A Study of Pregnancy and Birth Outcomes among African-Born Women Living in Utah

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Executive Summary

Complications during pregnancy, birth, and early infancy (known as "perinatal complications") can have a lasting effect on children's development. Research suggests that, within countries of resettlement, such complications can be particularly acute among resettled African refugee women. Though many U.S. states now have significant African refugee populations, health-care providers and policymakers may not be aware of the particular challenges facing African-born refugee women and their children.

This report compares the perinatal complications experienced by African-born Black women—the majority of whom are assumed to be refugees, based on their low education levels and countries of origin—with those of U.S.-born White, non-Hispanic women who gave birth in Utah between 2002 and 2008. Using data from Utah birth certificates, it identifies numerous significant differences between these two groups.

Health-care providers and policymakers may not be aware of the particular challenges facing African-born refugee women and their children.

On average, the African-born mothers had lower levels of education and they were more likely to be single—two factors often accompanied by a relatively low family income. Women in the African-born group were slightly more likely to be underweight (9 percent, compared with 6 percent for the U.S.-born cohort), or overweight or obese (38 percent, compared with 35 percent); they were also much more likely to be under the age of 20 or over the age of 40. All of these factors are associated with perinatal complications.

A look at study participants' medical history revealed that a larger share of the African-born group had suffered from past complications during childbirth and systemic diseases such as lung and renal disease. The perinatal complications they experienced included anemia and high blood pressure during pregnancy, and cesarean and premature births. The infant mortality rate was higher among the African born than the U.S.-born mothers. Notably, almost half of the African-born women in this study received inadequate prenatal care.

These and other problems can have long-term negative effects on the health and development of women, children, and their families. While adequate prenatal care can offset some perinatal complications, research suggests African refugee women encounter numerous barriers to care. These include language and cultural differences, inadequate translation services, and inadequate transportation. Health-care providers and policymakers would do well to work with resettlement agencies and representatives of African refugee communities to address barriers to care, provide culturally sensitive services, and disseminate clear information about how women can access these services. Meanwhile, it is crucial that health-care providers understand the risks faced by this population and learn to communicate important information in a culturally sensitive manner. These actions, among others, may improve birth outcomes, reduce complications, and assure normal child development.

I. Introduction

The African refugee populations in many U.S. states, including Utah, are growing. Between fiscal years (FY) 2004 and 2013, the United States admitted about 152,000 African refugees; of these, 45 percent came from Somalia, 11 percent from Liberia, 9 percent from Sudan, 8 percent apiece from the Democratic

Republic of the Congo and Eritrea, and 7 percent from Burundi and Ethiopia.[1] These populations have particular health-care needs, including for obstetrical care. To ensure the short- and long-term health of African-born refugee women and their children, it is important for health-care systems, health-care providers, and policymakers to understand the complications that African-born mothers experience during pregnancy, childbirth, and the early infancy of their children. Many of these perinatal complications can be prevented or diminished if identified and treated early during the pregnancy.

In any examination of perinatal outcomes, it is important to understand that two distinct organisms are involved in the process of fetal development and birth: the mother and the infant.[2] While infants are naturally resilient, they are nevertheless affected by the mother's physical and mental health. The relationship between maternal and infant health is a delicate balance. Prior to conception and during pregnancy, labor, and birth, a health problem in the mother may set into motion a cascade of events that negatively affects the health of the infant, including physical and cognitive development. Such problems include maternal stress, high blood pressure, and diabetes. The number of past pregnancies and their spacing can also affect maternal and infant health. Meanwhile, labor outcomes may be affected by the position of the fetus, amniotic fluid levels, and indications of fetal distress. Each of these, in turn, affects the neurologic development and status of the infant, with long-term consequences for the cognitive development of the child.

Many of these conditions in infants and children can be prevented or diminished, if identified and treated early on in the pregnancy. Therefore, it is imperative that health-care providers fully understand the common perinatal complications—and risk factors associated with them—experienced by mothers from different backgrounds. This report focuses on the experiences of African-born Black women, the majority of whom are refugees, who gave birth in Utah. It utilizes state-level administration data on births from FY 2002 to FY 2008 to identify the perinatal outcomes and risk factors of these women. Comparisons are drawn with the birth outcomes of U.S.-born White, non-Hispanic women, and policy recommendations for Utah health-care systems, health-care providers, policymakers, and resettlement agencies are discussed.

