provided to women at high risk of delivering low birthweight infants (African-American, Native American and low-income women)<sup>17</sup>. Although premature birth is a factor in low birthweight infants, and many factors have been identified as contributing to premature birth, almost half of all premature births are of unknown etiology<sup>2, 18</sup>.

Preliminary data indicate that Somali women had a 43% lower incidence of premature infants (8.5%) than all other women (12.3%) with singleton births delivered at RMH between 1997 and 2003. Somalia-born women had a higher incidence of anemia (30% to 15%), gestational diabetes (11% to 5.3%), and hyperemesis (7% to 2%) as compared to all other women. In addition, fifty percent more Somali women (9%) required social worker intervention (although reasons for referral were not available) than all other women (6%). Additional factors common in Somali women (but not quantified to date) shown to affect birth outcomes include high parity, closely spaced births, low or high maternal weight and infectious diseases<sup>11, 19-22</sup>. <sup>ø</sup> Further investigation is needed to determine if protective factors among Somali women account for these unexpected positive birth outcomes despite increased prevalence of infectious diseases.

Questions relative to this issue that will be explored include:

- 1) Why are premature births lower for Somali women despite multiple risk factors?
- 2) Can protective factors in Somali women be generalized to improve birth outcomes for women with similar risk factors?
- 3) Will birth outcomes deteriorate with length of US residency, and

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<sup>ø</sup> Minnesota Department of Health data indicated that refugees from South/Southeast Asia and Sub-Saharan Africa accounted for 50% of all foreign-born tuberculosis cases upon arrival between 1998-2002; 66% of these tuberculosis cases in Africans were diagnosed among Somalis. Parasitic infections, hepatitis B, sexually transmitted infections and malaria were also diagnosed among new refugees in 2002<sup>23</sup>. Meade K. *Immigrants and health*. Minneapolis, MN: Greater Twin Cities United Way; March, 2004.

4) Will second generation Somalis have higher rates of premature births and low birthweight infants, following similar patterns observed in foreign-born Hispanic women?

#### Significance of the Issue

##### *Somali Refugee Population Growth*

Somali women have a high completed fertility rate of 7 children<sup>24</sup> which appears to be continuing after resettlement in the U. S. Obstetrical care has been one of the primary entry points into Minnesota's health care system for Somali refugee women. Somali refugees' race, low levels of formal education, and low income levels are related to high rates of low birthweight and premature infants as experienced by U.S.-born women with similar demographic profiles. However, Minnesota Department of Health data (2001) indicate that Somali women have significantly lower infant low birthweight rates compared to other blacks residing in Minnesota (5.3% vs. 9.8%). Table 5 illustrates Rochester Methodist Hospital (RMH) data indicating that Somali women had a substantially lower premature birth rate compared to all other women with singleton births (8.5% vs. 14.3%)<sup>11</sup>. However, RMH is a high risk perinatal care center and therefore these data may not represent a comparative cohort of women with normal risk pregnancies.

##### *Refocusing Clinical Care*

Because of the previously stated risk factors, Somali women are considered high risk patients at RMH. Perceptions of obstetrical providers and educators that affect Somali women's prenatal care practices and subsequent birth outcomes will need to be addressed to provide appropriate care to this sub-population. If protective factors exist that compensate for maternal and infant physical risk factors, then clinicians and patients will benefit from this knowledge. Data indicating that premature births and low birthweight rates increase

with acculturation and/or subsequent generations of women should move health care policies to address these disparities.

Table 1.  
Rochester Methodist Hospital obstetrical data for Somalia-born and all other women: 1997-2004

	Somalia-born women		Women other than Somalia-born		Between group comparisons	
	N = 432		N = 11,068**			
	n	%	N	%	X <sup>2</sup> or F*	p value
Anemia	130	30	1953	15	42.60	.0001
Hyp/Pre/Eclampsia	8	2.3	277	2.5	0.48	.4865
Gestational Diabetes	48	11	616	5	72.48	.0001
Prenatal Class	0	---	2054	16	96.34	.0001
Premature Labor	16	4	755	6	9.02	.0027
Premature Rupture	13	3	493	4	9.09	.0026
Hyperemesis/Naus.	23	7	182	2	906.07	.0001
Social Worker	32	9	513	6	6.48	.0109
Prenatal Visits						
mean ( SD)	10.1 (3.5)	n/a	11.4 (5.6)	n/a	25.86	<.0001
Delivery Type						
C-Section	116	26.8	2905	22.5	.050	.8223
VBAC	31	7.1	357	2.7	9.13	.0025
Vaginal	285	65.9	9601	74.6	146.99	.0001
Birth Outcomes						
Level II	42	9.8	1252	9.8	.899	.3431
NICU	10	2.3	452	3.5	2.93	.0869
New Born Nursery	375	87.8	10975	86.0	483.39	.0001
Peds Room	0		41	0.3	.68	.4097
Premature	37	8.6	1584	14.3	10.87	.0010
Term	390	90.3	9484	85.7	6.84	.0089

\*Chi-square statistics were computed for all categorical variables, and F statistics were computed for continuous variables. Standard deviations (SD) were not shown for categorical variables.

\*\*Some cells have missing values



### *Policy Implications*

On a larger scale, if Mexican, Central and South American and African women delivering infants in the United States deliver “healthier” infants upon arrival in the United States, and infant birth outcomes deteriorate thereafter, are there common causal factors? On the federal level, what can agencies do to help prevent health disparities in future generations of refugees?

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Introduction

Preliminary data indicate that Somalia-born women had fewer preterm births than all other women delivering infants at Rochester Methodist Hospital (RMH) between 1997 and 2004 despite higher physiologic risk factors. This chapter reviews the literature on four areas of inquiry related to this issue:

- 1) Low birthweight and preterm birth – etiology, risk factors, prenatal care guidelines and costs,
- 2) Birth outcomes of Somali refugees and other immigrant and refugees,
- 3) The “healthy immigrant effect” and “Latina paradox,” and
- 4) Sociocultural differences and similarities between Somali refugees and Mexican immigrants.

#### Definitions

*Acculturation* – the process of change that results from continuous firsthand contacts between people from different cultures<sup>25</sup>.

The following definitions were adopted from the World Health Assembly for data reporting and to provide comparable statistics on an international basis<sup>26</sup>:

*Birth weight* - the first weight of the fetus or newborn obtained after birth, preferably within the first hour of life.

*Fetal death* is death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation the fetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.

*Gestational age* - the duration of gestation is measured from the first day of the last normal menstrual period. Gestational age is expressed in completed days or completed weeks (e.g. events occurring 280 to 286 completed days after the onset of the last normal menstrual period are considered to have occurred at 40 weeks of gestation.)

*Intrauterine growth restriction* - term used when fetal growth is estimated to be less than adequate (formerly also known as intrauterine growth retardation).

*Live birth* is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered liveborn.

*Low-birthweight* – birthweight less than 2,500 grams (up to and including 2,499 grams).

*Neonatal period* – the neonatal period commences at birth and ends at 28 completed days after birth.

*Perinatal period* - the perinatal period commences at 22 completed weeks (154 days) of gestation and ends seven completed days after birth

*Preterm birth* – two definitions for preterm birth are currently in use. The American Academy of Pediatrics Committee on Fetus and Newborn (1966) defines preterm birth as

infants less than 38 weeks gestational age. The World Health Organization (WHO) and the Institute of Medicine (2006) define preterm birth as a gestational age less than 37 weeks<sup>18</sup>.

Because this study includes international statistics on preterm birth, the WHO and Institute of Medicine's (IOM) definition will be used to assure valid comparisons of international data.

*Total fertility rate* - number of births a woman would have by the end of her reproductive life if she experienced the currently prevailing age-specific fertility rates from age 15 to 49 years.

#### Preterm Birth and Low Birthweight – Differentiation, Etiology and Risk Factors

While preterm birth and low birthweight sometimes occur simultaneously, the IOM (2006) reports a primary problem with using birthweight as a proxy for prematurity. The IOM notes that “many infants who are large for gestational age have normal birth weights but have rates of mortality and morbidity different from those of full-term infants with normal birth weights”<sup>3</sup>.

Low birthweight is considered the single most important factor affecting infant mortality in both developed and developing countries. Low-birthweight is determined by the interplay of two processes: length of gestation and intrauterine growth. Low-birthweight, therefore, can be determined by a short gestational period, restricted intrauterine growth or both.

Although a key risk factor for LBW is preterm birth (PTB), the two terms are not interchangeable and not all preterm births result in LBW infants. In addition, full-term pregnancies may also result in infants that are small for gestational age, due in part to intrauterine growth restriction (IUGR)<sup>27</sup>.

Gestational age data is also inaccurate when used in research related to preterm birth. The use of early prenatal ultrasound is more accurate than other pre-or postnatal estimates of pregnancy duration, but ultrasound tests are not available for women with reduced access to

prenatal care or are conducted too late in pregnancy to be sufficiently accurate<sup>3</sup>. Therefore, including outcome measures of both birthweight and preterm birth may provide more robust information when exploring risk factors that effect infant morbidity and mortality.

The Institute of Medicine (IOM) Report on Preterm Birth (2006) noted a 30% increase in U.S. preterm births between 1981 and 2004 (9.45% to 12.5%). Causes of preterm birth are multifaceted and include but are not limited to neighborhood characteristics, environmental exposures, pre-existing medical conditions, genetic influences and biological factors. Despite extensive study, half of all low birthweight and preterm births are largely unexplained<sup>2 18</sup>. Although technological advances have increased the survival of preterm infants, we do not yet know how to prevent all preterm birth<sup>3</sup>.

The Institute of Medicine Report on Preterm Birth (2006) noted significant disparities among non-Hispanic African-American women who had a preterm birth rate of 17.8% in 2003<sup>3</sup>. Socioeconomic status, race and ethnicity are related to low birthweight (LBW), and increased rates are also found among African-American and low-income U.S.-born Hispanic women<sup>8, 28-31</sup>. Low birthweight infants are twenty times more likely to die and are more likely to suffer long-term illnesses and have neurological or developmental disabilities than heavier infants<sup>30</sup>. Long-term effects of LBW among African Americans include increased risks of hypertension and obesity<sup>32</sup>.

#### *Risk Factors for Preterm Birth and Low Birthweight*

Preterm birth has been associated with physiologic factors including genital tract and intrauterine infections, abnormal placentation and uterine abnormalities, underlying medical conditions including systemic inflammation, maternal weight and body mass index (BMI), fetal abnormalities and prior preterm birth. Environmental risk factors include maternal

stress, smoking, working during pregnancy and maternal malnutrition. Demographic factors include maternal race, country of birth, educational level, and socioeconomic status<sup>27</sup>.

Risk factors that contribute to both LBW and preterm birth (PTB) include smoking, use of alcohol or illicit drugs during pregnancy, poor maternal nutrition, inadequate weight gain during pregnancy, stress and lack of social support, domestic violence, periodontal disease, high blood pressure, vaginal infections, young maternal age, hazardous environmental exposures, heavy physical work and/or standing during pregnancy and short intervals between pregnancies<sup>19, 27, 33-40</sup>.

Factors associated with intrauterine growth restriction (IUGR) were identified in a meta-analysis by Kramer (1987). They include genetic factors (infant sex, maternal and paternal weight and height, and racial or ethnic origin), maternal pre-pregnancy weight, parity, history of prior low birthweight infants, maternal caloric intake and weight gain during pregnancy, illness during pregnancy (particularly malaria), and tobacco and alcohol use. Gestational duration was associated with pre-pregnancy weight, history of preterm births or spontaneous abortion, exposure to diethylstilbestrol (DES), and cigarette smoking<sup>18</sup>.

A recent meta-analysis conducted by Conde-Aguedelo, Roas-Bermudez and Kafury-Goeta, indicated that inter-pregnancy intervals of less than 18 months or greater than 59 months were associated with preterm birth, LBW and small for gestational age (SGA). Women with shorter intervals (6 to 17 months) had higher odds ratios for these three outcomes than women with 18 to 23 months between pregnancies<sup>33</sup>.

Small for gestational age (SGA) infants are associated with intrauterine growth restriction (IUGR) and is experienced in developing African countries on a seasonal basis. The highest incidence of SGA in a Gambian population was shown to occur during the hungry season

(August through December) and was inversely proportional to maternal weight changes. Seasonality was not associated with preterm births. The overall incidence of LBW was 13.3%, 12.3% were preterm births, and the incidence of SGA was 25.1%<sup>41</sup>.

### *Prenatal Care Guidelines*

Current prenatal care clinical guidelines in the U.S. specify 14 visits for average risk pregnancies. Prenatal care should be initiated in the first month of pregnancy followed by one visit per month through 28 weeks, one visit every 2 weeks through 38 weeks and one visit per week until delivery<sup>19</sup>. High-risk pregnancies require more frequent visits with the exact number determined on an individual basis<sup>21</sup>.

Clinical studies have been limited in their ability to produce a direct link between prenatal care and low birthweight infants. In addition, lack of early or regular prenatal care and low birthweight infants are not unequivocally related<sup>9</sup>. The American College of Obstetricians and Gynecologists (ACOG) recommends, based on limited or inconsistent evidence, that “screening for risk of preterm birth by means other than historic risk factors is not beneficial in the general obstetric population”<sup>21</sup>. Regardless of conclusive evidence-based data and due to the preventive medical and educational benefits that are provided by early and often prenatal care, *Healthy People 2010* includes an objective that 90% of all women should begin prenatal care in the first trimester of pregnancy<sup>42</sup>.

### *Economic and Societal Costs*

Inpatient costs for a normal delivery in 2003 averaged \$1,700. In contrast, hospital costs for premature or low birthweight infants averaged \$77,000<sup>43</sup>. Over a lifetime, low birthweight is correlated with high blood pressure, cerebral palsy, deafness, blindness, asthma, childhood lung diseases, lower IQ, and cognitive development and behavioral

problems, all bearing associated increased costs. Policies and practices that can modify risk factors for low birthweight in infants, therefore, should be explored to improve infant health and reduce direct and societal costs<sup>44</sup>.

### Birth Outcomes of Immigrants and Refugees

Women who emigrate from developing countries are considered “high risk” for adverse birth outcomes because of increased rates of anemia, infectious diseases, lack of early and continued prenatal care, and lower socioeconomic status<sup>29</sup>. However, inconsistencies exist in findings of birth outcomes in foreign-born women compared to their U.S. counterparts. Demographic and sociological factors assumed to contribute to poor birth outcomes are increasingly shown to vary across foreign-born racial and ethnic groups.

Only one study specific to Somali women examining birth outcomes in the U.S. was found. Johnson, Reed, Hitti and Batra (2005) used Washington State birth certificate data from 1993 – 2001 to compare Somali women to two comparison groups of black and white U.S.-born women. Rather than reporting an increased incidence of preterm infants, results indicated that Somali women were nine times more likely to deliver after 42 weeks gestation with associated increased risk of oligohydramnios. Fewer preterm births were experienced by Somali women: 6.5% compared 10.3% for U.S.-born blacks and 7.3% for U.S.-whites. Somalis had almost half the rate of low birthweight infants compared to U.S.-born blacks (6.3% to 9.7%), but a slightly higher rate than U.S.-born whites (5.0%). Somali women were more likely to deliver by cesarean section, have gestational diabetes and experience perineal lacerations associated with female circumcision. More Somali infants had low Apgar scores, required assisted ventilation, and meconium aspiration<sup>45</sup>.



Two additional studies conducted in other countries describe Somali refugee women's birth outcomes. Yoong, Kolhe, Karoshi, Ullah & Nauta (2005) conducted a small retrospective study comparing Somali refugees to British-born women<sup>46</sup>. Results indicated that more Somali women had cesarean births, instrumental deliveries, preterm and low birthweight differences, although differences were not statistically significant. A Swedish study compared suboptimal factors in perinatal care resulting in more perinatal deaths in women from the Horn of Africa (Eritrea, Somalia and Ethiopia) compared to Swedish women. The authors concluded that suboptimal factors in perinatal care characterized as maternal, medical care or communication were more likely to result in perinatal death among East African mothers' infants than those of native Swedes. Differences were attributed to socio-cultural attitudes toward pregnancy strategies, and suboptimal performance of some health care practices in the Swedish perinatal care system<sup>47</sup>.

Because of the paucity of published literature on Somali birth outcomes, studies on other foreign-born immigrant and refugee women were reviewed. In a recent U.S. study, Gould, Madan, Qin and Chavez (2003) reported that foreign-born Mexican American mothers with low levels of formal education, low income, less access to prenatal care and higher rates of Medicaid-paid delivery had similar outcomes to US-born non-Hispanic white women<sup>48</sup>. Acevedo-Garcia, Soobader and Berkman (2005) conducted a large U.S. study of approximately 2.5 million women finding that LBW varied considerably across racial/ethnic groups and country of birth<sup>49</sup>. Foreign born women's infants had lower rates of LBW than their U.S.-born counterparts in all groups except Asian women. Although all black women had the highest rates of LBW, foreign-born blacks had a 30% lower incidence of LBW (7.9%) compared to U.S.-born blacks (11.2%). Among Hispanics, the LBW rate was 20%

lower in foreign-born (4.7%) compared to U.S.-born Latinas (6.0%). In contrast to many studies associating reduced low birthweight rates with higher educational attainment, this study showed a protective effect of lower formal education among both Hispanic and foreign born black women<sup>49</sup>.

Chan, Roder and Macharper (1988) studied non-English speaking Australian immigrants and refugees (from Italy, Holland, Germany, Greece, Yugoslavia, the Philippines, Greece and Vietnam) and found that although immigrant and refugee women had a slightly higher incidence of preterm and LBW infants than Australian-born women, the differences were not statistically significant<sup>50</sup>. However, Vietnamese women had a considerably lower mean birth weight than Australian-born women (3,120 grams vs. 3,363 grams). Immigrant and refugee women were more likely to hold low status jobs, were older and of higher parity. Vietnamese refugees had the highest parity with 6.7% having 5 or more previous live births. A higher percentage of immigrant women had their pregnancies diagnosed after the first trimester (11.7% vs 9.0%), and the highest figures were associated with Vietnamese women (27.3%). Medical conditions complicating pregnancy were similar between groups although immigrants were twice as likely as Australian-born women to be anemic (4.4% vs. 2.2%). The highest rates were among women from the Philippines (6.5%) and Vietnam (6.7%)<sup>50</sup>. Results of this study may have been influenced by the underlying differences between immigrants and refugees, failure to control for anthropological, racial and socio-economic differences between immigrants of European descent and refugees of Asian descent.

Faller (1992) observed that of 78 Hmong refugee women in the southeastern United States giving birth over a period of five years, 76 infants were full-term and 2 were stillborn. Birthweight was not reported in the study results. Area physicians and nurses expressed that

Hmong women had “a baby every year” and stated the need for contraceptive interventions in the Hmong community. However, data indicated that of the 64 women delivering live infants over five years, 53 had one baby, 10 had 2 infants each, and 1 woman had 3 births. Fallner concludes that clinical expectations clouded by bias, caused Hmong women to be labeled as “high risk,” although concern remains about whether and to what extent environmental and lifestyle changes affected or will affect Hmong women<sup>51</sup>. The author expected to find negative affects of acculturation in these women due to over fifteen years of U.S. residency, yet no high risk medical conditions or risk behaviors were reported.

Lalchandani, MacQuillan and Sheil (2001) described birth outcomes of refugee women in Ireland and found no differences in the gestational age at delivery, incidence of caesarean section or birth weight as compared to other women delivering in the same hospital. However, perinatal mortality was higher for refugee women (14.8 vs. 5.6). Seven women were HIV-positive and 2 had active tuberculosis. Eighty percent of the women, the majority of whom were from Africa (67%), were living in emergency accommodations and had their first visit to the hospital in the third trimester having just arrived in Ireland within the previous 24 hours<sup>52</sup>.

An assessment of Indochinese refugees in the U.S. (Davis, Goldenring, McChesney, Medina, 1982) reported that refugees had a lower incidence of low birthweight compared to US women (5.7% vs. 7.1%) and a similar median birth weight (3,175 grams vs. 3,340 grams). They also had an overall lower infant mortality rate than their US counterparts. However, the incidence of cephalo-pelvic disproportion (CPD) and pre-eclampsia were higher in Indochinese women compared to U.S. women (4.6% vs. 3%; 1.3% vs. 0.6%), leading the authors to conclude that although overall birth outcomes were favorable in the

refugee population, risk factors including lack of prenatal care could lead to future poor birth outcomes<sup>53</sup>.

Similarly, Ward, Pridmore and Cox (1981) compared Vietnamese refugees in Australia to the general population and noted that although mean weights of Vietnamese infants were lower (3.07 kilograms vs. 3.37 kilograms), there were no perinatal deaths in the refugee group, and no particular perinatal problems were identified. Communication with health care providers was noted as the most obvious difficulty, and although some women exhibited anemia, Hepatitis B and sexually transmitted infections, the relationship to compromising birth outcomes was not realized<sup>54</sup>.

Vahratian et al. (2004) found that infants of North African immigrants to Belgium had higher birth weights than their Belgian counterparts and were less likely to be born preterm. The difference in mean birthweight between infants was explained by differences in preterm birth and other risk factors<sup>55</sup>. Similarly, a study of birth outcome of three cohorts in Washington State between 1980 and 1991 indicated that Ethiopian-born women were more likely to have high birth weight babies than U.S.-born black women. The authors postulated that differences were due to greater levels of emotional and psychological support, better nutritional status of Ethiopian women, and genetic differences between Ethiopian and U.S.-born black women<sup>29</sup>.

David and Collins (1997) reviewed Illinois birth certificates to determine whether birthweight differences existed between U.S.-born blacks, foreign-born blacks and U.S.-born white women. U.S.-born blacks had the highest rate of LBW infants (13.2%) followed by African-born blacks (7.1%) and U.S.-born whites (4.3%)<sup>56</sup>. Pallotto, Collins and David (2000) further explored LBW infants of U.S.-born white, U.S.-born black and Caribbean-

born black women. Rates of moderate LBW were 10% for U.S.-born blacks, 6% for Caribbean-born blacks, and 4% for U.S.-born whites. Rates of very LBW (<1,500 grams) were similar for U.S.-born and Caribbean-born blacks (2.6% vs. 2.4%) and lowest for U.S.-born whites (0.7%). Collins, Wu and David (2002) reviewed vital records of 3 generations of U.S.-born, foreign-born African American and white women. The third generation descendants of African/Caribbean-born women had a mean birthweight of 57 gm less than second generation descendants and a 40% greater moderately low (1,500-2,499 grams) birthweight rate. Descendants of U.S.-born African American women had a 17 gm increase in birthweight between generations 2 and 3<sup>57</sup>.

In summary, data available in the current literature are difficult to compare because of variances in study designs, subject and comparison profiles, study aims and outcomes. Further study is warranted to provide additional information on Somali refugee women's birth outcomes.

Table 2.  
Refugee women's birth outcomes results

Authors (Year)	Study population & country	Aims	Methodology	Results
Johnson, Reed, Hitti and Batra (2005)	Washington State - 579 Somali pregnancies 2384 black and 2345 white women	To compare maternal and neonatal morbidity among Somali immigrants, US-born blacks and whites in Washington state	Retrospective using birth certificate data & hospital discharge records between 1993 and 2001 Multiple logistic regression	Somali women had fewer preterm births but were 9X more likely to deliver after 42 weeks gestation, more likely to have GDM, be anemic & less likely to smoke. Somali women had fewer LBW infants than blacks (6.3% vs. 9.7%), but more LBW infants than whites (5.0%).
Yoong, Kolhe, Karoshi, Ullah & Nauta (2005)	United Kingdom 69 Somali refugees 69 British-born Caucasian women	To evaluate the obstetric performance of Somali women in the U.K.	Case control Descriptive statistics using Chi-squared tests	Somali women had more cesarean sections, instrumental deliveries, preterm deliveries and low birthweight infants, although differences were not statistically significant.

Authors (Year)	Study population & country	Aims	Methodology	Results
Gould, Madan, Qin and Chavez (2003)	California - 622,234 births consisting of foreign born Asian Indian women (0.8%), foreign-born Mexican Americans (26.7%), U.S.-born whites (31.2%) and U.S.-born blacks (31.2%)	To define SES risk profile and perinatal outcomes for Asian Indian births compared to foreign-born Mexican American and U.S.-born whites and blacks	Retrospective using vital records between 1995-1997 Logistic regression	Foreign-born Asian Indian women had higher rates of LBW and fetal death than U.S.-born white women, despite high SES and early entry into prenatal care. Mexican-born women had similar birth outcomes to U.S.-born non-Hispanic women
Acevedo-Garcia D, Soobader M & Berkman L (2005)	United States 3,945,192 births to U.S.- and foreign-born women by race/ethnicity (white, black, Asian, Hispanic)	To determine whether foreign-born status confers a protective effect against LBW and whether it varies across racial/ethnic groups and be SES.	Retrospective 1998 Natality data set using logistic regression	Foreign-born women have lower LBW rates than their U.S.-born counterparts. The protective effect is particularly strong among black and Hispanic women. The protective effect of immigrant status is stronger among women with low education compared with women of higher education.

Authors (Year)	Study population & country	Aims	Methodology	Results
Chan A, Roder D, Macharper T (1988)	Australia- 5675 immigrant & refugee women	To obtain obstetric profiles of non-English speaking women for health services planning	Retrospective using case notes from midwives and neonatal nurses between 1981-83 compared to a random sample of Australian women	Immigrant women had a lower incidence of pregnancy-related hypertension and induced births, higher rates of anemia, antepartum bleeding and Cesarean births. No statistical significance between groups in LBW, preterm births, or perinatal death although mean birthweight was significantly lower ( $p<.05$ ) for immigrant women.
Faller (1992)	Southeastern U.S. – 78 infants born to 68 Hmong refugee women	To obtain parity, child spacing and health status of women and their newborns due to health providers' concerns of non-compliance with contraception and multiparity	Mixed methods using interviews and medical record review between 1985-90	No attrition in birth outcomes over 15 years No evidence that birth frequency or outcomes are problems.



Authors (Year)	Study population & country	Aims	Methodology	Results
Lalchandani, MacQuillan and Sheil (2001)	Dublin, Ireland 271 refugee women– 67% from Africa	To describe obstetric profiles and pregnancy profiles of refugee women	Retrospective medical record review Descriptive statistics using Chi-squared test	No difference between refugee women and other women in gestational age, cesarean section or birthweight.
Davis JM, Goldenring J, McChesney M, Medina A. (1982)	California – 542 Indochinese immigrant and refugee women	To examine birth outcomes of recent Indochinese arrivals	Birth certificates and a sample of hospital medical records between 1979-80	Refugee women had a lower LBW rate, lower infant mortality for LBW infants and similar mean birthweight infants compared to U.S. women
Ward, BG, Pridmore, BR & Cox, LW. (1981)	Adelaide, Australia 76 deliveries to Vietnamese refugee women	To detail outcomes of Vietnamese refugee women to improve optimal hospital care.	Retrospective All antenatal Vietnamese refugee patients at one hospital between June 1977 to January 1980	Vietnamese infants were smaller, but no perinatal deaths or complications despite increased risk factors. Gestational age and preterm birth were not reported.

Authors (Year)	Study population & country	Aims	Methodology	Results
Vahratian A, Buekens P, Delvaux T, Boutsen M, Wang Y, & Kupper L. (2004)	North African refugee women in Belgium	To determine mechanisms that result in lower LBW incidence of infants born to North African refugee women compared to Belgian women	Prospective Comparing rates of preterm births and low birthweight infants between African refugee and native women	North African women had higher birthweight infants (3,338 to 3,184), fewer LBW infants (4.2% to 7.9%) and a lower preterm rate than Belgian women (6.2% to 11.0%). Differences in preterm birth may explain the differences in LBW.
Collins, J, Wu, SY & David, R. (2002)	Illinois	To determine intergenerational birthweight differences among U.S.-born and foreign-born African American and white women	Retrospective using vital records of 3 generations.	In descendants of African/Caribbean-born women, generation 3 had a birthweight 57 gm less than generation 2 & a 40% greater moderately low birthweight rate. Descendants of U.S.-born AA women had a 17 gm increase in birthweight between generation 2 and 3.

Authors (Year)	Study population & country	Aims	Methodology	Results
David, R. & Collins, J. (1997)	Illinois 44,046 U.S.-born whites 43,322 U.S.-born blacks 3,135 African-born blacks	To determine differences in birthweight between U.S.-born blacks, foreign-born blacks and U.S.-born white women	Retrospective Birth certificates between 1980-1995	Rates of LBW infants were: U.S.-born blacks (13.2%); African-born blacks (7.1%); U.S.-born whites (4.3%)
Essen, B, Bodker, B, Sjoberg, N, Landhoff-Roos, J, Greisen, G, Gudmundsson, S & Ostergren, P. (2002)	Sweden-Somali, Eritrean and Ethiopian refugee women	To test the hypothesis that suboptimal perinatal care services resulted in more perinatal deaths among East African women than Swedish women	Retrospective audit of perinatal deaths between 1990-96	More African refugee women had perinatal deaths than Swedish women. Differences are attributed to different sociocultural pregnancy strategies, but also suboptimal performance of the Swedish perinatal care system.
Pallotto, E, Collins, J & David, R. (2000)	Illinois 67,357 U.S.-born black women 34,124 U.S.-born white women 2,265 Caribbean-born black women	To determine LBW components of infants delivered to U.S.-born white, U.S.-born black and Caribbean-born black women	Retrospective Illinois vital records between 1990-95	Rates of moderately LBW (1,500-2,499 gm) were: U.S.-born blacks (10%); Caribbean-born blacks (6%); U.S.-born whites (4%). Rate of very LBW (<1,500 gm) were similar for U.S.-born and Caribbean-born blacks (2.6% vs. 2.4%), and lowest for U.S.-born whites (0.7%).

## The Healthy Immigrant Effect or Latina Paradox

The National Center for Health Statistics (1994) indicated that foreign-born individuals reported better overall health than U.S.-born individuals of similar socioeconomic status<sup>6</sup>. This phenomenon, called “the healthy immigrant effect,” varies by the length of residence in the U.S.<sup>6</sup>. with the most recent foreign-born immigrants reporting better health than immigrants who had resided in the U.S. from 5 – 9 years or 10 years and longer<sup>6</sup>. These data suggest that immigrants experience a decline in health related to the duration of stay in the U.S.<sup>6</sup>.

Several explanations for these findings are possible. Recent immigrants may be healthier than previous cohorts at the time of immigration. Earlier cohorts may have been of similar health as recent cohorts but acquired physical conditions or experienced the effects of aging on health. Earlier immigrants may also have acquired behaviors that put them at risk or limited access to health care causing a deterioration in health. Another suggestion offered is that older, foreign-born individuals, who may be in poorer health due to age, may return to their countries of origin. The elderly foreign-born population remaining in the U.S. would then appear healthier, masking the full extent of morbidity and mortality of this population<sup>58</sup>. A combination of these influences or other factors not considered could also explain these findings.

Similarly, a phenomenon referred to as the “Latina paradox” has been observed. Despite economic disadvantages, infants born to Mexican-, Central- and South American-born U.S. immigrants have similar or lower LBW rates compared to U.S.-born whites<sup>7-10, 28, 59-62</sup>. However, second generation Latinas and acculturated foreign-born women experience an

increase in low birthweight infants<sup>62</sup> in accordance with deterioration of the healthy migrant effect with time.

Adverse affects of acculturation and lack of access to health care are thought to contribute to the inverse relationship between immigrant health and years of residence in the United States<sup>6</sup>. Several, but not all, studies comparing birth outcomes between US-born and foreign-born Mexican American women indicate that the U.S.-born Mexican American mothers have higher rates of LBW infants<sup>9, 28, 29, 62, 63</sup> or preterm birth<sup>62</sup>.

