X. Generational Differences in Perinatal Health among the Mexican American Population: Findings from HHANES 1982–84

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Abstract: Data from the Hispanic Health and Nutrition Examination Survey (HHANES) were used to examine a profile of social, medical, and behavioral characteristics associated with low birthweight (LBW) and miscarriages in first and second generation Hispanics of Mexican descent. The percentage of LBW was 5.3 and of miscarriages was 12.7. LBW rates were higher for second generation primipara and multipara compared with first generation women. Using multivariate logistic regression techniques and adjusting for complex design effects, generation was found to be a significant predictor of LBW but not of miscarriages. The findings support existing evidence that a Mexican cultural orientation protects first generation, Mexico-born women against a risk for LBW. However, the findings do not show significant effects of generation on miscarriages, suggesting that cultural effects are not consistent for all pregnancy outcomes. Furthermore, we suggest that the higher rates of LBW in second generation women are not due to a higher rate of miscarriages as has been hypothesized. [*Am J Public Health* 1990; 80(Suppl):61–65.]

Introduction

The Mexican-origin population in the United States has been growing sharply since 1970, largely as a result of high fertility rates and immigration. Despite the high birth rates of Hispanic women, little is known about their perinatal outcomes and their associated risk factors. Existing evidence, mainly derived from birth and death certificates, suggests that Mexican-origin women have birth outcomes similar to those of White non-Hispanic populations.[1–9]

Recent findings also suggest that birth outcomes are more favorable among first generation women born in Mexico than among second or successive generations of US-born women of Mexican descent. According to a 1985 nationwide study, only 5.0 percent of the infants of Mexico-born mothers were of low weight, compared to 6.3 percent of infants of US-born Mexican origin mothers and 5.7 percent of white non-Hispanic mothers.[7] Similar differential rates by birthplace have been found in California, the state with the largest concentration of Mexican descendants,[1] and most recently by Scribner and Dwyer[10] in a study of the Hispanic Health and Nutrition Examination Survey (HHANES).

The lower rates of low birthweight (LBW) of first generation mothers is intriguing and difficult to explain according to evidence derived from birth certificates.[1,4–7] Compared to US-born mothers of Mexican descent, foreign-born, first generation women have a lower socioeconomic status, a higher percentage of women over 35 years of age, and less adequate prenatal care.[2–4] On the basis of these risks, one would expect first generation mothers to have an increased risk of LBW. Recent evidence from the HHANES challenges this assumption. According to Scribner and Dwyer women with a Mexican cultural orientation have a reduced risk of LBW, even after controlling for sociodemographic characteristics and smoking.[10] A Mexican orientation serves as a marker for a lifestyle that is protective against the negative influences on pregnancy outcomes.[10,11]

A few other studies have suggested that the lower LBW rate in Mexico-born women may be related to a high rate of miscarriages which eliminate weaker fetuses.[12,13] Approximately 10 percent to 15 percent of pregnancies identified by conventional criteria end in clinically recognizable spontaneous abortions.[14] Miscarriage/stillbirth rates for Mexican American farmworkers range from 24 percent to 31 percent, depending on the target population and method of ascertainment.[15,16]

In this study, we use the HHANES data base to examine the acculturation and miscarriage hypotheses regarding more favorable LBW rates in Mexico-born compared with US-born women of Mexican origin. For this purpose we first explore a wide array of social, behavioral, and medical variables associated with LBW and miscarriages in first and second generation women of Mexican descent. We subsequently investigate the effects of generation on LBW, controlling for social, behavioral, and medical factors in separate predictive models for primipara and multipara. The use of separate models is based on findings by Eisner, *et al*,[17] indicating that multipara have a lower percent LBW than primipara and different factors predict LBW in each group. Finally, controlling for the other maternal characteristics in a multivariate regression model, we examine whether generational status also has an effect on miscarriages.

Methods

Sample

Data were obtained from the Medical History section of the HHANES which is a health survey conducted in 1982–84 of three Hispanic sub-populations (Mexican American, Puerto Rican, Cuban American)[18] living in selected areas of the United States.[18] The survey contains information on approximately 8,500 Mexican Americans residing in the southwestern US. Representatives were selected using a multistage, stratified area probability sample of households and residential clusters. All adult women of Mexican birth or origin, were initially included in this study if they were interviewed in the household and examined in a mobile examination unit and were between the ages of 16 and 55. We excluded women over age 55 due to concerns regarding recall accuracy. Out of 1,518 participants, 128 (8.4 percent) were excluded due to missing values of LBW, miscarriages, and/or generation which are the key variables of interest. Thus the final analytic sample consisted of 1,390 respondents.

