



REMHU - Revista Interdisciplinar da
Mobilidade Humana

ISSN: 1980-8585

remhu@csem.org.br

Centro Scalabriniano de Estudos
Migratórios
Brasil

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REMHU - Revista Interdisciplinar da Mobilidade Humana, vol. 21, núm. 40, enero-junio,
2013, pp. 163-176

Centro Scalabriniano de Estudos Migratórios
Brasília, Brasil

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HEALTH PROFILE OF BRAZILIAN MOTHERS IN MASSACHUSETTS IN THE TWENTY-FIRST CENTURY

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This paper describes the health profile of Brazilian mothers in Massachusetts according to data collected through Massachusetts Standard Certificate of Live Births (1989 revision) filed with the Massachusetts Registry of Vital Records and Statistics during 1999 and 2009. To our knowledge this is the first time that such information is reviewed with a focus on Brazilian immigrants. The findings of this article suggests that Brazilian mothers who gave birth in Massachusetts between 1999 and 2009 fared better than all mothers in Massachusetts in most obstetric health indicators considered.

Keywords: Brazilian mothers; Maternal health; Prenatal care of Brazilian mothers; Health of Brazilian immigrants in the U.S.; Immigrant health.

Introduction

Brazilian immigration to the U.S. and Massachusetts grew significantly in the mid-80s and continued into the mid-2000s.¹ The three most important

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¹ SUM, Andrew M. *et alii*. *Immigrant Workers and the Great American Job Machine: The Contributions of New Foreign Immigration to National and Regional Labor Force Growth in the 1990s*; SALES, Teresa. *Brazilians Away from Home*; SIQUEIRA, Carlos E.; JANSEN, Tiago. *Updating Demographic, Geographic, and Occupational Information on Brazilian Immigration to the United States*.

receiving states in the U.S. were Florida, Massachusetts and the New York/New Jersey area. The emigration patterns and pathways fluctuated during this time in response to immigration policy changes in the U.S. and socioeconomic conditions in Brazil. There was an overall increase in the number of Brazilians living in the U.S. over this same period, with many immigrants serving as support groups for migration of members of their extended social networks – an immigration pattern that may be characterized as a social network process.²

According to Siqueira and Jansen, most Brazilian immigrants are young and work in manual jobs in the construction and service sectors. Furthermore, they claim that Brazilian emigration to the U.S. has become a national phenomenon during the 2000s and that Brazilians have also settled during the 2000s in several new states in the U.S., such as Georgia, New Hampshire, Maryland, and Texas. Thus, national emigration from Brazil became national immigration in the U.S. In Massachusetts, the receiving hubs include a larger number of cities and new areas of residence have developed, suggesting a process of decentralization of the first wave of emigration in the mid to late 1980s.

According to the U.S. Census, the largest group of foreign nationals living in Massachusetts originates from Brazil.³ About 3% of all births in Massachusetts in 2009 were to Brazilian mothers—the fifth largest maternal ancestry group in that year, preceded only by American (39%), European (19%), Puerto Rican (6.5%), and African-American (3.7%) mothers.⁴

While it is possible to get accurate demographic and socio-economic data about Brazilian immigrants in the U.S. from regular surveys conducted by the U.S. Census Bureau, it is very difficult to obtain quantitative data on health conditions of the Brazilian immigrant population, because most sources do not identify Brazilians by country of birth. Most available data sources only include race and ethnicity questions that do not allow for clear identification of Brazilians. Massachusetts is one of the few states in the country that has produced some databases that identify the place of birth of patients or survey respondents.

Taking advantage of availability of reliable and valid data on certificates of birth collected between 1999 and 2009 from the Massachusetts Standard Certificate of Live Births (1989 revision) filed with the Massachusetts Registry of Vital Records and Statistics, this article describes the obstetric profile of Brazilian mothers in Massachusetts, comparing them with all mothers in

² SIQUEIRA, JANSEN, *op. cit.*; SALES, *op. cit.*

³ U.S. CENSUS BUREAU. *American Community Survey 5 Year Estimate 2005-2009*.

⁴ MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH. *Massachusetts Births 2009*.