#### *The Effects of Acculturation on Foreign-born Women's Birth Outcomes*

In an Illinois study<sup>64</sup>, maternal age, education, and trimester of prenatal care initiation were associated with low-birthweight among Mexican American mothers but not foreign-born Mexican immigrants. Higher levels of acculturation measured by language preference, ethnic identification and nativity status were associated with higher rates of low birthweight. Dietary choices, including exposure to alcohol, smoking and other unhealthy behaviors may increase with acculturation to U.S. lifestyles. There is indirect evidence that the health behaviors practiced as Mexican cultural norms are protective against low birthweight<sup>61, 65, 66</sup>. Mexican American communities that maintain strong cultural traditions have reduced low birthweight rates compared with U.S.-born Mexican Americans with higher levels of acculturation<sup>63</sup>. These effects are not limited to the U.S. as Hyman and Dussault (1996) evaluated Canadian women and found that immigrant women were at a lower risk for LBW, but noted that LBW increased among immigrants as they acculturated<sup>65</sup>.

An ethnographic study conducted in Oregon (Lagana, 2003) indicated that “selective biculturalism” has maintained protective factors in Mexican American communities. The study suggests that the promotion of strong social support networks and active stress

reduction during pregnancy can maintain the “healthy immigrant effect” related to birth outcomes<sup>63</sup>. Fullerton, Bader, Nelson and Shannon (2006) studied the influence of acculturation on the use of prenatal care services in a U.S./Mexican border community. Results indicated that there were no differences in birth outcomes between four defined levels of acculturated Mexican Americans, although the least acculturated group had a higher rate of cesarean sections<sup>9</sup>. The authors offered no explanation for this difference.

Further study by Buekens, Notzon, Kotelchuck and Wilcox (2000) noted that while Latinas from Mexico had fewer LBW infants than non-Hispanic Whites, the mean birth weight of Mexican American babies was lower (3,343 g vs. 3,393 g) and the overall preterm birth rate was higher among Mexican Americans (10.6%) than non-Hispanic Whites (9.3%). The authors questioned whether recording errors in gestational age existed and suggest using methods that reduce misclassification in future studies. They posit that Latinas from Mexico have fewer preterm babies and that further studies should focus on identifying protective factors<sup>28</sup>. Callister and Birkhead (2002) published a systematic review of studies examining acculturation, patterns of prenatal care, and socio-demographic profiles of Mexican- and U.S.-born women. Results indicated that the rate of LBW infants born to Mexican-born women was the same as non-Hispanic whites, and half the rate of African American women. They concluded that preservation of native cultural values and family support contribute to a protective effect against LBW<sup>7</sup>.

In summary, sociocultural changes have the potential to affect health outcomes in periods as short as 5 years. Therefore, it may be possible to note the affects of acculturation on birth outcomes in five year increments. Because available studies are observational rather than

prospective, randomly controlled trials, all generalizations or conclusions must be viewed in light of these limitations.

Table 3.  
Mexican-born compared to U.S.-born Hispanics' birth outcomes

Authors (Year)	Study population & country	Aims	Methodology	Results
Crump, Lipskey & Mueller (1999)	Washington State- 4800 US-born Hispanic and 4800 Mexican-born women	To examine adverse birth outcomes of Mexican Americans to determine the effect of country of maternal births as a measure of acculturation	Retrospective cohort analysis using Washington State birth certificate data between 1989-1994	US-born women had a slight increased risk of preterm birth despite higher education, better prenatal care and higher SES
Buekens, Notzon, Kotelchuck & Wilcox (2000)	United States- 454,264 Mexican American babies 2,436,634 non-Hispanic white babies	To assess components of LBW among Mexican Americans by comparing the full birthweight distributions & gestational ages of Mexican Americans with non-Hispanic whites	Retrospective U.S. birth certificates for singleton births - 1994	Mean weight for both foreign-born and U.S.-born Mexican American babies was lower than non-Hispanic whites. Mexican Americans had a higher rate of preterm birth than non-Hispanic whites; however after removing infants weighing 2,500 gm or more, the preterm rate was lower for Mexican Americans.



Authors (Year)	Study population & country	Aims	Methodology	Results
Chung, Boscardin, Garite, Lagrew & Porto (2003)	California women - 27,297 white 4,832 African American 15,540 Hispanic	To examine ethnic differences in LBW controlling for gestational age & ethnic differences in birthweight among groups	Retrospective using medical records Gestational age calculated by date of confinement and date of delivery	White women had the lowest LBW rate compared to African American and Hispanic women. Although Hispanic and African American women had similar demographic factors, Hispanic women had lower LBW rates than African American women.
Fullerton, Bader, Nelson & Shannon (2006)	Texas 493 El Paso women	To study acculturation as a factor that might influence adequacy of prenatal care among Mexican American women	Descriptive and correlational survey using logistic regression. 4 levels of acculturation were identified; outcome measures were pregnancy induced hypertension and cesarean birth	Least acculturated women had the highest incidence of cesarean birth. No difference between levels of acculturation and pregnancy induced hypertension
Collins & Shay (1994)	Illinois 22,000 Hispanic women	To study the effects of SES and poverty on low birthweight between foreign & U.S.-Hispanics	Illinois vital records and 1980 U.S. Census data	Maternal age, education, and trimester of prenatal care initiation were associated with LBW among Mexican American mothers, but not foreign-born Mexican immigrants.

Authors (Year)	Study population & country	Aims	Methodology	Results
Fuentes-Afflick, Hessol & Perez-Stable (2006)	California-249,500 Hispanic women separated into subgroups of Central & South American, Cuban, Mexican & Puerto Rican compared to 223,090 white women	To analyze the relationship between ethnicity, Latino subgroup, confounding variables, and LBW	Retrospective - 1992 Birth certificates using bivariate analysis and logistic regression. Outcome measures were extreme LBW, very LBW, moderate LBW, normal and high birthweight.	Slightly higher OR for VLBW & MLBW between Latina and white infants although adjusting for maternal and infant characteristics showed no difference in VLBW but a slightly higher OR (1.06) for Latinas. By Latina subgroup, there was no difference in adjusted OR of VLBW infants among groups although adjusted OR of MLBW infants were higher among Central, South Amer. & PR women compared to whites
Callister & Birkhead (2002)	United States – Existing studies of Mexican- and U.S.-born women compared to other racial groups	To review published studies examining acculturation, patterns of prenatal care, sociodemographic profiles and other sociocultural profiles	Integrative literature review of sociocultural variables postulated to effect LBW	Rate of LBW infants born to Mexican immigrant women same as non-Hispanic whites & half that of AA women. Preservation of cultural values and family support contribute to a LBW protective effect.

Authors (Year)	Study population & country	Aims	Methodology	Results
Hyman & Dussault (1996)	Canadian immigrant subgroups including Italian, Greek, Chinese, South Asian and SE Asian	To examine the effects of acculturation on term LBW in 5 ethnic groups with different immigration experiences	Retrospective using Canadian population register for Montreal residents between 1979-1988.	Immigrant women were at lower risk for LBW compared to native born women. More acculturated women had higher rates of LBW. OR for term LBW was higher for second births.
Lagana (2003)	California 29 women with Mexican cultural heritage	To determine whether “selective biculturalism” can maintain positive birth outcome for Mexican women living in the U.S.	Ethnographic observation and semi-structured interviews	Strong social support networks and active stress reduction during pregnancy can maintain the “healthy immigrant effect.”

## Somali Refugees and Mexican Immigrants: Similarities and Differences

The terms “immigrant” and “refugee” are often used interchangeably, but important differences exist between groups regarding socioeconomic factors, service provision entitlement and attitudes and preparation toward resettlement. Immigrants represent all sectors of society in their home countries although there is an over-representation of low SES immigrants, particularly among the undocumented. Immigrants are usually required to fend for themselves if they lack relatives, friends or colleagues in the United States, but support varies depending on educational levels and documentation status<sup>67</sup>. Refugees are from all social classes and many have a high educational level. For reasons of instability or persecution in their home countries, they are pushed out and forced to resettle first in camps. They then are sent to receiving countries, which may or may not be their choice of resettlement location. Refugees receive considerable governmental assistance but face barriers to retaining their previous standard of living. Professionals who are not permitted to practice their previous professions due to lack of U.S. transference of educational and professional credentials often work in blue-collar jobs along side their less educated countrymen to meet employment requirements of the U.S. “welfare system”.

Immigrants and refugees share numerous potentially stressful challenges in language, housing and lack of information about their new homeland. In the presence of pressures to acculturate, both groups may encounter difficulties. However, if cultural pluralism is accepted, ethnicity can be an advantage to adaptation<sup>67</sup>.

### *Somalia Maternal and Child Health Data*

The average life expectancy in Somalia in 2004 was estimated at 43 years for women and 45 years for men<sup>68</sup>. The infant mortality rate was 132 per 1,000 live births and the maternal

mortality rate was 1,600 per 100,000 live births aggravated by high levels of anemia, malnutrition and the almost universal practice of female circumcision. Sub-Saharan Africa estimates (2003) for maternal age at birth of a woman's first child are 41% < age 20, 44% aged 20-34, and 39% > age 35. Parity estimates are 47% with one pregnancy, 45% reporting 2-3 pregnancies, 42% reporting 4-5 pregnancies and 38% reporting 6 or more pregnancies<sup>69</sup>. The total fertility rate for Somalia women was 7.0 children between 1995 – 2000<sup>68</sup>.

The literacy rate in Somalia is 34% for men and 18% for women<sup>70</sup>. Sub-Saharan Africa has the world's lowest rates for prenatal care initiation with a substantial proportion of women making their first prenatal visit late in pregnancy: 40% present for care in the second trimester and 28% present for care in the third trimester<sup>69</sup>. Prenatal care has been shown to increase in developing regions as women's level of education increases. However, education has the least effect in Sub-Saharan Africa where no consistent pattern is observed between increasing education and perinatal care<sup>69</sup>.

Data are not available for preterm and LBW infants in Somalia. The World Health Organization (WHO) assumed responsibility for Somalia's vital public health functions after the total collapse of the centralized government in 1992. Current health care access is limited with about one doctor for every 22,000 people<sup>24</sup>. Nearly 58% of all newborns in developing countries are not weighed as a result of lack of attended delivery and no available scales for weighing. Assuming that similarities exist between neighboring countries, the following LBW data for 2002 is: Eritrea – 21%, Kenya – 11%, and Sudan – 31% with a Sub-Saharan Africa regional estimate of 14%. Ethiopia is similar to Somalia both geographically and culturally and reported that 95.6% of newborns were not weighed. Available data comparing Somali and Ethiopia indicate similarities in early neonatal mortality rates calculated per

1,000 live births (37 vs. 38) and neonatal mortality rates (49 vs. 51)<sup>24</sup>. Between 7.0% and 15% of Ethiopian infants were estimated to be of low birthweight by actually weighing or through maternal surveys. However, Somalia is estimated to have a stillbirth rate of 44 compared to Ethiopia with a rate of 20 suggesting that although similarities exist between the two countries, Somalia may have poorer birth outcomes<sup>71</sup>. In summary, lack of birth weight and preterm birth data for Somalia and East Africa in general make comparisons of refugee infant health outcomes difficult<sup>72</sup>.

#### *Mexican and Central American Maternal and Child Health Data*

The life expectancy at birth for a Mexican female born between 2000 and 2005 is 76.4 years for Mexicans and 74.5 years for Central Americans. The infant mortality rate in 2000 was 30 per 1,000 live births in Mexico and 37 for Central America<sup>73</sup>, and the stillbirth rate was 11 for both Mexico and Central America<sup>74</sup>. The total fertility rate is 2.4 for Mexican women and 3.0 for Central American women<sup>74</sup>. The adolescent fertility rate for Latin America is 12.8<sup>75</sup>. Maternal mortality per 100,000 live births is 31 for Mexico and 33 for Central America<sup>73</sup>. Births were attended by trained personnel for 86% and 84% of Mexican and Central American women, respectively<sup>24</sup>.

In Latin America over two-thirds of women begin prenatal care in the first trimester. Adult female literacy rates in 2002 were 90% for Mexicans and 85% for Central Americans, and women with secondary schooling were at least twice as likely to seek prenatal care as women with no education<sup>69</sup>. Low birthweight infants born to Mexican women in 2002 were 9% of all live births and averaged 12% for Central American women<sup>24</sup>.

Table 4 provides a comparison of available data between Mexico, Central American and Somali and/or Sub-Saharan Africa. No data were available for preterm births. Note that

there is an inverse relationship between skilled attendant at birth and infant mortality, stillbirth rate and maternal mortality.

Table 4.

Comparisons of reproductive health indicators: Mexico, Central America and Somalia/sub-Saharan Africa.

	Mexico	Central America	Somalia*/Sub-Saharan Africa**
Infant mortality rate per 1,000 live births (2000) <sup>24</sup>	9	10	133**
LBW (2000) <sup>76</sup>	9%	13%	14%**
Stillbirth rate <sup>74</sup>	11	11	44*
Total fertility rate (1995-2000) <sup>24</sup>	2.40	3.0	7.0*
Maternal mortality per 100,000 live births (2000) <sup>73</sup>	31	33	1,600*
Life expectancy - females	76.4	74.5	43*
No formal education- females <sup>24, 69</sup>	5%	35%	82%*
Skilled attendant at birth <sup>24</sup>	86%	77%	2%-34.2%* <sup>77, 78</sup>

### *Differences in Health Care Access*

Upon relocation to the United States, Somali women are eligible for healthcare coverage because of their refugee status. Preliminary data indicate that Somali women average only one fewer prenatal visit than all other women delivering at RMH. However many Latinas are either legal or illegal immigrants and have either no or limited health care insurance providing regular access to prenatal care. Because utilization of prenatal care has shown marked reductions in preterm birth and low birthweight infants, comparisons between Somali and foreign-born Latinas are not equitable.

### *Multigenerational Birth Outcomes of Foreign-born Women*

Collins, Wu and David (2002) examined Illinois birth certificates to determine intergenerational differences between birthweights of US-born and foreign-born white and black women. The authors noted that third generation female infants of U.S.-born African

American women exhibited a small increase in birthweight (17g) compared to second generation females. However, third generation descendants of African/Caribbean born women had female infants with birthweights averaging 57 grams lower than second generation women from this group (RR = 1.4). The authors concluded that “the expected intergenerational rise in birth weight does not occur among the direct female descendants of foreign-born African-American women<sup>57</sup>.”

### Discussion

Regardless of etiology, infants with a birthweight of less than 2,500 grams are at higher risk of morbidity and mortality. The literature indicates that foreign-born women often have a similar or reduced rate of preterm and/or low birthweight infants compared to non-Hispanic U.S.-born women. The assumptions that poor perinatal outcomes are associated with low SES do not hold true for many foreign-born U.S. immigrants. There is a paucity of information on birth outcomes of Somali refugee women, and no information on whether acculturation is occurring or influencing birth outcomes in this subpopulation.

Half of the causes of preterm birth are unknown. It is of interest that many foreign-born women experience positive birth outcomes despite exhibiting many known physiologic conditions and behaviors assumed to increase the incidence of LBW and preterm birth in U.S.-born women. The literature indicates several psycho-social determinants of health including acculturation, social support and health behaviors.

As previously noted, acculturation is defined by Kang<sup>79</sup> as the “process of change that results from continuous firsthand contacts between people from different cultures.” Several studies seek to explain the effects of acculturation on birth outcomes, but there is little agreement on how acculturation is either described or measured. Commonly included



constructs include time residing in the U.S., age at immigration, preferred language or language spoken in the home<sup>79</sup>, and preference of ethnic or American food. Health behaviors include substance use (tobacco and alcohol), initiation of prenatal care, use of prenatal vitamins and diet quality<sup>80</sup>.

There is no literature on validated instruments measuring acculturation, and health behaviors specific to Somali refugees. In summary, the association of acculturation with Somali women's birth outcomes is of interest and will be further explored due to the following factors identified in the literature:

- Known physiological risk factors do not appear to have a marked effect on increasing the incidence of Somali women's adverse birth outcomes,
- Acculturation has been shown to affect birth outcomes of other foreign-born women,
- No known published studies explore the association between acculturation and Somali women's birth outcomes, and
- Time in the U.S. has been shown to affect immigrants' health outcomes in increments of 5 year periods and therefore it is feasible that acculturation could affect birth outcomes among Somali women in the 16 years since initial immigration.

## CHAPTER III

### METHODOLOGY

#### Conceptual Framework

The causes of preterm birth and low birth weight are multifactorial including genetic<sup>21</sup>, biological<sup>21</sup>, psychosocial<sup>81-84</sup> and environmental factors<sup>3, 35</sup>. The social ecological framework<sup>85</sup> captures the multiple levels of influence that together have the potential to influence birth outcomes (Figure 1). Social networks may impact health through several layers of factors labeled as social-structural conditions, social networks, psychosocial mechanisms and pathways. Social-structural conditions include factors described as culture, socioeconomics, policies and social changes. Social networks include social network connectors and the multiple characteristics that differentiate various network ties. Psychosocial mechanisms include social support, social influence, social engagement, and access to resources and material goods. Pathways are described as those that directly effect health such as health behavior, psychological and physiologic<sup>85</sup>. Because of the complexity of potential influencing factors identified by the social ecological framework, it is problematic to empirically test all factors influencing birth outcomes.

This study tested a unique conceptual model (Figure 2) including factors supported by the existing literature and informed by the socio-ecologic framework. Acculturation was considered a latent variable affected by several psychosocial mechanisms hypothesized to affect physiologic causal pathways influencing infant gestational age and birthweight. These

variables and concepts operate at the psychosocial and behavioral levels of the social ecological model<sup>85</sup>.

Acculturation is difficult to measure, but researchers have used various proxies such as adoption of the host culture, or retention of native health behaviors, attitudes and norms.<sup>79, 86</sup> The ability to speak English has been shown to be the most robust measure of acculturation<sup>86, 87</sup>. Additional measures include generation status<sup>88</sup>, proportion of life spent in the country of migration<sup>87</sup>, age at immigration<sup>62, 88</sup>, length of residence in the country of migration<sup>62, 80, 88</sup>, native or American dietary preferences<sup>86</sup>, substance use<sup>86</sup>, activity<sup>89</sup>, preferred media source<sup>86</sup>, place of education<sup>86</sup>, and use of health care services<sup>86</sup>. Factors explored with regards to acculturation in this study included predominant language, age at immigration and years of U.S. residency. These factors were selected because medical records often contain this information. Because Somali refugees have lived in the U.S. for a relatively short time, measuring generational status is not possible. Collecting information regarding lifestyle factors via written surveys is difficult because of the high illiteracy rate. Telephone surveys are also difficult to administer because most Somalis have cell phones with no directory listings.

Mediating physiologic factors shown to effect perinatal outcomes are also included in the model to determine their relationships between acculturation and both birthweight and gestational age. Factors shown to indirectly reflect acculturation in studies of multiple immigrant and refugee groups include substance use<sup>21</sup>, adequate prenatal care<sup>3, 90</sup>, and body mass index<sup>20, 91</sup>. Smoking and alcohol use during pregnancy are known to increase the incidence of preterm birth. Acculturated women are more likely to smoke, drink alcohol, or use illicit substances than less acculturated women. Although U.S.-born women who initiate

prenatal care in the first trimester and continue care throughout their pregnancy have fewer preterm and low birthweight infants, it is not clear whether women who do not receive adequate care also have additional risk factors that predispose them to poorer birth outcomes<sup>28</sup>. Both U.S.- and foreign-born women who receive little or no prenatal care but have supportive familial networks and low rates of substance use exhibit preterm and LBW rates similar to those of women who receive the recommended number of prenatal visits. However, more acculturated women with access to care tend to seek prenatal care earlier than their less acculturated counterparts<sup>92</sup>. As body mass index (BMI) increases, so does the incidence of gestational diabetes with an associated increase in infant birth weight. While some studies have noted that more acculturated women tend to exhibit the BMI of the host population (e.g., lower BMI than their mothers), others indicate that immigrants who adopt U.S. dietary habits along with reduced activity patterns have higher rates of obesity the longer they reside in the U.S.<sup>93</sup>. Therefore, while BMI is influenced by acculturation, whether Somali women tend to have increased, reduced or exhibit a varying range of BMIs with increased acculturation is unknown.

This study explored whether acculturation effects birthweight and gestational age over time. Several hypotheses tested were consistent with past research but untested in this subpopulation:

H<sub>1</sub>=Acculturation will increase over two time periods: 1993 - 1999 and 2000 - 2006.

H<sub>2</sub>=Acculturation will be predictive of gestational age and birthweight.

H<sub>3</sub>=More acculturated women will have poorer birth outcomes than less acculturated women.

Figure 1.  
Conceptual model of how social networks impact health<sup>1</sup>

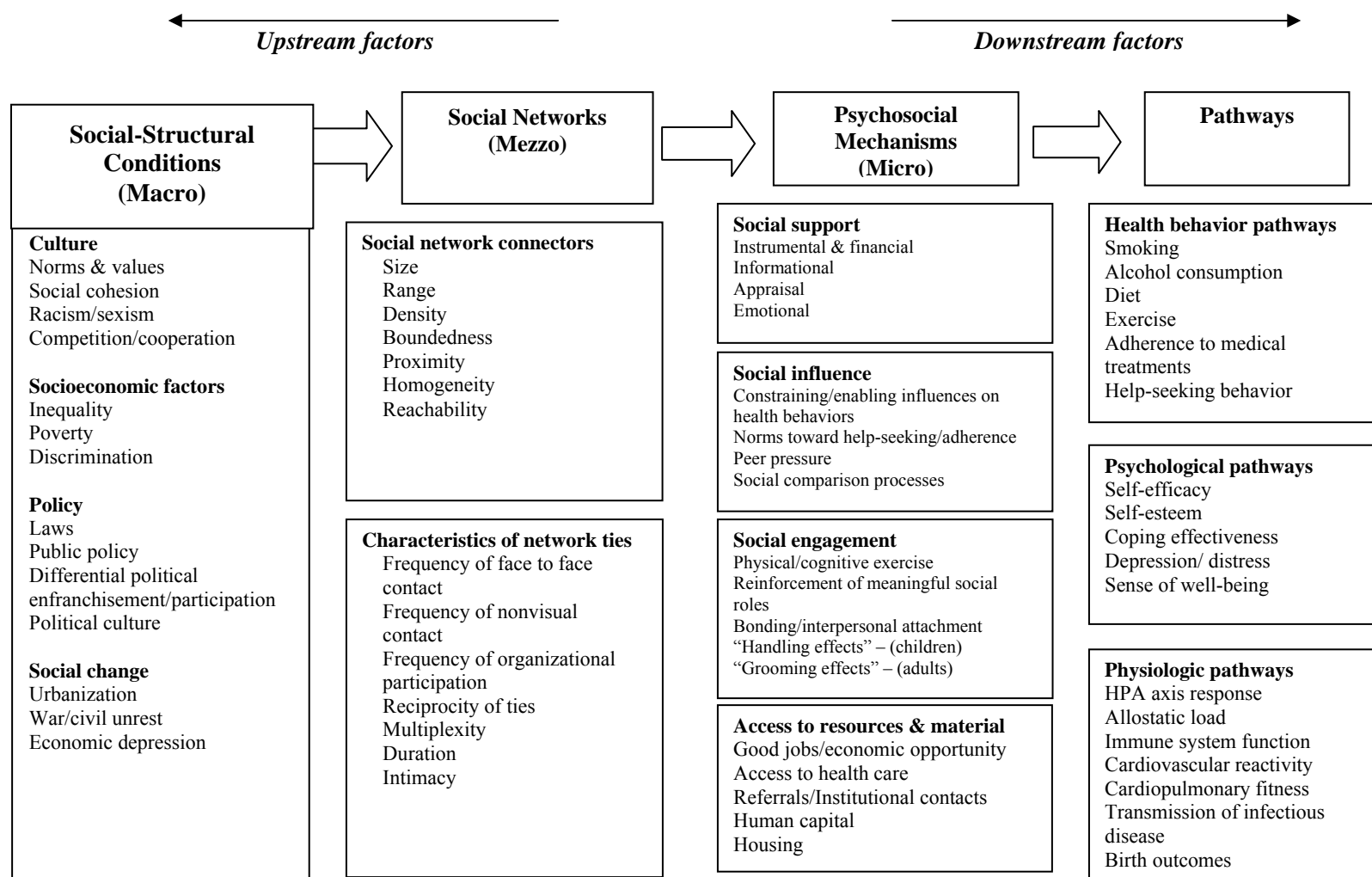
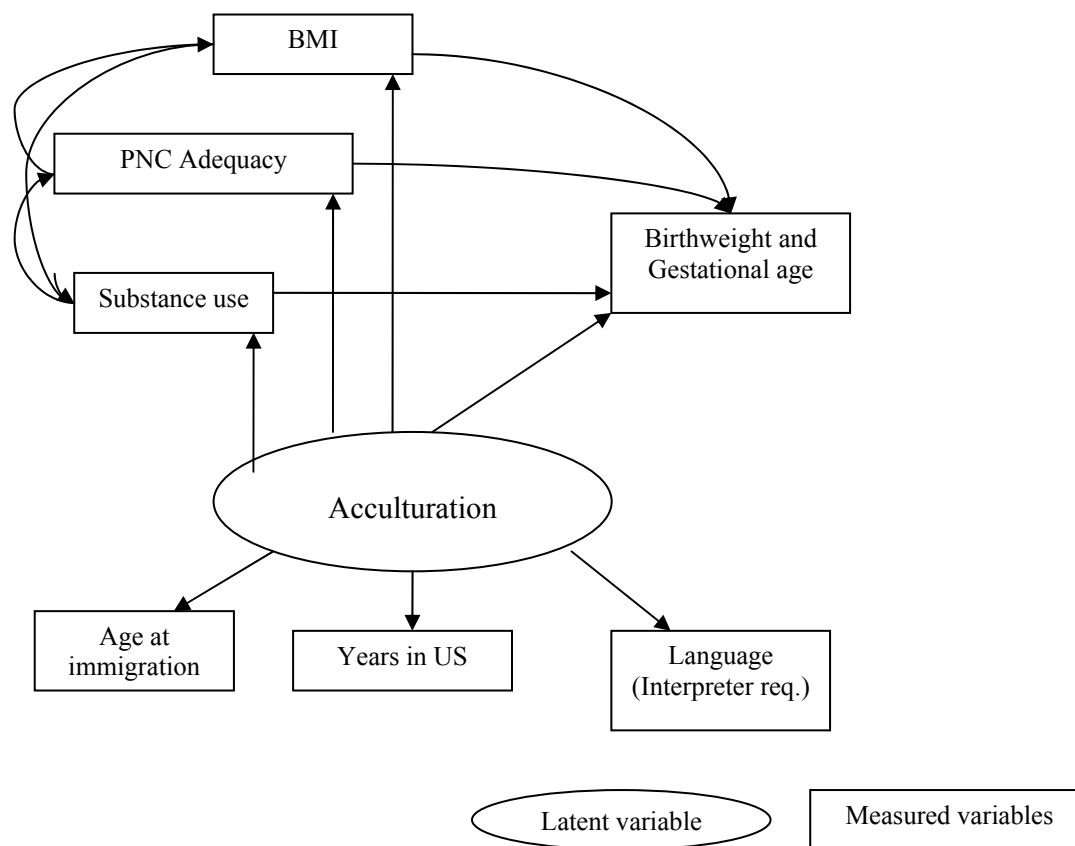


Figure 2.  
Conceptual model of the factors affecting Somali infant birthweight & preterm birth.



## Study Design and Methods

### *Study Setting*

Rochester, Minnesota is home to approximately 6,000 Somali refugees with 5% of infants at Rochester Methodist Hospital (RMH) born to Somali refugee women. Somali women deliver their infants at either RMH or Olmsted County Medical Center (OCMC), the only other hospital located in Olmsted County. Minnesota Health Plans (Medicaid) provide insurance coverage for most Somali women and require provision of care at either RMH or OCMC. No home births are known by the researcher or have been reported by Somali community liaisons. Recent data from a local survey (2007) indicates that of 448 Somalis, 75% sought care at Mayo Clinic and 12% sought care at Olmsted County Medical Center<sup>94</sup>. Although no data were available on the number of Somalis delivering infants at OCMC, it is reasonable to assume that three quarters of all Somali infants were delivered at RMH between 1993 and 2006. It is also assumed that the study population includes higher risk births since RMH is a high-risk perinatal center and routinely receives cases referred by OCMC.

Study sampling included all Somali women and women born in countries surrounding Somalia (Djibouti, Kenya, Ethiopia, and Eritrea). Additional countries of birth were included due to clouded familial and cultural borders than do not coincide with Somalia's geographic borders. Although the sample might have included several cases of non-refugees as a result, the African-born population residing in Rochester prior to 1993 was extremely small and largely comprised of male physicians working at Mayo Clinic. Therefore, few non-refugee cases were expected to confound results. The benefit of including women born in countries surrounding Somalia is that the sample will more fully reflect refugee women with similar

characteristics. Somali refugees began arriving in Minnesota in 1993; therefore data included women delivering infants between 1993 and 2006. The number of cases was expected to approximate 600 births. This sample represented the entire population available at RMH with the inherent strengths of using all available medical records.

### *Data Sources*

Secondary data were employed to identify the dependent, independent and latent variables required to meet the study's aim. The majority of variables were secondary data extracted from an existing obstetrical database at Rochester Methodist Hospital. Data were entered directly from medical charts into the database. The database includes all women receiving perinatal care at RMH regardless of outcome; fetal demise, still births and live births were included.

Variables not recorded in the obstetrical database were obtained by medical record chart review. These data include year of immigration, age at immigration, request for interpreter, and expanded investigation to identify substance use. Date of immigration is not a standard medical record entry field, but is often captured by the provider as narrative in clinical notes. It was assumed that not all patients have this information available and cases with missing variables were omitted from data analysis for this variable. Interpreter request is now a standard field in the Mayo Clinic electronic medical record in order to have a staff interpreter available for appointments. Substance use is a standard question included in the Clinical Visit Information (CVI) update gathered at the first prenatal visit. However, because the use of tobacco, alcohol and other substances is forbidden by Islam, the vast majority of women deny substance use regardless of actual usage patterns. Preliminary inquiry indicated that some Somali patients confide substance use to their providers in subsequent prenatal visits



following CVI completion, and this information is noted in the medical notes. Therefore, a review of medical records provided a more accurate representation of actual substance use among Somali women. Multiple questionable entries and obvious errors in the obstetrical database were also verified or corrected when reviewing the medical charts.

### *Limitations*

A limitation of using the RMH database instead of conducting data abstraction directly from medical record was that only selected data are entered. For example, a one hour glucose test is routinely entered at 28 weeks to determine gestational diabetes. However, the database would not include a test administered earlier. Additionally, RMH includes a high risk perinatal center that could skew the patient mix toward women with more complications than women with a normal risk pregnancy, the patients seen at RMH do not include all those living in the city and therefore may not be representative of all Somali women.

### *Study Variables*

Dependent dichotomous variables included:

Preterm birth - infants born at  $< 37$  weeks gestational age calculated from last menstrual period (LMP) to delivery (includes fetal demise) or

Term birth - infants born at  $\geq 37$  weeks gestational age calculated from LMP to delivery (includes term still births)

Low birthweight infants weighing  $< 2,500$  grams at birth

Normal birthweight infants weighing  $\geq 2,500$  grams at birth

Independent variables included in this study have been shown in the literature to effect preterm birth or low birthweight. Variables available in the RMH database include:

### Maternal factors

- age in years at delivery calculated by subtracting maternal birth date from delivery date.

