

# TESTING THE WEATHERING HYPOTHESIS AMONG MEXICAN-ORIGIN WOMEN

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**Objective:** To examine the “weathering hypothesis,” as proposed by Geronimus (1986; 1987; 1992; 1996), among US-born and foreign-born Mexican-origin women. This hypothesis specifically argues that the relationship between age and a variety of reproductively related health outcomes varies by socioeconomic and environmental context.

**Methods:** 1989–1991 National Center for Health Statistics (NCHS) linked birth-death files. These files include all women who experienced a live birth in the United States and whose infants were issued a birth certificate during the years 1989 to 1991 (NCHS 1995). Age and nativity specific distributions on infant mortality, low birth weight, anemia, pregnancy related hypertension, and smoking were estimated for Mexican-origin women.

**Results:** For the foreign-born, levels of neonatal mortality are highest for younger women and tend to increase again in women at the oldest ages. For the US born, the lowest levels are for women aged 17 and 18 years, and 27–29 years. Levels for women aged 19–24 years and 30–34 years are higher than those for 17- and 18-year-olds. For both groups of women, giving birth to infants with low birth weight is most common at the earlier ages, declining more or less until the mid twenties when the rate begins to rise again slowly. Patterns for the maternal health indicators vary, with pregnancy related hypertension most strongly following the pattern suggested by weathering.

**Conclusion:** Overall, this analysis suggests that there is evidence of weathering within the Mexican-origin population, particularly for the US-born population, and this is most clearly seen in levels of neonatal mortality and pregnancy related hypertension. (*Ethn Dis.* 2002;12:470–479)

**Key Words:** Mexican Americans, Nativity, Infant Mortality, Birth Weight, Maternal Risk Factors

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## INTRODUCTION

A well-established curvilinear link exists between maternal health and levels of neonatal mortality, such that levels of neonatal mortality are higher at younger and older maternal ages.<sup>1–3</sup> Associated with this is a body of literature that suggests that teenaged childbearing may contribute directly to poor birth outcomes and adverse child development.<sup>4</sup> However, the universality of this relationship is questioned in a series of articles written by Geronimus throughout the 1980s and 1990s.<sup>5,6</sup>

The “weathering hypothesis” suggests that age does not hold the same meaning for all people, that there exists an interaction between age and race/ethnicity such that certain groups age more rapidly than others, including experiencing a more rapid decline in reproductive health.<sup>1,5–7</sup> This more rapid aging, or weathering, occurs in response to a lifetime of the socioeconomic disadvantage and race/ethnic discrimination faced by many minority groups. These disadvantageous health outcomes are associated with socioeconomic disadvantage at both an individual and a community level. Minority groups, particularly African Americans, tend to be concentrated in communities that are characterized by high levels of residential segregation<sup>8</sup> and of neighborhood disadvantage,<sup>9–11</sup> including limited access to educational and employment opportunities, as well as to social services. This contributes to a life that includes risks such as “nutritional inadequacy, excessive stress, life-long medical under-service, inadequate housing and sanitation, and many medical conditions and diseases, both chronic and acute, such as genito-urinary tract infections and hypertension.”<sup>5</sup> As a result, peak maternal health may vary across groups, occurring earlier for those with greater in-

dividual and community level socioeconomic disadvantage. In fact, Geronimus finds much evidence to support this in her research on differences in maternal health characteristics and birth outcomes between Black and White women.<sup>1,5–7</sup>

Focusing on levels of neonatal mortality and low birth weight among singleton first births, Geronimus finds that age-specific distributions are quite different for Black and White women.<sup>5–7</sup> In general, the distribution for White women, a more socioeconomically advantaged group, follows a pattern such that the lowest risk for experiencing a neonatal death or giving birth to an infant with low birth weight occurs in the mid twenties. Additionally, the risk of these events for women in their teenage years always exceeds that for women in their mid twenties. Black women, on the other hand, experience the lowest risk at an earlier age, and the risk for teenagers does not exceed that for women in their mid-20s; it may, in fact, actually be lower. Interestingly, for both groups, the highest rates of childbearing tend to be concentrated at the ages with the lowest risk of neonatal mortality, ie, at younger ages for Black women. Geronimus argues that this may be, in part, an adaptive response to the lifetime of cumulative socioeconomic disadvantage experienced by this group at both the individual and community level.<sup>5</sup>

Though research has primarily focused on Black/White differences, the weathering hypothesis speaks to the adverse effects of cumulative socioeconomic disadvantage (individual and community level) and discrimination that are faced by many minority groups. This raises questions regarding the applicability of the weathering hypothesis to other minority groups facing socio-