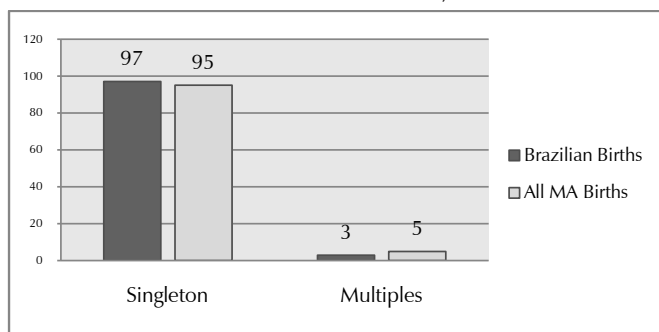
Massachusetts in the same period. The data include all births in that period for women who resided in Massachusetts. One limitation of the data is that some Brazilian mothers may have been counted more than once if they gave birth more than once during the ten year period. This database is the source for all figures presented in the article.

Though the data displayed in this article account for only a segment of the Brazilian population in Massachusetts, the breadth of health information offered about pre and post-natal conditions is significant. We know of no other publication that reviewed similar information about Brazilian immigrant mothers in the U.S. Thus, we hope to contribute to the literature about the health status of Brazilians in Massachusetts and the U.S. by focusing on important aspects of maternal and child health.

Health Profile of Brazilian Mothers in Massachusetts

There was a small relative majority (51.5%) of male compared to female (48.5%) births in Massachusetts between 1999 and 2009, which is equivalent to a sex-ratio at birth of 1.06. The sex-ratio at birth in the U.S. in 2002 was 1.05. According to 2000 Census and more recent American Community Survey (ACS) data, the gender distribution of Brazilians in the U.S was 54% female and 46% male. Between 1999 and 2009, an average of 97 % of births from Brazilian mothers (1, 695 births) included only one child compared to 95% for births from all mothers in Massachusetts (Figure 1). An average of only 3% of births from Brazilian mothers included multiple births, compared to an average of almost 5% for births for all mothers in the state.

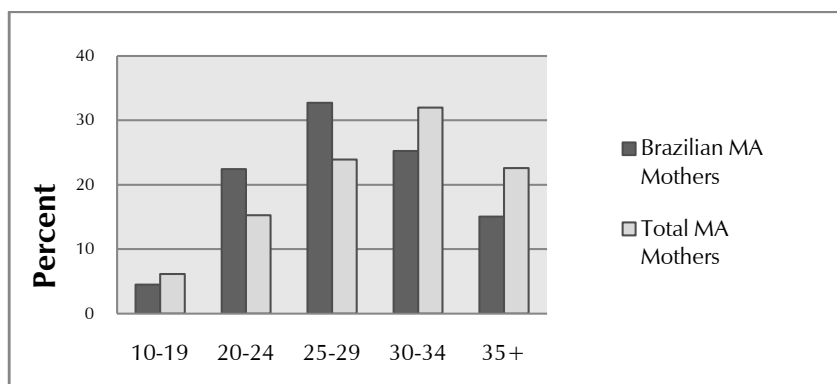
FIGURE 1
Relative Distribution of Single and Multiple Births for Brazilian and All Mothers in Massachusetts, 1999-2009



Source: Massachusetts Registry of Vital Records and Statistics.

Figure 2 shows that between 1999 and 2009 in Massachusetts there were fewer very young (10-19 years) and very old (35+ years) Brazilian child bearers than among all mothers giving birth in that decade. There was also a smaller percentage of 30-35 year old delivering mothers among Brazilians, as opposed to all delivering mothers. A higher percentage of Brazilian mothers (80%) gave birth between the ages of 20-35 than all Massachusetts mothers (71%). Why is it that Brazilian mothers delivered more during this middle-age range than all Massachusetts mothers? The teens in the Aught decade were born in the 1980s to early 1990s. While there was significant and increasing migration from Brazil to Massachusetts in that period, it was mainly composed of young adults before childbearing and those who left their young children in Brazil.⁵ The young Brazilians who were teens in the Aughts were perhaps mainly born in the U.S., which may account for variance in the teen delivery rate between Brazilian-born and all Massachusetts mothers during this period.