### Fertility history

- parity – number of previous live births  
Nulliparous women (no previous births = 0) have a higher risk of delivering a preterm and/or low birthweight infant (Continuous)
- Gravidity – number of previous pregnancies (Continuous)

### Health behavior

- Substance use includes “ever use” of alcohol, tobacco, khat or other illicit drugs (No=0, Yes=1)
- Weight gained during pregnancy in pounds – weight in pounds calculated by subtracting prepregnancy weight from maternal weight at delivery – Continuous
- Body mass index (BMI) calculated from maternal height from medical chart, and prepregnancy weight from medical chart or maternal report – [ $<18.5$  (under weight);  $\geq 18.5$  to 25 (normal);  $> 25$  to 30 (overweight); 30+ (obese)] (Continuous)

### Complications of pregnancy

- Gestational diabetes (GDM) determined by lab test at 28 weeks - (Dichotomous: No = 0, Yes = 1)  
Patient does not have gestational diabetes (0) if a one hour oral glucose tolerance test  $<140$  mg/dl, or if three hour glucose if less than 2 blood sugars exceed the

following limits: fasting - 95 mg/dl, 1 hour – 180 mg/dl, 2 hour – 155 mg/dl, 3 – 140 mg/dl)

Patient does have gestational diabetes if 1 hour glucose is  $\geq 190$  mm/dl, or if 2 or more blood sugars exceed the following limits: fasting – 95 mm/dl, 1 hour – 180 mg/dl, 2 hour – 155 mg/dl, 3 – 140 mg/dl) or if fasting blood sugar alone is  $> 120$  mm/dl.

- Anemia as indicated by lab test (Continuous)

Maternal prenatal care history:

- The Kotelchuck Index will be used to describe the adequacy of prenatal care (Appendix A) The index includes 4 categories described as adequate plus =1, adequate = 2, intermediate = 3, and inadequate = 4.

Acculturation is a latent variable that will include several variables:

- Age at immigration (Continuous)
- Years lived in the U.S. calculated by subtracting the year of immigration from the year of infant delivery (Continuous)
- Interpreter needed (No = 0, Yes = 1)

Unavailable omitted variables associated with preterm birth and low birthweight include pregnancies of less than 20 weeks duration (spontaneous or elective abortion), date of onset for “complications of pregnancy”, environmental/neighborhood factors, prior preterm birth and time between pregnancies.

### *Study Sampling*

Study sampling included a “consecutive series” of all women delivering infants at RMH including and between 1993 and 2006. Sample size was determined to assure that this

strategy would be adequate to yield valid results for the selected analysis. Necessary sample size for comparing two proportions was estimated using the following equation:

$$N \approx \frac{2 \cdot \rho_{av} (1 - \rho_{av}) (Z_{\alpha} + Z_{\beta})^2}{\Delta^2}$$

N = the number of subjects needed in each proportion

$\rho_{av}$  = the estimated average proportion. The estimated average proportion of low birthweight infants was used and set at .10 based on preliminary data.

Power index =  $(Z_{\alpha} + Z_{\beta})^2$  was selected from a standard table<sup>95</sup>. The power index was 6.2 using a 1-sided test with  $\alpha = .05$  and 80% power.

$\Delta$  = estimated margin of error and was set at .03

$$N \approx \frac{2 \cdot .10(.90)(6.2)}{.009}$$

$$N \approx 124$$

Because over 500 charts were available for review, all available information were used in this study. Noting that the calculated sample size above requires a minimum of 124 subjects in each comparative group, the projected sampling method provided more than adequate subjects at 80% power and an alpha level of .05.

#### Analysis Plan

1) Descriptive statistics. Counts and proportions were provided to describe the full sample and the two time periods (1993-1999 and 2000-2006).

2) Bivariate analysis were conducted for each independent variable to determine its relationship with both preterm birth and low birthweight. Chi-squared tests were used for categorical independent variables and two-sample t-tests were used for continuous independent variables with 0.05 selected as the alpha criterion for establishing statistical

significance. Further comparisons between continuous independent and dependent variables used contingency analysis.

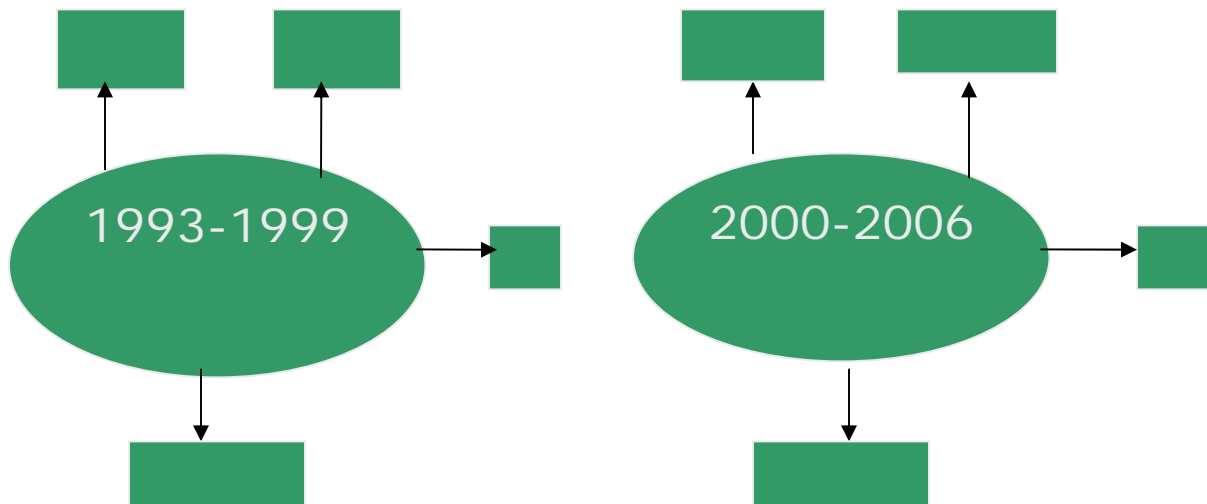
3) Structural equation modeling (SEM). Study variables as depicted in the hypothesized model (Figure 2) was tested using computer software designed to conduct this type of analysis. SEM is a unique analysis tool in that it allows the use of multiple measures of theoretical constructs to determine construct validity and causality, and tests relationships between latent (i.e. unmeasured) variables. SEM is particularly useful in exploring new theoretical models in that it is possible to assume that different levels of measurement error are present in data and tests the effects of these different levels on the theoretical relationships specified in the model<sup>96</sup>.

SEM produces a model chi-square to assess the difference between the observed data and a “restricted structure” resulting from the full (i.e. theoretical and measurement) model<sup>96</sup>.

While there is no completely objective measure of model fit, there are measures of relative fit upon which researchers rely. A non-significant chi-square test is desirable in that it indicates no difference between the data and the model. Model fit statistics that will be reported include the goodness of fit index (GFI) and comparative fit index (CFI) that range from 0 to 1.0 with 0.9 or greater representing a good fitting model. The relative chi-square (ratio of chi-square to degrees of freedom) will be reported, setting the level of model fit at less than 3. Theoretical models will be tested eliminating variables that do not meet these parameters until a final model is produced with the possible addition of significant variables identified in the bivariate analysis.

Because acculturation is expected to increase over time, two periods (1993 - 1999 and 2000 - 2006) were compared using the variables included in Figure 3 simplified below:

Figure 3.  
Simplified conceptual model comparing acculturation between 1993-1999 (Acculturation 1)  
and 2000-2006 (Acculturation 2)



The direct effects of substance use, BMI, and adequacy of prenatal care on birth outcomes were examined as well as how these factors were indirectly affected by acculturation. A final model was generated that provides the best fit to the data.

#### IRB and Confidentiality Issues

Mayo Clinic IRB approval was received for use of the secondary data available from the obstetrical database in May 2006. An amendment to the Mayo Clinic protocol was submitted concurrently with UNC IRB submission to include use of 2006 obstetrical data and allow medical record reviews. Only data from women who have previously approved use of their medical records for research were used in this study. Data is not entered into the RMH obstetrical database without prior approval. Confidentiality was assured by using clinic numbers to identify data rather than names. Data copies were stored on the researcher's password protected lap top computer and on the password protected Mayo Clinic server.

Future published articles will not include the name of the community where either the hospital or participants reside to provide greater anonymity.

## CHAPTER IV

### RESULTS

#### Description of the Sample

##### *Sampling and Variables*

The initial sample was comprised of 661 Somali women delivering infants between and inclusive of 1993 and 2006. After excluding cases based on refusal to participate in research (45), twin births (2), women under age 18 (11), not a Somali refugee (16), or stillbirths due to fetal anomaly (3), 584 cases remained for analysis. Data were extracted from the Rochester Methodist Hospital (RMH) obstetrics database and patients' medical records. Not all cases include all variables although all cases include the dependent variables of birthweight and gestational age. Missing fields were primarily due to women who received late or no prenatal care, or the field was not required for the provision of prenatal care (e.g., year of immigration). Sample size (N) was included for each variable in the data tables and narrative where appropriate.

At the onset of data collection, it was not known whether medical records would include information on year of immigration to the United States. Fortuitously, many clinicians referred to this information in their notes. Because of the availability of immigration dates, an additional indicator of "proportion of life lived in the U.S." was included and calculated using the formula:  $(1 - \frac{\text{maternal age at immigration}}{\text{maternal age at delivery}})$ . This indicator better reflects the potential for acculturation due to the proportion of life lived both in and outside the United



States, and is supported in the literature as a useful variable to describe acculturation<sup>97</sup>.

Other specifications for analysis include using both gestational age and birthweight expressed as continuous variables in addition to nominal definitions (preterm/term or low birthweight/normal birthweight). Parity was also described and analyzed as a continuous variable and a nominal variable (parity = 0 and parity = 1+) potentially controlling for nulliparous women shown to have a higher incidence of preterm and low birthweight infants. The definition of “substance use” was expanded to include exposure to second hand smoke by husband/partner smoking in addition to maternal smoking and/or alcohol use during pregnancy.

Data were analyzed for the full sample to describe characteristics of Somali refugee women delivering infants at Rochester Methodist Hospital, and also analyzed between groups defined by chronological period (1993 - 1999 and 2000 - 2006). Independent variables in both the full sample and each chronological group were then compared to preterm birth and low birthweight. Descriptive statistics and comparisons between groups are provided in Tables 6 through 9. Between group differences were determined using chi-square and Fisher’s exact tests for categorical variables, and t-tests for continuous variables. Statistical significance was established at the 0.05 level and reported confidence intervals (CI) are 95%. Between groups comparisons were calculated for variables used in the bivariate analysis and structural equation modeling only.

#### *Maternal Factors and Fertility History*

The majority (498 or 85.7%) of women were under age 35 at the time of infant’s birth with 84 (14.3%) women aged 35 years and older. As noted in Table 5, maternal age ranged from 18 to 49 years with a mean of 28.1 years of age (SD = 5.77). However, accurate age is

questionable since most maternal dates of birth were recorded as “January 1, <year>”. Most Somalis do not know their actual birth day or year, and, therefore, maternal age should be considered estimates. Conclusions based strictly on maternal age for this population should be viewed with reservation. Nulliparous women comprised 21.6% (126) of the sample with a mean parity of 2.4 and a mean gravidity of 3.8. The mean education was 9.9 years. Most women were married (399 or 68.6%) and described their employment as “homemaker” (299 or 51.2%). Although increases were noted with time in maternal mean age (27.4 years to 29.3 years), parity (2.1 to 2.4) and gravidity (3.5 to 3.9), no between groups significant differences were found for maternal or fertility characteristics (see Table 7).

#### *Prenatal Care History and Acculturation Factors*

Adequacy of prenatal care utilization (APNCU) using the Kotelchuck Index<sup>98, 99</sup> (see Appendix A) indicated that 111 (12.7%) women received “adequate plus” care, 161 (38.5%) received “adequate” care, 215 (28.9%) received “intermediate” care, and 71 (19.9%) received “inadequate” prenatal care (see Table 6). There were no significant differences between Groups 1 and 2 for APNCU (see Table 7).

Nearly three quarters of the women in the sample (405 or 74.2%) immigrated to the United States prior to the year 2000 ranging between 1988 and 2006 with the majority of women arriving in 1997. Most women immigrated as adults with 453 (83.7%) between ages 18 and 34 (mean 23.9 years, range 8-45 years). Mean time in the United States was 4.3 at the time of delivery, ranging from 0 to 14 years. The mean proportion of life lived in the U.S. was 15% and over half (298 or 53.6%) of all women used an interpreter at prenatal care appointments (see Table 6).

Table 5. Maternal factors and fertility history for Somali women delivering infants at Rochester Methodist Hospital: 1993 - 2006			
Variable	N	n (%)	Mean (SD)
Maternal Age in years	581		28.1 ( 5.77)
18-19		28 (4.8)	
20-24		150 (25.8)	
25-29		167 (28.7)	
30-34		153 (26.3)	
35+		83 (14.3)	
Education in years	539		9.9 (3.4)
Marital status	582		
Married		399 (68.6)	
Separated/Widowed/Divorced		143 (13.5)	
Single		40 (6.9)	
Occupation	581		
Homemaker		299 (51.2)	
Manual laborer		139 (23.8)	
Student		41 (7.0)	
Professional		31 (5.5)	
Unemployed		71 (12.1)	
Parity	583		2.4 (2.22)
Para = 0		126 (21.6)	
Para = 1+		457 (78.4)	
Gravidity	584		3.8 (2.46)
Kotelchuck Index (APNCU)	558		
1=Adequate+		111 (12.7)	
2=Adequate		161 (38.5)	
3=Intermediate		215 (28.9)	
4=Inadequate		71 (19.9)	
Interpreter	556		
No		258 (46.4)	
Yes		298 (53.6)	
Years in US	544		4.3 (2.9)
Age at immigration in years	541		23.9 (6.0)
Proportion life lived in US	541		.15 (1.1)
BMI (kg/m <sup>2</sup> )	496		26.9 (5.67)
<18.5		26 (5.2)	
≥18.5-25		174 (35.1)	
> 25-30		154 (31.1)	
> 30		142 (28.6)	
Substance use and/or exposure	512		
No		448 (87.5)	
Yes		64 (12.5)	
Weight gain in pounds	581		17.0 (11.90)

Statistically significant differences were found between Group 1 and Group 2 (see Table 7) in “years lived in the U.S.” (2.7 years to 4.8 years,  $p = .0001$ ) with an associated increase in “proportion of life lived in the U.S.” (11% to 17%,  $p < .0001$ ). Between group differences in interpreter use were also significant with fewer women in Group 2 (49.9%) using an interpreter for prenatal care appointments compared to Group 1 (65.2%, chi-square = 9.47,  $p = .0021$ ). Women in Group 2 immigrated at a slightly younger mean age compared to Group 1 (23.7 to 24.7 years of age) although the difference was not statistically significant.

### *Health Behaviors*

Mean body mass index (BMI) at the onset of pregnancy was 26.9 or in the “over weight” category (range 15.3 - 46.4). Using BMI categories as descriptors, 26 (5.2%) women were “underweight”, 174 (35.1%) were of “normal weight”, 154 (31.1%) were “overweight”, and 142 (28.6%) were “obese”. Mean weight gain during pregnancy was 17.0 pounds (SD = 11.90) ranging from a loss of 16 pounds to a gain of 62.7 pounds (see Table 6).

Specific levels of substance use were not available (i.e., number of cigarettes smoked or alcohol consumed daily), and no khat use was noted in medical records. Sixty-four (12.5%) women used tobacco or alcohol or were exposed to second hand smoke with most cases identified as husband/partners’ smoking (51).

Differences in BMI analyzed as a continuous variable between Groups 1 and 2 were not statistically significant although a slight overall increase in mean BMI was noted over time (26.4 to 27.1). Changes between BMI groups over time were noted with fewer women in the “under weight” (7.3% to 4.7%) and “over weight” (39.1% to 28.8%) categories. Increases in “normal weight” (32.7% to 35.7%) and “obese” (20.9% to 30.8%) were observed (see Table 7).

Table 6.

Maternal factors, fertility history, prenatal care, health behavior and acculturation factors for Somali women delivering infants at RMH: Group comparisons

	Group 1: 1993-1999			Group 2: 2000-2006			Group comparisons
Variable	N	n (%)	Mean (CI)	N	n (%)	Mean (CI)	X <sup>2</sup> or t (p-value)
Maternal age in yrs	138		27.4 (26.4, 28.3)	443		29.3 (28.5, 30.1)	3.37 (.0668)
18-19		10 (7.2)			18 (4.1)		
20-24		38 (27.5)			112 (25.3)		
25-29		43 (31.2)			124 (28.0)		
30-34		31 (22.5)			122 (27.5)		
35+		16 (11.6)			67 (15.1)		
Parity	138		2.1 (1.8, 2.5)	210		2.4 (2.2, 2.6)	1.6 (.2069)
Para = 0		35 (25.4)			91 (20.5)		1.5 (.2215)
Para = 1+		103 (74.6)			354 (79.5)		
Gravidity	138		3.5 (3.1, 3.9)	446		3.9 (3.6, 4.1)	2.9 (.0918)
APCNU	137			421			5.65 (.1302)
1=Adequate+		34 (24.8)			77 (18.3)		
2=Adequate		35 (25.5)			126 (29.9)		
3=Intermediate		46 (35.6)			169 (40.1)		
4=Inadequate		32 (16.1)			49 (11.6)		
Interpreter	135			421			9.47 (.0021*)
Yes		88 (65.2)			210 (49.9)		
Years in US	135		2.7 (2.4, 3.1)	409		4.8 (4.5, 5.1)	57.3 (<.0001*)
Age at immigration	135		24.7 yrs (23.6, 25.8)	406		23.7 yrs (23.1, 24.3)	2.67 (.1027)
Prop life in US	135		.11 (.09, .12)	406		.17 (.16, .18)	38.8 (<.0001*)
BMI	110		26.4 (25.3, 27.4)	386		27.1 (26.5, 27.7)	1.2 (.2753)
<18.5		8 (7.3)			18 (4.7)		4.19 (.0406*)
>18.5-25		36 (32.7)			138 (35.7)		
> 25-30		43 (39.1)			111 (28.8)		
> 30		23 (20.9)			119 (30.8)		
Substance use/exp.	112			400			4.83 (.0280*)
Yes		7 (6.2)			57 (14.2)		
Weight gain – lbs.	137		17.3 (15.2, 19.5)	444		16.8 (15.8, 17.9)	.19 (.6653)

\*p < .05

The Wilcoxin rank sum test indicated a significant difference between BMI groups by year group (chi-square = 4.19, p = .0406) with significance realized between women in the “overweight” and “obese” BMI categories only (chi-square = 5.75, p = .0165). Of clinical interest, a 68% increase in “obese” women occurred between Group 1 (23 or 20.9%) compared to Group 2 (119 or 30.8%). Substance use and/or exposure was significant (chi-square = 4.83, p = .0280) between Group 1 (6.2%) and Group 2 (14.2%).

### *Complications of Pregnancy*

Gestational diabetes was diagnosed in 57 (12.9%) of the women in the sample using fasting or 3 hour oral glucose tolerance testing at 28 weeks gestation. Ninety-eight (17.6%) women were diagnosed with anemia (hemoglobin < 11 g/dl) at the first prenatal appointment (see Table 8). The mean hemoglobin level was 11.89 (SD = 1.25).

Table 7.

Complications of pregnancy and birth outcomes for Somali women delivering infants at RMH between 1993 and 2006

Variable	N*	n (%)**	Mean (CI)	Range (SD)
Hemoglobin	556		11.89 (11.8, 12.0)	5.8–18.6 (1.25)
Anemia	556			
No		458 (82.4)		
Yes		98 (17.6)		
GDM	441			
No		384 (87.1)		
Yes		57 (12.9)		
Gestational age	584		39.1 weeks (38.9, 39.3)	22–44 (2.5)
<37 weeks		50 (8.6)		
≥37 weeks		534 (91.4)		
Birthweight	584		3337.4 (3287.1, 3387.7)	250–5120 (618.4)
<2500 gms		36 (6.2)		
>2500 gms		548 (93.8)		
Delivery type	583			
Vaginal		384 (65.8)		
Cesarean		156 (26.7)		
VBAC		43 (7.3)		

\*N=number in sample      \*\*n=number in category, % =  $\frac{n}{N}$

Gestational diabetes almost tripled (5.2% to 15.1%) between Group 1 (5.2%) and Group 2 (15.1%) and was statistically significant (chi-square = 6.03,  $p = .0140$ ). While the mean increase between hemoglobin levels (11.6 to 12.0) was statistically significant ( $t = 6.96$ ,  $p = .0086$ ) and anemia rates decreased between Groups 1 and 2 (23.3% to 15.9%), the decrease in anemia diagnoses was not statistically significant (chi-square = 3.6,  $p = .0569$ ) (see Table 9).

### *Birth Outcomes*

Low birthweight infants (< 2,500 grams) comprised 36 or 6.2% of all births. The mean infant birthweight was 3337.4 grams (SD = 618.4). Ten percent of all infants weighed 4,000 grams or more. Preterm infants (< 37 weeks gestational age) comprised 50 (8.6%) of all infants in the sample ( $N = 584$ ) and included 7 stillbirths not attributed to developmental or congenital anomalies. The majority of infants (534 or 91.4%) were born at 37 weeks or greater, and considered “term” births. Mean gestational age was 39.1 weeks (SD = 2.5).

The majority of infants born to Somali women (446 or 76.4%) were born between 2000 and 2006 with 138 (24.6%) born between 1993 and 1999 ( $N = 584$ ). A significant increase in preterm birth was observed between Groups 1 and 2 (4.3% to 9.9%, chi-square = 3.87,  $p = .0491$ ). While an increase in the proportion of low birthweight infants was observed between Groups 1 and 2 (2.9% to 7.2%), the difference did not reach significance (chi-square = 3.11,  $p = .0779$ ) (see Table 9).

Table 8.

Complications of pregnancy & birth outcomes for Somali women delivering infants at RMH between 1993 – 2006: Group descriptions and differences

Variable	Group 1: 1993-1999			Group 2: 2000-2006			Between groups
	N*	n (%)**	Mean (CI)	N*	n (%)**	Mean (CI)	X <sup>2</sup> or t (p-value)
Hemoglobin	129		11.6 (11.4, 11.8)	427		12.0 (11.9, 12.1)	6.96 (.0086*)
Anemia	129			427			3.6 (.0569)
No		99 (76.7)			359 (84.1)		
Yes		30 (23.3)			68 (15.9)		
GDM	97			344			6.0 (.0140*)
No		92 (94.8)			292 (84.9)		OR=.305
Yes		5 (5.2)			52 (15.1)		
Gestational age	138		39.6 (39.2, 40.0)	446		39.0 (38.8, 39.2)	-2.49, (.0133*)
<37 weeks	138	6 (4.3)		446	44 (9.9)		3.87 (.0491*)
≥37 weeks		132 (95.7)			402 (90.1)		OR=2.4
Birthweight in gms	138		3423.1 (3323.2, 3525.1)	446		3310.8 (3252.6, 3368.5)	
<2500 gms		4 (2.9)			32 (7.2)		3.11 (.0779)
≥2500 gms		134 (97.1)			414 (92.8)		

\*N=number in sample

\*\*n=number in category, % =  $\frac{n}{N}$



## Bivariate Analysis

Bivariate analysis of the full sample was conducted for each independent variable against the dependent variables of preterm birth ( $0 = < 37$  weeks gestation;  $1 = \geq 37$  weeks gestation) and low birthweight ( $0 < 2,500$  gms;  $1 \geq 2,500$  gms). Independent variables included maternal age, parity (continuous and nominal variables), gravidity, substance use/exposure, gestational diabetes (GDM), anemia (continuous and nominal variables), BMI (continuous and categorical variables), weight gain, adequacy of prenatal care utilization (APNCU), age at immigration, years lived in the U.S., proportion of life lived in the U.S., and interpreter use at prenatal appointments.

As shown in Table 10, a significant relationship was realized between parity as a continuous variable and preterm birth, but not low birthweight. The likelihood of preterm birth decreased with increasing parity (chi-square = 4.12,  $p = .04$ , OR = 1.18). Significant differences were found between both preterm birth and low birthweight for interpreter use, weight gain, GDM and APNCU (see Tables 10 and 11). Of those women delivering preterm infants, almost twice as many did not require interpreters (29 or 11.24%) compared with those who used an interpreter (18 or 6.04%). Of those women delivering low birthweight infants, 21 (8.14%) required interpreters compared to 12 (4.03%) who did not use an interpreter (chi-square = 4.03,  $p = .04$ ). Women with increased weight gain were less likely to have a preterm (chi-square = 9.19,  $p = .0024$ ) or low birthweight infant (chi-square = 10.74,  $p = .001$ ). Likewise, women with GDM were less likely to have a preterm (chi-square = 9.41,  $p = .002$ ) or low birthweight infant (chi-square = 7.6,  $p = .006$ ).

Logistic regression was used to determine significance between APNCU categories, coding APNCU 1, 2 and 3 as dummy variables (0, 1) and using APNCU 4 as the referent

category. Significant differences were found between APNCU categories 1 and 4 (chi-square = 11.76,  $p = .006$ ) categories 2 and 4 (chi-square = 22.79,  $p < .0001$ ) and 3 and 4 (chi-square = 30.24,  $p < .0001$ ) relative to preterm birth. Similarly, significant differences were found between APNCU categories 1 and 4 (chi-square = 10.36,  $p = .0013$ ) 2 and 4 (chi-square = 18.91,  $p < .0001$ ) and 3 and 4 (chi-square = 21.20,  $p < .0001$ ) relative to low birthweight.

Table 9.

Somali women delivering women at RMH between 1993 – 2006:  
Bivariate analysis compared to preterm birth

Variable	Preterm birth			
	X <sup>2</sup>	p value	OR	95% CI
Patient age	.44	.51	1.02	.96, 1.07
Age at Immigration	1.20	.28	1.03	.97, 1.19
Years in US	1.27	.26	.94	.85, 1.05
Proportion life in US	1.91	.17	.15	.01, 2.37
Gravidity	1.39	.24	1.08	.96, 1.24
Parity	4.12	.04*	1.18	1.02, 1.39
Hemoglobin	.0006	.98	1.00	.78, 1.27
Weight gain	9.19	.002*	1.04	1.02, 1.08
BMI	.83	.36	1.03	.97, 1.10
BMI categories				
<18.5	.07	.79	.81	.19, 5.54
>18.5-25	.34	.56	.77	.31, 1.81
> 25-30	.00	.96	.97	.38, 2.49
> 30 (referent)	---	---	---	---
GDM	9.41	.002*	.26	.11, .64
Substance use	.34	.56	.78	.35, 1.97
Anemia	.71	.40	.73	.36, 1.60
Nulliparous	2.3	.13	1.63	.83, 3.04
Interpreter used	4.8	.0279*	1.97	1.08, 3.70
APNCU				
1=Adequate+	11.76	.0006*	4.24	1.89, 10.05
2=Adequate	22.79	<.0001*	9.24	3.87, 24.64
3=Intermediate	30.24	<.0001*	17.64	6.81, 53.89
4=Inadequate (referent)	---	---	---	---

\* $p < .05$

Table 10.

Somali women delivering women at RMH between 1993 – 2006:  
Bivariate analysis compared to low birthweight

Variable	Low birthweight			
	X <sup>2</sup>	p value	OR	95% CI
Patient age	.45	.50	.98	.93, 1.04
Age at Immigration	.03	.89	.99	.94, 1.06
Years in US	.34	.55	1.04	.86, 1.09
Proportion life in US	.02	.87	.77	.04, 22.47
Gravidity	.16	.68	1.03	.89, 1.19
Parity	1.87	.17	1.13	.96, 1.37
Hemoglobin	.07	.80	1.04	.77, 1.37
Weight gain	10.74	.001*	1.06	1.03, 1.10
BMI	2.56	.11	1.07	.99, 1.16
BMI categories				
<18.5	4.27	.0388*	.24	.06, 1.01
≥18.5-25	.37	.54	.72	.24, 2.00
> 25-30	.20	.66	1.31	.39, 4.65
> 30 (referent)	---	---	---	---
GDM	7.6	.006*	.23	.08, .69
Substance use	1.02	.31	.61	.26, 1.72
Anemia	.07	.80	.89	.38, 2.44
Nulliparous	3.02	.08	1.89	.89, 3.84
Interpreter used	4.03	.04*	2.11	1.03, 4.51
APNCU				
1=Adequate+	10.36	.0013*	4.67	1.89, 12.73
2=Adequate	18.91	<.0001*	16.58	5.31, 72.98
3=Intermediate	21.20	<.0001*	33.51	9.24, 215.5
4=Inadequate (referent)	---	---	---	---

\*p < .05

*Bivariate Analysis by Year Group: Group 1 (1993 – 1999)*

A statistically significant difference was found between APNCU 1 and 4 (referent group) within Group 1 (chi-square = 4.01, p = .0453). However, several cells had counts fewer than 5 making the results suspect. A statistically significant difference was observed between hemoglobin and low birthweight (chi-square = 4.23, p = .0398) only for Group 1.

### *Bivariate Analysis by Year Group: Group 2 (2000 – 2006)*

Statistically significant differences were noted between both low birthweight and preterm birth for weight gain, and gestational diabetes (see Tables B3 and B4). Increased weight gain was associated with fewer low birthweight (chi-square = 14.12,  $p = .0002$ ) and preterm infants (chi-square = 17.05,  $p < .0001$ ). Women with gestational diabetes were less likely to have either a preterm (chi-square = 6.67,  $p = .0098$ ) or low birthweight infant (chi-square = 8.75,  $p = .0031$ ) (see Tables B3 and B4). Logistic regression of APNCU and preterm birth showed significant differences between APNCU 1 and 4 (chi-square = 7.71,  $p = .0055$ ), APNCU 2 and 4 (chi-square = 18.23,  $p < .0001$ ) and APCNU 3 and 4 (chi-square = 25.61,  $p < .0001$ ). A statistically significant difference was noted between APNCU 3 and 4 (chi-square = 8.44,  $p = .0037$ ) only for low birthweight.

### *Structural Equation Modeling Analysis*

The model in Figure 2 was analyzed using AMOS<sup>100</sup> structural equation modeling (SEM) software. The original intent of this study was to use dichotomous or nominal variables for preterm or term birth, and low birth weight or normal birthweight. Problems in successfully running the software with the available data resulted in using continuous data for both birthweight and gestational age at birth. Several additional variable changes resulted in reducing the magnitude of scale between variables and resulted in successful completion of the analysis. The variables included in the modified model are as follows:

Observed, endogenous variables

- BW in lbs (birthweight in pounds) – Birthweight in grams was converted to pounds (birthweight  $\times 2.2/1000$  = birthweight in pounds)

- GAbyDate (gestational age by dates) – Gestational age in weeks determined from last menstrual period
- APNCU – Adequacy of Prenatal Care Utilization or Kotelchuck Index  
1 = Adequate plus, 2 = Adequate, 3 = Intermediate, 4 = Inadequate
- BMI categories – 1 = < 18.5, 2 = 18.5 to 25; 3 = 25 to 29.9, 4 =  $\geq 30$
- Prop in US – Proportion of life lived in the United States replaces “Age at immigration” and “Years lived in the United States” calculated by 1 – Age at Immigration divided by Age at birth of infant
- Interpreter – Interpreter utilized at prenatal care appointment. 0 = No, 1 = Yes,
- Substance – Alcohol use, tobacco use or exposure during pregnancy as noted in medical record. 0 = No, 1 = Yes

AMOS<sup>100</sup> software was used to test the hypothesized model illustrated in Figure 2.

Results yielded a chi-square statistic of 83.4 with a p-value less than .0001. Standardized regression weights between variables are illustrated in Figure 3. The comparative fit index (CFI) for the model was .853 and the relative fit index (RFI) value was .462. The root mean square error of approximation (RMSEA), which assists in determining how well the model would fit unknown data with optimally chosen parameters, was .127. These test statistics indicate that, given the present data, the hypothesized model represents an unlikely event and should be rejected. This result means that the model is a poor fit to the data, and the differences between the model and the data is very unlikely to have occurred by chance.