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economic disadvantage such as Mexican Americans, a group with high levels of poverty and high rates of teenaged childbearing. Given the socioeconomic disadvantage of the group,<sup>12-15</sup> the infant mortality rate among the Mexican-origin population in the United States is surprisingly low. The fact that women of Mexican origin in the United States experience this disadvantage and tend to reside in more disadvantaged neighborhoods than do White women<sup>9,16</sup> suggests that Mexican-origin women will also experience weathering. While Gerominus briefly looked at age-specific patterns of neonatal mortality among Mexican-origin women, she did not distinguish by nativity, which is, perhaps, as important a distinction as ethnicity when analyzing health outcomes.<sup>17,18</sup> Research has documented significant differences in maternal health behaviors and birth outcomes by nativity status among Mexican-origin women, suggesting that “Americanization” has a negative impact on these women.<sup>19-21</sup>

Additionally, generational differences in the Mexican-origin population can tell us much about how descendants of this population fare over time within the context of the United States: do their situations improve or worsen? Traditional assimilation theory predicts an

immigrant group will fare better across generations and the longer a group is in the United States.<sup>22</sup> However, recent research documenting increasingly disadvantageous socioeconomic and health outcomes for certain groups has challenged these assumptions. This research suggests that there is a segmented pattern of assimilation, with some immigrant groups assimilating into the mainstream and others into other more socioeconomically disadvantaged groups within the United States, based in large part on community context.<sup>23-25</sup> Despite the fact that US-born Mexican Americans have a higher individual socioeconomic status than the foreign-born, research has documented that this does not provide much of an advantage in terms of neighborhood status.<sup>9</sup> Though the US born have a slight advantage over the foreign born in neighborhood socioeconomic status, all Hispanics, regardless of nativity status, fare worse than do non-Hispanic Whites, though not as poorly as do non-Hispanic Blacks.<sup>9,10</sup> Research on segmented assimilation, some of which has focused on Mexican Americans, has found that neighborhood disadvantage and race/ethnic discrimination within the United States have led to an increased divergence of the group from the mainstream, and increased disadvantage over time and across generations, particularly in levels of education and family formation patterns. In light of this, one would expect weathering to be more pronounced among Mexican-American women than among immigrant women, due in part to an increased exposure to the community level socioeconomic disadvantage and race/ethnic discrimination experienced within the United States.

This study used data from the 1989–1991 NCHS linked birth-death files to examine “weathering” using a variety of indicators among the Mexican-origin population. Additionally, this study explored whether Mexican Americans experience a greater degree of

weathering than do Mexican immigrant women. In particular, patterns of neonatal mortality, low birth weight and 3 maternal health indicators (levels of smoking, hypertension, and anemia during pregnancy) are examined. Though weathering is hypothesized to affect birth outcomes, it does so through its effect on maternal health.<sup>26-28</sup> Additionally, exploring the differences in maternal health indicators allows one to examine the mechanisms by which cumulative disadvantage may work to affect the aging process. For example, differences in levels of smoking may signify that cumulative disadvantage is associated with higher levels of stress, while higher levels of hypertension may have as much to do with access to adequate health care as with exposure to high levels of stress.

## DATA AND METHODS

The data for this study are drawn from the 1989–1991 NCHS Linked Birth/Infant Death Files. These files include all women who experienced a live birth in the United States and whose infants were issued a birth certificate during the years 1989 to 1991.<sup>29</sup> All infant deaths from this 3-year cohort of births were identified and linked to their respective birth certificates, thereby allowing researchers to investigate certain risk factors and their relationship to both birth outcomes and infant mortality. In addition to information on infant deaths and birth outcomes, the birth certificates include information on certain characteristics of the mother, such as age at birth, race/ethnicity, nativity, as well as on a variety of maternal health indicators.

The sample was restricted to Mexican origin women aged 15–34 years. This restriction is made for 2 reasons: 1) the majority of first births to reproductively mature women occur between these ages; and 2) women who have a first birth at ages greater than 35 are a

highly select group. In addition, the data are restricted to singleton, first births of greater than or equal to 500 grams of birth weight and with a gestational age of 22 weeks or longer. Birth-weight restrictions are employed because it is generally conceded that live births under 500 grams reflect coding errors or are misclassified as stillbirths, and gestational age restrictions are employed because gestational ages at the extreme ends of the distribution are unreliable.<sup>13</sup> Nativity is one of the 2 key dependent variables in this study, therefore, women missing information on country of birth were removed from the sample. Fortunately, this was a very small number of women (less than 0.1%) and should not bias the results. Our final sample for the analysis of birth outcomes comprised 387,909 births. Further restrictions, described below, were employed when examining maternal health indicators.

Rates of infant mortality serve as one of the best indicators of the well being of a group.<sup>30,31</sup> Recent advances in medical technology have increasingly concentrated on infant mortality among premature and low birth-weight infants thus making infant mortality more subject to availability of health care and to the adequacy of maternal health. This is even more true for neonatal deaths (deaths within the first 28 days of life); and therefore, neonatal mortality is the first dependent variable examined in this paper. Additional dependent variables, through which cumulative disadvantage may work to affect neonatal mortality, are low birth weight, and several maternal health indicators examined by Geronimus and colleagues,<sup>6,26-28</sup> including smoking, pregnancy related hypertension, and anemia.