II. Background

Utah resettled more than 1,400 African refugees between FY 2002-08—the years covered in this study—and around 2,100 between FY 2009-14.[3] During these years, most African refugees came to Utah from sub-Saharan Africa: Somalia, Sudan and South Sudan, Kenya, Burundi, Tanzania, and Liberia.[4] Utah has become a resettlement site for African-born refugees because of the presence of supportive local nongovernmental and governmental agencies: the International Rescue Committee (IRC), Catholic Community Services (CCS), Refugee and Immigration Center at Asian Association of Utah, and the Refugee Services Office and Temporary Assistance for Needy Families (TANF) program within the Utah Department of Workforce Services.[5] These offices and agencies help refugees secure housing, find employment, establish health care, enroll in English classes, access translation services, and enroll in available federal and state assistance programs for specific periods after relocation.

1 U.S. Department of Homeland Security (DHS), Office of Immigration Statistics, "Refugee Arrivals by Region and Country of Nationality: Fiscal Years 2004 to 2013," in *Yearbook of Immigration Statistics: 2013* (Washington, DC: DHS, 2014), www.dhs.gov/yearbook-immigration-statistics-2013-refugees-and-asylees.

2 Throughout this report, the word "infant" is used to indicate a baby in the fetus, neonate, newborn, and infant stages.

3 Data for fiscal year (FY) 2002 to FY 2008 are from the Utah Refugee Health Access Database, Refugee Health Program and were provided to the authors by the Utah Refugee Services Office on October 15, 2014; data for FY 2009 to FY 2014 are from the federal Office of Refugee Resettlement (ORR), "Refugee Arrival Data—Overseas Refugee Arrival Data," accessed June 1, 2015, www.acf.hhs.gov/programs/orr/resource/refugee-arrival-data.

4 These top countries of origin are arranged from most common (Somalia) to less common (Liberia). Data from the Utah Refugee Health Access Database.

5 Authors' correspondence with the Utah Refugee Services Office, January 13, 2015.

Many African refugee groups place great value on large families. For comparison, in 2013 the fertility rate in sub-Saharan Africa was 5.05 (births per woman), but 1.87 in the United States.[6] Thus, obstetrical care is an important part of these refugees' overall health-care needs.

In general, research suggests that African-born women living in the United States and other developed countries experience a higher incidence of certain perinatal conditions—as well as higher neonatal or infant mortality rates—than the general populations of these countries.[7] Sub-Saharan refugee women were found to have a larger number of pregnancies, poorer access to prenatal care, and increased incidence of anemia than the general population.[8] These women were more likely to have a cesarean birth (especially for their first child), which is associated with maternal and neonatal complications.[9] Interestingly, they were less likely to have a preterm or low-birth-weight infant than were native-born women.[10] But their newborns were more likely to undergo a lengthy hospital stay and be put on a ventilator to breathe.[11]

Refugees ... encounter a variety of barriers to accessing health care, and thus to identifying and preventing perinatal complications.

Importantly, maternal stress has been associated with a number of perinatal complications.[12] Refugees are vulnerable to post-traumatic stress disorder, anxiety, and depression. This is in large part due to the experiences they had before resettlement. However, even in the relative safety of their new environments, resettled refugees often experience stress while finding employment, learning a new language, adapting to a new culture, caring for family members, and simultaneously dealing with past traumas.[13] Factors such as social isolation and discrimination can further increase stress among refugees after resettlement in the United States.[14]

Refugees also encounter a variety of barriers to accessing health care, and thus to identifying and preventing perinatal complications. A lack of timely and accessible translation and interpretation services,[15]

6 World Bank, "Fertility Rate, Total (Births per Woman)," accessed June 1, 2015, http://data.worldbank.org/indicator/SP.DYN.TFRT.IN.

7 Mika Gissler et al., "Stillbirths and Infant Deaths among Migrants in Industrialized Countries," *Acta Obstetrica et Gynecologica Scandinavica* 88, no. 2 (2009): 134–48.

8 Mary Carolan, "Pregnancy Health Status of Sub-Saharan Refugee Women Who Have Resettled in Developed Countries: A Review of the Literature," *Midwifery* 26, no. 4 (2010): 407–14.

9 Lisa Merry, Rhonda Small, Béatrice Blondel, and Anita J. Gagnon, "International Migration and Caesarean Birth: A Systematic Review and Meta-Analysis," *BMC Pregnancy Childbirth* 13 (2013): 27.

10 Rhonda Small et al., "Somali Women and Their Pregnancy Outcomes Postmigration: Data from Six Receiving Countries," *BJOG* 115, no. 13 (2008): 1630–40; Marcelo L. Urquia et al., "International Migration and Adverse Birth Outcomes: Role of Ethnicity, Region of Origin and Destination," *Journal of Epidemiology & Community Health* 64, no. 3 (2010): 243–51.