Note: GFI (goodness of fit) was not calculated by AMOS; therefore GFI was not reported in the results.

A post hoc analysis was accomplished using only those variables achieving significance against either preterm birth or low birthweight in bivariate analysis. These included interpreter use, parity as a continuous variable, weight gain, APNCU and GDM. Birthweight in pounds and gestational age were included as continuous variables. The model was constructed similarly to the original model with covariances between weight gain, APNCU and gestational diabetes. Relationships that support these covariances in the literature are that weight gain<sup>63</sup> during pregnancy is positively associated with gestational diabetes<sup>45</sup>, and both may increase with acculturation. Adequacy of prenatal care is expected to increase with acculturation<sup>64</sup>.

Results indicated that the post hoc model fit the data better than the hypothesized model, but reached statistical significance (chi-square = 14.4, 4 degrees of freedom,  $p = .006$ ). Standardized regression weights are shown in Figure 5. Statistically significant relationships in the measurement model were noted between acculturation and weight gain ( $p < .0001$ ), GDM ( $p = .008$ ), gestational age ( $p = .014$ ), interpreter use ( $p < .0001$ ) and birthweight ( $p = .028$ ). The CFI was .985, NFI was .979, and RMSEA was .067. Comparisons between time periods (Group 1 and Group 2) using the post hoc model showed no differences between groups (CFI = .996, NFI = .909, RMSEA = .016).

Figure 4.  
Structural equation modeling (SEM) results for the hypothesized model of the effects of acculturation on Somali women's birth outcomes

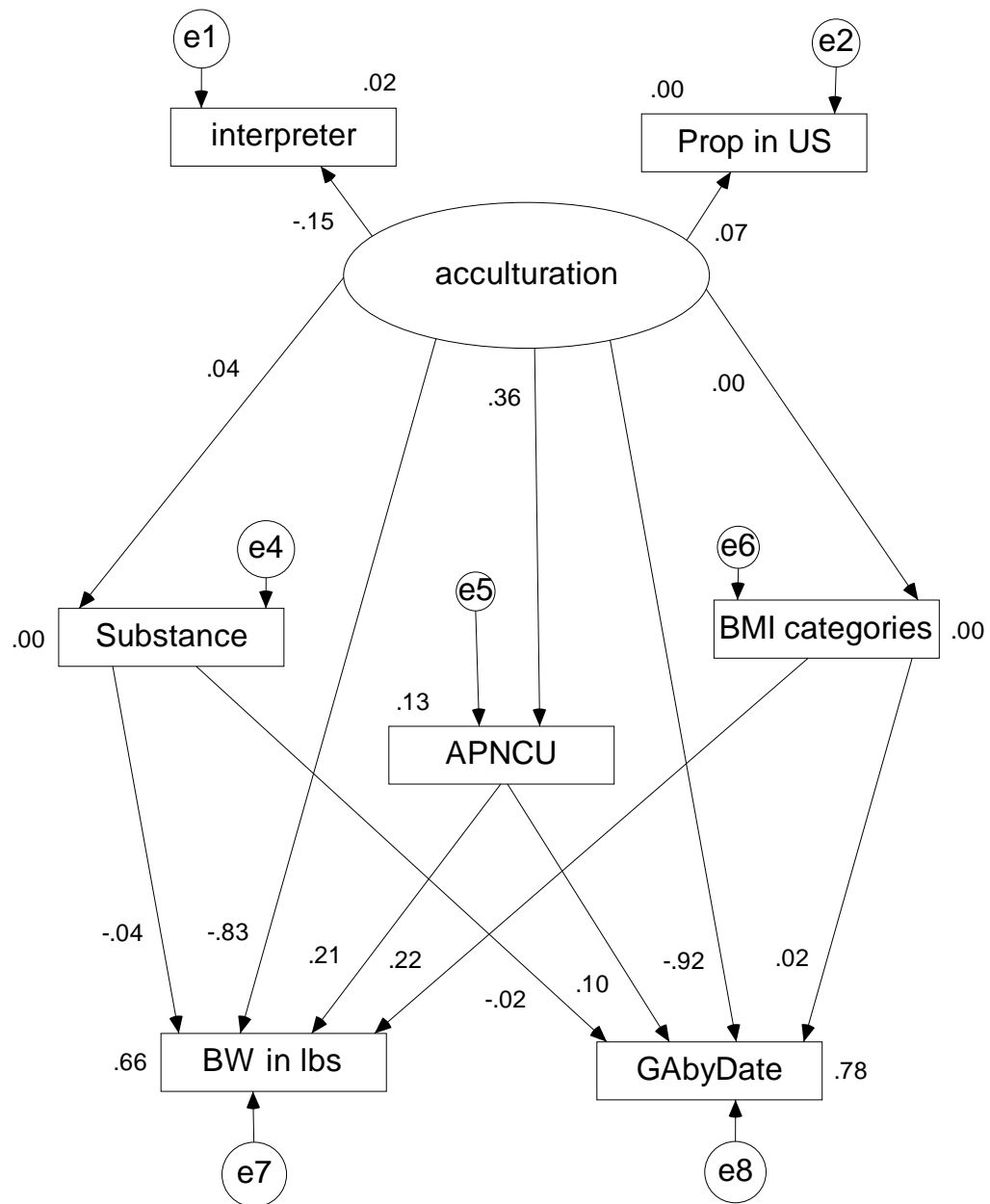
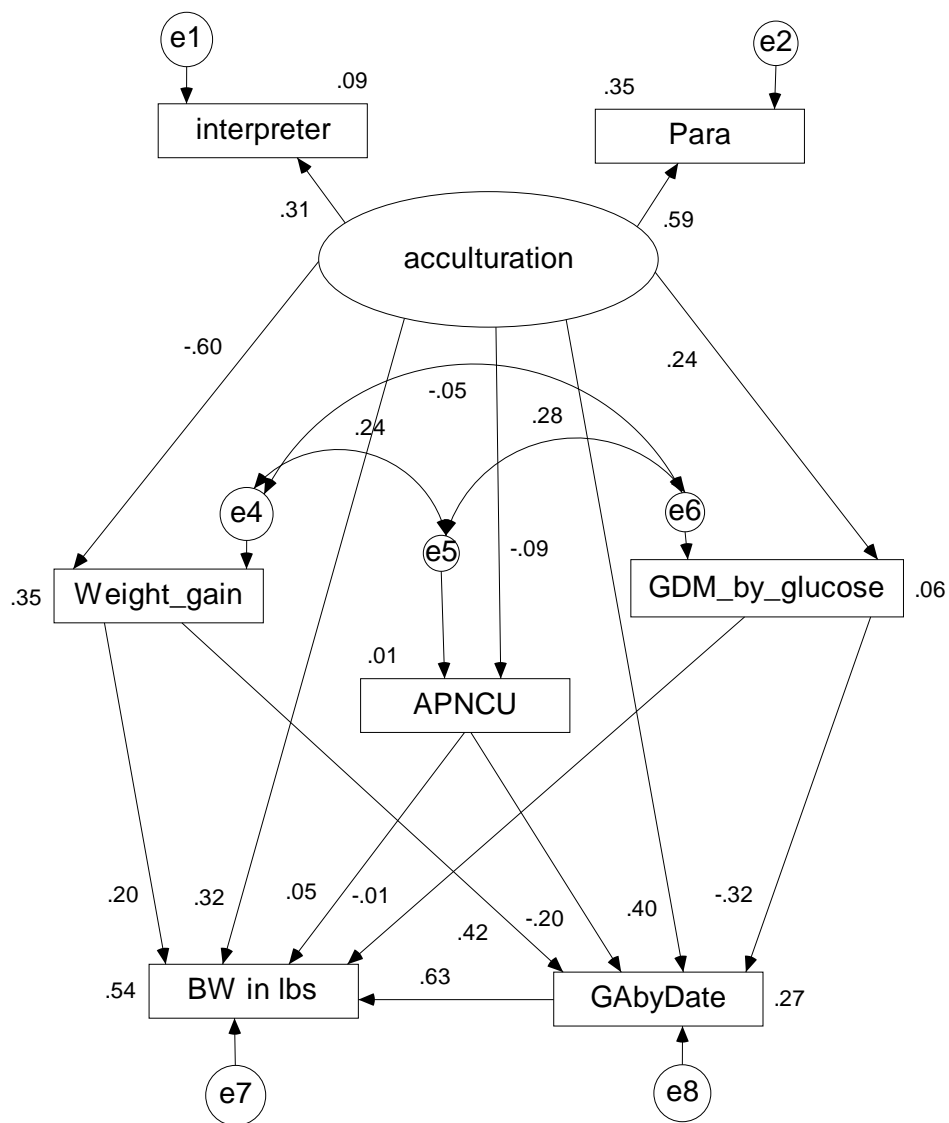


Figure 5.  
Structural equation modeling (SEM) results for the post hoc model of the effects of acculturation on Somali women's birth outcomes





## Discussion

*Hypothesis 1=Acculturation will increase between two time periods (Group 1 = 1993-1999 and Group 2 = 2000-2006).*

This study reviewed the literature to determine factors identified in other populations that measure acculturation that could prove salient for Somali refugees. Because data collection was limited to medical record data, an attempt was made to use existing data to measure acculturation. Acculturation, as a phenomenon, generally increases over time. However, specific factors that measure whether an individual is “acculturated” and the time period required to acculturate is not necessarily a linear process or an exact science<sup>65, 101, 102</sup>. Extensive studies have been conducted in Hispanic and Asian groups to identify specific factors associated with the process of acculturation<sup>31, 65, 87, 103-106</sup>. Because Somali refugees have resided in the U.S. for a relatively short period of time (up to 14 years), opportunities have been limited to determine whether acculturation is following a path similar to other immigrant and refugee groups. Factors that accurately describe acculturation in this population are also preliminary.

Factors associated with acculturation include language utilization using the proxy of interpreter required at clinical visits, age at immigration, years lived in the United States, and proportion of life lived in the United States. Mediating variables included substance use, adequacy of prenatal care utilization, and body mass index.

All variables selected to reflect acculturation (age at immigration, years lived in the U.S., proportion of life lived in the U.S. and interpreter used) were statistically significant between Groups 1 and 2. No significant differences were observed between Group 1 and 2 in regards to maternal age, parity or gravidity. A slight but non-significant decrease in mean age at

immigration was observed between women in Group 1 and Group 2 (24.7 years to 23.7 years). The number of years lived in the United States and the proportion of life lived in the United States showed significant increases between Group 1 and 2 (11% to 17%, respectively). This increase was expected in that women in Group 2 resided in the U.S. longer than those in Group 1 and could be expected to exhibit an increase in the factors associated with acculturation.

Time lived in the United States had the expected associations of decreased interpreter use. Expected results were confirmed as a significantly smaller proportion of women in Group 2 (210 or 49.9%) compared to Group 1 (88 or 65.2%) used an interpreter (chi-square = 9.47,  $p = .0021$ , OR = 1.88).

Although the mean weight gain during pregnancy decreased slightly between groups with time, there was a significant increase in women entering pregnancy as “obese” based on BMI. Somali women exhibit a high incidence of hyperemesis (see Table 1) which may account for the moderate mean weight gain during pregnancy. The increase in BMI may be due to multiple factors including diet, exercise and overall lifestyle changes. Women in Somalia had comparatively active daily routines where they commonly walked to the market, visited friends and family, and tended to their households. Life in the United States has changed with women more often holding sedentary factory jobs, and live in cities where walking to the grocery store is not practical or safe. The weather in Minnesota is also not conducive to exercising outdoors during the winter months. Exercising and dietary modification for weight loss and health maintenance are not common concepts for Somalis. In addition, the United States is experiencing an obesity epidemic and it should not be

surprising that newcomers are also adopting diet and exercise habits similar to their American neighbors.

The proportion of women with gestational diabetes almost tripled between Group 1 and 2 (5.2% compared to 15.1%). An inverse relationship was shown between gestational diabetes and both preterm and low birthweight infants in the total sample and also for Group 2.

Gestational diabetes may confound other factors predisposing women to deliver preterm and LBW infants since women delivering larger infants may appear to be “healthier” or within normal ranges if outcomes alone are observed. Both women with gestational diabetes and their infants are at increased risk for developing Type I or Type II diabetes later in life.

These results, therefore, while not posing the immediate risks inherent with LBW or preterm infants should be considered when evaluating potential long range health outcomes of this population.

Substance use and exposure showed a significant increase between Groups 1 and 2 although most cases indicated “substance exposure” associated with either a husband or partner smoking. The integrity of these data are suspect as it is not culturally appropriate for Muslim women to admit smoking, drinking or khat use. All women completing the clinical visit inventory (CVI) forms issued at the first prenatal visit indicated “no substance use” in comparison to information later revealed in the medical record notes. In addition, studies of largely U.S.-born pregnant women estimate actual substance use at least twice that of reported use. Therefore, it is highly likely that substance use is higher than reported in this study.

The Kotelchuck Index (APNCU)<sup>98</sup> combines two measurements including the month prenatal care was initiated and the number of recommended visits based on initiation of care.

The index was developed for normal risk women. Participants in this study included both normal and high risk women and results should be viewed with this caveat. No significant differences between Groups 1 and 2 were noted for APNCU categories. When collapsing the “adequate” and “adequate plus” categories together, there were fewer women receiving recommended levels of care over time (Group 1 = 50.3% and Group 2 = 48.2%). However, fewer women received “inadequate” care over time (Group 1 = 16.1% and Group 2 = 11.6%) and an increase was noted in women receiving “intermediate” care between Groups 1 and 2 (35.6% and 40.1%, respectively).

*Hypothesis 2 = Acculturation will be predictive of gestational age and birthweight.*

While factors hypothesized to influence acculturation showed significant differences in the expected directions over time (years in the U.S. and proportion of life lived in the U.S. increased, substance use/exposure increased), these factors were not significantly associated with either preterm birth or low birthweight infants. While these factors were supported in the literature related to Latinas<sup>65, 107, 108</sup>, they may not apply to Somalis.

The difference in mean years lived in the U.S. between Group 1 (2.7) and Group 2 (4.8) should be critically considered when evaluating study results. While the difference for this variable is statistically significant between groups (chi-square = 57.3,  $p < .0001$ ), the functional difference is questionable since acculturation resulting in health outcome differences has not been reported in increments of less than 5 years in other populations<sup>10</sup>. Somali refugees may not have been in the U.S. for long enough periods of time to show changes in health outcomes attributed to acculturation on a population level. While significant changes have occurred in factors expected to reflect acculturation in this study, it

is expected that some of these factors have not shown significant differences between birth outcomes when noting that the comparison groups have means less than 5 years apart.

While the overall study sample showed significant differences between interpreter use and both preterm birth and low birthweight infants, these differences were not seen in the chronological subgroups. This could be due to unavailable data for some of the women and analyzing fewer cases between year groups. Expected results were partially realized in that comparisons for the total sample indicated poorer birth outcomes as interpreter use decreased. It was also expected that women in Group 2 would have poorer birth outcomes if they did not use an interpreter, indicating a greater degree of acculturation. A significantly smaller proportion of women in Group 2 (210 or 49.9%) used an interpreter compared to Group 1 (88 or 65.2%; chi-square = 9.47,  $p = .0021$ ). A significantly larger proportion of women in Group 2 (44 or 9.9%) had preterm infants compared to Group 1 (6 or 4.3%). However, bivariate analysis of interpreter use and preterm birth did not yield significance for the total sample or between groups. These results suggest that a) factors other than language are stronger predictors of preterm birth, b) multiple factors reflecting acculturation measured together are necessary to impact birth outcomes, c) interpreter use is a questionable proxy for language competency, or d) actual use of interpreters introduces a confounding factor not corrected for in this study.

The significance of reduced preterm birth and low birthweight infants with increasing prenatal care utilization (APNCU) was expected. However, there was an unexpected increase in poor birth outcomes among those women in the APNCU category of receiving “adequate plus” care. An additional post hoc analysis indicated that almost half (3 or 42.9%) of the women with gestational diabetes delivering preterm infants received “adequate plus”

care which could partially account for high risk women coming in for additional prenatal visits. However, gestational diabetes is one of numerous pregnancy complications that require more frequent prenatal visits and can lead to larger birthweights<sup>52, 109</sup>. Increased scrutiny should focus on those women receiving an increased level care yet have poorer outcomes. This finding should be investigated on a case by case basis to determine potential contributing factors to these outcomes including a cost benefit analysis. Potential explanations for these findings could be that this group of women a) would have poorer outcomes regardless of prenatal care, b) did not follow clinical recommendations beyond attending a greater number of prenatal appointments, or 3) did not have culturally-appropriate teaching tools available to assure patient understanding of and adherence to a recommended course of treatment.

There were significant inverse relationships between weight gain and gestational diabetes with preterm birth and low birthweight. This result was expected as weight gain is a factor in the development of gestational diabetes and is associated with greater infant birthweight. A significant difference was found between BMI “underweight” and “obese” (referent) categories for low birthweight for the total sample. Significant inverse relationships were observed for weight gain and gestational diabetes between both preterm birth and low birthweight for the total sample and also for Group 2. As previously stated, the increase in gestational diabetes in this population may cloud the actual health of women and their infants if birth outcomes alone are used as endpoints. Because of the long term health consequences of GDM for both mother and infant, increased attention to the prevention of GDM should be prioritized for this population.

A key finding of this study was that preterm birth increased between chronologically defined groups indicating that preterm birth is increasing in Somali women residing in Rochester, Minnesota. However, the hypothesized factors expected to account for this change were not significantly related to this outcome. Therefore, additional research is required to determine the etiology of this finding.

*Hypothesis 3 = More acculturated women will have poorer birth outcomes than less acculturated women.*

Structural equation modeling (SEM) allows testing of the hypothesized model illustrated in Figure 2. In SEM, two extreme models are measured with the hypothesized model falling somewhere between. The independence model is the most restricted model as it is independent of all variables with all correlations equal to zero. The saturated model has the same number of estimated parameters as it has data points (i.e., variances and covariances of observed variables, as in the case of the ‘just-identified’ model) and is the least restricted. The null hypothesis tested in SEM analysis is that the specification of the factor loadings, factor variances and covariances, and error variances for the model under study are valid. Chi-square simultaneously tests the extent to which this hypothesis is true. The chi-square statistic is used to indicate the “goodness of fit” of the data, or measurement model, to the hypothesized, or measurement, model and is indicated by a non-significant p-value ( $> .05$ )<sup>110</sup>. The chi-square statistic of the data as applied to the hypothesized model in this study was 83.4 with a p-value less than .05 ( $p = .000$ ). The comparative fit index (CFI) was .853 with the advised CFI  $> .90$  on a scale of 0 to 1. Bollen<sup>111</sup> developed the relative fit index (RFI) which takes into account the sample size and degrees of freedom. The RFI also ranges between 0 and 1 with a value of .95 representing a superior fit. In this study, the RFI was

substantially lower than the recommended value (RFI = .462). The root mean square error of approximation (RMSEA) assists in determining how well the model would fit unknown data with optimally chosen parameters. RMSEA values less than .05 indicate goodness of fit with values up to .08 indicating reasonable error. RMSEA values ranging from .08 to .10 indicate a mediocre fit and values greater than .10 indicate a poor fit<sup>110</sup>. The root mean square error of approximation (RMSEA) for the hypothesized model in this study was .127 indicating a poor fit and suggesting that a new model should be constructed to better explain the relationship of acculturation to birth outcomes, if any exist.

In summary, these test statistics suggest that, given the present data, the hypothesized model represents an unlikely event and should be rejected. Either the model was invalid or the existing data did not fit the hypothesized model. Although a statistically significant increase in preterm birth was noted over time, the hypothesized structural equation model developed to reflect acculturation did not fit the data.

A post hoc analysis was constructed with only those variables shown to have statistically significant relationships in this study's bivariate analysis. Results provided a much better fit of the data to the model. The chi-square statistic 14.4 (df = 4) resulted in a p-value of .006. While the desired probability level is greater than .05, the post hoc model provided a much closer fit than the original hypothesized model. The CFI of .985 was above the recommended level of .95 reflecting a well-fitting model. However, the RFI of .856 was slightly below the recommended level of .95 indicating a superior fit. The REMSEA for the post hoc model was .067, indicating goodness of fit within a reasonable range.<sup>110</sup>

The characteristics of women in Groups 1 and 2 were then compared using the post hoc model to determine whether there was a statistically significant difference between the two.



Regression weights are shown for each group in Figures 6 and 7. Comparisons between time periods using the post hoc model showed no differences in the cumulative factors reflecting acculturation (CFI = .996, NFI = .909, RMSEA = .016).

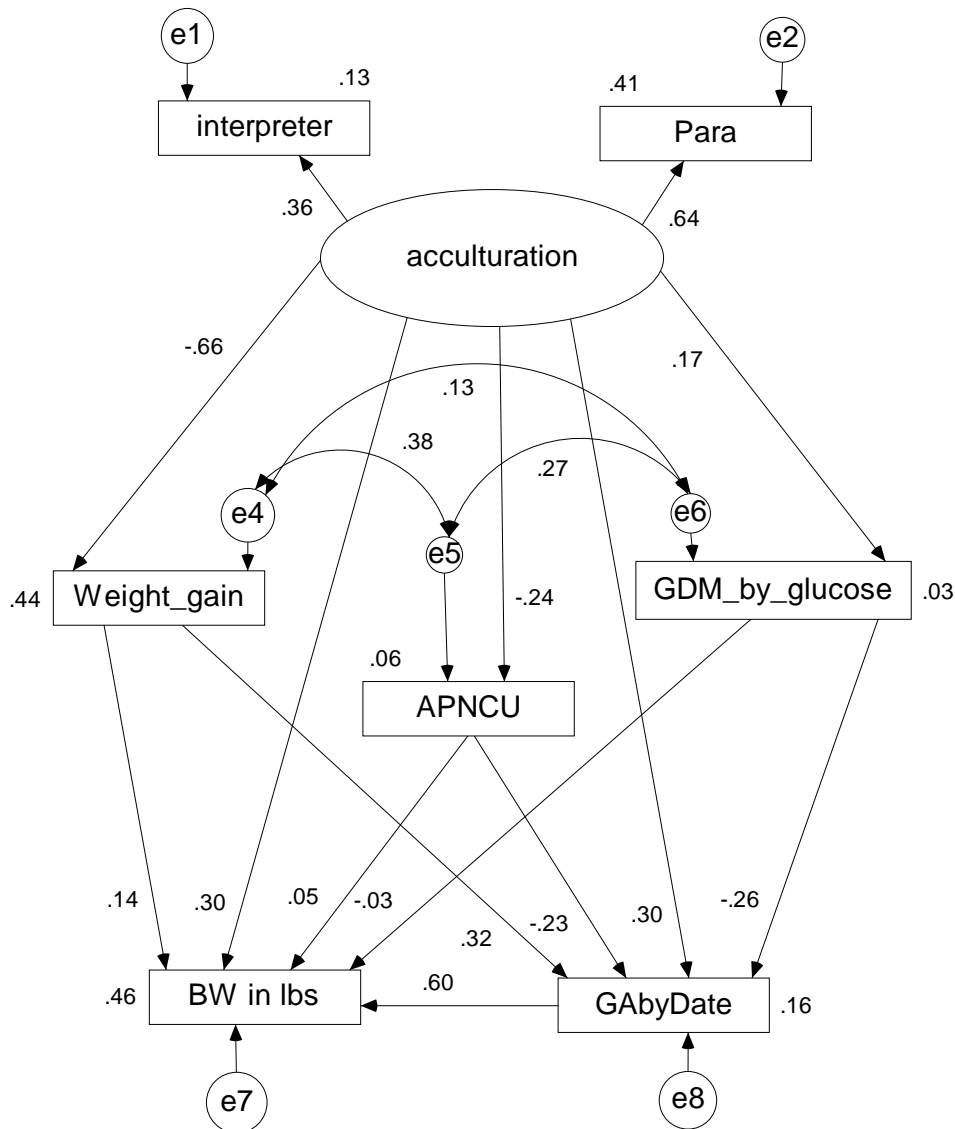
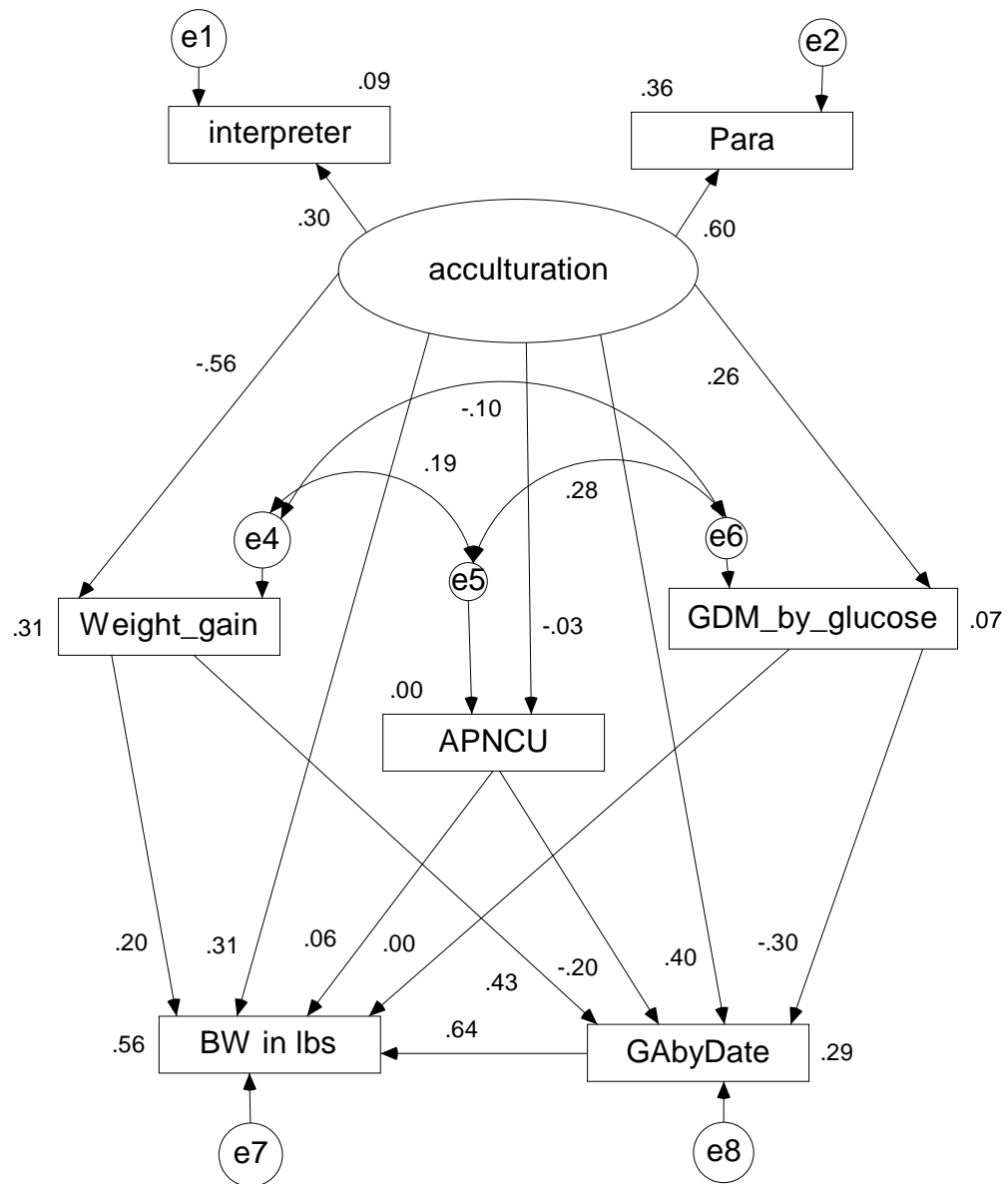


Figure 7.  
Standardized regression weights for the post hoc model of the effects of acculturation on Somali women's birth outcomes in Group 2: 2000-2006



### Limitations of the Study

This study tested hypotheses as a first step in understanding the effects of acculturation on Somali refugee women's birth outcomes. This study was limited by:

1. Use of retrospective data in currently existing medical records. It is questionable whether the data used to represent factors reflecting acculturation were accurate proxies.
2. A limited number of independent variables related to birth outcomes. Numerous factors are related to preterm birth and low birthweight. Only those related to acculturation in previous studies were included in this study.
3. Women seeking prenatal care at only one health care facility. Therefore, the study was subject to possible bias in its method of prenatal care delivery along with related ancillary determinants of care (health insurance, transportation, child care and appointment availability).
4. No referent group. The outcomes identified in this study were not compared to other foreign-born women in the same geographic area or presented in the context of the larger population. Therefore it is unknown whether trends noted for Somali women are similar for other groups or the general population.
5. Limited information on whether Somali women desire acculturating to Western norms. Therefore, it may have been premature to identify factors hypothesized to reflect acculturation.
6. Lack of a systematic methodology to identify an exploratory structural equation model. The SEM hypothesized model was based on factors reflecting acculturation in other foreign-born groups rather in the studied population. A confirmatory rather than exploratory

approach was initially undertaken when an exploratory approach would have been more expeditious.

### Recommendations for Future Research

Noting the study's limitations, the following measures are recommended for future research:

- 1) Prospective data collection. This study was limited by the use of retrospective data in currently existing medical records. A prospective study could identify and collect data on variables that may reflect acculturation more accurately than the available proxies.
- 2) Women seeking prenatal care at other health care facilities. Future studies should include women seeking care at other clinics and alternative methods of prenatal care including discussions with traditional healers and women choosing home birthing.
- 3) A comparison of Somali women to those in the general population and other refugee groups relocating to the same geographic area(s). The outcomes identified in this study are not presented in the context of the larger population. Future studies should include additional referent groups to determine whether health disparities exist between racial and ethnic populations. Results will inform changes in the provision of clinical care, if necessary.
- 4) Focus groups and interviews that provide insight into the acculturation of Somali women, identifying commonalities and differences related to other foreign-born groups. Somalis may have yet undefined constructs unique from other groups (e.g., wearing traditional dress versus Western clothing).
- 5) Identifying a structural equation model that provides a better fit between factors reflecting acculturation and birth outcomes. SEM offers a unique method of combining measured variables to create an unmeasured, or latent, variable. Future studies should consider the use

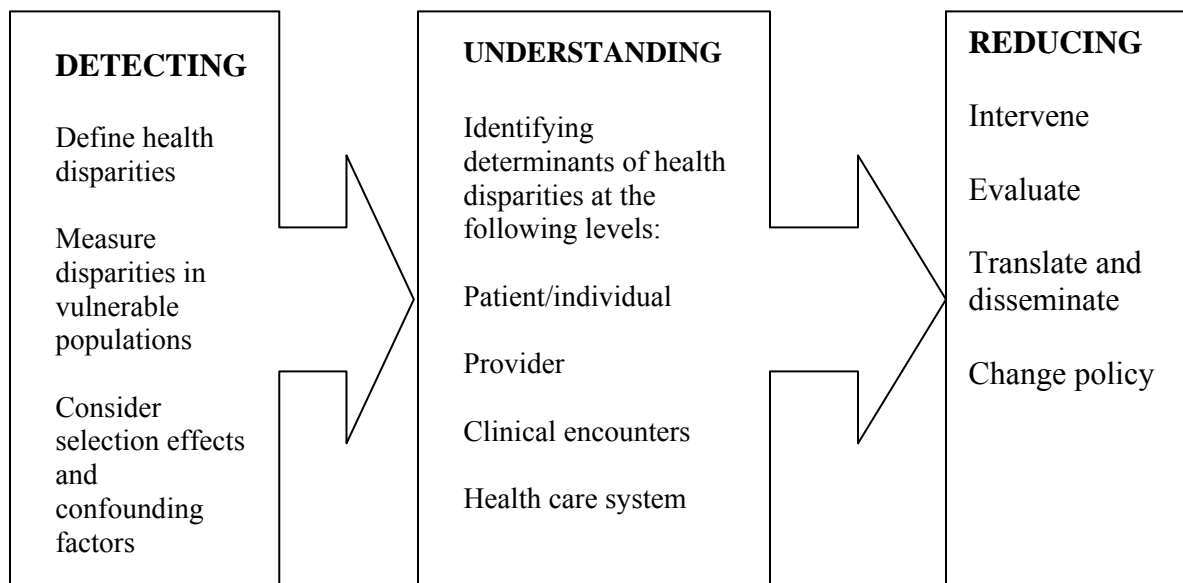
of exploratory factor analysis to provide a more systematic construction of a structural model.