These outcomes were coded into dichotomous measures following categorization used in previous research. Neonatal mortality was assigned a value of 1 when the infant dies before the age of 28 days. Though much more complex measures of birth outcome are some-

times employed that take into account the infant's gestational age and maturity in addition to birth weight,<sup>13,19</sup> this analysis uses a simplified measure based only on birth weight, where birth weight is considered low if it is less than 2500 grams. This dichotomous indicator of low birth weight is still a strong independent predictor of infant mortality and this coding scheme has proven to be very useful.<sup>21,32</sup>

In general, birth certificates do not offer the most reliable information on maternal health. Nonetheless, they do allow for some preliminary analysis of age specific patterns of maternal health among a very large sample of Mexican origin women. Variables indicating the presence of anemia and hypertension during the pregnancy were assigned a value of 1 if the birth certificate indicates the presence of this condition for the mother. Because this information was not available for all women, the sample for this analysis was reduced by roughly 5% providing a working sample of 364,278. Additionally, information on smoking was not available for all the birth certificates. Five states, including New York and California, did not ask about the smoking behavior of the mother. Because of this, the analysis focusing on age specific levels of smoking excluded a large proportion (57%) of the original sample, since Mexican origin women tend to be highly concentrated in a few states, including California.

The presence of weathering can be determined in 2 ways. First, by examining within-group age-specific distributions of various outcomes (such as low birth weight and neonatal mortality) to determine whether teenage women are at a higher or lower risk than women in their 20s, since a lower (or at least not higher) risk would suggest the presence of weathering. And second, by comparing age-specific patterns for a socioeconomically disadvantaged (or highly discriminated against) group on these outcomes to those for a relatively advan-

tagged group to see if group differences are narrower for mothers in their teenage years relative to those in their twenties, implying that one group is worsening at a more rapid pace than another.

Our study specifically documented the age-specific distributions of neonatal mortality, low birth weight, maternal hypertension, maternal anemia, and maternal smoking within the Mexican-origin population. This analysis compares the US-born and the foreign-born Mexican-origin population. In this case, though US-born Mexican Americans generally have a higher socioeconomic status than the foreign born, they have also spent a greater proportion of their lives in the US context of socioeconomic disadvantage (relative to Whites) and race/ethnic discrimination than have the foreign born, and thus are expected to fare worse over time within the United States. Age was coded similarly to the categorization employed by Geronimus,<sup>1,7</sup> which allows for single measures of ages through 19, with the following additional categories: 20-21, 22-23, 24-26, 27-29, and 30-34. Though the analysis in this study was based on relatively simple bivariate relationships among Mexican-origin women and did not focus on other groups of women, it begins to document the relationship between cumulative socioeconomic disadvantage within the United States and the aging process for these 2 groups in order to explore assumptions about the relative disadvantage of each group and what this means in terms of assimilation trajectories across generations.

## RESULTS

Table 1 presents the age distribution of first births by nativity among Mexican-origin women. Of the 387,909 singleton first births to Mexican-origin women between 1989 and 1991, roughly 40% were to women born in the United States, and the other 60% were to foreign-born women. There are clear-

**Table 1. Distribution of first births by maternal age for all Mexican-origin women**

Age	Total			US Born			Foreign Born		
	N	% Births	Cumulative %	N	% Birth	Cumulative %	N	% Births	Cumulative %
15	10,150	3	3	6,719	4	4	3,431	1	1
16	20,412	5	8	12,325	8	12	8,087	3	5
17	30,117	8	16	16,072	10	23	14,045	6	11
18	37,471	10	25	17,936	12	34	19,535	8	19
19	41,305	11	36	17,919	12	46	13,386	10	29
20-21	75,292	19	55	26,735	17	63	48,557	21	50
22-23	57,817	15	70	17,098	11	74	40,719	18	68
24-26	59,329	15	86	18,950	12	86	40,379	17	85
27-29	33,669	9	94	12,731	8	94	20,938	9	94
30-34	22,347	6	100	9,199	6	100	13,148	6	100
	387,909			155,684			222,225		

ly differences in the age specific child-bearing patterns between the 2 groups. First births are concentrated at earlier ages for US-born women compared with foreign-born women; 46% of the first births to US-born women occurred by the age of 19, compared to 30% for the foreign born. While roughly 85% of first births for both groups of women occur by age 26, most of these occur after age 20 for the foreign born and before age 20 for the US born. This differential shows us that US-born women have age-specific patterns of childbearing that are more similar to those for other socioeconomically disadvantaged groups than do those of foreign born. This fits the pattern suggested by the weathering hypothesis, though it is crit-

ical to keep in mind that the family and social context surrounding teenaged births for Mexican-American women is very different than that for Black women. Though the teenage birthrate is higher among Mexican-origin women than among Black women, the non-marital birthrate is lower, reflecting the much higher levels of marriage among Mexican-origin women.<sup>33</sup> This means that many more children are being born into 2 parent families, presumably with higher levels of economic resources. Nonetheless, rates of non-marital fertility among Mexican-origin teenagers are still substantially higher than those for White teenagers.<sup>33</sup>