FIGURE 2
Proportional Age Distribution of Brazilian and All Mothers
in Massachusetts, 1999-2009



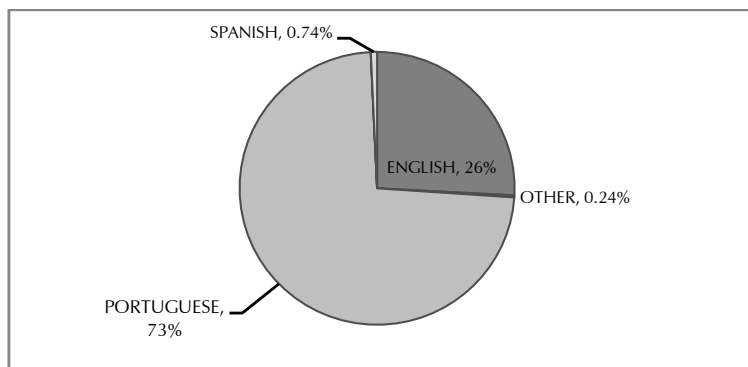
Source: Massachusetts Registry of Vital Records and Statistics.

As seen in Figure 3, twenty-six percent of Brazilian mothers reported that they prefer to read or discuss health-related materials in English while 73% prefer Portuguese and 1% prefers other languages (Figure 3). Although there is no data on birth certificates about time of residence in Massachusetts, it is likely that those Brazilian mothers who prefer English have higher level of fluency and competency in English than those who prefer Portuguese. Thus, it appears that about a quarter of Brazilian mothers would not

⁵ MARTES, Ana Cristina Braga. *Brasileiros nos Estados Unidos*.

have a language impediment to have regular social interactions with English speaking residents in Massachusetts.

FIGURE 3
Relative Preference of Language Use by Brazilian Mothers
in Massachusetts, 1999-2009



Source: Massachusetts Registry of Vital Records and Statistics.

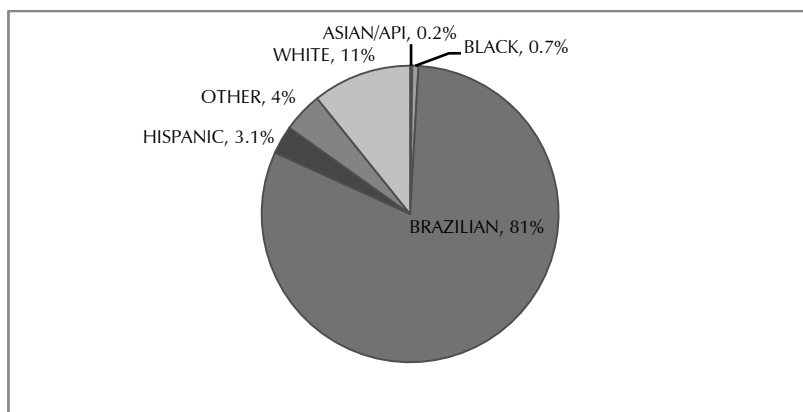
The large size of the Massachusetts birth certificate database allows for the first time a glimpse at the degree of interracial/interethnic marriages or intimate relationships between Brazilians and other races in Massachusetts. 69% of Brazilian mothers who had babies in Massachusetts between 1999 and 2009 reported that they were legally married while 31 % were not. Figure 4 shows that 81% of fathers reported that they were Brazilians, while 11% were Whites, 4% from other races, and 3% Hispanics. Asian and Black fathers combined were less than 1%. Given the high presence of whites in Massachusetts, it is not surprising that most Brazilian women who intermarried chose whites as the fathers of their children.

Based on this evidence, it appears that almost one in five Brazilian women in Massachusetts married out or had intimate relationships with men of other races or ethnicities. This statistic may overestimate the proportion of intermarriages because some Brazilian mothers may have been counted more than once, as mentioned before.

Even taking into consideration this potential bias, it appears that Brazilian females marry out more than native whites or Hispanic females. According to a report from the Pew Research Center based on 2010 Census and 2008-2010 ACS data, only 9% of white and Hispanic newlywed females in the U.S. marry men from another race or Hispanic origin.⁶

⁶ WANG, Wendy. *The Rise of Intermarriage*.

FIGURE 4
Relative Ethnic Distribution of Spouses or Partners of Brazilian Mothers
in Massachusetts, 1999-2009



Source: Massachusetts Registry of Vital Records and Statistics.