## CHAPTER V

### IMPLEMENTATION PLAN

Kilbourne et al<sup>112</sup> (2006) proposed a framework to guide current and future research, and to implement interventions within the health care system designed to reduce potential disparities. Because this study focused on an underrepresented minority group with little published literature on translational research, this framework is particularly appropriate.

Figure 8.  
The 3 phases of the disparities research agenda<sup>113</sup>



The framework is organized into three phases. The first phase, *detection*, involves identifying health disparities and developing valid measures for further research (see Figure 8). The second phase, *understanding*, involves identifying potential determinants of disparities. These include multilevel factors including individual preferences, biological and genetic differences, health care access and provision, and health care organizational culture

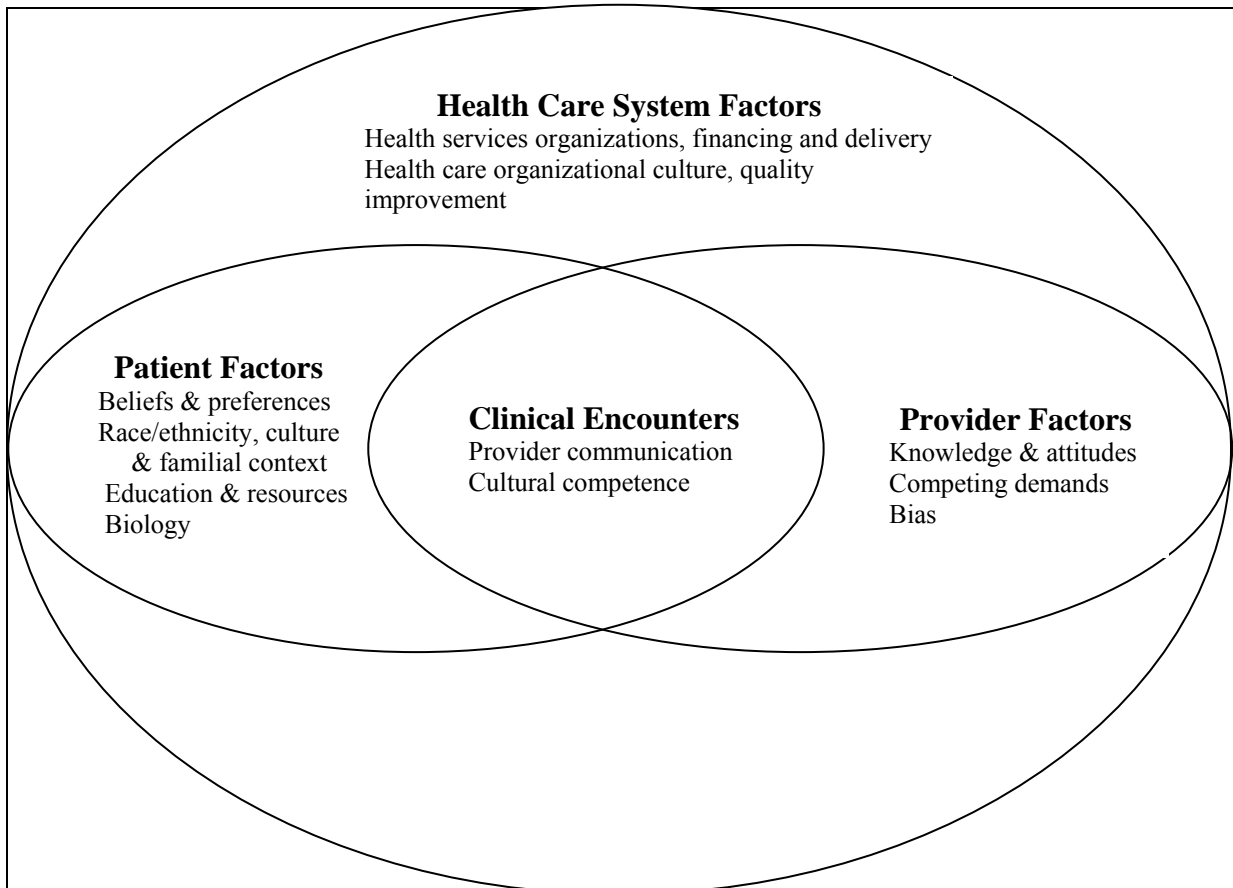
(see Figure 9). The third phase, *reducing disparities*, involves developing appropriate intervention strategies with concurrent evaluation strategies, determining whether the strategies can be translated into routine health care settings, and promoting policy changes based on the intervention. While this study centered on measuring disparities in vulnerable populations (phase one), suggestions are provided for understanding and reducing disparities.

The results of this study indicate an increase in preterm infants born to Somali women and an almost three-fold increase in gestational diabetes. More research is required to understand the etiology of these results, as previously recommended. The need for more research, however, does not preclude developing interventions designed to improve the birth outcomes of Somali women. Kilbourne et al's two phases of "understanding" and "reducing disparities" can be accomplished in an iterative rather than linear manner as more information becomes available. The goals of both phases, in fact, may be facilitated by parallel and interactive implementation.

As previously discussed, half of all causes of preterm birth are unknown. In addition, multiple factors influence health outcomes as illustrated in the socio-ecological framework (see Figure 1). This study focused on patients seen in a specific clinical setting, and therefore, the implementation plan will focus on modifying factors within that setting. A framework that illustrates these multiple influences and is limited to the health care setting is depicted in Figure 9. External forces (i.e., patient and provider factors) play an integral role in driving health care outcomes. Multiple strategies are required to influence patients, providers, clinical encounters and systems with numerous potential points of intervention. Because this study focused on outcomes measured in a clinical setting, two interventions are recommended for immediate implementation specific to prenatal education and clinical care.

Figure 9.

Understanding the origins of health and health care disparities from a health services research perspective: key potential determinants of health disparities within the health care system<sup>113</sup>



### *Standardized Data Collection*

Among the recommendations for future studies to determine whether factors reflecting acculturation are related to birth outcomes is prospective data collection. This effort can begin in the clinical setting by assuring that key data fields in the Obstetrics Work-up are (Appendix C) completed at the first prenatal visit. Although the current Mayo Clinic medical record includes adequate fields to capture data on social history, exercise, pertinent family history, nutrition and overall impressions that influence care, many of these fields are not



completed. In addition, a cultural assessment tool (Appendix D) is available for inclusion in the electronic medical record. Specific questions include language preference, family/social structure, decision makers in the family, health and illness beliefs, cultural/spiritual healers, expression of pain and dietary practices. Ancillary information (Sheryl Ness, personal communication, March 17, 2008) indicate that nurses are more likely to complete the cultural assessment for hospital inpatients than for outpatients. Adherence by nursing staff to complete the existing forms appears to be the implementation step necessary to assure that factors reflecting acculturation are documented in the patient record. An additional factor suggested for inclusion is whether the patient has adopted Western dress or continues to wear traditional African clothing. This information can be entered in several existing free-text fields in either the obstetrics work-up or the cultural assessment. Additional scrutiny at the first prenatal appointment should include attention to BMI and weight gain between pregnancies, time period between pregnancies and diabetes or gestational diabetes history. Adequate appointment time should be provided for the intake nurse to discuss questions or concerns women may have regarding standard clinical care in relation to cultural or religious beliefs. These recommendations will be shared at an RMH obstetric nurses' meeting scheduled for May 29, 2008.

#### *Somali Prenatal Care and Education Programs*

Somali women view pregnancy as a natural process rather than one requiring medical intervention<sup>14, 15, 114</sup>. While Somali women attend prenatal care appointments, they do not attend prenatal education classes<sup>11, 15, 115</sup>. Innovative methods are being implemented in order to reach Somali women prenatal care education. Somali prenatal education DVDs were developed by the author to address key issues learned through focus groups with Somali

women and key informant interviews with obstetric providers. Six short programs (3 to 5 minutes) deliver targeted messages using a skit format. The content includes reasons for seeking routine prenatal care, nutrition and exercise, paternal roles, pregnancy myths and facts, episiotomies for circumcised women, and cesarean sections (see Appendix E). A recurring theme throughout the segments is an emphasis on communicating the patient's personal and cultural values to health care providers. The literature documents that patient-provider communication drives patient satisfaction. Satisfied patients are less likely to fail clinical appointments and more likely to achieve recommended behavioral changes<sup>40, 116-119</sup>.

The DVDs were developed to air on Somali TV, a cable access program viewed by most Somalis in the Rochester area. Health messages developed with the assistance of Mayo Clinic are aired daily. Interest by the Mayo Clinic Department of Obstetrics and Patient Education led to piloting the programs in a clinical setting. The programs are viewed prior to prenatal care appointments with the intent of increasing levels of patient knowledge and facilitating patient-provider communication. The project is currently in the pilot phase with surveys completed by both patients and providers (see Appendix F). The involvement of health care staff in evaluating the programs and including the provider survey instrument may also facilitate culturally-competent communication and care through the Hawthorne effect.

The expanded current concept for program dissemination is to air the programs on Somali TV statewide, view in a clinical setting prior to prenatal care appointments, and add to the Video-on-Demand (VOD) system throughout the Mayo Clinic system. The DVDs will also be available for sale and distribution to other clinics and organizations serving Somali women.

Funds to develop the DVDs came from a \$25,000 Minnesota March of Dimes grant supplemented with a \$5,000 GlaxoSmithKline community grant. Funds for distributing the DVDs will be provided by the Mayo Clinic Office of Women's Health with expenses off set by a modest fee for the DVD set. Preliminary discussions with Mayo Clinic Solutions, the for-profit arm of Mayo Foundation, are also in process to add the DVDs to its product catalog.

Another approach to reach Somali women in a clinical setting is through modification of the CenteringPregnancy® program, a prenatal education and support program. The Centering Healthcare Institute currently recognizes Mayo Clinic as an approved site obtained through staff training and site inspections. Because CenteringPregnancy® employs a group support format; it has inherent factors that would facilitate implementation for both health care facilities and Somali women. Providing targeted information specific to one group of women with unique risk factors requiring an interpreter would be advantageous from an organizational standpoint. Somalis have an oral culture and therefore prefer discussion over didactic presentation. The low literacy rate also makes a discussion format more desirable than a program laden with written information. Group classes also facilitate transportation issues as women can pool resources to reach the class location and gain support from other Somali women.

The CenteringPregnancy® Program has three core components:

**Assessment:** Women enter a group after their initial prenatal evaluation. Standard prenatal assessments are completed within the group setting at each session. Unless a woman develops medical problems, she does not need to enter a clinical exam room until 38 to 40 weeks gestation. Women participate actively by monitoring their own weight and blood

pressure and record those values on their chart. Each woman has individual time with an obstetrical provider to discuss concerns and evaluate the health status of her baby.

Education: A general curriculum is provided as part of the program with handouts, worksheets, and suggested visual aids. The existing English materials will be evaluated and modified for Somali patients. Topic areas include nutrition, exercise/relaxation, childbirth preparation, pregnancy problems, infant care and feeding, postpartum issues, communication and self-esteem, comfort measures, sexuality, abuse issues, and parenting. Again, the education process occurs through a discussion format congruent with Somali oral culture and traditional learning styles<sup>120</sup>.

Support: CenteringPregnancy® begins early in pregnancy and continues through the early postpartum period. This format provides a stable group structure for building trust among the members. Women become invested in one another leading to increased support and decreased feelings of isolation. Time for refreshments and socialization during the sessions helps to promote cohesion. Group interactions can promote and preserve the cultural strengths within the Somali community and serve to educate providers on cultural traditions and preferences. Providers facilitating the classes are expected to learn more about Somali culture and preferences while Somali women will benefit from increased expression and understanding of their unique needs.

Financial resources to implement the program will be provided through grant funding. The Minnesota March of Dimes has annual community grant funds available in the amount of \$25,000 to fund programs aimed at reducing preterm birth. Staff members from the Mayo Clinic Office of Women's Health and Department of Obstetrics are currently meeting to adapt the CenteringPregnancy® program for implementation at Mayo Clinic. The

submission deadline for grant proposals is September 1, 2008 with program implementation slated to begin in January 2009. The proposed model (see Appendix F) was developed by an RMH midwife and will form the basis of the grant proposal and program.

Informal discussions with obstetrics department administration, leadership and staff indicate a great deal of support for the CenteringPregnancy® approach. The program is seen as a culturally appropriate approach to providing prenatal care and education to Somali women. Program implementation has the potential to result in increased patient satisfaction, improved birth outcomes, fewer visits to the Patient Receiving Unit (PRU) and reduced clinical care costs.

#### *Assuring Culturally Competent Care*

The Mayo Clinic Diversity Oversight Committee (DOC) was created in October 2007 to assure system-wide coordination of existing diversity policies effecting patient care, education and research. Current Mayo Clinic cultural competency policies and programs are under review. The Clinical Practice Committee (CPC) is in the process of determining how best to assure cultural competency of all staff interacting with patients. The Department of Obstetrics and Gynecology will have substantial impact on how the results from this study are incorporated into CPC policy.

The interventions outlined above, while designed to educate Somali women, will also assist in educating providers on culturally competent care for Somalis. Investigating, discussing and tailoring interventions based on Somali risk factors and preferences will improve the cultural understanding of providers involved in the implementation of these programs. This method of real-time discovery promises to be as effective (or more so) as a didactic classroom session on culturally competent care for Somalis.

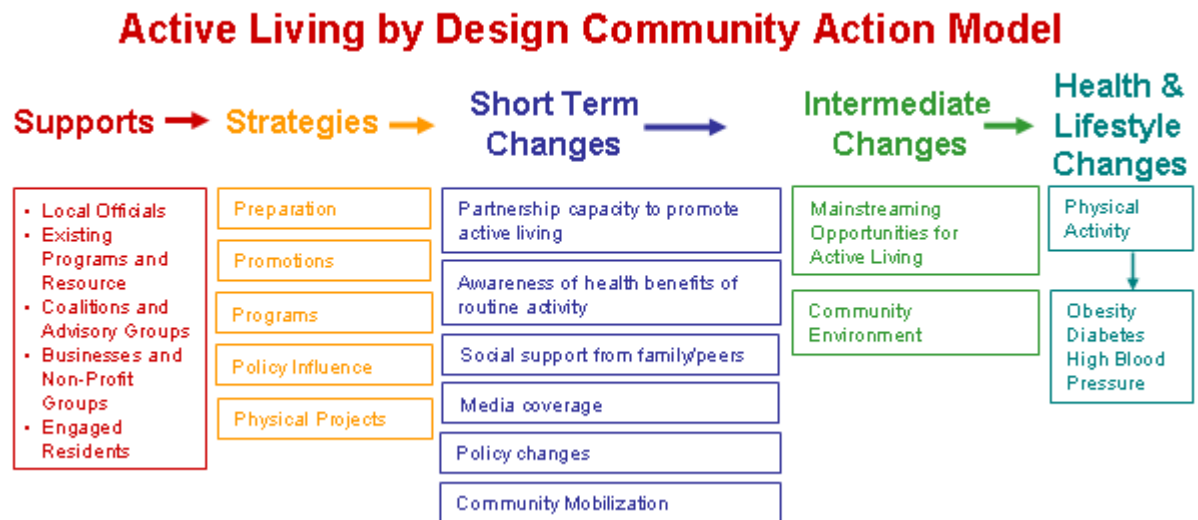
## Leadership Implications

A transformational leadership approach is the most applicable in a situation where different communities share a common issue. This approach is the most reasonable leadership style where no single person or organization has power or control over a situation and cannot dictate finite consequences related to behavior change. Transformational leadership appeals to “the moral values of followers in an attempt to raise their consciousness about ethical issues and to mobilize their energy and resources to reform institutions”<sup>122</sup>. The key behaviors for transformational leadership to be successful are communication, trust, caring and creating opportunities<sup>121</sup>. The overall leadership strategy to engage invested organizations, however, will emphasize a community-based participatory approach<sup>123</sup>. Research results are often not shared with communities-at-risk, particularly when underserved communities are involved. Therefore, study results will be shared with the Somali community leaders and members through individual and town hall meetings and Somali TV.

Communication between the author and Somali community members has been ongoing throughout this research study. The increase in both gestational diabetes and BMI and discussions with Somali women and leaders in the Somali community indicate both a need and desire for women to learn behaviors in order to achieve and maintain a healthy weight. Somali Community Resettlement Services has approached Mayo Clinic with an interest in partnering to apply for grant funding intended to impact the built environment. Prevention Minnesota, an arm of Blue Cross and Blue Shield of Minnesota Foundation, recently issued a request for proposals (RFP) titled “Physical Activity Promotion: Active Living Minnesota.” The Active Living Minnesota funding program (RFP #599) will support interdisciplinary

partnerships to plan for and implement a comprehensive approach to encourage active living among community residents, with a focus on environmental and policy change.

Figure 10.  
Active Living by Design community action model



The Prevention Minnesota RFP requires implementation of the “Active Living by Design Community Action Model”. Active Living by Design ([www.activelivingbydesign.org](http://www.activelivingbydesign.org)) is a national program of the Robert Wood Johnson Foundation and is administered by the UNC School of Public Health. The model (see Figure 10) depicts how active living can be incorporated into a community and should ultimately result in increased physical activity. The model employs strategies to achieve short, middle and long term changes and uses a logic model concept to map the process of community change. The logic model also provides a useful tool to evaluate the project from initiation to conclusion.

This active living model appears to be a culturally appropriate method of improving physical activity for Somalis as activity is incorporated into daily routines rather than requiring use of a recreational facility. The goal is to accumulate at least 30 minutes of

activity each day. Specific strategies and program requirements for the grant application are provided in Appendix G.

An application to provide \$75,000 for the planning stage of this program will be submitted on March 15, 2008 by Somali Community Resettlement Services, Inc. Mayo Clinic will serve as the medical partner and the City of Rochester Planning Department will be approached to serve as the required government partner. Grant funding is phased over a five year period to provide a) planning (up to 12 months at \$75,000), b) early implementation (time period negotiable with \$125,000 available), and c) advanced implementation (time period negotiable with \$125,000 available).

Study results will be submitted for publication to inform health care practitioners and policy makers on the increase in preterm birth with time and the increase in factors reflecting acculturation. The Minnesota Department of Health and its Refugee Health subcommittee, as well as the Minnesota Department of Human Services will be given results that should be considered when updating risk profiles or restructuring funding to better serve this population.

### Evaluation Plan

Each of the three interventions will include an individual evaluation plan. The Somali prenatal care DVDs are currently being pilot tested in a clinical setting. The Mayo Clinic Institutional Review Board has approved a process evaluation (Appendix H) that includes surveys for both patients and providers (Appendices I and J). The aims of the evaluation are to a) determine the cultural and clinical acceptability to Somali patients of six prenatal educational videos developed specifically for pregnant Somali women, and b) determine to what extent the Somali prenatal education videos facilitate patient-provider



communication in clinical encounters immediately following program viewing as evaluated by obstetrics providers.

Results of the process evaluation will determine whether patient-provider communication is enhanced following program viewing as well as next steps. Preliminary results of the project have been submitted to the American Public Health Association for presentation at the October 2008 annual meeting (see Appendix K).

The CenteringPregnancy® program includes an evaluation component that will be modified for Somali women. Short-range outcomes include satisfaction with the program for normal risk women and regular participation in program meetings. Long-range goals are to reduce the incidence of gestational diabetes, increase the adequacy of prenatal care utilization, and assure birth outcomes within normal ranges: infant gestational age between 37 and 42 weeks and birthweight between 2,500 and 4,000 grams.

The evaluation of the Prevention Minnesota grant requires implementation of the Active Living by Design model and includes a logic model evaluation to be designed during the planning portion of the program. Prevention Minnesota employs an external evaluation firm that works with grantees to assure adequate tracking of activities, short- and long-term outcomes.

## CHAPTER VI

### DISCUSSION

#### The Effect of the Proposed Implementation Plan on the Public's Health

Assuring standardized data collection as part of the obstetrics intake procedure will require increased communication with the nursing staff regarding comprehensive form completion. Following the information and training session scheduled with obstetrics nursing staff on May 29, periodic chart reviews will be conducted to determine adherence to medical history and cultural assessment intake.

Both the Somali Prenatal Education DVD project and adapting the CenteringPregnancy® program for Somali women follow guidelines outlined to provide culturally-competent care<sup>25, 124, 125</sup>. Mayo Clinic Obstetrics and Patient Education departments are aware and supportive of the DVD project. These endorsements are critical to assure the long term viability of the programs. Initial evaluation results indicate a high level of acceptability of both the DVD format and program content (see Appendix K). The key drawback of showing the programs in a clinical setting has been the high parity of Somali women. Women with several children comment that the information would be most helpful for women in their first pregnancy, or experiencing their first pregnancy in the United States. The potential for dissemination of the DVDs outside the Rochester, Minnesota area is very high as other Minnesota organizations and refugee health groups in Atlanta, Georgia and Rochester, New York have requested copies upon their completion. Women in the local Somali community have commented that

the programs, particularly the nutrition and exercise segment, should be viewed by “all Somalis all over the world” (Hibu Nur, personal communication, September 18, 2007).

The CenteringPregnancy® model for Somali women has an excellent chance of receiving funding through the Minnesota Chapter of the March of Dimes. A nurse midwife in the obstetrics department has drafted initial modifications to the program (see Appendix D). Should funding be secured, focus groups of Somali women will review current materials and assist in their modification. The curriculum will then be piloted and adjusted, as necessary, to assure that it is appropriate and effective for Somali women. An additional favorable analysis of the cost of providing prenatal care using this model along with improved patient satisfaction and healthy infants should provide a solid basis of evidence to merit the use of continuing the CenteringPregnancy® model. If the program does not receive funding from the March of Dimes, alternate sources of external funding will be pursued to implement the program. Should the program prove successful in Rochester, Minnesota, its dissemination to other health care institutions and clinics is highly likely as the model promises a cost effective and culturally congruent method of care.

The Prevention Minnesota “Healthy Living by Design” grant is highly competitive and requires a high level of coordination between key community partners. While Somali Community Resettlement Services, Inc. (SCRS) has an ongoing partnership with several Mayo Clinic departments, it currently has no relationship with the Rochester City Planning Department. A strong relationship will be required with the City of Rochester because environmental design changes are required to reach the long-range goals of the program. Therefore, it is imperative that SCRS begin discussions with the City in order to receive planning grant funding. The success of the planning phase will determine whether SCRS

will be awarded funding for the second and third levels of program implementation. The long-range program goals are lifestyle changes that will improve health outcomes.

The main barrier to the success of receiving grant funding is the lack of power held by the Somali community. Building a case to change the built environment in publically owned and federally subsidized housing areas will be difficult given the high level of negative media coverage around immigrants in the U.S. The arguments for these changes will center on the detrimental changes that the environment has caused in Somalis' lives. The change from an active life in Somalia to a sedentary life in the United States is demonstrative of a cultural transition with adverse consequence. Somalis are experiencing a dramatic increase in diabetes and heart disease along with the changes attributed to the acculturation-related factors in this study. The long term societal costs to provide health care for chronic disease care will most likely outweigh the costs of providing sidewalks and other environmental changes in neighborhoods where Somalis reside.

Receiving the grant award will enable healthcare providers to assist acculturated Somalis with the management of the resulting health outcomes of their newly adapted lifestyles. Key opportunities exist to engage Somalis in improving the health of their community. Current relationships between Mayo Clinic and SCRS are positive, providing appropriate staging for the two groups to work together for a common purpose. Assuring maternal and child health is critical to the long term health of the community.

In summary, external funding will provide the impetus for program implementation to improve health outcomes among Somalis in Rochester, Minnesota. Assuming that the two obstetrics interventions show positive outcomes, Mayo Clinic will integrate the programs in to existing operations.

## APPENDIX A

### KOTELCHUCK INDEX

The Kotelchuck Index, also called the Adequacy of Prenatal Care Utilization (APNCU) Index, uses two sources of data obtained from the patient record: *initiation* of prenatal care and the number of prenatal visits between initiation of prenatal care until delivery (*received services*)<sup>126</sup>. The Kotelchuck index classifies the adequacy of initiation as follows: pregnancy months 1 and 2, months 3 and 4, months 5 and 6, and months 7 to 9, with the underlying assumption that the earlier prenatal care begins the better. To classify the adequacy of received services, the number of prenatal visits is compared to the expected number of visits for the period between when care began and the delivery date. The expected number of visits is based on the American College of Obstetricians and Gynecologists prenatal care standards for uncomplicated pregnancies and is adjusted for the gestational age when care began and for the gestational age at delivery. A ratio of observed to expected visits is calculated and grouped into four categories-Inadequate (received less than 50% of expected visits), Intermediate (50%-79%), Adequate (80%-109%), and Adequate Plus (110% or more). The final Kotelchuck index measure combines these two dimensions into a single summary score. The profiles define adequate prenatal care as a score of 80% or greater on the Kotelchuck Index, or the sum of the Adequate and Adequate Plus categories.

The Kotelchuck Index does not measure the quality of prenatal care. It also depends on the accuracy of the patient or health care provider's recall of the timing of the first visit and the number of subsequent visits. The Kotelchuck Index uses recommendations for low-risk pregnancies, and may not measure the adequacy of care for high-risk women. The

Kotelchuck Index is preferable to other indices because it includes a category for women who receive more than the recommended amount of care (adequate plus, or intensive utilization).

**TABLE 6—Outline of the Adequacy of Prenatal Care Utilization Index**

- I. Month prenatal care began (Adequacy of Initiation of Prenatal Care)
  - Adequate Plus: 1st or 2nd month
  - Adequate: 3rd or 4th month
  - Intermediate: 5th or 6th month
  - Inadequate: 7th month or later, or no prenatal care
- II. Proportion of the number of visits recommended by the American College of Obstetricians and Gynecologists received from the time prenatal care began until delivery (Adequacy of Received Services)
  - Adequate Plus:  $\geq 110\%$
  - Adequate: 80–109%
  - Intermediate: 50–79%
  - Inadequate:  $< 50\%$
- III. Summary Adequacy of Prenatal Care Utilization Index
  - Adequate Plus: Prenatal care begun by the 4th month and 110% or more of recommended visits received
  - Adequate: Prenatal care begun by the 4th month and 80%–109% of recommended visits received
  - Intermediate: Prenatal care begun by the 4th month and 50%–79% of recommended visits received
  - Inadequate: Prenatal care begun after the 4th month or less than 50% of recommended visits received

Table from Kotelchuck, M. An evaluation of the Kessner adequacy of the prenatal care index and a proposed adequacy of prenatal care utilization index. *American Journal of Public Health*, 1994; 84 (9) 1414-1420.

## APPENDIX B

### SELECTED STATISTICS

Table B1.

Somali women delivering infants at RMH between 1999-1999: Bivariate analysis compared to preterm birth (< 37 weeks = 0, ≥ 37 weeks = 1)

Variable	X <sup>2</sup>	p value	Unit OR	95% CI
Patient age	2.46	.1166	.89	.76, 1.03
Age at Immigration	3.44	.0635	.88	.77, 1.00
Yrs in US	2.18	.1397	1.58	.94, 3.21
Proportion life in US	2.37	.1239	.98	.49, 1.68
Gravidity	0.05	.8326	.96	.71, 1.42
Parity	.0006	.9801	.99	.71, 1.55
Weight gain	.31	.5762	.98	.92, 1.05
BMI	.65	.4192	1.09	.90, 1.38
Hemoglobin	1.29	.2564	1.41	.74, 2.50
Nulliparous (n<5)	.21	.6463	1.40	.20, 8.05
BMI				
<18.5 (n<5)	.00	1.0	1.0	**
18.5-25 (n<5)	.00	.9461	.00	**
> 25-30 (n<5)	.00	.9471	3.98	**
> 30 (referent)	---	---	---	---
GDM (n<5)	3.33	.0682	.09	.007, 2.14
Substance (n=0)	.01	.9361	**	**
Interpreter (n<5)	.64	.4244	1.93	.34, 10.82
APNCU				
1= adeq + (n<5)	4.01	.0453*	9.71	1.42, 193.87
2= adeq (n<5)	.00	.9496	**	**
3= interm (n<5)	.01	.9422	**	**
4= inadeq (referent)	---	---	**	--
Anemia (n<5)	.35	.5537	.59	.11, 4.41

\*p value is statistically significant at the .05 level

\*\*inadequate number of cells for analysis

Table B2.

Somali women delivering infants at RMH between 1993-1999: Bivariate analysis compared to low birthweight (< 2,500 gms = 0, ≥ 2,500 gms = 1)

Variable	X <sup>2</sup>	p value	Unit OR	95% CI
Patient age	.002	.9655	1.03	.84, 1.21
Age at Immigration	.07	.7917	.97	.84, 1.15
Yrs in US	.93	.3385	1.38	.80, 3.06
Proportion life in US	.51	.4745	285.6	.002, 5.39e+10
Gravidity	2.28	.1309	2.59	1.07, 14.55
Parity	2.4	.1216	4.55	1.23, 79.51
Weight gain	0.34	.5617	.97	
BMI	3.05	.0809	1.33	1.005, 1.95
Hemoglobin	4.23	.0398*	2.02	1.01, 4.08
Nulliparous (n<5)	1.48	.2244	1.86	.633, 5.4
BMI				
<18.5 (n<5)	.01	.9415	**	**
18.5-25 (n<5)	.01	.9499	**	**
> 25-30 (n<5)	.00	.9508	**	**
> 30 (referent)	---	---		**
GDM (n<5)	.00	.9665	**	**
Substance (n<5)	**	----	**	**
Interpreter	2.32	.1279	5.93	.73, 121.79
APNCU				
1= adeq + (n<5)	1.92	.1654	5.2	.62, 109.48
2= adeq (n<5)	**	**	**	**
3= interm (n<5)	**	**	**	**
4= inadeq (referent)	---	---	---	---
Anemic (n<5)	1.48	.2244	1.86	.63, 5.47

\*p value is statistically significant at the .05 level

\*\*inadequate number of cells for analysis



Table B3.

Somali women delivering infants at RMH between 2000-2006: Bivariate analysis compared to preterm birth (< 37 weeks = 0,  $\geq$  37 weeks = 1)

Variable	X <sup>2</sup>	p value	Unit OR	95% CI
Patient age	2.15	.1425	1.04	.99, 1.11
Age at Immigration	3.54	.0598	1.06	.99, 1.12
Yrs in the US	.94	.3320	.94	.85, 1.06
Proportion life in US	2.09	.1479	.12	.007, 2.29
Gravidity	2.19	.1391	1.11	.97, 1.29
Parity	5.22	.0244	1.23	1.04, 1.48
Hemoglobin	0.05	.8213	.97	.74, 1.26
Weight gain	12.20	.0005*	1.06	1.03, 1.10
BMI	.59	.4358	1.02	.96, 1.10
Nulliparous	2.48	.1151	1.74	.84, 3.41
BMI				
<18.5 (n<5)	.26	.6080	.65	.15, 4.54
$\geq$ 18.5-25	.11	.7412	.86	.33, 2.11
> 25-30	.01	.9179	15.90	5.79, 51.42
> 30 (referent)				
GDM	6.11	.0134*	.32	.13, .87
Substance use	.01	.9361	---	---
Interpreter	3.14	.0764	1.83	.95, 3.64
APNCU				
1= adeq +	7.71	.0055*	3.66	1.49, 9.49
2= adeq	18.23	<.0001*	8.24	3.24, 23.02
3= interm	25.61	<.0001*	15.90	5.79, 51.42
4= inadeq (referent)	---	---	---	---
Anemia	0.68	.4444	.71	.32, 1.72

\*p value is statistically significant at the .05 level

\*\*inadequate number of cells for analysis

Table B4.