Table 2 and Figures 1 and 2 show the age-specific distribution of the neo-

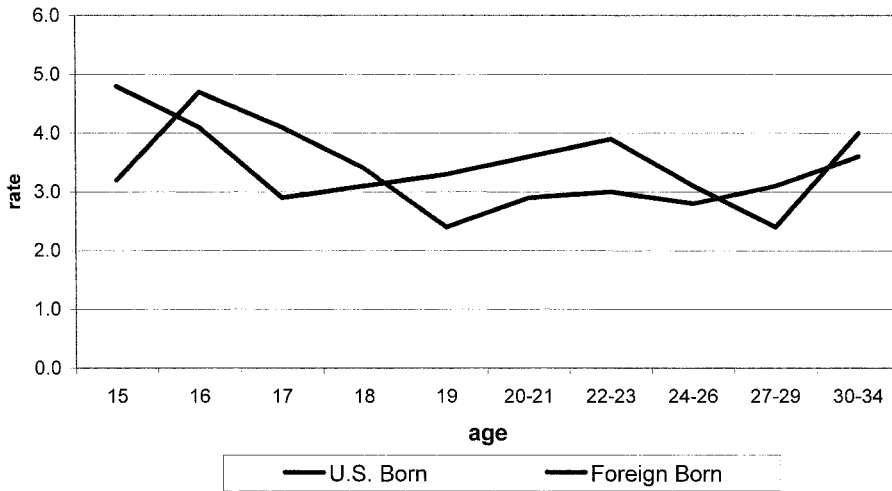
natal mortality rates and percent distribution of low birth weight by nativity for Mexican-origin women as well as the associated rate ratios. Confidence intervals surrounding the rate ratios are in parentheses. Levels of neonatal mortality are lower than would be expected, due to the previously described restrictions placed on data.

Though these curves do not smoothly fit expected patterns and show fluctuation across ages, in general, different patterns emerge for each group. One can see that the more advantageous time for childbearing, if we were to use only neonatal mortality as an indicator and not take into account the foreign-born 15 year olds and the US-born 27-29 year olds, tends to be earlier for US-

**Table 2. Neonatal mortality rate (per 1,000) and percent low birth weight by maternal age: first births for Mexican origin women by nativity**

Age	US Born			Foreign Born			Rate Ratios (US/Foreign Born) and Confidence Intervals	
	N	Neonatal Mortality	Low Birth Weight	N	Neonatal Mortality	Low Birth Weight	Neonatal Mortality (CI)	Low Birth Weight (CI)
15	6,719	4.8	7.4	3,431	3.2	6.7	1.5 (.8, 2.9)	1.1 (1.0, 1.3)
16	12,325	4.1	6.8	8,087	4.7	6.0	0.9 (.6, 1.3)	1.2 (1.0, 1.3)
17	16,072	2.9	6.4	14,045	4.1	5.8	0.7 (.5, 1.1)	1.1 (1.0, 1.2)
18	17,936	3.1	6.9	19,535	3.4	5.7	0.9 (.6, 1.3)	1.2 (1.1, 1.3)
19	17,919	3.3	6.1	13,386	2.4	5.3	1.4 (1.0, 2.0)	1.2 (1.1, 1.3)
20-21	26,735	3.6	5.7	48,557	2.9	5.1	1.2 (1.0, 1.6)	1.1 (1.1, 1.2)
22-23	17,098	3.9	5.7	40,719	3.0	4.9	1.3 (1.0, 1.7)	1.2 (1.1, 1.3)
24-26	18,950	3.1	5.8	40,379	2.9	4.9	1.1 (.8, 1.5)	1.2 (1.1, 1.3)
27-29	12,731	2.4	5.9	20,938	3.1	5.4	0.8 (.5, 1.2)	1.1 (1.0, 1.2)
30-34	9,911	4.0	6.7	13,148	3.6	6.3	1.1 (.7, 1.7)	1.1 (1.0, 1.2)
	155,684			222,225				