11 Other risk factors included a higher occurrence of meconium aspiration (in which the baby's first bowel movement in utero clogs their air passages and might need to be removed manually after birth) and lower Apgar scores (on an initial assessment of the baby's responses and vital signs). See E. Blair Johnson, Susan D. Reed, Jane Hitti, and Maneesh Batra, "Increased Risk of Adverse Pregnancy Outcome among Somali Immigrants in Washington State," *American Journal of Obstetrics and Gynecology* 193, no. 2 (2005): 475–82.

12 Michael S. Cardwell, "Stress: Pregnancy Considerations," *Obstetrical & Gynecological Survey* 68, no. 2 (2013): 119–29.

13 B. Heidi Ellis et al., *Mental Health Risks and Resilience among Somali and Bhutanese Refugee Parents* (Washington, DC: Migration Policy Institute, 2016), www.migrationpolicy.org/research/mental-health-risks-and-resilience-among-somali-and-bhutanese-refugee-parents,

14 Theresa S. Betancourt et al., "We Left One War and Came to Another: Resource Loss, Acculturative Stress, and Caregiver-Child Relationships in Somali Refugee Families," *Cultural Diversity & Ethnic Minority Psychology* 21, no. 1 (2015): 114–25.

15 Nathaly Herrel et al., "Somali Refugee Women Speak out About Their Needs for Care During Pregnancy and Delivery," *Journal of Midwifery & Womens Health* 49, no. 4 (2004): 345–49; Catherine Ruhl and Barbara Moran, "The Clinical Content of Preconception Care: Preconception Care for Special Populations," *American Journal of Obstetrics and Gynecology* 199, no. 6, Supplement 2 (2008): S384–88.

despite federal requirements, means that refugees cannot always understand or be understood at the health-care site.[16] Health-care providers may struggle to quickly obtain female translators to relay sensitive information.[17] Additionally, health-care systems and providers may not be equipped to provide culturally sensitive care, no matter how well intentioned.[18] Financial issues present another set of barriers. While access to care is often initially covered through public assistance, refugees may struggle to understand the U.S. health-care system and billing processes. Additional health-care costs not covered by public assistance may place further stress on family finances. Also, at some point, public assistance for health care is no longer available to those with refugee status, creating further financial difficulties.[19] Meanwhile, perinatal care may not be offered in a nearby or convenient location. As many African-born female refugees do not drive, they may require male accompaniment and depend on family members or others for transportation. Public transportation, where available, may be cumbersome.[20]

Health-care systems and providers may not be equipped to provide culturally sensitive care, no matter how well intentioned.

III. Methods

Data for this study come from the birth certificates of the 365,287 infants born in Utah between January 1, 2002 and December 31, 2008. Each birth certificate includes demographic information provided by a parent; medical data on risk factors and birth outcomes; and information on the country of birth, race, and Hispanic ethnicity of both parents.

Two groups are analyzed in this study: African-born Black and U.S.-born White, non-Hispanic women. The U.S.-born White, non-Hispanic group was chosen as the reference because it comprises the majority of Utah's population and is covered by most relevant U.S. studies. For the purposes of this study, women are classified as U.S.-born White, non-Hispanic if their places of birth are within the United States, their race is White, and they did not identify as being of Hispanic origin. Women are classified as African-born Black if their race is listed as Black/African American and their country of birth is in Africa.

Women who were not assigned to either of these two categories were eliminated from the analysis, along with women having twins, triplets, or higher order multiples (as these births are less common and typically involve more complications). After these eliminations, there were 838 African-born Black women and 271,061 U.S.-born White, non-Hispanic women in the study dataset (see Table 1).

16 Under Title VI of the Civil Rights Act of 1964 and Executive Order 13166, *Improving Access to Services for Persons with Limited English Proficiency* (2000), any health-care provider that receives federal funds is required to provide language access to all of its patients.

17 Linda Murray, Carol Windsor, Elizabeth Parker, and Odette Tewfik, "The Experiences of African Women Giving Birth in Brisbane, Australia," *Health Care for Women International* 31, no. 5 (2010): 458–72.

18 Ibid.

19 Murray, Windsor, Parker, and Twefik, "The Experiences of African Women;" Katherine Yun, Elena Fuentes-Afflick, and Mayur M. Desai, "Prevalence of Chronic Disease and Insurance Coverage among Refugees in the United States," *Journal of Immigrant and Minority Health* 14, no. 6 (2012): 933–40.

20 See, for example, Ignacio Correa-Velez and Jennifer Ryan, "Developing a Best Practice Model of Refugee Maternity Care," *Women Birth* 25, no. 1 (2012): 13–22.