Somali women delivering infants at RMH between 2000-2006: Bivariate analysis compared to low birthweight (< 2,500 gms = 0, ≥ 2,500 gms = 1)

Variable	X <sup>2</sup>	p value	Unit OR	95% CI
Patient age	.33	.5652	.98	.93, 1.04
Age at Immigration	.04	.8488	.99	.93, 1.06
Yrs in the US	.07	.7864	.98	.89, 1.12
Proportion life in US	.01	.0954	1.23	.04, 47.12
Gravidity	.0003	.9862	.99	.87, 1.16
Parity	0.88	.3334	1.08	.92, 1.32
Hemoglobin	.15	.6955	.93	.68, 1.28
Weight gain	13.87	<.0001*	1.08	1.03, 1.13
BMI	1.31	.2517	1.05	.97, 1.14
Nulliparous	.03	.8706	.96	.51, 1.57
BMI				
<18.5 (n<5)	3.06	.804	.26	.06, 1.36
≥18.5-25	.25	.6148	.76	.25, 2.18
> 25-30 (n<5)	.28	.5947	1.42	.39, 5.68
> 30 (referent)	---	---	---	---
GDM	7.41	.0065*	2.15	1.21, 3.73
Substance use	1.06	.3030	.61	.25, 1.72
Interpreter	1.75	.1863	1.68	.78, 3.78
APNCU				
1= adeq +	.24	.6262	1.27	**
2= adeq (n<5)	**	**	**	**
3= interm (n<5)	8.44	.0037	8.9	**
4= inadeq	---	---	---	---
Anemia	0.03	.8706		

\*p value is statistically significant at the .05 level

\*\*inadequate number of cells for analysis

## MAYO CLINIC OBSTETRICS WORK-UP

[illegible]

# PAST MEDICAL HISTORY - CONTINUED

## Surgical Procedure

Anesthesia Complications: ☐ Yes ☐ No

## Exercise

## Pertinent Family History

## Other Past Medical History

## Genetic Screening

☐ Genetic Screening Completed

### At Risk

Includes Patient, Baby's Father or Anyone in Either Family With:

- ☐ Yes ☐ No Patient's age >= 35 years  
☐ Yes ☐ No Father of baby's age >= 55 years  
☐ Yes ☐ No Thalassemia MCV < 88  
☐ Yes ☐ No Neural tube defect (Meningocele, Spina Bifida, or Anencephaly)  
☐ Yes ☐ No Down Syndrome (1st deg. relative)  
☐ Yes ☐ No Sickle Cell Disease or Trait  
☐ Yes ☐ No Hemophilia  
☐ Yes ☐ No Muscle Dysrophy  
☐ Yes ☐ No Cystic Fibrosis (Screening Recommended)  
☐ Yes ☐ No Huntington Chorea  
☐ Yes ☐ No Consanguinity (Parents are first cousins or closer)  
☐ Yes ☐ No Tay-Sachs disease  
☐ Yes ☐ No Carcinoma disease  
☐ Yes ☐ No Mental Retardation If Yes, Fragile X: ☐ Positive ☐ Negative ☐ U  
☐ Yes ☐ No Patient or baby's father had a child with birth defects not listed above  
☐ Yes ☐ No > Two 1st trimester spontaneous abortions, or a stillbirth  
☐ Yes ☐ No History of multiples  
☐ Yes ☐ No Other inherited genetic or chromosomal disorder

Other Genetic History / Counseling / Ethnic Risk Group(s):

# INITIAL EXAM

Areas marked with an asterisk are required fields for a comprehensive exam. ☐ Comprehensive elements, heart, lungs examined

Height: \_\_\_\_\_ cm \_\_\_\_\_ inches Baseline weight: \_\_\_\_\_ kg \_\_\_\_\_ lbs. Current weight: \_\_\_\_\_ kg \_\_\_\_\_ lbs. Baseline BMI: \_\_\_\_\_

Comments:

- General Appearance: ☐ Normal ☐ Other  
 Skin: ☐ Normal ☐ Other  
 HEENT: ☐ Normal ☐ Other  
 Lymph Nodes: ☐ Normal ☐ Other  
 Thyroid: ☐ Normal ☐ Other  
 \*Breasts: ☐ Normal ☐ Other  
 \*Pulses: ☐ Normal ☐ Other  
 Heart: ☐ Normal ☐ Other  
 Lungs: ☐ Normal ☐ Other  
 \*Abdomen, Liver, Spleen: ☐ Normal ☐ Other  
 \*Hernia (Femoral, inguinal): ☐ Absent ☐ Present  
 Bladder: ☐ Normal ☐ Other  
 Urinary: ☐ Normal ☐ Other  
 Pelvic/rectal: ☐ Normal ☐ Other  
 \*Adrenal: ☐ Normal ☐ Other  
 \*Genia: ☐ Normal ☐ Other  
 \*Vagina: ☐ Normal ☐ Other  
 \*Vaginal Infection Screen: ☐ Negative ☐ Positive  
 \*Vulva: ☐ Normal ☐ Other  
 \*Rectum, Anus, Perineum: ☐ Normal ☐ Other  
 Extremities: ☐ Normal ☐ Other  
 Mental Status (Mood, Orientation): ☐ Normal ☐ Other  
 Other: ☐ Normal ☐ Other  
 \*Uterus Size: \_\_\_\_\_ weeks ☐ Other

# SAFETY

Physically, emotionally, or sexually abused:

Desire for resource information:

Health/ illness Beliefs/practices:

Other concerns:

Comments:

# NUTRITION

Does patient meet any of the following inclusion criteria for dietary consult?

<p><b>Obstetrics Work-up</b> Obstetrics</p> <p>Provider: _____ Page: _____</p>	<p>NOTES - Specialty</p> <div style="border: 1px solid black; padding: 2px; text-align: center;"> <b>BACKUP PLAN</b>              Discard after electronic entry.           </div>
<b>PAIN</b>	
<p> <input type="radio"/> No    <input type="radio"/> Yes    Location: _____    Expression of pain: _____    Frequency: _____              Intensity / other: _____    Duration: _____    Desired goal: _____              Pain management options / comments: _____  <div style="border: 1px solid black; height: 20px; width: 100%;"></div> </p>	
<b>CURRENT MEDICATIONS</b>	
<b>NURSING DOCUMENTATION</b>	
<b>ALLERGIES</b>	
<b>IMPRESSION/REPORT/PLAN</b>	
<b>CONTRIBUTING AUTHORS</b>	

BACKUP

## APPENDIX D

### MAYO CLINIC CULTURAL ASSESSMENT

BACK HOME LIST PREV NEXT INFO PAGE PAGE PAGE PAGE ENTER LOGOFF HELP HELP

Patient Info Documents Viewers/Labs Allergies/Immuniz Orders/Meds Problem List/Bill Worklists Flowsheets Mgmt Fu

**Name:**  
**MRN:** 3 303 927
 **Sex:** M
 **DOB:** 24May1993 Mon
 **Room Bed:** ZMIC100B
 **User Number:** MRB0681
 **Age:** 13

**Flowsheet Charting:** NURSE HOSP NOTES/BASELINE
 Check box, click OK to show data for this F/S only ☐ OK

<< Nurse Hosp Notes/DC Functional Status Baseline Screen AdmissionAssessm... AdmAssessment(co...

Baseline Screening	19Jan2007 08:05	18Jan2007 16:15	12Jan2007 09:05	12Jan2007 08:37	8-Jan2007 16:05	8-Jan2007 16:04	3-Jan2007 16:02	3-Jan2007 16:02
Summary Note	other fiw	other fiw			other fiw	other fiw	other fiw	other
RN Review								Nc
-Tobacco Use Past Yr								
-Secondhand Smoke Exp								
-ETOH Use Past 5 Days								
-Substance Abuse								
-Cultural Practices								
-Family's RoleInCare								
-Language								
-Mayo Interpreter								
-Cultural Practice								
-Food Preference								
-Expression of Pain								
-AdvanceDirective								
-Verify Pt Receipt								
-Advance Directive								
-Document Location								
-Pt Discussed w/MD								
-MD Notification								
-ResusPolicyDiscussed								
-Nutrition (S)								
-Unplan Wt Loss>10lbs								
-Poor PO >5 Days								
-DifficultySwallowing								

Add Column Update Change Time Display Details Change Display <= Column Older Column New

Support Team Use Nsg Order Entry PtProvMedList Print FS Charted FS Cancel

22Jan07 ZMIC100B MRB0681 FLWCHT-S W252437

File Patient Session Navigate Help

BACK HOME LIST PREV NEXT INFO PAGE PAGE PAGE PAGE ENTER LOGOFF HELP HELP

Patient Info Documents Add/Update with Note Flowsheets Mgmt Functions

**Name:**  
**MRN:** 3 303 927
 **Sex:** M
 **DOB:** 24May1993 Mon
 **Room Bed:** ZMIC100B
 **User Number:** MRB0681
 **Age:** 13

**Flowsheet Charting:** NURSE HOSP NOTES/BASELINE
 Check box, click OK to show data for this F/S only ☐ OK

<< Nurse Hosp Notes/DC Functional Status Baseline Screen AdmissionAssessm... AdmAssessment(co...

Baseline Screening	19Jan2007 08:05	18Jan2007 16:15	12Jan2007 09:05	12Jan2007 08:37	8-Jan2007 16:05	8-Jan2007 16:04	3-Jan2007 16:02	3-Jan2007 16:02
Summary Note	other fiw	other fiw			other fiw	other fiw	other fiw	other
RN Review								Nc
-Tobacco Use Past Yr								
-Secondhand Smoke Exp								
-ETOH Use Past 5 Days								
-Substance Abuse								
-Cultural Practices								
-Family's RoleInCare								
-Language								
-Mayo Interpreter								
-Cultural Practice								
-Food Preference								
-Expression of Pain								
-AdvanceDirective								
-Verify Pt Receipt								
-Advance Directive								
-Document Location								
-Pt Discussed w/MD								
-MD Notification								
-ResusPolicyDiscussed								
-Nutrition (S)								
-Unplan Wt Loss>10lbs								
-Poor PO >5 Days								
-DifficultySwallowing								
-Receiving TF/CPN/PPN								

Add Column Update Change Time Display Details Change Display <= Column Older Column New

Support Team Use Nsg Order Entry PtProvMedList Print FS Charted FS Cancel

22Jan07 ZMIC100B MRB0681 FLWCHT-S W252437

Add/Update with Note

Family's RoleInCare Modifier:  

Result: Note Date/Time: 22Jan2007 08:56

Enter Note Editor To Save: Press F12; click [Update] To Exit without saving: Press ESC then [Close]

**Role of persons involved in your hospital care.**  
**How are decisions made in your family?**

File Edit Format

Pt is new to country. Has husband and 3 young children. Include husband in decision-making and planning care. Will need to work around his work schedule.

Provider: ROSLIEN, JENNIFER

Update Skip Row Delete Close

22Jan07 ZMIC100B MRB0681 FLWCHT-S W252437

## **Language Assessment Questions**

What language do you speak? Is there a specific dialect?

### **Rationale**

It is important that there is effective communication in order to provide culturally congruent care. If the patient is not able to speak English, it is essential to determine the language/dialect spoken and to utilize a medical interpreter. Assess the patient's literacy skills before using written teaching materials.

### **Example**

If the patient is unable to understand English, try stating languages that may be appropriate for the patient's ethnic background. For example, if the patient is Asian, say the words: "Vietnamese, Laotian, Cambodian, Mandarin." Often they can recognize their language when it is stated.

Another option is to access, the Transcultural Resources For Communicating with Non-English Speaking Patients/Family from the Homepage of the Department of Nursing web site. Print a copy and take it to the patient's room. Point to the various languages, and the patient may be able to recognize his/her language. If unable to determine the language/dialect spoken, contact the interpreters. They can also assist in problem solving.

## **Family/Social Structure, Role of Family Members Assessment Questions**

Describe the members of your family who will be involved in your care.  
Who is the most important person to help with your care?

### **Rationale**

The definition of family can vary across cultures. It is important to assess whether the patient defines family (mother, father, siblings) or as an extended family (parents, siblings, aunts, uncles, grandparents, cousins, etc.)

### **Example**

Mrs. Whitehorse, a Native American, was on a post-operative care unit. She frequently had multiple visitors, and someone was in attendance with her at all times. Through assessment, the nurse was able to determine that the patient's family not only included her nuclear family, but aunts, uncles, cousins and individuals that were not blood relatives. It is important to accommodate visitation by all family members, but in a way that is respectful of other patients on the unit as well.

## **Decision Maker in the Family Assessment Questions**

How are decisions made in the family? Are there certain members of your family that we need to involve directly in your care, particularly as we make decisions about treatment of your illness? How will you be involved?

#### Rationale

Many cultures are collective (group) rather than individual oriented. The responsibility for making decisions regarding the patient's treatment may be made by family members or someone in the community. It is important that we assess who makes decisions and include them in the decision making process.

#### Example

Mrs. Lee from the Hmong community recently had surgery for a malignancy. The physicians were making rounds and began discussing treatment options. The patient asked that they speak to Mr. Xiong who is the clan leader. She indicated that he would be the one to make the decision in consultation with her and other members of the community.

### **Health and Illness Beliefs, Practices/Perception of the Cause of Illness Assessment Questions**

Tell me what you think caused your illness?

Why do you think your illness started when it did?

What meaning does this illness have for you? For your family?

#### Rationale

Not all cultures accept the germ theory of Western medicine. Other causes of illness can include a loss of balance of body (hot/cold), bad wind, breach of taboo, soul loss, and spirit possession, etc. Often when illness occurs, the reason for the disease is attributed to a specific cause or incident. Assessing the patient's belief about the cause of illness and disease will help health care workers provide culturally congruent care.

#### Example

A Mexican-American male was referred to medical services when he complained about symptoms of a possible heart attack. No cardiac abnormalities were discovered, but the patient continued to complain of pain in his chest and appeared extremely frightened. He was shaking violently and had a look of terror on his face. He asked the nurse to contact his family because he believed he was dying. The nurse asked the patient if he believed in God, and when he indicated yes, she gave him a Bible, which the patient placed over his heart. In a short time he was calm and was able to tell the nurse how a brufa (witch) had put a spell on him and that this would cause him to die from a heart attack.

### **Cultural/Spiritual Healers Assessment Questions**

Have you sought assistance from individuals in your community to help you with your illness?

How can I include them in your healing and care now?

#### Rationale

Individuals in many cultures have various spiritual leaders and healers that are sought out at the time of illness. This is related to the fact that many individuals believe that illness is brought about by an imbalance between the spiritual and physical world. It is important to understand the roles that the healer plays in their healthcare and discuss with the patient how



we can include them in their care.

#### **Example**

An elderly Cherokee Indian with symptoms of nausea and vomiting was brought to the ER by his grandson. Lab tests and x-rays showed that he had a bowel obstruction. It was determined that surgery was necessary. The patient refused the surgery and requested to see the medicine man. The medicine man was contacted and came to the hospital to perform a healing ceremony. After the ceremony, the patient was willing to have the surgery. Cultural healers include: Shaman, Cuandero/Cuandera, Herbalist, etc.

### **Expression of Pain Assessment Questions**

How would I know if you were having pain?

Can you tell me what you might say or do if you were having pain?

How would I know that you are feeling uncomfortable?

#### **Rationale**

Culture influences the meaning of pain and it helps to determine what is an acceptable way of expressing pain.

#### **Example**

Mrs. Tasha, an Arab woman, who was pregnant and in labor, would yell out with each contraction. Her labor lasted many hours. Even when her physician spoke to her in Arabic, they were unable to calm her. Although her behavior seemed excessive to some observers, it was consistent with her culture. Arab women are expected to express their pain.

### **Dietary Practices**

#### **Assessment Questions**

Are there foods that you feel are helpful to eat because of your illness?

Are there foods that you want to have while you are here at the hospital that will help you get well or help you heal?

#### **Rationale**

In some cultures, there are particular foods that are important at the time of illness. There may also be specific food laws associated with the patient's religion, e.g., Judaism and Islam.

#### **Example**

Mr. Friedman was an elderly Jewish patient on a medical unit. The nurses were challenged because he refused to eat many of the food items that were provided for him. In consulting with the patient, the staff learned that throughout his life and at the time of his illness, his wife provided him with chicken soup. In addition, he and his wife were concerned that the food being provided was not Kosher. After consulting with the dietary staff, arrangements were made to provide chicken soup for the patient at both the noon and evening meal. They were also reassured that the food being served was prepared according to Kosher laws.

## APPENDIX E

### SOMALI PRENATAL EDUCATION VIDEO SCRIPTS

#### A Somali Pregnancy in America: Two Cultures, One Vision

##### *Prenatal Care: Prevention and Preparation*

Scene	Video	Audio
1	<<Music & SB from videos>> Somali musicians playing (family celebration) along with pics from all the different segments. It ends with the title of the program in Somali and English on the screen	<Open> We hear Somali music playing from the open
2	Pan from item in the exam room to Zahra and translator are sitting in an exam room waiting for the doctor to come in.	<translator> It's good that you came today and I'm glad you called for a translator. Even if you know some English, some things are easier to understand in your first language. More and more Somali women are coming in for checkups before they give birth- which is important.
3		<Zahra> Well, it's different. Some of my friends said I didn't need to go in, but my sister encouraged me. She came in for check-ups while she was pregnant with her son and was glad she did.
4		<Translator> Many times there aren't any problems with the pregnancy or the baby. Overall, pregnancy is a normal process. But, even if you're healthy, there are things you can do to help you and the baby during pregnancy. At your prenatal check-ups you'll learn about those things. The health care providers you'll see are the experts and they do this all of the time- this is their job.  <Zahra> Some things are very different here than in

		Somalia. Sometimes I worry that they won't understand our customs and traditions.
5		<p>&lt;Translator&gt;</p> <p>It's normal if you're worried- most mothers are nervous- no matter where they are living. But, it's good you came in. Your doctor, midwife and other health care professionals will talk to you about how and why they do certain things in America.</p> <p>And, you can tell her about how we do things in our culture. That way you can decide on the birth plan for your baby.</p>
6	<p>Dr walks into the rm and greets the patient and translator</p> <p>Translator will translate into Somali at start, we will transition to hearing the translator over the voice of the doctor (for pace purposes)</p>	<p>&lt;Greet Each Other&gt;</p> <p>(translator translates all of this)</p> <p>&lt;Dr-english&gt;</p> <p>Hello to both of you. How are you doing?</p> <p>&lt;Zahra&gt;</p> <p>I'm good. This is my first baby, so I'm not sure what to expect.</p> <p>&lt;Dr-english&gt;</p> <p>I'm glad you came in. Today will give us a chance to talk and to answer your questions. Let's look at your information.</p> <p>(looks at computer)</p> <p>Let's see... The information from your previous appointments says you're about 13 weeks along-just entering your second trimester. And your due date is Oct 23.</p>
7		<p>&lt;Zahra&gt;</p> <p>October 23? Is that when I will have the baby?</p> <p>In our culture we do not determine when the baby is going to be born. That is determined by Allah. If I have the baby at this hospital, do I have to have a due date?</p>
8		<p>&lt;Dr-english&gt;</p> <p>That's a good question.</p> <p>The due date isn't the date that you will necessarily have the baby. I respect your</p>

		<p>beliefs and I'm glad you shared this with me. The due date is for our knowledge- for medical reasons- to help us keep track of how long you've been pregnant.</p> <p>From experience we know that most women are pregnant for 38 to 42 weeks.</p> <p>Due dates are helpful for healthcare providers so we can track the growth and development of the baby.</p> <p>The due date can help us make sure you and the baby are healthy.</p> <p>And, many women want to know about when their babies will be born, so they can prepare.</p>
9		<p>&lt;Zahra&gt;</p> <p>So I don't have to have my baby on my due date? I can still leave it up to Allah?</p>
10		<p>&lt;Dr- english&gt;</p> <p>Hopefully. However, sometimes we may discover a problem with you or your baby. If there's a problem, we can help the labor progress. But we only do this when there is a danger to you or the baby.</p>
11		<p>&lt;Zahra&gt;</p> <p>What kind of problems?</p>
12		<p>&lt;Dr&gt;</p> <p>There are a couple of conditions we watch for. There could be an infection. Or, your water may break, but your labor doesn't start by itself.</p> <p>We may find that your baby has stopped growing or you may have gestational, or pregnancy-related, diabetes.</p> <p>Additional reasons for inducing, or starting labor, are if your baby hasn't been born after 41 or 42 weeks. At that time the nourishing system between the mother and the baby starts to break down.</p> <p>If any of these things happen, we'll discuss your options with you so that you can make the best decision for you and your baby.</p>

		That's another reason to continue to come in for checkups. We can monitor your progress and the baby's. Sometimes there are things we can do to prevent problems. But you need to come in for prenatal checkups to know what those things are.
13		<Zahra> So, what kinds of things should I do so there aren't any problems?
14		<Dr> It's difficult to prevent all problems from happening, but there are several things you can do to help keep you and the baby healthy. You need to pay attention to your body. Sometimes women go into preterm labor. This is when a women goes into labor early, weeks before the baby is able to survive on its own. If you have any contractions, or have pain in your abdomen, pelvis, or back, make sure to come in to the hospital right away. Don't wait. Also, make sure to come in if it feels like the baby is pressing down or if you have diarrhea, menstrual-type cramps, or a watery discharge.
15		<Zahra> It sounds like a lot of things can go wrong.
16		<Dr> Some things can go wrong, but you can help avoid some problems or catch them before the effects get too serious. You've taken the first important step by coming in to get prenatal care. You should also make sure you're eating healthy, getting some exercise such as walks and managing any diseases you have. You should also take care of your teeth and limit your stress.  Today we'll examine you a little closer to see how you and your baby are doing. You'll even get to hear your baby's heart beat.

17		<p>&lt;Zahra&gt;  (smiles) I'm excited for that part.  Thank you. You've answered a lot of my questions. Everyone has different advice, so I never quite know what to believe.</p>
18		<p>&lt;Dr&gt;  That's our job. If you ever have questions, just ask me or any of the health care providers caring for you. Some things are different in America, but since you've come in to see us, we'll be able to talk about your pregnancy and answer your questions.  We want to maintain your customs and traditions as much as possible throughout your pregnancy and birth. Coming in to discuss these things now is a good first step.  (music comes in)</p>
19	Pan over to another item in the exam rm, or the mother's hand on her belly, or crossed hands, or faces or Zahra and translator.	
20	Title of the program appears over the last shot.	<Music full>
21	Dip to black	
22	March of Dimes Logo & wording: "Funded by a Community Grant from the March of Dimes." "This material is for information purposes only and does not constitute medical advice. The opinions expressed in this material are those of the author(s) and do not necessarily reflect the views of the March of Dimes."	
23	Mayo copyright	

## A Somali Pregnancy in America

### *Balancing Nutrition & Exercise during Pregnancy*

Scene	Audio	Video
1	<<Music & SB from videos>>	<Open> We hear Somali music playing along with soundbites from the various series. It ends with the title of the program in both Somali and English on the screen
2	Zahra (visibly pregnant) and husband are coming through the door (they've let themselves in). <u>(should they/would they be bringing something with? Food?)</u> Zahra's mother greets them near the kitchen, she is busy cooking. Sister greets them from the kitchen table where she is busy cutting up food. On table is food from all food categories- things for dinner.	<Zahra> Hello. We're here.  <greet each other>  <Husband> I'm going to head outside to see what your father is doing.  <Zahra> Ok. (turns to mother) What's for Dinner? I thought we were having goat (hilib ari).
3	Mother and Sister are busy preparing the meal- cutting up ingredients, such as vegetables and meat while talking.	<Mother> We're having chicken (suqar). Your sister insisted.  <Sister> (Smiling-lighthearted) I figured we should have something not fried in all of that butter. We needed something a little better for you and the little one on the way. My kids want a healthy cousin.
4	Zahra takes a knife and starts helping as well.	<Zahra> You sound like my doctor.  <Sister> So you went in to see her? Good!

		<p>&lt;Zahra&gt;  Yes, you convinced me. I really didn't think I needed to go. Since when do we go into the clinic when we're not sick?  But I decided to go in- it couldn't hurt anything.</p>
5	Continue cutting ingredients	<p>&lt;Sister&gt;  Well, I'm glad you went in- I'm glad <i>I convinced</i> you to go in.  I didn't go in with first baby and I wish I had. With my second child I made sure to visit the doctor as soon as I knew I was pregnant.  So, what did the doctor say?</p>
6	Continue cutting ingredients. Stop and talk every once in awhile.	<p>&lt;Zahra&gt;  Well, we went over some of the things I should be doing including what I should and shouldn't be eating...I remembered some of it from when you were pregnant.</p>
7		<p>&lt;Mother&gt;  When your sister was pregnant I was surprised at what they wanted her to eat! And everything that they said she should avoid!  When I was pregnant with you two, everyone always told me if you eat too much the baby could get too big so I ate less than usual.</p>
8		<p>&lt;Sister&gt;  Well, don't believe everything you hear from others. Eating the right amount of healthy foods doesn't make your baby grow too big.  I'm glad I listened to the doctor. I had a healthy baby and if I have another, be sure to pay special attention to the foods I eat as well.</p> <p>There are many women that don't eat healthy- all of that fat and oil. And eating too much sugar can increase your chance of diabetes. That can hurt both you and the baby.</p> <p>So, what did the doctor tell you about what you should and shouldn't eat?</p>
9		<p>&lt;Zahra&gt;  I know I need to eat a lot of healthy foods, such as fruits and vegetables, and avoid a lot of the fats and sugars. I</p>



		need to cut down on the fried foods, such as fried goat - which is tough since I seem to crave it all the time now!
10		<p>&lt;Sister&gt; But you can still have chicken and goat- just not fried in lots of oil, butter or other fats. In fact, every day you should have 3 servings of protein, such as meat or fish or eggs.</p> <p>&lt;Zahra&gt; That's where I get confused. How much is a serving?</p>
11	<p>Takes some of the meat (cooked) and places it in her hand, places 2 servings on the table</p> <p>Puts three servings out in front of her (2 meats, 1 egg)</p>	<p>&lt;Sister&gt; One serving of protein is about the size of your hand. Here- about this much (shows with actual food) So, three of those a day. You can also get protein from eggs- which I know you like. Eggs are easy – one egg is one serving.</p>
12	<p>Fills a cup full of carrots Puts a cup of carrots out in front of her, &amp; cup of spinach</p> <p>Puts 2 tomatoes out in front of her.</p> <p>Places a mango &amp; banana out next to the tomatoes.</p>	<p>&lt;Mother&gt; I remember all the vegetables you ate when you were pregnant.</p> <p>&lt;Sister&gt; Yes, you're supposed to eat 4 servings of vegetables and 3 servings of fruit everyday. In other words, you need to eat more of them than you do now. One serving is a cup, which is this much. (slides a pile of carrots into a serving size pile) I don't like a lot of the fruits and vegetables they have here in America, but I did find some I liked- potatoes, carrots, spinach, and of course tomatoes (holds up tomato), it even counts when it's in spaghetti sauce. And I also ate a lot of mangos, papayas, bananas, watermelon &amp; lettuce. You just have to find something you like.</p>
13	Puts out another mango.	<p>&lt;Zahra&gt; What about juice? Does that count as a fruit?</p> <p>&lt;Sister&gt; It does have fruit in it, but it's better to have whole fruit.</p>

		Juice often has sugar in it.
14	<p>Pours 1 glass of milk (1 c), dumps into a large glass.</p> <p>Places yogurt on the table.</p>	<p>&lt;Zahra&gt; But what about milk? Can I drink what I normally do?</p> <p>&lt;Sister&gt; It depends on what you're drinking now. Milk is good for you, because it gives you calcium. Calcium protects your bones and helps the baby develop strong bones and teeth. But, skim milk is best because the fat is taken out and the calcium remains. A serving of milk is 1 cup...so a large glass is already 2 servings. You should have at least 3 servings of dairy food every day. Dairy foods are anything made from milk products, such as a cup of yogurt or one ounce of cheese. (holds up cheese).</p> <p>I don't forget to drink water too- to stay hydrated. You should be drinking 8 glasses a day.</p>
15	<p>Puts out rice &amp; pasta on table</p> <p>Places a piece of bread on table.</p> <p>Pan of table with the food</p> <p>Fill up a plate with proper portions</p>	<p>&lt;Mother&gt; What about breads and pasta? Where do those fit in?</p> <p>&lt;Sister&gt; I knew you'd ask that. We seem to eat a lot of those. You need 9 servings of those. That sounds like a lot, but you might eat almost that much already. Portion sizes are smaller than you think- for example only 1/3 c of rice is a serving. If you're eating pasta for dinner or shurbad masheri for breakfast, a serving size is only 1/2 a cup. One serving is also one slice of bread.</p> <p>&lt;Zahra&gt; All of these portions seem a little confusing. How do I keep track?</p> <p>&lt;Sister&gt; Just remember, when you fill your plate, cover most of it with fruits, vegetables and whole grains. When you eat meat, don't fry it in lots of butter. And, drink plenty of low-fat milk.</p>
16		<p>&lt;Zahra&gt; And you're sure the baby won't get too big from eating?</p> <p>&lt;Sister&gt;</p>

		<p>No, your baby won't get too big from you eating. It's better for your baby if you eat the right foods and the right amount.</p> <p>&lt;Mother&gt; And don't forget to get some exercise- that keeps you and your baby healthy too. Try going for a walk every day, or even dancing! I know you can dance.</p> <p>&lt;Sister&gt; And stay away from a lot of fried foods, ok?</p> <p>&lt;Zahra&gt; I guess I have to- I want a healthy baby..</p>
17	<p>Start to take the servings that were set out and put them in the pot to cook.</p> <p>They each put in what they were cutting up.</p> <p>Pan from group to pile of veggies on the counter.</p>	<p>&lt;Mother&gt; Ok, enough talking about food- it's making me hungry. Let's put this together and go join the others outside.</p> <p>&lt;Zahra&gt; Sounds good.</p> <p>&lt;Sister&gt; Pretty soon we'll have something else to celebrate...</p> <p>&lt;music starts to come up&gt;</p> <p>&lt;Zahra&gt; (conversation fades off) I am getting excited... next weekend we're going to set up the baby's crib...</p>
18	Title of the program appears over the last shot.	<Music full>
19	Dip to black	
20	<p>March of Dimes Logo &amp; wording: "Funded by a Community Grant from the March of Dimes." "This material is for</p>	

	information purposes only and does not constitute medical advice. The opinions expressed in this material are those of the author(s) and do not necessarily reflect the views of the March of Dimes."	
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## A Somali Pregnancy in America

### *Understanding Caesarean Birth*

Scene	Video	Audio
1	<<Music & SB from videos>> Somali musicians playing (family celebration) along with pics from all the different segments. It ends with the title of the program in both Somali and English on the screen	<Open> We hear Somali music playing from the open
2	Pan from baby on the floor/sitting in seat to Zahra (visibly pregnant) and her sister (baby's mother) sitting on the couch. We pick up their conversation...	<Zahra> (looking at her sister's baby) I am glad that our children will be close in age- it will be fun as they grow up as cousins. (asks Sister) How are you doing? Are you feeling ok? Getting any sleep?
3	Sister and Zahra are on the couch talking the entire time. They glance occasionally over to the baby. We have cut-aways of the baby, close-up of hands, reaction shots, etc.	<Sister> Well, I'm not sleeping much. She's been awake quite a bit during the night- a lot like her older brother was when he was a baby. But, other than that, I'm feeling well. The recovery is different then when I had my son by caesarean birth.
4		<Zahra> I'm surprised you had a normal birth with her, especially after having a caesarean birth with your first child.
5		<Sister> I was worried about that too. But the doctor said it's possible to have a natural birth after you have a caesarean birth. Many women do. With my second child I made sure to go to the doctor as soon as I found out I was pregnant. That gave me a chance to get to know the doctors,

		<p>midwife and nurses. We talked about my choices and what I wanted to happen.</p> <p>With my first child, I didn't go in, so I didn't know what to expect.</p> <p>&lt;Zahra&gt; Why didn't you go into the doctor when you were pregnant the first time?</p> <p>&lt;Sister&gt; Well, just like a lot of Somali women, I didn't feel any pain, so I thought things were fine. I didn't think there was a reason to go in. But then when I went into labor we found out he was turned around. Instead of his head pointing down, his feet were coming first. They call this the breech position. So I had to have a caesarean birth.</p>
6		<p>&lt;Zahra&gt; That would scare me so much.</p>
7		<p>&lt;Sister&gt; It was a little scary, but mostly because I didn't see the doctor beforehand. I had heard people say they try to make you have a caesarean birth. Afterwards, I realized the only reason I had a caesarean birth was because there were problems. If there aren't any problems, they won't <i>make</i> you have one. They only do a caesarean if there <i>are problems</i>. I didn't know any of that, because I never went to see a doctor until I went into labor.</p> <p>That's why I'm glad you started having check-ups as soon as you knew you were pregnant.</p>
8		<p>&lt;Zahra&gt; I'm glad I went in too. I told my doctor you had a caesarean birth and that I didn't want that. She told me the same thing you said- if everything goes as planned, I can have a natural birth.</p>
9		<p>&lt;Sister&gt; Even if things don't go as planned, try not to worry. You may be nervous for a caesarean birth, but here in America the doctors do it all of the time.</p>

		The most important thing is do what you can to have a healthy baby- not how he or she is born.
10		<Zahra> My doctor said I might need to have a caesarean if the baby's heart beat is abnormal. Or, I could have one if there's a problem with the umbilical cord, or if I have a health problem.
11		<Sister> Yes, you want to do everything you can to stay healthy too. Eat the right foods and avoid a lot of fats and sugars.
12		<Zahra> Someone told me that the doctors like doing caesarean births because they cost more and make more money.
13		<Sister> No, that's not true. The doctor gets paid the same no matter what. That's part of their job. The doctor wants you and the baby to be healthy and safe. That's how they make their decisions.
14		<Zahra> There are just so many things that I'm nervous about.
15		<Sister> I worried with my first baby too. But, going in for prenatal check-ups will help. You'll get to know your healthcare providers and that will help you trust them. The checkups also give you a chance to talk about what you would like to happen during the birth. If you don't go in and talk to her beforehand, she won't know what you prefer.
16		<Zahra> So, now that you've had both a caesarean birth and a natural birth, what will you do with your next child?
17		<Sister> I enjoyed having a natural birth, so I hope that it will be naturally again. But, if there are problems, and a caesarean birth is best for me and the baby, that's ok too.