**Chart 1: Distribution of Neonatal Mortality Rate among Mexican Origin Women by Age and Nativity**

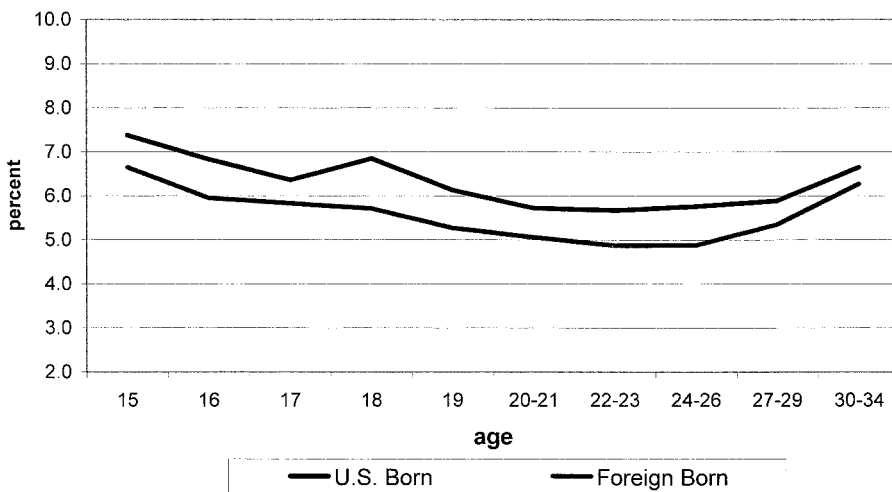


**Fig 1. Distribution of neonatal mortality rate among Mexican-origin women by age and nativity**

born Mexican-origin women and somewhat later for Mexican-born women. The rate ratios demonstrate that, numerically, the greatest advantage for the US-born group over the more advantaged foreign-born group occurs at ages 16, 17, and 18, and again at ages 27–29

which will be discussed later. Though the differences between the groups are either not significant or only marginally significant (due to the small number of events, which may explain aberrant findings among the younger women), the tendencies are suggestive. Import-

**Chart 2: Percent Distribution of Low Birthweight among Mexican Origin Women by Age and Nativity**



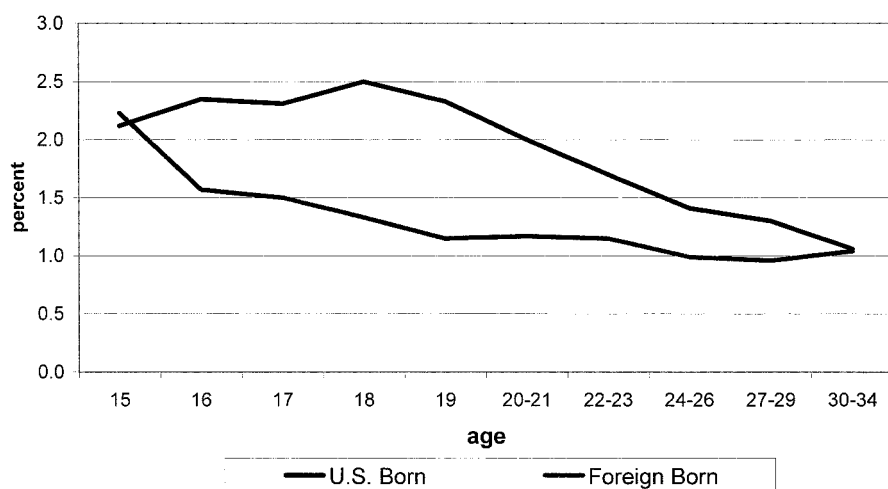
**Fig 2. Percent distribution of low birth weight among Mexican-origin women by age and nativity**

tantly, while the risk for Mexican born women through age 18 appears to be consistently higher than the risk through age 29, the risk for US-born Mexican-origin women in their later teens is no higher than the risk for the same group of women in their mid twenties, following the pattern predicted by weathering. Interestingly, Table 1 shows that almost half of first births to the US born were to women under the age of twenty, which, as Table 2 demonstrates, is when the risk of neonatal mortality is generally lowest.

Given that low birth weight is the most common cause of neonatal mortality, one might expect to see the same age specific patterns emerge when looking at the distribution of low birth weight, which is more common than neonatal mortality. However, this is not quite the case. The rate ratios in Table 2, comparing levels of low birth weight, demonstrate that the foreign born have a significant, and relatively consistent, advantage at every age (also seen in Figure 2). Aside from magnitude, there is no difference in the patterns. Low birth weight is most common at the earlier ages, declining more or less until the mid-20s, when it begins to rise slowly again. It is important to note that the prevalence of low birth weight between ages 30–34 years is similar to that for women in their teenage years. Despite the fact that this indicator provides no clear evidence for weathering either within groups or between groups, this does not necessarily preclude observable differences in maternal health characteristics.

Tables 3 and 4 show the age specific distribution of the maternal health indicators among first time Mexican-origin mothers. Chart 3 depicts the age and nativity specific patterns of anemia and Table 3 reports the associated rate ratios and confidence intervals. Because anemia is generally more common in younger people relative to older,<sup>34</sup> between-group differences need to be explored for evidence of weathering in

**Chart 3: Percent Distribution of Anemia among Mexican Origin Women by Age and Nativity**



**Fig 3. Percent distribution of anemia among Mexican-origin women by age and nativity**

US-born women (e.g., by looking at the age-specific differences in anemia between the US born and the foreign born, across ages). For both groups of women, the highest levels of anemia occur at the younger ages. Interestingly, the prevalence of anemia actually increases for US-born women through age 18 before declining, while it declines consistently from age 15 for foreign-born women. Though this creates a situation where the rate ratios increase

through age 18, the difference between US and foreign-born women actually is narrower at the older ages relative to the younger ages.