Rates of prematurity were somewhat lower in Brazilian mothers than among all Massachusetts delivering mothers as a whole (Figure 5). Medically speaking, the age range of 20-35 years is a healthier and less risky age range for pregnancy and delivery than either extreme. One question that arises is “Does the relative lack of extremes in maternal age among the Brazilian mother cohort partly or wholly account for the lower rate of preterm birth (PTB)?” Much obstetrical science has shown certain risks to be higher with very young or very old maternal age. Gibbs⁷ found youth to be associated with higher rates of low birth weight (LBW), PTB, and anemia. “Elderly” maternity, operationalized variously as older than 35 or 40 years, has also been linked to negative outcomes such as PTB, stillbirth, and Neonatal Infant Care Unit (NICU) admission.⁸

There are other issues common in the Brazilian immigrant community that may increase risks for obstetrical complications. For instance, if long working hours and hard physical labor is associated with PTB⁹ and Brazilian women in Massachusetts have predominantly been employed as housecleaners¹⁰

⁷ GIBBS, Cassandra *et alii*. The Impact of Early Age at First Childbirth on Maternal and Infant Health.

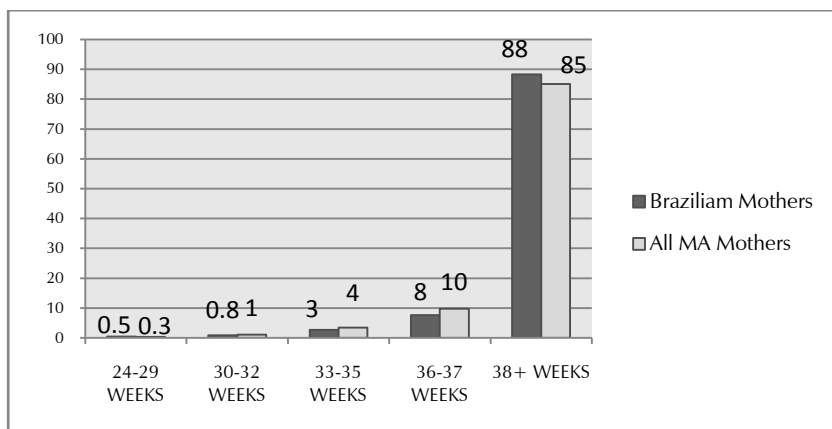
⁸ CAROLAN, Mary; FRANKOWSKA, Dorota. Advanced maternal age and adverse perinatal outcome: A review of the evidence; LISONKOVA, Sarka *et alii*. The effect of maternal age on adverse birth outcomes: does parity matter?; VOIGT, Manfred *et alii*. Evaluation of maternal parameters as risk factors for premature birth (individual and combined effects).

⁹ NEWMAN, Roger B. *et alii*. Occupational fatigue and preterm premature rupture of membranes. National Institute of Child Health and Human Development Maternal-Fetal Medicine, Units Network.

¹⁰ FLEISCHER, Soraya R. *Passando a América a limpo: o trabalho de “housecleaners” brasileiras em Boston, Massachusetts*; MARTES, *op. cit.*; SIQUEIRA, JANSEN, *op. cit.*

working 40-80 hours/week,¹¹ then why do they have comparatively low rates of PTB? Massachusetts does have a high rate of health technology access for the well-insured, which includes much of the middle and upper classes, especially white U.S. citizens. In this population fertility assistive technology has gained use in the Aught decade.¹² Techniques like in-vitro fertilization and medically-assisted multiple gestation are probably disproportionately more common in the overall population. The pregnancies resulting from such technological efforts carry more risks than non-technologically assisted pregnancies¹³ and could account for some amount of the higher rate of PTB in the non-Brazilian population of mothers. Though single marital status is associated with preterm birth, low birth weight, and small for gestational age birth,¹⁴ the Brazilian mother cohort does not differ significantly from all birthing mothers in Massachusetts vis-à-vis marital status.

FIGURE 5
Prematurity Rates of Brazilian and All Mothers
in Massachusetts, 1999-2009



Source: Massachusetts Registry of Vital Records and Statistics.

Brazilian mothers in Massachusetts had a higher proportion of single parity than all, while the latter had higher proportions of multiple parity, i.e., two or more births (Figure 6).

¹¹ MESSIAS, Deanne. Transnational perspectives on women's domestic work: Experiences of Brazilian immigrants in the US; SIQUEIRA, Carlos Eduardo; DE LOURENÇO, Cileine. *Brazilians in Massachusetts: Migration, Identity and Work*.