Definition of Variables and Data Analysis Technique

Our two outcome variables are a history of LBW and of miscarriages (0 = no; 1 = yes) derived from the following HHANES questions:

- For *multipara*, "How many of your children (who were born alive) weighed less than 5½ pounds (2,500

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grams) at birth?" and "What is the total number of live births you have had?"

- For *primipara,* "Did this (the only) child weigh less than 5½ pounds (2,500 grams) at birth?"
- Other questions asked of *all women* were "What is the total number of miscarriages you have had?" and "How many times have you been pregnant?"

Generation, which is determined by the birthplace of the subjects, was selected as the primary independent variable. To allow for sufficient sample size, the original three-generation coding given in the data tape (first generation born in Mexico; second generation not born in Mexico, one or both parents born in Mexico; third or higher generation, neither parent born in Mexico) was collapsed into two groups: 1) subjects born in Mexico whose parents were born outside the US, and 2) subjects born in the US who had at least one parent born in Mexico or of Mexican descent.

Other social, behavioral, and medical variables were initially screened if they have been reported in the literature as significantly related to birthweight or miscarriages in non-Hispanic populations.[19,14] Only those variables that were at least moderately associated ($p \leq .20$) with LBW in pairwise analyses and/or with miscarriages in separate pairwise analyses (adjusting for number of live births and number of pregnancies, respectively) were included for further study.

The *social variables* considered in the predictive models for LBW and miscarriages are: 1) Medicaid coverage in the last 12 months prior to the interview; 2) highest grade of regular school completed; 3) family income which is the combined income obtained in the last 12 months from jobs, public assistance, rents, interests or other sources; 4) marital status which refers to whether a spouse is living in the home; and 5) age in years at the time of the interview.

The *behavioral factors* are: 1) current drinker status determined by asking of non-abstainers whether they have had a drink in the last 28 days; 2) current smoker status determined by the question "Do you currently smoke cigarettes?"; and 3) interval, in years, since the last Pap smear test, recoded into four ordinal categories ranging from last two weeks to never.

Medical factors include: 1) self-reported physician-diagnosed blood pressure or hypertension; 2) Quetelet index, i.e., a body mass index based on self-reported weight at age 25 and height (weight/height^2). On the basis of the pairwise analyses described above, three additional variables were included in the model for miscarriages, namely: self-reported physician diagnosed diabetes, heart problems, and self-perceived health status ranging from very good to poor.

Differences between the two generational groups for each independent and outcome variable were examined by performing Student's two sample t-tests for the continuous variables and chi-square tests for the categorical variables. Since the HHANES is a multistage, stratified probability sample of clusters of persons in area-based segments,[18] estimates were weighted using the "examined weights" and complex design effects were taken into account using the Super Carp program.[20] To facilitate presentation, only the weighted values and statistics are presented in the generational profile in Table 1.

Logistic regression was used (SAS Logist procedure)[21] to examine the effects of generation on each outcome variable controlling for the social, medical, and behavioral factors studied. Only cases which had complete information on all these variables were included in the analyses (n = 1,078). We ran simultaneous logistic regressions for all women and then separate models for primipara and multipara. From these results we estimated odds ratios and their 95 percent confidence intervals. For continuous or ordinal predictors, standardized odds ratios are estimated. These are presented in Tables 2–5. To check whether the statistical significance of some variables might be affected by collinearity with other variables, the simultaneous logistic procedure was followed

TABLE 1—Maternal Characteristics by Generation for Hispanic Women, HHANES 1982–84