The pattern for pregnancy related hypertension, seen in Table 3 and Figure 4, is quite different and again the story that emerges is not very clear. There are large and significant nativity differences, with levels of hypertension roughly twice as high for US-born Mexican-origin women as for foreign-born

women at every age. There is, perhaps, some evidence that the lowest levels of hypertension are occurring at a slightly younger age for US-born women relative to the foreign born. Levels for the US born are lowest between the ages of 16 and 19 years, beginning to rise slightly in the early twenties, while levels for the foreign born do not begin to increase again until age 24. In contrast to the age-specific patterns of anemia, there is some evidence that the rate is increasing more rapidly for the US-born relative to the foreign born as seen in the rate ratios, at least through age 27.

The last maternal health characteristic examined was smoking, and these age specific patterns and rate ratios are displayed in Table 4 and Figure 5. Not surprisingly, the levels of smoking are significantly higher for the US born than for the foreign born. Interestingly, however, the difference in the age-specific patterns is almost the inverse of what might be expected by weathering. While the presence of weathering would suggest that smoking should increase with age for the group experiencing the greatest cumulative individual and community level socioeconomic disadvantage, in this case, the levels of smoking tend to increase for the foreign born with age, while declining for the US born.

**Table 3. Levels of anemia, hypertension, and smoking by maternal age: first birth among Mexican-origin women**

Age	US Born			Foreign Born			Rate Ratios (US/Foreign Born) and Confidence Intervals	
	N*	% Anemic	% Hypertensive	N*	% Anemic	% Hypertensive	Anemic (CI)	Hypertensive (CI)
15	6,090	2.1	3.8	3,267	2.2	2.4	1.0 (.7, 1.3)	1.6 (1.3, 2.1)
16	11,226	2.4	3.6	7,689	1.6	2.1	1.5 (1.2, 1.9)	1.7 (1.4, 2.0)
17	14,652	2.3	3.3	13,420	1.5	2.0	1.5 (1.3, 1.8)	1.7 (1.4, 1.9)
18	16,354	2.5	3.7	18,758	1.3	2.1	1.9 (1.6, 2.2)	1.8 (1.5, 2.0)
19	16,288	2.3	3.6	22,415	1.2	2.0	2.0 (1.7, 2.4)	1.8 (1.6, 2.1)
20-21	24,416	2.0	3.8	46,576	1.2	2.0	1.7 (1.5, 1.9)	1.9 (1.7, 2.1)
22-23	15,584	1.7	4.1	39,115	1.2	2.1	1.5 (1.3, 1.7)	2.0 (1.8, 2.2)
24-26	17,288	1.4	4.1	38,669	1.0	2.3	1.4 (1.2, 1.7)	1.8 (1.6, 2.0)
27-29	11,612	1.3	3.8	19,921	1.0	2.4	1.4 (1.1, 1.7)	1.6 (1.4, 1.8)
30-34	8,391	1.1	4.7	12,547	1.0	2.8	1.0 (.8, 1.3)	1.7 (1.5, 1.9)
	141,901			222,377				

\* N=number of births.

**Table 4. Smoking by maternal age among Mexican-origin women: first births**

Age	US Born		Foreign Born		Rate Ratios (US/Foreign Born) and Confidence Smoking (CI)
	N	% Smoking	N	% Smoking	
15	3,604	6.0	1,206	1.7	3.4 (2.1, 5.4)
16	6,829	5.4	2,766	1.6	3.5 (2.5, 4.8)
17	9,146	5.9	4,870	1.6	3.7 (2.9, 4.6)
18	10,225	6.4	6,795	1.3	5.0 (4.0, 6.2)
19	10,234	5.9	8,005	1.3	4.5 (3.7, 5.5)
20-21	15,326	5.6	16,251	1.3	4.3 (3.7, 4.9)
22-23	9,663	5.3	13,539	1.4	3.9 (3.3, 4.7)
24-26	10,561	4.9	13,487	1.6	3.0 (2.6, 3.6)
27-29	6,848	5.3	7,175	2.2	2.4 (2.0, 2.9)
30-34	5,002	5.0	4,588	2.6	2.0 (1.6, 2.4)
	87,438		78,682		

**DISCUSSION**

Weathering can be measured in 2 ways: first by comparing the age-specific patterns of any number of health outcomes between socioeconomically advantaged and disadvantaged groups; and second, by looking at within-group variations, across ages, for these outcomes. Given that there is an overall “optimal age” for childbearing, the age when the best reproductive outcomes occur, research needs to address how specific

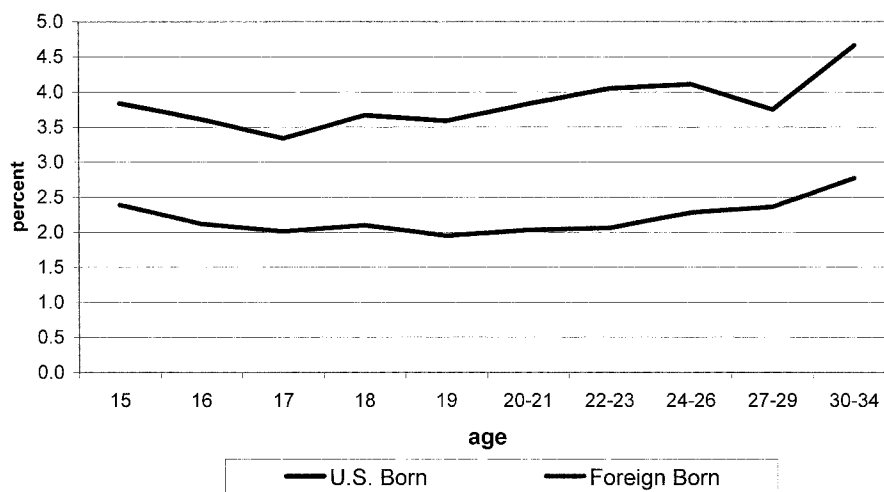
groups compare, what this tells us about their aging processes, and the ways in which the cultural and socioeconomic environment interact with the aging process.