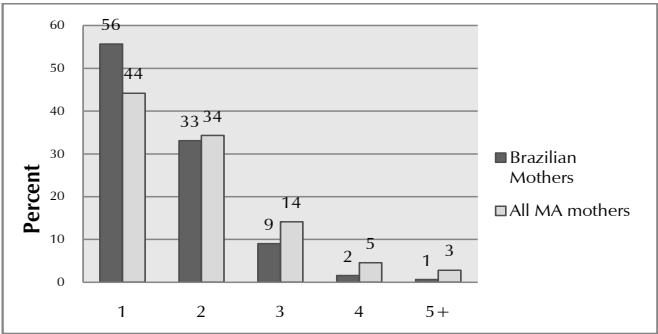
¹² SUNDERAM, Saswati *et alii*. Assisted reproductive technology surveillance - United States, 2009.

¹³ McDONALD, Sarah D. *et alii*. Preterm birth and low birth weight among in vitro fertilization singletons: a systematic review and meta-analyses.

¹⁴ SHAH, Prakesh; ZAO, Jamie; ALI, Samana. Maternal marital status and birth outcomes: a systematic review and meta-analyses.

FIGURE 6

Proportional Distribution of Single and Multiple Parity in Brazilian Mothers and All Mothers in Massachusetts, 1999-2009

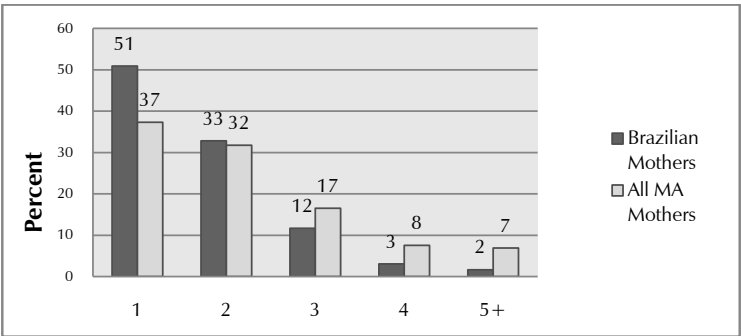


Source: Massachusetts Registry of Vital Records and Statistics.

Figure 7 shows that Brazilian mothers who gave birth between 1999 and 2009 had a higher proportion of one or two pregnancies (84% x 69 %) and a lower proportion of more than two pregnancies (17% x 32%).

FIGURE 7

Proportional Distribution of Number of Pregnancies of Brazilian Mothers and All Mothers in Massachusetts, 1999-2009



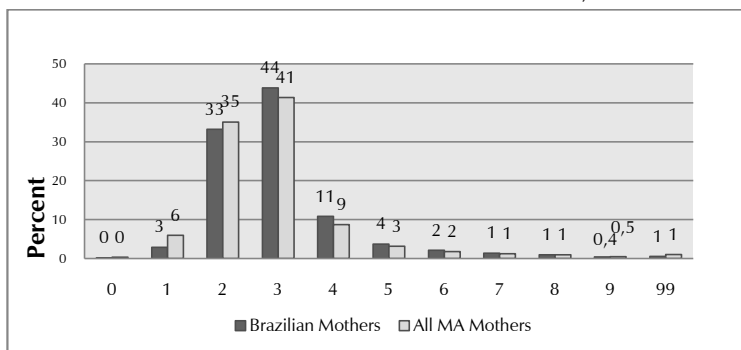
Source: Massachusetts Registry of Vital Records and Statistics.

Prenatal visits are crucial for the health of the mother and the infant. Studies show that prenatal visits promote mother-infant health by educating mothers on nutrition, immunization, and the impact of substance use and weight gain on the infant. Prenatal visits also help expecting parents to monitor the growth of the fetus and maternal health during gestation, as well as provide important information that can prevent early childhood illness and malnourishment.¹⁵

¹⁵ HAGAN, Joseph F.; SHAW, Judith S.; DUNCAN, Paula M. *Bright Futures: Guidelines for health supervision of infants, children, and adolescents.*

Brazilian mothers initiated prenatal care at similar rates as the average rates for all Massachusetts mothers. Eighty-eight percent of Brazilian immigrant mothers living in the state from 1999-2009 initiated prenatal care within the first trimester (figure 8). Only 3.4% of Brazilian immigrant mothers had late (beginning in the third trimester) or no prenatal care. National birth certificate data show that out of all births in the U.S., 71% of mothers initiated prenatal care within the first trimester.¹⁶ This suggests that Brazilian immigrant women living in Massachusetts have more optimal prenatal care timing rates than most women living in the U.S.