Table 1. Countries of Origin of Sub-Saharan African-Born Mothers in the Utah Study Sample, 2002–08

Country or Region of Origin (self-reported)	Percentage of Total Sample (n=838)
Somalia	39.1
Sudan	24.2
Nigeria	7.9
Ethiopia	6.1
Ghana	5.3
Liberia	4.7
Kenya	1.8
Cameroon	1.4
Africa, not specified	1.2
West Africa	1.1
Sierra Leone	0.8
Zimbabwe	0.8
Burundi	0.7
Congo*	0.7

* The Congo category spans both Democratic Republic of Congo and the Republic of Congo, as the country of mother's birth is self-reported and respondents at times wrote "Congo."

Most African-born women in this study were born in sub-Saharan Africa (the majority, 63 percent, came from Somalia or Sudan); very small numbers came from other African countries or did not specify their country of origin on their child's birth certificate, simply answering "Africa" (see Table 1). More than three-quarters of the women were from countries that are common sources of refugees resettled in the United States. These women also reported a low level of education, consistent with refugee status.[21]

Additional birth certificate variables analyzed included: maternal age, maternal education level, paternal education level, marital status, urban/rural residence, prepregnant body mass index, delivery method, birth interval, adequacy of prenatal care, number of previous live births, gestational age, infant weight at delivery, maternal risk factors, conditions of the newborn, and complications of labor and delivery. Other variables were also examined, but were excluded due to small samples.[22]

IV. Results

The data reveal clear demographic differences between the African-born and U.S.-born White, non-Hispanic groups, several of which are linked to worse birth outcomes (see Appendix Table A-1). A larger percentage of the African-born women in the sample were under the age of 20 or over the age of 40, two

21 Paul M. Schyve, "Language Differences as a Barrier to Quality and Safety in Health Care: The Joint Commission Perspective," *Journal of General Internal Medicine* 22, Supplement 2 (2007): 360–61; Josefin Wångdahl, Per Lytsy, Lena Mårtensson, and Ragnar Westerling, "Health Literacy Among Refugees in Sweden: A Cross-Sectional Study," *BMC Public Health* 14, no. 1 (2014): 1; Paul Anisef, Robert Sweet, Maria Adamuti-Trache, and Sarah V. Wayland, *Explaining Self-Reported Language Proficiency Gains of Immigrant Women* (Ottawa: Citizenship and Immigration Canada, 2012).

22 Continuous variables were grouped into categories where appropriate. Data regarding maternal risks, obstetric complications, and infant outcomes is submitted as a checkbox. If a variable was checked, it was coded as existing. If unchecked, it was impossible to determine if the variable was negative or missing. Univariate analysis and multivariable logistic regression were conducted. Data were analyzed using SAS 9.2. Both the University of Utah and Utah Department of Health Institutional Review Boards approved the study.

age groups that are at particular risk for adverse birth outcomes. The African-born women had lower levels of education: half had less than a high school education (compared with just 7 percent of the U.S.-born group) and only 13 percent were college graduates (compared with 31 percent of the U.S.-born group). A greater share of African-born women were single (20 percent, compared with 13 percent of the reference group). Both low education levels and unmarried status are often accompanied by a relatively low level of family income. Women in the African-born group were slightly more likely to be underweight (9 percent, compared with 6 percent) or overweight or obese (38 percent, compared with 35 percent), factors that can lead to perinatal complications.

A look at study participants' medical history revealed that a larger share of the African-born group had suffered from systemic diseases that included lung disease and renal disease (see Appendix Table A-2). Certain obstetrical problems were more common among the African-born women, including pregnancy induced hypertension, eclampsia, too little or too much amniotic fluid, and uterine bleeding (see Appendix Table A-3). The African-born group also had a larger number of total pregnancies (i.e., parity), and a higher share had interpregnancy intervals of less than 12 months. Notably, almost half of the African-born mothers in this study received inadequate prenatal care.

Certain obstetrical problems were more common among the African-born women.

The African-born women were also more likely to experience intrapartum (the period encompassing labor and birth) and infant complications. They were more likely to have an initial cesarean birth, a vaginal birth after cesarean (VBAC), rapid labors (less than three hours), breech or other fetal malpositions,[23] prolonged/dysfunctional labors, and "other excessive bleeding" than women in the White, non-Hispanic reference group. In part because of these complications, African-born mothers were at greater risk for fetal and newborn problems such as moderate to heavy meconium (passage of stool while in the uterus), fetal distress, small size for gestational age, and in rare cases, infant death (see Appendix Table A-4).[24]

V. Discussion

The maternal and infant complications identified in this study are associated with numerous long-term health and development issues for the women involved, their infants, and ultimately, their families. It is difficult to disassociate perinatal complications of the mother from those of the infant. While the study suggests that African-born women and their children are at particular risk for a variety of health problems, this must be examined in the context of other perinatal and refugee health studies. Further research might also distinguish outcomes across immigrants' various countries of origin and sociodemographic backgrounds, as African refugees are not a homogeneous group. (Utah currently does not capture information on the clan or tribal affiliations of its refugee population.)