Despite the fact that the Mexican-origin population as a whole is relatively socioeconomically disadvantaged in the United States, segmented assimilation theory suggests that US-born Mexican Americans may fare worse over time and lose the advantage maintained by their Mexican-born counterparts (despite

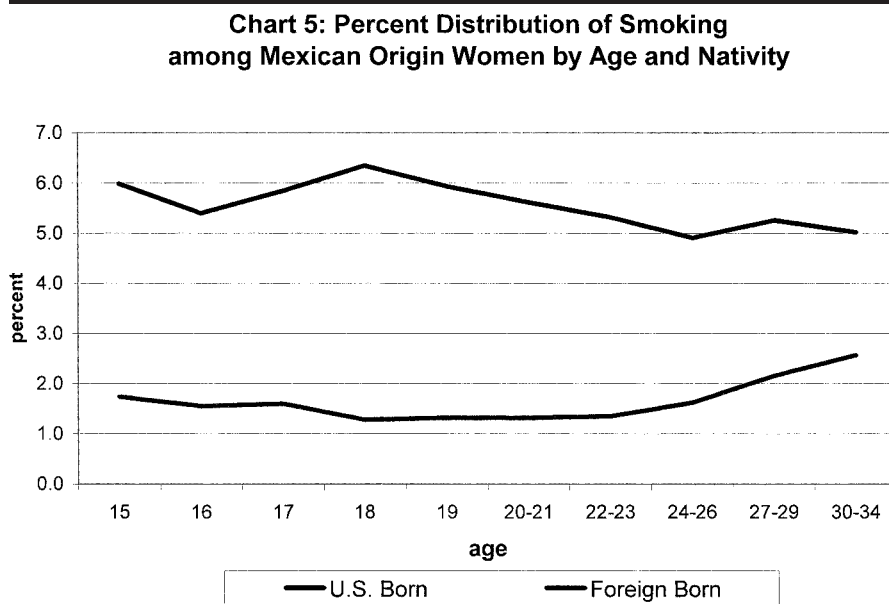
their own socioeconomic disadvantage). This variation may be due to the lifetime of community and individual level socioeconomic disadvantage faced by this population within the United States, as well as to the adoption of poorer health behaviors associated with “Americanization.” This study attempted to assess whether or not US-born Mexican-origin women experience a greater degree of weathering, as indicated by neonatal mortality, low birth weight, and a number of maternal health characteristics, compared to foreign-born Mexican-origin women.

The strongest evidence for this theory was seen in the patterns of neonatal mortality among younger women, with the small and steady increase in levels of neonatal mortality from age 17 through age 23 for US-born Mexican women. The dip that occurs between the ages of 24 and 29 is interesting. One might hypothesize that women who have first births at these later ages are distinctly different from women who have births at younger ages, more likely to be of higher SES and less likely to have experienced a lifetime of disadvantage. Level of education in years is available on the birth certificates, and in order to explore whether socioeconomic differences account for some of the age-specific patterning of neonatal mortality, the distributions were recalculated, controlling for education (analysis not shown). In general, this did little to change the overall age specific distributions of neonatal mortality, though it did weaken the dip at the later ages. This is suggestive, but one must remember that years of education may not be complete for all women, as some are still of school age. Additionally, years of education is not a reliable measure of cumulative socioeconomic disadvantage. Nonetheless, it is clear that the risk for US-born teenaged women older than age 16 is no higher than that for older US-born Mexican-origin women, and this is more so the case when education is controlled.

**Chart 4: Percent Distribution of Pregnancy Related Hypertension among Mexican Origin Women by Age and Nativity**



**Fig 4. Percent distribution of pregnancy-related hypertension among Mexican-origin women by age and nativity**



**Fig 5. Percent distribution of smoking among Mexican-origin women by age and nativity**

Interestingly, there were no nativity differences in the age-specific patterns of low birth weight, though for both groups, women aged 30–34 exhibit a risk of low birth weight similar to that of the younger women. Clearly, however, both the US- and foreign-born Mexican-origin women in their early 20s are at the lowest risk for a low weight birth.