Characteristics	First Generation			Second Generation and Beyond			
	N = 543	Weighted Mean or %*	S.E.	N = 847	Weighted Mean or %*	S.E.	p**
Social							
Education, M in years	543	M = 7.1	0.2	847	M = 10.6	0.3	.000
Income, M in $1,000 increments	543	M = 14.1	0.3	847	M = 15.8	0.4	.009
Medicaid last 12 months	541	5.9%	1.4	842	8.6%	1.1	.168
Married	541	75.8%	2.3	847	70.0%	2.0	.094
Age, M in years	543	M = 34.1	0.5	847	M = 34.3	0.4	.763
Live births, M number	543	M = 3.3	0.8	847	M = 3.1	0.4	.827
Behavioral							
Current smoker	528	21.1%	1.3	798	28.1%	1.6	.009
Current drinker	542	6.0%	1.0	847	12.4%	1.3	.005
Never had a Pap smear	538	11.1%	1.3	832	3.3%	1.1	.002
Biological							
History of high blood pressure	543	21.4%	2.2	847	22.4%	1.9	.740
Quetelet index at age 25	446			801			
Low Quetelet index		30.8%	1.6		28.6%	1.4	.517
Medium Quetelet index		56.8%	2.3		55.7%	1.7	
High Quetelet index		12.5%	2.3		15.7%	2.7	
History of diabetes	543	5.1%	0.5	847	8.0%	0.4	.002
History of heart problems	543	2.4%	0.6	846	4.8%	0.8	.043
Perceived health status, M	542	M = 3.28	0.03	847	M = 2.83	0.04	.000
Pregnancies, M number	543	M = 3.9	0.7	847	M = 3.7	0.6	.834

SOURCE: Hispanic Health and Nutrition Examination Survey, 1982–1984.
*Complex design effects also taken into account.
**p values represent the significance level for the first and second generation comparison in the weighted analysis.

up with a backwards stepwise regression.[21] Data in the models were weighted according to the scaled weighting procedure proposed by the National Center for Health Statistics, where the sum of the weights is equal to the observed sample size.[22] The results on Tables 2–5 were also examined adjusting for complex design effects using the estimated average design effect of 1.5 as described by Delgado, et al.[23]

Results

Generational Profiles of Maternal Characteristics

The two generational groups were similar with respect to age at interview (34.1 years for the first and 34.3 years for the second) and the proportion of primiparous women (19.7 percent in the first and 20.8 percent in the second). The findings in Table 1 indicate that a variety of significant changes take place between the first and second generation or beyond. Second generation women have a significantly higher educational attainment than first generation women. On the average they have 3½ more years of formal schooling. Family income is also significantly higher in the second generation despite the fact that, compared with the first generation, there are more women living without a spouse at home. From a behavioral standpoint, far more second generation women are smokers and drinkers than first generation women. However, significantly fewer second generation women have never had a Pap smear compared with those in the first. No significant differences in high blood pressure or Quetelet index were found between the two generations, but second generation women had significantly higher proportions of physician-diagnosed diabetes and heart problems. Despite reporting more medical problems, second generation women perceived their health status significantly better than first generation women.

Generational Effects on Low Birthweight

The percentage of low birthweight out of the total live births for Mexican origin mothers is 5.3 (S.E. = 0.04). This estimate is similar to the rates based on birth certificate data reported by Williams[1] (5.3 percent) and Ventura[5] (5.6 percent) and higher than those reported by Scribner and Dwyer[10] (4.8 percent) using an HHANES sample of older women up to age 74. Similar to Scribner and Dwyer, we found that LBW rates differ significantly for the two generational groups. Out of the total live births for the first generation 3.9 percent (S.E. = 0.7) are of LBW, whereas out of the total live births for the second generation, 6.1 percent (S.E. = 0.7) are of LBW. The generational effects on LBW are significant, even after adjusting, in a logistic regression model, for the social, behavioral and medical characteristics. The risk of LBW is 1.73 times higher (95% CI = 1.11, 2.71) in the second generation compared with the first (Table 2). This result remains significant even after adjusting for complex design effects.

We examined the generational differences in birthweight outcomes in the two parity groups and found that, in the first generation, the LBW rate was 6.3 percent (S.E. = 1.8) in primipara and 3.8 percent (S.E. = 0.05) in multipara. In the second generation, primipara also had higher rates: 9.7 percent (S.E. = 2.4) compared with 5.9 percent (S.E. = 0.06) in multipara. These estimates indicate that although the percentage of LBW increases in the second generation, in both generations primipara have LBW rates that are almost 1.5 times higher than multipara.