Although Utah is generally known for its high numbers of pregnancies—as of 2014, it had the highest birth rate of any U.S. state[25]—this trend was particularly pronounced among the African-born women in this study. Compared with the reference group, African-born women had higher parities, shorter intervals

23 Anwar H. Nassar et al., "Grandmultiparas in Modern Obstetrics," *American Journal of Perinatology* 23, no. 6 (2006): 345–49.

24 Jun Bai, Felix Wong, Adrian Bauman, and Mohammed Mohsin, "Parity and Pregnancy Outcomes," *American Journal of Obstetrics and Gynecology* 186, no. 2 (2002): 274–78; Agota Babinszki et al., "Perinatal Outcome in Grand and Great-Grand Multiparity: Effects of Parity on Obstetric Risk Factors," *American Journal of Obstetrics and Gynecology* 181, no. 3 (1999): 669–74.

25 Utah Department of Health, "Indicator-Based Information System for Public Health (IBIS-PH)—Complete Health Indicator Report of Birth Rates," updated December 9, 2014, http://ibis.health.utah.gov/indicator/complete_profile/BrthRat.html.

between pregnancies, older age at childbirth (averaging over 35), and several of the associated maternal and infant complications consistent with others' findings.[26] This may reflect low use of family planning methods for religious reasons, lack of access to family planning methods, or cultural preferences for larger families among African-born women.[27]

Early and continuous perinatal care aids the prevention or early identification of a variety of treatable conditions in both mother and infant—conditions that can otherwise affect the long-term health of the child. Inadequate prenatal care—that is, an insufficient number of prenatal visits, initiated too late in pregnancy—has been identified as a problem among African refugee women in this and other studies.[28] For many African-born women, pregnancy is considered a normal healthy state; accessing medical care in early pregnancy is not the cultural norm.[29]

The African-born women in this study were more likely to have a cesarean birth.

If undetected, the health problems discussed here can lead to severe complications down the road. Severe anemia may necessitate medical attention soon after arrival, and in some cases may even prevent resettlement. In pregnant women, excessively high blood pressure can compromise the oxygen supply from the placenta to the fetal brain. This can in turn lead to a variety of neurological disorders in children, including cerebral palsy, epilepsy, and attention deficit hyperactivity disorder.[30]

In accordance with other national and international studies, this study found that the African-born group did not have significantly different rates of preterm births than the U.S.-born group, even for women with histories of preterm births.[31] However, the African-born women in this study were more likely to have a cesarean birth: a finding that is corroborated by other reports.[32] While cesarean surgery can be a lifesaving procedure, its overuse in the United States is associated with an array of problems. This study found that, compared with their U.S.-born White peers, African-born women had higher rates of fetal distress (a general term that applies to changes in fetal heart rates and rhythms during labor)[33] and infant death, and were more likely to have low levels of amniotic fluid—points also corroborated in other

26 Mary Carolan and Loris Cassar, "Antenatal Care Perceptions of Pregnant African Women Attending Maternity Services in Melbourne, Australia," *Midwifery* 26, no. 2 (2010): 189–201; Carolan, "Pregnancy Health Status of Sub-Saharan Refugee Women."

27 Extending Service Delivery Project, *Somali Refugee Attitudes, Perceptions, and Knowledge of Reproductive Health, Family Planning, and Gender-Based Violence* (Washington, DC: U.S. Agency for International Development, 2008), http://pdf.usaid.gov/pdf_docs/pnaec190.pdf; Huguette Comerasamy et al., "The Acceptability and Use of Contraception: A Prospective Study of Somalian Women's Attitudes," *Journal of Obstetrics and Gynaecology* 23, no. 4 (2003): 412–15.

28 María Paz-Zulueta et al., "The Role of Prenatal Care and Social Risk Factors in the Relationship between Immigrant Status and Neonatal Morbidity: A Retrospective Cohort Study," *PLoS One* 10, no. 3 (2015): e0120765; Tharani Kandasamy et al., "Obstetric Risks and Outcomes of Refugee Women at a Single Centre in Toronto," *Journal of Obstetrics and Gynaecology Canada* 36, no. 4 (2014): 296–302.

29 Carolan and Cassar, "Antenatal Care Perceptions of Pregnant African Women;" Nancy Hill, Emmy Hunt, and Kristiina Hyrkäs, "Somali Immigrant Women's Health Care Experiences and Beliefs Regarding Pregnancy and Birth in the United States," *Journal of Transcultural Nursing* 23, no. 1 (2012): 72–81.