While the age-specific patterns of neonatal mortality suggest that US-born Mexican-origin women may experience a somewhat greater degree of weathering than the foreign born, the age-specific patterns in the maternal health indicators were not consistent in predicting why this might be the case. The only maternal health indicator used in this analysis that offered any clear evidence of weathering among either group was pregnancy-related hypertension. Though levels were consistently higher for the US-born Mexican-origin women, it is clear that the ages of lowest risk occur in the late teenage years to the early 20s, occurring even earlier for US-born women.

Iron deficiency is more common among younger people relative to older,

though women of childbearing age also tend to be at risk.<sup>34</sup> This was the case for all Mexican-origin women, especially for those born in the United States, whose reported levels of anemia were higher among the younger mothers. Yet, in her study looking at anemia as a cause of death among Black and White women of reproductive age, Geronimus<sup>26</sup> found that rates among women in their mid-20s were greater than those for women in their teen years, especially for Black women. There are likely to be differences in age specific patterns of anemia based on pregnancy status, since pregnancy can be a cause of anemia, and differences among pregnant women may be due to differences in diet, adequacy of prenatal care, and SES. Nonetheless, in this study, teens had the highest reported levels of anemia during their pregnancies. It is important to note that some studies have found that although teens have higher rates of anemia, they do not necessarily have higher risk births.<sup>35</sup>

In this analysis, the age-specific patterns differentiated by nativity for smoking were not those expected. Levels of smoking were highest for US-born

*Clearly, however, both the US- and foreign-born Mexican-origin women in their early 20s are at the lowest risk for a low weight birth.*

women around age 18 and declined fairly steadily after that, a pattern similar to that for White women, while levels for the foreign born were very low and increased with age, a pattern more similar to that for Black women. In this case, the pattern among the foreign-born does not follow the pattern predicted by weathering. This raises the question, what effects do age at immigration and length of time in the United States have on this pattern? Is the increased time these immigrants spent in the United States associated with the increase in smoking with age? Although this question is of concern, it is important to note that levels of smoking are very low among all Mexican-origin women, compared to those of White and Black women.<sup>36</sup>

Some have argued that the acculturation of an immigrant group is selective; that some ethnic traits tend to weaken over time, while others may actually strengthen. Keefe and Padilla (p.190)<sup>37</sup> argue that,

Native born Mexican Americans acculturate but it is selective, and some ethnic traits, especially maintenance of family ties, are sustained and even strengthened from generation to generation . . . at other times they are Chicanos, practicing new and emergent cultural patterns and sustaining an ethnic community set apart from both Anglo and recent immigrant Mexicans.

Given the very disadvantaged socioeconomic status (SES) of Mexican Americans in general, if they were to fully assimilate to the White majority (in every

way except SES), they would have very high levels of infant mortality, much higher than those for the White population. However, behavioral and other unmeasured cultural differences are working to help protect against this. Certainly, differences in the familial and social contexts of childbearing among young women play a role, but these protective effects might be weaker in later generations. In fact, this emergence of a third, distinctive culture may even result in environments and behavioral patterns that would increase the group's disadvantage, as is suggested by segmented assimilation theory. It is apparent that US-born Mexican women are worse off than Mexican born women at almost every age on every outcome measured. In addition, US-born Mexican women appear to experience weathering to a greater degree than do foreign-born women, as reflected in the age-specific patterns of neonatal mortality and pregnancy related hypertension. Overall, despite their greater disadvantage, US-born Mexican women are still somewhat protected against negative health outcomes, perhaps due to the selective acculturation discussed above, which, in turn, may be due to the generational and spatial proximity of the immigrant community.

Given the importance of the community context, the socioeconomic future of Mexican Americans over time and across generations in the United States will depend, in part, on how the group spatially assimilates. Despite the fact that residential segregation for Hispanics is not as extreme as it is for Blacks,<sup>8</sup> evidence suggests that continued high levels of immigration are contributing to increased levels of residential segregation and isolation over time, particularly in metropolitan areas, though there is regional variation.<sup>8,38,39</sup> Although neighborhoods overall have become more racially and ethnically diverse, there has been an increase in the proportion of Hispanics living in socioeconomically disadvantaged minority only neighborhoods.<sup>39</sup>

To truly examine the effects of cumulative socioeconomic disadvantage (individual and community level) on Mexican-origin women, future research should focus on populations in these particular neighborhoods.

The data used in this study provide very reliable information on infant deaths and birth outcomes. Both these indicators show some evidence of within-group weathering, particularly for neonatal mortality. The information on maternal health indicators, however, is subject to reporting error, either because the woman herself was unaware of any health conditions, or because the interviewer filling out the birth certificate was unaware. To better test the weathering hypothesis as indicated by maternal health, data offering more consistent and reliable information on maternal health indicators are needed. Additionally, this study only examined within-group weathering and nativity differences. A necessary next step of the analysis would be to compare levels for both US-born Mexican and foreign-born women to those for White women to see if differentials in health indicators increase with age, and whether this differs by nativity or time spent in the United States.

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*Design and concept of study:* Wildsmith

*Acquisition of data:* Wildsmith

*Data analysis and interpretation:* Wildsmith

*Manuscript draft:* Wildsmith