As shown in Table 3, we found that after adjusting for the potential confounders included in the logistic regression model, the risk of LBW is approximately four times higher for second than first generation primiparous women (OR 4.08; 95% CI = 0.81, 20.45). The risk factor, however, was not statistically significant at the p = .05 level, possibly due to small sample size. The risk for LBW is five times higher for primiparous women with a physician-diagnosed history of high blood pressure (OR 5.07; 95% CI = 1.59, 16.20) and it almost doubles when the interval since last Pap smear is greater than one standard deviation from the mean (OR 1.87; 95% CI = 1.09. 3.20). After adjusting for complex design

TABLE 2—Adjusted Odds Ratios⁺ for Low Birthweight (n = 1078)

Variables	Adjusted Odds Ratios*	95% CI
Generation (0 = first, 1 = second or beyond)	1.73	1.11, 2.71
Number of live births	1.37	1.13, 1.67
Age at interview	1.13	0.91, 1.41
Marital status (0 = no spouse home; 1 = spouse at home)	0.92	0.58, 1.47
Years of education	0.93	0.75, 1.15
Income	0.93	0.75, 1.14
Medicaid coverage (0 = no; 1 = yes)	0.83	0.39, 1.78
Current drinker status (0 = abstainer; 1 = drinker)	0.76	0.41, 1.40
Current smoker status (0 = no; 1 = yes)	1.58	1.05, 2.38
Interval since last Pap smear	1.01	0.84, 1.21
Low Quetelet index at age 25 (0 = no; 1 = yes)	1.46	**
High Quetelet index at age 25 (0 = no; 1 = yes)	1.26	
History of high blood pressure (0 = no; 1 = yes)	1.25	0.82, 1.91

SOURCE: Hispanic Health and Nutrition Examination Survey; 1982–84

⁺ Logistic regression analysis techniques were used to obtain the adjusted odds ratios.

*For the continuous and ordinal variables, live births, age at interview, education, income and interval since last pap smear, standardized odds ratios are presented. (The odds ratio of LBW for the increase of one standard deviation of the predictor.)

**To evaluate the Quetelet index (a nominal variable with 3 categories), a X^2 test statistic with 2 D.F. was obtained from the difference of two log likelihood functions and was found to be not statistically significant.

TABLE 3—Adjusted Odds Ratios⁺ for Low Birthweight among Primiparous Women (n = 187)

Variables	Adjusted Odds Ratios*	95% CI
Generation (0 = first, 1 = second or beyond)	4.08	0.81, 20.45
Age at interview	0.97	0.53, 1.77
Marital status (0 = no spouse home, 1 = spouse at home)	1.23	0.31, 1.51
Years of education	0.98	0.51, 1.91
Income	1.32	0.68, 2.59
Medicaid coverage (0 = no; 1 = yes)	0.30	0.02, 4.18
Current drinker status (0 = abstainer; 1 = drinker)	0.93	0.78, 1.11
Current smoker status (0 = no; 1 = yes)	0.62	0.16, 2.43
Interval since last Pap smear	1.87	1.09, 3.20
Low Quetelet index at age 25 (0 = no; 1 = yes)	1.28	**
High Quetelet index at age 25 (0 = no; 1 = yes)	1.06	
History of high blood pressure (0 = no; 1 = yes)	5.07	1.59, 16.20

SOURCE: Hispanic Health and Nutrition Examination Survey; 1982–84

⁺Logistic regression analysis techniques were used to obtain the adjusted odds ratios.

*For the continuous and ordinal variables, standardized odds ratios are presented.

**To evaluate the Quetelet index (a nominal variable with 3 categories), a χ^2 test statistic with 2 D.F. was obtained from the difference of two log likelihood functions and was found to be not statistically significant.

effects, the only significant predictor that remained was blood pressure.

The effect of generation on LBW was significant for multiparous women. The findings in Table 4 show that the risk of LBW is almost double for second generation women (OR 1.69; 95% CI = 1.05, 2.84) and for current smokers (OR 1.79; 95% CI = 1.16, 2.76). Smoking remained a significant predictor even after adjusting for complex design effects. Results similar to those obtained with the logistic regression techniques were obtained when doing backwards stepwise regressions for primipara and multipara.

Generational Effects on Miscarriages

The percentage of miscarriages out of the total number of pregnancies for Mexican origin mothers is 12.7 percent (S.E. = 0.59). This rate falls within the expected range for spontaneous abortions in the mainstream population.[14] Furthermore, the rates for the two generational groups are not significantly different. Out of the total number of pregnancies for the first generation, 13.1 percent (S.E. = 0.99) have had miscarriages. For the second generation the percentage of miscarriages is 12. 5 percent (S.E. = 0.60).