30 Xi-Kuan Chen et al., "Pregnancy-Induced Hypertension and Infant Mortality: Roles of Birthweight Centiles and Gestational Age," *BJOG* 114, no. 1 (2007): 24-31.

31 Carolan, "Pregnancy Health Status of Sub-Saharan Refugee Women;" Lauren S. Miller, Jonnell Allen Robinson, and Donald A. Cibula, "Healthy Immigrant Effect: Preterm Births among Immigrants and Refugees in Syracuse, NY," *Maternal and Child Health Journal* 20, no. 2 (2016): 484-93.

32 See, for example, Merry, Small, Blondel, and Gagnon, "International Migration and Caesarean Birth: A Systematic Review and Meta-Analysis."

33 Contributing to additional data collection problems, "fetal distress" and "prolonged/dysfunctional labor" are categories on birth certificates and are often diagnosed by different and/or subjective criteria.

studies.[34] Fetal distress and low levels of amniotic fluid put laboring mothers at higher risk for a cesarean birth.

While the reasons for the higher rates of cesarean births in the African-origin group are not conclusively known, psychosocial factors may play a role. For example, in a small study of Somali women who had recently given birth, many of the women interviewed shared a desire for more information on what to expect in the delivery room, including pain medications and the roles of hospital staff.[35] These informational needs suggest that hospital childbirth in the United States is often an unknown and intimidating experience for these women, causing stress and fear. Some African-born women have reported that they are frustrated by traditional Western perinatal procedures and fear death from a cesarean birth.[36]

VI. Limitations

A lack of homogeneity of designs and definitions between this study and other studies makes it difficult to draw more than broad comparisons. The great variation between different groups of African migrants in physique, language abilities, and education levels contributes to difficulties of generalization. It is also possible that this study includes a few African-born women living in Utah under a different immigration status, like students.

The Utah birth certificates used for the study were often missing data on women's health histories, for example, maternal height and prepregnancy weight, previous perinatal conditions or complications, birth weight of previous babies, and preexisting maternal health problems. The birth certificates did not indicate possible barriers to prenatal care (such as poor understanding of the U.S. health-care system, no available transportation to appointments, and lack of culturally and linguistically appropriate care), which are thought to contribute to poor outcomes for African refugee women in Utah. Finally, data from hospital records on the reasons women underwent cesarean births were not required on birth certificates.

VII. Policy Implications

African-born refugee women experience more perinatal complications than other U.S. populations, placing them and their infants at greater risk. The incidence of health problems in both mothers and infants could be reduced by facilitating access to prenatal care, educating providers about African-born populations, and redesigning health-care systems to provide more tailored care. Implementing relevant policy changes would involve resettlement agencies, health-care providers and systems, refugee organizations, and others.

Resettlement agencies often lack the resources and funding to fully address the needs of the refugee populations they serve. With increased governmental funding, these specialized organizations could expand their health screening and health-care orientation services to address some of the logistical barriers discussed. African-born women would benefit from additional health education, orientation to the U.S.

34 See, for example, Small et al., "Somali Women and Their Pregnancy Outcomes Postmigration;" Johnson, Reed, Hitti, and Batra, "Increased Risk of Adverse Pregnancy Outcome."

35 Herrel et al., "Somali Refugee Women Speak out About Their Needs."

36 Maithri Ameresekere et al., "Somali Immigrant Women's Perceptions of Cesarean Delivery and Patient-Provider Communication Surrounding Female Circumcision and Childbirth in the USA," *International Journal of Gynaecology & Obstetrics* 115, no. 3 (2011): 227–30; Elizabeth Brown, Jennifer Carroll, Colleen Fogarty, and Cristina Holt, "'They Get a C-Section...They Gonna Die': Somali Women's Fears of Obstetrical Interventions in the United States," *Journal of Transcultural Nursing* 21, no. 3 (2010): 220–27.

health-care system (including information about prenatal care), and improved transportation options. Newly resettled refugees may also require further health services.

Closer collaboration with representatives of African communities can help health-care systems and administrators understand and address some of the barriers revealed in this study. Orienting refugees to U.S. health-care systems (for example, by explaining prenatal care, hospital delivery procedures, and reimbursement for care) could reduce barriers while ultimately decreasing health-care costs. Providing more readily available, gender-appropriate, and culturally sensitive translation and interpretation services, as required under federal law, would greatly facilitate the provision of care. While diversifying the health-care workforce to include more professionals from within African-born refugee communities is an important long-term goal, educating existing support staff to provide information in culturally sensitive and clear terms may be achieved in the short term. Community health workers might also be recruited from within refugee communities to provide much-needed liaison and education services.