18		<p>&lt;Zahra&gt;  Well, I'm glad you'll be there with me during my labor.  It will be nice to have someone that has been through it before.</p>
19		<p>&lt;Sister&gt;  I am excited to be there with you. Allah gave me two healthy children- one through natural birth and one through caesarean birth. And I will be there when Allah brings your child into this world too.</p>
20		<hear baby cry>
21	Sister reaches down to pick up/sooth the baby	<p>(music comes in low)</p> <p>&lt;Sister&gt;  Pretty soon you'll be the one the baby is crying for.</p>
22	Pan over to a baby toy	Music up
22	Pan over to another item in the exam rm, or the mother's hand on her belly, or crossed hands, or faces or Zahra and translator.	
23	Title of the program appears over the last shot.	<Music full>
	Dip to black	
24	<p>March of Dimes  Logo &amp; wording:  "Funded by a Community Grant from the March of Dimes."  "This material is for information purposes only and does not constitute medical advice. The opinions expressed in this material are those of the author(s) and do not necessarily reflect the views of the March</p>	



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## A Somali Pregnancy in America

### *Episiotomy: Understanding Individual Differences and Practices*

Scene	Video	Audio
1	<<Music & SB from videos>> Somali musicians playing (family celebration) along with pics from all the different segments. It ends with the title of the program in Somali and English on the screen	<Open> We hear Somali music playing from the open
2	Pan from item in the exam room to Zahra and translator are sitting in an exam room waiting for the doctor to come in.	<translator> Before your doctor comes in, do you have any questions for me?
3	Zahra and translator are sitting in an exam room waiting for the doctor to come in.	<Zahra> It's been really nice to have you here at my appointments to support me and help translate. Will they allow you to be there for the birth as well?
4	Zahra and translator are sitting in an exam room waiting for the doctor to come in.	<Translator> Yes, of course. It's good to have a translator with you during the birth. Even if you know some English, some things are easier to understand in your first language. With someone there to help support you and translate, you can be sure to communicate with all of the health care providers.
5	Female Dr comes in and greet Zahra and the translator. She sits down.	<hear dr come in> <greet doctor>
6		<Doctor> How have you been since the last visit?
7		<Zahra> I've been doing pretty well. I'm starting to get some

		leg cramps. But nothing too severe- and I've been stretching and walking like you suggested.
8		<p>&lt;Doctor&gt;  Good. Those are symptoms that are often experienced during pregnancy. But I'm glad you told me. Sometimes things that seem little, may help detect larger problems.  Today I want to talk a little more about what will happen during the birth.  I want to make sure you know what the process is and answer all of your questions.</p>
9		<p>&lt;Zahra&gt;  I do have some questions about that. Some things are different here than in my country and I'm a little nervous about some of the customs.</p>
10		<p>&lt;Doctor&gt;  Well, let's start with your questions. What are some of the things you're concerned about?</p> <p>&lt;Zahra&gt;  I am worried about the way that I may be cut to help the baby be born.</p>
11		<p>&lt;Doctor&gt;  We call that an episiotomy. It's an incision in the opening where the baby is born to allow room for the baby's head.  It isn't always done. But you <i>may</i> need it done in some circumstances.</p> <p>&lt;Zahra&gt;  How will I know if I need to have one?</p> <p>&lt;Doctor&gt;  That's a good question. You may need an episiotomy if you need to give birth to your baby quickly.  It also may be necessary for women who've been circumcised. The tissue doesn't stretch well and often the opening is not large enough for the baby's head.</p> <p>&lt;Zahra&gt;</p>

		<p>How will I know if I need to have an episiotomy ?</p> <p>&lt;Doctor&gt;  Each women is different. We often don't know until you're in labor.  It also depends on your age, how many children you've had, and other factors.  Later in our exam I'll be able to tell you more based on your particular factors.</p>
12		<p>&lt;Zahra&gt;  I think in Somalia they cut differently.</p>
13		<p>&lt;Doctor&gt;  Again, it depends on the woman and her circumstances. Often we cut down and to the side. In Somali, doctors often cut upwards on both sides.</p> <p>&lt;Zahra&gt;  Why is it done differently here?</p> <p>&lt;Doctor&gt;  Cutting down to the sides is often safer and avoids harming your internal organs.  Cutting up may cause damage.</p>
14		<p>&lt;Zahra&gt;  So, you will do what is best for me and my baby?</p>
15		<p>&lt;Doctor&gt;  Yes, each woman's situation is different.  And remember, an episiotomy isn't always done. It depends on the woman, how the labor progresses and the practice preferences of different health care providers.  That's why I'm glad you brought it up.  Communication is really important during these prenatal exams and during labor. There may be things that we do differently than in Somalia and I want to make sure we have a chance to talk about those things and explain why we do things differently.</p>
16		<p>&lt;Zahra&gt;</p>

		And the translator can be there with me to help express what I want?
		<Doctor> Yes. We encourage you to have a translator. A translator can help make sure we both understand what each other is saying.
17		<Zahra> And what about other family members?  <Doctor> It's up to you to decide who you do and don't want with you during the birth. You may want your sister and mother. Or you may want to have your husband with you. We encourage your husband to be here when the baby is born- it's an exciting time and it's nice to have him here with you. Many Somali women now choose to have their husbands with them.
18		<Zahra> That makes me feel better. Having a translator and my family there will help. And talking to you about what is going to happen during the birth is important- I'm a lot less nervous about that part now.
19		<Doctor> Good. That's what we want. Our goal is to have a healthy birth for you and your baby- and to make you as comfortable as possible.
20	Pan over to another item in the exam rm, or the mother's hand on her belly, or crossed hands, or faces or Zahra and translator.	(conversation fades off and music goes up) <Doctor> What other questions do you have?
21	Title of the program appears over the last shot.	<Music full>
	Dip to black	
22	March of Dimes Logo & wording:	

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## A Somali Pregnancy in America

### *Pregnancy Myths and Facts*

Scene	Video	Audio
1	<<Music & SB from videos>> Somali musicians playing (family celebration) along with pics from all the different segments. It ends with the title of the program in Somali and English on the screen	<Open> We hear Somali music playing from the open
2	Pan from item in the birthing room to Zahra, a nurse, (and a translator?) are sitting in a birthing room. We pick up their conversation. <u>We will either need a translator or Somali speaking nurse.</u>	<Nurse> ...and this a typical room where you'll be giving birth. Do you know if you're having a boy or a girl?
3	During entire segment Zahra and nurse are speaking in the birthing room. They are casually talking.	<Zahra> No, we aren't going to find out. But my mother thinks it's going to be a girl, because I'm carrying high.
4		<Nurse> That's what everyone said to me too- and I had a boy! That's what we call an "old wives tale." Many people swear by them, but there isn't any scientific evidence to prove them. Some people also say if the baby's heart rate is slow it's a girl, and fast if it's a boy. Some people say it's the other way around.  But, the only true way to know if your baby is a boy or girl before birth is by medical exams and tests such as an ultrasound or amniocentesis.
5		<Zahra> I get advice from everyone- even people I don't

		know well. It's hard to know what is true and what isn't.
6		<p>&lt;Nurse&gt; If you ever have a question or are confused about what people say, just ask any of us during your check-up. We've heard a lot of myths and we can help you understand the truth.</p> <p>&lt;Zahra&gt; One thing I learned recently is that if a mother has a caesarean birth, she can still give birth naturally when she has another child.</p> <p>&lt;Nurse&gt; Yes, that can be true. Many women who have caesarean births are able to have a vaginal birth with the next baby, also called a VBAC. That stands for "vaginal birth after cesarean."</p> <p>Another myth is that a natural birth, or vaginal birth, is always better. This isn't true. The best type of birth is the type that keeps you and your baby the healthiest. Sometimes that's a vaginal birth, other times it's by caesarean birth. In the long-run the most important thing is to have a healthy baby and mother.</p>
7		<p>&lt;Zahra&gt; But, I will have a chance of having a natural birth if I eat less?</p>
8		<p>&lt;Nurse&gt; No, that's a myth as well. Eating too much will <i>not</i> make the baby grow so big that you must have a caesarean birth. However, you should not think you can eat as much as you want because you are 'eating for two'. Eating too much can cause diabetes and other health conditions. Those conditions can cause harm to you and your baby. The best advice is to eat healthy foods and healthy amounts. You should also remember that exercise is good for you. You should not stop exercising. And if you've never exercised before, it would be good to</p>



		talk to your health care provider about starting an exercise routine.
9		<Zahra> So, I should continue to exercise and eat healthy foods- but not eat for two!
10		<Nurse> Exactly.
11		<Zahra> But, what about pain medication during the birth? Is it better if I don't use any?
12		<Nurse> No, not necessarily. You don't get extra credit as a mother for not using medication. Asking for pain medication doesn't mean you are weak or have bad character. It just means that it's painful. Again, it's about having a healthy baby and healthy mother. It's all about the end result, not how it was done.
13		<Zahra> And I can make that decision?
14		<Nurse> Yes, you can choose whether you want pain medication and what type you want. There are several choices that you can go over with your doctor or midwife.
16		<Zahra> That's good to know. I get so much advice from people that sometimes it gets confusing.
17		<Nurse> That's what we're here for. Anytime you have a question, just ask. And it's important to know that even though things are different here in America, our goals are the same- a healthy baby and a healthy mom. American doctors are trained in a certain way, but that doesn't mean Somali culture can't be included. It can. You just need to discuss your

		<p>preferences with your doctor. Some Americans know a lot about Somali culture, others don't know as much. But, most are willing to learn in order for you to have a good experience.</p> <p>&lt;Zahra&gt; That's good to know.</p> <p>&lt;Nurse&gt; Somali families have many strong positive aspects of their culture that are important and can improve the birthing process. You and your traditions add value to our community. It's important to share those with your health care providers. (music starts to come in) If you do, the experience should be great for everyone.</p> <p>Let's go down the hall and finish our tour, we might get to see one of the newborns... (walk off)</p>
18	Pan from someone in the room to an object in the room.	
19	Title of the program appears over the last shot.	<Music full>
	Dip to black	
20	<p>March of Dimes Logo &amp; wording: "Funded by a Community Grant from the March of Dimes." "This material is for information purposes only and does not constitute medical advice. The opinions expressed in this material are those of the author(s) and do not necessarily reflect the views of the March of Dimes."</p>	
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## A Somali Pregnancy in America

### *Part I: A Father's Changing Role*

Part II: "I Rock Me in My Arms, I Rock You in My Arms"

A Poem Celebrating African Fatherhood in America performed by Ibe Kaba

Scene	Audio	Video
1	<<Music & SB from videos>>	<Open> We hear Somali music playing along with soundbites from the various series. It ends with the title of the program in both Somali and English on the screen
2	Zahra (visibly pregnant) and sister-in law are in the kitchen talking we pick up their conversation	<Zahra> (reaching up to cupboard) My stomach is big enough that it's starting to get in the way!
3	Zahra and her sister-in-law are making tea in the kitchen.	<sister-in-law> I remember those days. How have you been doing?  <Zahra> Pretty well, although my emotions are all over the place. Yesterday I was doing laundry and I couldn't find a matching sock and I started to cry!  <sister-in-law> (starts to laugh) Oh no! You were crying over a sock?  <Zahra> Well, I guess it was more than that. My thoughts are feelings are all over the place. And it's more difficult not having more of our family here to help.
4	The two women pick up the tea and bring it into the living room where the husband and his brother are sitting. They drop off the tea and go back into the kitchen. We stay with the men and listen to their conversation.	<sister-in-law> I know it can be tough, but we're here for you. I know that pregnancy can be a lot of emotions- anger, sadness, happiness all in the same minute. But just remember it's not just you. It's very common. But if it gets really hard to keep up your normal activities, make sure to talk about it with your doctor.  <Zahra> Here you go (sets down tea)

5	Women leave	<Husband> Thank you.
6	Husband and brother take a drink of the coffee.	<Brother> So, are you ready to become a father like the rest of us?
7		<Husband> Yes, I'm excited, but a little nervous. Having Zahra pregnant has been different. The other day she was happy and then started crying while folding clothes. It was very strange and not like her.
8		<Brother> (Laughs) Yes, I remember that with my wife as well. Mood swings are very common. But it's not just the mother who experiences changes. The father goes through many things as well. There are many changes that happen in the household. Pregnancy can be a stressful time- especially with the first child. I found that helping around the house can even help- it relieves some of the stress.  <Husband> I have been doing more little things around the house- like picking up dirty dishes or helping with other chores. I've also been trying not to get mad at her mood swings.  <Brother> Good idea. Sometimes it's tough being a father. It seems different here in America. Fathers here are more involved and many of our family members are still back home. And, there are more options during the birth. For example, there are different pain medications that can help Zahra during pregnancy. You'll both need to talk about that to figure out what is right for her. Pain medication can help a lot. But if she decides not to use pain medications, there are other things the health care providers can have her do to help with the pain.
9		<Husband> Zahra said her doctor mentioned I could be in the

		<p>birthing room. I thought that was strange.</p> <p>&lt;Brother&gt; No, not at all. More Somali fathers are attending their children's births. I did with our son. It was nice to be there for Asha and see the baby being born. It also gave us the chance to make sure Somali customs were carried out.</p>
10		<p>&lt;Husband&gt; The traditions are important to us. Can we still whisper in the baby's ear?</p> <p>&lt;Brother&gt; Oh yes. But, make sure Zahra speaks with her doctor beforehand about it. Is she going in for checkups already?</p> <p>&lt;Husband&gt; Yes. I think she has another checkup next week.</p> <p>&lt;Brother&gt; Then, just have her talk to her doctor or midwife about it so you both know what to expect. Many Americans don't know about our customs, but they are willing to learn- you just need to tell them and talk about options. Zahra can talk to her doctor about all of her wishes. Here in America it seems the women have many more choices than back home. So make sure you both talk about how you want things done beforehand.</p>
11		<p>&lt;Husband&gt; Yes, I don't want an argument in the hospital during the birth. I think there will be enough stress already.</p>
12	Pan from brothers to another item in the room- possibly the tea cups.	<p>(music starts to come in)</p> <p>&lt;Brother&gt; You two will be fine and you'll make great parents..</p>
13	Title of the program appears over the last shot.	<Music full>
14	Ibe Kabal on Cam	<<Ibe Kabal Poem>>
15	Dip to black	
16	March of Dimes Logo & wording:	

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## APPENDIX F

### SOMALI CARES PROGRAM FOR PREGNANCY

©Michelle Dynes, CNM, RN, MSN

## Somali **C**ulturally Program for Pregnancy **A**ppropriate & **R**espectful **E**ducation & **S**upport

### Background

Somali refugees began fleeing their country in the early to mid-1990s primarily related to civil war. The United Nations High Commission for Refugees reports over thirty-four thousand Somali refugees/asylum seekers residing in the United States as of 2005 (UNHCR web site). Minnesota is home to the largest population of Somali refugees in the US; they comprised sixty-nine percent of the primary refugees entering the state in 2006 (Minnesota Department of Health website). Like so many refugees around the world, Somali women have lived through significant traumatic experiences, and these can lead to psychological, emotional, and physical problems (Bhugra, 2004; de Jong et al, 2003; de Jong et al 2001; Robertson et al, 2006). One study concluded that refugees are at risk for stress related dysfunction long after settling in the host country and may have difficulties coping with the challenges of acculturation. (Matheson, et al, 2007)

Pregnancy can be an especially taxing time for refugee women who are already living under high-stress conditions. Davies and Bath (2001) investigated the concerns of Somali women related to pregnancy information and found that women had concerns about communication problems and lack of information sharing related to punitive and prejudiced

attitudes among health care providers. Herrel et al (2004) carried out research on the birth experiences of Somali women in Minnesota. Focus groups revealed that although women reported overall positive experiences, many negative aspects of care were described including racial stereotyping, apprehension of cesarean section, and concerns about the competence of medical interpreters. Women also wished they had received more information regarding the topics surrounding labor, and they felt reminder calls, transportation, and childcare would be most beneficial in increasing attendance at prenatal visits.

### The Problem and Purpose Statements

There are no prenatal care programs designed specifically to meet the needs of Somali women in pregnancy. It is clear from the literature that Somali women have deep concerns about their care during pregnancy in the United States. This refugee population is expected to fit into a medical system that is not only unfamiliar to them, but is inherently flawed and unable to meet their needs in pregnancy. Providing care to Somali women that is culturally appropriate is imperative. Evidence is now available suggesting that Somali women and babies have poorer pregnancy and birth outcomes as compared to black and white women (Johnson et al, 2005). These health disparities will only increase if we continue to offer the same model of care that is currently available. The purpose of my new intervention is to fill this need by designing a prenatal care program that takes into account the cultural and social context of the lives of Somali women.

### Influence of Contexts

As a midwife, I have observed numerous contexts that influence the health and care of Somali women in pregnancy. From a Muslim religious perspective, Somali women will only



accept a female provider. In addition, some Somali women will continue to fast during specific holidays such as Ramadan which can impact their nutritional health. In my opinion, the largest impact of religion on Somali women in pregnancy is the concept that “it is up to Allah”. During many discussions with Somali women throughout pregnancy, women will admit a feeling of powerlessness in affecting the outcomes of pregnancy. In this powerlessness, I sense resignation which translates into a low level of personal accountability. From a cultural context, Somali women are generally not the decision-makers within the family. In labor, the Somali women will often redirect questions to their significant other to answer though the answer directly impacts her.

#### Influence of Personal Experiences

Personal experiences of Somali women likely play an immense role in their perceptions of pregnancy and health. For instance, the overall experience of being a refugee living in a new culture has major implications for health care. Refugees that have experienced trauma may have psychological problems that affect their ability to manage stress, and therefore, people may resort to avoidance as a coping strategy. Somali women that have had babies prior to arriving in the United States have very different ideas regarding pregnancy and how to give birth. Somali women are much more likely to have experienced loss of a pregnancy or baby, so their expectations of the pregnancy may be very different than those of mainstream America. I have also noticed that Somali women do not engage in childbirth education classes even when they are fluent in English. In addition, it seems that the Somali people have a level of distrust in the American medical system and fear unnecessary cesarean sections. This perception of too much intervention likely arises from their experiences with

the health care system in Somalia as compared with here. Women only very rarely had operative delivery in Somalia and often care was initiated only if there was a problem.

### Existing Interventions

With such a large Somali population in the state of Minnesota, it is surprising to find that no interventions exist specifically for Somali women in pregnancy. I believe this is the case because until recently, data has demonstrated good pregnancy outcomes for this population. Since data is not available on existing interventions, I will briefly describe two programs that I have experience with: CenteringPregnancy and Home-Based Life-Saving Skills (HBLSS). Though these programs were not developed particularly for Somali women, components of these programs were utilized in the development of my intervention.

CenteringPregnancy is a group prenatal care program that utilizes the three aspects of assessment, education, and support in order to empower women during pregnancy and childbirth. It was developed by a nurse-midwife in Connecticut as a way to improve the provision of prenatal care by increasing the amount of time that provider and patient have per encounter, provide a social support system for women, and increase the educational component of care. CenteringPregnancy has been implemented in over thirty states across the country. The mission of the Centering Pregnancy and Parenting Association (CPPA) is to “change the paradigm of health services to a group care model in order to improve the overall health outcomes of mothers, babies, new families, and individuals across the life cycle” (CPPA, 2006).

HBLSS is a community-based, family-focused intervention developed by the American College of Nurse-Midwives (ACNM) Department of Global Outreach with the aim of reducing maternal and infant deaths in places where home birth is common (ACNM).

Within the HBLSS training of trainers program, specific teaching methods are used in order to provide education in a culturally sensitive and respectful manner. Each HBLSS meeting begins with the reading of a story about a woman with a problem related to pregnancy or birth. The participants are then asked if they have ever known or heard about a woman with this problem and what was done to help her. This step really gets at specific cultural practices related to pregnancy. Once they are finished talking, the facilitator describes what “trained health workers” do for this problem.

What follows is the key to this style of teaching – a negotiation of practices. The facilitator has a dialogue with participants about what they are willing and not willing to do if this problem occurs. Through this process of teaching, women feel respected for the knowledge that they have. To quote Cheryl’s description of this phenomenon, “people bring themselves with themselves”. There is also no hierarchy between teacher and student because the facilitators are learning just as the participants are; a trusting relationship can then develop under these circumstances

### Proposed Intervention

The Somali **Culturally Appropriate & Respectful Education & Support (CARES)** Program for Pregnancy is a clinic-based, group prenatal care program for Somali refugees. Somali CARES is an approach to prenatal care that encompasses aspects of two programs: CenteringPregnancy and Home-Based Life-Saving Skills (HBLSS). One characteristic of CenteringPregnancy that I have incorporated into Somali CARES is the provision of prenatal care within a group setting. Another aspect of CenteringPregnancy that I have included into Somali CARES is facilitative discussions conducted during each session rather than using a didactic approach to education and learning. The components of HBLSS that are integrated

into Somali CARES are story-telling, role-playing, and facilitative discussions in order to display respect for cultural differences and build trust within the group.

Somali CARES is an intervention program with a target population of Somali women in pregnancy seeking care at Mayo Clinic in Rochester, Minnesota. Somali women in early pregnancy will be offered the opportunity to participate in the program; ideally eight to ten women will participate per group. The initial Somali CARES Program will be conducted as a pilot program at Mayo Clinic with the option of implementing the program on a wider scale. Prenatal care will include one individual visit with a provider at the beginning of pregnancy, six group meetings throughout pregnancy, followed an individual postpartum visit at six weeks post-partum.

Each Somali CARES session will follow a general outline including participatory and educational activities and discussions, though the themes change from session to session. The common facets of each session involve general pregnancy education, Somali specific education, story-telling, drama (role-playing), discussion, and relaxation exercises. Educational topics will be altered as needed to meet the specific needs of participants during each group session. The table below provides further details:

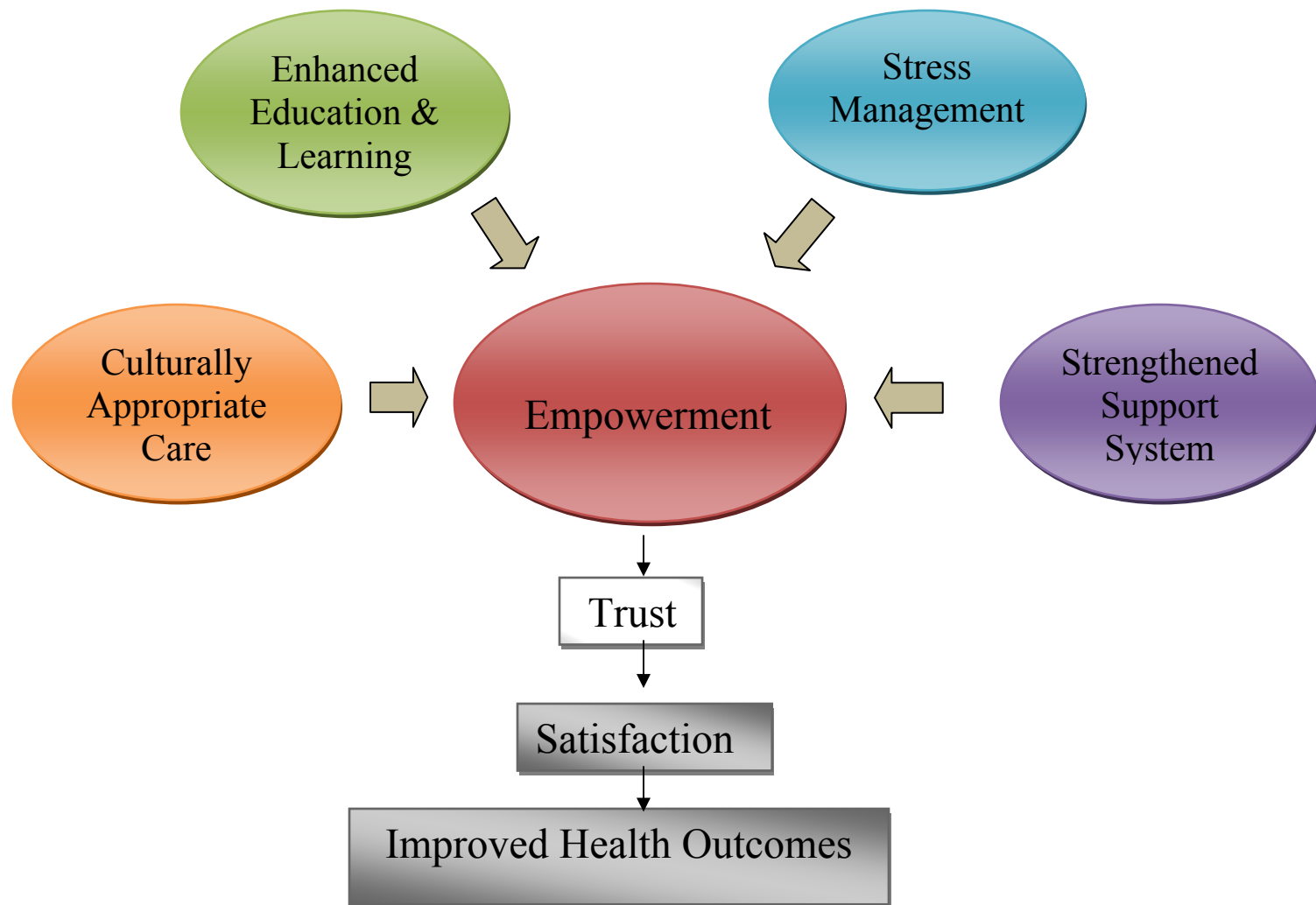
Table D1

PRENATAL VISITS	DISCUSSION TOPICS	ACTIVITIES
Individual Visit with Provider 10-12 weeks gestation	Offer Somali Cares Program	Assessment
Somali CARES #1 16-18 weeks	General Pregnancy Education	Assessment Storytelling Drama Relaxation
	Nutrition Exercise	
	Somali Specific Education	
	Fasting Hydration Community Resources	

Somali CARES #2 22-24 weeks	General Pregnancy Education	Assessment Storytelling Drama Relaxation
	Common Discomforts Warning Signs	
	Somali Specific education	
	Traditional practices Past and Present Stressors Beginning Coping Strategies	
Somali CARES #3 28-30 weeks	General Pregnancy Education	Assessment Storytelling Drama Relaxation
	Anatomy of pregnancy Physiology of labor	
	Somali Specific Education	
	Evaluation of Fears Somatization More on Coping Strategies	
Somali CARES #4 32-34 weeks	General Pregnancy Education	Assessment Storytelling Drama Relaxation
	Labor and Birth - signs and symptoms - pain management - operative delivery	
	Somali Specific Education	
	Traditional practices Decision-making Management of Circumcision	
Somali CARES #5 36-38 weeks	General Pregnancy Education	Assessment Storytelling Drama Relaxation
	Postpartum - self-care - baby-care - breastfeeding - birth control	
	Somali Specific Education	
	Traditional practices Lactation Amenorrhea Method Social support	
Somali CARES #6 38-40 weeks	General Pregnancy Education	Assessment Storytelling Drama Relaxation
	Parenting Strategies Induction of labor	
	Somali Specific Education	
	Roles within the Family More on social support Personal strengths	
Individual Postpartum Visit with Provider 6 weeks postpartum	Interview regarding satisfaction	Assessment

I have developed my own conceptual framework for how I perceive the Somali CARES program to be effective in the care of Somali women in pregnancy. Providing culturally appropriate care is an essential aspect of this program and aims to make prenatal care work for the population, not oblige patients to conform to the Western medical model of care. The expanded time that the women have with the provider allows for greater education and learning opportunities. Providing women with stress management through discussion of coping mechanisms and relaxation exercises will build each woman's repertoire of coping skills. Finally, the group environment provides women with a strengthened support network that I anticipate will last well beyond the program itself.