Using logistic regression, we examined whether generation becomes a significant predictor of miscarriages after adjusting for the social, behavioral and medical factors listed in Table 5. Generation was not a significant predictor of miscarriages (OR 0.81; 95% CI = 0.57, 1.15). The adjusted odds ratios reported in Table 5 indicate that miscarriages increase 1.25 times with every increase in one standard deviation in education (95% CI = 1.04, 1.51); it increases 1.47 times (95% CI = 1.79, 1.22) with every decrease in one standard deviation in age and 1.43 times among women without a spouse living at home (95% CI = 2.13, 0.97). Education and age remained significant after adjusting for complex design effects.

Since Scribner and Dwyer[10] reported that generation was not as strong a predictor of pregnancy outcome as acculturation, we examined the role of acculturation in predicting miscarriages. Like Scribner and Dwyer, we looked at the effect of the acculturation index with and without including generation and found that it was not a significant predictor of miscarriages.

Nor was generation a significant predictor of miscarriages when logistic models were constructed separately for primipara and multipara (primipara: OR 0.76; 95% CI = 0.31, 1.87; multipara: OR 0.91; 95% CI = 0.62, 1.34). However, for primipara, an older age at interview (OR 1.74; 95% CI = 1.17, 2.57) and Medicaid coverage (OR 3.30 95% CI = .93; 11.69) was positively associated with miscarriages, whereas in multipara age and socioeconomic factors were inversely associated with miscarriages (age OR 0.64; 95% CI = 0.52, 0.78; income OR 1.17; 95% CI = 0.97, 1.42; education OR 1.22; 95% CI = 1.00, 1.49).

TABLE 4—Adjusted Odds Ratios[+] for Low Birthweight among Multiparous Women (n = 892)

Variables	Adjusted Odds Ratios*	95% CI
Generation (0 = first, 1 = second or beyond)	1.69	1.05, 2.84
Number of live births	1.37	1.11, 1.68
Age at interview	1.18	1.05, 1.33
Marital status (0 = no spouse home, 1 = spouse at home)	0.86	0.52, 1.44
Years of education	0.92	0.73, 1.16
Income	0.89	0.79, 1.11
Medicaid coverage (0 = no; 1 = yes)	0.97	0.43, 2.20
Current drinker status (0 = abstainer; 1 = drinker)	0.79	0.41, 1.52
Current smoker status (0 = no; 1 = yes)	1.79	1.16, 2.76
Interval since last Pap smear	0.89	0.72, 1.09
Low Quetelet index at age 25 (0 = no; 1 = yes)	1.46	**
High Quetelet index at age 25 (0 = no; 1 = yes)	1.38	
History of high blood pressure (0 = no; 1 = yes)	0.95	0.60, 1.51

SOURCE: Hispanic Health and Nutrition Examination Survey; 1982–84
[+]Logistic regression analysis techniques were used to obtain the adjusted odds ratios.
*For the continuous and ordinal variables, standardized odds ratios are presented.
**To evaluate the Quetelet index (a nominal variable with 3 categories), a χ^2 test statistic with 2 D.F. was obtained from the difference of two log likelihood functions and was found to be not statistically significant.

TABLE 5—Adjusted Odds Ratios[+] for Miscarriages (n = 1078)

Variables	Adjusted Odds Ratios*	95% CI
Generation (0 = first, 1 = second or beyond)	0.81	0.57, 1.15
Pregnancy number	3.92	3.09, 4.96
Age at interview	0.68	0.56, 0.82
Marital status (0 = no spouse home, 1 = spouse at home)	0.69	0.47, 1.03
Years of education	1.25	1.04, 1.51
Income	1.15	0.97, 1.37
Medicaid coverage (0 = no; 1 = yes)	0.96	0.52, 1.75
Current drinker status (0 = abstainer; 1 = drinker)	0.99	0.60, 1.61
Current smoker status (0 = no; 1 = yes)	1.11	0.78, 1.58
Interval since last Pap smear	0.91	0.78, 1.06
Low Quetelet index at age 25 (0 = no; 1 = yes)	1.13	**
High Quetelet index at age 25 (0 = no; 1 = yes)	0.96	
History of high blood pressure (0 = no; 1 = yes)	1.23	0.86, 1.76
History of diabetes (0 = no; 1 = yes)	1.25	0.70, 2.24
History of heart problems (0 = no; 1 = yes)	1.07	0.52, 2.20
Perceived health status	1.09	0.93, 1.29

SOURCE: Hispanic Health and Nutrition Examination Survey; 1982–84
[+]Logistic regression analysis techniques were used to obtain the adjusted odds ratios.
*For the continuous and ordinal variables, standardized odds ratios are presented.
**To evaluate the Quetelet index (a nominal variable with 3 categories), a χ^2 test statistic with 2 D.F. was obtained from the difference of two log likelihood functions and was found to be not statistically significant.