Health-care providers at all levels can learn more about the specific needs of their refugee patients. Educators would do well to provide a variety of learning experiences for health-care students to increase their cross-cultural understanding and sensitivity. Employers might provide ongoing professional development specific to the challenges faced by refugees. Many educational opportunities are available at little or no cost. For example, the Cultural Orientation Resource Center (housed at the nonprofit Center for Applied Linguistics in Washington, DC) provides free cultural orientation resources for various refugee populations.[37] Similarly, EthnoMed—a joint initiative of the University of Washington and Harborview Medical Center—provides free medical and cultural information about refugee and immigrant populations living in the Seattle area.[38]

Health-care providers at all levels can learn more about the specific needs of their refugee patients.

Even within resource constraints, there are a number of steps that policymakers and health-care and education providers can take to improve the birth outcomes of African-born refugees in the United States. Increasing this vulnerable group's access to perinatal care is critical. Greater care, provided earlier, will likely improve the long-term health of both mothers and infants, and result in healthier families.

37 For more information, see Cultural Orientation Resource Center, "Home," accessed June 1, 2015, www.culturalorientation.net.

38 EthnoMed, "About EthnoMed," accessed June 1, 2015, http://ethnomed.org/about.

Appendix

Table A-1. Demographic Differences between Sub-Saharan African-Born and U.S.-Born Mothers in the Utah Sample

Maternal Characteristics	African Women	95% Confidence Interval	U.S.-Born White/Non-Hispanic Women	95% Confidence Interval	African Women Significantly Different from U.S.-Born/Non-Hispanic White Women?
Maternal Age					Yes
< 20	5.9%	(4.3, 7.5)	5.2%	(5.1, 5.2)	
20-29	56.6%	(51.6, 61.6)	65.9%	(65.5, 66.1)	
30-39	35.1%	(31.1, 39.0)	27.6%	(27.4, 27.8)	
40 +	2.4%	(1.4, 3.5)	1.4%	(1.4, 1.5)	
Education Level – Mother					Yes
Less than high school	50.0%	(45.1, 54.9)	7.0%	(7.0, 7.1)	
Completed high school	24.3%	(20.9, 27.7)	30.1%	(30.6, 31.0)	
Some college	12.3%	(9.9, 14.8)	31.7%	(31.5, 31.9)	
College graduate	13.3%	(10.8, 15.9)	30.5%	(30.2, 30.7)	
Marital Status					Yes
Married	79.4%	(73.5, 85.3)	87.0%	(86.6, 87.3)	
Unmarried	20.1%	(17.6, 23.6)	13.0%	(12.9, 13.2)	
Body Mass Index Prior to Pregnancy					Yes
Underweight	9.0%	(6.7, 11.3)	5.8%	(5.7, 5.9)	
Normal	53.4%	(47.8, 59.0)	59.2%	(58.9, 59.5)	
Overweight	27.1%	(23.1, 31.1)	20.4%	(20.3, 20.6)	
Obese	10.5%	(8.0, 13.0)	14.6%	(14.5, 14.8)	
Delivery Method					
Vaginal birth	69.4%	(63.9, 75.0)	77.3%	(77.0, 77.7)	Yes
Vaginal birth after cesarean	4.1%	(2.7, 5.4)	2.1%	(2.1, 2.2)	Yes
First cesarean birth	17.3%	(14.5, 20.0)	11.3%	(11.2, 11.5)	Yes
Repeat cesarean birth	9.3%	(7.2, 11.3)	9.2%	(9.1, 9.3)	No
Birth Interval (Previous Birth to Conception)					Yes
0-6 Months	16.0%	(12.4, 19.6)	5.0%	(4.9, 5.2)	
7-12 Months	19.7%	(15.6, 23.6)	13.6%	(13.4, 13.8)	
13-18 Months	15.4%	(11.8, 18.9)	17.7%	(17.5, 17.9)	
19-36 Months	27.7%	(23.0, 32.5)	38.4%	(38.1, 38.7)	
37+ Months	21.3%	(17,1, 25.5)	25.3%	(25.1, 25.6)	
Number of Previous Live Births					Yes
None	24.2%	(20.9, 27.5)	34.3%	(26.9, 27.3)	
1-5	67.2%	(61.7, 72.7)	64.4%	(641.1, 64.7)	
6+	8.6%	(6.6, 10.5)	1.33%	(1.29, 1.38)	

Table A-2. Maternal Complications among Sub-Saharan African-Born and U.S.-Born Mothers in the Utah Sample*