FIGURE 8
Proportional Distribution of Gestational Month of Start of Prenatal Care for Brazilian and All Mothers in Massachusetts, 1999-2009



Source: Massachusetts Registry of Vital Records and Statistics.

In 2010, Hispanic women living in the U.S. had a rate of 8% of late or no prenatal care, in contrast to only 4% for white women.¹⁷ Late or no prenatal care has been shown to be associated with health problems in the infant, as well as higher rates of low-birth weight. Mothers who had late or no prenatal care were three times more likely to deliver low birth weight babies and their babies were five times more likely to die during the first year.¹⁸

According to birth certificate data from births in Massachusetts between 1999 and 2009, 85% of Brazilian mothers had on average ten or more prenatal visits, which is the same percentage for all mothers in Massachusetts. The Adequacy of Prenatal Care Utilization Index (APNCU) is based on the ratio of actual number of visits reported on the birth certificate to the expected number of visits,¹⁹ according to gestational age at initiation of prenatal care.

¹⁶ OSTERMAN, Michelle J.K. *et alii*. Expanded data from the new birth certificate, 2008.

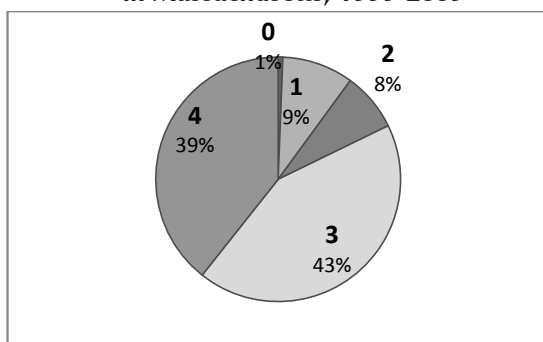
¹⁷ CHILD TRENDS. *Late or No Prenatal Care*.

¹⁸ MATERNAL AND CHILD HEALTH BUREAU. *Child Health 2008-2009*.

¹⁹ AMERICAN COLLEGE OF OBSTETRICIANS AND GYNECOLOGISTS, *Standards for Obstetric-Gynecologic Services*.

The APNCU, also known as the Kotelchuck Index, is correlated with positive pregnancy outcomes and reduced rates of infant injuries and postpartum depression.²⁰ From 1999 to 2009, on average, 82% of Brazilian mothers living in Massachusetts received adequate (43%) and adequate Plus (39%) prenatal care (Figure 9). These rates were similar to those observed in all Massachusetts mothers (45% Adequate, and 38% Adequate Plus). According to the National Center for Health Statistics, 69% of mothers in 2009 in the U. S. received adequate/adequate plus prenatal care, while 14% received intermediate care and 11% received inadequate care.

FIGURE 9
Distribution of the Kotelchuck Index in Brazilian Mothers
in Massachusetts, 1999-2009*



* A ratio of observed to expected visits is calculated and grouped into four categories:

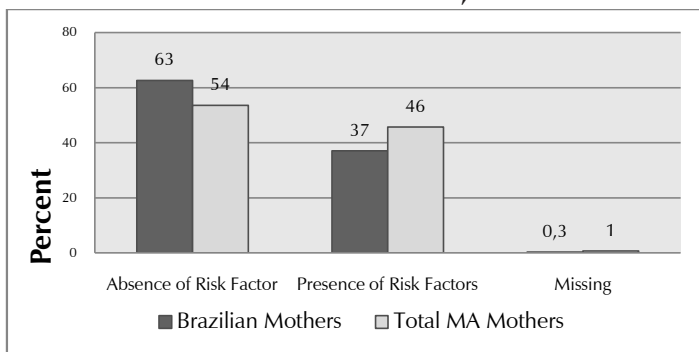
- 1) Inadequate (received less than 50% of expected visits; prenatal care begun after the 4th month of pregnancy);
- 2) Intermediate (50%-79%; prenatal care begun by the fourth month of pregnancy);
- 3) Adequate (80%-109%; prenatal care begun by the fourth month of pregnancy);
- 4) Adequate Plus (110% or more; Prenatal care begun by the fourth month of pregnancy and 110% or more of recommended visits received).

Source: Massachusetts Registry of Vital Records and Statistics.

Brazilian mothers in Massachusetts had a lower proportion of health risk factors during pregnancy and were thus healthier than all mothers. About two thirds of Brazilian mothers who gave birth between 1999 and 2009 did not have any diagnosed health risk factor, while 54% of the latter had at least one health risk factor (Figure 10). Health risk factors included in the birth certificates include diabetes, anemia, eclampsia, pregnancy hypertension, RH sensitization, among others.