Discussion

The findings from this study show that for the Mexican origin population in the United States the percentage of LBW was 5.3 and the percentage of miscarriages was 12.7. Whereas the incidence of LBW in this population is lower than that for the general population, the rate of miscarriages seems similar to what is expected for the mainstream population.[5,8,14]

Mexican Americans are a heterogeneous group and our analysis demonstrates that wide variations are found according to generation and parity. US-born Mexican Americans are at 60 percent higher risk for LBW than Mexico-born women. Furthermore, the rate of LBW among US-born primipara at 9.7 percent begins to approximate that of the Black population.[19]

The findings, based on a rich array of variables, further demonstrate that across generations, significant changes take place in certain bio-social-behavioral characteristics of mothers which are associated with pregnancy outcomes (Table 1). While second generation Mexican American women show a higher educational and income status and more use of health care relative to their first generation counterparts, certain behavioral characteristics such as smoking and drinking behaviors actually deteriorate in the second generation. The

second generation also has higher rates of physician-diagnosed diabetes and heart problems. However, this could be a result of improved access to care rather than to poor health status.

Our multivariate models indicate that generation is a significant predictor of LBW but not of miscarriages. This evidence points to two important findings: first, even after controlling for other factors, US-born Mexican origin women of the second generation or beyond have a higher likelihood of giving birth to LBW infants; and second, these patterns are not consistent for all pregnancy outcomes.

According to the acculturation model, the behaviors or lifestyles that protect women against adverse pregnancy outcomes are associated with a Mexican cultural orientation which predates pregnancy. If this were the case, we would have expected that generation (as a proxy for acculturation) would have been a significant predictor, not only of LBW but also of miscarriages. Evidence from this study does not support this conclusion. The findings show no significant effects of generation or the acculturation index on miscarriages. Rather than cultural factors, the results suggest that socioeconomic, genetic, and unaccounted medical factors are better predictors of miscarriages in Latinas.

Furthermore, the findings do not support the hypothesis that increased fetal losses explain the more favorable LBW outcomes in first generation Mexican-Americans.[12,13] The 13.1 percent miscarriage rate in the first generation was very similar to the 12.5 percent found in the second generation.

However, the possibility of reporting bias cannot be discounted in this study. Underreporting miscarriages among first generation women could occur as a result of less education which leads to less body awareness or less likelihood of recognition of miscarriages. Furthermore, compared with US-born, Mexico-born women are more likely to seek prenatal care late or none at all,[5] and thus are less likely to receive a medical diagnosis if miscarriages occur. Conversely, because induced abortion in Mexico is illegal, Mexico-born women could be misreporting induced abortion as miscarriages to make it more acceptable.[24] The possibility of measurement error also arises given the potential ambiguity concerning what events actually constitute a miscarriage. We suspect that miscarriages may be more prone to reporting bias than LBW, particularly among less educated women. Hence, further studies are needed to confirm the validity of the fetal loss hypothesis.

Because the HHANES is a cross-sectional, retrospective survey, variables do not necessarily measure the conditions or behaviors at the time of birth, hence possibly washing away some of the effects. In this study, the recall bias was as long as 40 years and no attempts at verifying the accuracy of the miscarriage or LBW information given to the mother at the time of delivery were made in the HHANES. Nevertheless, some of the traditional risk factors e.g. smoking for LBW and e.g. age for miscarriages are corroborated using the HHANES data. Furthermore, the results of LBW are consistent with those found by Williams, *et al*,[1] in California. The latter found that the lower rates of LBW among Mexico-born compared with US-born women of Mexican origin could not be the result of systematic underreporting by Mexican women.

In conclusion, the findings from the HHANES suggest that cultural explanations of differential pregnancy outcomes in women of Mexican origin must be restricted to LBW. The evidence strongly argues for the need to include generation as a risk factor when doing studies of LBW in Mexican-Americans. Further studies are also needed to assess the extent to which prematurity or intrauterine growth retardation determine pregnancy outcomes in each generation. This is a question that cannot be addressed in the HHANES.

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