These four tenets together help to bridge the gap between the current prenatal care system and the needs of Somali women in pregnancy, thereby, empowering women to have healthy pregnancies. As empowerment develops, it is my hope that women will begin to build trust in the provider and institution, have improved satisfaction with their care, and ultimately have better physical and psychological health outcomes. This conceptual framework is presented below:



The goal of the Somali CARES Program for Pregnancy is to provide a specialized approach to prenatal care in order to meet the specific needs of Somali women. The objectives and associated activities are summarized in the following table:

Table D2

Objectives	Activities
Determine the feasibility of Somali CARES	<ol style="list-style-type: none"> <li>1. Conduct focus group discussions in the Somali community to determine their interest level and willingness to participate in the program.</li> <li>2. Introduce Somali CARES Program to the administration and OB department chair as a pilot program</li> <li>3. Present a short powerpoint to OB nursing and midwife staff to familiarize them with the program</li> <li>4. Determine willingness and availability of Somali interpreters to participate in the program</li> <li>5. Write a grant to March of Dimes for funding of the pilot</li> </ol>
Implement Somali CARES Pilot	<ol style="list-style-type: none"> <li>1. Offer program to every Somali women in early pregnancy at the nurse OB visit and first provider visit and obtain informed consent</li> <li>2. Conduct the program in a group space</li> <li>3. Use two Somali interpreters to bridge the communication gap</li> <li>4. Somali food and music</li> <li>5. Use teaching methods of story-telling, role-playing, and facilitative discussions in each session</li> <li>6. Teach, discuss, and practice coping strategies and relaxation exercises to promote stress management</li> <li>7. Provide childcare and transportation to improve</li> </ol>
Evaluate Somali CARES	<ol style="list-style-type: none"> <li>1. Conduct focus groups with participants and interpreters to determine satisfaction with care</li> <li>2. Conduct chart review of participants to determine pregnancy outcomes and core measures <ul style="list-style-type: none"> <li>- PRU or ER visits</li> <li>- birth gestation</li> <li>- newborn weight</li> <li>- delivery mode</li> <li>- rate of missed appointments</li> <li>- number of phone calls</li> </ul> </li> <li>3. Makes changes to the program based on these findings</li> </ol>



Partners and stakeholders identified in Somali CARES include the institution, Mayo Clinic employees, Somali community members, and the funding agency. Mayo Clinic employees that will aid in the implementation of the program include the midwives, obstetric nurses, and Somali interpreters. In addition, Somali community members will be engaged prior to the implementation regarding the feasibility of the program and their willingness to participate. Community participation will be promoted through advertisement of the program in the community with information on potential benefits of participation. If the pilot program goes well and the program continues, then I believe word of mouth advertisement will go a long way in promoting Somali CARES. If funding is obtained, I will maintain contact with the funding agency through predetermined program updates and evaluations as needed.

Buy in from Mayo Clinic may be one of the biggest obstacles of this intervention. Presentations and informational meetings will be conducted to familiarize department staff and administration on the benefits of Somali CARES. Following the pilot, I will present the results of a program evaluation in order to facilitate institutional willingness to implement and fund the program on a more long-term basis. Logistically, I can see lack of funding and staffing to be the biggest obstacles in making Somali CARES a long-term program at Mayo Clinic. Though the clinic may be supportive of the program, there may not be a willingness to increase staffing to accommodate the program needs. I can also see the potential for the clinic to want to move forward with the program following the pilot, but with a water-down, less expensive version (ie without transportation, childcare, Somali food, two interpreters).

## Evaluation of Intervention

Likely outcomes of the Somali CARES program are numerous. In order to measure outcomes, a program evaluation will be conducted following the pilot program which will include focus group discussions with participants and interpreters and chart reviews. In the chart review, various indicators will be reviewed as described in Table 2 to determine general outcomes of pregnancy. Focus group discussions will reveal level of satisfaction and empowerment of participants. One likely outcome from the program is decreased use of the ER visits and phone calls during pregnancy because women are receiving a higher level of care and education in the program. Another likely outcome is increased satisfaction of care on the part of Somali women. I also hope that the participants will feel more trusting of the institution and providers. In addition, I hope that the Somali women will have less stressful, more enjoyable pregnancy and birth experiences. In the long-term, it would be nice to see improved coping skills that would benefit the women in all aspects of their lives.

There are ethical considerations and psychological risks of this program. First, it is absolutely necessary to obtain informed consent from participants. Forms would need to be in Somali, or at the very least, have a Somali interpreter available to read the form to the patients prior to the start of the program. Another consideration is confidentiality of participants. At the first group session, confidentiality will be discussed and participants will be asked to sign forms stating their intent to not share information about other participants outside of the group. There are also potential negative psychological consequences of the program. Women may feel some level of embarrassment with receiving care in a group environment. Also, there is the possibility that discussions within the group could bring

about memories of traumatic events leading participants to experience emotional distress. In these situations, women will be offered further services as needed and desired.

### Discussion

In summary, Somali women in the United States have lived through traumatic experiences which can cause psychological and physical problems. Pregnancy, complicated by the general experience of having to adapt to a new culture, can be especially stressful with the potential of causing harm to mother and baby. There are currently no prenatal care programs designed specifically to meet the needs of Somali women. The Somali CARES Program for Pregnancy is a program developed to fill this need using components of CenteringPregnancy and HBLSS. Women in the Somali CARES program will receive increased support, education, and stress management in a culturally appropriate manner in order to empower women in their lives. I anticipate that through this empowerment process, Somali women will gain trust in the institution and providers and have increased satisfaction in their care. Though many barriers exist in the implementation of this program, the potential positive outcomes are vast.

I learned a lot during this writing process. Conducting a literature review was a good reminder of how much information is out in the world, as long as you are willing to seek it out. At the same time, it was surprising and sad to realize how little attention has been devoted to refugee women in pregnancy. I also learned the importance of thinking through the details of implementing a new program. Without considering the logistics and likely barriers, the program is not likely to succeed. My last and biggest lesson has been coming to the realization that it is a pretty intimidating endeavor to develop and implement a program from scratch, especially when the outcomes are truly unknown. Though this would never

deter me from moving forward, it is a good reminder that much time and patience is needed when taking on such a big task!

I incorporated the course materials into my paper and intervention in a couple of ways. The readings and breezes were truly my foundation of knowledge on the topic of refugee health. The readings helped me see the broader context of refugee issues. The more recent readings that discussed community interventions helped me to frame my own intervention, though in the setting of a hospital clinic. The discussions were also very helpful for me in developing my intervention. I received good advice from other students on how to gain community support and institutional buy-in. I also think that I gained a lot of ideas from the other students through reading about their interventions. At this point, I cannot think of other information that would have been helpful in writing this paper. Though there is certainly much more information out there to learn, I truly felt prepared to develop and write about my intervention!

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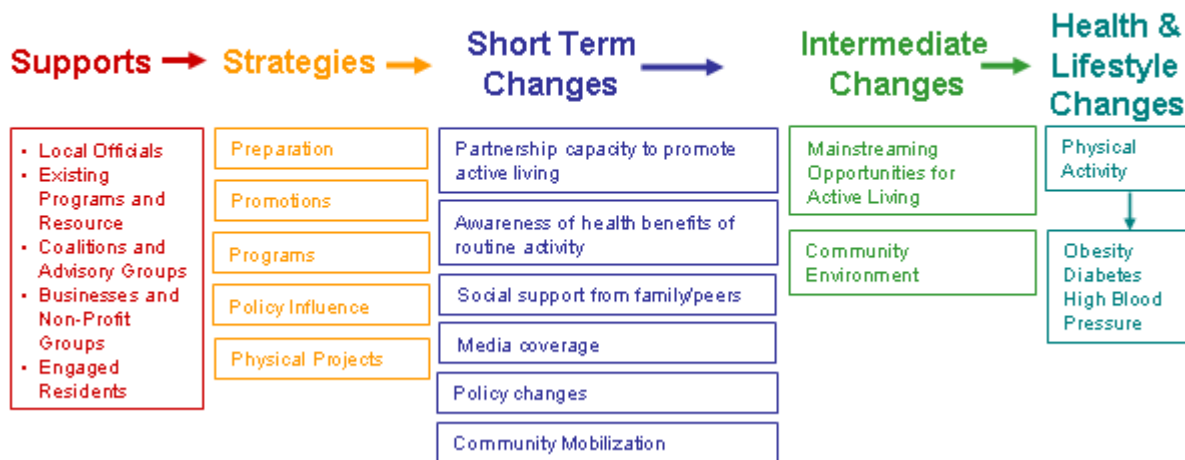
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## APPENDIX G

### ACTIVE LIVING BY DESIGN COMMUNITY MODEL AND PROGRAM DESCRIPTION

Information in this appendix is excerpted directly from [www.activelivingbydesign.com](http://www.activelivingbydesign.com):

#### Active Living by Design Community Action Model



**Supports:** Every community has existing assets that can contribute to creating a more active public. Local departments of public health, planning, transportation, public works, and parks/recreation have expertise to offer an active living movement and they are essential organizations to work with in creating health promoting environments. Elected officials are responsible for policy decisions and for directing resources that can ultimately shape the community environment. Government officials often appoint advisory groups (e.g. Pedestrian or Bicycle Advisory Committees) and other coalitions form to address active living issues. Businesses and non-profit organizations may also play significant roles in creating more active communities. Finally, the expertise and commitment of local residents will ultimately help create and sustain a successful movement for active living.

**Strategies:** ALbD has identified 5 “P” strategies: Preparation, Promotion, Programs, Policy, and Physical Projects. These strategies represent a comprehensive approach to increasing

physical activity in a community. Each strategy is comprised of specific tactics, which characterize the type of work necessary to create more active community. See the accompanying Active Living by Design 5 P Strategies and Tactics for more detailed descriptions.

Short Term Changes: We expect successful implementation of 5”P” strategies to result in critical initial outcomes that can motivate active living advocates and help residents recognize their influence in their community. These changes are initial steps that lead to further-reaching outcomes of a healthy environment.

The engine of a successful active living movement in a community is a partnership or collaborative of diverse people and organizations. Partnerships are vital for active living because they can bring together the many disciplines that have influence in a community, such as public health, urban planning, transportation, recreation, architecture and others. A capable partnership can consider the range of perspectives related to active living issues and can advocate for policy changes and physical projects as one voice.

Both targeted and community-wide promotions will result in greater awareness of active living. Appropriate audiences include government officials, community leaders, residents, and specific priority populations, e.g. older adults, children, low income women. Greater active living awareness includes the health benefits of physical activity, tips for leading more active lives, existing opportunities for physical activity, and the role of the built environment for a healthy community. Increased media coverage on active living issues and events can play a key role in shaping public opinion.



Increased access to programs will increase opportunities and social support for physical activity. By expanding existing programs and developing new ones, individuals will encounter many options for regular physical activity nearby their home, work, and school.

Policy changes are important for the active living movement because the built environment is typically shaped by ordinances, master plans, design guidelines, and government rules and protocols.

A final short term change is a mobilized community that proactively seeks to create a healthier environment. Community participation in an active living movement is essential for building a constituency that supports change. Engaged residents will also grow as neighborhood leaders through their participation in active living events and community change processes.

Intermediate Changes: The goal of Active Living by Design is to help create environments with comprehensive supports for active living. We envision communities in which physical activity opportunities have been “mainstreamed,” where residents have easy access to physical activity programs and local officials consider healthy environments to be a high priority. Workplaces, schools, and other organizations will provide regular incentives and encouragement for physical activity. Elected leaders and other government officials will support active living through public policies and decision-making processes that routinely consider the impact of community design on health. Healthy community environments will provide safe, convenient, and integrated facilities such as sidewalks, greenways, and neighborhood parks that make it easy to be active.

Health and Lifestyle Changes: The active living movement relies on many disciplines and the potential impacts can benefit air quality, traffic congestion, and quality of life; yet the primary rationale is to improve health by increasing physical activity levels. The scientific evidence linking the built environment to physical activity is established and growing. It is also well documented that active people, i.e. those achieving the recommended of 30 minutes of moderate intensity physical activity on most days, are less likely to develop chronic diseases. We see future healthy communities in which most school children walk or bicycle to school. In addition, more and more adults will make active choices and incorporate physical activity into everyday routines. Finally, people who can most benefit from increased physical activity are able to lead active and healthy lives in environments that support those lifestyles.

## APPENDIX H

### IRB APPLICATION FOR EVALUATING SOMALI PRENATAL EDUCATION VIDEOS



Title: Evaluating Somali Prenatal Education Videos

PI: Priscilla Flynn, MPH

**Abstract:** The overall goal of this project is to improve the quality of patient-provider communication through cost-effective culturally specific DVDs to supplement prenatal education in low literacy, non-English speaking Somali patients. This portion of the project will evaluate the use of six culturally-appropriate, media-enhanced prenatal educational segments to determine the acceptability to patients, and measure the quality of patient-provider communication as determined by the provider following patient DVD viewing. Results will be used to determine use of the DVDs in a clinical setting.

#### Schematic Design of the Study:

This study aims to evaluate six videos developed specifically to provide basic information to Somali women on pregnancy concerns and prenatal care. In addition, this study will evaluate whether viewing the videos prior to a clinical appointment will facilitate patient-provider communication. Patient satisfaction with prenatal care is highly correlated to quality patient-provider communication. Satisfied patients are more likely to follow provider advice regarding their health care. Background for this project includes holding 3 focus groups of Somali women to determine their highest priorities in prenatal care and prenatal education. Mayo Clinic obstetrics providers were consulted regarding key areas that could be improved

regarding prenatal care for this population. Six topics were prioritized and developed into short segments intended for viewing on Somali television and in public health or clinical settings. The script treatments are below:

### A Somali Pregnancy in America: Two Cultures, One Vision

#### Overview & Objectives

- The Somali Prenatal video series will be a collection of six (6) videos four to six minutes each.
- This series will be aired on Rochester's Somali cable network and Minnesota Somali TV cable network. DVD/videos will also be distributed for use in obstetric and public health departments.
- The objective of this series is to make Somali women and their families identify with prenatal situations and get early prenatal care. Ultimately, Somali women in Rochester (and other viewing areas) will begin prenatal preventive care in the first trimester of her pregnancy, will have healthier pregnancies with fewer complications, and the number of premature/low birthweight infants will decrease.

This series will be formatted to fit the Somali culture and how they typically prefer to learn- through role playing. It will also include music, which is a large part of their culture. Each video will follow the same pregnant women (first time mother) through different aspects of her care and concerns. In this treatment we will call her Zahra.

The ongoing theme is that pregnant women should go into the clinic for prenatal exams.

## Video Open

Each video will open with a group playing Somali music (at a home or celebration) along with clips from each of the video programs, visually showing the various aspects of a healthy pregnancy. The open with end with the title of the series: “Pregnancy in the Somali Culture/A Somali Pregnancy in an American Culture” (working titles)

### 1) Nutrition & Exercise

Objective: To illustrate what foods (and portion sizes) are appropriate and what should be avoided. This video series will also touch on the importance of exercise.

What the audience will think: *I need to watch what I’m eating and be aware of what I’m putting into my body. If I eat less, my baby will not necessarily be smaller to avoid delivery complications. Eating too much may result in gestational diabetes that will compromise both my health and the baby’s health.*

Treatment:

In this segment Zahra is at her house and she and her mother are beginning to make a meal. We may see other family members through a kitchen window, to acknowledge it is a family gathering.

Zahra starts to make a food (something spicy?) and she comments how her baby doesn’t seem to be fond of it. Her mother asks if there are foods she has been craving. She comments she has been craving a lot of fried foods and the mother comments on how she needs to avoid eating a lot of that now that she is feeding the baby as well. They get into a discussion about nutrition. The mother uses actual food to show serving sizes. The mother also comments on the importance of exercise-walking or dancing. To end the segment she comments on dance and says they should go join the festivities outside.

Items that will be covered:

- Aim to eat more than the minimum number of servings
- Baby will not get too big if you eat a lot –
- Eating too much can cause gestational diabetes which DOES increase the size of the baby, and can increase the likelihood that both mother and baby will develop Type 2 diabetes later in life.
- Breads/Cereals: spaghetti, oatmeal or cream of wheat; 9 servings (1 cup each)
- Vegetables: broccoli, carrots, tomatoes; 4 + servings, 1 cup each
- Fruits: Bananas, mangos, peaches; 3+ servings; 1 cup/med size
- Dairy: camel milk, yogurt, low fat milk, low-fat cheese; 3+ servings, 1 cup
- Protein: chicken, goat, eggs; 3 servings, 6-9 oz (pack of cards)
- Fats & sugars- use sparingly. Avoid butter, fried foods
- Family history of Diabetes- eat healthy to avoid

## 2) Caesarean birth

Objective: To discuss why a c-section may happen and why it is safe. This should be informative rather than persuasive.

What the audience will think: *Although I may not want a c-section it could be a possibility. I need to know my health care provider to have confidence in their suggestions and talk with them beforehand about it. C-sections are not uncommon in the US and they are much safer than in Africa. I may still have a natural birth afterwards.*

Treatment:

In this segment Zahra is at her house and she and her sister are sitting in the living room. Her sister recently had a baby and they are ‘fussing’ over the infant. Zahra asks how she is

feeling. The sister says her recovery is different with this child- this child was delivered naturally; with her first child she had a c-section. They start talking about the previous c-section and how it went.

Items that will be covered:

- Sister wasn't expecting a c-section for the first baby
- The baby was having problems during the pregnancy- during the ultrasound she was in an abnormal position.
- She didn't go to prenatal exams with the first child. She has gone in with the second child.
- She said she since has met other mothers who have had c-sections as well for different reasons- the baby's heartbeat is abnormal, there is a problem with the umbilical cord, or the mother has a serious health problem.
- They don't do c-sections for no reason or for the doctor's convenience. Mothers can usually deliver naturally if they choose to, and going in for prenatal visits may allow the doctor to avoid a possible c-section (turning a breech baby, etc.). C-sections are only done if there are problems.
- She was glad she had seen her doctor beforehand- because she saw her many times beforehand, she trusted her doctor and knew she was giving her good advice. The most important thing was to have a healthy baby, not how it was delivered. And by the grace of God she did have a healthy baby!
- The next baby she has she hopes it will be naturally, but if it is by c-section, she will be ok with that. Helping the baby come into the world healthy is the most important.
- C-sections are safe in the US.

### 3) Preparing for the unexpected

Objective: To discuss why there are due dates, what is preterm labor, and why labor may need to be induced. Explain how these complications can help be avoided.

What the audience will think: *In the US they have due dates to help follow the health of the baby. This date will help me and my doctor take care of my child and myself. There are things I can do to help.*

Treatment:

In this segment Zahra is at a regular appointment. She is with a translator in an exam room. She is talking with the translator about how she typically only goes to the doctor when she has pains. Some of her friends told her she didn't need to go into the doctor before giving birth- they didn't and their babies were ok. The translator talks to her about how important it is- to know the doctor and to know how the baby is doing. The doctors do this all the time and they can help you have a healthy baby.

The female physician will come into the exam room and discuss Zahra's concerns about due dates and then go into preterm labor and induction. At the end Zahra thanks the doctor and says she was glad she came in- now she knows a lot more and can help her baby stay healthy.

Items that will be covered:

- Due Dates: we are able to measure how 'old' (far along) the baby is and make sure the baby is doing well based on its 'age'. We measure in weeks. Although it helps to know approximately when the baby will be born within 2 weeks on either side, it is not used to determine exactly when you will have the baby (or 'play God'), or force a c-section.
- Normal pregnancies are 38-42 weeks.



- Preterm labor can happen 27-37 weeks. Doctor says to watch for signs, which include contractions, pain in abdomen, pelvis or back; feels like the baby is pressing down, diarrhea, menstrual-type cramps, watery discharge. Contact your health care provider if any of these happen.
- Zahra comments that God is the determining factor and he determines when the baby is born. The Dr agrees but also comments that there are sometimes when a labor goes too long and they may have to help the labor along (to prevent the baby from not getting enough oxygen which can cause brain damage and lifelong problems, or to reduce too much blood/fluid loss in mother, etc.)
- Reasons for induced labor: baby is 2 weeks past due date, water has broken but your labor hasn't started; infection in uterus; baby's growth has slowed or stopped, you have diabetes or other complications.
- Importance of staying healthy:
  - Seek regular prenatal care.
  - Eat healthy
  - Manage chronic conditions.
  - Take care of your teeth.
  - Limit stress.
  - Follow your doctor's guidelines for activity.
  - Avoid risky substances/secondhand smoke

#### 4) Episiotomy

Objective: To discuss the importance of making your wishes known to your health care provider- talk to them before you go into labor.

What the audience will think: *In the US they do things differently then back home. My health care provider will not know my needs unless I go and talk to them beforehand. If I go in, they will know my wishes.*

Treatment:

In this segment Zahra is at a regular appointment. She is with a translator in an exam room. She is talking with the translator about how she is glad she has come in for check-ups before the baby is born. It is a chance to check on the baby but also a good time to talk to the doctor about her concerns. It makes her less nervous. The translator says she wishes everyone came in- it really does help.

The female physician will come into the exam room and want to discuss the actual birthing process. They discuss Zahra's concerns about episiotomy. At the end, Zahra thanks her doctors for talking about this now- it makes her less nervous about the birth.

Items that will be covered:

- Episiotomy- An episiotomy is an incision made in the tissue between the vaginal opening and anus (perineum) during childbirth.
- It isn't always preformed. It may need to be done if the baby is in an abnormal position, tearing appears likely, or you need to deliver quickly.
- In Somalia they cut up diagonally on both sides; in the US they cut down. Female circumcision can be a complication on how or why an episiotomy is performed.
- It is very important to discuss this with your health care provider before the birth. Some doctors will alter the way they do it- others may not.
- Can also cover other preferences before labor- who to have in the room, medications, etc

- This also brings up the importance of having a translator or advocate (who speaks English) in the birthing room with you. This way you can communicate with the health care staff.

#### 5) For the Father

Objective: To discuss some of the issues fathers may be facing and the differences in the US

What the audience will think: *Now I know what my role is and more about the pregnancy process and can better understand what my wife is going through.*

Treatment:

In this segment Zahra and her husband are at their house and his brother and sister-in-law are over. The segment starts in the kitchen with Zahra and her sister-in-law. They are making tea and talking about her pregnancy and the difference in their life afterwards. The sister-in-law talks about how its tough to be away from many family members and how its not uncommon to feel sad, cry or get angry for “no reason.” . But they will be there to support them and the doctors can also help. They bring the tea into their husbands and go back into the kitchen.

The video remains on the husbands. The father begins to talk about his coming child. The brother talks about some of the differences in the US and what he should expect.

Items that will be covered:

- Daddy Issues during pregnancy: mood swings, irritability, sadness, and anxiety are all common. Making decisions with the wife- options during pregnancy for pain. Being present in the birthing room (many Somali men do), Talk with the wife about her wishes before talking to the health care provider. Decisions should include both husband and wife. (Many times men will dictate her care.)

- Somali customs and traditions (such as whispering in the ear) can still be carried out- that's why it's important to go into the clinic and talk to your doctor early in the pregnancy.
- The father is an important person during the pregnancy as well as after. Helping the wife to reduce stress in her life by helping with other children with household chores, understanding that hormone changes can make her irritable or moody, can actually help make her delivery easier and a healthier baby. (Increased stress has been linked to low-birthweight infants.)
- The birth of a baby can trigger a jumble of powerful emotions, from excitement and joy to fear and anxiety. But it can also result in something you might not expect — depression.
- Self Care:
  - Make healthy lifestyle choices
  - Set realistic expectations
  - Make time for yourself
  - Avoid isolation

## 6) Pregnancy Myths

Objective: To discuss some of the truths and myths of pregnancy

What the audience will think: *Now I know what things are true and what are not*

Treatment:

In this segment Zahra is at the hospital getting a tour of the birthing area by the nurse. This is an opportunity for the audience to see what a typical birthing room looks like. Zahra starts

asking the nurse about some of the myths. Again, it is stressed how important coming into the clinic before the birth is- so she is less anxious and can clear up the myths.

Myths/Items that will be covered:

- Once a cesarean section, always a cesarean section. Many women who have had cesarean sections with previous deliveries are able to have vaginal deliveries (VBAC) with subsequent pregnancies. Discuss this with your clinician if you have had a previous cesarean birth.
- You can tell the sex of the baby by how you are carrying the fetus or by how your abdomen protrudes. The only ways to tell the sex of your baby before delivery are with ultrasound or amniocentesis.
- A low heart rate means a boy, high heart rate means a girl.
- Natural birth is always better. No extra “points” are given in the mother of the year contest for who suffered the most in labor. Asking for pain medication or an epidural does not mean that you’re weak in character; it does mean you are experiencing one of the most painful conditions! The goal of pregnancy and delivery is a healthy mother and a healthy baby; in the long run, it doesn’t matter what it took to get that desired outcome.
- Sleeping on your back can hurt the baby. This is based on studies done many years ago (1960’s & 70’s) that is decreases blood flow during *labor* on your back. Does not apply to sleeping. If this were true you would feel dizzy and naturally roll off of your back.
- You have to stop exercising and should not start any new activities.

- Eating too much can make the baby big, and therefore have a c-section. (However, gestational diabetes can increase infant size. Best recommendation is moderation in eating and weight gain.)
- You are ‘eating for two’ is not true. You need to maintain healthy eating habits.
- Myth: American health care providers want all immigrants to follow American birthing customs. Fact: US providers are trained to provide care to improve the health of both mother and baby. However, Somali families need to discuss their preferences (food choices, birthing options, induction, etc.) with their providers to educate them on African customs/culture. There is a wide difference in what Americans know about Somali culture, but many are willing to learn and help their patients have a positive birth experience. Somali families can help bring the positive aspects of strong family support systems that improve birth outcomes to American obstetric care.

#### Study Aims:

- 1) Determine the cultural and clinical acceptability to Somali patients of six prenatal educational videos developed specifically for pregnant Somali women.
- 2) Determine to what extent the Somali prenatal education videos facilitate patient-provider communication in clinical encounters immediately following program viewing as evaluated by obstetrics providers.

#### Methods

##### Description of Recruitment Methods:

How will patients be identified? Somali patients scheduled for routine obstetrics appointments will be identified by the OB appointment desk through CVI data (place of birth = Somalia).

How will patients be contacted? Patients will be asked to participate in the study upon check in for their routine appointment.

Patient Population:

Number (total, each subgroup): 25

Gender: Female

Ages: 18 to 45

Inclusion Criteria: Pregnant women born in Somalia attending a routine MCR prenatal appointment

Endpoints: This is a “process evaluation” to determine the acceptability of the videos rather than to determine final outcomes. Therefore, descriptive statistics will provide a summary of survey results for both patients and providers. These data will inform next steps in determining the further use of the video series in a clinical setting.

Human Safety Aspects

Risks: The evaluation project involves viewing a 3-5 minute educational video and filling out a one-page survey with the assistance of an interpreter, if necessary. Risk to the patient is considered minimal.

APPENDIX I

SOMALI PRENATAL EDUCATION VIDEO EVALUATION  
FOR OBSTETRICS PROVIDERS

# \_\_\_\_\_



MAYO CLINIC

**Somali Prenatal Education Video Evaluation  
for Obstetric Providers**



Name:.....

Date:.....

Patient Number: .....

Video Viewed:

☐ “Prevention and Preparation”

☐ “Balancing Nutrition and Exercise”

☐ “Understanding Caesarean Birth”

☐ “Episiotomy: Understanding  
Individual Differences and Practices”

☐ “Pregnancy Myths and Facts”

☐ “A Father’s Changing Role”

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Provider Survey:

A1. Your patient viewed a prenatal education video in Somali during this visit. How *helpful* do you think this information was to the patient?

1 ☐                      2 ☐                      3 ☐                      4 ☐                      5 ☐  
Not helpful at all                      Somewhat helpful                      Extremely helpful

A2. Would you *recommend* to other providers that prenatal educational information be presented to Somali patients using a video format prior to obstetrical visits?

1 ☐                      2 ☐                      3 ☐                      4 ☐                      5 ☐  
Not helpful at all                      Somewhat helpful                      Extremely helpful

A3. How interactive was this visit compared to previous appointments with this patient?

☐                      ☐                      ☐                      ☐  
Less Interactive                      Same level of interaction                      More interactive                      Unable to evaluate

Thinking about the discussion you had with your patient today regarding prenatal care, which picture best reflects how that discussion went? Please mark the best answer to this question by putting an X in the box.



- ☐ **A**  
**Provider is the  
predominant speaker**



- ☐ **B**  
**Provider speaks most of the  
time with some patient  
questions.**



- ☐ **C**  
**Equal exchange of  
information**



- ☐ **D**  
**Patient is the predominant  
speaker**

Adapted from Montori, Weymiller and Mullen, 2003  
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APPENDIX J

SOMALI PRENATAL EDUCATION VIDEO EVALUATION  
FOR OBSTETRICS PATIENTS

# \_\_\_\_\_



**Somali Prenatal Education Video  
Evaluation  
for Obstetric Patients**

Patient Demographics

Name: \_\_\_\_\_

Gestational Age: \_\_\_\_\_

Date: \_\_\_\_\_

Gravida/Para: \_\_\_\_\_

Patient Number: \_\_\_\_\_

Patient Age: \_\_\_\_\_

Video Viewed:

☐ “Prevention and Preparation”

☐ “Balancing Nutrition and Exercise”

☐ “Understanding Caesarean Birth”

☐ “Episiotomy: Understanding Individual Differences and Practices”

☐ “Pregnancy Myths and Facts”

☐ “A Father’s Changing Role”

The following questions are about the Somali prenatal education program you watched before your clinical visit, and whether the information was helpful in learning about pregnancy-related issues.

Questions A1 through A5 refer to the information about the prenatal education program you watched during this visit. Please mark the best answer to each of these questions by putting an X over the number you select.

A1. How would you describe the *amount* of information about the prenatal education program you viewed during this visit?

1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
Too little information			Just the right amount of information			Too much information

A2. How would you describe the *clarity* of information in the prenatal education program you viewed during this visit?

1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
Not clear at all			Somewhat clear			Extremely clear

A3. How *helpful* was the prenatal education information you watched during this visit?

1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
Not helpful at all			Somewhat helpful			Extremely helpful

A4. Do you think this video is appropriate for Somali patients?

1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
Yes, I would strongly recommend it			Not sure whether to recommend it or not			No, I would strongly recommend against it

A5. Would you recommend this prenatal education program to other Somali patients?

1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
Yes, I would strongly recommend it			Not sure whether to recommend it or not			No, I would strongly recommend against it

A6. Would you want to get other health information in the same way that you received information about prenatal care during this visit?

1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>
Yes, for sure			Not sure			No, not at all

A7. What language do you primarily speak at home?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Somali	English	Other _____

A8. What language do you prefer to receive your health information?

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Somali	English	Other _____

## APPENDIX K

### RESULTS OF A PILOT PROJECT TO EVALUATE SOMALI PRENATAL EDUCATION VIDEOS IN A CLINICAL SETTING

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Broad differences in pregnancy-related health care expectations exist between Somali women and obstetrics practitioners. Focus groups identifying key themes led to the development of six targeted prenatal educational videos in Somali. Originally developed for Somali TV, topics include preparation for pregnancy, nutrition and exercise, pregnancy myths and facts, the father's role, episiotomies, and cesarean sections. The purpose of this study was to evaluate the videos in a clinical setting. Patient acceptability and improved patient-provider communication were key outcomes. Study participants were recruited when presenting for regularly scheduled prenatal appointments. Programs were viewed prior to the clinical appointment and participants completed an 8-item survey. Following the clinical visit, providers completed a 4-item survey to indicate the video's helpfulness in facilitating patient-provider interaction. Sixteen patients (mean age 29.4 years, gravida 4.6, and para 3.0) viewed at least one video. Results showed that all women rated the videos as "appropriate for Somali patients", 74% were rated as "extremely clear", 61% indicated the information was "just the right amount" and "extremely helpful". The language primarily spoken at home was Somali (69%) and 63% indicated Somali as the preferred language to receive their health information. Providers completing surveys indicated 36% of appointments were "more interactive" with 94% finding the videos as "somewhat" or

“extremely helpful.” All providers “recommended” or “strongly recommended” that prenatal educational material be presented using a culturally-appropriate, video format. These results will inform a larger study measuring the quality of patient-provider communication comparing the intervention to a control group (standard of care).

Following this session, participants will be able to:

1. Describe methods to develop culturally-specific patient education materials
2. Define 3 reasons why videos are an acceptable format for Somali patients
- 3) Indicate an understanding of patient-provider communication and health outcomes.

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