²⁰ KOTELCHUCK, Milton. An evaluation of the Kessner Adequacy of Prenatal Care Index and a proposed Adequacy of Prenatal Care Utilization Index; ALEXANDER, Greg; KOTELCHUCK, Milton. Assessing the role and effectiveness of prenatal care: History, challenges, and directions for future research.

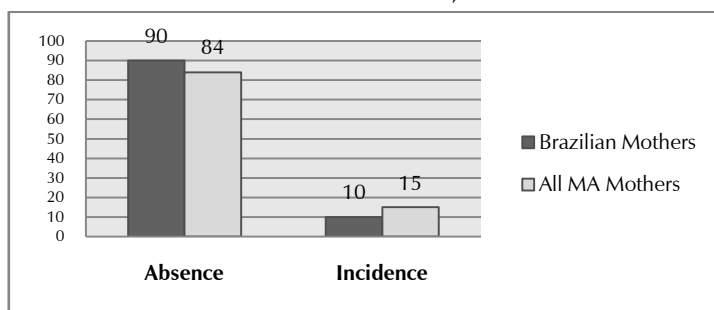
FIGURE 10
Relative Distribution of Health Risk Factors in Brazilian Mothers and All Mothers in Massachusetts, 1999-2009



Source: Massachusetts Registry of Vital Records and Statistics.

Between 1999 and 2009, Brazilian mothers who gave birth in Massachusetts had a 5% lower incidence of abnormal infant conditions than all mothers (Figure 11).

FIGURE 11
Incidence of Abnormal Infant Conditions in Brazilian Mothers and All Mothers in Massachusetts, 1999-2009*



* Abnormal conditions include: acidosis, anemia, congenital infection, cyanosis, cerebral palsy, other birth trauma, fetal alcohol syndrome, hyaline membrane disease, hypotonia, hypoxia, intracranial hemorrhage, jaundice, meconium aspiration, positive toxin screen, seizures, sepsis, tachynea, and congenital anomalies. Source: Massachusetts Registry of Vital Records and Statistics.

Conclusion

The evidence presented in this article suggests that Brazilian mothers who gave birth in Massachusetts between 1999 and 2009 fared better than all mothers in Massachusetts in most obstetric health indicators described. Brazilian mothers scored well in the Kotelchuck Index, implying that a) they had access to health care, and b) maternal risk factors were likely identified

and managed adequately on a timely basis. Although we did not include information on the location of the delivery and type of health insurance coverage in this article, we know that birth certificate data are collected in hospital facilities in Massachusetts. Thus, it is very likely that most Brazilian mothers were covered by public or private health insurance, which is not surprising given the high rate of insurance coverage in the state in the 2000s.

We assume that our comparisons may underestimate the magnitude of the difference because we did not eliminate Brazilian mothers from the total for all mothers. Since to our knowledge this is the first study of Brazilian mothers' health in the U.S., we do not know if the same pattern would be found in other states that have a significant presence of Brazilian immigrants, such as Florida, New Jersey, New York, and California. We hope that many other states in the U.S. will also identify the nationality of parents in their birth certificates, allowing for national comparisons amongst Brazilian mothers and between Brazilian mothers and mothers from other ethnicities and national origins.

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Abstract

Perfil de saúde das mães brasileiras no Massachusetts no século XXI

Este artigo descreve o perfil de saúde das mães brasileiras no Massachusetts, de acordo com os dados coletados através de Massachusetts Standard Certificate of Live Births (revisão de 1989) relacionado com o Massachusetts Registry of Vital Records and Statistics durante 1999 e 2009. Conforme nosso conhecimento esta é a primeira vez que tais dados são analisados com foco nos imigrantes brasileiros. As conclusões deste artigo sugerem que as mães brasileiras que deram à luz em Massachusetts entre 1999 e 2009 se saíram melhor do que o total das mães em Massachusetts no que diz respeito aos indicadores de saúde obstétrica.

Palavras-chave: *Mães brasileiras; Saúde materna; Pré-natal das mães brasileiras; Saúde dos imigrantes brasileiros nos EUA; Saúde imigrante.*

Recebido para publicação em 04/02/2013.

Aceito para publicação em 28/04/2013.

Received for publication in February, 04th, 2013.

Accepted for publication in April, 28th, 2013.