Maternal Complications	African Women	95% Confidence Interval	U.S.-Born White/Non-Hispanic Women	95% Confidence Interval	African Women Significantly Different from U.S.-Born/Non-Hispanic White Women?
Acute or chronic lung disease	1.0%	(0.4, 1.7)	3.6%	(3.5, 3.6)	Yes
Pregnancy-induced high blood pressure	3.8%	(2.5, 5.1)	5.7%	(5.6, 5.8)	Yes
Eclampsia	0.9%	(0.3, 1.6)	0.4%	(0.3, 0.4)	Yes
Too much or too little amniotic fluid	5.7%	(4.1, 7.3)	2.3%	(2.2, 2.3)	Yes
Previous infant 4,000+ grams	2.4%	(1.4, 3.5)	4.5%	(4.4, 4.6)	Yes
Previous preterm infant	1.9%	(0.9, 2.8)	4.0%	(3.9, 4.1)	Yes
Previous small-for-gestational-age infant	1.2%	(0.4, 1.9)	0.5%	(0.5, 0.5)	Yes
Kidney disease	1.2%	(0.4, 1.9)	2.9%	(2.8, 2.9)	Yes
Uterine bleeding	0.6%	(0.1, 1.1)	2.9%	(2.8, 3.0)	Yes
Maternal low blood iron	6.8%	(5.1, 8.6)	2.8%	(2.8, 2.9)	Yes
Inadequate prenatal care	48.4%	(43.6, 53.3)	16.6%	(16.5, 16.8)	Yes

* Other factors examined but not statistically significant included cardiac arrest and gestational diabetes.

Table A-3. Complications of Labor and Delivery among Sub-Saharan African-Born and U.S.-Born Mothers in the Utah Sample*

Complications of Labor and Delivery	African Women	95% Confidence Interval	U.S.-Born White/Non-Hispanic Women	95% Confidence Interval	African Women Significantly Different from U.S.-Born/Non-Hispanic White Women?
Meconium moderate/heavy	13.1%	(10.7, 15.5)	4.7%	(4.6, 4.8)	Yes
Placenta previa	0.9%	(0.3, 1.6)	0.4%	(0.4, 0.4)	Yes
Precipitous labor (labor lasting less than three hours)	7.0%	(5.2, 8.7)	2.0%	(1.9, 2.0)	Yes
Breech/malpresentation of fetus	7.3%	(5.5, 9.1)	5.7%	(5.6, 5.8)	Yes
Umbilical cord prolapse	0.6%	(0.1, 1.1)	0.3%	(0.2, 0.3)	Yes
Dysfunctional labor	5.6%	(4.0, 7.1)	3.4%	(3.4, 3.5)	Yes
Fetal distress	20.3%	(17.3, 23.3)	6.8%	(6.7, 6.9)	Yes
Other excessive bleeding	1.9%	(0.9, 2.8)	1.0%	(1.0, 1.1)	Yes
Induction of labor	19.8%	(16.8, 22.8)	36.7%	(36.5, 37.0)	Yes

* Other factors examined but not statistically significant included fever at delivery, premature rupture of membranes, placental abruption, prolonged labor, small maternal pelvis, and preterm delivery.

Table A-4. Fetal and Newborn Complications among Sub-Saharan African-Born and U.S.-Born Mothers in the Utah Sample*

Fetal and Newborn Complication	African Women	95% Confidence Interval	U.S.-Born White/Non-Hispanic Women	95% Confidence Interval	African Women Significantly Different from U.S.-Born/Non-Hispanic White Women?
Size for gestational age:					Yes
Small for gestational age	13.7%	(11.2, 16.1)	7.6%	(7.5, 7.7)	
Appropriate for gestational age	81.3%	(75.3, 87.4)	84.7%	(84.4, 85.0)	
Large for gestational age	5.0%	(3.5, 6.5)	7.7%	(7.6, 7.8)	
Low birth weight	8.5%	(6.5, 10.4)	6.5%	(6.4, 6.6)	Yes
Infant death	1.4%	(0.6, 2.2)	0.5%	(0.4, 0.5)	Yes
Meconium aspiration syndrome	0.6%	(0.1, 1.1)	0.2%	(0.2, 0.2)	Yes
Birth injury	3.4%	(2.1, 4.6)	1.4%	(1.3, 1.4)	Yes
Anemia	1.9%	(0.9, 2.8)	0.7%	(0.6, 0.7)	Yes

* Other factors examined but not statistically significant included assisted ventilation and respiratory distress syndrome.

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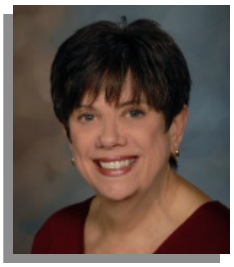

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